International Exhibition

INVENTCOR

3rd edition

Editor: Corneliu BIRTOK BĂNEASĂ

CORNELIUGROUP Research-Innovation Association

INVENTCOR

Power of Creative Mind



Posters

SCAN ME

Deva, Romania

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Posters 3rd International Exhibition InventCor
15-17.12.2022 – Deva, Romania

International Exhibition InventCor, 3rd edition

CORNELIUGROUP research-innovation Association in collaboration with **Romanian Association for Alternative Technologies Sibiu - A.R.T.A. Sibiu** organizes online, the **International Exhibition INVENTCOR, 3rd edition**

Description: Non-formal educational event for all ages. **INVENTCOR** presents inventions, research projects, products, educational programs, experimental teaching stands of universities, research institutes, multinational companies and private inventors.

The exhibition will also include the **KidsCorner**, **InnovativeART** as well as extensive presentations from various fields: innovation, ecology, health, people's safety, community, intellectual property, automotive and travel.

Objective: The main objective of the International Exhibition INVENTCOR is the importance of developing the creative – innovative spirit, through the involvement of young people.

Site: CORNELIUGROUP association http://corneliugroup.ro/inventcor.html

FB event page: INVENTCOR 2022 https://fb.me/e/1i6Z8zDTV

Period & Location: 15-17.12.2022 Online

Motto: **C**reation **O**pportunity **R**ealization

Promo: https://youtu.be/OLU406znO18

Hashtag: #InventCOR2022 #CorneliuGroup #PutereaMintiiCreative

Origin: Deva City





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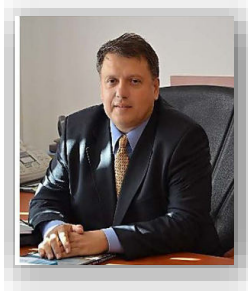

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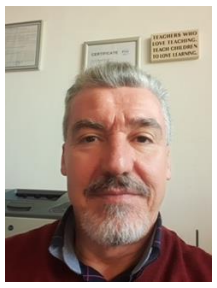

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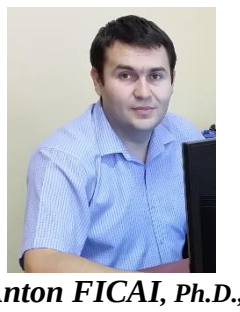

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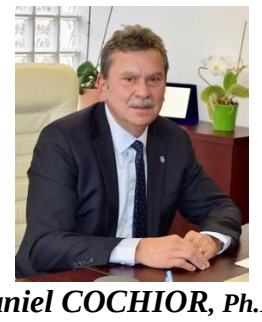

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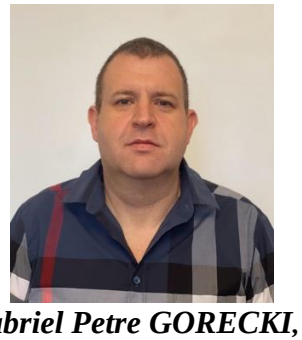

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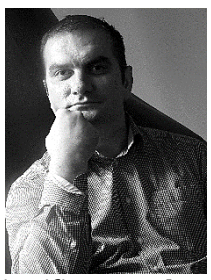

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F - Medicine, Paramedical, Pharmacy, Cosmetics, Hygiene

G - Agriculture, Veterinary medicine

H - Foods, Drinks, Restaurants, Hotels & Spa

I - Textiles, Clothing, Fashion, Handmade

J - Kids Corner, Games, Toys, Outdoor activities

K - Innovative ART, Music, Video, Photography, Publicity

A

Energy

Protection of the environment

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A

Title

EQUIPMENT AND PROCESS OF DECONTAMINATION BY WASHING OF HEAVY METAL POLLUTED SOILS

Inventor/s - Contact

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Damian Gianina Elena, gianina.damian@uab.ro, 0742143523;
Micle Valer, valer.micle@imadd.utcluj.ro, 0741160356.

Patent/ Application number

Patent OSIM: RO133822 -B1/29.04.2021

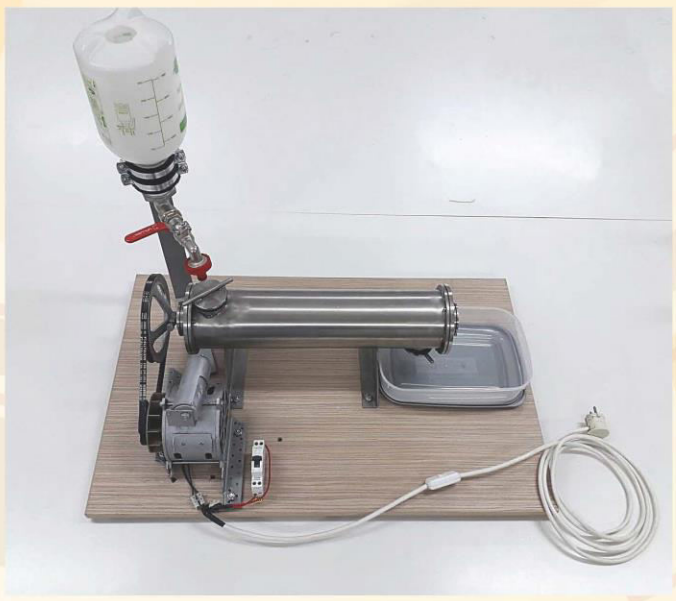
Short presentation

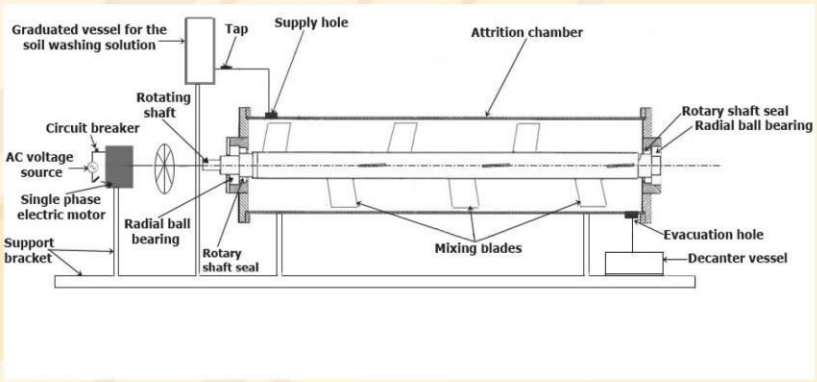
The process uses a suitable mixing and shredding equipment where the contaminated soil together with the washing solution containing potassium salts of humic acids and chitosan is introduced into the attrition chamber, inclined at 1 with respect to the horizontal plane. The stirring of the mixture in the attrition chamber is performed with 12 mixing blades arranged on a rotating shaft and inclined at 3 with respect to the rotating shaft. The rotating shaft is driven by an electric motor. This decontamination process and equipment for washing of heavy metal polluted soils ensures a high contact of the soil particles with the washing solution, which leads to high efficiency. By using this process and equipment the need for soil sorting on small particle size prior the decontamination is eliminated, and it is also an ecological process due to the nature of the washing agents used. By using this equipment and process in the case of treating, in a single step and under optimal conditions, an amount of 400 g of sandy soil contaminated with heavy metals with an initial concentration of 633.05 mgkg-1 of lead, 424.81 mgkg-1 of copper, 201.76 mgkg-1 of zinc, 45.38 mgkg-1 of chromium and 13.68 mgkg-1 of nickel using a washing agent containing 5% soluble potassium salts of humic acids (pH=9.60), in a soil:solution ratio of 1:5 (g:mL) and a stirring time of 360 minutes at 700 rpm, the decontamination efficiency reaches 99.06% and 37.65% in the case of lead and copper, respectively. In the case of treating, in a single step and under optimal conditions, an amount of 250 g of the same sandy soil using a washing agent containing 2% chitosan (pH=7.88), the decontamination efficiency reaches 91.02% and 49.79% in the case of lead and copper, respectively.

Applicability

Decontamination of soils polluted with heavy metals - an innovative soil washing process and equipment for decontamination of soils polluted with heavy metals using soluble potassium salts of humic acids and chitosan have been developed. The soil washing equipment developed can also be adapted to treat polluted soil with organic pollutants and to use other washing agents. Ecological rehabilitation of heavy metal polluted sites – a larger capacity soil washing plant based on this patent can be used for the ecological rehabilitation of heavy metal polluted sites.

Images





AAM ADSORBENTS FOR COPPER AND NICKEL IONS REMOVAL

MASDIYANA BINTI IBRAHIM, DR WAN MASTURA BINTI WAN IBRAHIM, PROF. DR. MOHD MUSTAFA AL-BAKRI ABDULLAH, DR ROMISUHANI BINTI AHMAD,AHMAD SYAUQI SAUFFI, IZZAH NADHIRAH ZALANI, IZZAH ATIRAH HARISLIKI, RAQIBAHTUL HUSNA AZAHAR, MOHAMAD ARVIN MOHD GHANI.

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Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP)
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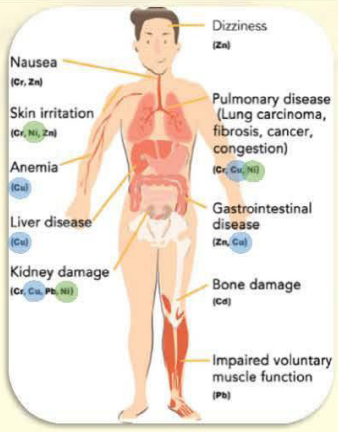
Patent Number : P12020004793



PRODUCT DESCRIPTION



- The most common toxic heavy metals in wastewater include copper, nickel, lead, mercury, cadmium, chromium, silver, and zinc.
- The release of high amounts of copper and nickel ions into water bodies creates serious health and environmental problems.
- New technology of self-supported metakaolin based alkali activated materials (AAMs) for copper and nickel metal ions adsorption through geosynthesis reaction that chemically integrates minerals that involves naturally occurring aluminosilicate sources to form 3D tetrahedral network.
- Additions of foaming agents increased the porosity and consequently the permeate flux with a reasonable compressive strength.
- This metakaolin based alkali activated materials have good properties of adsorbent which are large surface area, isotropic pore size distribution, available polar sites, and reproducibility in the degree of activation.

A

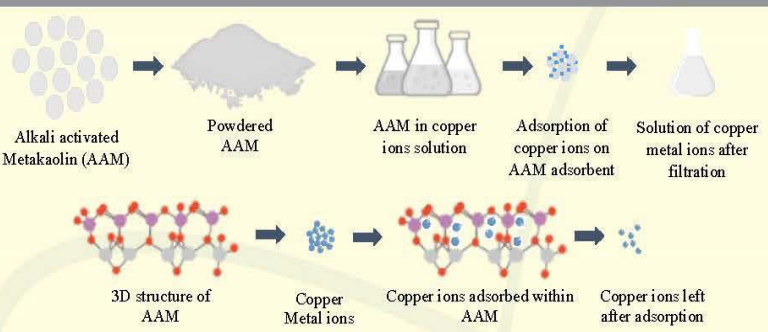
PROBLEM STATEMENTS

- Conventional ceramic/membrane fabrication and processes having complicated chemistry, high cost and time depends on the materials type.
- Highly toxic copper and nickel metals ions present as pollutants in industrial wastewater.

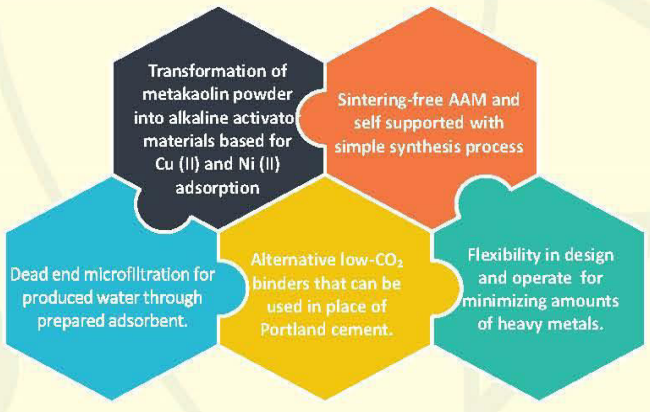
PRODUCT PROPERTIES

Water Absorption	:	32.24 %
Density	:	1.152 g/m^3
Specific Surface Area	:	28.5 m^2/g compared to metakaolin based AAMs unfoamed only at 9.6 m^2/g
Volume of Pores	:	0.194348 cm^3/g compared to metakaolin based AAMs unfoamed at 0.034969cm^3/g
Compressive Strength	:	17.98 MPa that can survive in harsh corrosive environment.
Structure	:	Possessed a distinct and homogenous porous structure which could provide channels for liquid penetration

PRODUCT SYNTHESIS

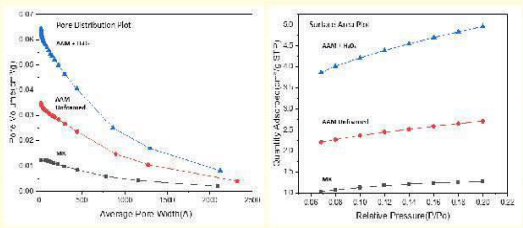


NOVELTIES

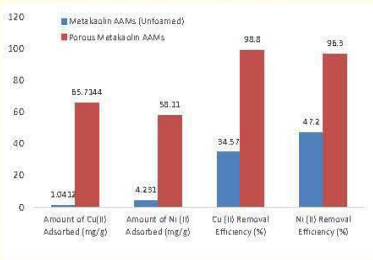


PRODUCT ANALYSIS

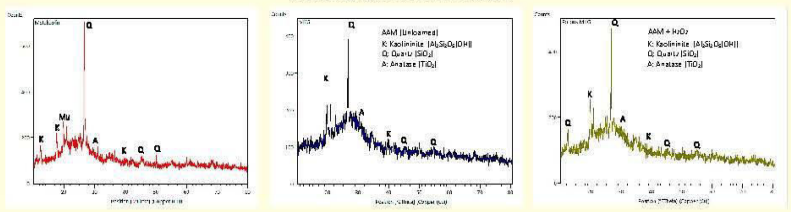
Surface Area and Pore Size Distribution of Alkali Activated Metakaolin



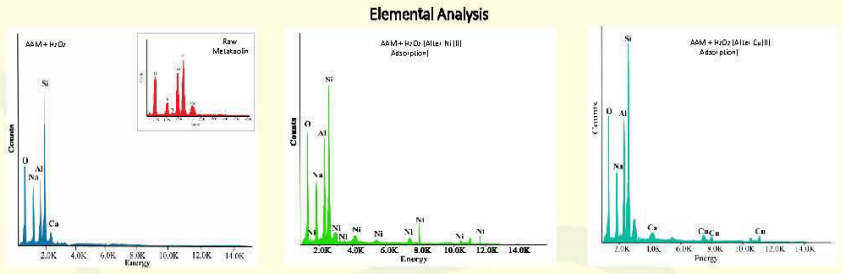
Cu (II) and Ni (II) Adsorption Test



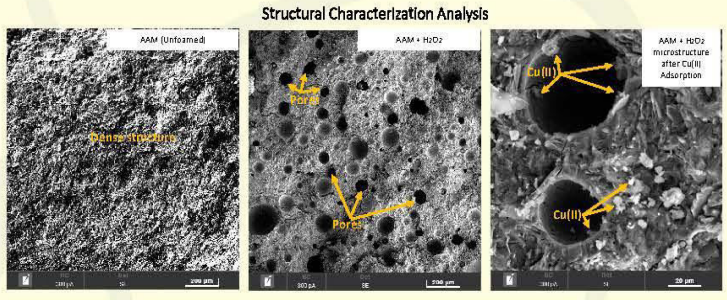
Crystallographic Structure Analysis



Elemental Analysis



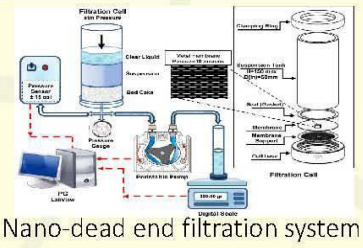
Structural Characterization Analysis



POTENTIAL APPLICATION



Recommended to replace conventional ceramic membrane in existing waste water treatment



Nano-dead end filtration system

Publication:
1. A Review of Geopolymer Based Metakaolin Membraneas an Effective Adsorbent for Waste Water Treatment.
2. Effect of Solid to Liquid and Na_2SiO_3 to NaOH Ratio on Metakaolin Membrane Geopolymers .
3. Phase Analysis of Different Liquid Ratio on Metakaolin/Dolomite Geopolymer.

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Power of Creative Mind

Optoelectronic neural network based on dye-sensitized solar cells for zero electric power consumption

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Project number PN-III-P2-2.1-PED-2021-0624

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A

Description

The European Green Deal 2021 proposes ambitious environmental goals which require a green transformation of many sectors of society, in especially a sustainable development of urban areas, "smart city", being a challenge of key importance. The transformative potential of artificial intelligence (AI) to contribute to the achievement of the goals of a green transition have been increasingly and prominently highlighted. At the same time, digital technologies such as AI considerably increase energy and resource consumption and create risks of adverse environmental effects. In this context, the solar cells open a new perspective as the most suitable candidate for zero electric power consumption. The dye-sensitized solar cell (DSSC) has the essential characteristics that could make these cells the ideal candidate for artificial intelligence system with zero electric power consumption. A singular preliminary proof of the DSSCs learning capabilities was highlighted by Gratzel, the inventor of DSSC, using the exposure time as a cue for learning under 1 sun-simulated conditions. This new perspective for AI devices which are the optically learning solar cells, have the potential to serve as building blocks for intelligent optoelectronics enabling visually interacting machines that operate at minimal power and zero electric power consumption, in both outdoor and indoor lighting conditions..

In this context, ***the project is aimed*** to design, build, learning and test an optoelectronic neural network prototype based on dye-sensitized solar cells for zero electric power consumption in the outdoor and indoor lighting conditions, as a technically and economically credible concept for the artificial intelligence devices. The optoelectronic neural network prototype is presented in fig.1 and consists in (i) photonic layer provided by a natural or artificial light sources, (ii) the arrays of our DSSCs presented in fig.2 and (iii) electronic layer which consists of the electrons generated by the DSSCs

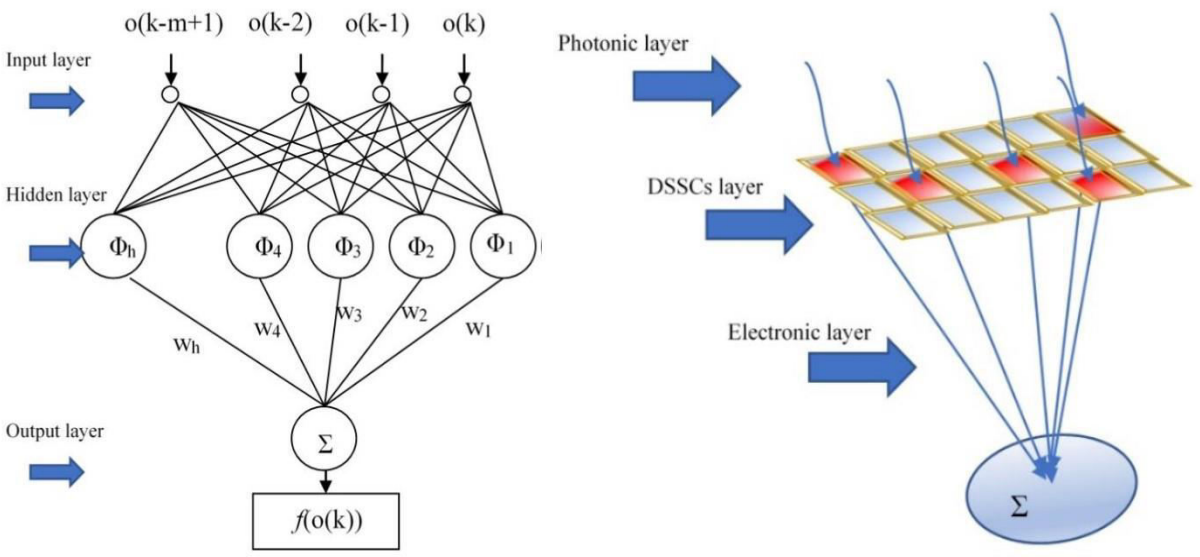

Fig. 1. The optoelectronic neural network prototype based on dye-sensitized solar cells for zero electric power consumption (left side) and the theoretical neural network architecture (right side) [original work].

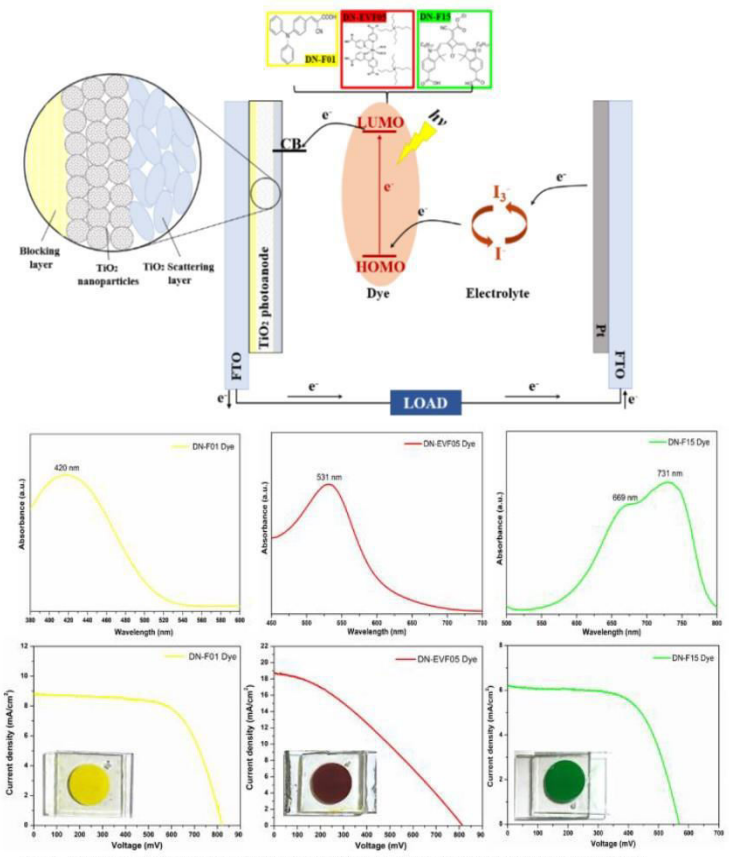

Fig. 2. Our works to be published in 2021: (a) Schematic configuration of DSSCs based on TiO_2 and (b) our DSSCs for broad solar spectrum (UV-Vis-NIR) 1 sun illumination.

According with the outcomes of the project, the **main objective** of the project is to develop an *optoelectronic neural network working prototype based on dye-sensitized solar cells* for zero electric power consumption, the additional objectives correlated with the successful implementation of the project are the following:

O.1. Design, build, and test the efficient and low-cost n-type DSSCs based onTiO_2 and dyes which absorb in UV, Vis and NIR for outdoor lighting conditions (OLCs).

O.2. Learning the efficient and low-cost n-type DSSCs based on TiO_2 for OLCs, as the future neurons of the optoelectronic neural network.

O.3. Models and simulate the optoelectronic neural networks for OLCs.

O.4. Design, build, and test the efficient and low-cost n-type DSSCs based on TiO2 for indoor lighting conditions (ILCs), as the future neurons of the optoelectronic neural network.

O.5. Learning the efficient and low-cost n-type DSSCs based onTiO_2 for ILCs, as the future neurons of the optoelectronic neural network.

O.6. Models and simulate the optoelectronic neural networks for ILCs.

O.7. Design, build, test and implementation of *an optoelectronic neural network working prqtotype based on dye-sensitized solar cells* for zero electric power consumption.

Acknowledgment
This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, UEFISCDI, Project No. PN-III-P2-2.1-PED-2021-0624, within PNCDI III.

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Research and Development in Construction, Urban Planning and Sustainable Territorial Development National Institute "URBAN - INCERC, R&DNI "URBAN - INCERC„

RESEARCH AND DEVELOPMENT ACTIVITY IN THE ALTERNATIVE ENERGY INDUSTRY AND ITS IMPACT ON THE ENVIRONMENT AND POPULATION

Research Project

Author/s: Mircea-Iosif RUS, Larissa Margareta BĂTRÂNCEA, Adrian-Victor LĂZĂRESCU

A

Over time, it has been observed that there is an increase in energy consumption, which causes fossil fuel resources to decrease and, at the same time, to pollute the atmosphere. Moreover, worldwide, conventional energy is owned by a limited number of organizations that, for this reason, can afford to dictate the amount exploited and set energy prices, a resource of strategic importance. Under these conditions, renewable or alternative energy, produced by nature, has become very important, being a life-saving solution in these conditions, cheap and with a very high impact on the environment.

Today, the global temperature has risen by 1.1°C more than 30-40 years ago, although the COVID-19 pandemic has caused a decrease in CO_2 emissions, global warming remains on a wrong path, which it affects us all.

Alternative energy is also obtained due to the research-development activity, activity from which it is going to put into practice its results. These results are present especially in the investments made, subsequently, by the companies producing alternative energy.

Alternative energy, also called green energy, is produced by or by unconventional, renewable sources that have a low negative impact on the environment.

Alternative energy sustainably replaces conventional energy, and this leads to increased energy independence and, at the same time, decreases the negative impact on the environment.

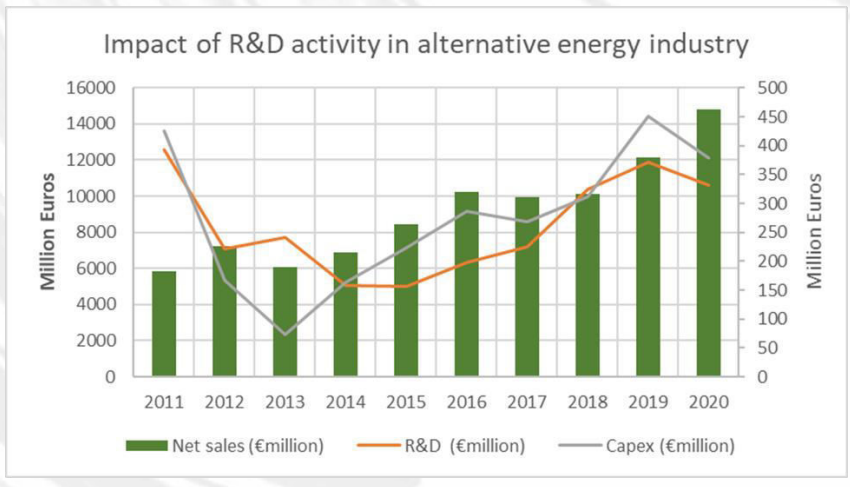


In recent decades, the public policies of many states have encouraged the production of energy produced by other sources by applying incentives to producers.



The main types of alternative energy are: wind energy, solar energy, hydraulic energy, geothermal energy and biomass.





Alternative energy has **several advantages:**

- -its sustainability character because it can occur in the long run and the costs are quite low;
- -this energy is renewable and its consumption does not have the effect of diminishing resources;
- -renewable energy is ecological and does not affect the environment, that is why it is also called green energy;
- -costs for this energy are reduced to zero because wind, sun, geothermal water and energy of watercourses are nothing but free and unlimited sources for alternative energy;
- -maintenance costs are low, especially for solar and wind energy.

But we must not forget that these advantages of alternative energy have many years of research and development, the results of which have been put into practice.

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UniMAP

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Cu-Doped AC/TiO_2 Ternary Composite Photocatalyst for Efficient Pharmaceuticals Water Treatment

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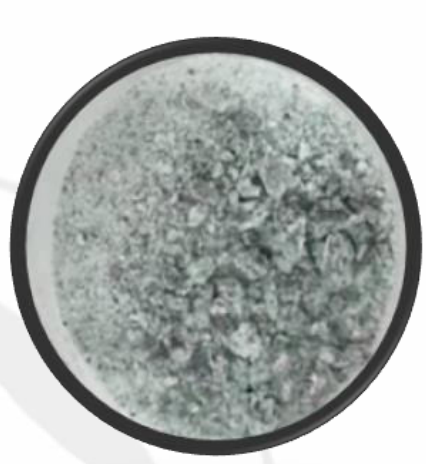
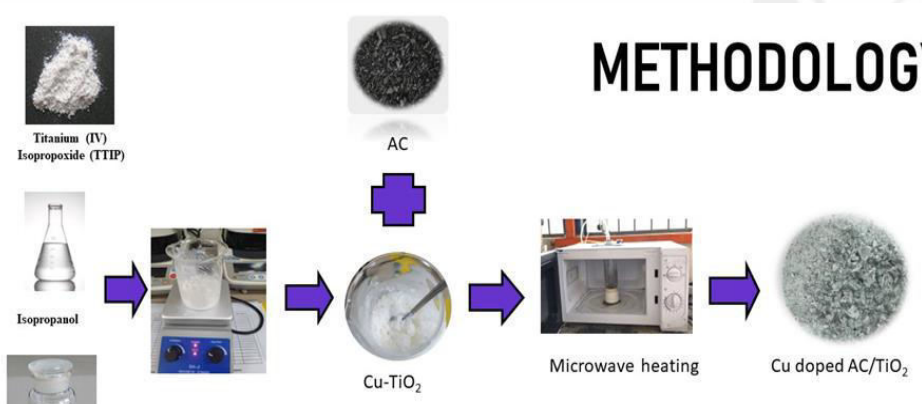
Author/s: Noorulayuni Atiqah Yaacob, Azduwin Khasri, Noor Hasyierah Mohd Salleh, Mohd Ridzuan Mohd Jamir and Mohd Mustafa Al Bakri Abdullah

Summary of invention

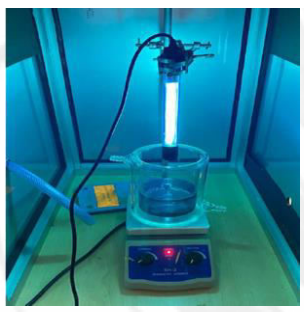
Wastewater produced by pharmaceutical industries contains non-biodegradable organics, such as antibiotics drugs, ineffectively removed by traditional wastewater treatment systems. Thus, some pharmaceutical by products end up as persistent contaminants in water bodies. The photocatalysis is a promising advanced oxidation process, which usually uses heterogeneous titanium dioxide (TiO_2) as a photocatalyst to degrade pollutants by the decomposition and oxidation processes on its surface. However, it suffers from low photocatalytic activity because of its intrinsic wide band gap. Therefore, assembling Cu-AC/TiO_2 ternary composite structure can simultaneously increase pollution uptake, extend the light absorption edge, and reduce the recombination of electrons and holes via synergistic effect of AC and metal Cu.



Production of photocatalyst

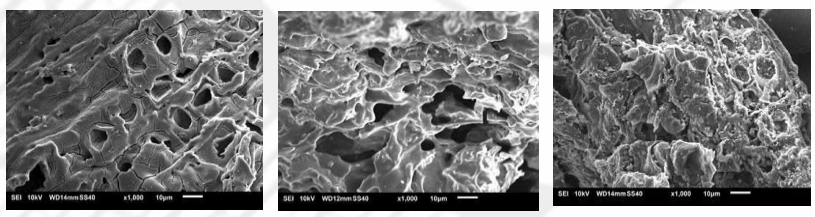


Adsorption/photodegradation



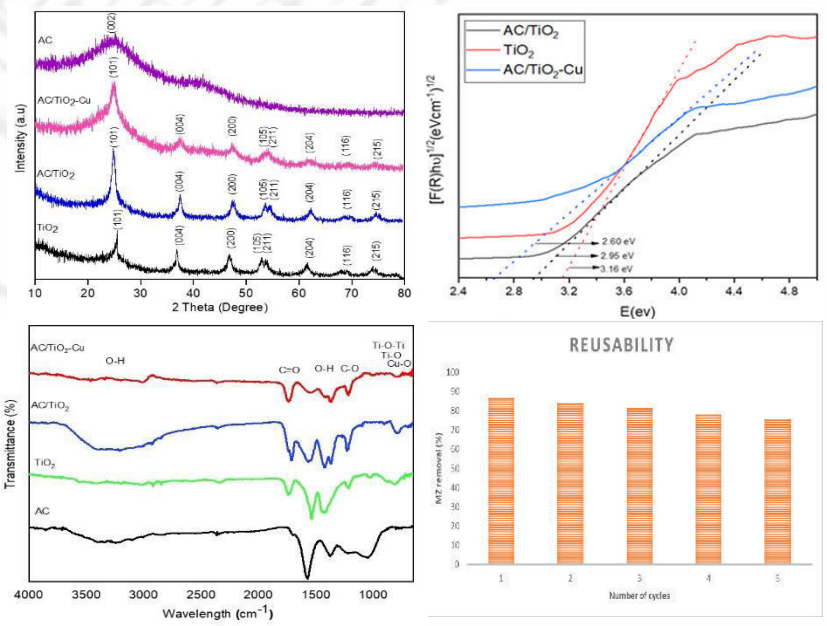
Adsorption/photodegradation process was carried out in photoreactor that equipped with 254 nm UV-light source

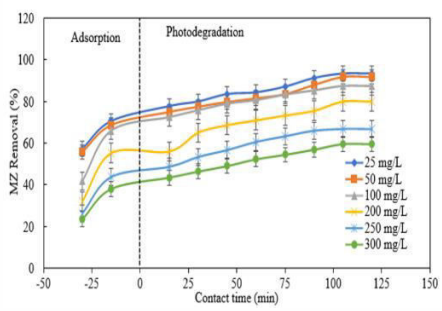
Characterization Results



AC AC/TiO_2 Cu doped AC/TiO_2

FTIR, XRD, UV DRS Analysis, and Reusability





Novelty & Advantages

A novel Cu-AC/TiO_2 ternary composite synthesized via sol-gel and rapid heating via microwave irradiation. Successful Cu-AC/TiO_2 surface reducing its band gap and improve efficiency up to 90% pharmaceuticals removal from aqueous solutions under 254 nm UV irradiation for 120 minutes. Cu-AC/TiO_2 ternary composite photocatalyst showed remarkable adsorption properties and great efficiency for recycle performance making this material as a promising and economically sustainable solution to water depollution.

Applications

A potential sorbent for removal of various toxic pollutants and dye molecules from wastewater and can be used for water and air purification.

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Inventors

Syiefa Nafisah Binti Aminnudin, Ts. Dr Amira Mohd Nasib, Ir. Ts. Dr. Mohamad Syahmie Mohamad Rasidi, Dr. Siti Kartini binti Enche Ab Rahim, Ts Dr Hoo Peng Yong, Dr Ng Qi Hwa, Prof. Ts. Dr. Mustafa Albakri Abdullah

Contact Details

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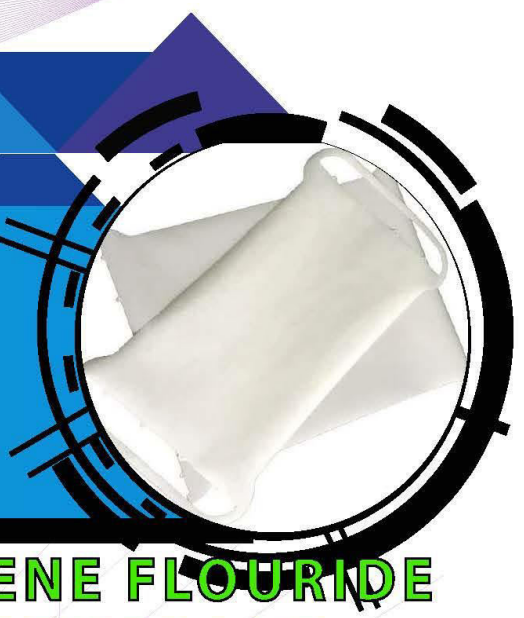

"SELF-CLEANING ASSYMETRIC POLYVINYLIDENE FLOURIDE -CO-POLYTETRAETHYLENE (PVDF-CO-PTFE) MEMBRANE FILLED WITH TITANIUM DIOXIDE FOR METHYL ORANGE DYE REMOVAL "

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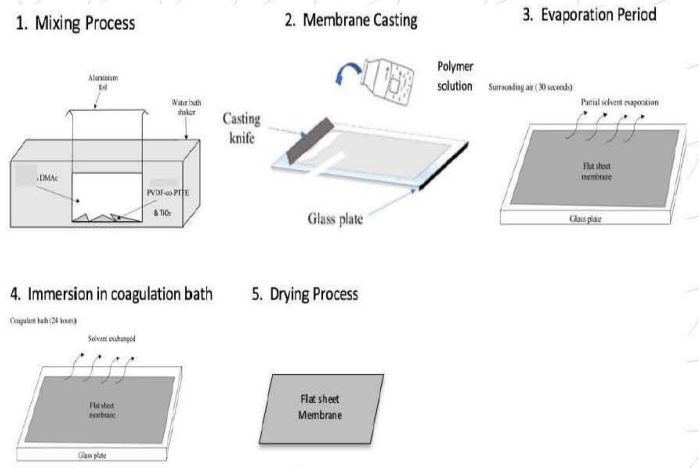
PROCESS DESCRIPTION



PRODUCT DESCRIPTIONS

Polymeric membrane has been widely used in membrane technology due to the lightweight, proceesability into a thin film, huge variations in structure and properties. However, current polymer membrane suffers fouling due to the foulant blockage on the membrane surface when it been used repeatedly over the time. Therefore, this is where photocatalyst come to plays. The additional of photocatalyst such titanium dioxide on the membrane surface able to give self-cleaning ability to the membrane, hence the reuseability of the polymeric membrane can be extended. Photocatalytic based membranes offer potential solutions and novel ideas for further improvement of membrane technology. High hydrophobicity and porosity with an ability to undergo photocatalytic process of this products make them great candidate for the water treatment applications.

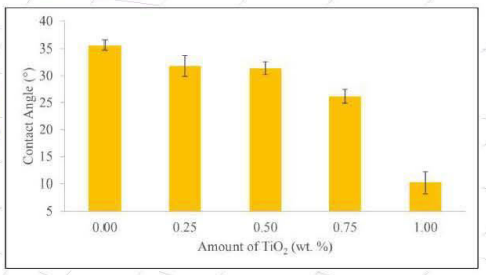
INVENTION ADVANYAGES

- Photocatalyst materials with self-cleaning ability
- Simple and easy processing
- Innovative product with locally developed technology

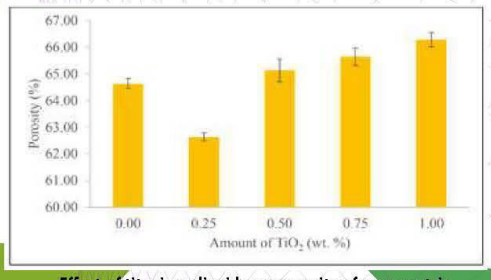
COMMERCIAL POTENTIAL

This invention is suitable for use in water treatment that involve dye removal. No competition directly or indirectly by the local company. No such organization has provided any product in terms of asymmetric porous polyvinylidene flouride-co-polytetraethylene (PVDF-co-PTFE) membrane filled with titanium dioxide (TiO2) as photocatalyst. Hence, there are chances for market penetration. Potential customers can be from all kinds of industries such as textile, food and beverage sectors. It can be used widely in Malaysia and internationally and has a large geographic view of market opportunity.

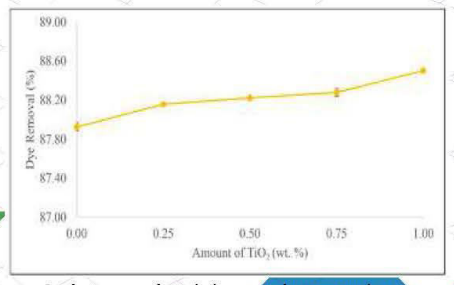
PRODUCT PERFORMANCE



Effect of titanium dioxide on contact angle of asymmetric PVDF-co-PTFE membrane



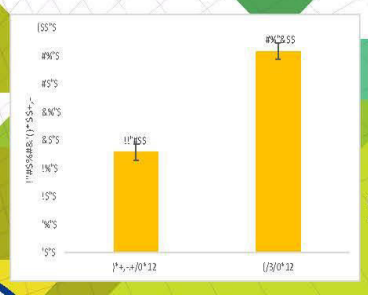
Effect of titanium dioxide on porosity of asymmetric PVDF-co-PTFE membrane



Performance of methyl orange dye removal at different amount of titanium dioxide filled up in asymmetric PVDF-co-PTFE membrane

NOVELTIES

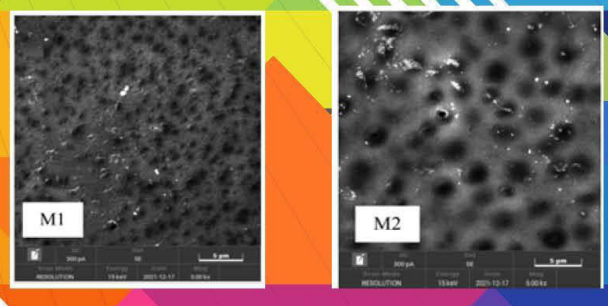
i. This innovation is use of titanium dioxide as photocatalyst in porous polyvinylidene flouride-co-polytetraethylene (PVDF-co-PTFE) membrane matrix.
ii. PVDF-co-PTFE polymer used as a membrane matrix with excellent hydrophobicity, porosity and thermal properties.
iii. Mass productions with simple to moderate engineering skills.



Dye removal performace after membrane undergo photocatalytic reaction at different amount of titanium dioxide

POTENTIAL APPLICATIONS





Scanning electron micrograph of top surface of asymmetric PVDF-co-PTFE membrane with and without TiO2 (M1) without TiO2 and (M2) with TiO2 (1wt %).

INTERNATIONAL EXHIBITION INVENTCOR 2022

MULTI-STRESS TOLERANT BIOCATALYST FOR LIGNOCELLULOSIC ETHANOL PRODUCTION





RESEARCHERS:

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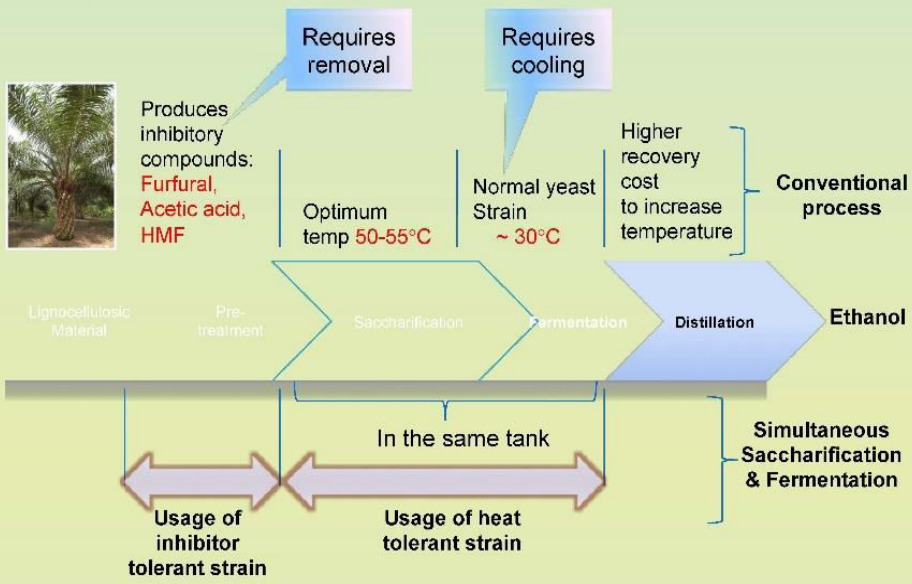
BACKGROUND

Biofuels from lignocellulosic materials are becoming an increasingly important alternative to fossil fuels. For cellulosic ethanol to compete with other technologies, simultaneous saccharification and fermentation, which converts cellulose to ethanol in a single tank is under research attention. To ensure that the process economics for industrial ethanol production is feasible, the biocatalyst involved in the fermentation process must be capable of fermenting all the sugars present in the hydrolysates, including xylose, with high ethanol yields and productivities. To add to the challenge in fermenting xylose to ethanol, high temperature fermentation is required to cope with the temperature differences between saccharification and fermentation process. Thus, a novel strain capable of producing ethanol from glucose and xylose at high temperature with tolerance to inhibitors was successfully isolated and named as *Pichia kudriavzevii* UniMAP 3-1. Implementing and promoting cost-effective bioethanol production from biomass is definitely a strategic move which supports the government's aim to accelerate renewable energy implementation to 20% of total Malaysian energy mix by the year 2025 and able to mitigate carbon emission and climate change caused by fossil fuel combustion.



NOVELTY

- Microbes isolated from local sources
- *Pichia kudriavzevii* UniMAP 3-1 is able to consume both glucose and xylose and can withstand high temperature and acetic acid environment.

ADVANTAGES

- Can be used in simultaneous saccharification fermentation to reduce the number of tanks in bioethanol processing.
- Can help reduce the operating cost due to removal of cooling step.
- Can help convert biomass waste into valuable fuel.

PUBLICATIONS

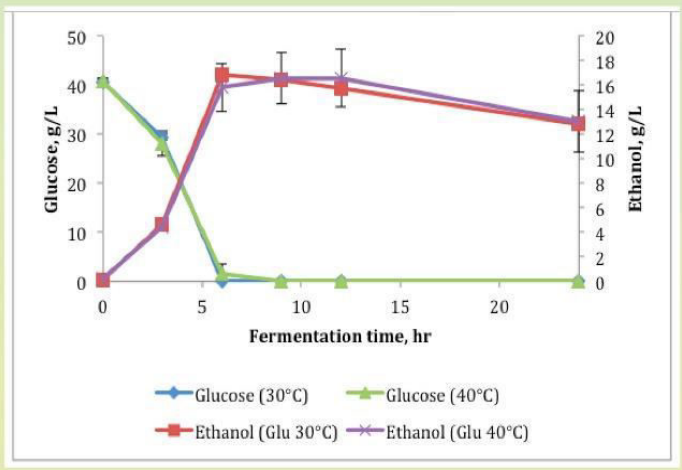
Rahman, K. H. A., Najimudin, N. and Ismail, K. S. K. (2022) Transcriptomes analysis of *Pichia kudriavzevii* UniMAP 3–1 in response to acetic acid supplementation in glucose and xylose medium at elevated fermentation temperature. *Process Biochemistry*, Vol. 118, 41-51.

Rahman, K. H. A., Ismail, K. S. K. and Najimudin, N. (2021). Growth of thermotolerant *Pichia kudriavzevii* UniMAP 3-1 strain for ethanol production using xylose and glucose at different fermentation temperatures. *IOP Conference Series: Earth & Environmental Science*, 765, 012107.

M Z Ishak, M L Kuan and K S K Ismail. Optimization of Upstream Processing for the Production of Bioethanol from Leucaena leucocephala Seeds using Kluyveromyces marxianus UniMAP 1-1. 2021 IOP Conf. Ser.: Earth Environ. Sci. 765 012053

S E R A Rashid, M Z Ishak, K H A Rahman and K S K Ismail. Ethanol Production from Alkaline-treated Rice Straw via Separate Hydrolysis and Fermentation (SHF) using K. marxianus UniMAP 1-1. 2021 IOP Conf. Ser.: Earth Environ. Sci. 765 012052

RESULTS



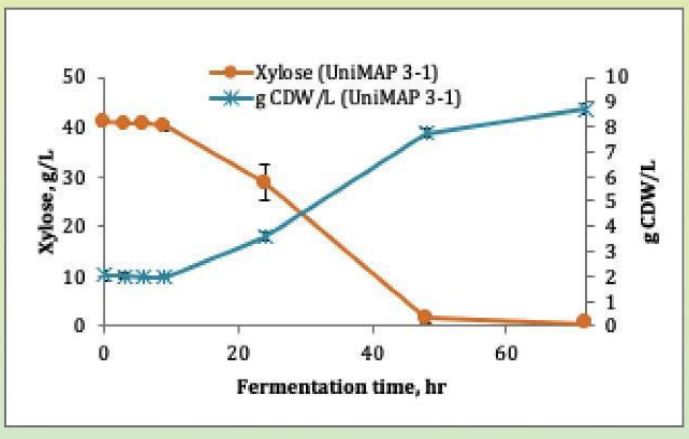


Figure 1 Ability of *P. kudriavzevii* UniMAP 3-1 to utilize glucose and xylose at 40ºC to produce ethanol.

Table 1 Ability of *P. kudriavzevii* UniMAP 3-1 to produce ethanol even under acetic acid stress

Acetic acid conc. g L^{-1}	Time for max. ethanol (h)	Max. ethanol conc. (g L^{-1})	$Y_{e/s}$ (g g^{-1})
0	9	16.55 ± 0.8	0.41
1.8	12	17.46 ± 0.13	0.42
3.6	24	13.53 ± 0.56	0.34
5.4	48	7.36 ± 1.47	0.19

ACKNOWLEDGEMENT

This work is not possible without the grant awarded by the Ministry of Education Malaysia; Fundamental Research Grant Scheme (FRGS) No. FRGS/1/2014/SG05/UNIMAP/02/2

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Hemerocallis x hybrida hort.
'FRUMOASA'

(DAY LILY)

Patent : MD Nr. 363/30.06.2021

Autors: Svetlana Manole , Tatiana Sîrbu, Ion Roșca

A

Work description: Rhizomatous perennial plant with numerous linear, light-green leaves. The length of leaves is about 60cm. The plants are about 90 cm tall in the flowering stage. The flowers are simple, about 16cm in diameter, salmon pink. The outer petals are lighter. The edge of the tepals is very wavy. Dense, membranous texture. The inflorescences consist of 5-7 flowers. 7-10 year old plants produce 15-18 flower stalks. The flowering stage lasts from June till July. It lasts about 50-60 days. This cultivar can grow in sunny and half-shaded areas. It is undemanding towards soil, but the plants that grow on rich soil are more vigorous. The plants are very resistant to pathogens, pests and unfavourable environmental conditions.

Socio-economic and technical importance: : This cultivar is recommended for cut flowers production, in various floral decorations, in landscape planning: flower beds, mixed flower beds, solitary groups, on the banks of water basins; can be promoted as a container plant.







REPUBLICA MOLDOVA

Agenția de Stat pentru
Proprietatea Intelectuală

BREVET
PENTRU
SOI DE PLANTĂ

Nr. 363

Eliberat în temeiul Legii nr. 39/2008 privind protecția soiurilor de plante

Denumirea comună: CRIN GALBEN
Taxonul botanic: *Hemerocallis x hybrida* hort.
Denumirea soiului: FRUMOASA
Titular: GRĂDINA BOTANICĂ NAȚIONALĂ (INSTITUT) „Alexandru Ciubotaru", MD
Data acordării: 2021.06.30

Descrierea soiului constituie parte integrantă a prezentului brevet pentru soi de plantă

Director General

CHIȘINĂU

The Day Lily variety 'FRUMOASA' was obtained in the National Botanical Garden (Institute) "Alexandru Ciubotaru" of Republic Moldova, by hybridizing the varieties ♂ Missouri Beauty x ♀ Chipper Chery . With the financial support of the project „Research on mobilizing plant diversity with ornamental potential for *ex situ* conservation"-20.80009.7007.14.

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The new cultivar ‘SOFIA’

of eastern galega *Galega orientalis* Lam.

Institution: **„Alexandru Ciubotaru” National Botanical Garden (Institute) Chișinau, Republic of Moldova**

Patent MD 00013/2022.05.05

Authors: Victor ŢÎŢEI, Alexandru TELEUȚĂ

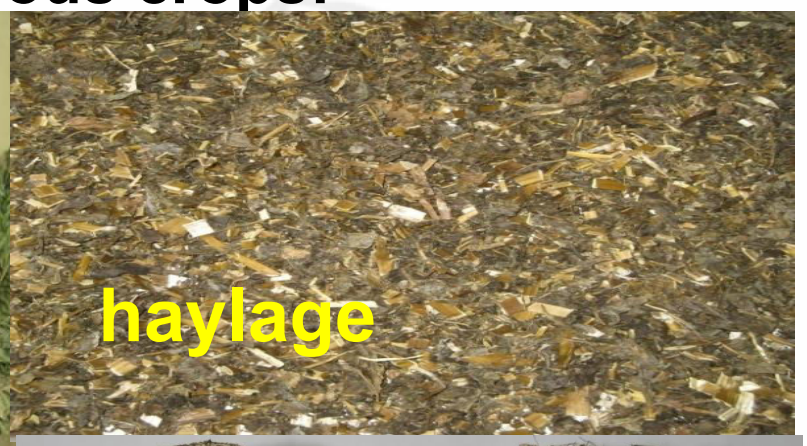
A

The cultivar ‘***SOFIA’*** has been created by individual breeding of introduced ecotypes of eastern galega *Galega orientalis* Lam., it grows 120-145cm tall and has highly frost-tolerant. The first cut in mid-May. The yield of aerial fresh mass (2-3 cuts per season) reaches 78-92 t/ha, dry biomass 15-20 t/ha.

Multi-purpose perennial leguminous crops:









Forage for animals (natural fodder, hay, haylage, vitaminized flour) with feed value: 16.3-22.5% crude protein, 28.1-33.0% ADF, 46.0-53.4% NDF, 3.9-5.0 ADL, 12.6% ash, 18.8 % TSS, 16.1 % hemicellulose, 21.7% cellulose, 63.0-74.0 % OMD, RFV=123-137, 10-11 MJ/kg ME, 5.8-6.1 MJ/kg NEl.
Energy biomass: methane potential of 305-350 l/kg; solid biofuel - briquettes with 800-870 kg/m^3 specific density, 16.8-18.0 MJ/kg gross calorific value.
The eastern galega seed plantations ensure a 40-60-day beekeeping season (May-July) with a honey production potential of 400-600kg/ha.
The cultivar ‘SOFIA’ is sown in a pure or mixed culture with several species of grasses and legumes, the established plantations are maintained for 15-20 years, symbiotic nitrogen fixation capacity of 100-150 kg/ha/year.
It can be used in phytoremediation of degraded lands and the valorization of marginal and polluted lands.

Financially supported, National Agency for Research and Development of the Republic of Moldova, projects no. 20.80009.5107.02 and no. 20.80009.7007.01

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Grădina Botanică Națională (Institut) "Alexandru Ciubotaru" 1950

Cerasus tomentosa (Thunb.) Wall. 'Andreia'

Project no. v2022 0007

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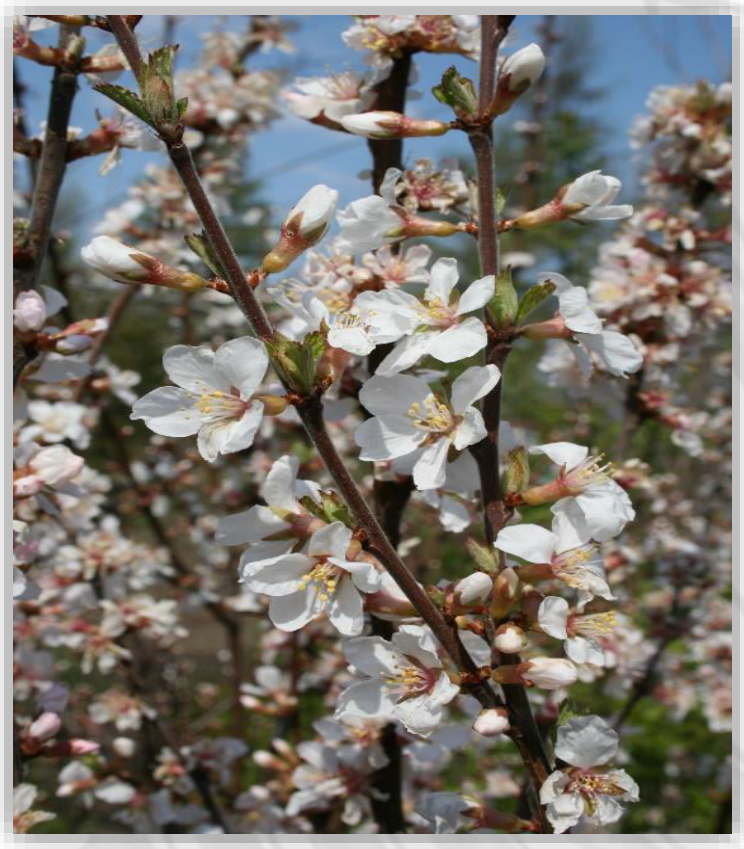
Authors: Roșca Ion; Onica Elisaveta,
Cutcovschi-Mușțuc Alina, †Palancean Alexei

The '*Andreia'* cultivar is a shrub characterized by exceptional abundance of flowering, fruiting, as well as weight (2,1-2,7 g) and size (13-16 mm) of fruits. Fruits contain carbohydrates, organic acids, vitamins, minerals, beta carotene, melatonin, serving as a natural source of phytonutrients. The cultivar is used as a fruit-bearing, honey-bearing and ornamental plant for landscaping.





The benefits of *Cerasus tomentosa*:

- Strengthens the immune system;
- Prevention and treatment of biliary and renal diseases;
- Regulates blood pressure;
- Balances body fluids;
- Maintains the elasticity of blood vessels;
- Reduces the concentration of C-reactive protein (inflation marker).

Contact: roscasilva@yahoo.com

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THE ASSESSMENT OF THE SPONTANEOUS VEGETATION OF THE REPUBLIC OF MOLDOVA FOR THE CONSERVATION AND THE SUSTAINABLE USE OF PLANT DIVERSITY AND PLANT GENETIC RESOURCES IN THE CONTEXT OF ADAPTATION TO CLIMATE CHANGE

Grădina Botanică Națională (Institut) "Alexandru Ciubotaru" 1950

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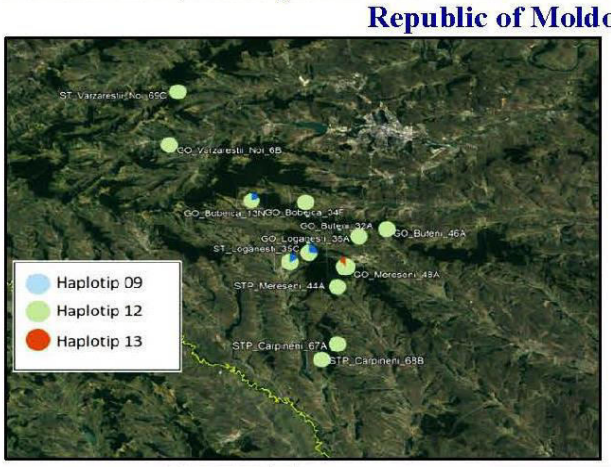
Project number: 20.80009.7007.01

Authors: MIRON Aliona, project manager, POSTOLACHE Gheorghe (coord.), GALUPA Dumitru (coord.), TALMACI Ion (coord.)

The project addresses a multidisciplinary thematic area covering fields of fundamental and applied research, such as, geobotany, forestry, forest genetics, grassland assessment and management, conservation and sustainable management of plant diversity and forest genetic resources, climate change, database management. The project aims at incorporating scientific results in the development strategies and priorities of the country by correlating them with the approved policy documents in the field of environmental protection.

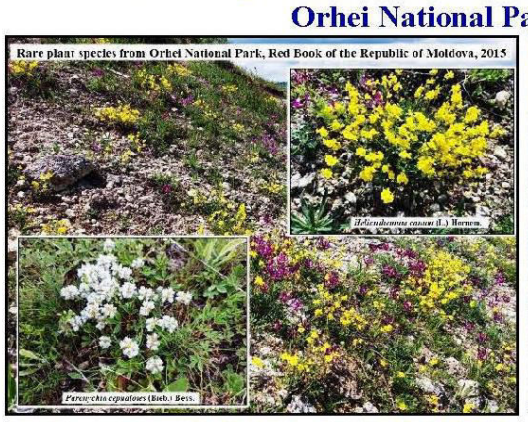
The general purpose of this project is to provide scientific support for improving the conservation and sustainable use of plant diversity and plant genetic resources.

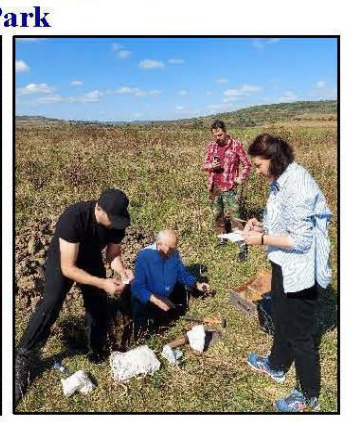
Identification, description and delimitation of forest genetic resources of the Republic of Moldova





Inventory of flora and grassland vegetation in Orhei National Park



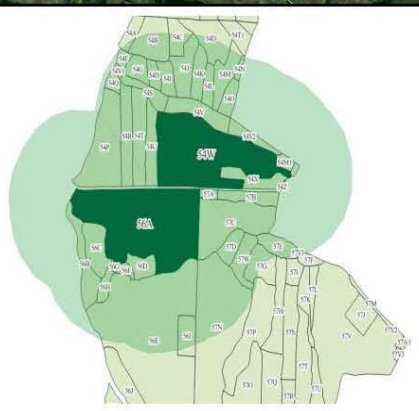


Assessment of the productive and nutritional potential of grasslands in Orhei National Park



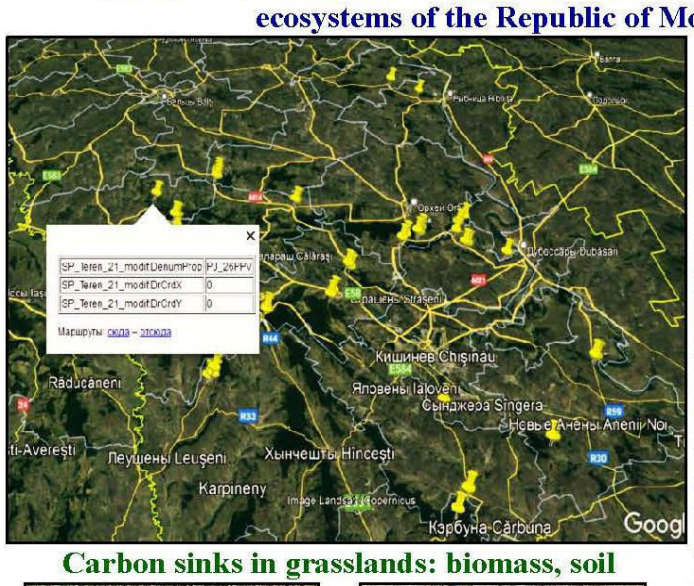


Monitoring and conservation of rare plant species of national and international importance under *ex-situ* conditions in the "Vegetation of Moldova" Exhibition of NBGI





Estimation of the current carbon stock in the forest and grassland ecosystems of the Republic of Moldova



Forest carbon sinks: litter, biomass, soil







Carbon sinks in grasslands: biomass, soil







More information: https://gbni.md/sites/default/files/PDF-2080009700701-Miron-Aliona.pdf

Contact: aliona_miron@yahoo.com; gradinabotanicachisinau@gmail.com; icas@moldsilva.gov.md

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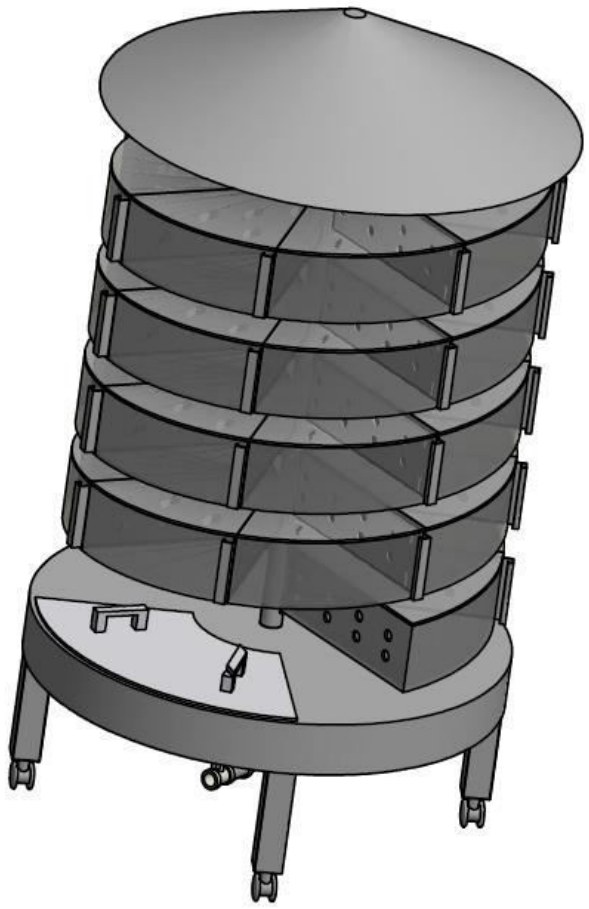
BRAZIL

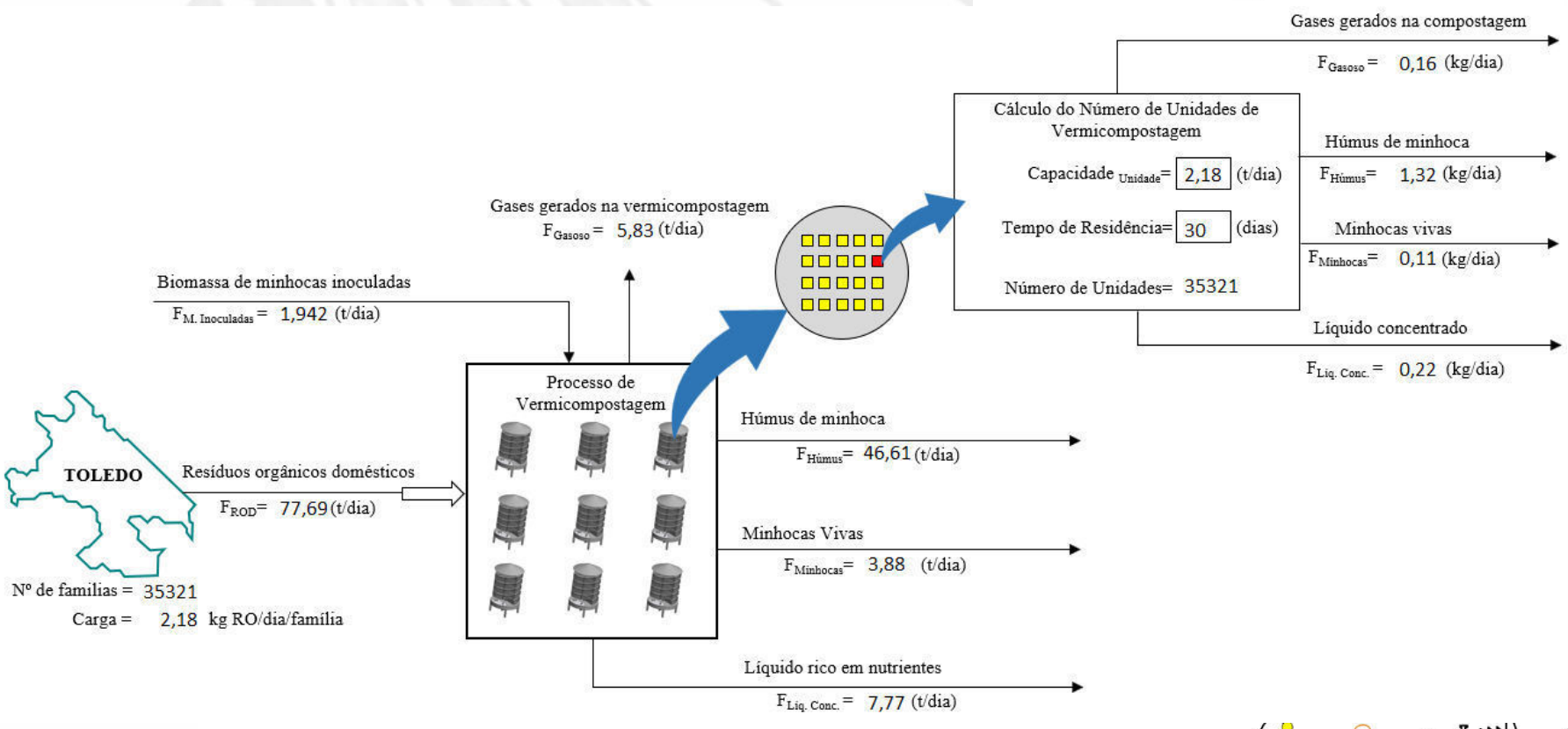
Modular Equipment for Distributed Processing of Organic Waste

A

Author/s: Camilo Freddy Mendoza Morejon, Andy A. Saavedra Mendoza
Patent no.: BR1020190246243

Patent of equipment that, for the vermicomposting, process of domestic organic waste to obtain differentiated value-added products (humus, liquid fertilizer and surplus earthworms). The equipment's differential lies in the characteristics of the cells, in the support of the cells, in the slurry reservoir, in the complementary devices and in the elements that provide the functionality, size and capacity of operation with maximum efficiency.





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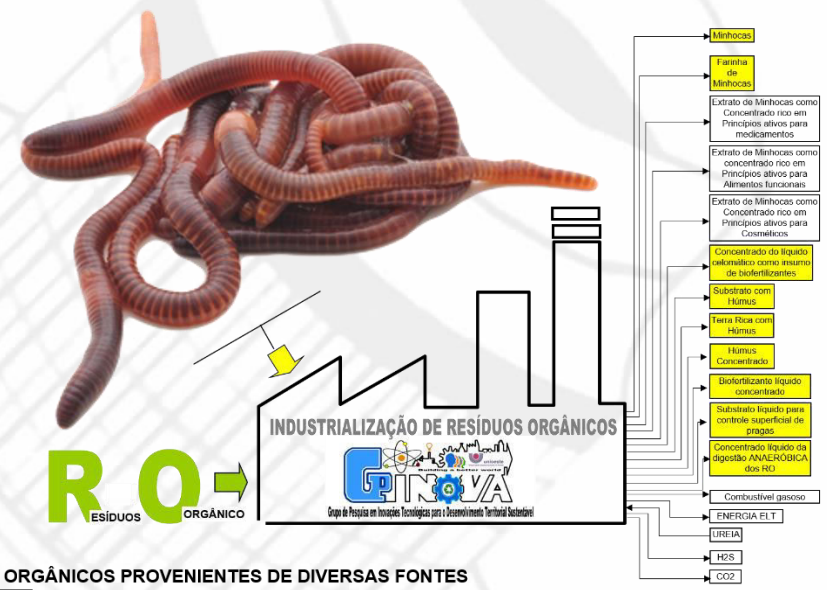
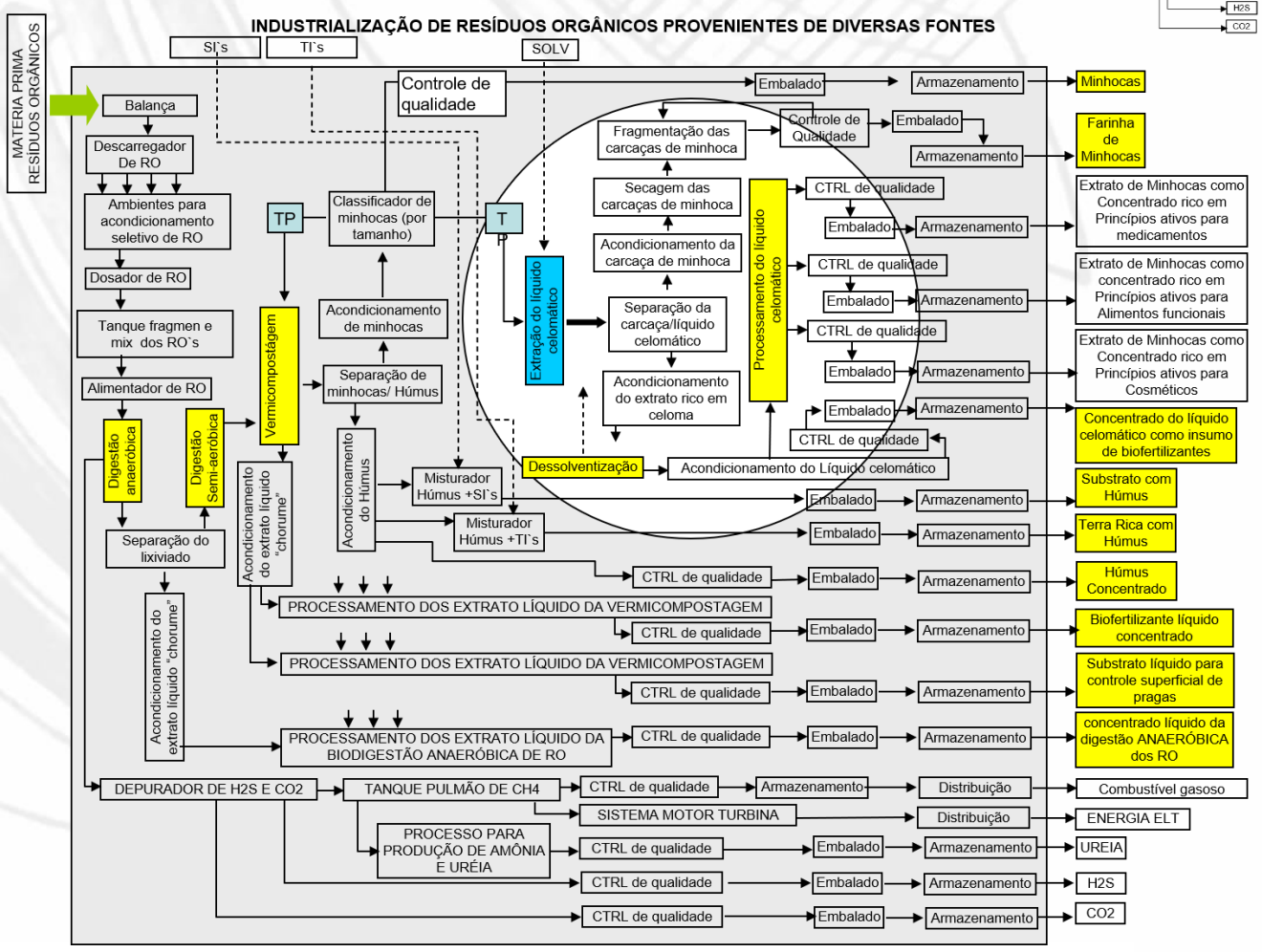
A

Hybrid Process for Centralized Industrialization of Domestic Organic Waste

Author/s: Camilo Freddy Mendoza Morejon, Andy A. Saavedra Mendoza
Patent no.: BR 10 2020 012074 3

Hybrid process patent for the industrialization of organic waste and obtaining 17 value-added products. The process includes a set of stages, whose novelty elements are found in the process flow, in the operational characteristics of each stage, in the differentiated use of organic waste and also in the value-added products.





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A

The process for obtaining the hybrid photocatalyst based on nanocrystalline TiO2 and diatomite by electrolysis

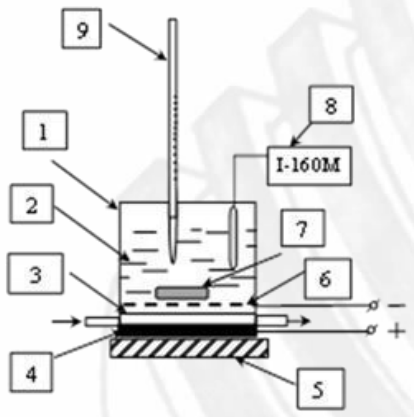
Patent application Nr. s 2021 0046, 2021 05 31.
Dațko T.[1], Zelențov V.[1], Dvornikov D.[2], Sainsus I.[2]

[1]Institute of Applied Physics (IAP)
[2]The Institute of Electronic Engineering and Nanotechnologies (IEEN);

The invention relates to the field of renewable alternative solar energy, photocatalytic purification of water and air from organic and inorganic pollutants using a Heterogeneous

Photocatalysis

Invention consists in possibility of one-step obtaining of hybrid photocatalyst on the base of diatomite and nanocrystalline TiO_2 (NTD) by processing the mixture of diatomite and titanium dioxide precursor ($TiCl_4$) in the cathode chamber of the two-chamber electrolyzer by passing an electric current with a density of 30-100 mA / cm^2 through an aqueous suspension of diatomite and $TiCl_4$



1. Electrolyzer;
2. Suspension - diatomite + TiCl4 solution;
3. MK-40 cation exchange membrane;
4. Carbon anode; 5. Magnetic stirrer;
6. Cathode - Pt grid; 7. Magnet;
8. pH meter I-160M; 9. Thermometer

Fig.1 Diagram of the experimental installation for the synthesis of the NTD photocatalyst

***Advantages of the proposed process compared to the classic procedures*:**

- **Increasing the synthesis productivity by reducing the number of operations,**
- **The synthesis time reduction - 30 minutes instead of 20 hours,**
- **Exclusion of toxic chemical reagents HCl and NH_4OH.**

A product with new properties was obtained:

- **increased specific surface area -198.1 instead of 108.3 m^2/g at the comparison sample,**
- **anatase crystallite size of 8 nm instead of 15.3 nm,**
- **adsorption value of standard dye - methylene blue 64.9 mg/g compared to 37.5 mg/g.**

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ISIM TIMIŞOARA

National Research&Development Institute for Welding and Material Testing - ISIM Timisoara

Method for ultrasonic welding of parts with spatial configuration of joining zones

A

Patent no.: 133155 B1 / 29.07.2022

Author: **Nicușor-Alin SÎRBU**

The technical problem that the invention solves is the need to provide constructive solutions for the construction of sonotrodes that can be used for welding complex parts with spatially arranged joining zones, which can usually only be made in a plan, these types of sonotrodes representing solutions for given industrial applications.

The method is applicable for the whole frequency range of the ultrasonic field. The pin length, which provides a sonotrode for ultrasonic welding of workpieces with spatial configuration of joint zones, i.e. their tolerance field, is limited by the resonant frequency of the sonotrode.

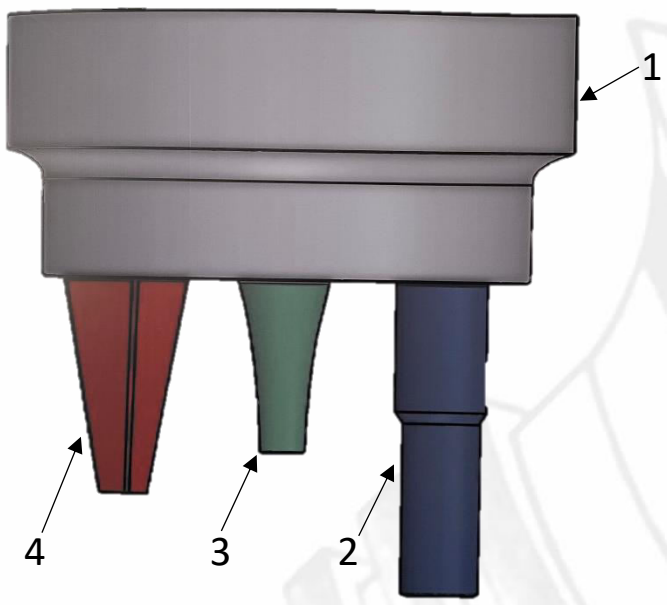

Figure 1. *Constructive solutions of a sonotrode*

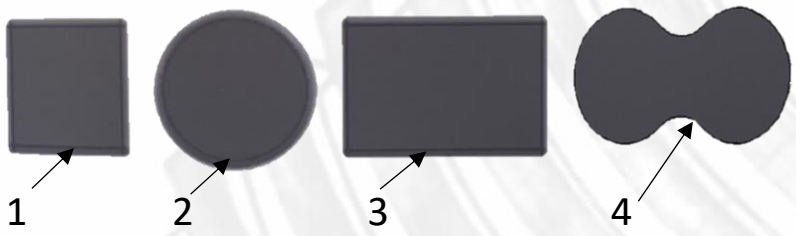

Figure 2. *The active area of the weld pin*

A method for ultrasonic welding of workpieces with spatial configuration of joining zones, according to the invention relates to constructive solutions of a sonotrode consisting of an equalizing body (1) and a number of welding pins (2,3,4), *figure 1*.

The shape of the equalizing body of the sonotrode is determined by the shape of the workpiece, and the number of pins and their shape, arrangement and dimensions are related to the spatial configuration of the joining zones of the workpiece.

The active area of the weld pin, shown in *figure 2*, may be square (1), circular (2), rectangular (3), or complex (4) in shape, which is dictated by the application, i.e. the type and size of the joint area.

The pins are mechanically coupled to the equalizer block by means of threaded nipples. The construction solution is a modular solution, so there is the possibility of replacing only the worn part or parts of the pins when necessary.

The sonotrodes must provide a constant working value of the ultrasonic microvibration amplitude at the pin active zone level, specific to the welding operations to be performed.

Advantages:

- Makes it possible to simultaneously weld parts with spatial configuration of welding zones under joint quality conditions;
- Increases work productivity, compared to the situation where welding could only be performed in plan and more operations were needed to weld parts with spatial configuration of joining zones;
- These specialized sonotrodes, thanks to the constructive solution of the method, allow the replacement of worn parts in the sonotrode composition with new ones and the containment of welding operations with the same sonotrode;
- The solution makes it possible to obtain new sonotrode configurations for welding parts with spatial arrangement of welding zones by replacing the pins at the level of the equalizer block;
- Welded joints can be made for a wide range of polymeric materials as well as metallic or composite materials.

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MEMORICE

ANALOG RICE

Energy, Protection of the environment, Biotechnology

Authors: Az Zahra Widjanarka, Vinia Trishanti, Glenn Abraham, Calysa Santoso, Didar Kertayojya



MEMORICE (Meniran Rice) Analog Rice innovation is an effort to diversificate food, and can be a substitute for local rice. It contains local ingredients such as *Phyllanthus urinaria*, which is rich in antioxidants that can strengthen the immune system, also mocaf and sweet potato which are rich in nutritional content.

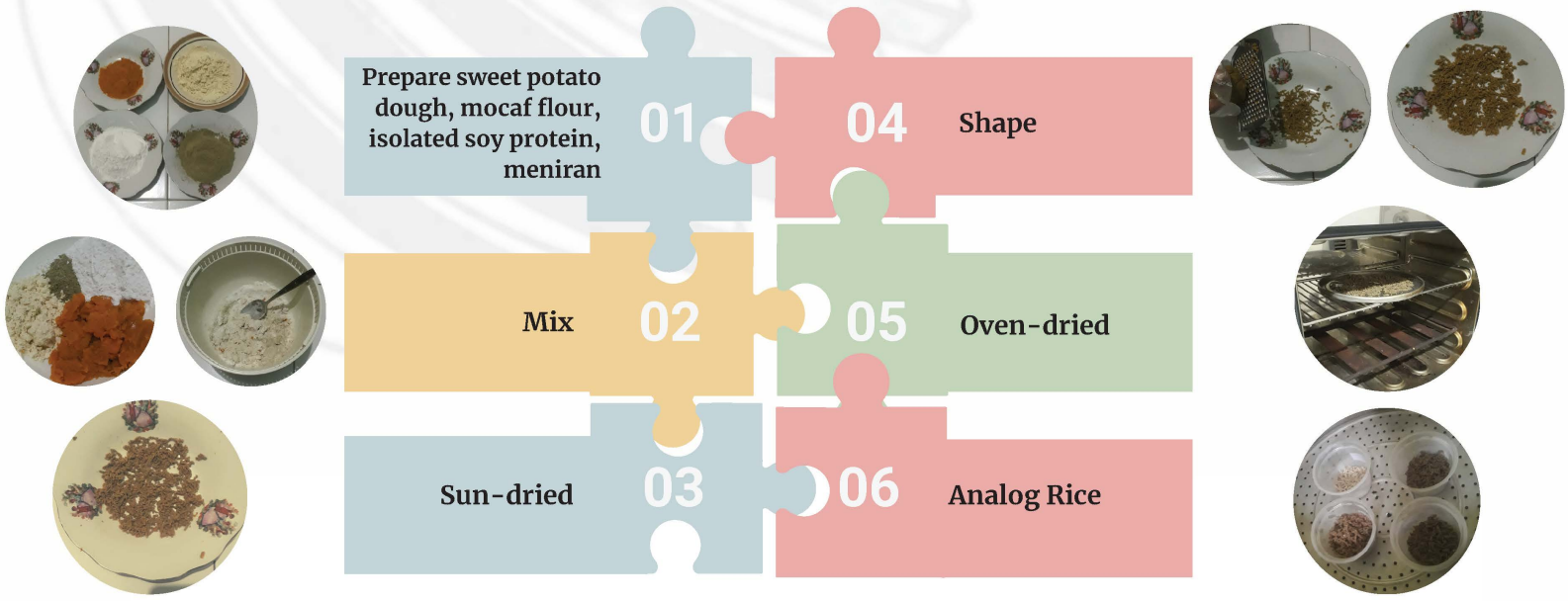
Made from a combination of Meniran (*Phyllanthus urinaria*), mocaf flour, sweet potato, and isolated soy protein, MEMORICE has high nutritional value.

Parameter	Result
Carbohyrate (%)	78,41
Protein (%)	8,74
Lipid (%)	0,51
Water (%)	8,75
Ash (%)	3,59
*IC50 (ppm)	107,216

TREATMENT	SWEET POTATO	MOCAF	ISOLATED SOY PROTEIN	MENIRAN
1	600 G	125 G	25 G	0 %
2	600 G	125 G	25 G	2.5 %
3	600 G	125 G	25 G	5 %
4	600 G	125 G	25 G	10 %

Superiority

- More nutritional content
- Prevent various disease
- Low fat
- Functional food
- Antioxidant
- Boosts immune system
- Longer storage period



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HR EXCELLENCE IN RESEARCH

METHOD FOR DETERMINING THE CONCENTRATION OF -SH GROUPS IN SURFACE WATERS

PATENT APPLICATION : MD a 2022 0030/2022.06.03

AUTHORS: Vladislav BLONSCHI, Viorica GLADCHI, Gheorghe DUCA

APPLICATION FIELDS: Ecological and Environmental chemistry, protection of surface water, ecology. **A**

AIM: Rapid and accurate determination of the concentration of -SH groups in natural waters for the estimation of their ecochemical state and in the identification of water pollution with proteinaceous compounds.

SOLUTION: A spectrophotometric method for determining the concentration of -SH groups in surface waters with low mineralization is proposed, which does not require sophisticated reagents and equipment and has a high detection limit.

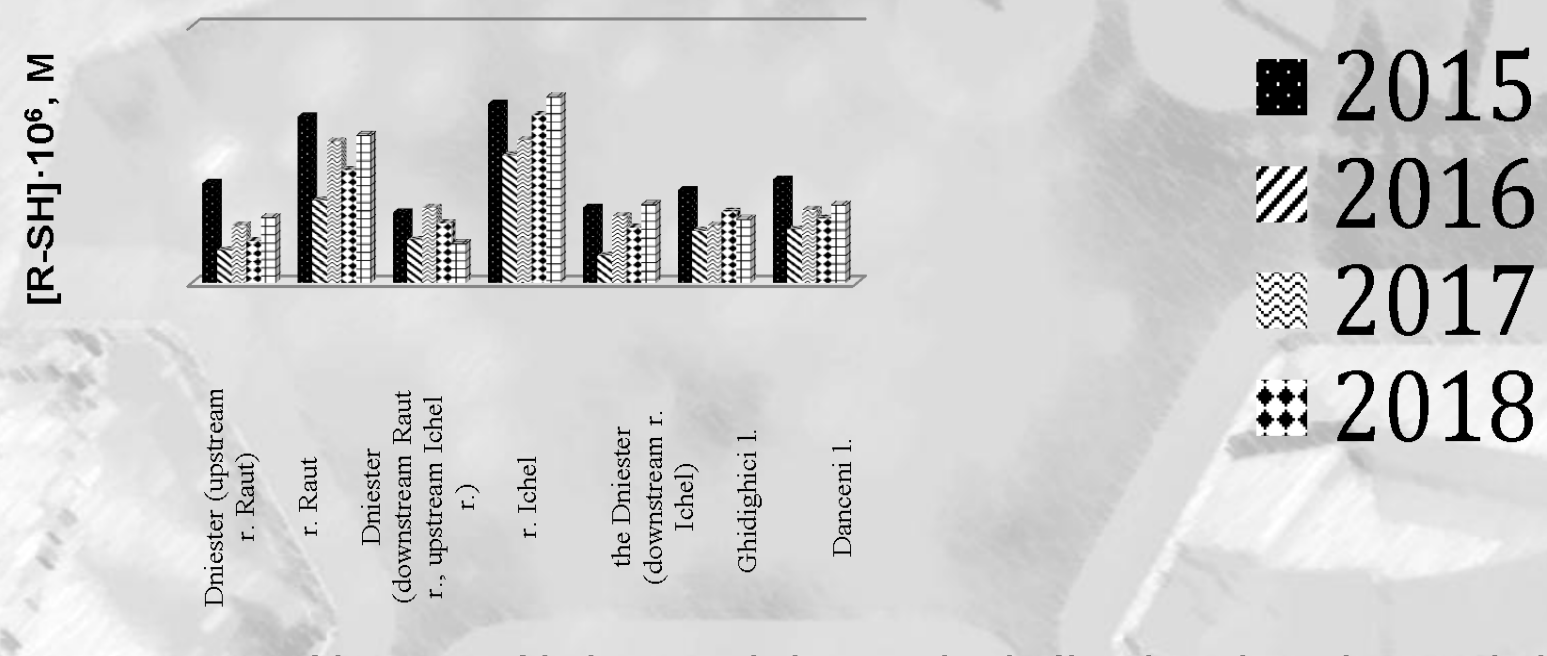

Fig. 1. Dynamics of the content of thiol compounds determined in the filtered samples, in the researched water basins, during the years 2015-2019

ADVANTAGES: Compared with the existing methods, the proposed method is adapted for the processing of surface water, which does not require specific equipment and additional chemical reagents and is performed in a short period of time. The results of monitoring the content of thiol compounds can be used to estimate the ecochemical status of waters and to detect sources of pollution with protein compounds.

IMPLEMENTATION STAGE: Application of the method in estimating the content of SH-groups in surface waters in the river basin of the Dniester River.

ACKNOWLEDGMENTS: This research was supported by the *research project: #20.80009.5007.27*

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HR EXCELLENCE IN RESEARCH

THE SOCIO-ECONOMIC MODEL OF FINANCIAL REPORTING IN THE CONTEXT OF RECOGNISING POWER OVER PROPERTY AS A CRITERION FOR ASSESSING THE ESG-BEHAVIOUR OF BUSINESS

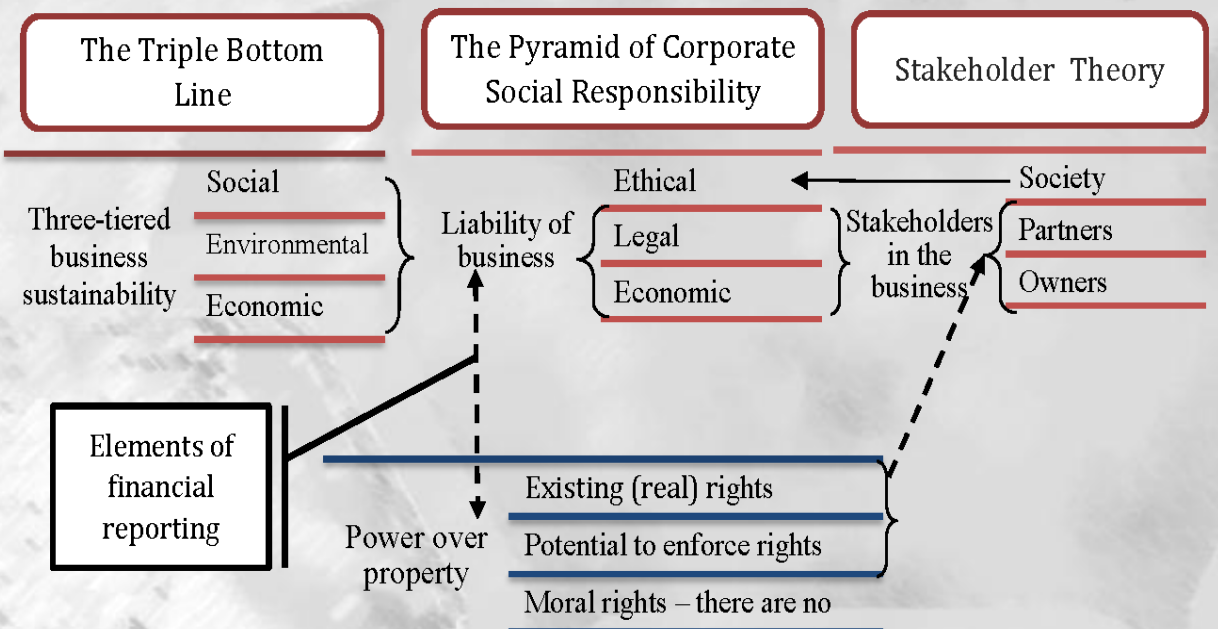
PROJECT: 22.00208.0807.09/PD

AUTHORS: Irina GOLOCHALOVA, Maria COJOCARU

APPLICATION FIELDS: Energy, Protection of the environment, Biotechnology. **A**

AIM: Identification of a criterion for recognising the results of business ESG-behaviour in financial reporting and the development of its innovative socio-economic model.

SOLUTION: A point of convergence between accounting methodology and the concept of social responsibility has been established for the development of an innovative socio-economic model of financial reporting.



Originality

1	Identified disadvantages of the algorithm for disclosing information on the performance of business ESG-responsibility.
2	A point of convergence between the theory of financial reporting and the concept of social responsibility has been established
3	Evaluated the importance of the concept of social responsibility in modernising financial reporting on the basis of power over to ESG-behaviour of business

ADVANTAGES: Interprets conceptually the performance of social responsibility by business. Demonstrates a transition from an undefined social responsibility to a specific social obligation of business. Reflects the business' contribution to the implementation of sustainable development purposes. Indicates the degree of sustainability of a company's business model for the purpose of making investment decisions.

IMPLEMENTATION STAGE: Application for registration of copyright and related rights has been submitted to the State Intellectual Property Agency.

ACKNOWLEDGMENTS: This research is supported by the scientific project "The methodology of accounting and financial reporting in the conditions of the innovation vector of the economy", registered under number 22.00208.0807.09/PD in the State Register of Projects in Science and Innovation of the Republic of Moldova.

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Universitatea Ştefan cel Mare Suceava

Electrical network fault signaling device

Patent Application A/00199/2021, EP 21464001.3

Ovidiu Magdin Ţanţa, Mihaela Pavăl, Laurenţiu-Dan Milici,
Oana Vasilica Grosu, Eusebiu Toader,
Pavel Atănăsoae, Valentin Popa

A

The automatic device for signaling the failure of the electrical network, according to the invention, consists mainly of a tube mounted on the electrical conductor which has inside a quantity of ferrofluid which will move inside the tube when a defect occurs.

The automatic fault signaling device of the electrical network, according to the invention, consists mainly of a tube of non-ferromagnetic material 1, having inside a quantity of ferrofluid 2, at one end it is provided with a permanent magnet 3, and at the other end with an indicator element 4 which can be actuated by the piston rod 5 and the spring 6. The tube is fixed by an electrical conductor 7 by means of the electrical insulating fastening support 8.

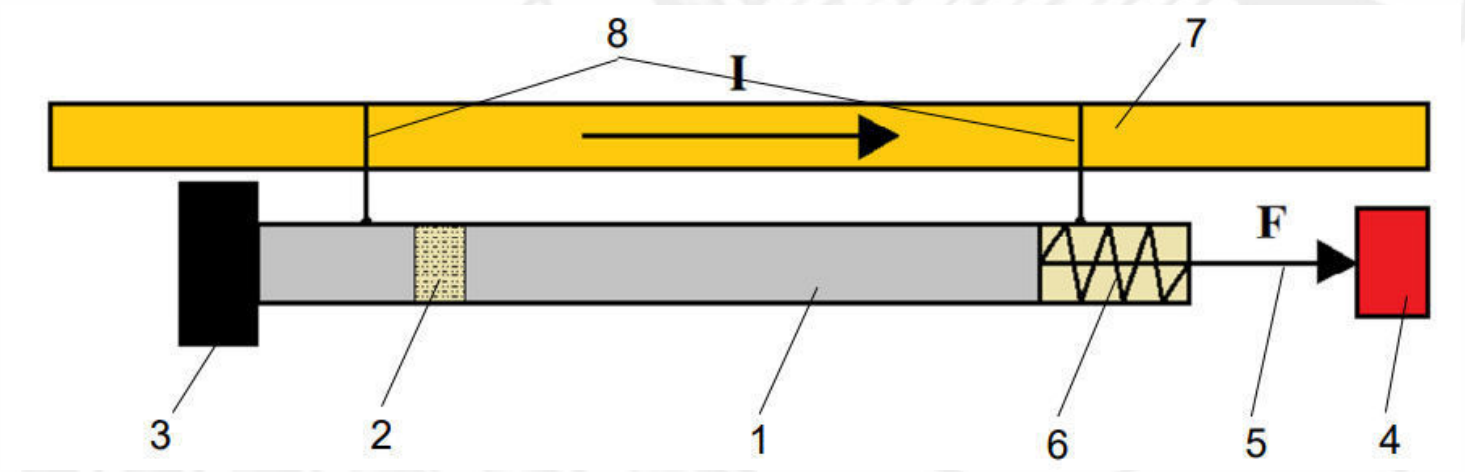

Fig. 1. Overview of the automatic device for signaling the failure of the electrical network

Under normal network conditions, at rated current through conductor 7, the ferrofluid 2 is maintained at the left end of tube 1 by the permanent magnet 3, which is dimensioned according to the value of the rated current through conductor 7.

In the event of a fault in conductor 7, the increase of the current determines the displacement of the ferrofluid 2 towards the opposite end of the tube 1, where, by means of the piston rod 5, the indicator element 4 acts.

Advantages:

- The system does not require additional power;
- Constructive simplicity;
- Accurate signaling of the fault zone.

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PROCEDURE FOR THE DRINKING WATER TREATMENT

A

Patent RO no.132097/30.09.2021

Authors: Florica Manea, Katalin Bodor, Ilie Vlaicu, Nicoleta Lungar, Aniela Pop, Rodica Pode

The invention relates to a procedure for the advanced treatment of drinking water, for the treatment of industrial and waste effluents and for the treatment of municipal wastewater, based on a modular installation, which includes an electrolyzer equipped with boron-doped diamond electrodes. The application of the proposed process is based on the reactions obtained in the electrolyzer with boron-doped diamond electrodes, which can function both as an electrooxidation/electroreduction and electro-disinfection processes. In addition, in the presence of the chloride anion in water, electrolytic processes are initiated in the electrolyzer, with germicidal effect. The operation of the electrolyzer in the process of anodic oxidation by applying an appropriate polarity allows the removal of ammonium, nitrite and organic loading from the water. By simply changing the polarity of the electrolyzer, the conditions of a cathodic process are ensured, which allows the removal of nitrate from the water.

The process for treating drinking water according to the invention has the following advantages: high degree of removal from the water of several types of pollutants / impurities (organic loading, ammonium, nitrite, nitrate, microorganisms), simple operation with the possibility of total automation and high versatility.

Electro-nitrification/denitrification

$2\ NH_{3\ (aq)} + 6\ OH^- \rightarrow N_2 + 6\ H_2O + 6\ e^-$

$6\ H_2O + 6\ e^- \rightarrow 3H_2 + 6\ OH^-$

$2\ NH_{3(aq)} \rightarrow N_2 + 3\ H_2$

$NO_3^- + H_2O + 2e^- \rightarrow NO_2^- + 2\ OH^-$

$NO_2^- + 5\ H_2O + 6\ e^- \rightarrow NH_{3(g)} + 7\ OH^-$

$2\ NO_2^- + 4\ H_2O + 6\ e^- \rightarrow N_{2(g)} + 8\ OH^-$

Electro-oxidation/mineralization

$H_2O + BDD \rightarrow BDD\ (\cdot OH) + H^+ + e^-$

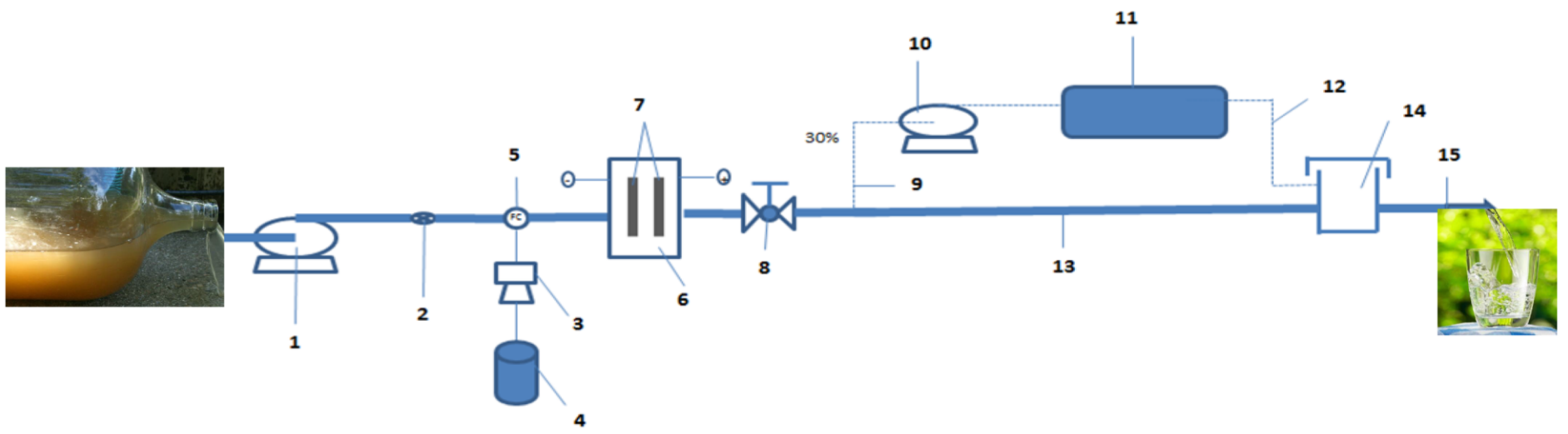
$BDD\ (\cdot OH) + \text{Organic load} \rightarrow BDD + CO_2 + H_2O + H^+ + e^-$

Electro-disinfection

$2\ Cl^- \rightarrow Cl_2 + 2\ e^-$

$Cl_2 + H_2O \rightarrow HOCl + HCl$

$Cl_2 + 4\ H_2O \rightarrow 2\ ClO2 + 8\ H^+ + 8\ e^-$



The process for the treatment of drinking water is based on a modular system, which comprises an electrolyzer (6) with boron-doped diamond electrodes (7) and a reverse osmosis unit (11). The raw water, which can come from different water sources, is supplied by pump (1) in the electrolyzer (6), in which NaCl solution is dosed optionally with the dosing pump (3) in the tank (4), ensuring a minimum flow in the electrolyzer controlled by the flow meter (5). NaCl is injected to ensure a conductivity of at least 1000 µS / cm necessary for the efficient operation of the electrolyzer (6), at current density of at least 25 mA/cm^2 and reversing the polarity applied to the boron-doped diamond electrodes (7) every 10 minutes of electrolysis.

Depending on the composition of the raw water, the electrolyzer can function either only as an electrooxidation cell, or only as an electroreduction cell or as an electrochemical cell in which the two oxidation and reduction processes alternate. For decreasing the concentration of Na^+ and Cl^-, part of the water thus treated is directed through a return loop, (9) + (10) + (11) + (12), where it passes through a unit of reverse osmosis (11), which also retains other organic and inorganic contaminants depending on the membrane used, the flow of the treated water fraction being entrained in the return loop being controlled by adjusting the flow of a pump (10).

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CITT POLITEHNICA 2020

System for functionalized membranes testing for water treatment

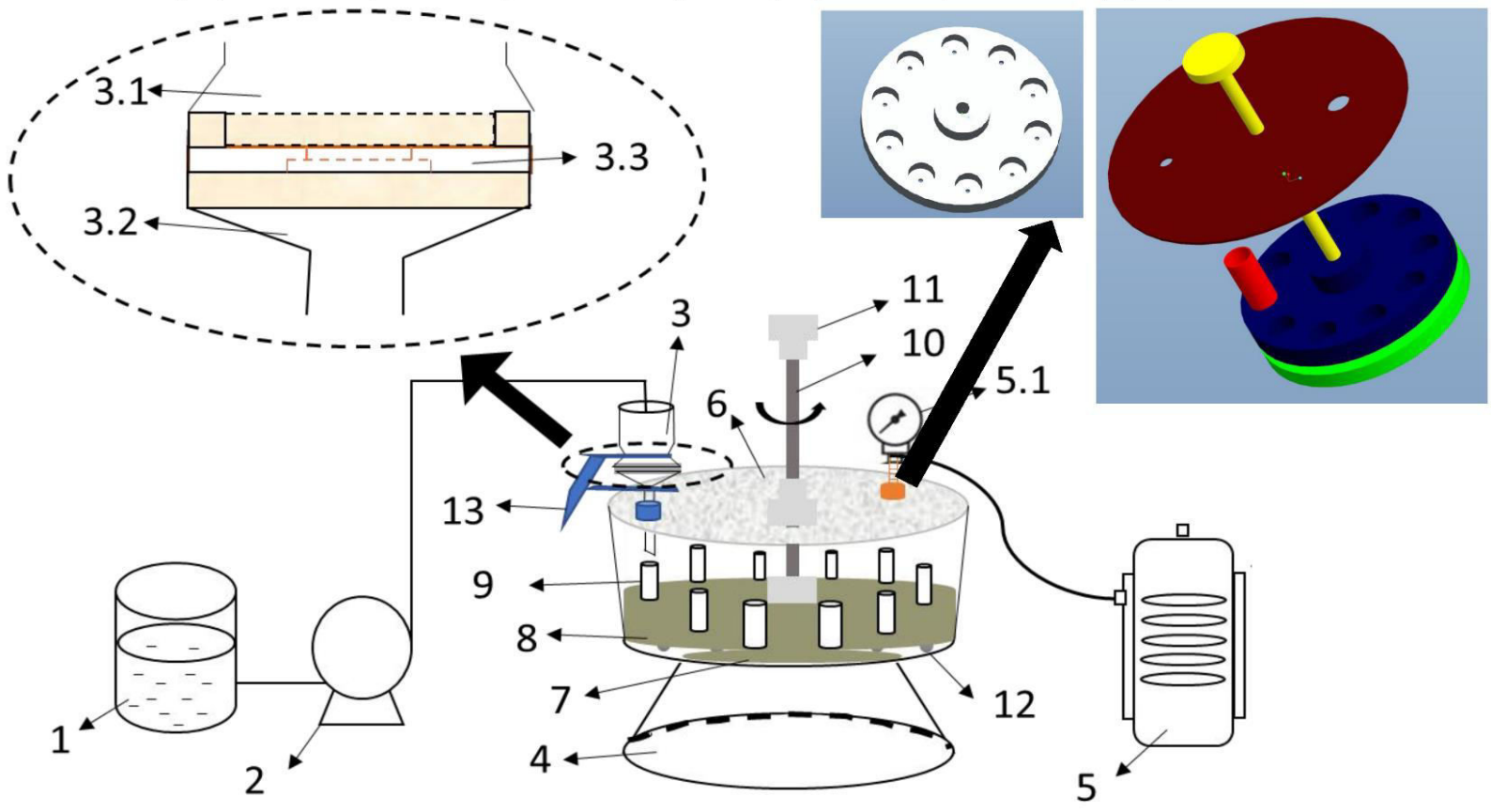
A

Patent application number A/00742/21.03.2022

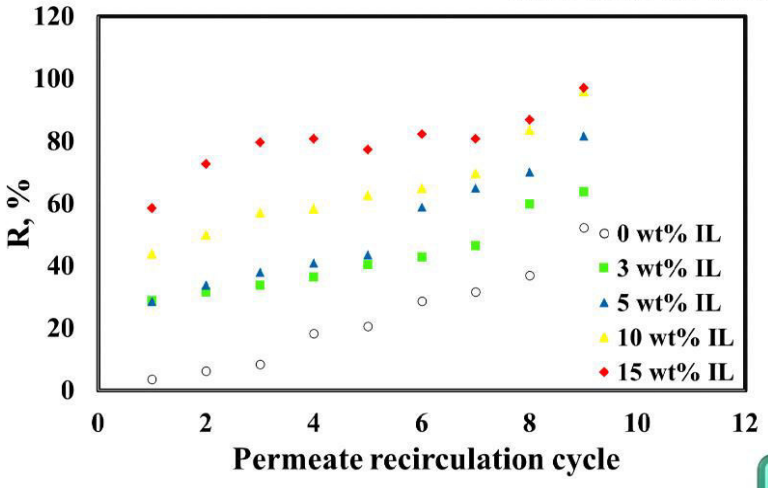
Lavinia Lupa[1], Petru Negrea[1], Laura Cocheci[1], Anca Filimon[2]

[1]University Politehnica Timisoara, Faculty of Industrial Chemistry and Environmental Engineering, Timișoara, 2 "Petru Poni" Institute of Macromolecular Chemistry, Iasi - Romania

The invention relates to a testing system of functionalized membrane in the treatment of polluted water, which can be used to evaluate the efficiency of small experimental membranes for various filtration conditions and consists of a storage vessel (1) of the aqueous solution. to be treated by membrane filtration, a peristaltic pump (2) by means of which the solution is passed into the membrane support device (3), which is attached to a pressure-resistant vessel (4). The aqueous solution is filtered through the membrane due to the vacuum created by the vacuum pump (5), the pressure being adjusted and kept constant by means of the manometer (5.1). Vacuum pump (5) is attached to the pressure vessel (4) through the stainless steel cap (6), through the hole (a) and the diaphragm support device (3) through the hole (b). The pressure-resistant vessel has a fixed base plate (7) and a movable plate (8) made of Teflon as a support for the sample collection containers (9). The movable plate (8) can be rotated to different positions by means of the shaft (10) which is operated by the indexing lever (11) and the position stop (12).

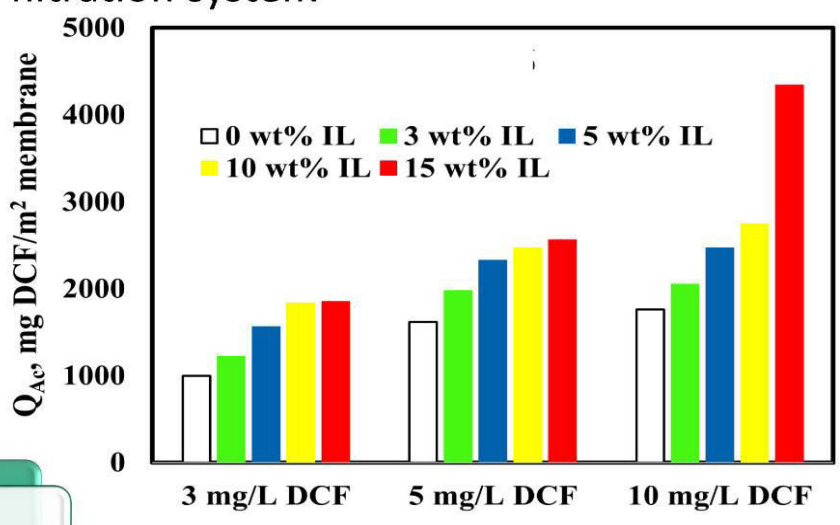


General presentation of the filtration system



Apparent separation coefficient developed by the studied membranes in the treatment process of waters containing 3 mg/L DCF.

APPLICATION



The amount of DCF accumulated on the membranes at the end of the treatment cycles.

ADVANTAGES

- Allows the use and testing of small surface membranes
- Consists of multiple compartiments for permeate collection
- Could be used to determine the time filtration efficiency of the studied membrane
- Accurately simulate the membranes lifetime in an industrial separation system
- It leads to an overall cost decreasing for testing of different membranes in water treatment

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CITT POLITEHNICA 2020

Experimental stand with digital multimeter made with Arduino Nano

Project

Authors: Gabriel Nicolae Popa, Corina Maria Diniș

A

A Digital multimeter presented, built, and tested in the laboratory, can measure several electrical parameters: direct voltage, RMS voltage, direct current, RMS current, active, reactive, apparent power, minimum and maximum values, frequency of alternating voltage and measurement time. For simplicity, the multimeter has only one measurement range, for voltage maximum values (56 V direct voltage or 40 V alternating voltage), and for current maximum values (5 A direct current or 3.54 A alternating current). A maximum of two parameters have displayed on the LCD display at a given time and can be selected according to preferences. Four buttons can be used to configure the information on the LCD.

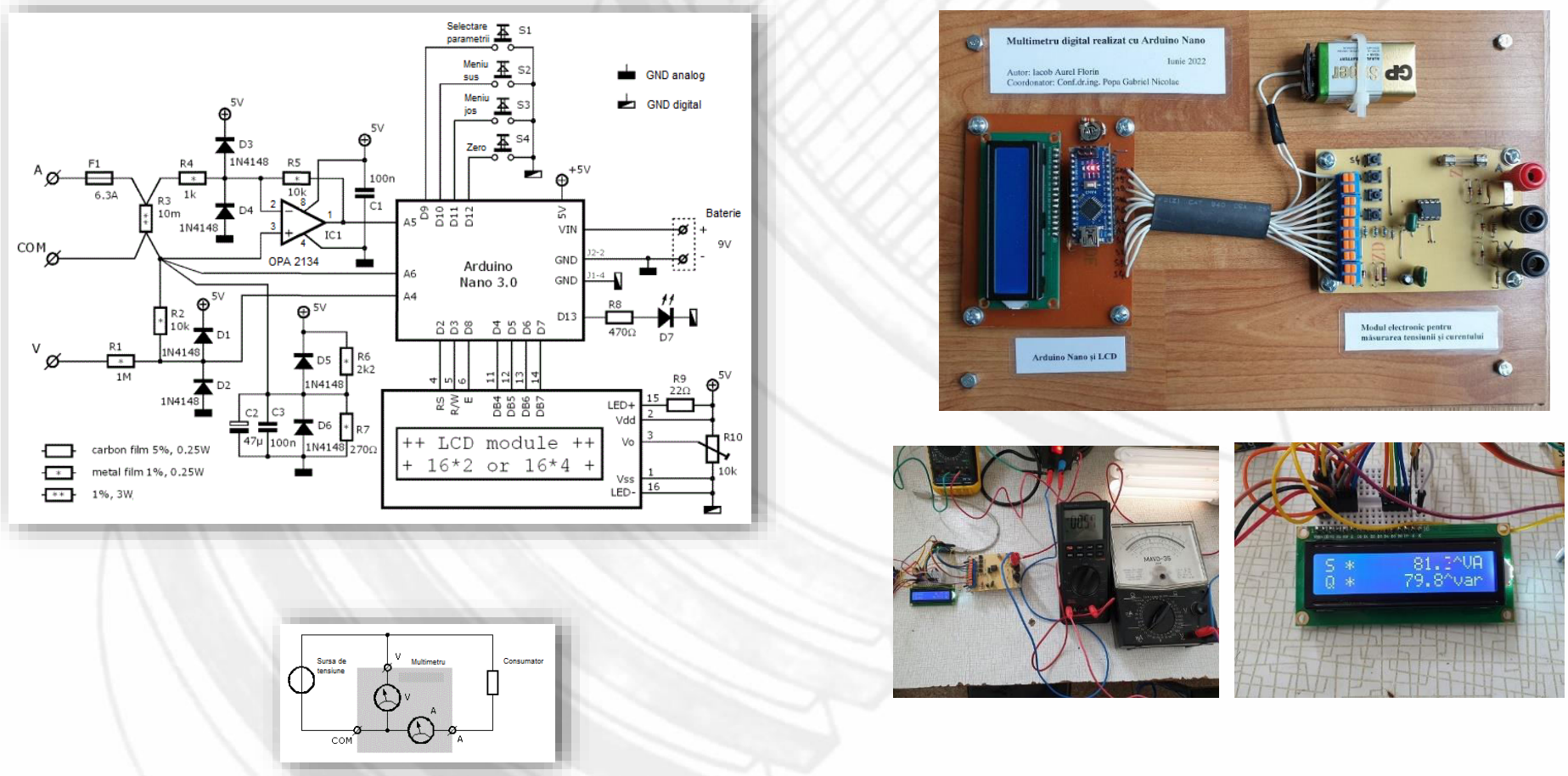

Fig.1. Experimental stand with digital multimeter: electronic and electric diagrams; views of multimeter

At the base of the multimeter is an Arduino Nano board (cheap) in which the program that performs the multimeter function has been implemented. The digital multimeter measures several electrical quantities, some of them RMS voltage and RMS current, with good accuracy (up to 5% for currents and up to 2.5% for voltage). It can be successfully used in laboratory work as well as in research.

Contact: Popa Gabriel Nicolae, e-mail: gabriel.popa@fih.upt.ro, tel. 0040254207541

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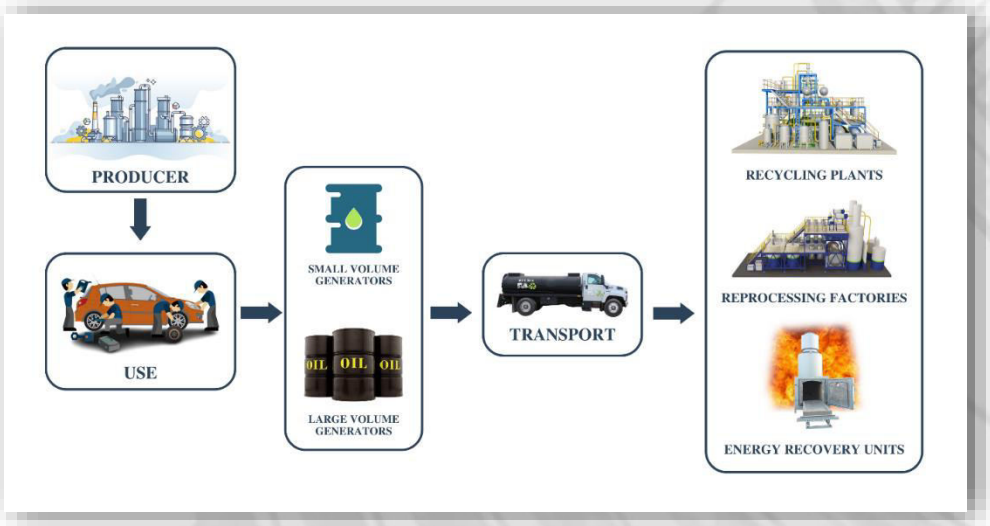
Study concerning methods for managing used engine oil. Analysis of a questionnaire-based survey

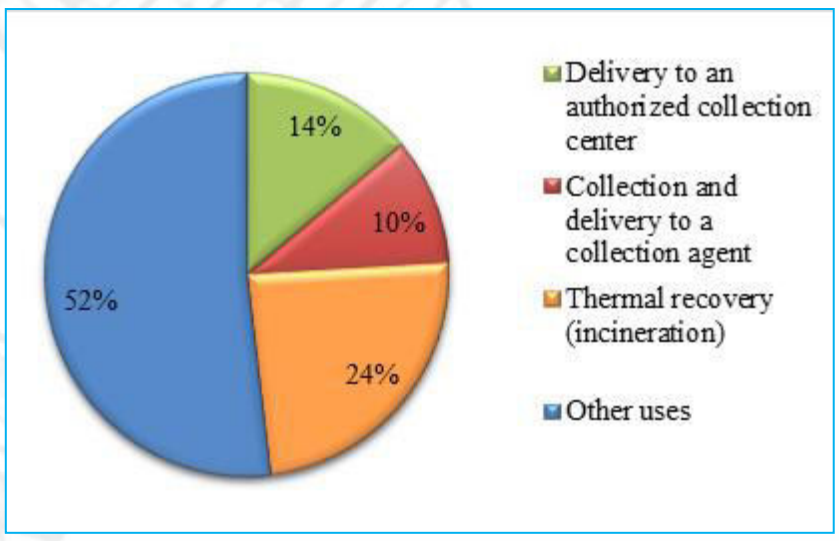
Scientific Paper

Authors: DIANA MIRUNA ARMIONI, IOANA IONEL, SORIN AUREL RAȚIU

A

This paper focuses on methods of managing used engine oil by presenting an analysis of the results of a survey based on a questionnaire designed by the authors, which aims to illustrate the real, objective situation of the management of used engine oil generated by vehicles powered by internal combustion engines.





The answers are analyzed for each question separately and both conclusions and implementable objectives that could improve the current situation are highlighted. In order to facilitate the understanding of the current framework, general aspects regarding the management of used engine oil are also presented, with an emphasis on the legislative perspective.

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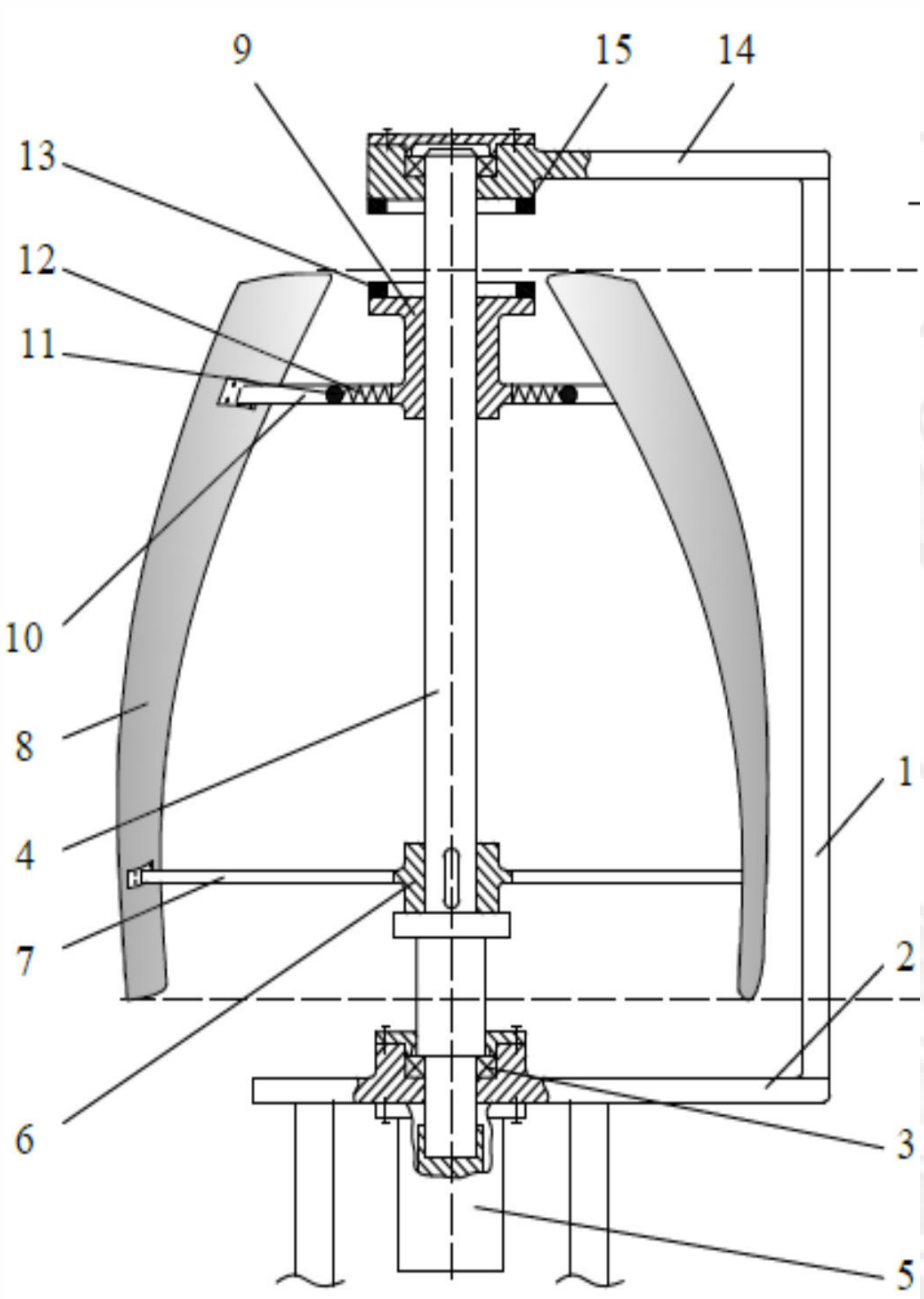
VERTICAL SHAFT WIND TURBINES WITH POWER CONTROL

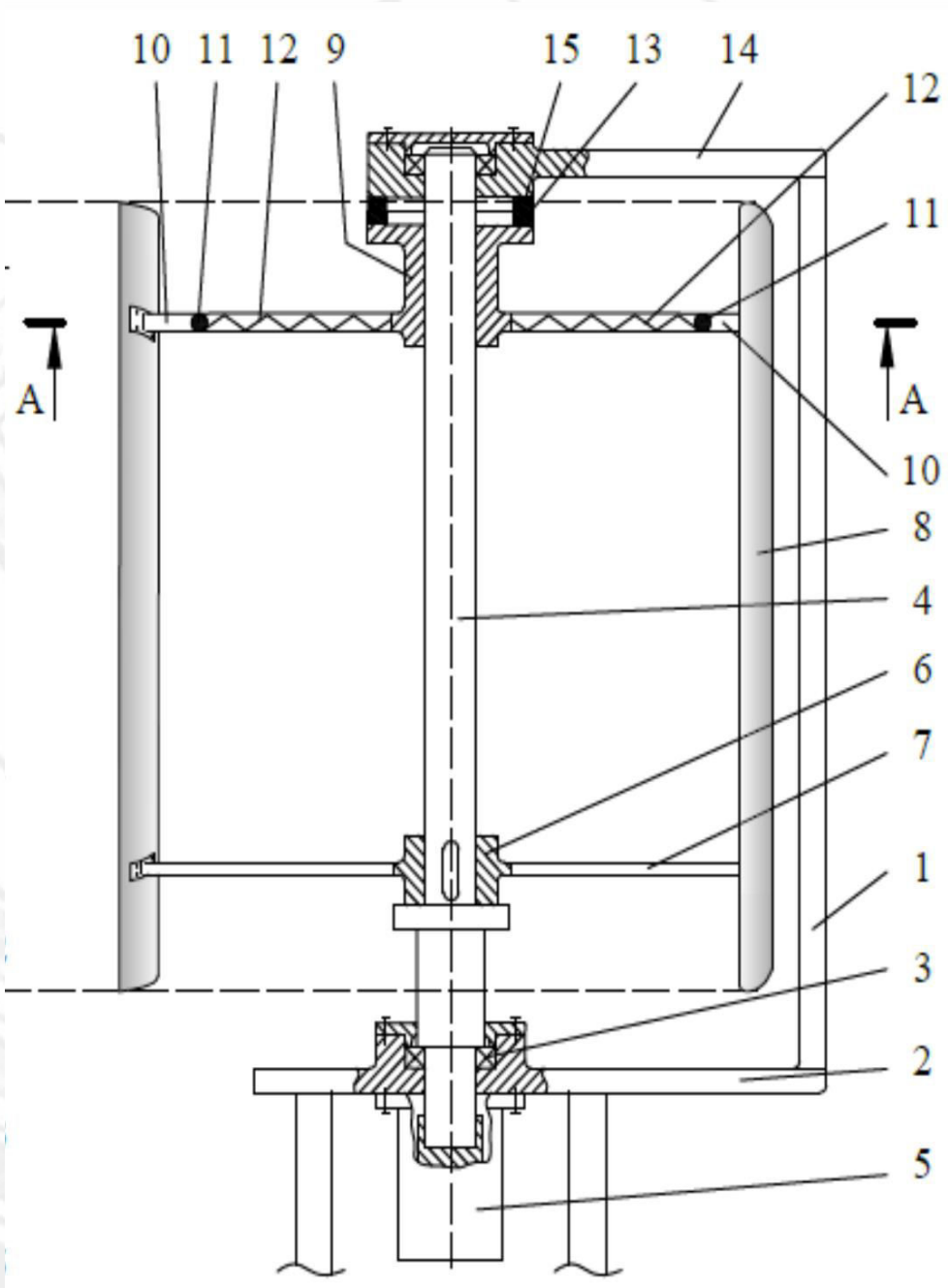
Patent nr. 1616 Y MD, of 30.04.2022

Authors: Dr. Sc., prof. Viorel BOSTAN; Dr. Sc., prof. Ion BOSTAN; Dr. Sc., prof. Valeriu DULGHERU; PhD., assoc. prof. Marin GUȚU; PhD. Ion RABEI; PhD., assoc. prof. Ion BODNARIUC; PhD., assoc. prof. Oleg CIOBANU; PhD., assoc. prof. Radu CIOBANU.

The invention relates to devices for converting wind energy into electricity, in particular to vertical axis wind turbines with power control. The problem solved by the invention consists in increasing the protection of the electric generator from overloads by automatic power control and increasing the reliability of the dynamic mechanical elements of the turbine.



Overview of the vertical axis wind turbine with power control, according to the first realization (initial phase)



Overview of the wind turbine, according to the first realization (final phase)

Solution: - The process of mechanical and aerodynamic braking;
- Relatively simple constructive solutions;
- Securing the tower from overloads generated by high wind speeds.

Contact: Departament of Machine Projecting Basics
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Power of Creative Mind

Climate Change Curb

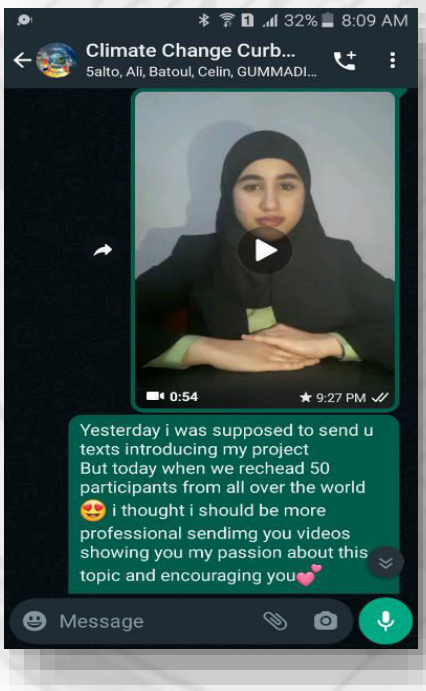
Student Project

Author: Zainab Arzouni

A

I'm a 17 years old Lebanese student joining Shohour Public High School. I was always passionate about protecting and saving nature, and when I joined some online webinars about Climate Change I was shocked with the threat our environment is exposed to. Then, I wanted to make a change, to make actions, not just to spread awareness by talking or writing. I knew that trees is the only cure for Climate Change as one tree can absorb 22KG of Carbon dioxide a year which is huge, since as we know that carbon dioxide is one of the poisonous gasses causing climate change. So, since I was a known international student, I took the advantage of making a whatsapp group and invited people from around the globe, when i had 70 people from more than 9 countries, I started sending them videos of me talking introducing them to Climate Change and spread awareness, then i planted lots of trees in my country and sent them the videos, this way they were encouraged and sent their contributions, so mision was accomplished.









Climate Change Curb

VIDEO

Contact: zeinabarzouni94@gmail.com

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VODE

Collection of the small patents

Patents

Author: Tomislav Trišović

A

The collection includes a number of 13 patents all are based on the idea of electrochemical water treatment. Unlike active chlorine, which is not healthy, we have created and patented various types of devices for the treatment of all types of water: drinking water, waste water, for swimming pools and spas, and so on.

The following pictures show some of the patented devices.

OUR PRODUCTS MADE IN INDUSTRY



INSITU PRODUCTION AND DOSING DEVICESHYPOCHLORITE WITH VARIABLE FLOW



DISINFECTION DEVICEWATER IN SWIMMING POOLS



TREATMENT PLANTWATERS IN THE GALVANIZATION PLANT





a) b)

INSITU PRODUCTION AND DOSING DEVICESBATCH TYPE HYPOCHLORITE a) AND FLOW TYPE b)



NICKEL DEPOSITION DEVICE IMPACTING SURFACES OF AIRCRAFT WINGS



CONTINUOUS CLEANING DEVICE PIPELINE CAPACITY UNTIL 2000 l/S

OUR PRODUCTS MADE IN INDUSTRY



MAGNETIC WATER TREATMENT DEVICE



ELECTROYLER FOR HYPOCHLORITE





NEW ELECTROCHEMICAL CELL WITH SPIRAL ELECTRODES



MODULAR ELECTROCHEMICAL ORGANIC SYNTHESIS CELLS

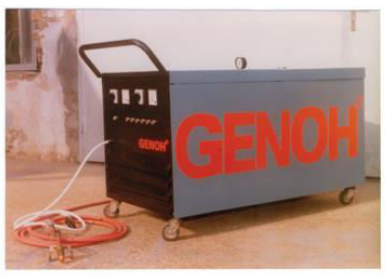


DEVICE FOR CHEMICAL AND ELECTROCHEMICAL METALIZATION OF GRAPHITE BOXES

OUR PRODUCTS MADE IN INDUSTRY



PRODUCTION DEVICE ACTIVE CHLORINE



DEVICE FOR OXYGEN AND HYDROGEN PRODUCTION BY WATER ELECTROLYSIS



DEVICE FOR ELECTRO FORMING GETTING TOOLS ON ROTARY SPINDLE



MANGAN AND IRON REMOVAL DEVICE AND HARDNESS FROM WATER

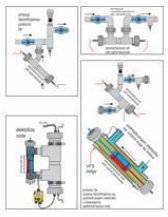


DEVICE FOR THE PRODUCTION OF ELASTICALUMINUM OXIDE-BASED MICROFILTERS

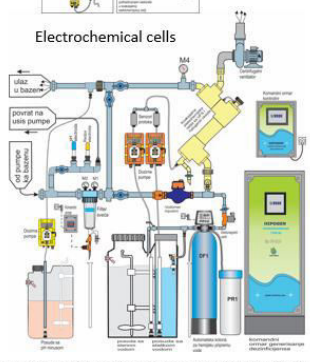


AUTOMATIC FEEDER FORDOMESTIC AND WILD ANIMALS

Artificial intelligence in water treatment processes generation disinfectant, monitoring (pH, ORP, EC, t, P, I), history, wifi router, intranet, remote control - smart devices



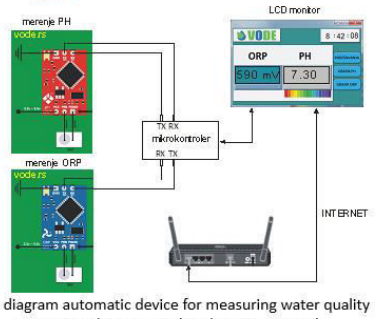
Electrochemical cells



Automatic device for in situ production of disinfectants with monitoring of water quality parameters (pH, ORP, EC, I, P, t) and with remote control



Automatic transmitter for measuring water quality parameters (pH, ORP, EC) and remote control



Block diagram automatic device for measuring water quality parameters (pH, ORP, EC) and remote control

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FKITMCMXIX

University of Zagreb
Faculty of Chemical Engineering and Technology

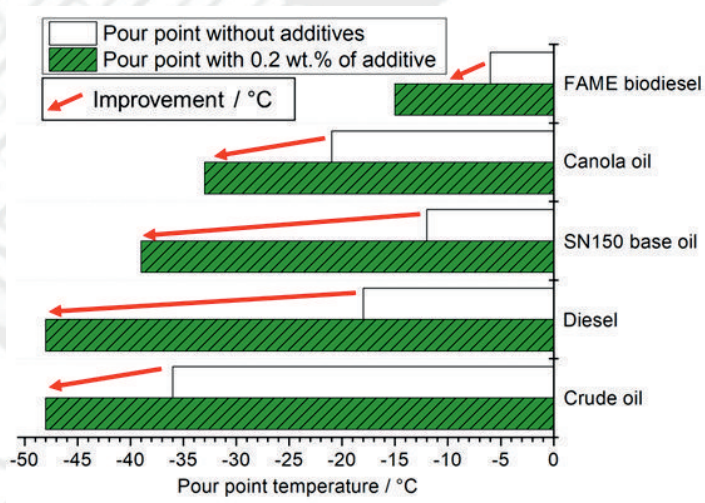
POLYMER ADDITIVE FOR IMPROVING LOW-TEMPERATURE PROPERTIES OF FUELS, BIOFUELS, LUBRICANTS, BIOLUBRICANTS AND CORRESPONDING BLENDS

A

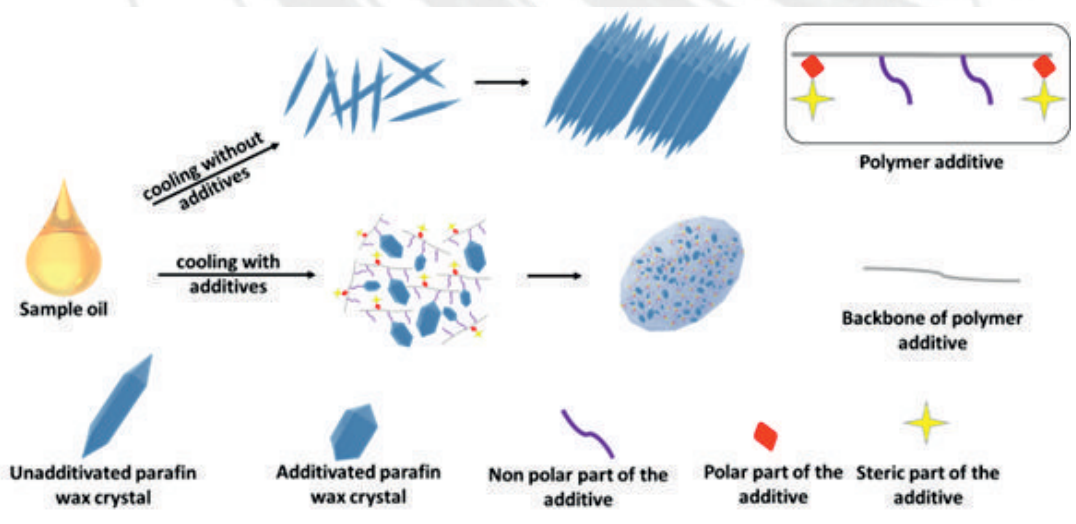
Authors: assoc. prof. dr. sc. FABIO FARAGUNA, dr. sc. MARKO RACAR, IVAN PUCKO, mag. ing. cheming., prof. dr. sc. ANTE JUKIĆ

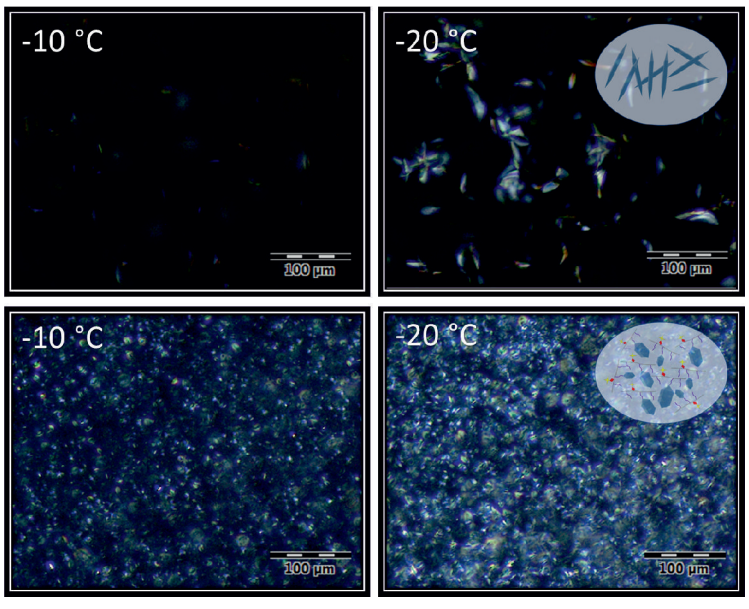
The composition of the polymer additives and the size of the molecules were tailored to be soluble and to significantly lower the pour point of various types of fuels, lubricants, biofuels, biolubricants and corresponding blends.

Even at low concentrations of 0.2 wt %, additive improves the pour point (ASTM D 5950) of biodiesel by 9 °C, canola oil and crude oil by 12 °C, lubricating oil by 27 °C and diesel by 30 °C, thus extending the range of application of the above mentioned fuels, lubricants, biofuels and biolubricants from -6 °C to -48 °C.



The additive affects the size of the crystals, makes them smaller and rounder and thus improves the flowability and the pour point.





Contact: CROATIAN INVENTORS NETWORK, e-mail:info@savez-inovatora-zagreba.hr
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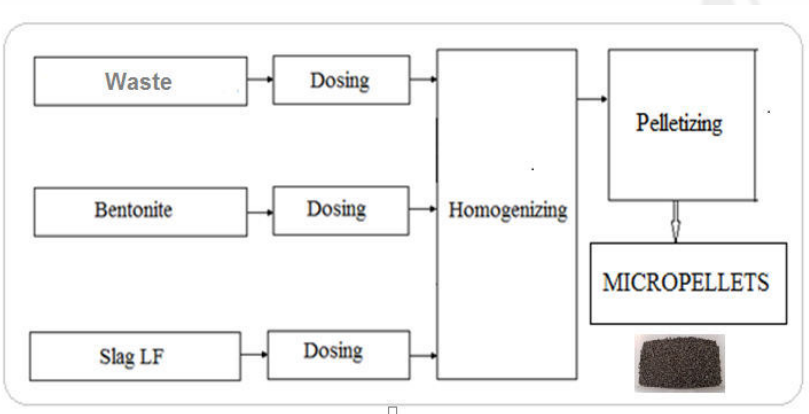
Processing of pulverous ferrous waste by agglomeration

Student Project

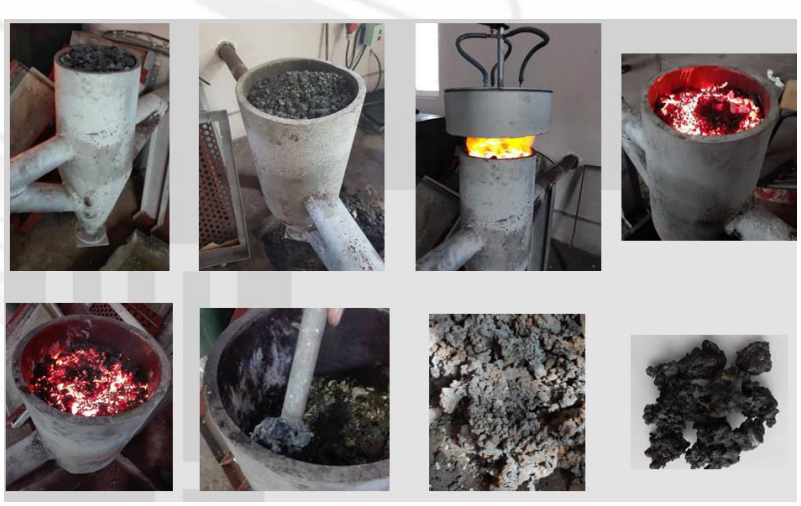
Author: Ioja Liliana-Dorina
Coordinators: Prof. Dr. Eng. Socalici Ana Virginia
Assoc. Prof. Dr. Eng.Corneliu Birtok-Bănească

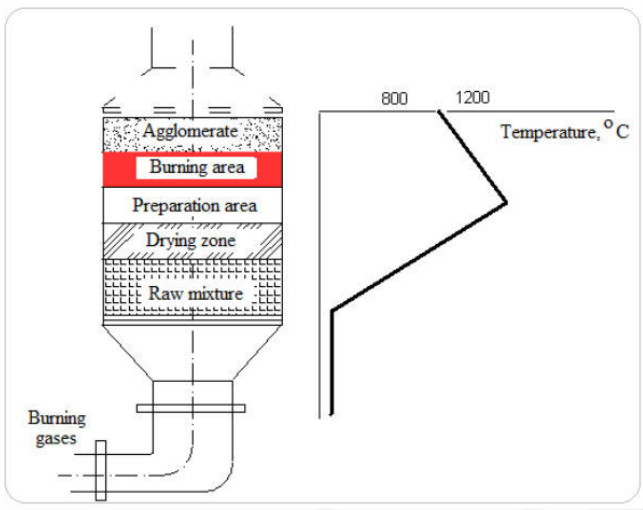
A

The projects presents the results obtained after the laboratory testing of the of agglomeration process of pulverous ferous waste. The obtained products are destined for use in the steel industry, as raw material for the production of steel. The worldwide development strategy of the metal industry consists in the advancement of new technologies that reduce the carbon emissions and grow the effective power of recovering and recycling by-products. The choice of the valorification proceedure must be made having in view the features of the waste, the destination of the obtained product and the existing processing equipments in the waste area.









The experimental agglomeration obtained have a high amount of iron 50%Fe. It is necessary to intensify the capitalization process of these waste for both economical (they represent a source of iron), technological and ecological reasons.

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ROMANIA: Shale gas could represent energy independence and lower bills

ROMÂNIA: Gazele de șist ar putea reprezenta independența energetică și facturi mai mici

Author/s: Valentin-Paul TUDORACHE[1], Niculae-Napoleon ANTONESCU

Romania consumes approximately 14 billion cubic meters of gas annually. This quantity is ensured in proportion of 80% of the domestic production, the difference of 20% is imported - at very high prices, through intermediaries - from the Russian Federation. In the near future, shale gas will have a number of favorable geostrategic and geopolitical implications for Romania, in the sense that increasing self-sufficiency and energy security will improve storage capacity and, of course, the abandonment of the main foreign supplier – Russia.

According to the Energy Information Administration (EIA) report on shale gas reserves in the European Union (EU), after Poland (4,190 billion cubic meters) and France (3,879 billion cubic meters), Romania ranks third with 1,444 billion cubic meters -so it can reduce the dependence on imported gases. Although the value potential of shale gas has long been recognized, a number of challenges have dampened expectations. However, despite a more favorable forecast, shale gas could represent Romania's energy independence and, obviously, lower bills, but there are concerns about the impact on the environment.

The authors, under the aegis the General Association of Engineers in Romania (AGIR), the Romanian Academy of Scientists (AOȘR) and the Romanian Academy of Technical Sciences (ASTR), of this paper offer a pass in the magazine of deposits unconventional, highlights potential shale gas resources on the territory Romania, which can describe the important role in the local energy sector and not only.

In Romania (see Fig. 1), shale gas formations with shale gas potential are located in orogen units, in corrugated structures and in platform units (from the Carpathian foreland), at depths exceeding 2,000 - 3,700 m, thus:

- Moesica Platform - Romanian Plain with its extension in South Dobrogea,
- Scythian Platform (Bârlad Depression),
- South of the Moldovan Platform.

Figure 2 shows the Program for the construction of a shale gas well, in which the realization of a horizontal well involves, first of all, a vertical drilling to a known depth, followed by KOP (kick-of point - change point of the drilling direction), then of the build-up area - deviated portion - until it reaches the productive layer and, finally, of the horizontal drilling on the projected length which can reach 2,500 m up to 3,700 m. part of the well, of horizontal section, allows a contact with the shale formation much more important than the one related to the vertical drilling.

A major problem is questioning the water.

Specialists have shown that each shale gas well requires between 10,000 and 30,000 m.c. of water, approx. 500 t of sand and approx. 50 t of chemicals. In total, between 60% and 80% of the mixture is returned to the surface. The rest, with 0.5% chemicals, remains in the fractured rock.

In all cases, this water is permanently lost, which is a problem in arid areas.

As for surface water, it must be stored and lightly treated for reuse during "well injection" operations or, at best, for reuse for other fractures.

Nothing would prevent from a technical point of view a cleaner solution, which would allow for example reuse in agriculture, but the cost being higher than approx. 4 (four) times, obviously, such a solution must be imposed.

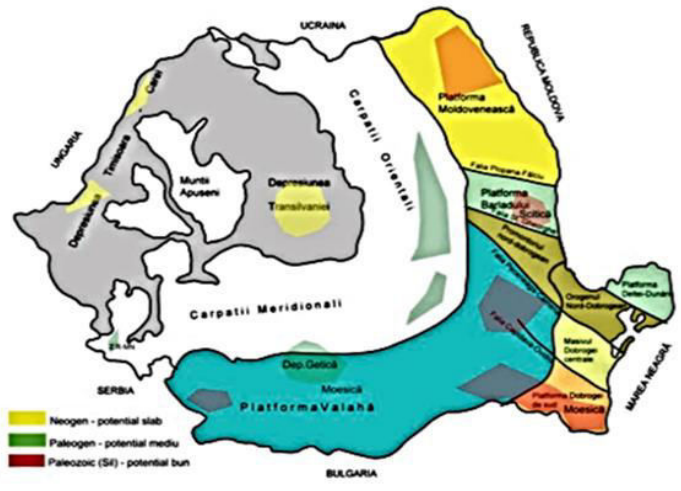
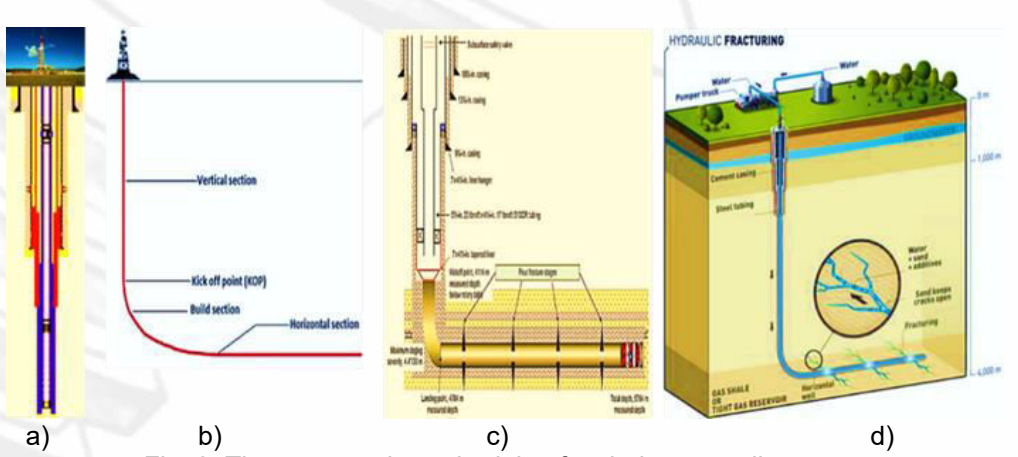


Fig. 1. Map of ROMANIA with the indication of the areas with shale gas potential



a) b) c) d)

Fig. 2. The construction schedule of a shale gas well
(a - *general scheme of the construction program;* b - *diagram of the construction program;* c - *typical scheme of the construction program;* d - *hydraulic fracturing/ cracking - the big picture*)

Romania could become independent of imported gas, which currently covers approx. 20% of domestic gas consumption.

Beyond the revitalization of entire industries as a result of shale gas, Romania can become an energy independent state. In this way, it can prepare for the status of natural gas exporter, and some of its coal-fired power plants can be converted to burn gas. As a general conclusion, the authors consider that the value potential of gases from unconventional deposits on the Romanian territory is significant.

Therefore, the authors recommend that the exploration and exploitation of shale gas is an opportunity and a necessity of the moment both in terms of the application of modern technologies and the adoption of an appropriate regulatory framework to reduce the risks caused by the war between Ukraine and the Russian Federation.

Contact: [1]***Associate Prof. PhD. Eng. Dipl, Faculty of Petroleum and Gas Engineering, University PETROLEUM - GAS of Ploiesti, Romania:*** ***valentin.tudorache@yahoo.com***

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UNIVERSITATEA TEHNICĂ DIN CLUJ-NAPOCA

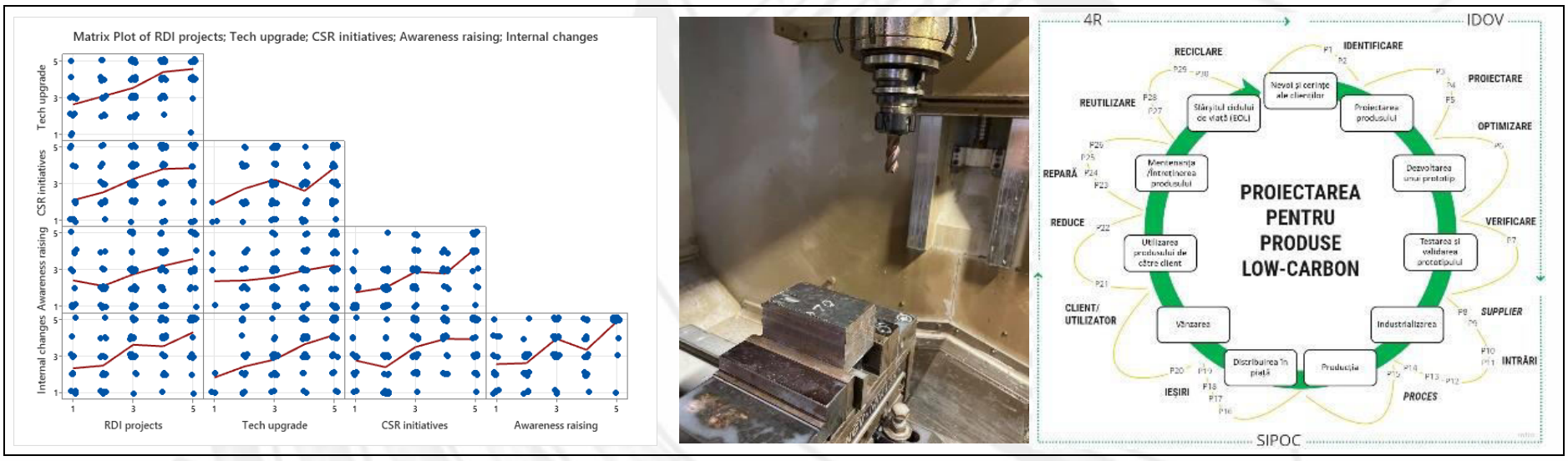
Innovative products and processes contributing to the low carbon economy

PhD Thesis

Author: Diana Alina BLAGU

A

The thesis focuses on three areas of the carbon footprint, namely the readiness of manufacturing companies in Transylvanian to transition to LCE, the analysis of the carbon footprint of a milling process and developing and validating a set of guidelines for designing low carbon products.



- **Our survey revealed** that manufacturing companies from Transylvania have a proactive attitude towards the environment, that there are already **measures they adopt to reduce their carbon footprint** even if their goal is mostly to reduce costs and that the voluntary commitment in this direction is reluctant.
- **The assessment of the carbon footprint of a milling process showed** that the emissions released are considerable and **that minor innovations** in this direction **can** improve the outcome of processes by **reducing the carbon footprint**.
- **The guidelines developed** for reducing the carbon footprint of manufactured products meet the expectations of design and production experts and **are considered an effective approach for LCE and environmental protection**.

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A

COMPOSITION OF PHBV/PCL AND NANOEMULSION OF NISINE AND DILL ESSENTIAL OIL AND METHOD FOR ITS OBTAINING

Patent application RO 00072/2022

Maria RÂPĂ[1], Elisabeta Elena POPA[2], Andrei Constantin BERBECARU[1], Ecaterina MATEI[1], Andra Mihaela PREDESCU[1], Cristian PREDESCU[1], Paul Alexandru POPESCU[2], Amalia Carmen MITELUT[2], Mona Elena POPA[2]

[1]University POLITEHNICA of Bucharest, Center for Research and Eco – Metallurgical Expertise (ECOMET), 313 Splaiul Independentei, 060042 Bucharest, Romania, www.upb.ro

[2]University of Agronomic Sciences and Veterinary Medicine Bucharest, Faculty of Biotechnology, 59 Marasti Blv., District 1, 011464, Bucharest, Romania, www.usamvb.to

PATENT DESCRIPTION

The invention relates to a composition based on a nanoemulsion of nisin and dill essential oil embedded in poly(vinyl alcohol) (PVA) solution to cover a poly(hydroxybutyrate-co-valerate)/poly(caprolactone) (PHBV/PCL) film and to a process for making antimicrobial, antifungal and biodegradable food packaging. In this purpose, the solutions of 8% PHBV and 10% PCL in dichloromethane (DCM), respectively were stirring at 60°C for 30 minutes and 400 rpm, and then mixed together in a volumetric ratio of 1:1. Nisin and dill essential oil nanoemulsion was encapsulated in 10% PVA solution. The process, according to the invention, consists in the co axial electrospinning of the mixture of components, with a flow rate of the PVA solution between 4 to 5 mL/h, a flow rate of the nisin and dill essential oil nanoemulsion in the range of 0.8...1.0 mL/h, a voltage in the range of 21.63...22.64 kV and the distance between the needle-collector tip of 14 cm.

ADVANTAGES

Antimicrobial, antifungal and biodegradable food packaging;
Coaxial electrospinning process is simple, versatile, without high energy; consumption and toxic solvents;
Controlled release of bioactive compounds;
Increase of the shelf-life of food;
Reduce the generation of packaging waste and food.

STEP 1
Obtaining of the PHBV/PCL support film

↓

STEP 2
Obtaining of the of nisine and dill essential oil nanoemulsion

↓

STEP 3
Fabrication of the nanofibers encapsulated in 10% APV solution and deposited on the polymeric support film



Fig. 1. Electrospinning equipment

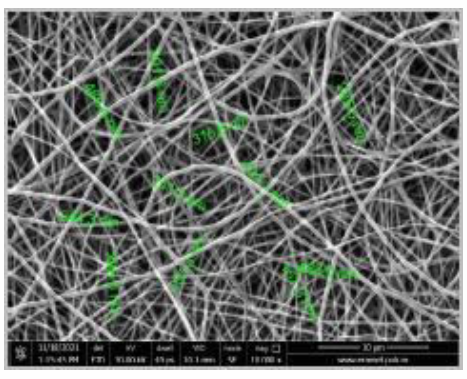

Fig. 2. SEM image for nisin and dill essential oil nanonoemulsion deposited on PHBV/PCL film

ACKNOWLEDGEMENTS

This work was supported by a grant of the Romanian Ministry of Education and Research, CCCDI - UEFISCDI, project number PN-III-P2-2.1-PED-2019-2878, within PNCDI III, contract no. 379PED/2020, acronym BIOMATFOOD.

Contact: Popa Elisabeta Elena, elena.eli.tanase@gmail.com; Râpă Maria, maria.rapa@upb.ro

Production process and mannoprotein A preparation obtained based on yeast biomass from the waste of the wine industry

Authors: **Beșliu Alina, Chiselița Natalia, Chiselița Oleg, Efremova Nadejda, Tofan Elena, Sprincean Ana, Daniliș Marina**

Patent no.: **a 2022 0003/2022.01.26**

The invention relates to microbial ecology and biotechnology, in the particular production process and mannoprotein preparation obtained based on yeast biomass from the waste of the wine industry.

The production process according to the invention includes the use of yeast biomass from wine industry waste which is subjected to autolysis with sodium phosphate buffer (1: 1 ratio) at a temperature of +45°C for 8 hours, with periodic stirring, centrifugation, treatment of cell walls with 50% alcohol solution (1: 3 ratio), stirring for 30 minutes at 200 rpm, centrifugation for 15 minutes at 3500 rpm, processing of remaining sediments with 1N solution NaOH (1:5 ratio) at +80±5°C for 2 hours, centrifugation, the obtained alkaline supernatants are mixed with 96% ethyl alcohol in a volume of 1: 2, centrifugation at 3500 rpm. Dissolve the mannoprotein in distilled water, standardization of the preparation of 10 mg/ml active substance.





Advantage: Elaboration of process and mannoprotein preparation obtained based on yeast biomass from the waste of the wine industry, allows obtaining 57.84±0.9% (d.w.) protein, 31.40±2.65% (d. w.) carbohydrates, 12.42±0.08 mg/g-1 anthocyanins, trace elements 4.05 mg/ml, antioxidant activity 33.4±0.3% inhibition, superoxide dismutase activity 263.0± 4.04 U/mg protein and catalase 525.0±3.1 mmol/min per mg protein.

Application: Environment-Pollution Control, Zootechnics, Agriculture, Medicine - Health Care-Cosmetics and Pharmaceutical Industry.

The research was carried out within the project 20.80009.5107.16 "New biologically active microbial preparations for increasing the reproductive and productive potential of animals of zootechnical interest", funded by NARD.

Contact: BEȘLIU Alina, dr., Institute of Microbiology and Biotechnology, 1, Academiei str., MD 2028, Chisinau, R. Moldova. e-mail: besliu.imb@gmail.com.

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Antioxidant anthocyanin extract and obtaining process from waste yeast biomass from wine industry

A

Authors: **Chiselița Oleg, Chiselița Natalia, Tofan Elena, Bețliu Alina, Efremova Nadejda, Sprincean Ana, Daniliș Marina**

Patent no.: **a 20220011/2022.02.21**

The invention relates to the field of ecology and microbial biotechnology, in particular to the elaboration of an antioxidant anthocyanin extract and to the process for obtaining the biologically active anthocyanin extract from waste yeast biomass from the wine industry, which can be used in agriculture, especially animal husbandry, food industry and cosmetology. According to the invention, the extract is obtained by thawing biomass, homogenizing the suspension and autolysis at +45°C for 8 hours or autolysis at +45°C for 8 hours in sodium phosphate buffer solution, with regular stirring, centrifugation of the suspensions, treatment of the remaining biomass with 50% ethyl alcohol solution, extraction for 30 minutes at room temperature with constant stirring, centrifugation of the suspension. The extract has a total anthocyanin content of 65.60±0.5-134.23±2.6 mg/L.

Advantage: The implementation of the invention will contribute to the diversification of natural biologically active preparations and the efficiency of the processing and recovery of waste from the wine industry, which will significantly reduce their negative impact on the environment.

Application: Environment-Pollution Control, Zootechnics, Agriculture, Medicine - Health Care-Cosmetics and Pharmaceutical Industry.



The research was carried out within the project 20.80009.5107.16 "New biologically active microbial preparations for increasing the reproductive and productive potential of animals of zootechnical interest", funded by NARD.

Contact: Chiseliță Oleg, dr., Institute of Microbiology and Biotechnology, 1, Academiei str., MD 2028, Chisinau, R. Moldova.e-mail: chiselita@mail.ru.

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Medium for lyophilisation of fungal strains of the genus *Trichoderma*

A

Authors **Sîrbu Tamara, Timuş Ion, Gorincioi Viorina, Moldovan Cristina, Ţurcan Olga, Bogdan Nina**

Patent no.: **1475 MD/2021.07.31**

The invention relates to biotechnology, namely to a medium for lyophilization of fungal strains of the genus *Trichoderma* and can be used for conservation and long-term storage of fungal strains. The medium, according to the invention, comprises, %: glucose - 7, Fe_2ZnO_4 nanoparticles - 0.0005 and skim milk - the rest. The result of the invention consists in increasing the viability of fungal strains after lyophilization and after storage in lyophilized state.









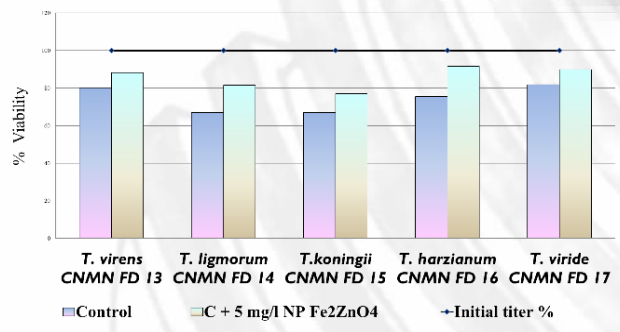


Fig. 1 Viability the *Trichoderma* strains after lyophilization.

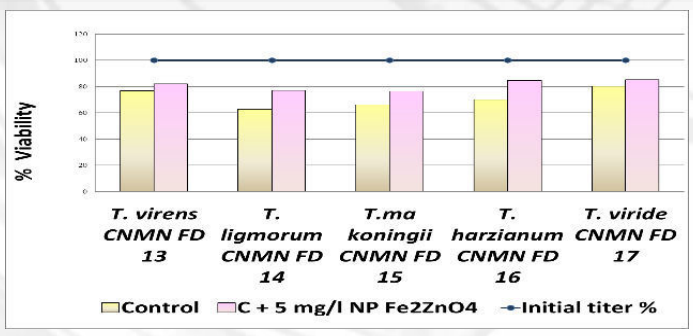


Fig. 2 Viability of *Trichoderma* strains after 1 year of preservation in lyophilized state.





The proposed protection medium (skimmed milk + 7% glucose + 5 mg / L Fe_2ZnO_4 nanoparticles) for lyophilization of fungi of the genus *Trichoderma* contributes to the stimulation of their viability after lyophilization and keeping in lyophilized state by 5-14,7% compared to the control variant. Areas of application: Microbiology, Biotechnology, Agriculture.

The research was carried out within the project 20.80009.7007.09 " Conservation and exploitation of microbial biodiversity as a support for the development of technology and sustainable agriculture, science and education ", funded by NARD.

Contact: Sîrbu Tamara, dr., ass. prof., Institute of Microbiology and Biotechnology, 1, Academiei str., MD 2028, Chisinau, R. Moldova. e-mail: tfsirbu@gmail.com.

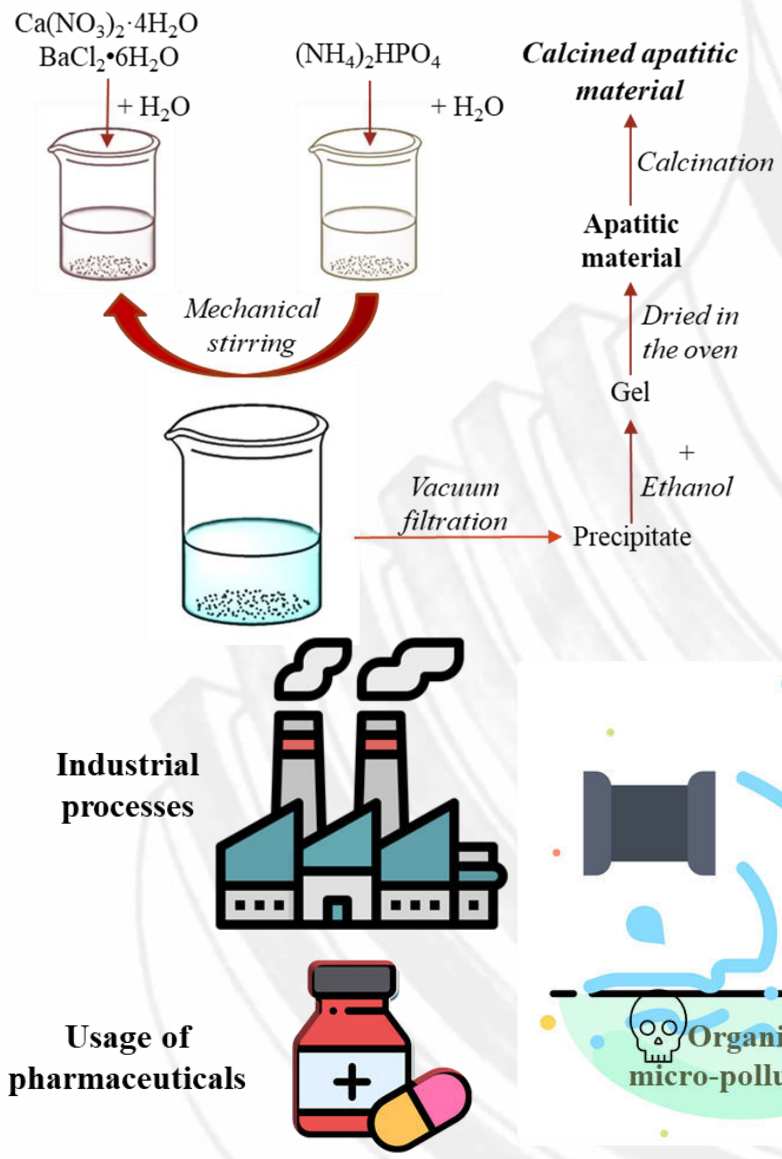
Process and absorbent material for absorption of organic pollutants from aqueous solutions

Patent application No. A-00123/2022

A

Roxana Ioana BRAZDIS, Radu Claudiu FIERASCU, Anda Maria BAROI, Irina FIERASCU, Toma FISTOS

The present invention relates to an adsorbent material and to a process for obtaining it, used to reduce the level of organic pollutants in aqueous solutions, at ambient temperature and atmospheric pressure. The adsorbent obtained according to the invention eliminates the disadvantages of current approaches, in that it is presented in the form of a powder, having a specific surface area between 35-55 m^2/g, with the crystallites size below 25 nm and the method of obtaining it is easily scalable to industrial scale.



- It is stable and allows the adsorption of organic micro-pollutants in conditions similar to real ones (ambient temperature, atmospheric pressure and neutral pH)
- It is reproductible in terms of physical and structural properties
- No secondary pollution (mud, ash, etc.)
- Can also be used in accidental pollution, with high concentrations of pollutant.

Acknowledgements: This work was supported by the INCDCP ICECHIM Bucharest 2019-2022 Core Program PN. 19.23–Chem-Ergent, Project No.19.23.03.01. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

Contact: fierascu.radu@icechim.ro, Fierascu Radu Claudiu (Technical Manager)

"Vasile Alecsandri" University of Bacau, Romania

Universitatea „Vasile Alecsandri" din Bacău

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PROCESS FOR PREPARING ASYMMETRICAL POLYMERIC MEMBRANES WITH PERMANENT WETTABILITY TO BE USED IN WATER ULTRAFILTRATION FOR PHARMACEUTICAL AND FOOD INDUSTRY

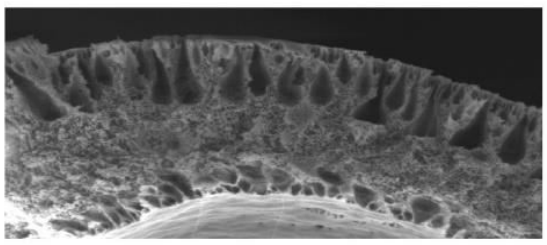
A

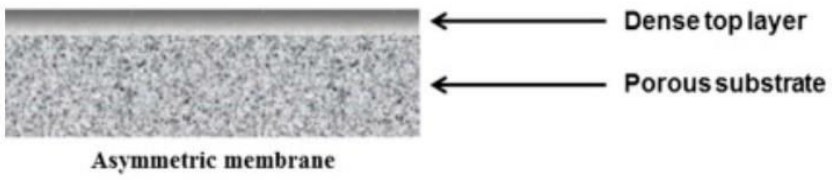
Authors:

NEDEFF Valentin,
SANDU Andrei Victor,
NEDEFF Florin Marian,
SANDU Ioan Gabriel,
BARSAN Narcis,
TĂTARU Laurenţiu,
SANDU Ion

Patent RO133608/2022

The invention relates to a process for preparing asymmetrical polymeric membranes with permanent wettability to be used in water ultrafiltration for pharmaceutical and food industry. According to the invention, the process consists in dispersing 0.3% mixture of silica naoparticles and colloidal silver, in a gravimetric ratio of 98:2 in a hydrophilic polymeric solvent, such as 1-methyl-2-pyrrolidone, followed by adding 30% polysulphone dispersed in polymeric solvent, while stirring, the stirring being continued for 24 h at 240 rpm, at the ambient temperature, to result in a stable homogeneous dispersion which is cast on an unwoven textile carrier made of yarns of less than 100 μ m, to result in polymeric membranes having a thickness of 100...200 μ m and a pore diameter asymmetrical stratigraphic profile.

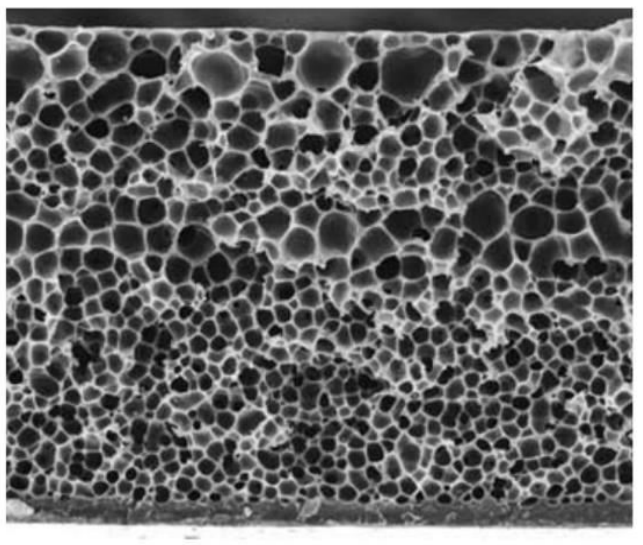




Asymmetric membrane

The invention presents the following advantages:

- allows obtaining a thin monolayer membrane, with thicknesses varying between 100 and 500 μm and with an asymmetric stratigraphic profile, regarding the gradual arrangement of pores from small diameters on the active filtering surface (front of the membrane) to large diameters on the opposite surface (back of the membrane) ;
- offers a wide field of application and good photo-chemical, thermal and mechanical stability;
- has a high water flow and high integrity;
- they allow the achievement of required characteristics for portable micro and ultrafiltration devices where integrity testing is very important;
- they are superior to isotropic membranes in terms of flow rate;- they are also distinguished from other asymmetric membranes by the parameters of their internal structure (many membranes are classified as asymmetric based only on the difference in the size of the pores on the front and back of the membrane, without taking into account the shape and size pores);



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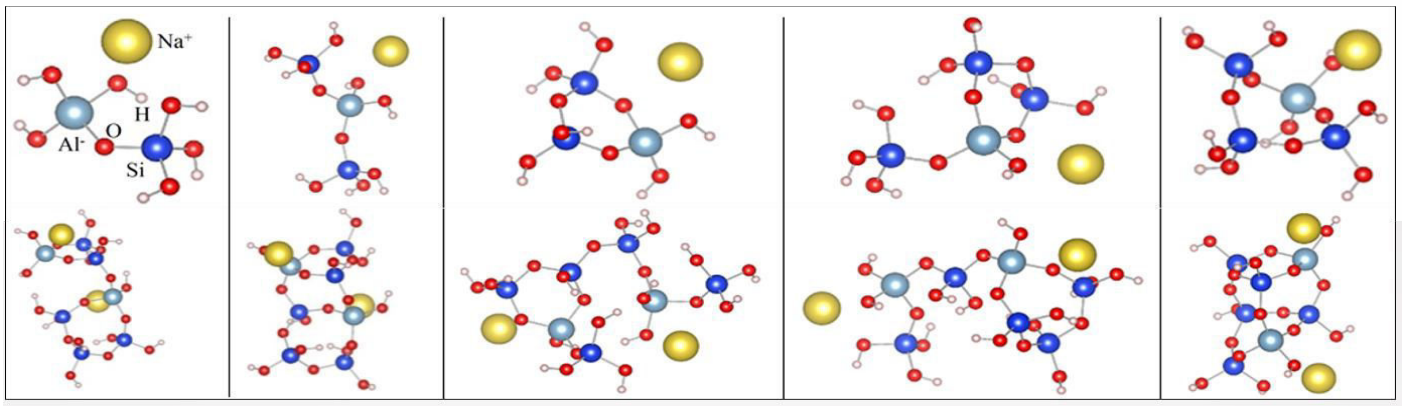

RecMine

Environmental footprint reduction through eco-friendly technologies of mine tailing recycling

A

ERA•MIN 3

Raw Materials for the Sustainable Development and the Circular Economy

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Department of Analytical Chemistry

Middle East Technical University
Robotics and Artifical Intelligence Technologies Center

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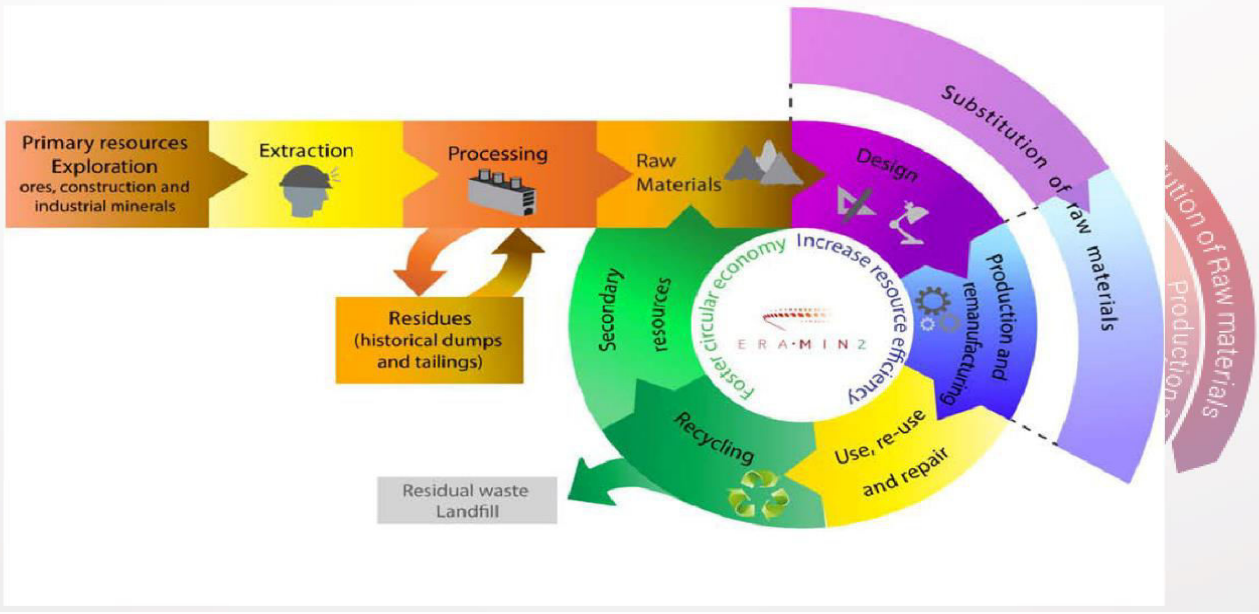


MECHANICAL DEVICE WITH ULTRASOUND FOR QUALITY CONTROL OF TREES

A

PETRICEANU Constantin, PETRICEANU Alexandru Daniel, COSTOIU Mihnea Cosmin, SEMENESCU Augustin, GÎDIUȚĂ Ioana, DIACICOV Călin-Marian, CHIVU Oana Roxana

University POLITEHNICA Bucharest, RO, EU

Introduction

The invention relates to the creation of a control device capable of assessing the quality of tree trunks in a non-invasive way. This is useful for identifying and deciding which trees are healthy and which are affected by various structural problems and need to be cut down.

The disadvantages of the solutions known so far refer to the fact that the introduction and reception of mechanical waves is done with the help of metal rods that are inserted into the trunk of the tree. Thus, the nearby wood tissue is irreparably damaged and degrades.

The technical problem solved by the invention consists in the realization of a technical system (mechanical, electronic and computer) that allows the investigation of the health of the trees in order to identify those with problems, without them being injured by the introduction of

Introducere

Invenția se referă la crearea unui dispozitiv de control capabil să evalueze calitatea trunchiurilor arborilor printr-o metodă care să nu implice vătămarea acestora. Acest lucru este util pentru a identifica și decide care arbori sunt sănătoși și care sunt afectați de diverse probleme structurale și trebuie tăiați.

Dezavantajele soluțiilor cunoscute până în prezent se referă la faptul că introducerea și recepția undelor mecanice se face cu ajutorul unor tije metalice ce sunt introduse în trunchiul copacului. Astfel țesutul lemnos din proximitate este afectat iremediabil și se degradează.
Problema tehnică pe care o rezolvă invenția c
onstă în realizarea unui sistem tehnic (mecanic, electronic și informatic) care să permită investigarea stării de sănătate a arborilor în vederea identificării celor cu probleme, fără ca aceștia să fie răniți prin introducerea de corpuri străine în trunchiul lor.

Starting Parameters

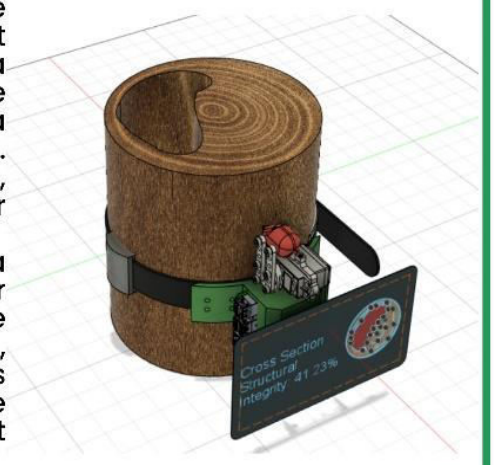
The type of wood essence to be controlled, characterized by the specific stiffness matrix, the modules of longitudinal and transverse elasticity and the speed of wave propagation in the material (parameters saved in the standard program library).

The diameter in each direction of examination, depending on the desired accuracy, the increment in degrees may have the values of 10°, 30°, 45° and 90°.

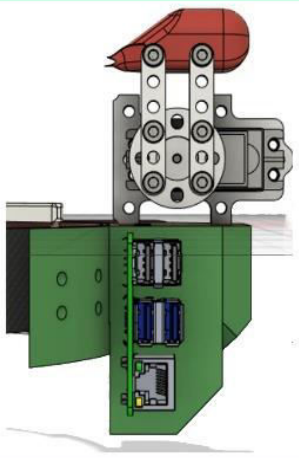
```
const double E = 11e9;
const double d = -5e-9;
const double ro0 = 571;
const double m = 12;
```

Conceptual Design and Function

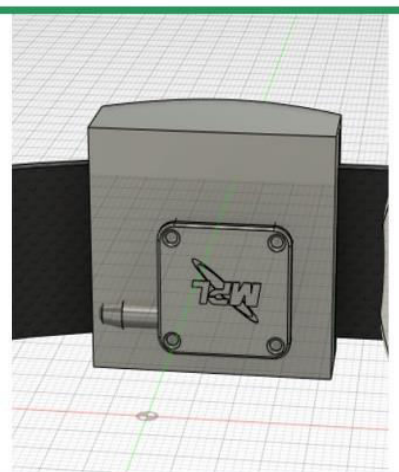
The control device has the possibility to be attached to the tree using an elastic belt adjustable to its diameter. It comprises a servomotor which is used to strike the tree according to a program which can be set for a specific force and frequency of impact. Attached to the belt are 4 piezoelectric sensors, arranged at 90o, which operate in receiver mode.
The signals received by them are captured by a microcontroller which transmits them for processing to the computer program. The results are displayed as a graph on a screen, highlighting the areas where the characteristics of the mechanical wave are different from the ideal transmission through the tree without defect.



CAD Design of the Device



Constructively, the device uses five distinct component parts: one for each sensor and one for the microcontroller, servomotor and display. The hammer head is made of PETG and has a length of 50 [mm]. The main box has a length of 90 [mm], a height of 65 [mm] and a width of 47.5 [mm] and has protective role for the electronic components inside. Each box has a special mounting bracket on the elastic strap, while also being able to slide along it. The belt has a length of 3000 [mm], a width of 100 [mm] and a thickness of 5 [mm] to ensure the specific conditions of rigidity and specific pressure required for the examination.



Theoretical Model Testing

The C ++ programming software controls the actuation of the active part of the device, the reception and processing of the signal received by the sensors, the introduction of the initial parameters in which the tree is degraded and the display of results.

The program is able to automatically issue an analysis bulletin containing information on the exact location of the examination taken by GPS, the type of tree examined, its diameter, the height from the ground at which the examination was made, the picture of the tree, the name and surname of the operator, the graph with the cross-section of the examination and the percentage in which the internal structure is affected.




```
std::ifstream fin("valori.txt");

double procent(double Q, double t) {
    double Fx = Q/d;
    double ro = E/pow((Fx*t/m), 2);
    return ro/ro0;
}

int main() {
    double Qmed=0., tmed=0, q1, t1;
    int iter = 0;
    while(fin >> q1 >> t1) {
        Qmed += q1;
        tmed += t1;
        iter++;
    }
    Qmed /= iter;
    tmed /= iter;
    std::cout << procent(Qmed, tmed);
    return 0;
```

SELECTIVE REFERENCES: [1] Allison, R.B.;Wang, X. Chapter 7—Nondestructive Testing in the Urban Forest, USDA Forest Service, Forest Products Laboratory: Madison, WI, USA, 2015, pp. 77–86; [2] Wang, X.; Allison, R.B., Decay detection in red oak trees using a combination of visual inspection, acoustic testing, and resistance microdrilling, Arboric, Urban For, 2008, 34; [3] Wang, X.; Wiedenbeck, J.; Liang, S., Acoustic tomography for decay detection in black cherry trees, Wood Fiber Sci. 2009, 41, pp. 127–137.

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PROCESS FOR MONITORING STABILITY OF ECOLOGICAL DUMPS IN MINING AREAS AND IN URBAN AREAS

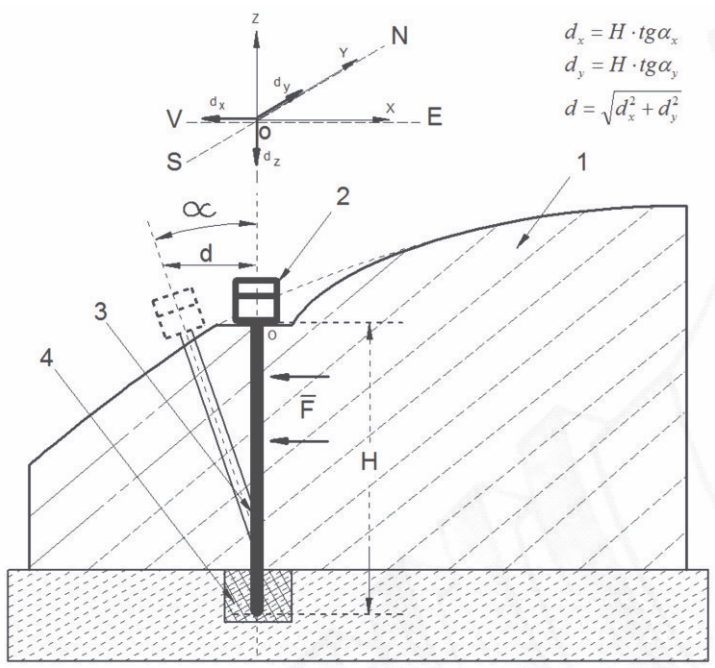
PROCEDEU DE MONITORIZARE A STABILITĂȚII DEPONIILOR ECOLOGICE

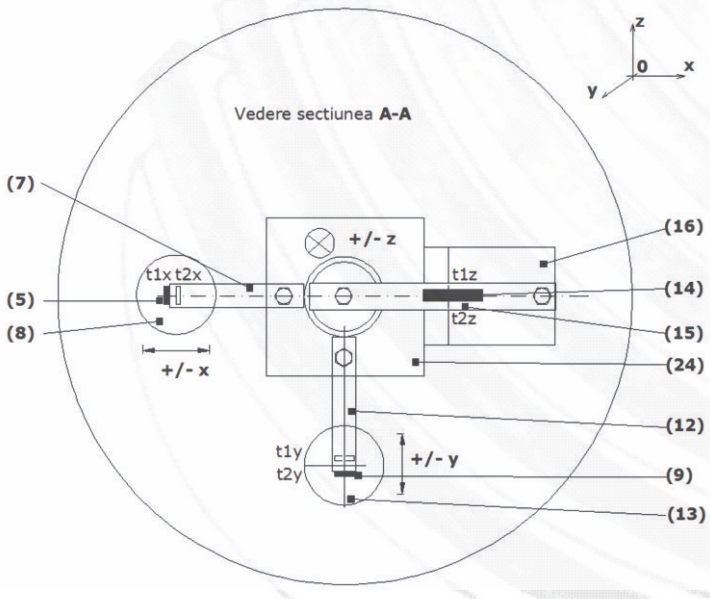
1948 UNIVERSITATEA DIN PETROȘANI

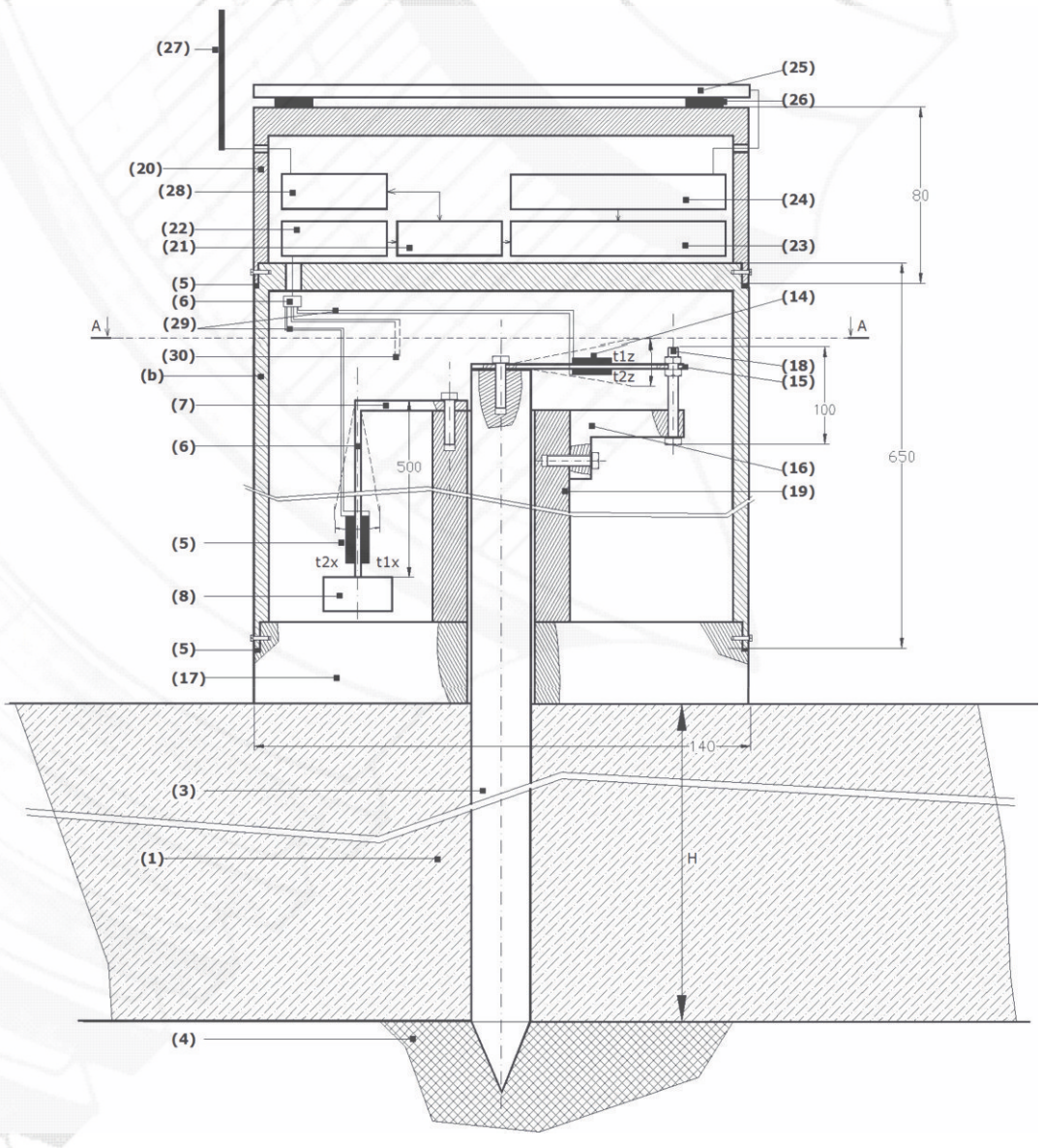
Patent number: OSIM A/00025/17.01.2017, concept
Remus DOBRA,
Mircea RÎȘTEIU, Dragoș PĂSCULESCU

Category
A

The invention refers to a process for monitoring the stability of existing ecological depositories in mining, dump and landfill areas, as well as in urban areas, such as decanting ponds and landfills.







Invenţia se referă la un procedeu de monitorizare a stabilităţii depozitelor ecologice existente în zonele miniere, haldelor şi depozitelor de deşeuri, precum şi în zonele urbane, cum ar fi iazurile de decantare şi gropile de gunoi.

Asociația de Cercetare Doctorală Petroșani

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The wonders of lantern fish

Author: ANDRE RERAT

High School student project
HIGH SCHOOLER SPARK SCHOOL
TRANSYLVANIA COLLAGE CLUJ

A

Raising awerness about the importancce of the lanternfish

Lanternfishes are small mesopelagic fish of the large family Myctophidae. One of two families in the order Myctophiformes, the Myctophidae are represented by 246 species in 33 genera, and are found in oceans worldwide.



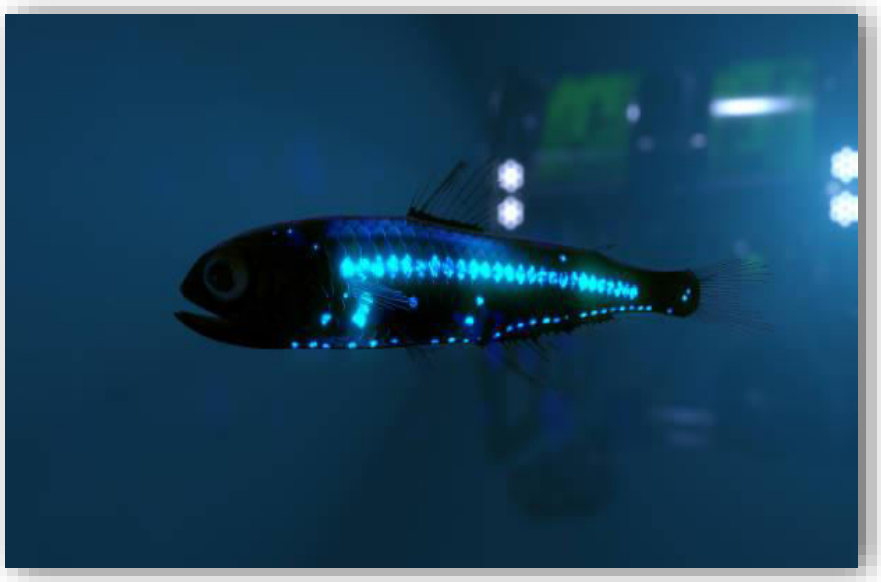
False sea floors

90% of fish biomass is located in the deep sea. Lantern fish account for about 65% of deep sea fish biomass. They are also the most diverse, widely distributed and populous vertebrate. This caused sonars to bounce off schools of lantern fish which created fake floors. This made maps of our oceans erroneous.



Bioluminescence

As the name suggests, lantern fish have photophores that help them camouflage, see prey and communicate. They possess two kinds of photophores that can light up independently, allowing for more complex patterns.



Importance

Not only are lanternfish important food for countless marine predators, but they also absorb more co2 than the Amazon rainforest. This makes lantern fish one of the most crucial animals in the world because of all the organisms that rely directly or indirectly on their immense numbers.

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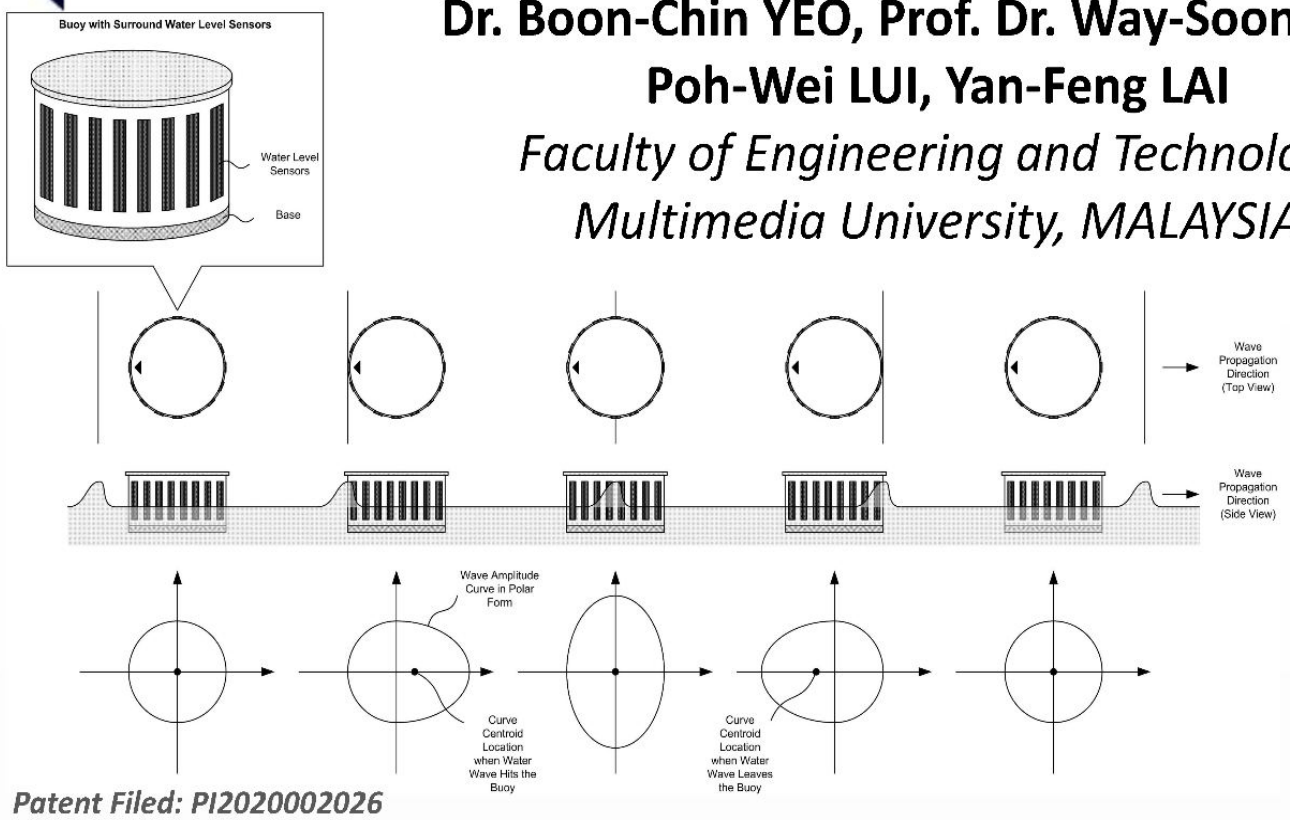
SURROUND SENSING-BASED WATER WAVE DETECTOR FOR BUOY

Dr. Boon-Chin YEO, Prof. Dr. Way-Soong LIM,
Poh-Wei LUI, Yan-Feng LAI
Faculty of Engineering and Technology
Multimedia University, MALAYSIA

A



Patent Filed: PI2020002026

A Monitoring Device For Locating Surface Wave Source in a Liquid Body

With Surround Water Level Sensors & Shape-Shifting Oval-Shaped Real-Time Graph Generation and Analysis

Overview

Reservoirs, dams, and lakes in Malaysia are important to provide water resources, generate hydroelectricity, and preserve biology diversity. Many illegal activities can happen around the areas such as illegal fishing, logging, swimming, wildlife crimes and illegal waste disposals into the water; and monitoring tasks can be challenging. Different water waves can be created from different activities. One of the solutions is to use the mobile floating device to monitor the activities on the water surface. Capturing the water waves will allow us to detect the abnormal situations. The floating device can also allow the monitoring process to be done at the middle of the lakes, where there is no place to mount the camera traps.

The Invention

The invention provides a monitoring device comprising a flotation body for enabling the monitoring device to float on a liquid surface. The flotation body has a plurality of sensing means disposed around its periphery such that when surface waves are propagating towards the monitoring device and contacting the plurality of sensing means along the periphery, each sensing means obtains an amplitude of the surface waves that come into contact therewith for computation by a processing means, wherein the processing means forms a pattern indicative of a first point of contact and a last point of contact between the surface waves and the periphery of the monitoring device for identifying a direction of a surface wave source.

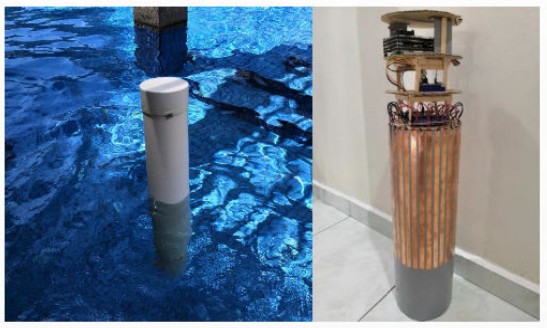
Market Potential

A market survey report titled "Malaysia Industrial Water and Wastewater Treatment Market Outlook to 2022 - By Region (North, Kuala Lumpur, South and East, and Sabah and Sarawak) and By Industry (Agriculture and Food, Palm Oil, Oil and Gas, Electronics, and Others)" from Ken Research provides a comprehensive analysis on the Malaysia Industrial water and wastewater treatment market. The market trend for wastewater treatment will reach USD 700 million by 2022.

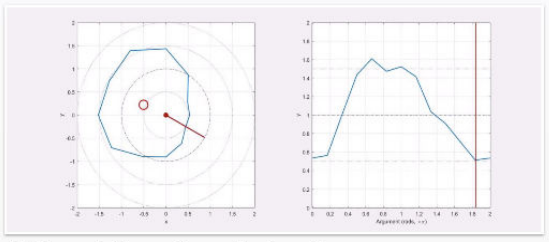
Scan QR Code to View Video

Awards

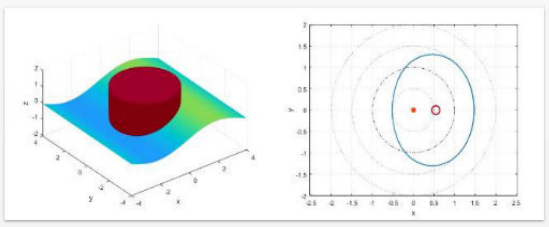




The Prototype (2nd Generation)



Wave Direction Detection



Simulation

Opportunity

- Pool Safety and Monitoring – Pool Alarm System
- Marine Monitoring – Tidal Waves and Pipeline Leakage Detection
- Water Reservoir Monitoring – Leakage and Intruder Detection
- River Monitoring

B

Nanotechnology

Advanced materials

Metallurgy

Civil engineering

Fabrication of a UV Photodetector Based on n-TiO_2 /p-$CuMnO_2$ Heterostructures

Project number: PN 19 22 04 01

Mircea Nicolaescu[1,2], Viorel-Aurel Serban[1], Cornelia Bandas[2], Corina Orha[2], Carmen Lazău[2], Simona Căprărescu[3]

[1]*Politehnica University Timisoara*

[2]*National Institute for Research and Development in Electrochemistry and Condensed Matter Timisoara*

[3]*University Politehnica of Bucharest*

Description

The heterojunction based on n-TiO_2 nanolayer /p-$CuMnO_2$ thin film was achieved using an efficient two-step synthesis process for the fabrication of a UV photodetector. The first step consisted of obtaining the TiO_2 nanolayer, which was grown on titan foil by thermal oxidation (Ti-TiO_2). The second step consisted of $CuMnO_2$ thin film deposition onto the surface of Ti-TiO_2 using the Doctor Blade method. Techniques such as X-ray diffraction, UV-VIS analysis, SEM, and AFM morphologies were used for the investigation of the structural and morphological characteristics of the as-synthesized heterostructures. The Mott–Schottky analysis was performed in order to prove the n-TiO_2/p-$CuMnO_2$ junction. The I-V measurements of the n-TiO_2 nanolayer/p-$CuMnO_2$ thin film heterostructure confirm its diode characteristics under dark state, UV and visible illumination conditions. The obtained heterojunction, which is based on two types of semiconductors with different energy band structures, improves the separating results of charges, which is very important for high-performance UV photodetectors.

Fabrication process of the sensors

The Ti-TiO_2-$CuMnO_2$ heterostructure of the sensor was achieved in two steps. The first step consisted of obtaining the TiO_2 layers that were grown on Ti foil (with an effective area of 1 cm^2) by thermal oxidation (Ti-TiO_2), as follows: prior to the chemical treatment, the Ti foil was degreased in an ultrasonic bath in acetone and ethyl alcohol solutions; the Ti foil was then etched in an HF solution (0.5 M) for different periods of time (1 h, 2 h, 3 h) at room temperature. After the chemical process, the titanium foils were washed with distilled water, then air-dried. For the formation of crystalline TiO_2, the process of thermal oxidation was carried out in a tubular furnace in a controlled atmosphere consisting of a mixed gas flow of Ar and O_2 at a temperature of 500 ◦C for 4 h. The second step consisted of depositing the $CuMnO_2$ film onto the surface of the Ti-TiO_2 layers by using the Doctor Blade method. Thus, for the deposition of the $CuMnO_2$ film, a homogeneous paste was prepared as previously described in our paper. The Ti-TiO_2-$CuMnO_2$ heterostructures were then air-dried for 30 min, and calcinated at 250 ◦C for 1 h. Before and after deposition, the films were UV cleaned using the UV Ozone Cleaner and then deposited in hermetically sealed dishes. In order to facilitate data collection, gold wires were affixed to the Ti and *p*-$CuMnO_2$ films by using Ag paste.

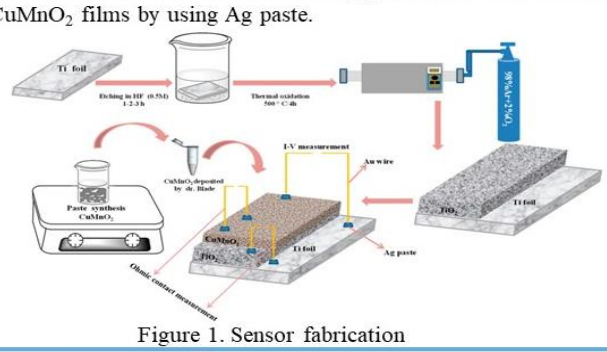


Figure 1. Sensor fabrication

Sensor testing

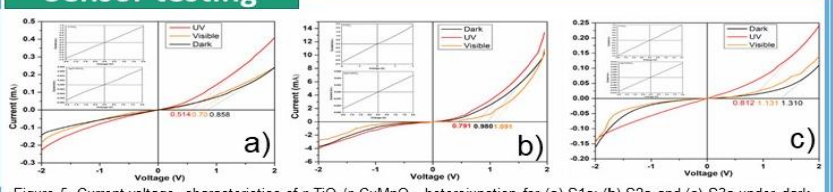


Figure 5. Current-voltage characteristics of *n*-TiO_2/*p*-$CuMnO_2$ heterojunction for (**a**) S1a; (**b**) S2a and (**c**) S3a under dark, UV and Vis irradiation (Inset: ohmic contact measurements

Figure 5 a-c presents the *I-V* measurements at different immersion times in the dark state, UV and Vis illumination. The dark state and UV light showed reduced turn-on voltages from 0.858 V to 0.513 V (for S1a), 0.980 V to 0.791 V (for S2a), and from 1.310 V to 0.812 V (for S3a). In addition, an increase in the current in the forward bias between dark and UV illumination, from 0.24 mA to 0.41 mA at S1a, from 10 mA to 13 mA at S2a, and from 0.11 mA to 0.24 mA for S3a, was noted. This can be attributed to the narrowed heterojunction interface that is generated by UV excitation . In addition, it can be seen that the turn-on voltages increase with an increase in corrosion time, which is likely a result of the growth of the surface area.

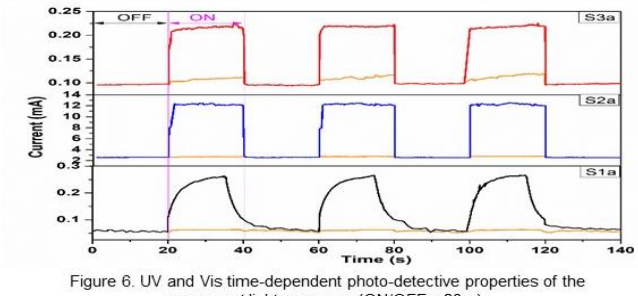


Figure 6. UV and Vis time-dependent photo-detective properties of the sensors at light exposure (ON/OFF = 20 s).

The photocurrent measurement in the dark was about 0.057 mA (S1a), 2.52 mA (S2a), and 0.095 mA (S3a), and under UV illumination for 20 s, the current increases to 0.262 mA S1a), 12.58 mA (S2a), and 0.22 mA (S3a). The sensitivity of the sensor was calculated as a ratio between photocurrent to darkness (I_{UV}/I_{DARK}), which was about 4.89 for S1a, 4.99 for 2a, 2.31 for S3a. From this equation knowing that the light power is 0.1 mW/cm^2, the responsivity values of the as-prepared *n*-TiO_2/p-$CuMnO_2$ heterojunction sensors are 2.05 A W^{-1} cm^2 (S1a), 100.6 A W^{-1} cm^2 (S2a) and 1.25 A W^{-1} cm^2 (S3a).

Material characterization

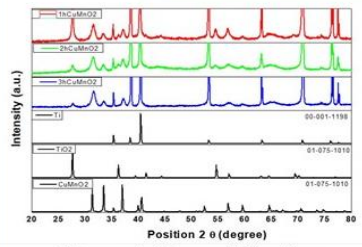


Figure 2. X-ray diffraction

The XRD patterns of the as-synthesized heterostructures S1a, S2a and S3a presented in Figure 2 show that the diffraction peaks specific for $CuMnO_2$ (crednerite form) and TiO_2 (rutile form) are preserved, which demonstrates the good deposition of the $CuMnO_2$ films onto the Ti-TiO_2 layers.

Figure 3 shows the surface morphology of the oxidized titanium samples S1 (Figure 3a), S2 (Figure 3b), and S3 (Figure 3c) for the Ti-TiO_2 layers. The SEM nium samples S1 (Fig 2a) , S2 (Figure 2b), and S3 (Figure 2c) for the Ti-TiO_2 layers. The SEM images show that the passivation layer from the surface of Ti foil was completely removed for all thr samples. TiO_2 layers were grown in the polyhedron form with curved surfaces (broken stone appearance). The growing of the TiO_2 layer was oriented in clearly defined and delimited directions by the curved surfaces of the polyhedral structure. The TiO_2 layers were very well defined, and the sample that was etched for 3 h (S3a) showed a compact growth of elongated grains. The distance between the elongated rows of grains decreased with the increase of corrosion time, and at 3 h the rows of grains were joined over the e face of the layer (Figure 3).

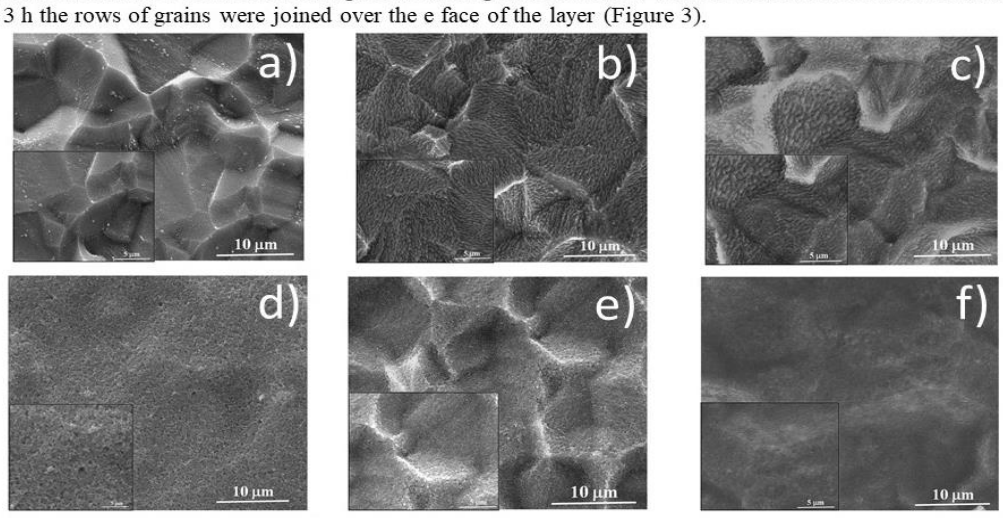


Figure 3. SEM images for the Ti-TiO_2 layers as S1 (**a**); S2 (**b**); S3 (**c**) and sensors Ti-TiO_2-$CuMnO_2$ as S1a (**d**); S2a (**e**); S3a (f)

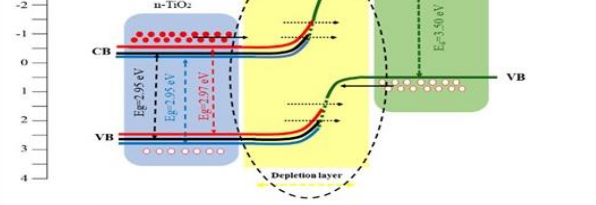


Figure 4. Diagram for corresponding conduction and valence band edges.

Figure 4 shows the illustrated diagram of the corresponding conduction and valence band edges based on the band-gap energies that were calculated from UV-Vis spectra and calculated VFB values.

Conclusion

In conclusion, the method of thermal oxidation that was used for obtaining the "*n*" component (Ti-TiO2) of the heterojunction provides a simple choice for the achievement of oxide layers with suitable structures for the development of UV sensors (Ti-TiO2-CuMnO2). The results show that the UV photodetectors that are based on the *n*-TiO2/*p*-CuMnO2 heterojunction and obtained through a new approach have great potential applications in light light detection systems

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Mention

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Acknowledgent

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Title

SANDWICH PANEL BASED ON HEMP SHIVES AND FIBERS, AND THE MODALITY OF OBTAINING IT

Inventor/s - Contact

IȘTOAN Raluca, TĂMAȘ-GAVREA Daniela-Roxana, MANEA Daniela Lucia, VASILE Ovidiu

B

Patent/ Application number

Patent OSIM: RO133611 -B1/30.06.2021

Short presentation

The invention relates to a sandwich panel based on hemp shives and fibers, and the method to obtain it, which has the applicability in the construction sector. The sandwich panel is designed with three layers: a low-density core defined by the hemp waste fibers with a cement binder and a thin skin-layer bonded to each side, prepared from hemp shives and hydrated lime-cement binder. The panel is used as a partition element with significant acoustic and thermal properties and it archive a part of sustainable development requirements. The panel was analyzed in four ways: (a) without perforations, (b) with perforations of 1 cm diameter and 10% degree of perforation, (c) with perforations of 1 cm diameter and 20% degree of perforation (d) with perforations of 1 cm diameter and 30% degree of perforation.

The physical characteristics of the sandwich panel are:

- without perforations (a): sound absorption coefficient αmax = 0.56 at 350 Hz, thermal conductivity λ = 0.068 [W/mK], density ρ = 413 [kg/m3].
- with perforations (b): sound absorption coefficient α>0,80 on the range frequencies between 650 - 1080 Hz, with max =0,97 (810 - 860 Hz)
- with perforations (c): sound absorption coefficient α>0,80 on the range frequencies between 970 - 1350 Hz, with max =0,85 (1090 - 1200 Hz)
- with perforations (d): sound absorption coefficient α>0,80 on the range frequencies between 880 - 1740 Hz, with max =0,95 (1140 - 1250 Hz)

Applicability

The problem solved by the invention consists in obtaining a sandwich panel accessible thanks to the raw material and the binders used. The sandwich structure is made of hemp shivs and fibers (natural resources considered waste from the textile fibers processing process) and common and accessible mineral binders. The sandwich panel is designed to act as a partitioning element while meeting acoustic and thermal performance requirements.

Images



Figure 1. Sandwich panel based on hemp

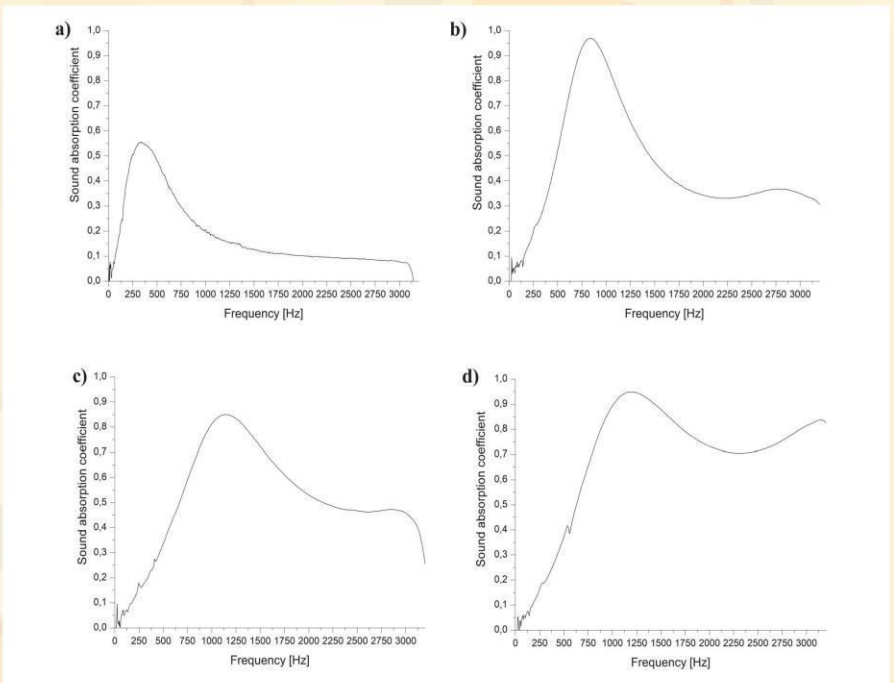

Figure 2. Sound absorption coefficient of the sandwich panel

(a) without perforations,

(b) with perforations of 1 cm diameter and 10% degree of perforations,

(c) with perforations of 1 cm diameter and 20% degree of perforations,

(d) with perforations of 1 cm diameter and 30% degree of perforations

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Title

ECO- INNOVATIVE CONCRETE BASED ON CEMENT AND RECYCLED WASTE GLASS AND PET (POLYETHYLENE TEREPHTHALATE) FOR APPLICATIONS IN CONSTRUCTION "BESTiPET"

Inventor/s - Contact

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Henriette SZILAGY, Gabriel PIRGARIU

Patent/ Application number

Patent OSIM: RO133833 -B1/29.04.2021

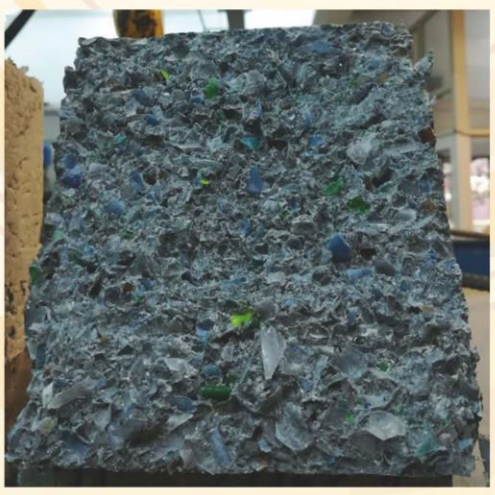
Short presentation

The invention relates to the obtaining of a NEW ECO-INNOVATIVE, SUSTAINABLE CONCRETE, based on cement and recycled waste in the form of artificial glass aggregate and PET flakes (polyethylene terephthalate), as raw material, which successfully replace the non-renewable natural aggregates (waste involving high storage and storage costs). The ECO-INNOVATIVE CONCRETE was made within the research-development-innovation project - "CHECKS OF INNOVATION" 266 CI / 2018 in order to develop the smes, where the beneficiary company, NEW NCR RECICLARE S.R.L. becomes the final recycler. the beneficiary of the research having the main activity object: collection, recovery of the waste and concrete products manufacturing, obtained the Technical Approval NO. 001SC-02/635-2019 for alveolar concrete blocks for the purpose of commercialization.

Applicability

In the field of constructions such as, for example, ALVEOLAR BLOCKS, BRICKS, BOLTS, etc.

Images

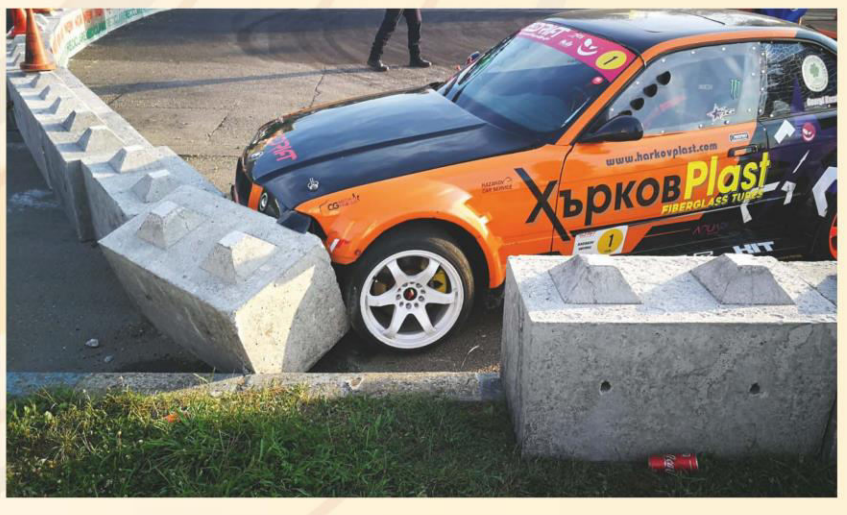












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B

Title

SOIL STABILIZATION WITH PLASTIC WASTE MATERIALS (PET)

Inventor/s - Contact

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Patent/ Application number

Patent pending

Short presentation

In this study, an approach for the recycling of plastic waste from water and soda bottles as stabilizing material in geotechnical and civil engineering practice is purposed. The aim of this research is to observe the variation of the shear parameters for clay mixed with polyethylene terephthalate waste. To investigate the effects of polyethylene waste on the strength of the soil, a series of test have been performed on the mixture.

By performing a compaction Proctor test, we determined the optimum water content (19%). First samples consisting of clay in the initial state were subjected to direct shear test. Thereafter, tests were performed on a mixture of clay and polyethylene terephthalate at a rate of 2%, 4%, 6% (by weight of the clay).Polyethylene was coming from shredded bottles (PET) and was provided by a local recycle deposit. The clay – PET mixture was prepared at optimal water content of 19% and subjected to the direct shear test.

The initial experimental results show that there is a significant improvement on the shear parameters. This increase is depending on the amount of waste plastic added to the clay.

Applicability

Reusing plastic waste is vital for the development of a clean environment. One of the most recent ways to reuse plastic wastes is mixing them with soils, in order to improve their geotechnical properties. By using this method, a part of plastic waste is reused and the consumption of natural materials is reduced.

Images



Figure 1.
Shredded plastic waste



Figure 2.
Shredded plastic waste and clay



Figure 3.
Mixture of clay + 6% PET at optimum water content



Figure 4.
Clay-PET mixture

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Title

INNOVATIVE USE OF SHEEP WOOL FOR OBTAINING NEW MATERIALS WITH SOUND-ABSORBING PROPERTIES

Inventor/s - Contact

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Patent/ Application number

Patent Pending

Short presentation

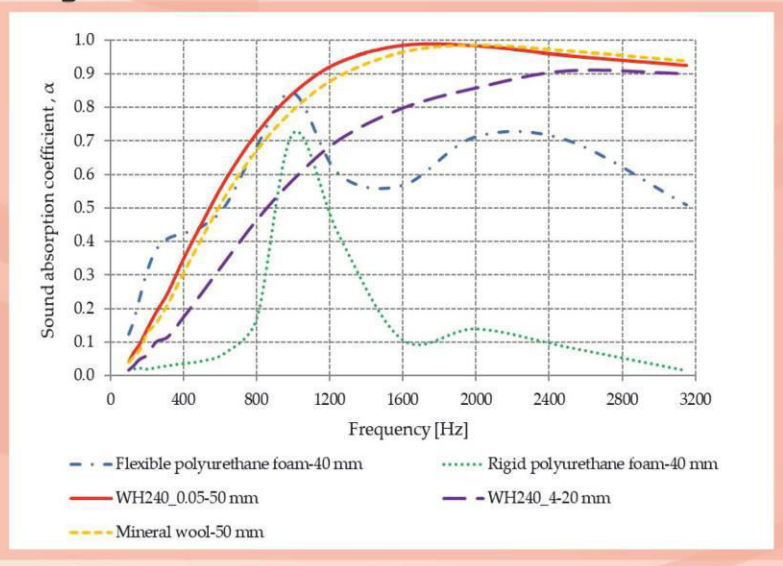
The aim of this study is to obtain new materials with sound absorbing properties using the sheep's wool as raw material. Seven new materials were obtained by hot pressing (60 ÷ 80 °C and 0.05 ÷ 6 MPa) of wool fibers and one by cold pressing. Results shown that by the simply hot pressing of the wool, a new product is obtained which can be processed and easily manipulated. The obtained materials have very good sound absorption properties with acoustic absorption coefficient values over 0.7 for the frequency range 800 ÷ 3150 Hz; the results prove that the sheep wool has a comparable sound absorption performance to that of mineral wool or recycled polyurethane foam. Hot pressed materials have a much higher density than cold pressed materials. The density of materials made from hot pressed sheep's wool increases with increasing pressure.

The hot pressed material (WH240_0.05) at 80 °C and 0.05 MPa, of 240 mm layer of wool, with 50 mm in thickness has the highest sound absorption coefficient values over the entire analyzed frequency range in comparison with WH120_0.05 material, obtained in the same conditions, but with a smaller thickness for it started from a 120 mm layer of wool. The WH240_0.05 material obtained in this study has the best sound-absorbing properties at frequencies below 2000 Hz, while in the frequency range 2000 ÷ 3200 Hz it has values almost identical to mineral wool. Thus, hot pressed sheep's wool has better sound absorbing properties or at least equal to mineral wool, which is one of the most widely used sound absorbing fibrous material. Obtaining the environmentally friendly materials with very good acoustic properties from natural and renewable raw materials, such as sheep wool, without using any binder is an important step in solving environmental problems and in the same time in finding new methods of using the wool.

Applicability

The study explores alternative usage of sheep wool as a construction material with improved sound absorbing properties beyond its traditional application as a sound absorber in textile industry or using of waste wool in the textile industry as a raw material. Sound absorbing materials can be used to reduce noise and to obtain an adequate acoustic for enclosed spaces. They can have many uses, both outdoors and indoors: in industry, commercial areas, relaxation and leisure areas, in areas used for education, in constructions, on building sites, highways, roads and streets, airports, ports, railways, etc. Materials studied in this research can be used to reduce noise impact, as decorative panels with sound absorbing role, to improve acoustic conditions, and to reduce or stop reverberations.

Images







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Title

STRENGTHENING THE BUILT HERITAGE WITH MODERN SOLUTIONS

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Patent/ Application number

Patent pending

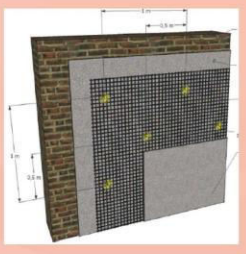
Short presentation

The history of building technology shows that before the classical mechanical theories, the construction of monumental buildings was based on empirical considerations, similarities with natural forms, intuition and centuries of building experience, older models of structures that performed well during their period of use, elementary geometrical and constructive rules and basic mechanical models. The age of computers has opened up new horizons for the possibility of expanding the range of techniques and materials used to rehabilitate historic buildings. New experimental methods and numerical analysis calculations make it possible to solve complex problems that previously could not be dealt with, thus making it possible to develop modern techniques and materials for the rehabilitation of historic buildings. Having strict legislative requirements to minimize the impact of the whole rehabilitation process on the historic monument status of buildings, due to the need to carry out complex works with short implementation deadlines imposed without the possibility of exceeding the allocated budget, modern alternative methods are highly sought after. The techniques, systems and materials for rehabilitation developed nowadays represent the future in the field as:

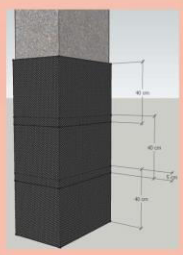
- They are non-invasive, allowing the possibility of preserving the original architectural and structural configuration of the building;
- They are versatile, so they can be adapted according to structural needs;
- They can be customized to each type of historical material;
- They do not increase the structure's own weight, thanks to their low weight;
- They can be carried out quickly without costly equipment with low skilled personnel while causing minimal disturbance.

Applicability and images

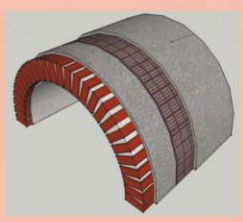
Structural strengthening of historic masonry walls with fiber mesh reinforced hydraulic lime and eco-pozzolan based grouts.



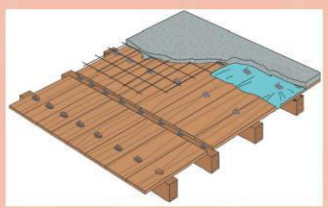

Structural strengthening of historic masonry columns and pillars with fiber reinforced polymer composite laminates.




Structural strengthening of historic masonry arches and vaults with fiber mesh reinforced hydraulic lime and eco-pozzolan based grouts and fiber reinforced polymer composite laminates placed on the external side.




Structural strengthening of historic wooden floors with fiber-reinforced cementitious mortar applied on the upper side and connected to the existing wooden beams by shear connectors.




Structural strengthening of historic wooden tie beams by insertion of carbon fiber tubes in the side cuts.




Structural strengthening of historic wooden beams with carbon plates placed on the inner side.

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GEOPOLYMER FILLER IN RHDPE FOR 3D PRINTING FILAMENT

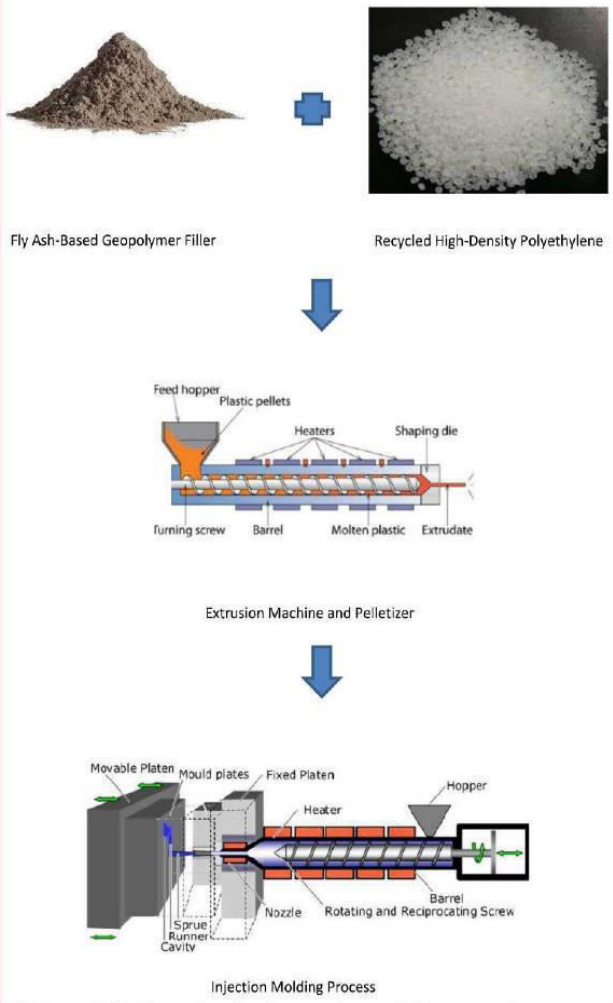
B

US 8,337,612 B2 – Environment Friendly Composite Construction Materials
PI 2014702066 – Nanocomposites with thermoplastic materials and fillers and method of preparation thereof

PRODUCT DESCRIPTIONS

"Green Kenaf Soundproof Wall Panel" is an innovative product which consists of fly ash-based geopolymer (reinforcing filler materials) in recycled High-Density Polyethylene (rHDPE). 3D printing concrete technology has progressed significantly in recent decades. The primary benefits and possibilities of 3DP concrete are its capacity to create structures with minimum human intervention and a sufficiently short time. Although the procedure is still more costly than traditional structures, due to the additional structural stability concerns, 3DP concrete offers a clear cost-benefit when increasing automation or complexity is demanded. Moreover, this innovation also helps in the contribution towards a greener world by sustaining the usage of renewable resources of fly ash-based geopolymer filler and recycled High Density Polyehtylene (rHDPE).

PRODUCTION METHOD



NOVELTY

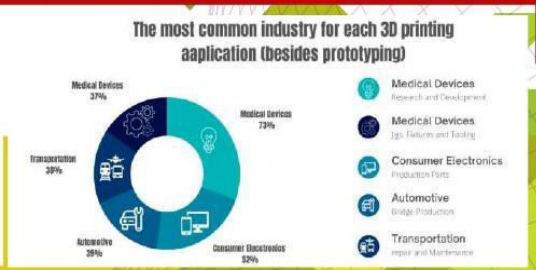
i. This innovation is new technology and the use of fly ash-based geopolymer as reinforcement and thermal stability materials in recycled High-Density Polyethylene (rHDPE) for 3DP filament.
ii. Utilization of fly ash-based geopolymer which is non-expensive and converted into commercial high value-added for 3D printing filament and 3D printing application.
iii. Comparable mechanical properties with existing products.
iv. Mass productions with simple to moderate engineering skills.
v. Environmental friendly.
vi. Towards green materials.
vii. Using geopolymer materials that are from waste materials, easily available and cheap.

COMMERCIAL POTENTIAL

This invention is suitable for use in all kinds of environments. No competition directly or indirectly by the local company. No such organization has provided any product in terms of geopolymer filler material. Therefore market penetration will be easy. Potential customers can be from all kinds of industries such as education, factory, or construction. It can be used widely in Malaysia and internationally since it has a large geographic view of market opportunity.

POTENTIAL APPLICATIONS

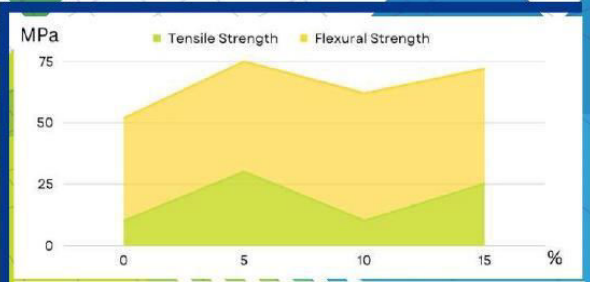




INVENTION ADVANTAGES

- Innovative product with locally developed technology
- Use environmentally friendly and renewable materials as reinforcement
- Improve the socio-economic of fellow Malaysian and other countries by encouraging fly ash-based geopolymer production by local products
- The primary benefits and possibilities of 3DP filaments are their capacity to create structures with minimum human intervention and a sufficiently short time.

PRODUCT PERFORMANCE



Sample (%)	Tensile Strength (MPa)	Flexural Strength (MPa)
0	16	42
5	21	45
10	26	52
15	23	47

INTERNATIONAL EXHIBITION INVENTCOR 2022

C-CALA
CO-COMBUSTION ASH LIGHTWEIGHT AGGREGATE

SUSTAINABLE ENVIRONMENT RESEARCH GROUP (SERG), CENTRE OF EXCELLENCE GEOPOLYMER AND GREEN TECHNOLOGY (CEGEOGTECH), FACULTY OF CIVIL ENGINEERING TECHNOLOGY, UNIVERSITI MALAYSIA PERLIS

FARALISA SHAARUDIN
NORLIA MOHAMAD IBRAHIM
ROSHAZITA CHE AMAT
NUR LIZA RAHIM
SYAKIRAH MOHAMED
KHAIRUL NIZAR ISMAIL



PROBLEM STATEMENTS

Despite the fact that gas remains the primary source of electricity generation, coal is rapidly gaining ground. Coal is made up of a complex mix of organic and inorganic minerals that has formed over ions from fallen vegetation layers. As a result, an increasing in the demand for electricity which has resulted in increased production of coal ash. According to Cheriaf, Rocha, and Péra, (2014), the combustion of 2.9 million metric tonnes of coal produces 1.2 million metric tonnes of coal ash. It can be summarized that the total use of the fuel mix for electricity production has been increasing annually, rising from 14% in 2008 to 16% in 2009, 22% in 2010, and 24% in 2011. This study was done to utilise co-combustion ash from coal as one of the material use to produce lightweight aggregate (LWA) for concrete. The LWA is produced by mixing foam, co-combustion ash and ordinary Portland cement and produced using cold-bonded pelletization technique.

NOVELTIES

1. Recycling the ash residue from co-combustion.
2. Less energy usage since the method of pelletizing is using cold-bonded techniques.
3. Potential use of C-CALA in concrete for partial replacement of normal weight aggregate .
4. Addition of foam into aggregate mixture helps to reduce the density of aggregate in order to achieve the lightweight characteristics.

PUBLICATIONS & COPYRIGHT



MAIN MATERIALS

B



CO-COMBUSTION ASH

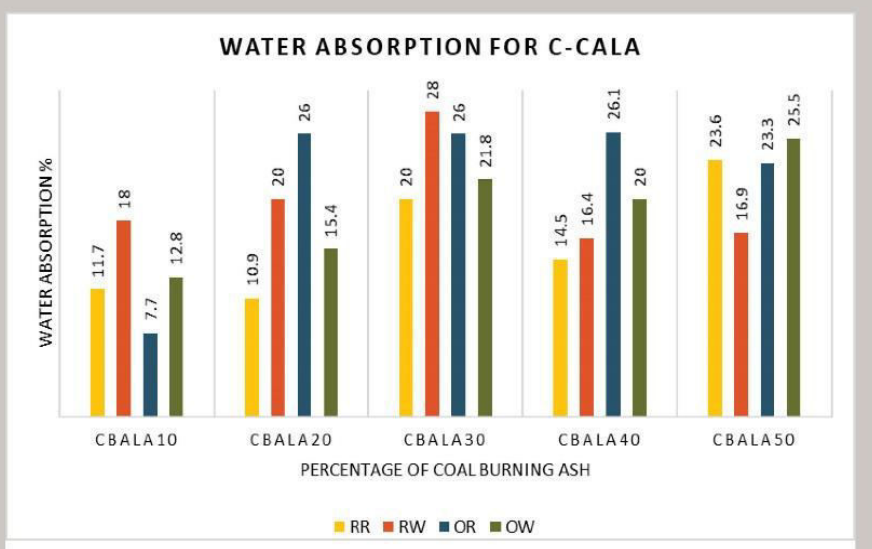


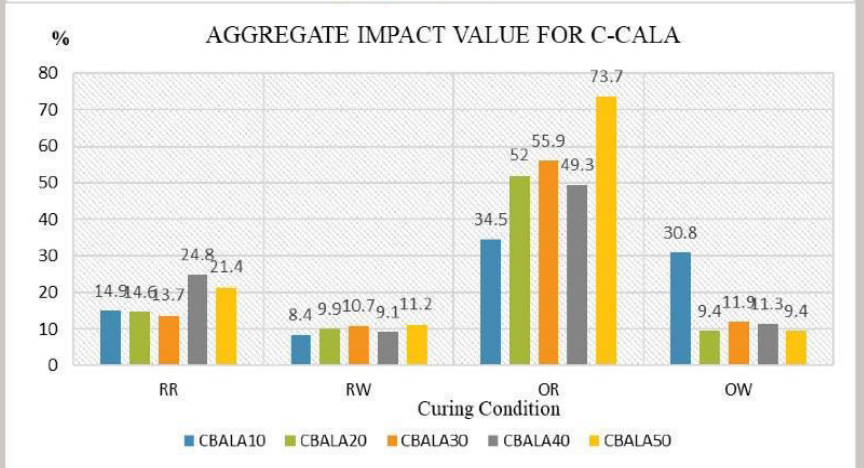
FOAM

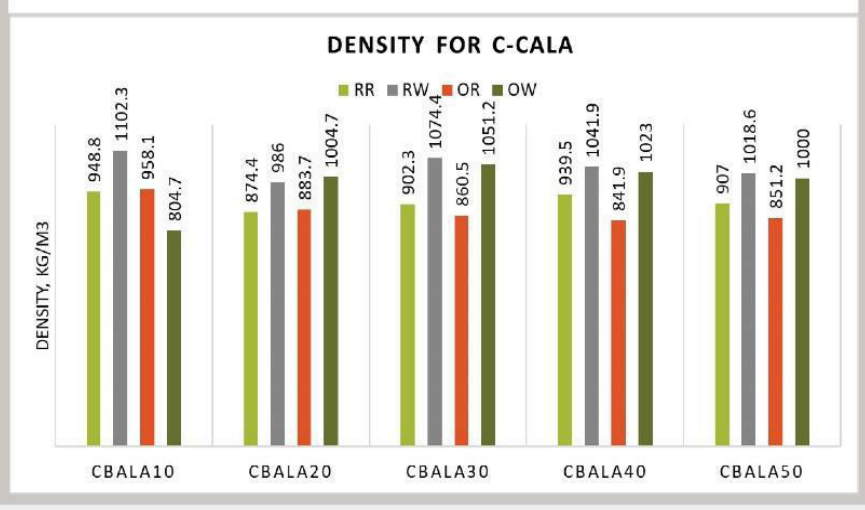


PORTLAND CEMENT

RESULTS







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B

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SUSTAINABLE TERNARY BLENDED CEMENT USING MSWI BOTTOM ASH AND RICE HUSK ASH

PATERN FILLING ID: **PI2021004414**

SUMMARY OF INNOVATION

Sustainable Ternary Blended Cement is another alternative for cement or finds a solution to reduce the cement usage in mortar. Rice husk ash (RHA) and municipal solid waste incineration bottom ash (MSWIBA) are using to replace a specific quantity of cement. The use of partial cement replacement such as pozzolanic material can improve the durability of the mortar produced. Municipal Solid Waste (MSW) bottom ash and rice husk ash have the ability of a commons cement in terms of its composition. Both raw materials are waste materials that are obtained abundantly in Malaysia. It can be described as an innovative inventory using simple and economically methods in concrete mix innovation. This environment-friendly product can reduce the construction cost spending on cement. This product can replace up to 15% of cement as binder

NOVELTY

- Develop new products that can be used in the construction industry as cement substitution materials in concrete.
- The product can be replaced up to 15% of cement as binder materials in construction material.
- Reduce the waste by recycling to make a new product that can be used in the construction industry and reduce disposal space in the landfill.

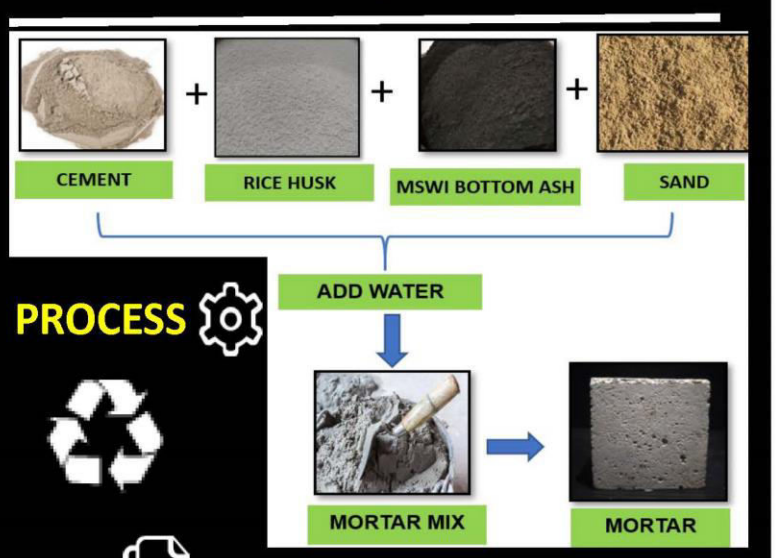


INTRODUCTION

Mortar is a composite material which is consist of cement paste and fine aggregates (sand). Ordinary Portland cement (OPC) has a significant role in mortar as a binder. Due to increasing its energy consumption and high carbon dioxide (CO_2) emission from production, alternative binding materials need to replace OPC partially. New alternative materials need to be found for sustainable development to substantially decrease the consumption of natural resources became vital to shield the interests of future generations.

PROBLEM STATEMENT

Municipal solid waste incineration Bottom as is the non-combustible residue of combustion inside a furnace or incinerator. MSWIBA has utilised as some portion for cement in structural concrete in several studies because it has pozzolanic properties. Meanwhile, RHA is from agricultural waste, which accounts for 20 % of the world's yearly rice production of 649.7 million tonnes. The primary component of RHA is amorphous silica, which accounts for 83 to 90 % of the RHA. It has a high level of pozzolanic reactivity, as well as strength and durability. Grinding RHA into cement enhances the qualities of concrete by reducing porosity, increasing resistance, and increasing strength. Rice husk ash is one of the pozzolanic materials widely used as cement replacement to produce high durability mortar. MSWIBA and RHA are waste utilising to replace some of the cement in mortar to reduce and stabilise the demand for the construction industry. Its benefits in reducing carbon dioxide emissions into the atmosphere, reducing waste footprint, and having a positive impact on the environment.



PROCESS

COMMERCIAL POTENTIAL

Sustainable resources using waste to produce new alternative product. For 50 kg of cement used can save up to RM 2.00. The waste material can be found easily in Malaysia which can get it for free.

PUBLICATIONS

1. Amat, R. ., Ismail, K. N., Ibrahim, N. M., & Rahim, N. L. (2020, December). Recycling Municipal Solid Waste Incineration Bottom Ash as Cement Replacement in Concrete. In IOP Conference Series: Earth and Environmental Science (Vol. 616, No. 1, p. 012062). IOP Publishing.
2. Amat, R. C., Ismail, K. N., Ibrahim, N. M., & Azmi, N. J. (2020, April). Influence of superplasticizer on performance of cement–bottom ash concrete. In IOP Conference Series: Earth and Environmental Science (Vol. 476, No. 1, p. 012025). IOP Publishing.
3. Che Amat, R., Ismail, K. N., Ahmad, K. R., & Ibrahim, N. M. (2020). Effects of Metakaolin on Municipal Solid Waste Incineration (MSWI) Bottom Ash-Cement Composite. In Materials Science Forum (Vol. 1010, pp. 653-658). Trans Tech Publications Ltd.
4. Amat, R. C., Ismail, K. N., Noor, N. M., & Ibrahim, N. M. (2017). The effects of bottom ash from MSWI used as mineral additions in concrete. In MATEC Web of Conferences (Vol. 97). EDP Sciences.

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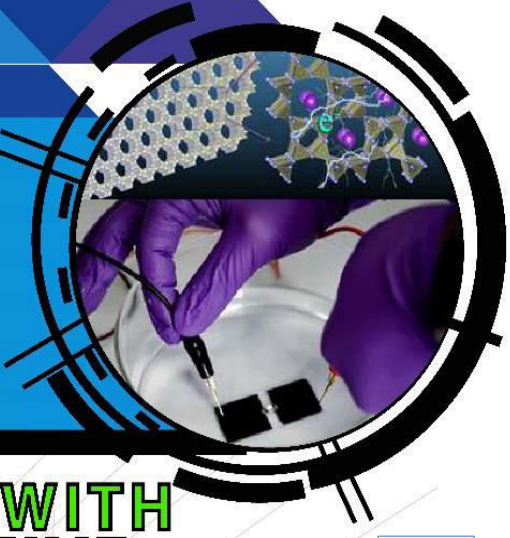


POROUS POLYLACTIC ACID (PLA) FILLED WITH MODIFIED CARBON BLACK FOR CONDUCTIVE MATERIAL APPLICATION

B

PRODUCT DESCRIPTIONS

Porous conductive polymer composites (CPCs) with functional additives attracted more and more attentions because of the low density and potentional functionality, where it allows electricity to travel through them. Metals, known for their high electrical conductivity, were the material for electrical improvement in the early stages. But soon enough, solutions providing better conductivity were required. This is where carbon came into play. Carbon based conductive materials offer potential solutions and novel ideas for further improvement of technology. High electrical conductivity, surface area, thermal conductivity, and desirable chemical properties of these products make them great candidates for the job.

NOVELTY

i. This innovation is new technology and the use of carbon black as reinforcement as well as conducting materials in porous Polylactic Acid (PLA)
ii. Conductive material with excellent electrical and mechanical properties.
iii. Utilization of carbon black which is non-expensive and converted into commercial high value-added conductive materials.
iv. Use of biopolymer as matrix for conductive material which are environmental friendly and towards green materials.
v. Mass productions with simple to moderate engineering skills.

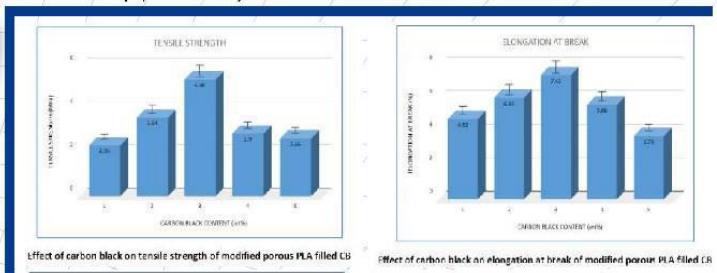
INVENTION ADVANTAGES

- Conductive materials with lightweight
- Simple and easy processing
- Consisting the usage of biodegradable polymer as matrix
- Renewable materials as reinforcement
- Innovative product with locally developed technology

COMMERCIAL POTENTIAL

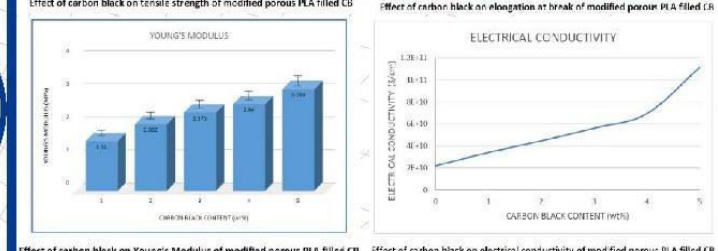
This invention is suitable for use in all kinds of environments. No competition directly or indirectly by the local company. No such organization has provided any product in terms of porous Polylactic Acid (PLA) filled with carbon black (CB) as conductive materials. Therefore market penetration will be easy. Potential customers can be from all kinds of industries such as elctronic and medical sectors. It can be used widely in Malaysia and internationally and has a large geographic view of market opportunity.

PRODUCT PERFORMANCE



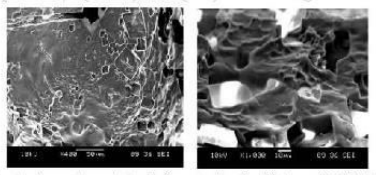
Effect of carbon black on tensile strength of modified porous PLA filled CB

Effect of carbon black on elongation at break of modified porous PLA filled CB



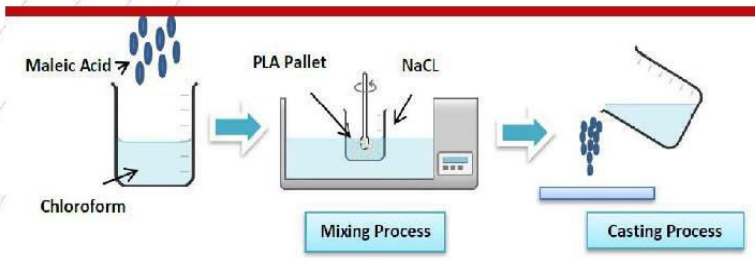
Effect of carbon black on Young's Modulus of modified porous PLA filled CB

Effect of carbon black on electrical conductivity of modified porous PLA filled CB

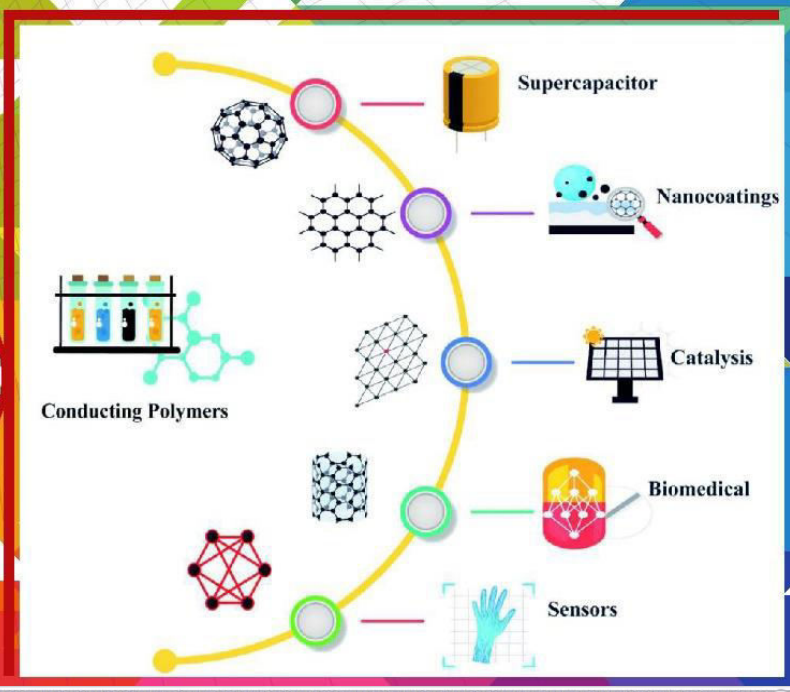


Scanning electron micrograph of tensile fractured surface of modified porous PLA filled with CB (a) 400x (1wt %) and (b) 1000x (1wt %).

PRODUCTION METHOD



POTENTIAL APPLICATIONS



INTERNATIONAL EXHIBITION INVENTCOR 2022

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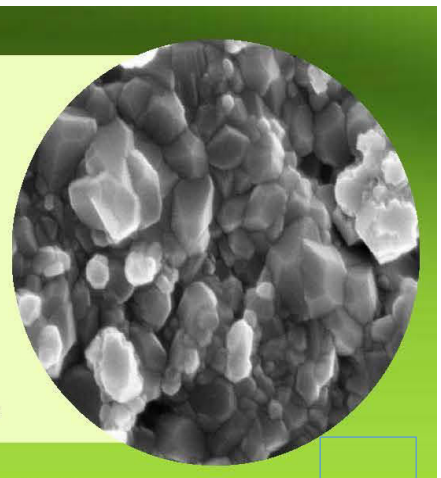
RESEARCH FUNDING
FRGS/1/2020/TK0/UNIMAP/02/43



Surf-Prep Optimizes Oxidation Performance

B

PROBLEM STATEMENT

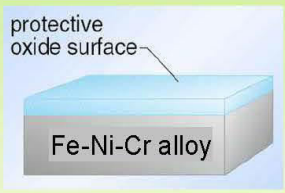
Fe-Ni-Cr alloy is an oxidation and heat-resistant alloy that forms a protective surface film of Cr_2O_3: excellent oxidation resistance. This alloy is commonly used in power generation and heat processing applications. During service, due to repeated thermal cycling causes temperature gradients on heating and cooling which induces oxide exfoliation.

RESEARCH QUESTION

- How does the grinding process create a subsurface region of fine grains on an alloy surface?
- How does the subsurface region of fine grains forming a protective oxide scale at the oxidation temperature affect the oxidation kinetics and oxide scale formation of the alloy?

KEY PERFORMANCE

- Goal: excellent microstructural stability and oxidation resistance.
- Key: to establish a continuous layer of a slow growing, thermodynamically stable oxide layer.
- Fe-Ni-Cr alloy: containing 15-25% Cr will form a protective oxide surface oxide scale Cr_2O_3 which grows slowly during high temperature service.



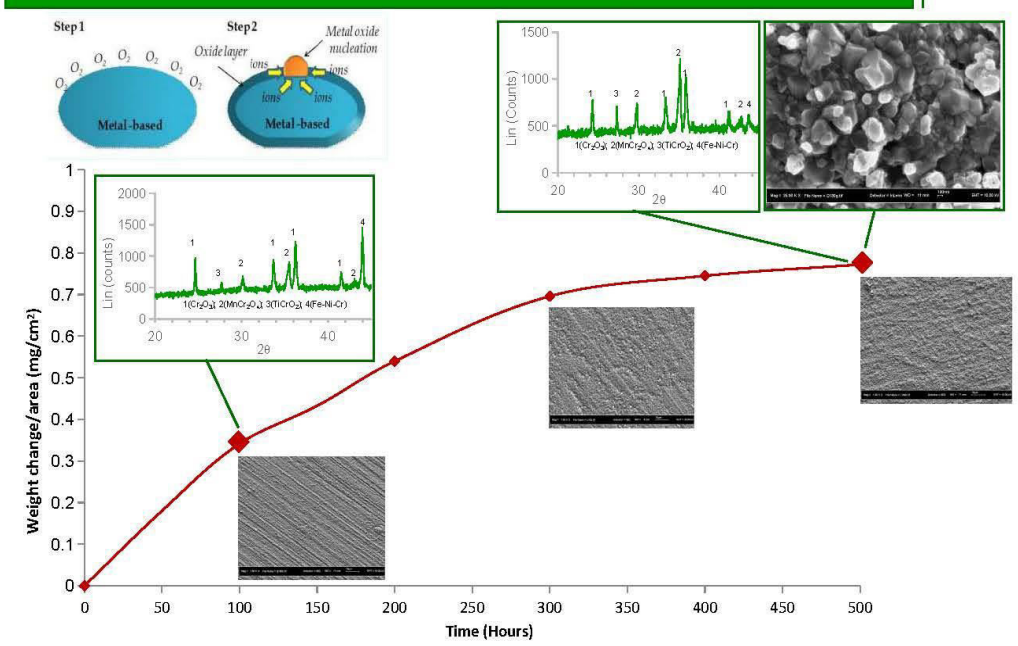
ADVANTAGES

- Optimum surface preparation (SiC paper grit P600) which will provide fine grain on the subsurface area.
- Optimized experimental data on oxidation kinetics at high temperature isothermal oxidation.
- New findings on oxide scale morphology and oxide phase formation on high temperature isothermal oxidation.
- A new experimental analysis of oxide-metal bond interactions in alloys on high-temperature isothermal oxidation.

NOVELTY

Modification of the alloy surface through the grinding process to introduce a subsurface region of fine grains to induce diffusion that dominates the early oxidation process, thus increasing good oxidation protection.

RESEARCH FINDINGS



Oxidation Kinetic (weight change)

- The curve shows that as the exposure time increases, the weight change of the sample also increases (formation of protective oxide scale).

Surface Morphology (FESEM)

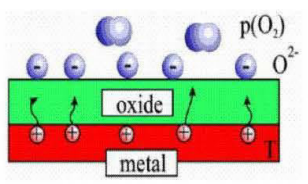
- Continuous and uniform oxide scale formation on the alloy surface.
- 100h: Grooves from the surface preparation are still visible, indicating the formation of a thin oxide layer.
- 300h: Grooves and thick oxide scale visible.
- 500h: The formation of compact and dense oxide structure, showing good adhesion between the oxide layer and the base metal. No oxide exfoliation.

Phase Analysis (XRD)

- The formation of a protective oxide layer consisting of an oxide scale containing Cr: Cr_2O_3, $MnCr_2O_4$, $TiCrO_2$
- 100h: Thin oxide scales and high intensity based alloys.
- 500h: Thick oxide scale with high intensity oxide peak compared to base alloy.

EXPERIMENTAL

- Material: Fe-Ni-Cr alloy.
- Chemical composition (in wt%): 40.45 Ni, 24.11 Cr, 0.05 C, 0.08 Al, 0.03 Ti, 0.44 Si, 0.7 Mn, 0.11 Cu, 0.25 Mo, 0.17 Co, 0.44 Nb, 0.05 W and balance of Fe.
- Surface preparation by grinding process: SiC paper grit P600.
- Isothermal oxidation test: discontinuous test at 700° C for 500 hours.
- Analysis: Oxidation kinetics (weight change), surface morphology (FESEM) & phase analysis (XRD).



- Mechanism: The formation of oxide nuclei occurs when metal alloys are exposed to high temperature conditions in the presence of oxygen atoms.

PUBLICATIONS

- Noraziana Parimin, Wafa Ramli. Influence of surface preparation on isotheral oxidation of Fe-Ni-Cr Ni-based alloy. AIP Conference Proceeding 2496 (2022), 020001.
- Noraziana Parimin and Esah Hamzah. Oxide Growth Behaviour of Fe-Ni-Cr Alloy at High Temperature Oxidation, IOP Conference Series: Materials Science and Engineering 957 (2020), 012001.
- N. Parimin and Jemahri, Effect of Surface Preparation on the Isothermal Oxidation of Fe-33Ni-19Cr Alloy, IOP Conference Series: Materials Science and Engineering 701(1) (2019) 012062.
- N. Parimin, A K J Singh, Investigation of Isothermal Oxidation on Heat-treated Fe-40Ni-24Cr Alloy at 950°C. IOP Conference Series: Materials Science and Engineering 701(1) (2019) 012063.
- N. Parimin, E. Hamzah. Effect of surface preparation on the cyclic oxidation of Fe-33Ni-19Cr alloy. Mytribos Symposium, 3, 20-23. 3rd Mytribos Symposium (2019).

New Fundamental Method to Unlock the Metastable Phases during the Dehydrogenation of TiH_2 Powder

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B

Introduction

- TiH_2 powder has several advantages over the pure titanium powder to produce titanium metallurgical parts:
  - ✓ better sinterability;
  - ✓ lower adherence with the metal die;
  - ✓ and a non-oxidized titanium surface for effective bonding
- The sintered products usually have lower oxygen contents.
- Besides, the price of TiH_2 powder is only a fraction of that of titanium powder.
- However, dehydrogenation of TiH_2 powder is a critical process in the fabrication of Ti components, because of the potential of hydrogen embrittlement in the final products if not completely free from hydrogen.
- Even though there are many works devoted to the study of the decomposition of TiH_2, there has been a lack of understanding on the detailed phase transformation sequences from TiH_2 to Ti.
- Consequently, a thorough understanding of this dehydrogenation process by elucidating the detailed phase transformation sequences is crucial to the production of Ti components from TiH_2.

Methodology

- The present work combined the application of thermal analysis and in-situ XRD with Rietveld refinement
- Rietveld refinement has an advantage over traditional XRD pattern analysis because it is a whole pattern analysis which can resolve the peak overlapping, and particularly it is able to identify small changes in lattice parameters.





Figure 1: X-Ray Diffraction Equipment

Research Findings

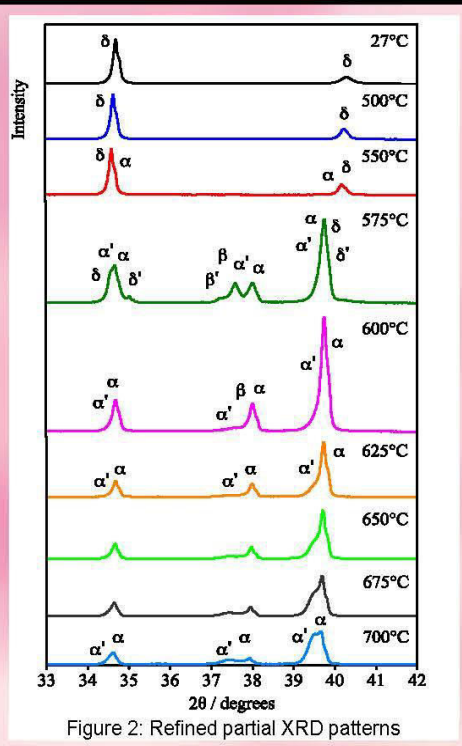

Figure 2: Refined partial XRD patterns

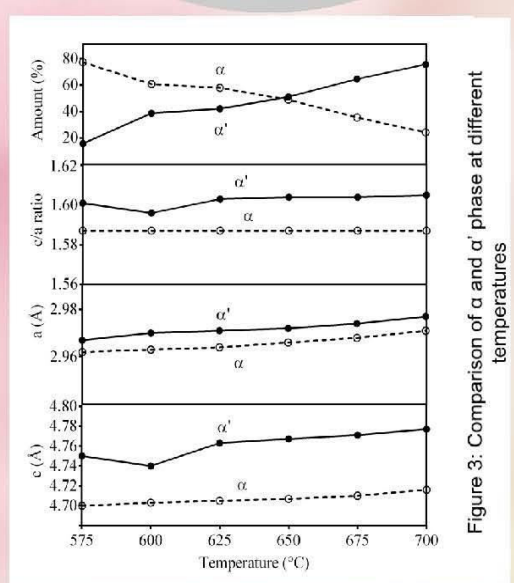

Figure 3: Comparison of α and α' phase at different temperatures

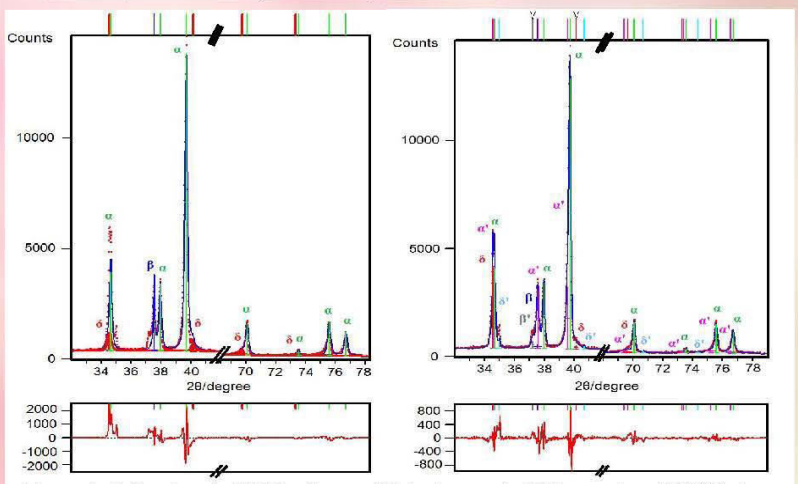

Figure 4: Refined partial XRD patterns of dehydrogenated TiH_2 powder at 575°C when considering (a) three equilibrium phases δ, β and α only; and (b) with the additions of 3 metastable phases δ', β' and α'; and 3 equilibrium phases; δ, β and α.

Novelties

- Able to identify some transition phases during the dehydrogenation of TiH_2 by using the in-situ high temperature XRD
- A detailed mechanism of dehydrogenation of TiH_2 with the full sequence of the phase transformation of δ-TiH_2 to α-Ti is: $\delta \rightarrow \delta' \rightarrow \beta' \rightarrow \beta \rightarrow \alpha' \rightarrow \alpha$
- Rietveld refinement results have proven the existence of two δ, two β and two α phases, each of the same phase only varies in lattice parameters.
- Successfully differentiating the changes in lattice parameters owning to thermal expansion and phase changes when combined with Rietveld refinement analysis

Publications

- Hayazi N. F., Wang Y. and Chan S., Unlocking the Metastable Phases and Mechanisms in the Dehydrogenation Process of Titanium Hydride, Materials Characterization Vol. 161 (2020) 110128
- Hayazi, N. F., Wang, Y., Mazlee, M. N., & Chan, S. L. I. (2013). Static X-Ray Scans on the Titanium Hydride Powder during Dehydrogenation, Advanced Materials Research (Vol. 795, pp. 124–127).

Acknowledgement

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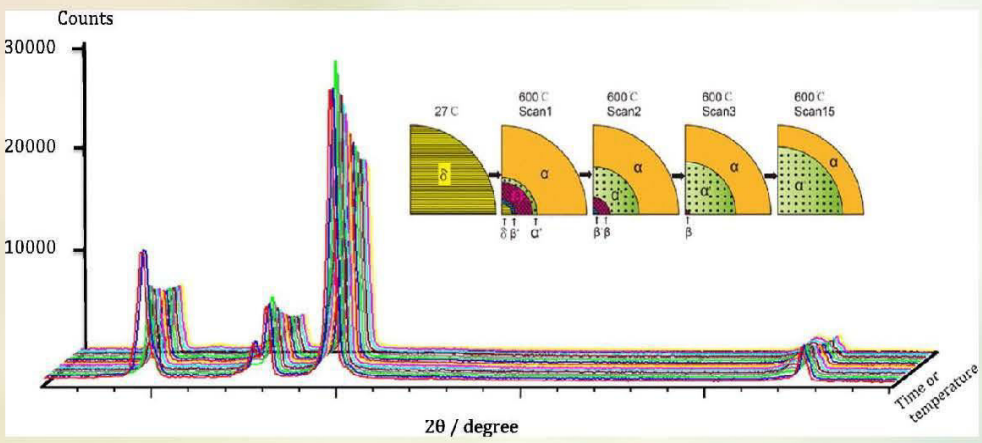

ZIRCONIA-KAOLIN GEOPOLYMER

B

ABSTRACT

This research discusses how to enhance the compressive strength of kaolin-based geopolymers by adjusting the liquid ratio and percentage of zirconia addition. The sodium hydroxide and sodium silicate ratio is 0.20, 0.24, 0.28 and 0.32 and percentage addiiton of zirconia is 1%, 3%, 5% and 7%, respectively. The concentration of sodium hydroxide has a noticeable influence on the compressive strength of geopolymers. Futher, the strength and toughness properties of kaolin geopolymer will be impart by adding the zirconia as reinforcement. Zirconia- kaolin geopolymer were investigated using ABAQUS software to simulate and validate the compressive stress distribution from experimental.

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Faculty of Civil Engineering and Technology, Universiti Malaysia Perlis.

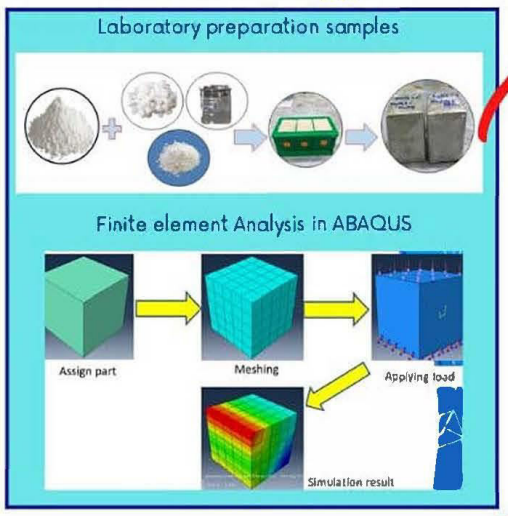
Introduction

- Kaolin is used as a supplementary cementitious material for ordinary Portland cement and improves the toughness properties by reinforcing with ceramic oxide materials, zirconia.
- Triggering transformation toughening requires zirconia inclusions of well-defined grain size. Too large grains will transform during cooling down from sintering temperature, while transformation of too small grains cannot be triggered by applied stress. The well form grain size not too large and too small improved the packing density of the geopolymer microstructure.
- Engineering problems occurs in these application can be earlier validating by simulating the requiring crack growth analysis on the software.

Objective

- To optimize the compressive strength of a kaolin-based geopolymer by varying the sodium hydroxide and sodium silicate ratio at a concentration of 8M NaOH.
- To determine properties of the kaolin geopolymer by adding zirconia at 0,1,3,5 & 7 wt %
- To examine the compressive stress distribution of zirconia added to kaolin geopolymer by using ABAQUS software.

Methodology

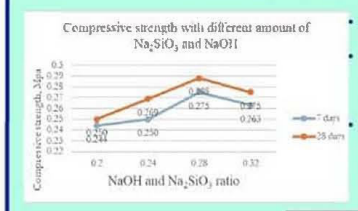


Problem statement



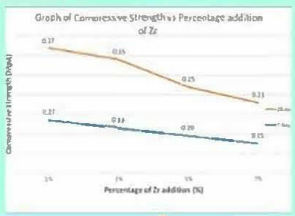
Results

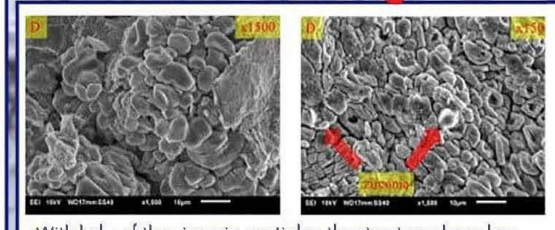
Compressive Strength



- The optimum ratio is the 0.28 of the alkali activator.
- With increasing the ratioof activator, more strength of the sample. But at the elevated level, strength will start to decrease.
- Referring to graph above, aftor reach 0.28 the strength decrease due the excess of Na ion and OH ion during the geopolymerization process

- •The optimum ratio is the 0.28 of the alkali activator.
- •With increasing the weight ratio of zirconia oxide, the loss of strength will occur.
- •Referring to graph above, with added the 1% of zirconia oxide had achieve the highest strength with 0.37 MPa.

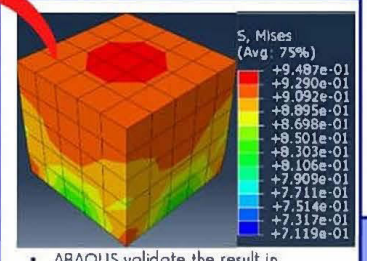




•With help of the zirconia particles, the structure shows less agglomeration and reducing the porosity. It will be increasing the strength of geopolymer.
•This is because zirconia is a very stable inorganic cation exchange material whose ability to absorb excess alkali from the matrix improves as the pH approaches 32.
•Zirconia-containing geopolymers are expected to have higher water resistance and durability as a consequence of the insoluble sodium polyciliate species formed inside the matrix.

Comparison experimental and simulation study





- ABAQUS validate the result in experimental data.
- Experimental and simulation quite same because the simulation use the data from the experimental to see the cracking and the applied force to the sample.
- The initial crack of sample generate from the top at edge of the sample.

Conclusion

- The limiting factors for the use of kaolin minerals in the manufacture of geopolymer ceramic are changes in the mixing and thermal parameters required for activation. Mechanical properties tensile strength, compressive strength and impact strength and thermal shock resistance are all controlled by this parameter.
- The direct way to study these problems is to use fracture mechanics in conjunction with the finite element method. Finite element analysis in ABAQUS can determine mechanical properties such as shear and stress properties, cumulative damage failure and crack deviation.
- Zirconia kaolin geopolymer being considered for a variety of industrial applications, including engine components, high-speed cutting tools, refractory linings in furnaces, molten metal vessels, and heat shields for spacecraft.

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HYBRID ECO-TRUCK PANEL

B

US 8,337,612 B2 – Environment Friendly Composite Construction Materials
PI 2014702066 – Nanocomposites with thermoplastic materials and fillers and method of preparation thereof

COMMERCIAL POTENTIAL

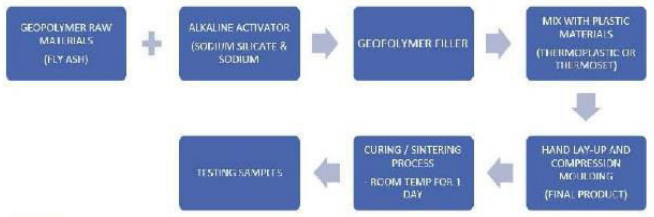
This invention is suitable for the use in all kinds of environment. No competition directly or indirectly by the local company. No such organization has provided any product in term of geopolymer material. Therefore, market penetration will be easy. Potential customers can be from all kind of industry such as educational, factory, or construction. Can be used widely in Malaysia and internationally and has large geographic view of market opportunity.

PRODUCT DESCRIPTIONS

Hybrid Eco-Truck Panel: A Novel Fly Ash-Based Geopolymer Filler mixed with Kenaf Fiber offers renewable of geopolymeric materials as filler in plastic applications for residential, commercial and industrial structures. Cargo panel structures in trucks and trailers are conventionally constructed largely of wood or steel. Conventional wooden truck cargo panel is normally manufactured with heavy hardwoods such as oak, maple, birch, beech, etc. Hardwoods offer several advantages such as high strength, stiffness, shock resistance, slip resistance and wear resistance. The use of steel as a truck cargo is due to the high strength of the material. But, as with wood, steel is heavy which results in less efficiency and high fuel costs for the vehicle. Further, steel is susceptible to corrosive attack when exposed to fresh water, salt water, oxygen, and other environmental elements such as acid rain, road salts, and other chemicals. Promoted as low-cost and low-weight (low-density) alternative material, kenaf has signaled the start of an "eco" automotive industry with enormous potential. The advantages of kenaf fiber and fly ash-based geopolymer filler as reinforcement in composite include low weight, high availability, ease of processing, environmentally friendly and high performance. This hybrid features an advanced bio-composite with a combination of fly ash-based geopolymer filler and kenaf fiber which offer high strength and rigidity with lighter mass, excellent processing and fabricating properties, as well as lower energy consumption.

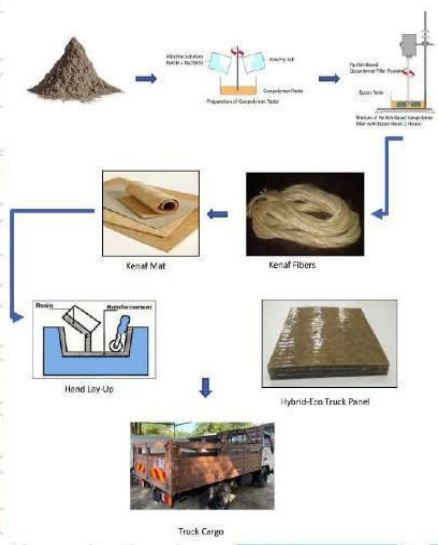
PROCESS DESCRIPTION

Geopolymer was prepared by mixing raw material which is fly ash with an alkaline activator. Geopolymer filler was then mixed with the plastic material (epoxy+hardener) for several hours before proceeding to the compression moulding process and hand lay-up process. Continuous glass fibres were impregnated ("wet-out") with geopolymeric plastic resin via filament winding technique. This product also can help to reduce global warming due to the geopolymerization process.



PRODUCT PERFORMANCE

Mechanical Properties	Hybrid Eco-Truck Panel	Conventional Wooden Truck Cargo Panel	Conventional Steel Truck Cargo Panel
Tensile Strength (MPa)	85.46	120	640-2000
Tensile Modulus (GPa)	16.3	16.5	190-210
Flexural Strength (MPa)	120.45	122	640-2000
Flexural Modulus (GPa)	26.7	16.8	190-210
Water Absorption (%)	0.06	15.5	0



INVENTION ADVANYAGES

These hybrid eco-truck panels can be prepared via existing commercial hand lay-up and compression moulding setups. Both types of fibers; synthetic and natural fiber can be applied to this system. These hybrid composites also can be used to reduce energy consumption of transportation, improve the fuel-efficiency of a truck, overcome environmental problems caused by timber logging and steel making, reduce the involvement of high-cost materials in product fabrication, overcome the injury problem caused by bulky and heavy truck cargo panel during handling, to boost cultivation and production of kenaf.

NOVELTIES

- Versatile – can produce various types of product e.g. pipe, tank, vessel.
- The invention is convenient to use and easy to install.
- Environmental friendly.
- Towards green materials.
- Using geopolymer materials that are from waste materials, easily available and cheap.
- Suitable for both synthetic and natural fiber.
- Using existing equipment set up for filament winding.
- This invention uses a combination of fly ash-based geopolymer filler and kenaf fiber as reinforcement in a hybrid FRP composite to produce a truck cargo panel.
- Utilization of natural (kenaf) fiber and fly ash based- geopolymer as reinforcement, which is non-expensive, and lightweight into high-performance commercial products for the automotive industry.
- Inexpensive prices (estimated 60% cheaper than existing products).
- Comparable mechanical properties with existing products.
- Mass productions with simple to moderate engineering skills.

POTENTIAL APPLICATIONS

- Aerospace
- As an alternative to more expensive coated steel, stainless steel and other exotic metal alloy piping
- Naval architecture
- Automotive industry
- Piping system

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GEO- RUBBSAN WALL PANEL

B

INTRODUCTION

- Composite sandwich panels have gradually become more popular due to their typical benefits including strength, weight, ease of handling, durability, versatility, thermal and acoustic properties.
- Sandwich panels are made of two materials that are relatively weak in their separated state, but are improved when they are constructed together in a sandwich panel
- CRC Wall sandwich wall panels are made of two fibre reinforced cement facing sheets, on either sides of a lightweight geopolymer mortar core.
- The core is made from a mix of fly ash, binders and silicaceous & crumb waste EPDM rubber from gasket.
- These panels are primarily used as walling material but can also be used as floor and roof panels.
- These are non-load bearing panels to be used with structural support frame only.

STATEMENT PROBLEM

- Excessive waste of EPDM from seal and gasket
- Emission of CO_2
- Consume space landfill

ADVANTAGES

JUST AHEAD

- Eco Friendly
- Lightweight Core
- Recycled Material
- Low Cost
- Good Acoustic Performance
- Easy to Install
- Low Energy Cost

ECO FRIENDLY

NOVELTY

- Incorporation of waste rubber in Geopolymer mortar
- Usage of waste EPDM from gasket and seals
- Flyash,waste as the matrix

POTENTIAL APPLICATION



PRODUCT DESCRIPTION

CRCWALL SANDWICH WALL PANELS VS OTHER SANDWICH WALL PANELS

Properties	Test Results			
	Standard	CRC Wall	Serba Cemerlang Eng. Sdn. Bhd.	Aerocon
Compressive Strength (MPa)		32.93	-	3.92
Density (g/mm²)	>1.2	1.5	1.25	-
Water absorption capacity (%)	≤40	4.5	39	-
Flexural Strength (MPa)	≥12	25	12	1.53
Sound Insulation (dB)	≥40	40	≥40	40

TECHNICAL DATA

Properties of CRC Wall Sandwich Wall Panel

Properties	Test Results
Compressive Strength (MPa)	32.93
Density (g/mm²)	1.5
Water absorption capacity (%)	4.5
Flexural Strength (MPa)	25
Sound Insulation	40 dB

PROCESS DEVELOPMENT



Fly Ash

Crumb Rubber

Alkali Activator

Mixing



Moulding



Geopolymer sandwich panel

Publication

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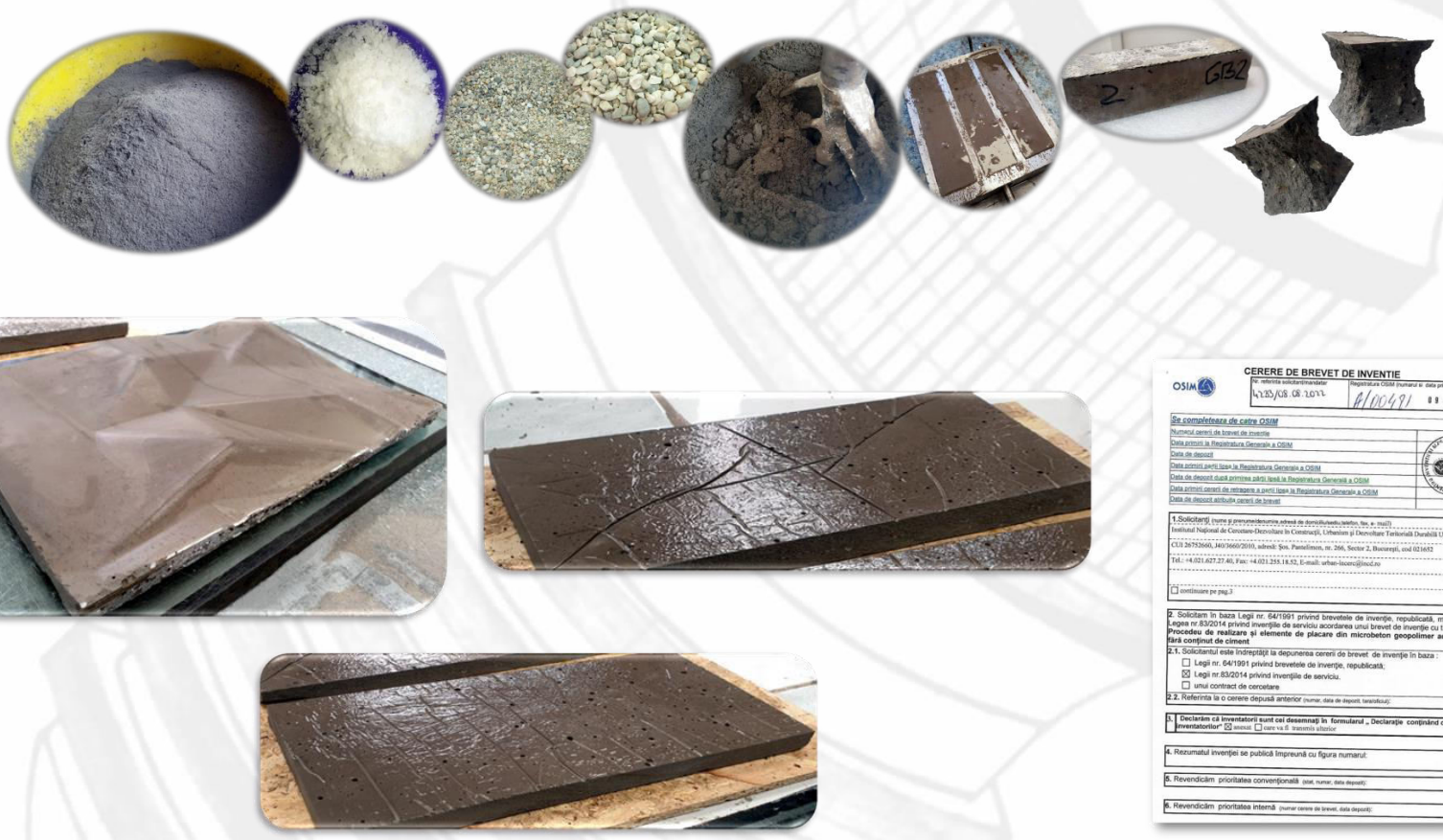
MANUFACTURING PROCESS AND CLADDING ELEMENTS FROM ALKALI-ACTIVATED GEOPOLYMER CONCRETE, WITHOUT CEMENT CONTENT

Pattent Application no. A/00481 from 09.08.2022

Author/s: Adrian Victor LĂZĂRESCU,
Bradut Alexandru IONESCU, Vasilica VASILE,
Andreea Cristina HEGYI

B

The invention refers to a process for making the composite material and cladding elements from alkali-activated geopolymer concrete, without cement content, using as raw materials fly ash, an alkaline activator based on sodium silicate and sodium hydroxide, aggregates natural river and dispersed reinforcement with metal fibers. Cladding elements produced are intended for use in finishing work / protection of walls or other inclined or vertical elements of constructions.



Claim 1: Process of producing.

Claim 2: Alkali-activated geopolymer concrete, no cement content, dispersed reinforcement with metal fibers.

Claim 3: Cladding elements from alkali-activated geopolymer microconcrete, without cement content.

- **Dimensions: max. 500 x max. 500 x min. 30 mm**
- **Apparent density: 1500 – 2000 kg/m^3**
- **Flexural strength: min. 5 N/mm^2**
- **Water absorption: max. 8%**



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UNCONVENTIONAL TEXTILE MATERIAL MADE ON THE BASIS OF SHEEP WOOL, FIBERS FROM RECYCLED PVC WASTE, RECYCLED TEXTILE WASTE AND VEGETABLE FIBERS, INTENDED FOR BUILDING INSULATION AND ITS MANUFACTURING PROCESS

Pattent Application no. A/00570 from 19.09.2022

Author/s: Andreea Cristina HEGYI, Cezar Florin BULACU, Adrian Victor LĂZĂRESCU, Brăduț Alexandru IONESCU, Elvira GREBENIȘAN, Gabriela Adela CĂLĂTAN, Carmen Silvia DICO, Mircea Iosif RUS, Cristian PETCU, Tudor Panfil TOADER, Carmen Teodora FLOREAN, Mihail CHIRA, Adriana SANDA

B

The invention relates to a non-woven textile material, made by carding-folding with heat welding, based on sheep's wool, fibers from recycled PET waste, recycled textile waste and vegetable fibers, intended for building insulation. The advantages are: the expansion of the possibilities of recycling waste and the use of sheep wool, the efficiency in thermal insulation and the positive impact on the quality of the air in the interior space through the hygroscopic character and the ability to reduce the concentration of formaldehyde, specific to the sheep wool thread.

Thickness: 20-60 mm
Apparent density: 15-40 kg/m^3
Thermal conductivity coefficient, λ: max. 0,045 W/mK

INNOVATION BASED ON TRADITION – HEALTHY HUGS FROM NATURE





Claim 1: Thermal insulation mattresses based on textile waste and recycled plastic waste integrating natural fibers of plant and animal origin.

Claim 2: Antistatic, antimicrobial, anti-insect, antimold treatment for thermal insulation bio-eco-friendly mattresses.

Claim 3: Capacity to improve indoor air quality through hygroscopic qualities for thermal insulation bio-eco-friendly mattresses and formaldehyde reducing capacity.

Claim 4: Process of producing thermal insulation mattresses.

Claim 5: Use for thermal insulation in construction field.

Advantages: Can be an alternative to commonly used thermal insulation products (expanded polystyrene, extruded polystyrene, mineral wool, etc.) and, at the same time, can contribute to increasing the quality of life of the population by ensuring a better indoor air quality.

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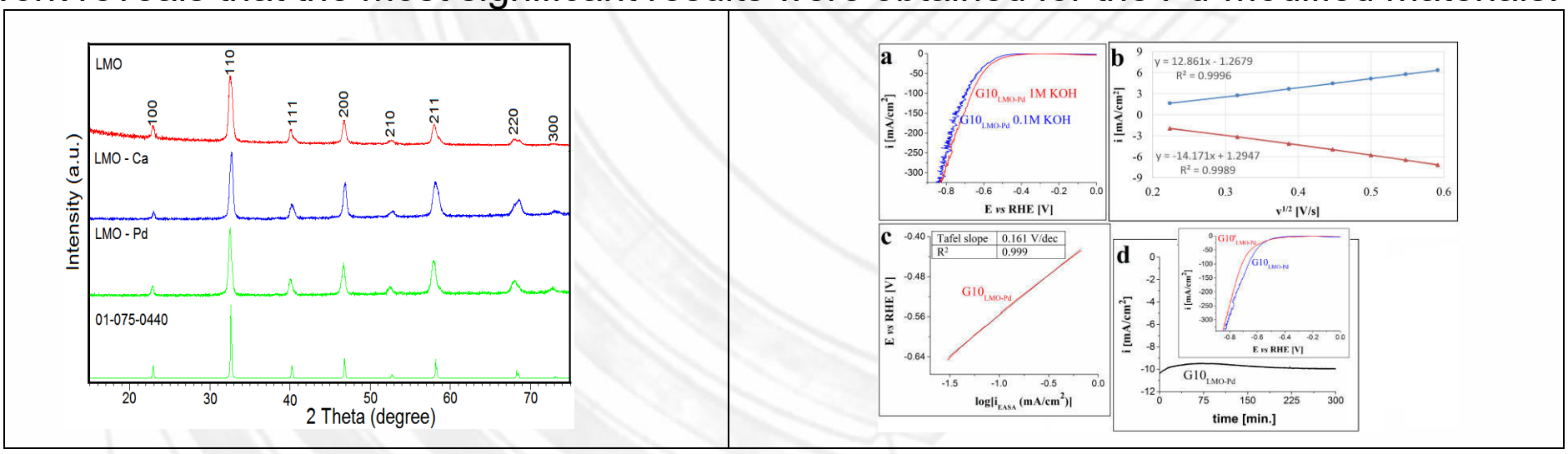
Addressing electrocatalytic activity of metal-substituted lanthanum manganite for the hydrogen evolution reaction

Paper: Surfaces and Interfaces, SURFIN-S-22-03882

Author/s: **Paula Sfirloaga**, Bogdan-Ovidiu Taranu, Maria Poienar, Paulina Vlazan

B

The perovskite materials, unsubstituted $LaMnO_3$ (LMO) and Ca (LMO-Ca) or Pd (LMO-Pd) substituted $LaMnO_3$, were studied in terms of their electrocatalytic activity for the hydrogen evolution reaction in alkaline medium. Out of the electrodes manufactured using compositions containing the perovskites, the most catalytically active was the one modified from a suspension obtained by adding 2 mg LMO-Pd, 1 mg Carbon Black and 10 µL Nafion solution in 0.5 mL ethanol, and it displayed an overpotential value of 0.49 V at i = -10 mA/cm2 and a Tafel slope value of 161 mV/dec. The analysis performed in this research work reveals that the most significant results were obtained for the Pd-modified materials.



The HER electrocatalytic activity of a series of electrodes modified with compositions containing the LMO, LMO-Ca and LMO-Pd perovskite materials was studied in alkaline medium, and the experimental data revealed that the electrode manufactured using the suspension obtained by adding 2 mg LMO-Pd, 1 mg Carbon Black and 10 µL Nafion solution in 0.5 mL ethanol was the most performant. In strong alkaline electrolyte solution, it displayed a HER overpotential value of 0.49 V at i = -10 mA/cm^2 and of 0.54 V at i = -20 mA/cm^2, as well as a Tafel slope value of 161 mV/dec. Its electrochemical stability was tested with good results, and the SEM analysis confirmed that the perovskite material did not suffer morphological changes during the investigation.

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Advanced Technologies for High Selectivity Detection of Organophosphate - Nerve Agent Simulants in Societal Security Applications

Project 683PED/2022

Author: Paula Sfirloaga

B

The aim of the WAsSENS project is development, testing and validation of technology in the laboratory namely, an SH-SAW sensor, using undoped and Co or Sn doped ABO_3 perovskite ceramics materials, obtained through low cost and environmentally friendly processes***, for detection of DMMP - the stimulant nerve agent sarin***.

This project aims to develop concepts at micro/nano scale and new functional materials to demonstrate their integration on a piezoelectric substrate in a miniaturized, low cost, ***high selectivity chemical sensor*** based on shear horizontal surface acoustic wave device. The sensor is basically composed by a material able to *detect changes in the medium of contaminants* (sensitive material-based on perovskite type compounds) and a transducer to translate this change into a quantifiable signal. Their production cost is low they can be mass–produced by micro-nano technologies.

To increase the sensitivity of the SH-SAW device, a thin layer of dielectric material will be deposited over the piezoelectric substrate where the interdigital translators are deposited. This increases the sensitivity of the **SH-SAW device**, a sensitivity that depends on the thickness of the guide layer and its acoustic properties. Over the waveguide layer, between the IDTs, a sensitive layer (based on undoped and doped Co or Sn doped $YMnO_3$ perovskite materials) will be deposited with the role of detecting contaminants.

So the ***SH-SAW devices***, integrated in a functional technology (with a microfludic cell and a testing platform) will allow monitoring, in real time, of the interaction processes at the surface of the guiding layer, due to the deposition of contaminants that will be detected.

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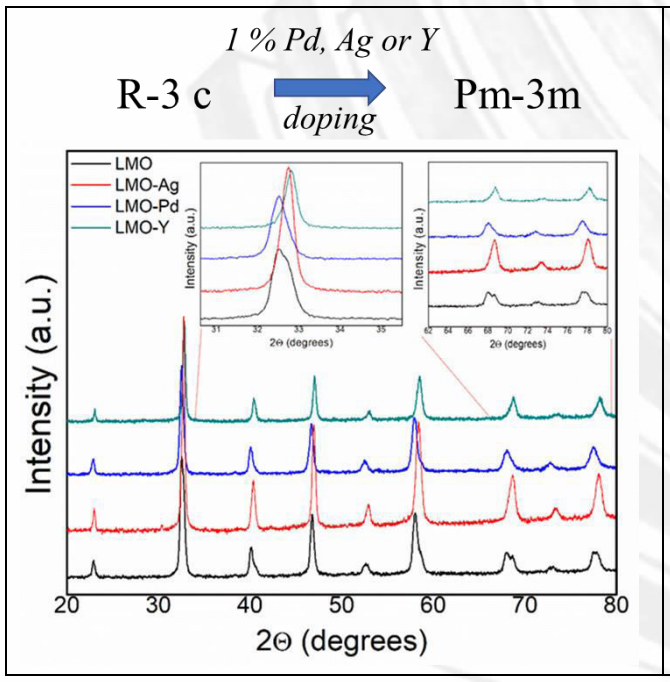
Investigation of catalytic and photocatalytic degradation of methyl orange using doped $LaMnO_3$ compounds

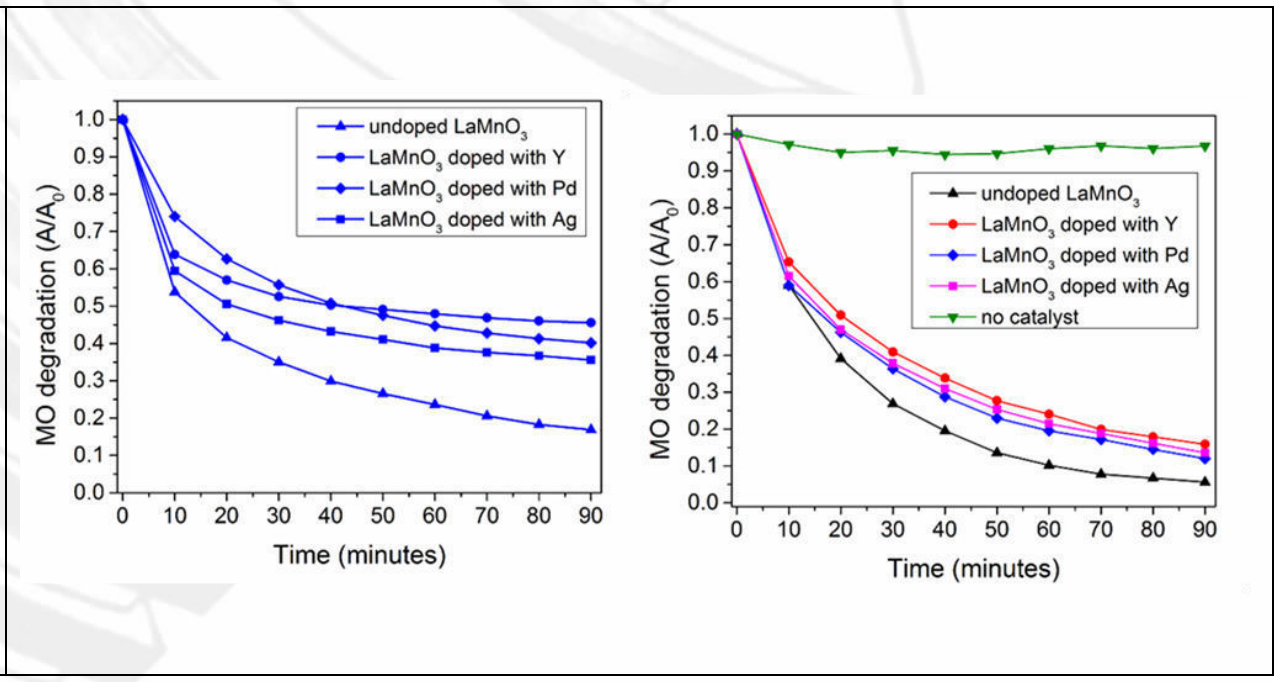
Paper Processes - 2044860, 2022

B

Authors: **Paula Sfirloaga**, Madalina-Gabriela Ivanovici, Maria Poienar,Catalin Ianasi and Paulina Vlazan

The perovskite type materials are reported to have promising results as they can be applied for the degradation of organic pollutants. Undoped and 1% Pd, Ag or Y doped perovskite type $LaMnO_3$ nanomaterials were prepared in this research work and their efficiencies for methyl orange removal was analyzed, wherein the effect of the doping ions and of the pH on the catalytic activity were studied together with a kinetic approach for the $LaMnO_3$ materials at different values of the pH. The investigation through X-ray diffraction and FT-IR spectroscopy indicate that all samples are well crystallised, without secondary phases and that the transition metal doping changes the crystal structure from R-3c space group for the undoped $LaMnO_3$ to Pm-3m space group for the doped perovskite compounds. Moreover, in the catalytic activity it should be noted a slightly better performance for the Ag doped materials compared to Y and Pd doped perovskite samples. The results presented here for the perovskite $LaMnO_3$ nanomaterials reinforces the interest for these multifunctional materials to be used in industrial applications as for example in water treatment.





The sol-gel method followed by the thermal treatment at low temperature allows to obtain well crystallized samples and without secondary phases (Figure left). The Ag doped $LaMnO_3$ led to better performance for methyl orange degradation under dark conditions when compared to Y and Pd probably related to some structural features facilitating this slightly enhancing of properties (Figure right).

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Structural and electrochemical studies of reed from the Danube in order to obtain green energy

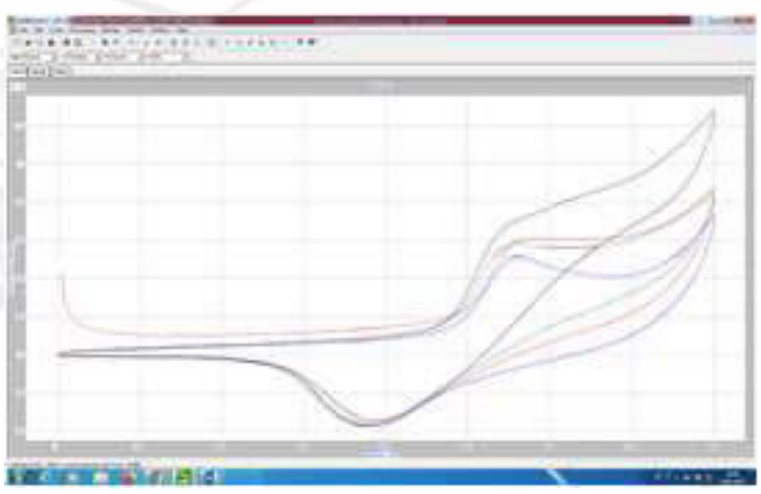
Project: 1PS / 09.11.2021 "Development of innovative technologies using artificial intelligence for the exploitation of biomass in lake areas inorder to sustain green energy sustainability

Authors: I. Balcu, A. C. Macarie, I. Taranu, V. Gherman, P. Sfirloaga

B

In this study, we present complete research regarding the structural and electrochemical studies regarding the reed from Danube. Studies on the production of biohydrogen have focused on the biophotolysis of water using algae and cyanobacteria, the photo-decomposition of organic compounds by photosynthetic bacteria and the fermentation in the dark of organic compounds with anaerobic bacteria. Obtaining hydrogen by electrolysis of solutions obtained by enzymatic treatment of reed in electrolysis cells without separation of electrode spaces involves in addition to streamlining the cathodic process and avoiding the release of oxygen to the anode. Taking into account that in the solutions obtained by enzymatic treatment of biomass (for example reeds) are found organic substances such as alcohols,aldehydes, ketones, etc. our goal is to identify those conditions in which only these substances oxidize on the anode andno oxygen is released.





The studies have shown that the solutions obtained by enzymatic treatment of reed from the Danube Delta can be used in a non-compartmentalized electrolyzer to generate green hydrogen.

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IN-SITU DEPOSITION PROCESS OF RGO FILMS ON TI-TiO_2 SUPPORT BY MICROWAVE-ASSISTED HYDROTHERMAL METHOD

INCD EMC

B

Patent Request Application: **A/00482/09.08.2022.**

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Description: The invention refers to the development of in-situ deposition process of reduced graphene oxide (rGO) films on a titanium-titanium dioxide (Ti-TiO_2) support, carried out in two steps: the first step involves growing of the TiO_2 layer directly on the titanium foil through thermal oxidation (Ti-TiO_2 support), and the second step refers to the in-situ deposition of the rGO film by the microwave-assisted hydrothermal method, obtaining the Ti-TiO_2-rGO electrode structure.

Morphological characterization and elemental analysis of Ti-TiO_2-rGO structure

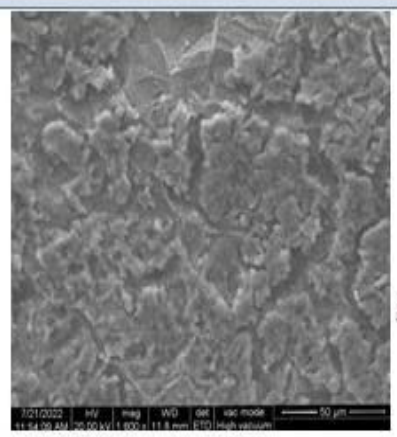

Fig 1. SEM images for the Ti-TiO_2-rGO structure



Fig 2..EDX analysis of the Ti-TiO_2-rGO structure

Schematic illustration of deposition process



Overview:

Graphene is one of the most promising advanced carbon-based nanomaterials, due to its extraordinary electronic transport properties, large surface area, and high electrocatalytic activity. Metal oxide semiconductors such as SnO_2, TiO_2, ZnO, CuO, WO_3, Fe_2O_3, and Co_3O_4 possess many outstanding advantages such as high sensitivity, fast response / recovery times, and low cost, so they are often used as important materials for gas sensors. The formation of p-n heterojunction nanocomposites could modify and engineer the gas-sensing capabilities of gas sensors by changing the electrical performance near the hetero-interfaces. In addition, the large specific surface area of the nanocomposites would provide more available active sites and promote gas adsorption for specific oxygen adsorption to design a gas sensor with high responsiveness. This research present a Ti-TiO_2-rGO structure developed by a simple in-situ microwave-assisted hydrothermal synthesis process. To the best of our knowledge, there are no reported papers on the in-situ synthesis of the Ti-TiO_2-rGO structures in microwave-assisted hydrothermal conditions by deposition of graphene oxide (GO) on titanium foil support.

Conclusions:

An innovative *in-situ* deposition of rGO approach was to synthesize Ti-TiO_2-rGO composite structures on Ti foil through a one-step microwave-assisted hydrothermal process. The microwave-assisted hydrothermal method for obtaining composite structures has proved to be feasible and easy to use for the development of Ti-TiO_2-rGO composite structures. SEM analysis showed an oriented growth, clearly and defined of the Ti-TiO_2 layers, and the rGO films were successfully deposited on the Ti-TiO_2 layers.

Acknowledgment: This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS - UEFISCDI, project number PN-III-P1-1.1-TE-2021-0963, within PNCDI III, with contract number TE13/2022 (DD-CyT); by Project "Network of excellence in applied research and innovation for doctoral and postdoctoral programs / InoHubDoc", project co-funded by the European Social Fund financing agreement no. POCU/993/6/13/153437, and partially by project code PN 19 22 04 01 TINSME, 40 N/2019.

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Concept for development of low cost silicone rubber-polymer mixed with perovskite materials for enhanced dielectric properties

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B

Description

We present a manufacturing concept of a new composite obtained by mixing a perovskite with silicone rubber. Composites are of interest for different applications, such as the design of flexible electronic devices or for dielectric energy storage. Recent literature reports on silicone rubber composites mixed with ferrofluids [1] and aluminum nanoparticles [2] present a potential to make flexible materials with good electric properties. Because of the excellent dielectric properties of many perovskites, we are going to study which material should be used in these kind of composites and the concentrations at which the materials are the most efficient.

A composite material is obtained by combining two or more materials with different properties, thus giving the composite unique properties, different from those of the component materials. Studies are known on the macroscopic electrical properties of artificial composite materials, consisting of two phases of separate materials, with a disordered microstructure. [1]

Perovskite materials have been used in ultrasound machines, memory chips, solar cells, information storage, and sensors. Further focus was directed to them because of their photovoltaic effect, that was highlighted by extremely high open-circuit voltage and external quantum efficiency.

Understanding the electrical conduction and dielectric polarization properties of elastomer-based composites is important for the design of flexible and elastic electronic devices and circuits.[2] For that we started by manufacturing a sample of silicone rubber without any added perovskites. The silicone rubber (SR) was purchased from Prochima and has the commercial code RTV-530. The obtained composite samples have the shape of a cylinder with a diameter of 5 mm and height of 7 mm. (fig. 1)

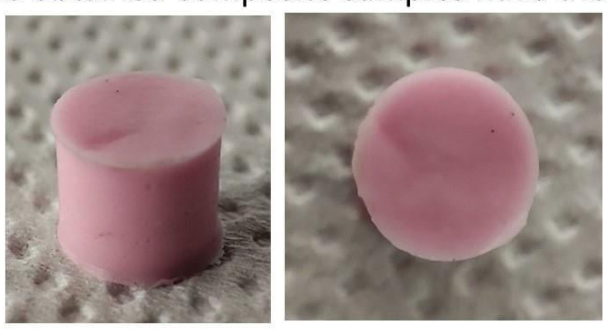

Fig. 1 images of the sample of silicone having the cylindrical shape

The silicon rubber was characterized using scanning electron microscope (SEM) and energy dispersive X-ray detector (EDX). (fig 2)

Figure 3 shows the frequency dependence of the real (Z') and imaginary (Z") components, of the complex impedance of the silicone rubber sample, over the frequency range (1 kHz– 600 kHz). The effect the mixing of different kinds of perovskites in the silicone on the electrical properties of the resulting composite will be presented in our future works.

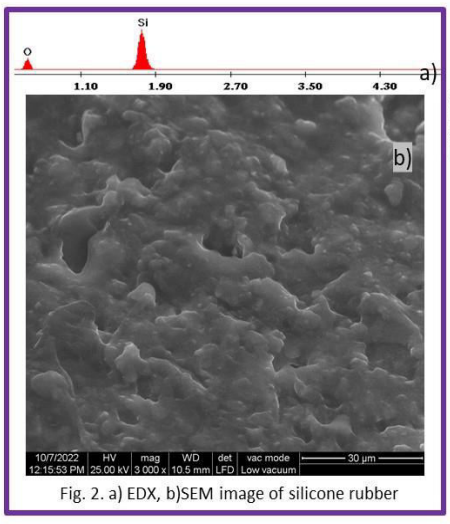

Fig. 2. a) EDX, b)SEM image of silicone rubber

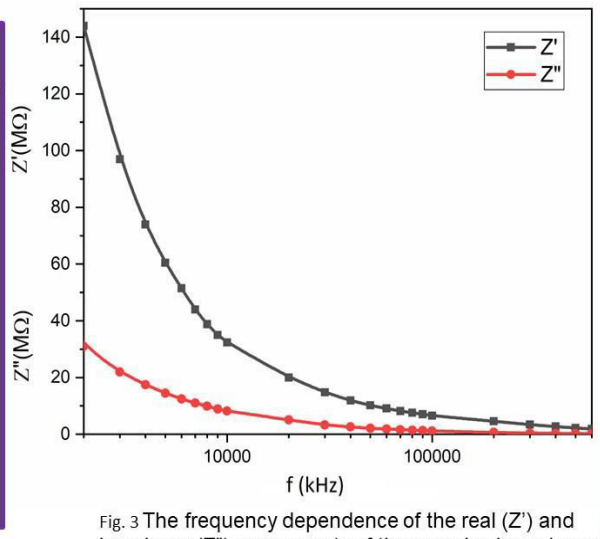

Fig. 3 The frequency dependence of the real (Z') and imaginary (Z") components of the complex impedance

Objectives:

- To control the electrical properties by changing the concentration of perovskite in our composites.
- To find the most suitable perovkite materials for any type of flexible devices
- To implement silicone rubber composites in future applications.

Acknowledgment:
Romanian National Authority for Scientific Research and Innovation, the project number PN 19 22 04 01, within PNCDI.

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References: [1] Teusdea, A.; Malaescu, I.; Sfirloaga, P.; Marin, C.N. , *Materials* **2022**, *15*(6), 2309 https://doi.org/10.3390/ma15062309
[2] Marin, C.; Malaescu, I; Sfirloaga P.; Teusdea, A.; *JIEC;* **2021**, 101, 405-413 https://doi.org/10.1016/j.jiec.2021.05.042

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Development of Self-Powered Photodetector Based on Transparent FTO/n-TiO2/p-CuMnO2 Thin Films

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Patent requst no. A/00298/02.06.2022

INCD EMC

B

Description

The technical problem solved: The invention refers to the development of a self-powered photodetector for ultraviolet radiation detection. The transparent self-powered sensor based on FTO-TiO2-CuMnO2 is made by the following components: the sensor support is fluorine-doped tin oxide glass (FTO), thin films of TiO2, the "n" component of the heterostructure, and thin films of CuMnO2, the " p" component of the heterostructure. The electrical measurements of the sensitivity of the sensors demonstrated the photosensitive character of the n-p junction in the -1V, +1V range, both in UV light irradiation and in the dark. Moreover, the property of the self-powered sensor was demonstrated by performing measurements at 0V. Thus, it was observed that under the action of UV irradiation, a self- powered current was generated

Testing UV sensor

In Figure 7 are presented the Current-voltage measurements in dark and UV condition.

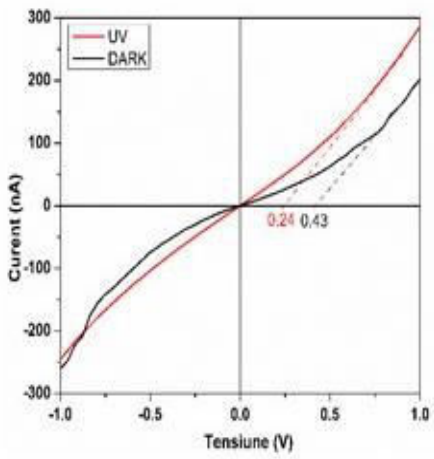


Fig. 7. Current-voltage characteristics of *n*-TiO2/*p*-CuMnO2 heterojunction under dark and UV irradiation

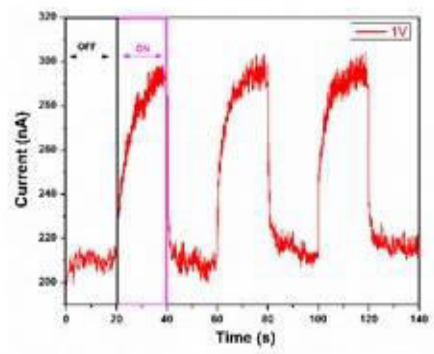


Fig. 8. Current-time photo-detective properties of the UV sensors at light exposure at 1V bias (ON/OFF = 20 s).

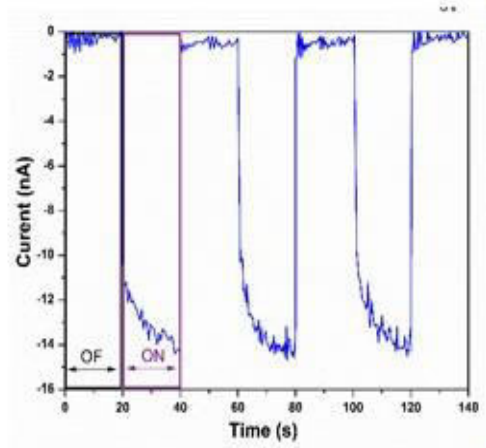


Fig. 9. Current-time photo-detective properties of the UV sensors at light exposure is self power mod (ON/OFF = 20 s).

Structural and Morphological Properties

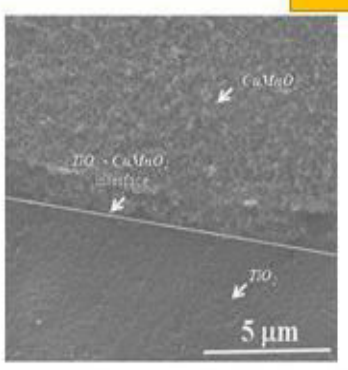


Fig 1. SEM images for the interface of TiO2-CuMnO2 films

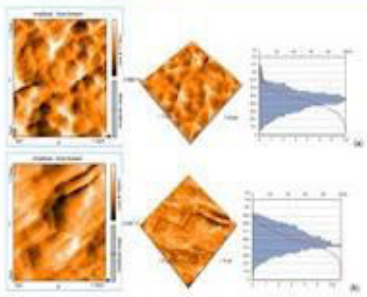


Fig 2. Two-dimensional and 3D AFM surface images and particle size distribution for FTO-TiO2 film (a) and FTO-TiO2-CuMnO2 film (b)

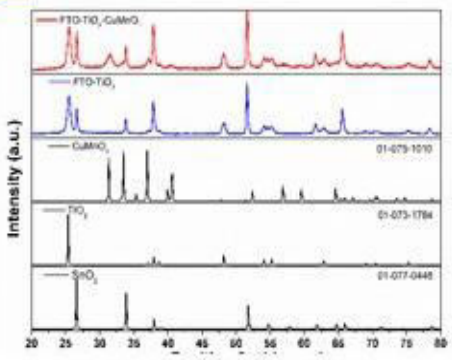
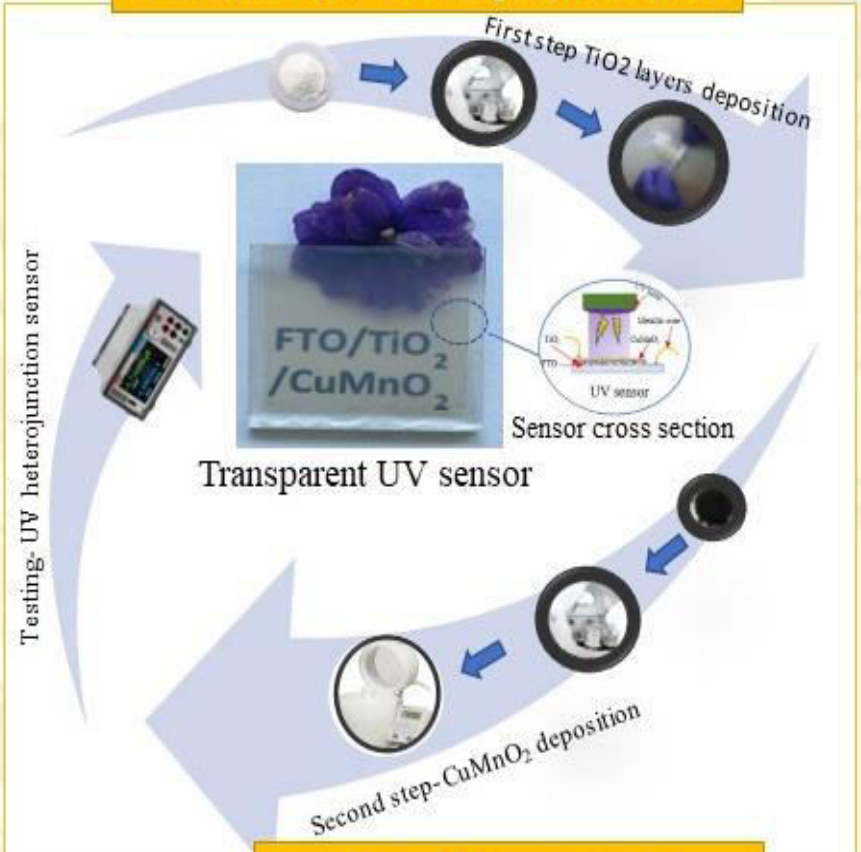


Fig.4. XRD patterns for FTO-TiO_2-$CuMnO_2$ layers

Production of UV heterojunction sensor



Conclusion

A self-powered photodetector with the configuration FTO/n-TiO2/p-CuMnO2 was successfully achieved for the first time, to the best of our knowledge, by using a layer-by-layer technique and doctor blade and spin coating methods. Due to the alignment of the band and the transparency of the layers, a device based on the n-p junction was demonstrated to operate without an external voltage bias. The device shows an excellent ON/OFF ratio at 0 bias of about 48.3, much higher than that for the 1 V bias of about 1.4. The above results show that the transparent heterojunction device of n-TiO2/p-CuMnO2 exhibited a self-powered ultraviolet photodetector with high sensitivity.

Optical Characteristics

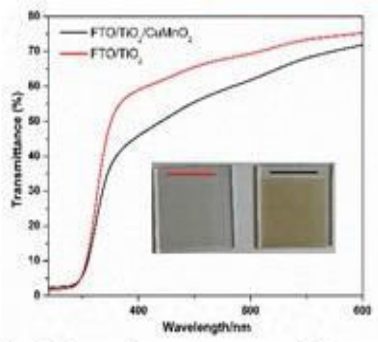


Fig. 4. Transmittance spectra and pictures of FTO-TiO2 and FTO-TiO2-CuMnO2 transparent films

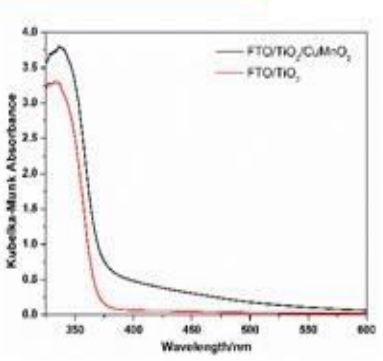


Fig. 5.); UV –VIS Absorption of the FTO-TiO2 and FTO-TiO2-CuMnO2

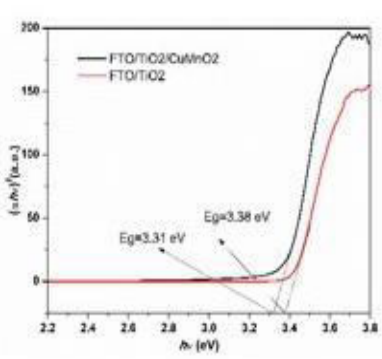


Fig.6. Optical bang gap for FTO-TiO2 and FTO-TiO2-CuMnO2

This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS-UEFISCDI, project number PN-III-P1-1.1-TE-2021-0963, within PNCDI III, with con-tract number TE13/2022 (DD-CyT); by Project "Network of excellence in applied research and innovation for doctoral and postdoctoral programs/InoHubDoc", project co-funded by the European Social Fund financing agreement no. POCU/993/6/13/153437, and partially by project code PN 19 2204 01 TINSME, 40 N/2019

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Recycled High-Density Polyethylene (HDPE) as an Additional Binder in Porous Asphalt Pavement

B

Product Description

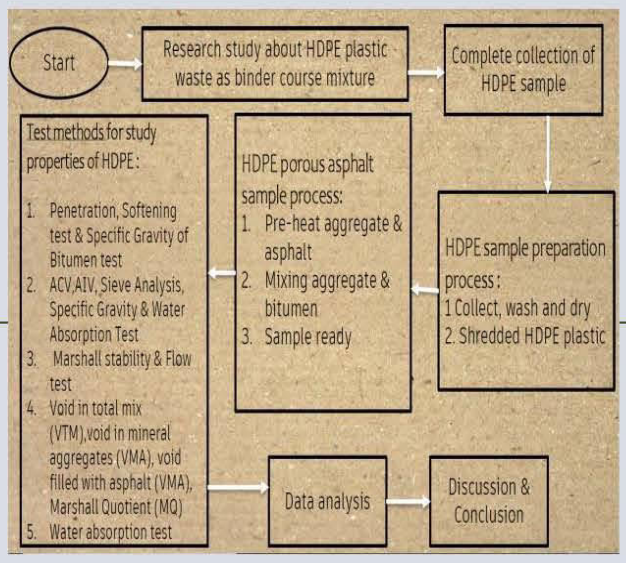
- Nowadays, numerous previous studies showed using recycled high-density polyethylene (HDPE) in porous asphalt road pavement construction.
- As a result, recycled HDPE plastic waste was utilised as an additional binder material to enhance the asphalt binder.
- The main purpose of this study is to look into the stability of modified HDPE porous asphalt samples and evaluate the optimum percentage of HDPE plastic waste from 3%, 6% and 9%.
- At 3% of HDPE plastic addition has improved the stability of porous asphalt specimens. The improvement about 73.71% higher than standard porous asphalt.

Problem Statement

- The utilization of porous asphalt has several benefits including enhanced skid resistance at full speed, decrease hydroplaning potential, minimize glare on slippery roadways and entirely increase in road and traffic safety protection.
- However, the porous pavement performance is lower because of low dense mix compared to conventional dense mix.
- Moreover, porous asphalt pavement has low stability to hold the aggregates and bitumen together required strong binding support from asphalt mixture.
- High destiny polyethylene (HDPE) is one of the effective materials that can be used to be an addition materials to utilize the asphalt binder course mixtures

Methodology

- Material Used : Coarse & Fine Aggregates, Ordinary Portland Cement, Recycled HDPE & Asphalt 80/100
- Wet Process Method – To study the modified HDPE asphalt mixture binder through penetration, softening and specific gravity of bitumen test
- Dry Process Method - Shredded HDPE plastic waste will added into porous asphalt mixture to created HDPE porous asphalt sample.





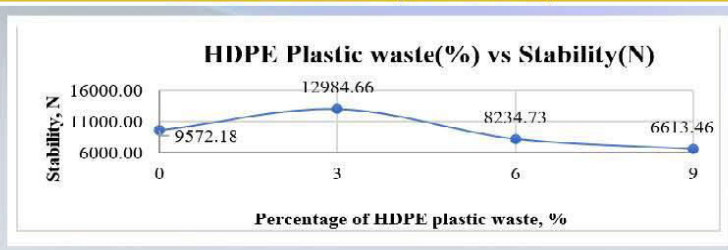
Results

Physical Properties of Asphalt Mixture

Properties	JKR requirement	0%	3%	6%	9%
Penetration at 25°C (dmm)	80-100	86.20	68.96	66.53	58.70
Softening point (°C)	42-52	48.70	51.20	53.90	55.50
Specific gravity at 25°C (g/cm³)	1.01-1.05	1.039	1.030	1.058	1.371

- Penetration value recorded between 50 to 70 dmm. Modified HDPE asphalt mixture being more hard, thick in texture and showing enhanced sturdiness.
- Softening test values went up when the addition of HDPE plastic increases. The 0% and 3% of HDPE asphalt mixture met the JKR standard criteria in 48.7°C and 51.2°C in temperature.

Marshall Stability Efficiency



- 3% HDPE porous asphalt speciemen has the maximum stability value
- 73.71% of improvement in stability

Properties	JKR requirement	0%	3%	6%	9%
Flow	2-6	2.43	2.78	4.41	2.83
Void in total mix (VTM)	10%-25%	15.98	17.72	17.14	17.05
Void in mineral aggregate (VMA)	-	19.05	19.70	11.62	10.73
Void filled with asphalt (VFA)	75%-85%	60.19	68.85	92.76	94.93
Marshall Quotient (MQ)	Maxi 400kg/mm	3891.60	4639.31	1579.59	2275.53

- 3% HDPE porous asphalt specimen was chosen as the best optimum percentage of recycled HDPE plastic waste for use as an additional plastic binder materials for asphalt mixture.
- In comparison to 0%, 6% and 9% HDPE porous asphalt specimens, the 3% HDPE porous asphalt specimens met the JKR standard requirement in throughout all criteria with greatest test results.

Conclusion

- Adding 3% shredded HDPE plastic into asphalt mixes enhances its performance and increases stability by 73.36%.
- Overall,3% HDPE porous asphalt was satisfied the Marshall Parameters compared to 6% and 9% of HDPE plastic waste addition to the mixtures.
- Help to reduce landfills and environment pollution by reusing HDPE plastic waste into road pavement construction

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LIGHTWEIGHT NEPHELINE-BASED CERAMICS

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B

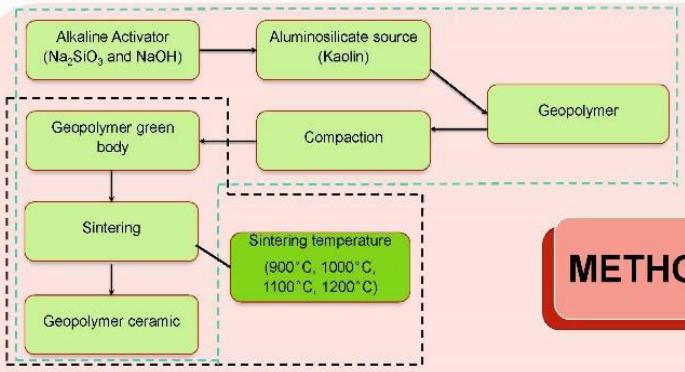
ABSTRACT

The focus of this study is the fabrication of innovative and sustainable lightweight nepheline-based ceramic with improved low temperatures performances. Kaolin was mixed with liquid sodium silicate (Na_2SiO_3) and 12M of sodium hydroxide (NaOH) solution using aluminosilicate/activator ratio of 0.24at a ratio of 1:1 and Na_2SiO_3/NaOH ratio of 0.24 to synthesize kaolin geopolymer. The effect of sintering profile on the microstructure, pore evolution and flexural strength were investigated. The heating exposure aided consolidation and created a fairly uniform microstructure, resulting in a smooth surface texture. In comparison to the unheated geopolymer, 3D pore distribution showed a significant increase in the range size of ~30 μm with the appearance of isolated and intergranular pores. The sintering process has an impact on the final microstructure formation thus improved the characteristic of nepheline-based geopolymer ceramic.

DESCRIPTION

Intriguing features of geopolymers such as excellent thermal properties, outstanding early strength, good acid resistance, low permeability and adjustable kinetics of curing at low manufacturing cost attracted extensive attention in recent decades [1]. In general, geopolymers are large inorganic molecules synthesized by alkali activation of aluminosilicates in highly alkaline solution at low temperature [2]. Aluminate and silicate species were produced by binding togethers through polycondensation reaction, resuled in formation of a compact amorphous and semi crystalline three-dimensional structure of polymeric Si-O-Al bonds. The unique properties of geopolymer can be applied in a variety of applications such as building and construction materials, thermal insulation coatings, fire resistant materials, repair and strengthening composites, low energy ceramic tiles, and refractory materials [2]. Another method of utilizing geopolymer technology is to reduce the high temperature necessary in the production of ceramic materials. Sintering can transform geopolymer amorphous to semicrystalline phases into crystalline ceramic phases

METHODOLOGY

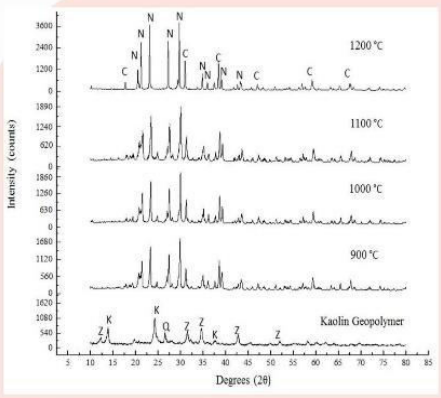


OBJECTIVES

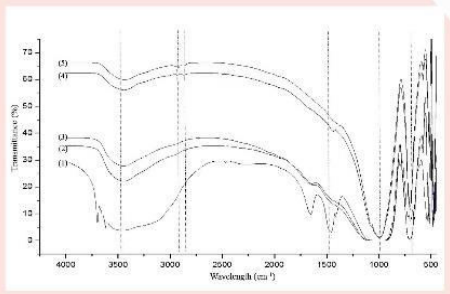
- To produce geopolymer-based ceramic with low sintering temperature
- To study the effect of sintering temperature on the properties of nepheline-based ceramic

RESULTS AND DICUSSION

Sintering Temperature	900 °C		1000 °C		1100 °C		1200 °C	
	Average	SD	Average	SD	Average	SD	Average	SD
Flexural Strength (MPa)	42.35	1.81	50.12	1.71	65.65	1.82	92	1.51
Theoretical density (g/cm³)	2.53	0.02	2.21	0.03	2.05	0.02	1.88	0.02
Total Porosity (%)	25.35	0.5	26.93	0.42	28.23	0.3	34.01	0.61
Volumetric Shrinkage (%)	10.02	0.62	13.54	0.32	16.55	0.54	18.32	0.63
Water Absorption (%)	6.32	0.63	8.54	0.32	13.26	0.51	17.31	0.63

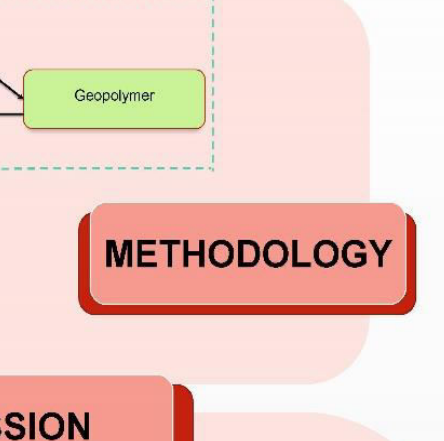


XRD pattern of kaolin geopolymer and kaolin geopolymer ceramic at different sintering temperatures (N= Nephaline, C= Carbon, K= Kaolinite, Q= Quartz, Z= Zeolite)

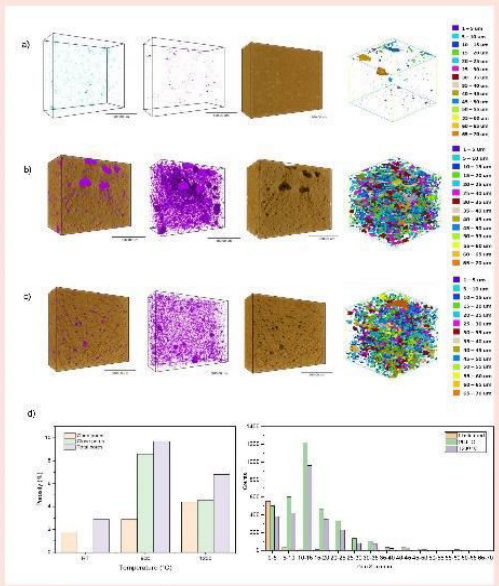


IR spectra of (1) unsintered kaolin geopolymer and geopolymer-based ceramic sintered at (2) 900 °C, (3) 1000 °C, (4) 1100 °C, and (5) 1200 °C

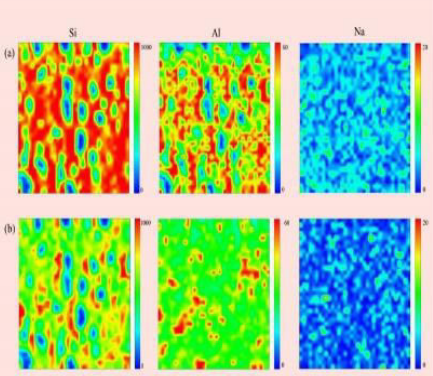
SEM micrograph of a) raw kaolin and b) kaolin-based geopolymer



SEM micrograph of lightweight nepheline-based ceramic at different sintering temperature (a) 900 °C, (b) 1000 °C, (c) 1100 °C, and (d) 1200 °C



3D pore structures with pore distributions of a)unsintered kaolin based geopolymer, nepheline-based geopolymer ceramic sintered at b)900 ° C, c) 1200 ° C, d) pore contents and pore size counts



Micro-XRF elemental distribution maps of Na-Al-Si for (a) kaolin-based geopolymer (b) nepheline-based geopolymer ceramic with the addition of UHMWPE at 1200 ° C sintering temperature

CONCLUSIONS

The lightweight nepheline-based ceramic were successfully fabricated using geopolymer method at 900 °C - 1200 °C. The role of sintering on the physical, mechanical and microstructural properties of nepheline ceramics based geopolymer was investigated. A compacted and smooth surface microstructure with the highest strength of 92 MPa and lowest density of 1.88 g/cm³ were obtained at the sintering temperature of 1200 °C. Structural consolidation was achieved and resulted in a relatively uniform and smooth microstructure at higher sintering temperatures. The presence of pores shows a significant contribution to the improvement of properties, due to phase transformation occurring during the sintering process. The sintering profile will promote material densification while diffusion is the matter transport mechanism that promotes densification and grain growth. The sintering profile of geopolymer materials is important in understanding the effort to improve the mechanical and microstructure properties of geopolymer ceramics.

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The authors of the present work wish to dedicate their great thanks to Centre of Excellent Geopolymer and Green Technology, (CeGeoGTech), UniMAP. The author would like to acknoeledge the support from the Fundamental Research Grant Scheme (FRGS) under a grant number FRGS/1/2021/TK0/UNIMAP/02/17 for financial support. Special thanks is dedicated to Synchrotron Light Research Institute (SLRI), Thailand for testing accommodation.

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DRUGON

Surface HARDening and highly wear-resistant nanocomposite COATtings for woodworking tools

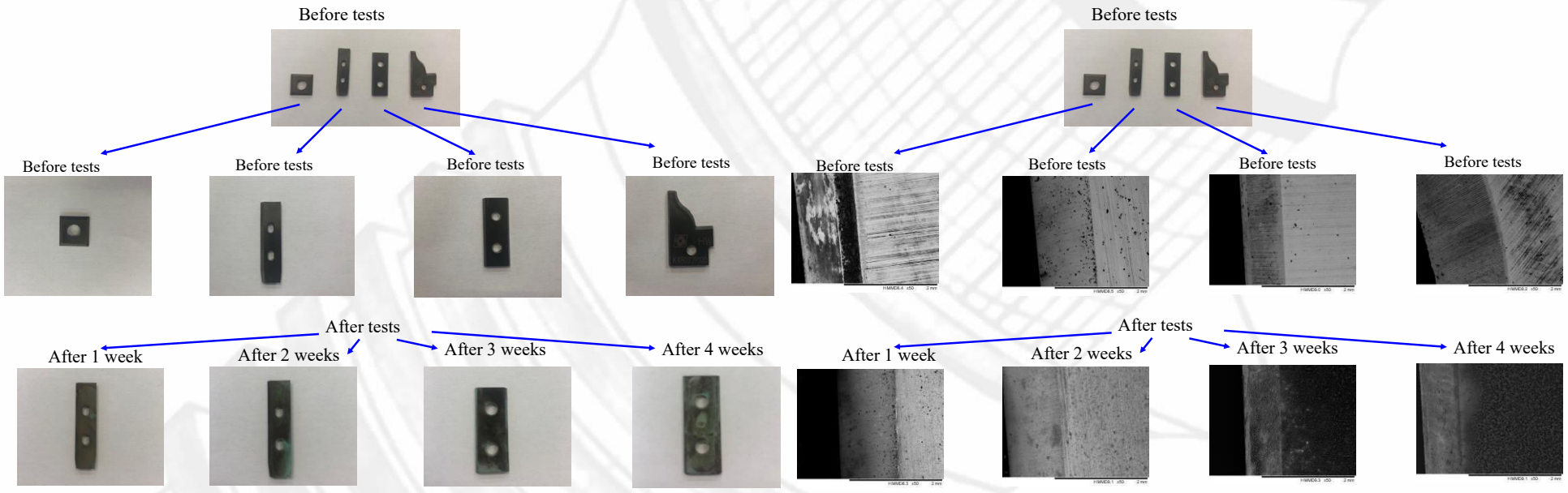
B

Spiridon Dragomir, Diana M.Vranceanu, Claudia P.Dragomir

Project number: COFUND-M-ERANET-3-HardCoat-2 (312/2022)

Through this project the development in surface modification of cutting tools used in wood industry as well as the optimization of methodologies for investigation of mechanical, physico-chemical, surface and interfacial properties like wear and corrosion performance of this materials is intended. One objective of this research is the development of a variety of new super-/hard nanocomposite coatings based cutting insert, using Cr, Fe, Ti, or W based nanocomposites, with high hardness, good adhesion to substrate, low internal stress, resistance against wear, corrosion and oxidation, low friction coefficient, high fracture toughness. The coatings are specially designed to be used as protective coatings against wear for parts and tools subjected to severe working conditions for industrial woodworking.

Cutting tools before/after use in factory



Protopyes of tools used for wood industry







Conclusions

- After 1 months of working, any cutting tools are destroyed.
- The medium of working of tools used in wood industry is extremely destructive, consisting in salts, sands, oil, dusty etc.
- Each tool exhibited high rate of deterioration, being affected simultaneous by wear and corrosive processes.

SOLUTIONS

Coated cutting tools

Details in presentation of patent no. A00605/2022

Contact: drugoninternational@gmail.com

This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS/CCCDI -UEFISCDI, project number COFUND-M-ERANET-3-HardCoat-2 (312/2022), within PNCDI III.

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Nanostructured thin films based on carbo-nitrides if transition metals with silicon additions resistant to wear

Spiridon Dragomir, Anca C.Parau, Diana M.Vranceanu,
Lidia R. Constantin, Claudia P.Dragomir, **Alina Vladescu**

B

Patent: A00605/04.10.2022

The invention relates to preparation of nanostructured thin films based on carbo-nitrides consisted in one or more of transition metals with Si additions prepared by cathodic arc evaporation method used as protective films of cutting tools which ran under wear harsh regime by abrasion, erosion, and corrosion used in wood machining and cutting. Materials consist in complex carbo-nitrides based on Cr, Fe, Ti and W as base metal with elemental concentrations of min. 30 at.%, and max. of 30 at.% of C or N, and Si ranged from 2 to 12 at.%.

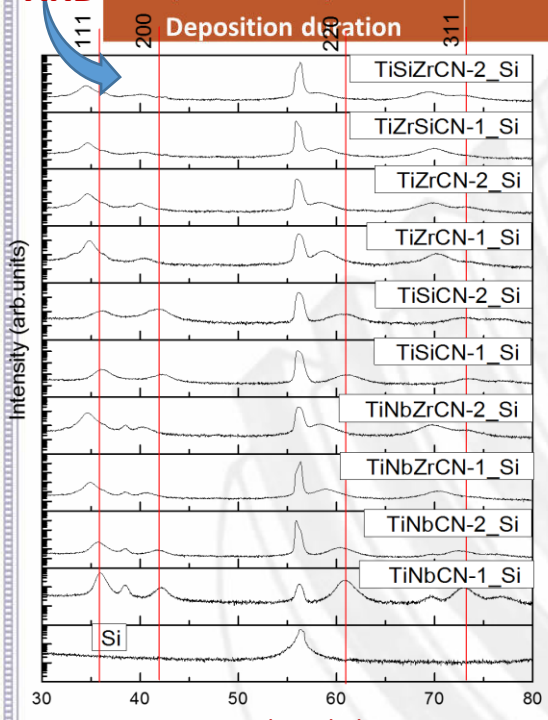
Deposition conditions for the coatings

Total (CH_4+N_2) mass flow rate	90 sccm
CH_4 mass flow rate	25 sccm
N_2 mass flow rate	65 sccm
Arc current	90 A for Zr, 110 A for TiNb and TiSi
Substrate bias voltage	-100 V
Deposition temperature	320 °C
Deposition duration	40–50 min

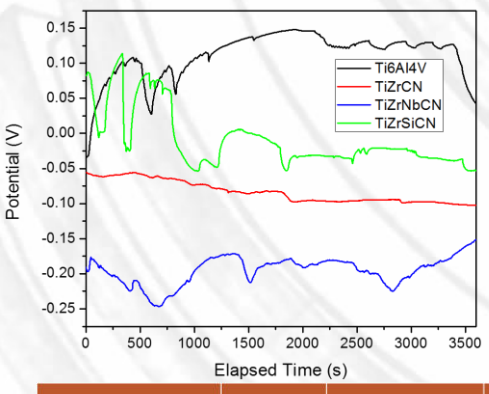
EDS

Coatings	Ti	Zr	Si	Nb	C	N	O	V	Al	C/N
TiZrCN	38.48	9.04	0	0	15.81	34.64	1.9	0	0.13	0.45
TiZrSiCN	34.55	8.82	4.64	0	15.66	34.12	2.11	0	0.10	0.45
TiZrNbCN	34.73	8.74	0	5.48	14.73	34.06	2.18	0	0.08	0.43

XRD

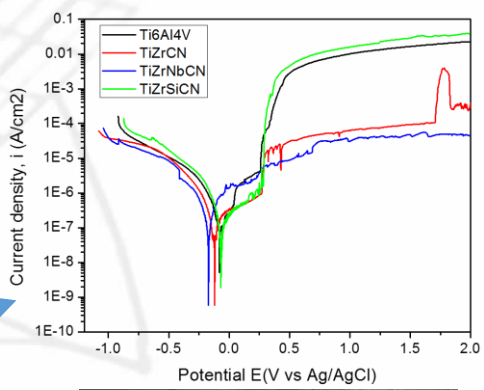


Electrochemical tests



Electrochemical parameters of the investigated samples:

E_{corr}: corrosion potential; i_{corr}: corrosion current density; R_p: polarization resistance; P: porosity; P_e: protective efficiency



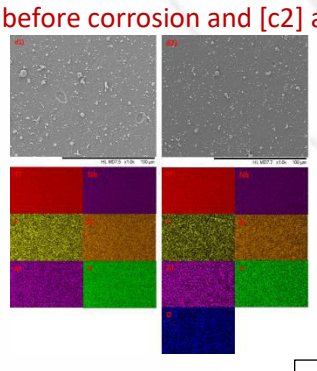
	E_{corr} (mV)	i_{corr} (nA)	Rp (Ω*10^3)	Pe (%)	P
Ti6Al4V	-78	222.123	193.93		-
TiZrCN	-122	36.77	1523.12	83.5	0.113
TiZrNbCN	-170	91.228	579.76	59.9	0.262
TiZrSiCN	-67	16.01	2618.50	92.7	0.0719



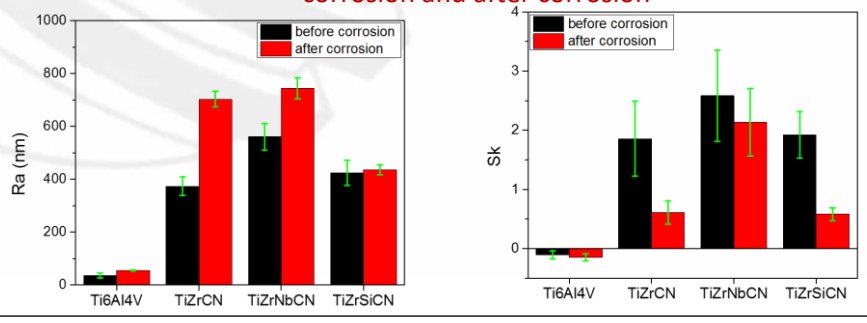




SEM micrograph and elements mapping analysis of TiNbCN coatings: [c1] before corrosion and [c2] after



Roughness parameters (R_a –arithmetic average deviation from the mean line (a); S_k – skewness (b)) of investigated samples before corrosion and after corrosion



Contact: Alina Dragomir, alinava@inoe.ro, 021.457.57.59

This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS/CCCDI -UEFISCDI, project number COFUND-M-ERANET-3-HardCoat-1 (311/2022) and COFUND-M-ERANET-3-HardCoat-2 (312/2022), within PNCDI III.

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Innovative strategies for bioactive/antibacterial advanced prostheses

Project: ERANET-M-ISIDE-1-171/01.07.2020

B

Alina Vladescu, Catalin Vitelaru, Anca C.Parau, Iulian Pana, Mihaela Dinu, Adrian Kiss, Lidia R.Constantin

1 ABSTRACT

The project relates to a possibility to reduce the degradation rate of Mg alloys used for the maxillofacial surgery by coatings with thin films-based hydroxyapatite prepared by RF magnetron sputtering. The coatings exhibit a thickness ranged from 250 nm to 300 nm nm, being deposited up to 400^0 C. These coatings resist to corrosive attack of SBF, DMEM and PBS at 37^0C, having a high protective efficient in these corrosive media (min 82%).

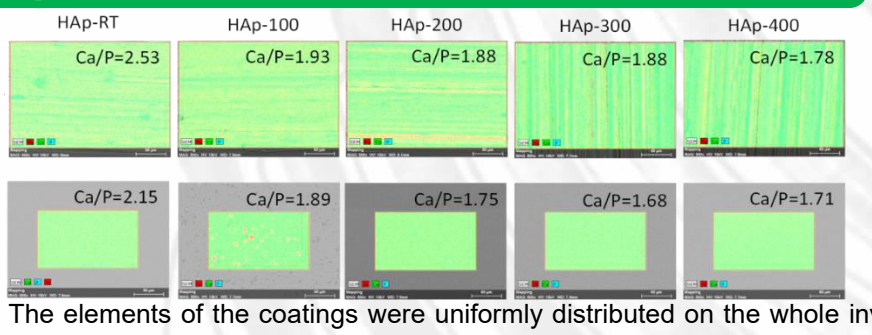
2 MATERIALS



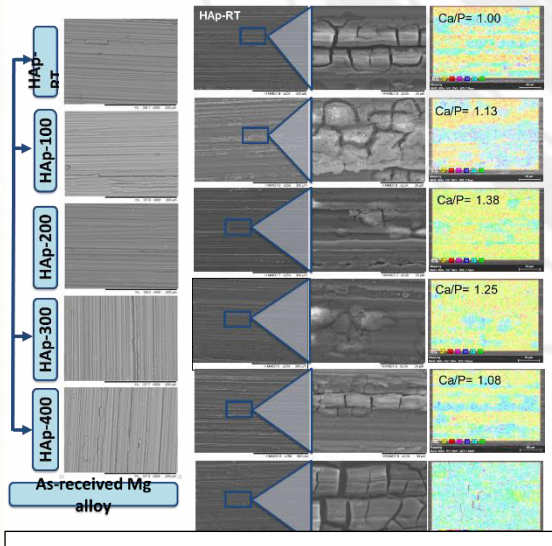
Substrate	Coating	Sample codification
AZ31B	HAp, T = **RT**	HAp-RT
	HAp, T = **100°C**	HAp-100
	HAp, T = **200°C**	HAp-200
	HAp, T = **300°C**	HAp-300
	HAp, T = **400°C**	HAp-400

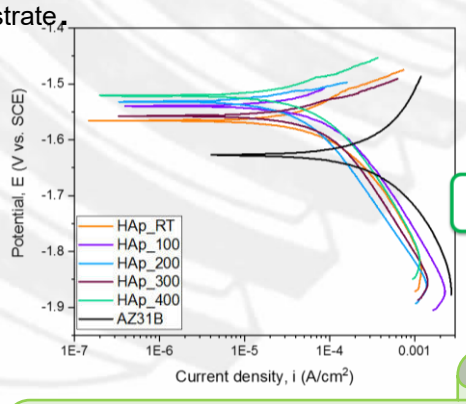
3 METHOD

4 RESULTS & DISCUSSIONS

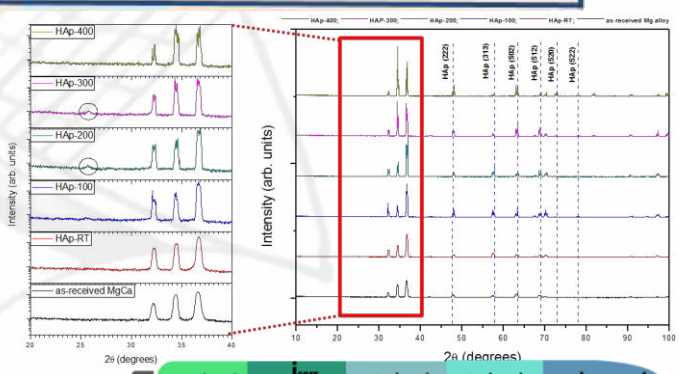


The elements of the coatings were uniformly distributed on the whole investigated surfaces, indicating the formation of homogenous coatings. Also, the Ca/P ratio decreased by increasing the deposition temperature, whatever the substrate.





The crystalline HAp coating can be obtained at deposition temperatures higher than 200 ◦C, while the amorphous structure can be obtained at temperature in the RT - 100 ◦C.



Nr.crt.	Sample	E_{corr} (mV)	i_{corr} (nA/cm²)	β_c (mV)	β_a (mV)	R_p (Ωx cm²)
1	As-received Mg alloy	-1627	2285	703.05	2372	103.19
2	HAp-RT	-1565	301.49	429.06	572.24	353.61
3	HAp-100	-1539	354.843	412.29	1423	391.68
4	HAp-200	-1531	**60.498**	248.64	118.37	**576.35**
5	HAp-300	-1557	113.515	275.83	124.69	328.90
6	HAp-400	-1520	136.664	321.31	301.08	494.50

5 CONCLUSIONS

RF magnetron sputtering method is versatile and suitable for obtaining hydroxyapatite coatings.

The hydroxyapatite coatings regardless of the deposition temperatures are uniform and they are covering the entire surface of the substrate.

The corrosion resistance in SBF of the uncoated Mg alloy could be improved by HAp coatings: all HAp coatings showed a corrosion behaviour better than the uncoated Mg alloy.

The best corrosion behaviour was showed by the sample deposited at 200 ◦C, which was characterised by the roughest surface and by the closest Ca/P ratio to the stoichiometric one.

This work was supported by grants of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, projects ERANET-M-ISIDE-1, no. 171/2020 and ERANET-M-ISIDE-2, no. 172/2020, within PNCDI III, and Romanian National Core Program

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Tripov-Tec (Triple Biopore Paving Technology): Effort to Reduce Flood Disaster with Combination of Infiltration Wells and Artificial Flood Detectors

B

Student Project

Project number: INOV/REV/02.09.2022/11/IKH/KIRSMANDAPML/INT

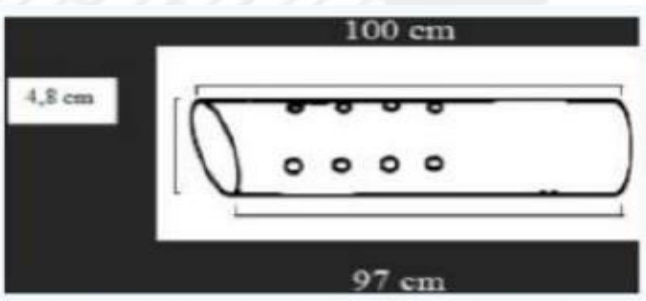
Author/s: Litaussi'il Arzaq, Nadhifah Yasmin, Sulis Suryani, Muhammad Bintang Pradith Tama Sukma, and Salsa Aulia Rossyana

Tripov-Tec (Triple Biopore Paving Technology) is a technology as an effort to minimize flood disasters combined with infiltration wells. The new innovation in using Tripov-Tec that we made is the addition of an artificial flood detector that uses a turn signal as a marker so that its operation will be easier and more efficient. To obtain data on the level of soil absorption, researchers conducted trials using 2 types of paralon, namely paralon with 20 holes and paralon without holes, each of which has a length of 100 cm and a diameter of 1½ inch.

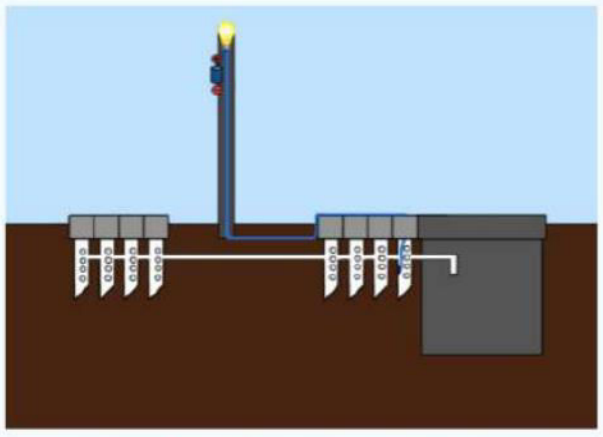




PICTURE 1.1 TRIPOV-TEC DESIGN



PICTURE 1.2 TRIPOV-TEC PARALON DESIGN



PICTURE 1.3 TRIPOV-TEC USE DISGN

Tripov-Tec has a simple shape and is easy to make. The use of perforated paralon makes Tripov-Tec work in absorbing water into the soil more effectively. The addition of a turn signal as a detection tool also helps in flood disaster mitigation efforts. The advantage of this artificial flood detector is that it uses a battery that utilizes solar power, namely sunlight, so there is no need to replace it regularly. When it rains, water will enter the holes in the Tripov-Tec and then be absorbed by the soil through the holes in the paralon. If the soil is saturated, the water in the soil will rise and hit the cable on the paralon. The cable that is exposed to water will channel an electric current that can turn on the flood detection light as a sign that the infiltration well is also full. Tripov-Tec can be installed in places with a small water catchment area.

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HR EXCELLENCE IN RESEARCH

PHOTOSENSITIVE ORGANIC POLYMER MATERIAL

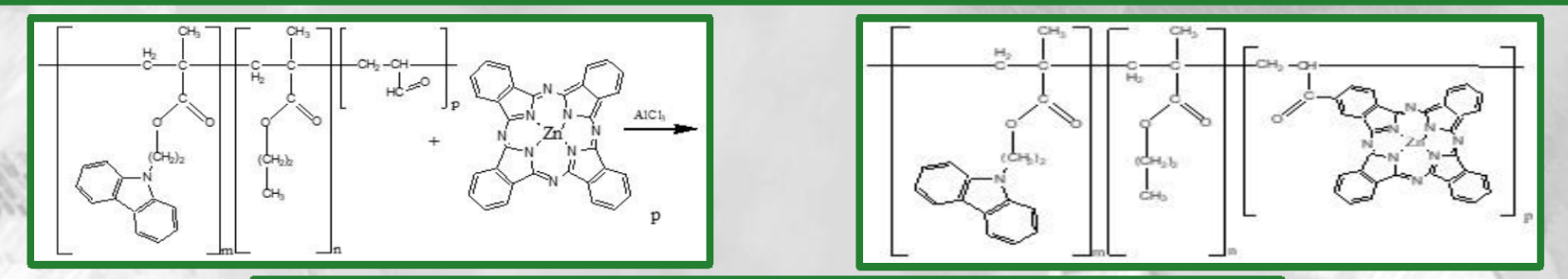
PATENT APPLICATION: a 2021 0068/2021.10.06

AUTHORS: Ion LUNGU, Stefan ROBU, Tamara POTLOG, Pavel TIULEANU, Petru BULMAGA

APPLICATION FIELDS: Photovoltaics and Electrophotography. **B**

AIM: Synthesis of a vinylcarbazole copolymer compound with ZnPc sensitive in the visible and near infrared range of the spectrum, due to the interaction of acryloyl chloride with zinc phthalocyanine in the copolymer.

SOLUTION: The new photosensitive organic polymer material with a grafted ZnPc content of 5-15 mol% by Friedel-Craftz reaction is easily soluble in organic solvents and has a good yield of 70-72%. The FTIR spectra of the N-VC copolymer: OC-1: Cl-AC (1) (Fig. 1) and of the analog polymer grafted with 10% mol of ZnPc (2) shows the disappearance of the absorption band ν = 680 cm-1 characteristic for the C-Cl bond from Cl-AC, as well as the increase of the band intensity ν = 1590 - 1610 cm-1 characteristic of the aromatic nuclei present in the copolymer (1), as well as in zinc phthalocyanine. From the FTIR spectrum of the analog polymer (2) it is observed the appearance of the wide band located at ν = 3200 - 3400 cm-1 characteristic for the secondary and tertiary amine groups. The UV-Vis spectrum of the ZnPc-grafted copolymer showed a wide band at λ = 600 - 700 nm, which increases in intensity at higher concentrations of ZnPc. UV-Vis absorption spectra of zinc phthalocyanine grafting on N-VC: OC-1: Cl-AC copolymers is a confirmation that they have photosensitivity in this region.



Scheme 1 Grafting of zinc phthalocyanine to copolymers N-VC: OC-1: Cl-AC

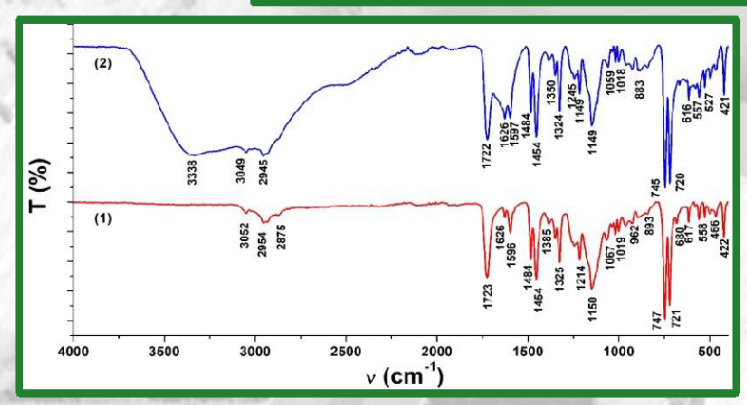


Fig.1. FTIR spectra for copolymer (1) and copolymer N-VC:OC-1:Cl-AC grafted with 10 mol% zinc phthalocyanine (2).

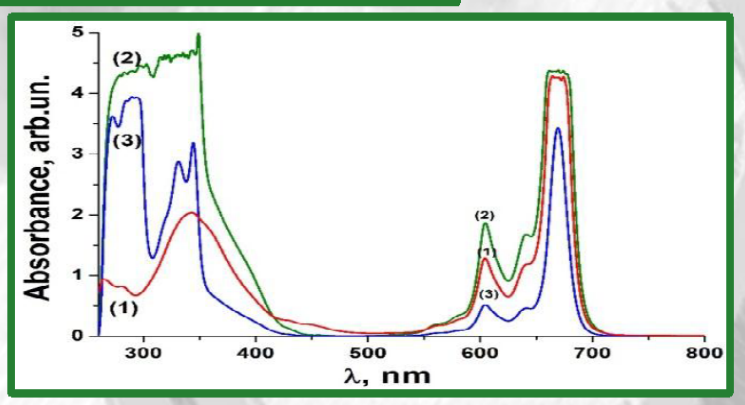


Fig.2. UV-Vis spectra for ZnPc(1), 0.5% ZnPc grafted to copolymer (2) and 0.02% ZnPc grafted to copolymer (3) solutions

ADVANTAGES: The ZnPc:N-VC:OC-1:Cl-AC thin films of photosensitive organic polymeric material have photosensitivity in the near visible and near infrared λ = 300-700 nm region.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGEMENTS: This work was supported by the research project "Photosensitizers for Photodynamic and Photovoltaic Therapy", 20.80009.5007.16.

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HR EXCELLENCE IN RESEARCH

IMPROVED METHOD FOR PRODUCING ZnO:Al CERAMICS

PATENT APPLICATION: MD s 2022 0027/2022.04.13

AUTHORS: Gleb COLIBABA, Dumitru RUSNAC

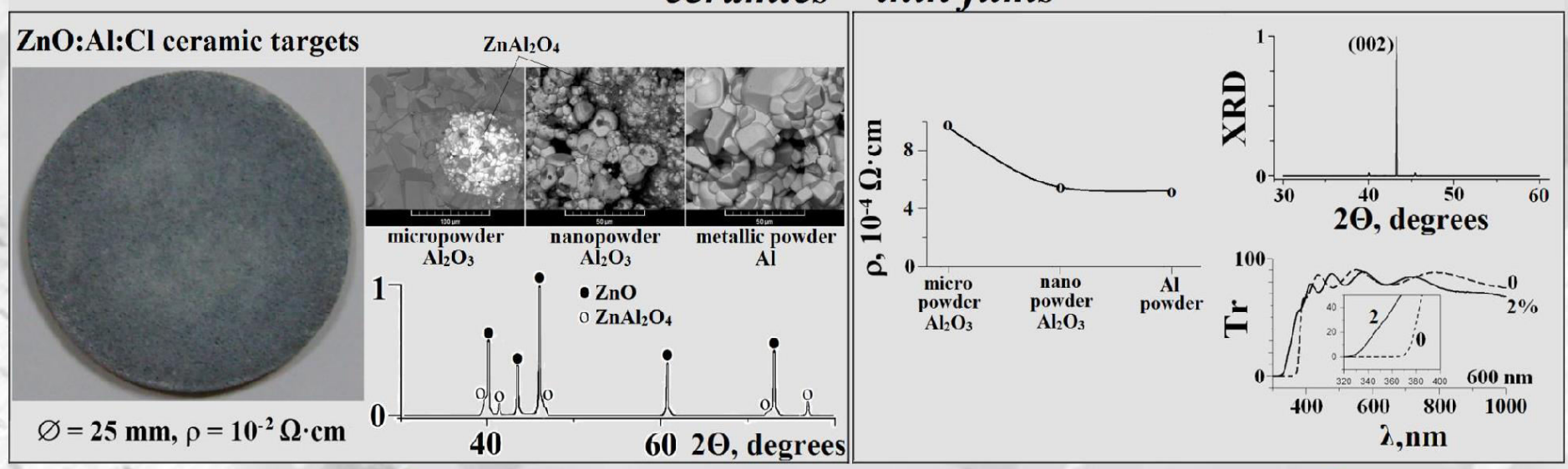
APPLICATION FIELDS: Optoelectronics. B

SCOP: The elaboration of cost-effective technology for producing highly conductive ZnO ceramics and thin films for photovoltaic devices.

SOLUTION: ZnO:Al ceramics is sintered using HCl as a transport agent

- ❖ the increase in the solubility rate of Al dopant by 7 orders of magnitude;
- ❖ the decrease in sintering temperature from 1500 °C to 1050 °C;
- ❖ cost-effective metallic Al powder can be used ($Al+3HCl \rightarrow AlCl_3(vapor) \rightarrow Al_2O_3$);
- ❖ ceramics is free from oxygen excess → higher conductivity of ZnO thin films.

ceramics *thin films*



ADVANTAGES

- ❖ Low sintering temperature of ceramics (1050 °C)
- ❖ 99% of the initial diameter
- ❖ High conductivity of ~100 $(\Omega \cdot cm)^{-1}$
- ❖ Possibility of multiple resintering
- ❖ Al micropowder can be used as a dopant
- ❖ Resistivity of ZnO thin films can be decreased by 2 times compared to classical targets

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project: #20.80009.5007.16*

Pencil Graphite Electrodes Decorated with Platinum Nanoparticles as Efficient Electrocatalysts for Hydrogen Evolution Reaction

Research project – Diploma work

Authors: Lorena-Cristina Balint, Iosif Hulka, Andrea Kellenberger

Platinum-based materials are state of the art electrocatalysts for the hydrogen evolution reaction (HER). However, due to the high cost and scarcity of platinum, strategies are searched to reduce the platinum amount. In our work, pencil graphite (PG) leads have been decorated with Pt nanoparticles (NPs) deposited by an electrochemical method to obtain very efficient electrodes for HER. PG is an affordable carbon-based support, highly available and very cost-effective. The main challenge for developing Pt electrocatalysts is to achieve as low as possible catalyst loading, while still preserving the electrocatalytic properties. This can be realized by using suitable deposition methods, such as pulsed current electrodeposition, which enables the formation of NPs with a narrow size distribution, highly dispersed on the PG support.

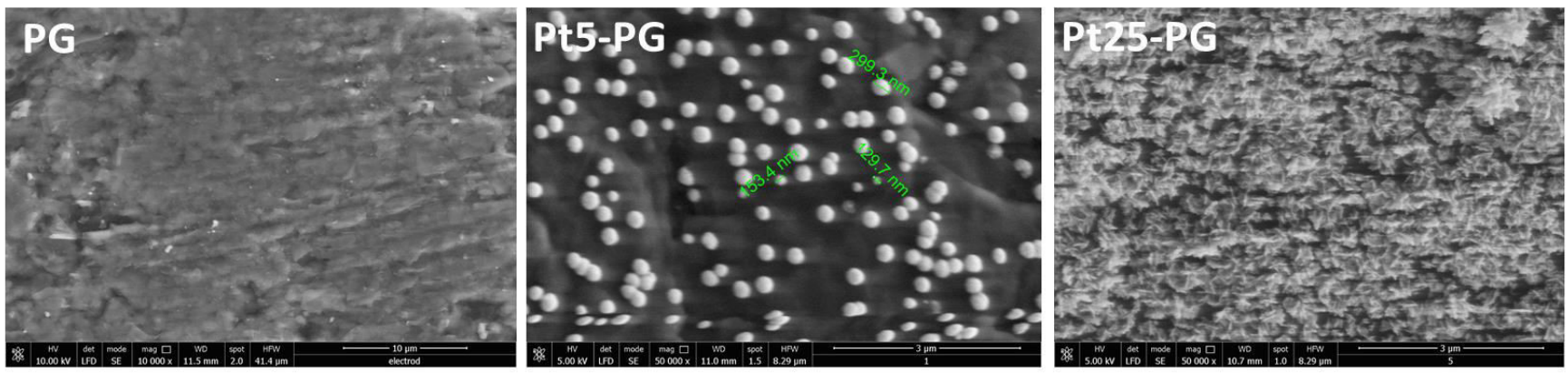


Figure 1. SEM micrographs of bare PG substrate (a) and Pt-PG electrodes obtained by pulsed current deposition from 5 mM H_2PtCl_6 in 1 M HCl solution, at different current densities: 5 mA cm^{-2} (middle) and 25 mA cm^{-2} (right).

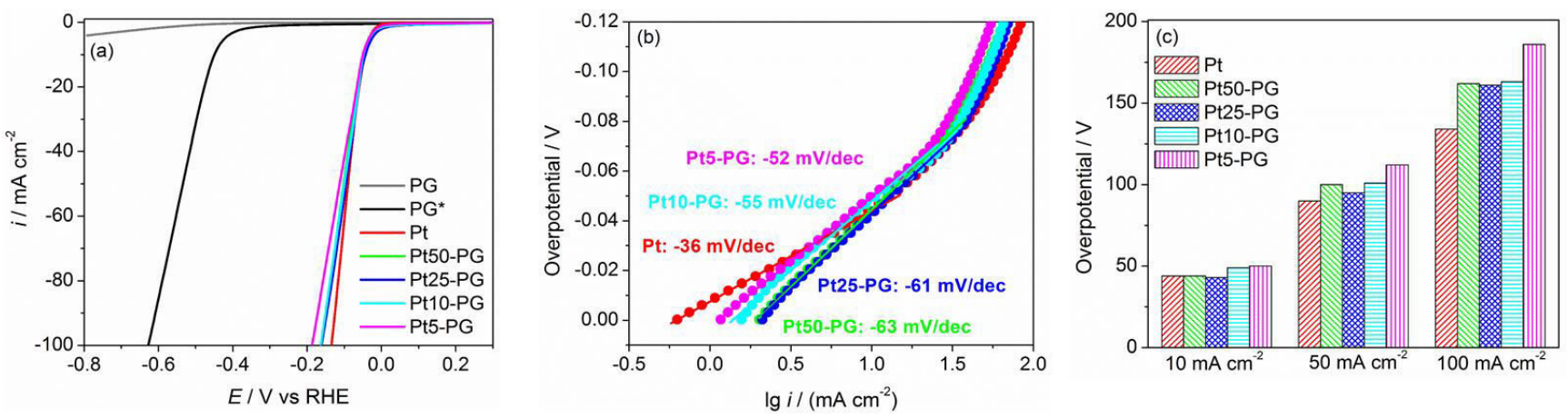


Figure 2. Performance of Pt-PG electrodes as compared to Pt in 0.5 M H_2SO_4: polarization curves (a); Tafel plots (b) and overpotential required to reach different current densities (c)

The Pt-PG electrodes can be applied for hydrogen production, with efficiencies similar to that of Pt. The advantages of Pt-PG electrodes refer to very short deposition time (120 s) and the use of very low Pt loadings (50 µg cm-2).

This work has been published: Balint, L.-C.; Hulka, I.; Kellenberger, A. Pencil Graphite Electrodes Decorated with Platinum Nanoparticles as Efficient Electrocatalysts for Hydrogen Evolution Reaction. Materials 2022, 15, 73. https://doi.org/10.3390/ma15010073

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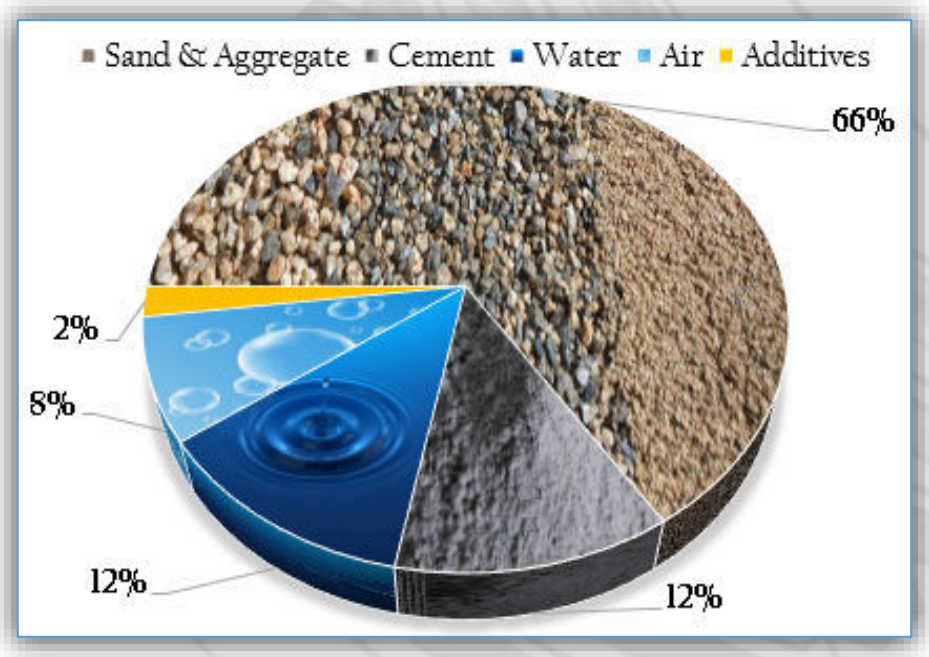
Development of Non–Steel Reinforcements for Fibre Reinforced Concrete

PhD Thesis

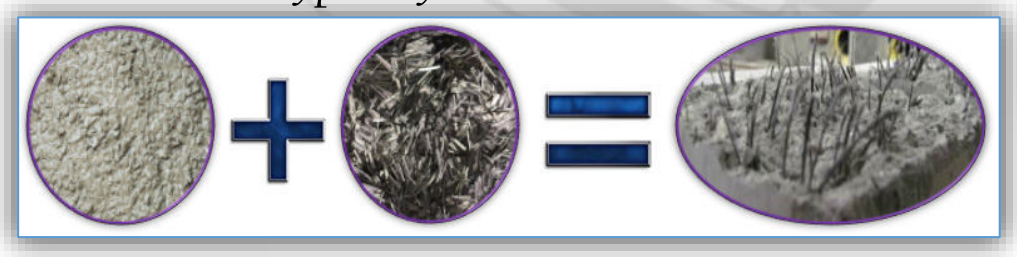
Author/s: *Andrei-Mihai BACIU, Imre KISS*

B

One of the materials that is the basis of constructions around the world is reinforced concrete, a material with truly remarkable properties and strengths. Reinforced concrete is a combination of adequate reinforcement and concrete designed to work together to resist applied loads. Properly placed reinforcement in concrete improves its compressive strength, the improper placement of the reinforcement designed to resist tension being one of the most common causes of structural concrete failures. In addition to its use to resist various tensions, reinforcements are used in concrete to minimize cracking, or more precisely, to promote numerous small cracks in place of fewer large cracks, in concrete structures. Also, reinforcements are used in concrete to limit widths and control spacing of cracks due to stresses induced by temperature changes and shrinkage. Concrete with fibres is stable, resistant, durable and much lighter than normal concrete. Unlike concrete with fibres, normal concrete is prone to cracking and has a lower tensile strength. With the help of suitable additives, such as fibres, concrete types with greatly improved properties are created.



Typically concrete mixture



Fibre–reinforced concrete



Typically fibers used in fibre–reinforced concretes

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Design and Realization of a Compression Moulding Press Used to Produce Plate Composite Parts

PhD Thesis

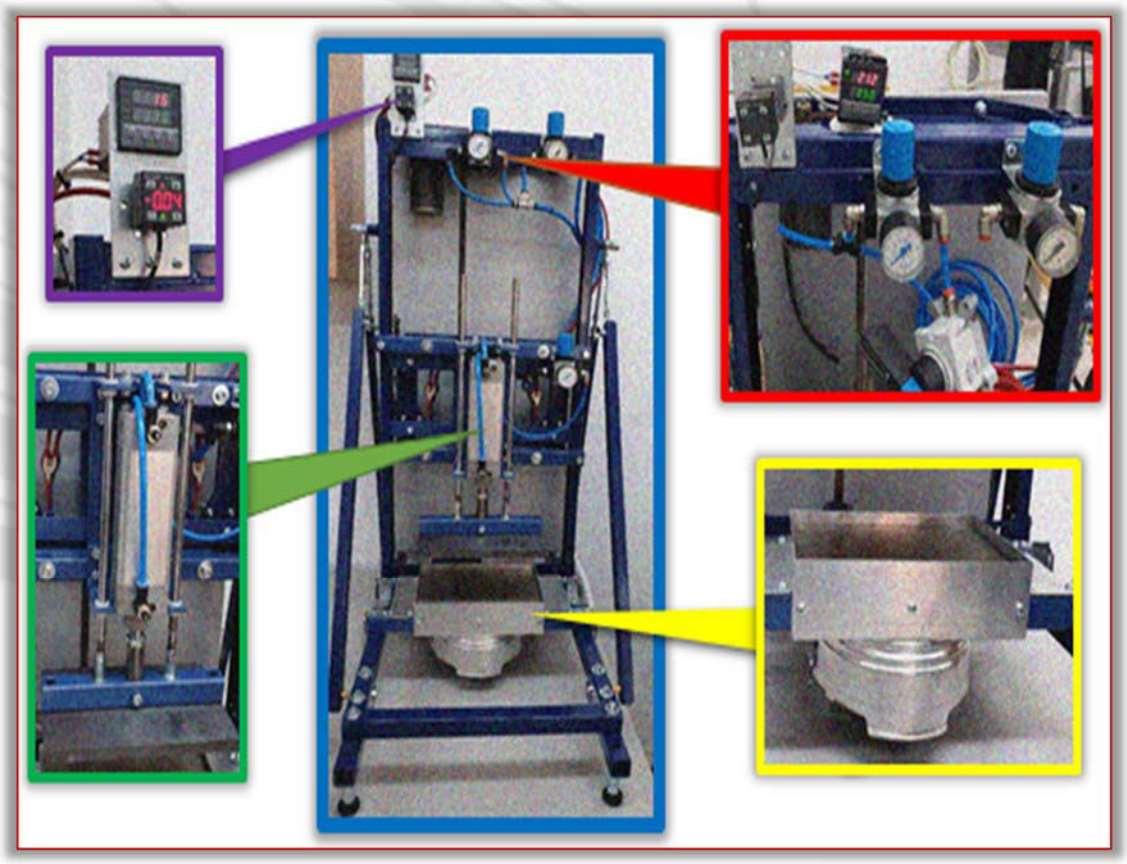
Author/s: *Mihai-Paul TODOR, Imre KISS*

B

Compression moulding is one of the oldest manufacturing technique used to rapidly cure large quantities of complex fibre–reinforced polymer parts on a rapid cycle time. Compression moulding is a high–volume, high–pressure method suitable for moulding fibre or fabric reinforcements – unidirectional tapes, woven fabrics, randomly oriented fibre mat or chopped strand– into a polymer matrix material. In fact, the compression moulding is a manufacturing process in which three–dimensional shapes are sandwiched between two matching moulds, using heat and pressure. The material is placed in a temperature controlled cavity – defined between two heated metal moulds mounted in pneumatic presses – then shaped under intense pressure and heat (from 120–200^{0}C) until the part cures. Therefore, the process parameters includes moulding time, temperature, and pressure. Compression features fast moulding cycles and high part uniformity and it provides design flexibility and nice surface finishes. In addition, it is one of the lowest cost moulding methods compared with other methods such as transfer moulding and injection moulding, due to the labour costs are low, the trimming and machining operations being minimized. We'll show how anyone can use this process to create plate composite prototypes using a composite moulding press, designed and realized within the faculty's Laboratory.



Compression moulding – the process



The laboratory press – front view

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Post–Consumer Aluminium Scrap – A Challenge in Aluminium Recycling

PhD Thesis

Author/s: *Ciprian BULEI, Imre KISS*

B

Aluminium is one of the most recyclable materials, as it can be recycled over and over again, and is one of few materials that keeps its properties after recycling. It can be re–melted and used again and again in new products, making it an environmentally friendly metal and a sustainable material. This makes aluminium an excellent material to meet the needs and challenges of different products. Also, aluminium recycling offers advantages in terms of environmental and economic benefits. Therefore, more aluminium must be collected, sorted, and returned into the economy as new products. Aluminium recycling is the process by which various scrap aluminium can reuse in products after its initial production and involves simply re–melting these scraps. This work provides an overview of the basic aluminium recycling process, using postconsumer scrap in the melting process in few laboratory experiments. Typically, postconsumer aluminium scrap is a mixture of alloys and sometimes even a mixture of metals, the main sources for aluminium scrap being the packaging, technology, construction, and the transport industry. In our experiments, different aluminium scrap sources were considered: mixed packaging aluminium scrap and used beverage can scrap, aluminium from electric cables and aluminium from collected castings.



Recycling of aluminium products



Types of aluminium scrap



Melting & casting of aluminium ingots



Aluminium ingots

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Development of the Rare, Deficient or Critical Metal Raw Material Base and Application of Innovative Technologies

PhD Thesis

Author/s: *Andrei Vasile FODOR, Teodor HEPUT, Imre KISS*

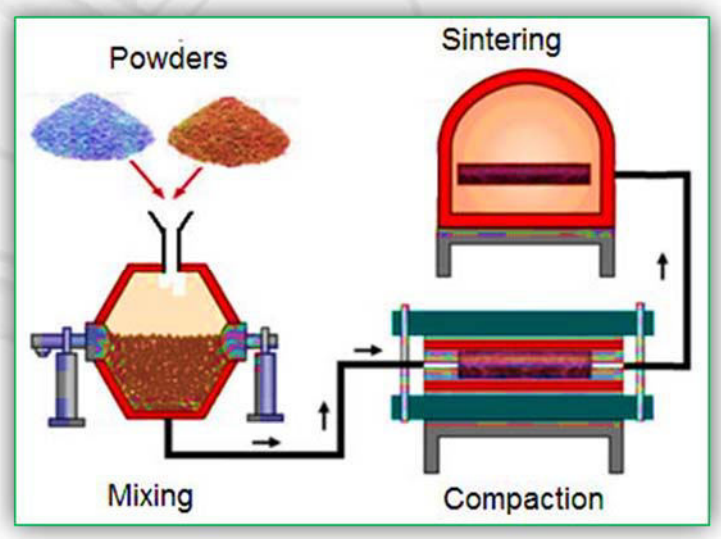
B

ACCESS TO RAW MATERIALS is fundamental in a functioning, modern and sustainable society. The technological development have increased global demand for many raw materials. Many of the critical metals are very important constituents in products, but they are rarely used in large volumes and are minor components compared with base metals (copper, zinc, lead, aluminum and iron). Modern technological developments and innovations generate increasingly complicated products that require access to a number of "new" raw materials.

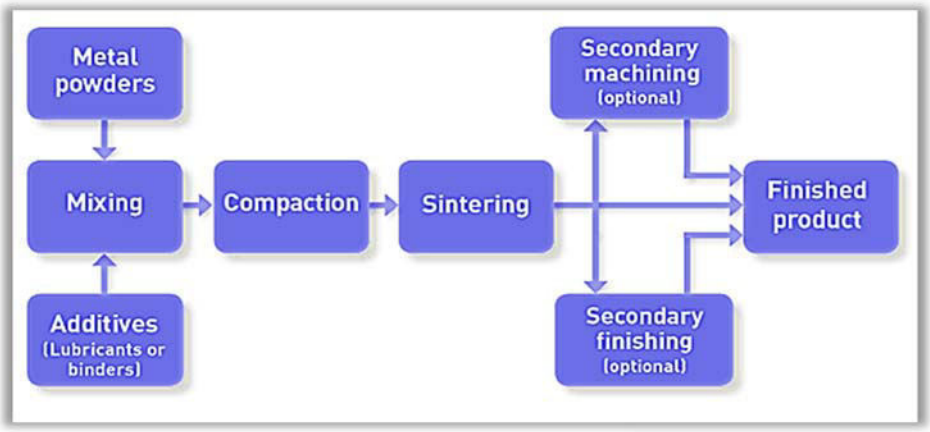
RECYCLING is very important to achieve resource efficiency and reduce environmental impact. However, the recycling rate for several of the critical raw materials is still low. Even with a very high recycling rate, recycling will not suffice to meet future demand. On another hand, the mining and metal extraction are only economically sustainable if they are profitable. This also applies to many critical metals that are usually extracted as by–products from other metal extraction and require their own processes in the mine, concentrator, metal production or metal refining.

CRITICAL RAW MATERIALS are defined as those that pose a particularly high risk of lack of supply in the coming years and that play a particularly important role in the value chain. In other words, they are at the forefront, the risk of poor supply is high and their economic importance is high. The monitoring of the situation and systems for the development of the rare, deficient or critical metal raw material base and the results of research into the application of innovative technologies open up new opportunities and perspectives.





POWDER METALLURGY is the way of producing sintered products. Powder is the most important raw material and the starting point of mineral products. It can be mixed with other item powders to make a variety of alloys or pseudo–alloys.



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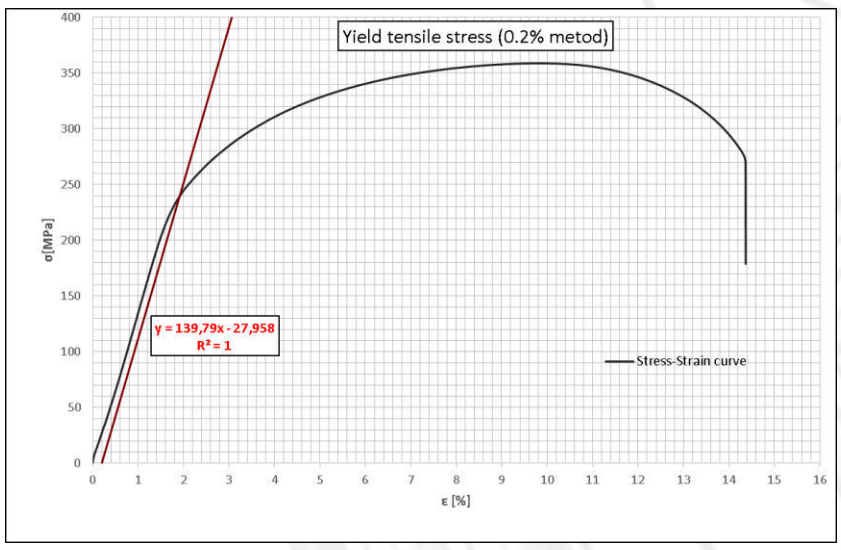
Effect of welding speed on submerged welded joint tensile strength

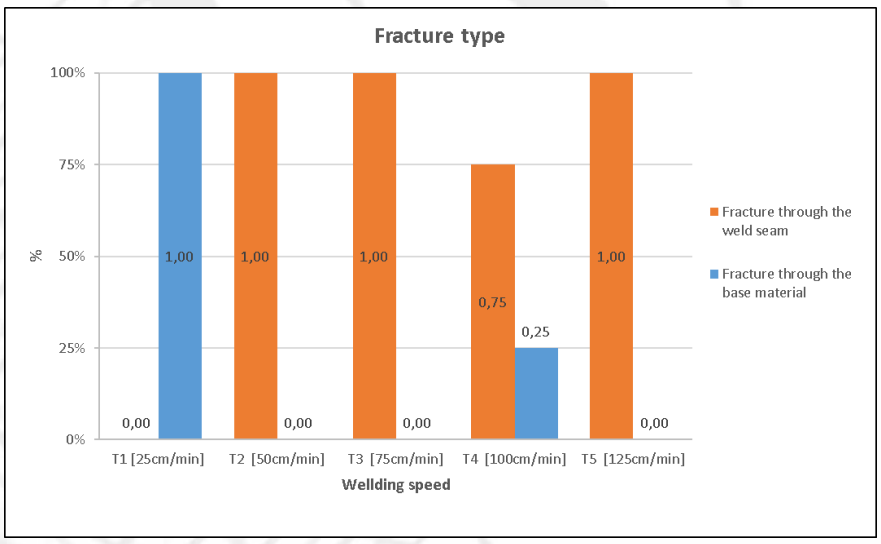
B

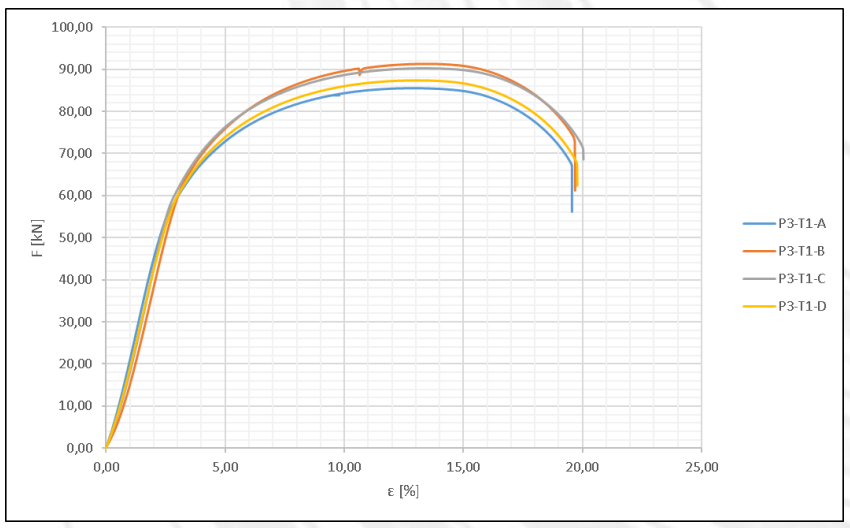
PhD Thesis

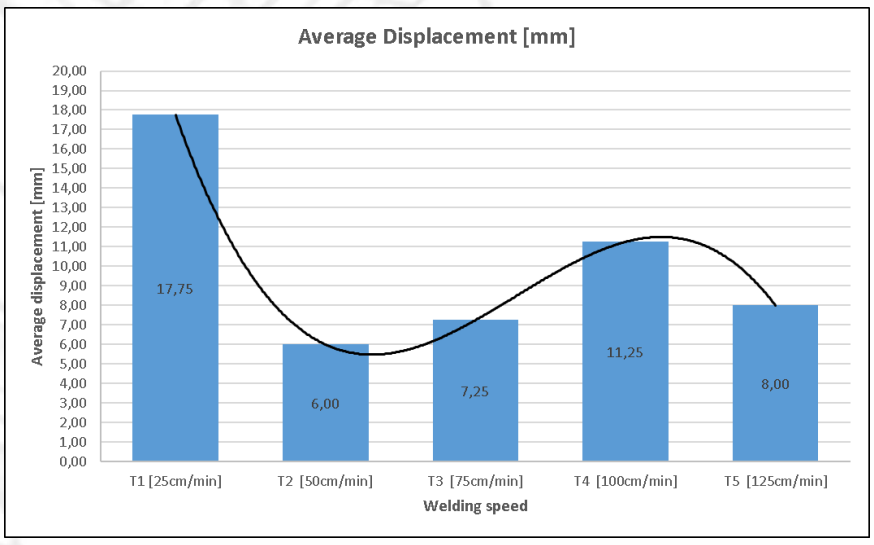
Author: CIOROAGĂ Bogdan-Dorel
Coordinators: SOCALICI Ana Virginia, CIOATĂ Vasile George

There are many regim parameters that can influence the quality and strength of a welded joint, the most comun one to evry arc welding technology is the welding speed. Part of the research consists of analyzing the effect of the welding speed on the mechanical properties of the welded joints in order to research the influence of welding speed 5 stages of variation where used to obtain a set of 4 tensile test samples for every stage that represents a distinct welding regim. Tensile-displacement and force-displacement curves resulted after testing the specimens, the data shows that increasing just the welding speed results in a similar welding effect as decreasing the electric arc amperage. After the tensile tests, it was found that the breaking of the majority of the samples takes place through the welding seam, having a brittle break, meaning that the welded area is much harder than the base material of the test specimen. The average braking force registered for the 5 sets of specimens are between 68-88 kN.

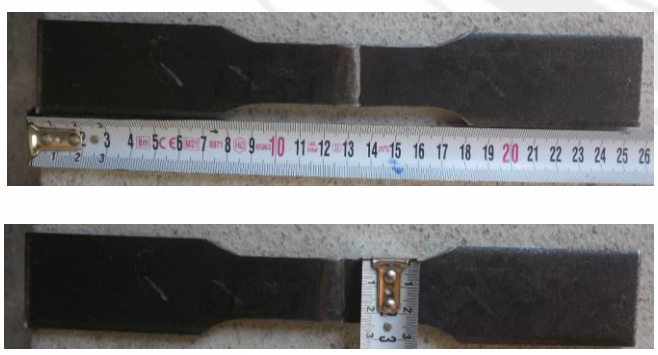








5 stages of welding speed where used to obtain a set of 4 tensile test samples for every stage that represents a distinct welding regim. Tensile-displacement and force-displacement curves resulted after testing the specimens.





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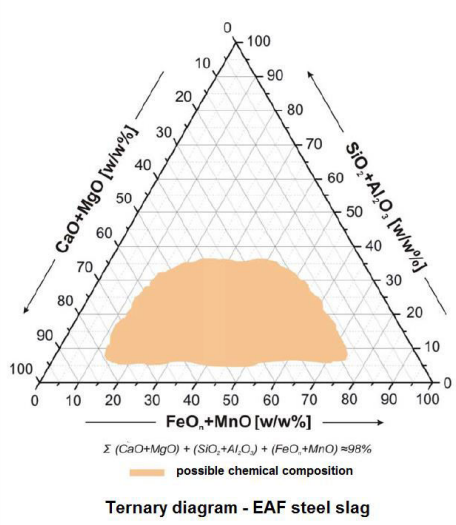
Research in the laboratory phase regarding the processing of steel slag by briquetting

PhD Thesis

Author/s: Lupu Oana
Coordinator: Prof. Dr. Ing. Socalici Ana

B

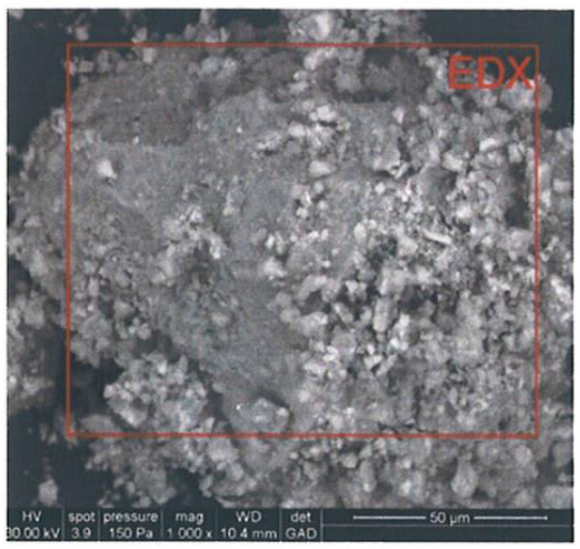
The slag represents approximately 70% of the waste produced in the steel sector and the recycling of the ferrous fraction of the slag in various technological stages within an integrated plant represents a strategic problem in the environmental protection policy in the steel sector. Experiments in the laboratory phase consisted in obtaining briquettes from steel slag (fractions 0-3mm, 3-5mm, 5-8mm and 8-10mm) mixed with ferrous sludge resulting from the steel industry. The experimental briquettes obtained have an iron content of 48-55%Fe.



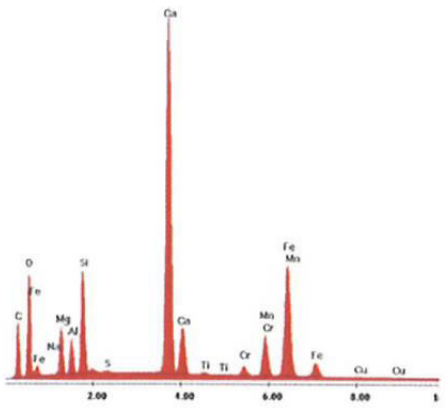
Ternary diagram - EAF steel slag

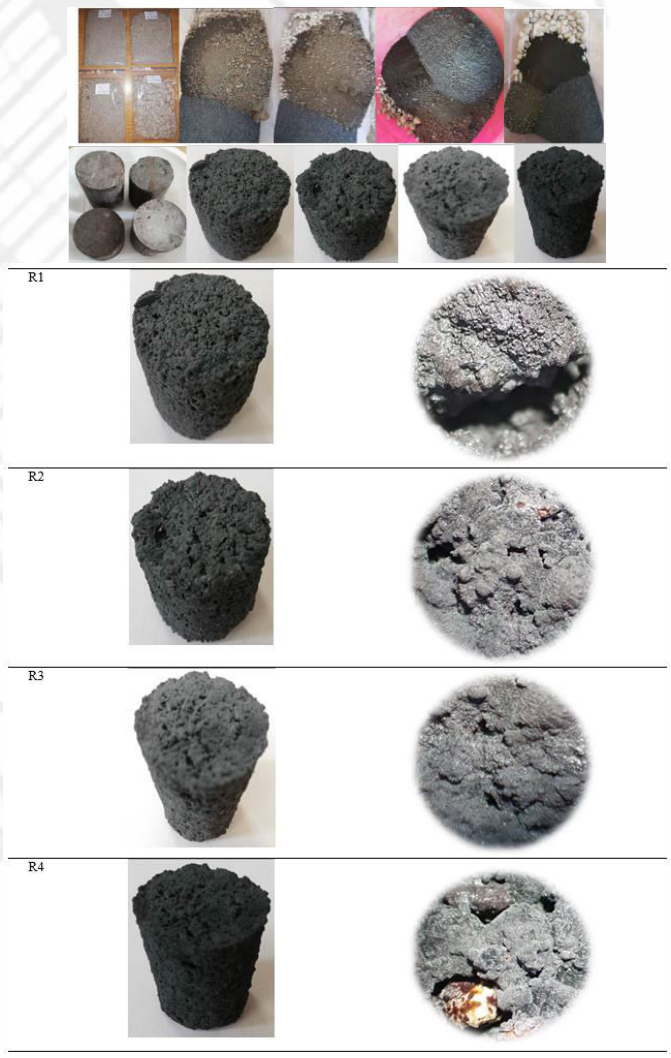


Slag sorts



SEM image for slag





The experimental briquettes

The small and pulverulent wastes from the steel industry, due to their high content of iron, manganese, carbon and various oxides (elements useful in the production process of cast iron or steel), are considered components of natural capital because they are exploited in the steel industry. The quality characteristics related to the strength and chemical composition of the obtained briquettes are suitable for their use as a metal assortment in the charge of electric arc furnaces in a proportion of 5-10%.

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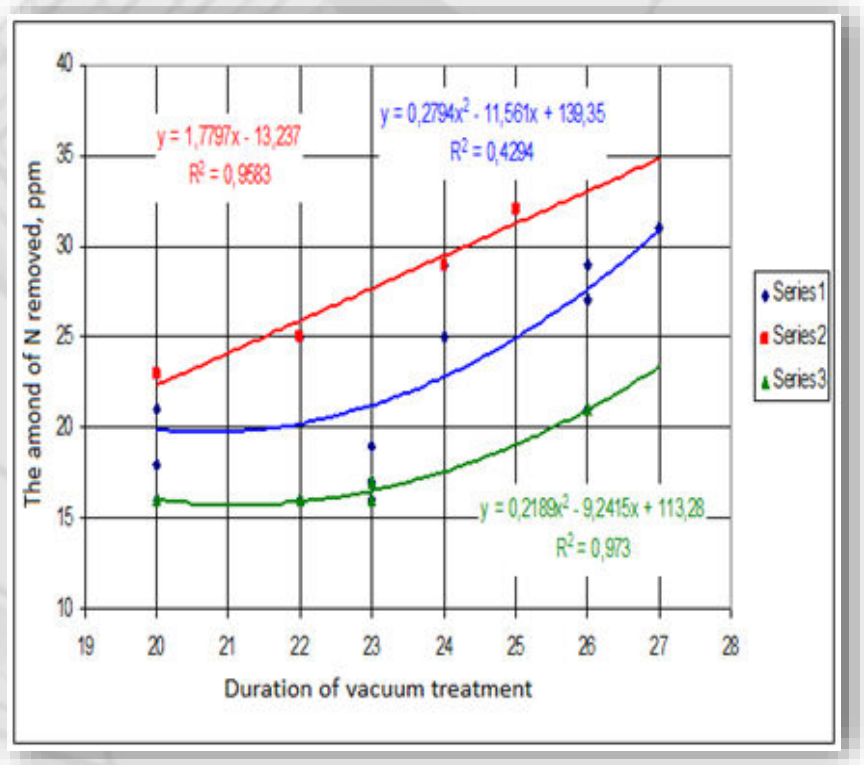
Optimization of the process flow producting steel continuous cast semifinished parts

B

Authors: Mihai Radu, Teodor Hepuț, Erika Ardelean, Vasile Putan

Proiectul prezintă rezultatele cercetărilor efectuate privind structura încarcăturilor cuptorului, principalele elemente chimice, carbon echivalent, reducerea conținutului de azot din oțelul produs într-o fabrică de oțel electric, folosind un cuptor cu arc electric de tip EBT de 100 t, metalurgie tip LF, degazare in vid VD si masina de turnare continua cu 5 fire. Corelațiile rezultate sunt date atât în formă analitică și grafică, cât și prin analiza lor tehnologică. Cercetarea a rezultat într-o serie de concluzii aplicabile în cercetare și în practica curentă.





The project presents the results of the research done on the structure of charge loads, the main chemical elements, equivalent carbon, the reduction of nitrogen content in the steel produced in an electric steel plant, using a 100 t EBT-type electric arc furnace, LF-type ladle furnace installations, VD vacuum degassing and a 5-strand continuous casting machine. The resulting correlations are given both in analytical and graphical form, as well as through their technological analysis. The research resulted in a series of conclusions applicable in research and in current practice.

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INCREASING THE COMPETITIVENESS OF PRECESSIONAL TRANSMISSIONS BY DEVELOPING AND CAPITALIZING ON THE GEAR WITH "CONFORMING" CONTACT OF THE TEETH.

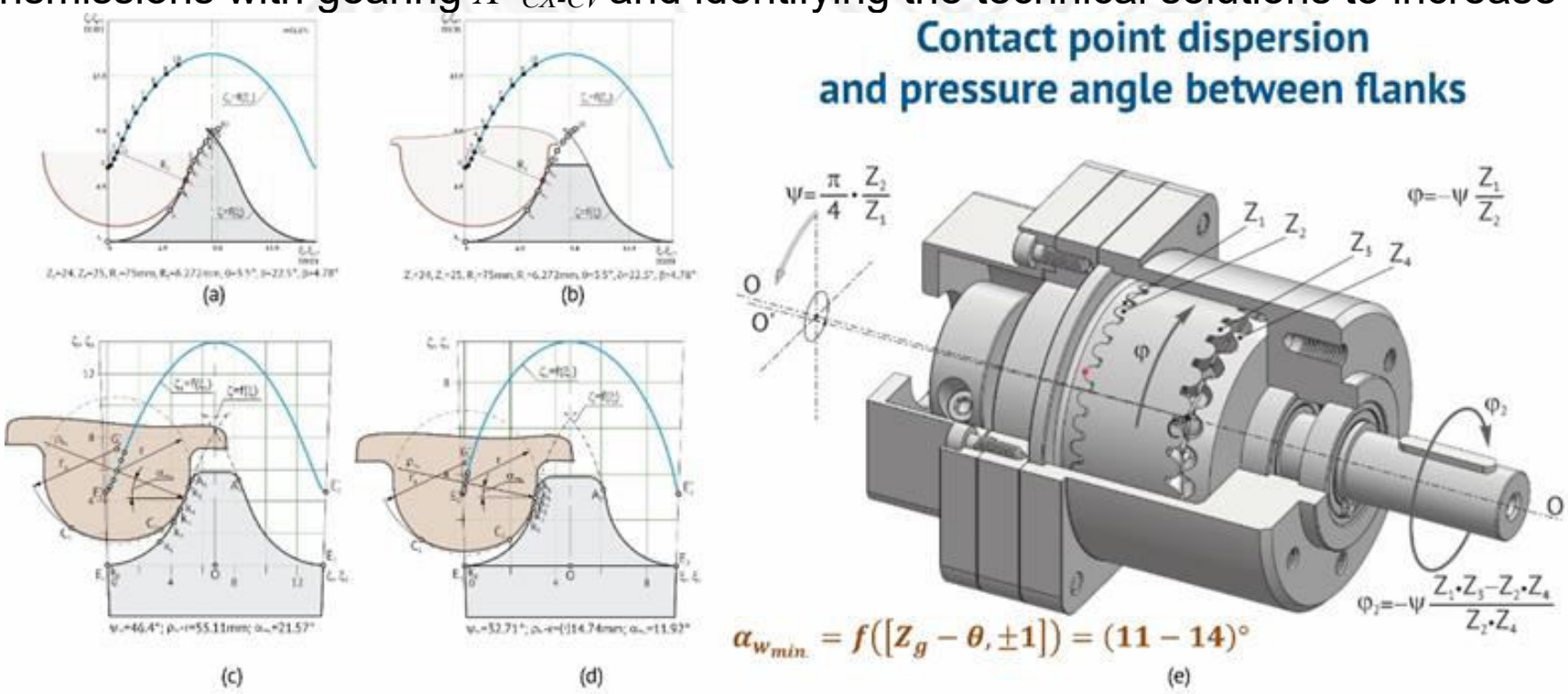
Research project no. 20.80009.7007.24 (2020-2023).

Authors: Dr. Sc., prof. Ion Bostan, Dr. Sc., prof. Viorel Bostan; PhD., assoc. prof. Maxim Vaculenco; PhD., assoc. prof. Ion Bodnariuc; Dr. Sc., prof. Valeriu Dulgheru; Dr. Sc., prof. Sergiu Mazuru; PhD., assoc. prof. Mihai Țopa; PhD., assoc. prof. Radu Ciobanu; PhD., assoc. prof. Oleg Ciobanu; PhD., assoc. prof. Nicolae Trifan; PhD., assoc. prof. Malcoci Iulian; PhD., Dumitru Vengher; PhD., Serghei Scaticailov; PhD., Valeriu Odainâi; PhD., Victor Pavelco; PhD., Alina Bregnova; PhD., Vasile Muntean.

Creating contact between teeth with convex-concave geometry and small difference in curves. It was found that the absolute multiplicity of tooth engagement (100%) in compliance with the three defining conditions can occur only when using the variable convex / concave profile of the tooth flanks, usually the central wheels, depending on the values of conical axoid angles and notation the radius of curvature of the profiles of the teeth of the crowns of the satellite wheel, as well as the number of teeth of the Z wheels and their ratio.

The purpose of the stage:

- to identify the conditions for increasing the load-bearing capacity of the gearing A^{D}_{CX-CV} and $A^{D,\beta}_{CX-CV}$, and for decreasing the energy losses in the convex-concave contact of the multiparous teeth;
- determining the functional characteristics of the kinematic precessional transmissions with gearing A^{D}_{CX-CV} and identifying the technical solutions to increase them.



Change in the shape of the teeth depending on the dispersion of the k_i contacts:
k_i contact points transposed on the unchanged (a) and modified (b) profile of the central wheel teeth;
(c), (d) - the dispersion of the contact points of one and the same pair of teeth as a function of ψ;
(e) - multipair gearing A^{D}_{CX-CV} view for the same ψ.

Solution: The profile of the teeth in the precessional gear, unlike the classic ones, is variable depending on the parametric configuration [Zg - q: ± 1] which ensures high bearing capacity and mechanical efficiency.

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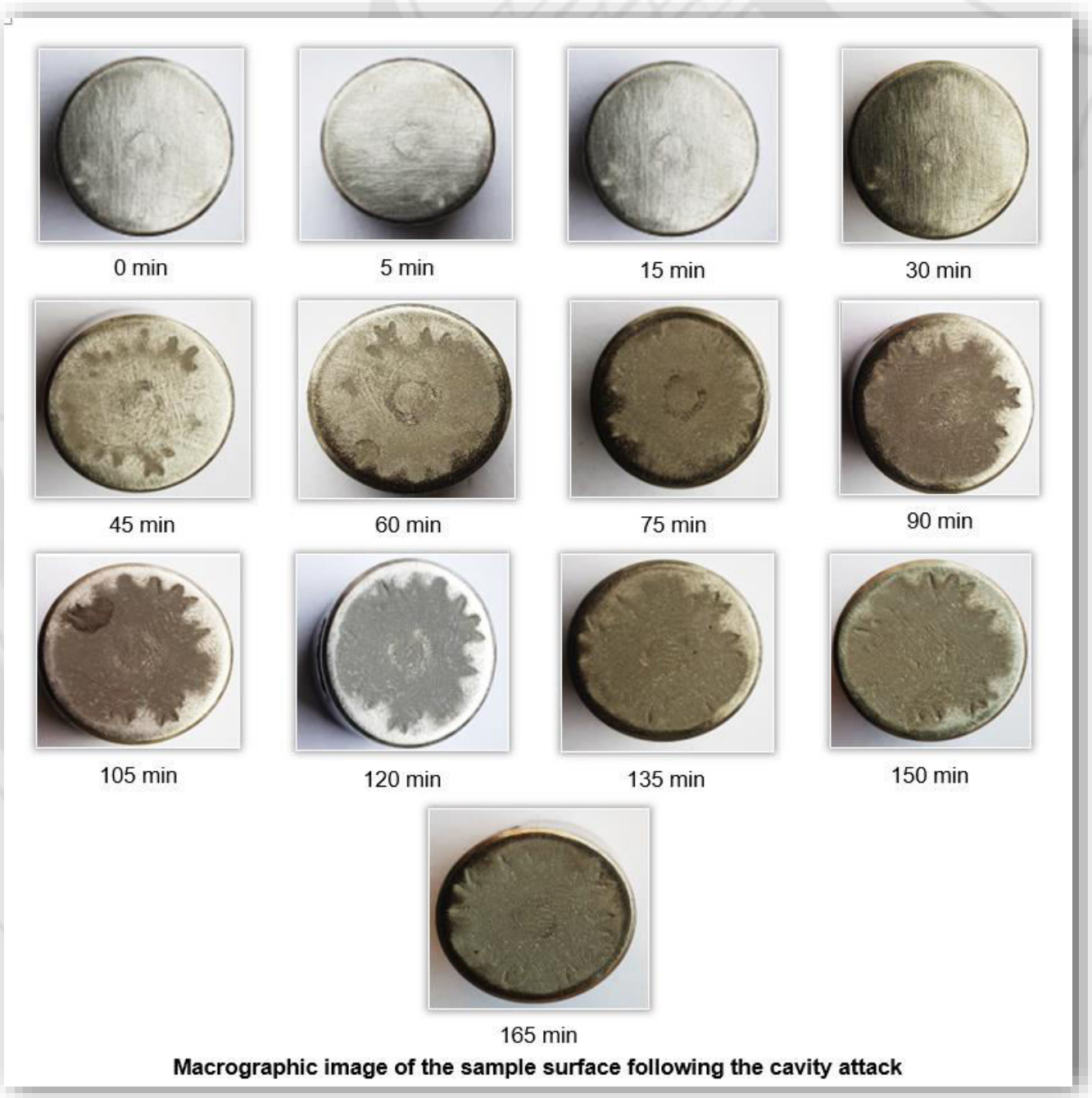
CAVITATION EROSION RESISTANCE OF GX40CRNISI 25 – 20 CAST STAINLESS STEEL

PhD thesis

B

Authors: Daniela COSMA (ALEXA), Ion MITELEA, Ilare BORDEASU, Vasile ALEXA, Corneliu Marius CRACIUNESCU

Cavity erosion is a complex and localized phenomenon involving mechanical, chemical and metallurgical parameters. The development of new materials depends on understanding the relationship between microstructure and cavity erosion. This paper investigates the role played by the chemical composition and microstructure on the erosion behavior through the cavity of a high alloy steel 25Cr – 20Ni cast in parts. The cavitation tests were performed using an ultrasonic vibrator at a frequency of 20 kHz and an amplitude oscillation amplitude of 50 μm.



Macrographic image of the sample surface following the cavity attack

The surface of the eroded samples was examined under an optical microscope and an electron scanning microscope. It's performance is compared to that of cast martensitic stainless steel, GX10Cr13.

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FKITMCMXIX
University of Zagreb
Faculty of Chemical Engineering
and Technology

RECORRQCQ

Quantitative Coating Quality Impedance Analyzer

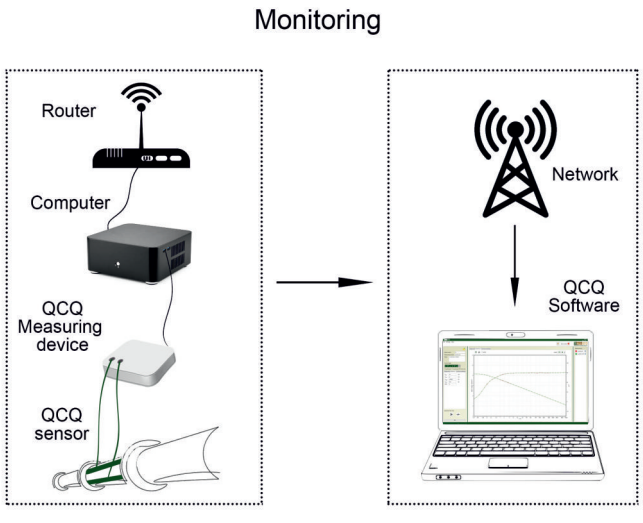
B

Authors: prof.dr.sc. SANJA MARTINEZ and IVANA ŠOIĆ, mag.appl.chem.

ReCorr QCQ is the first coating impedance tester tailored and EMC certified for use in industrial environments. The fast and easy application allows rating of the coatings with high confidence and precision (≥ 97%) which can be achieved through the integrated software function for AC interference management. The device consists of a pair of flexible, conductive polymer electrodes that adhere to a coated surface with the aid of a low-resistivity paste. The electrodes are connected to the impedance spectroscopy instrument, which is controlled by the Android tablet. Any coated metallic object is suitable for ReCorr® QCQ measurements. For small or irregularly shaped samples and for continuous monitoring, customized electrode design is used.







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THAMMASAT DESIGN SCHOOL

taWee COOL PRODUCTS



Asst. Prof. Khiensak Seangklieng, Ph.D.
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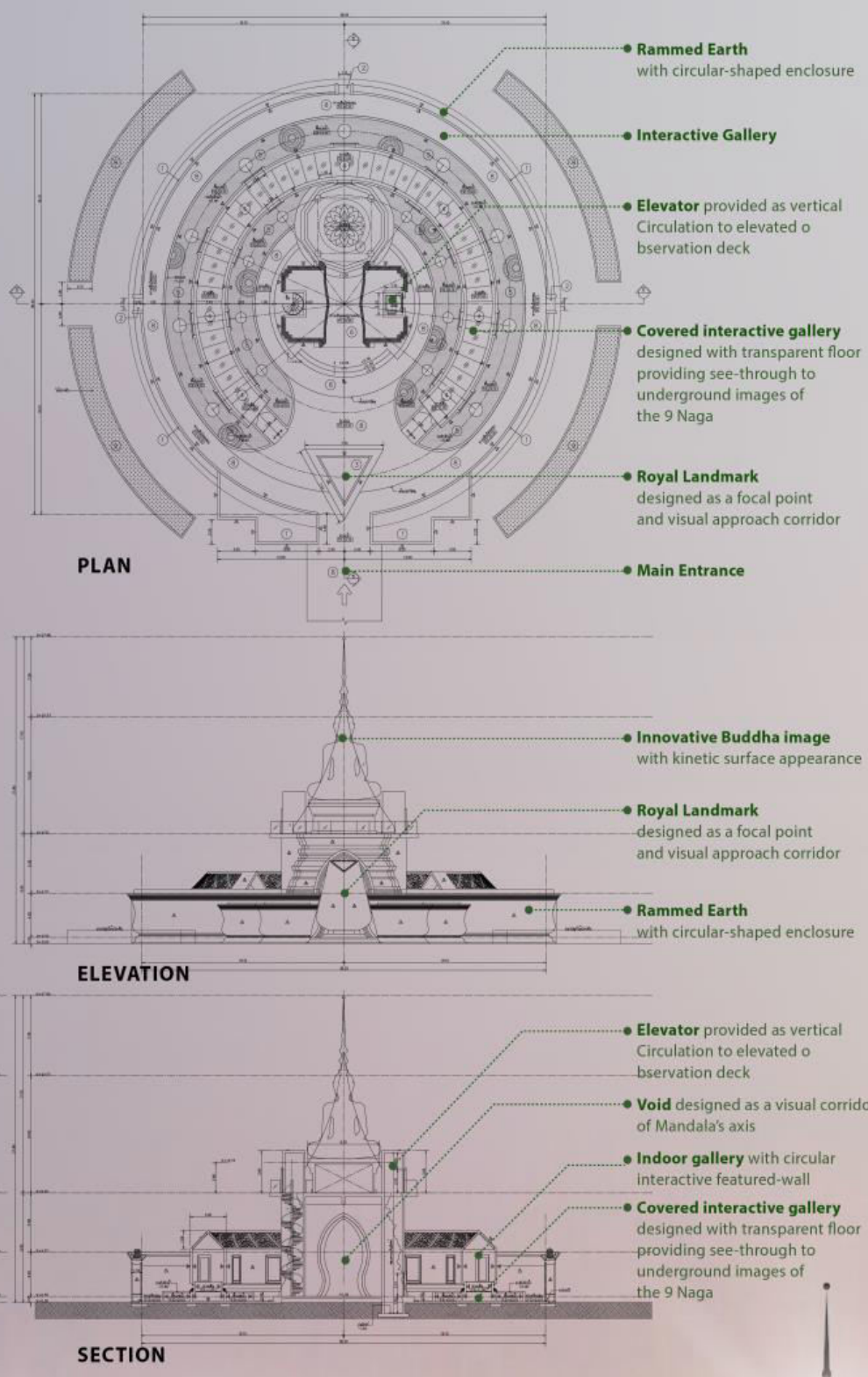
B

Naga Miracle Landscape @ *Wat Si Kunaram*

An Innovative Outdoor Museum with LCDs Design



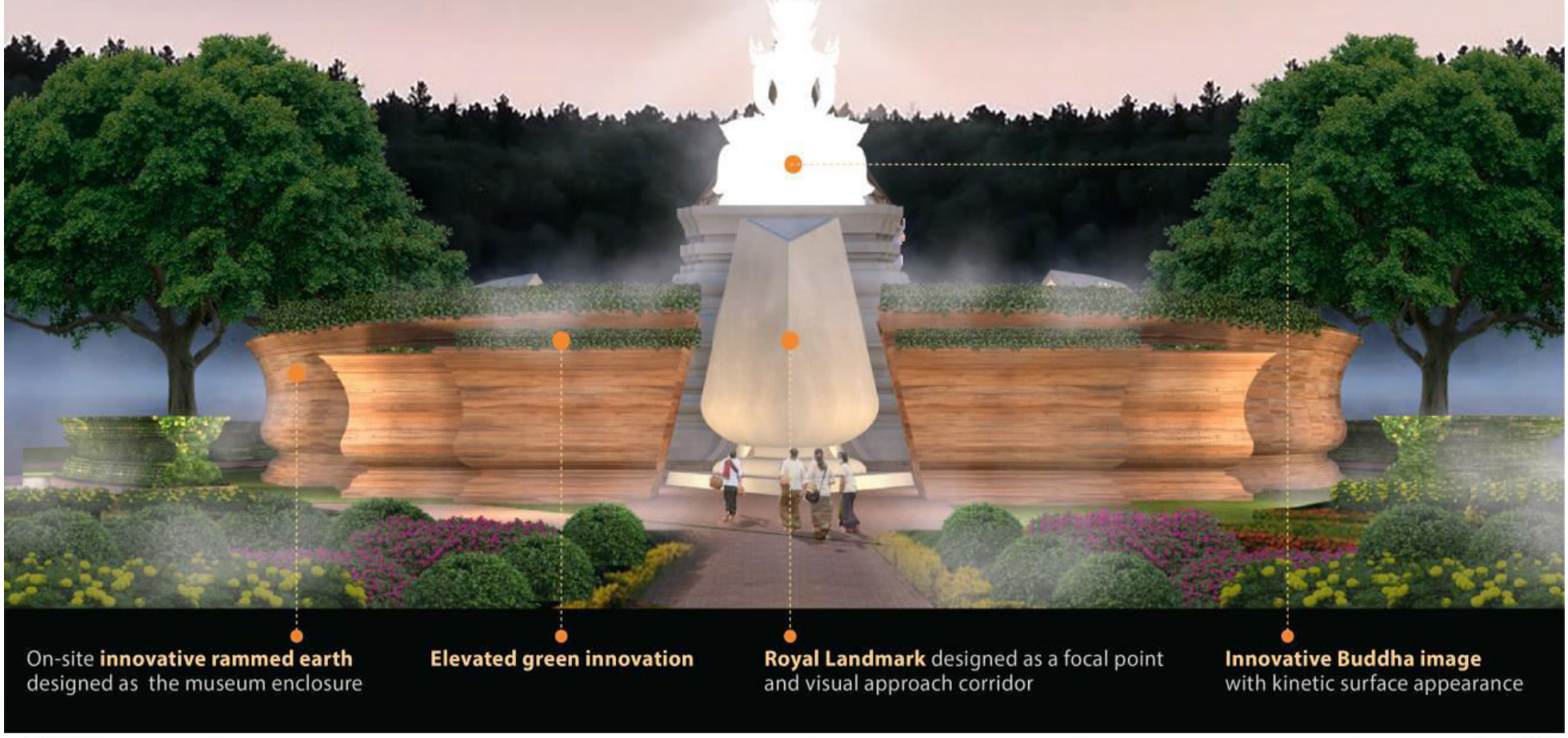
The main goal and objective of this invention is to design the new approach of unconventional architectural organization that enhancing the public opened spaces with innovative museum of built environment and to integrate the concept of Eco-friendly environment using the concept of Low-cost Design Solution: LCDs. Research-based design is strongly applied as a key principle in both creativity and practicality of an interactive museum in the context of cultural landscape. The design responses to an interactive between people and their contexts of living museum. Naga Miracle Landscape @ Wat Si Kunaram reveals that space organization, materials use and construction technology would be taken into futuristic design of architects' accountability.

OVERALL SUMMARY OF INVENTION/PROJECT

Naga Miracle Landscape @ Wat Si Kunaram, an innovative design of living museum created with an integrated solution for unconventional approach of public spaces development focused on the beautification of cultural landscape in global contexts. Design principle is emphasized into values-oriented approach which re-interpreting LCDs innovation of eco-friendly materials combined with local wisdom of traditional tectonics.

KEY INNOVATIVE FEATURES AND CHARACTERISTICS

- *Innovation through integration/invention*
- *Research-based design*
- *Innovative materials*
- *Local wisdom of architectural tectonics*
- *Unconventional organization*
- *Low-impact/low-cost design solution: LCDs*
- *Zero-waste/zero-energy consumption/zero-carbon emission/zero-carbon footprint*



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ASOCIAȚIA Justin Capră

B

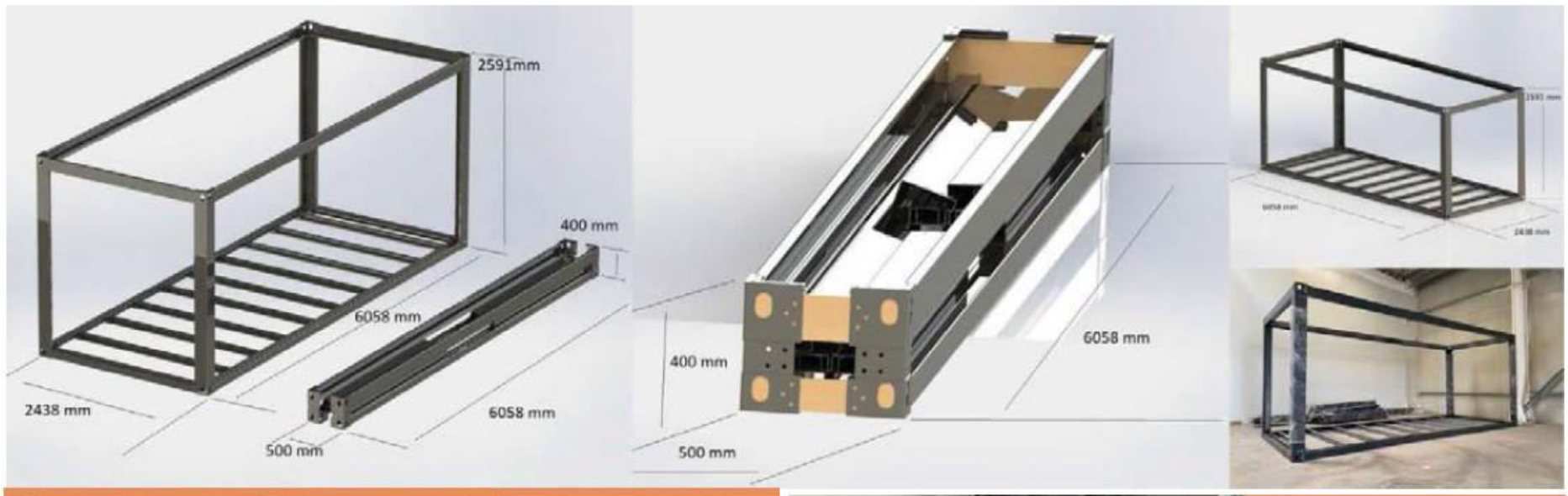
Container modular demontabil și kit de construit un container modular demontabil

U 2021/00001

SC DBV RESEARCH SRL Persoană de contact: Dumbravă Mihai **E-mail:** mihai.dumbrava@dbv-research.ro

RO: Prezenta invenție se referă la un container modular demontabil pentru asigurarea unui spațiu cu microclimat optim pentru utilizare în diferite domenii activitate precum locuri de muncă de birou, locuințe temporare, spații pentru spitale mobile și altele asemenea. Problema tehnică pe care o rezolvă prezenta invenție este de a realiza un container modular total demontabil care poate fi asamblat în totalitate prin organe de asamblare, fără să implice operațiuni de sudură și care să poată fi livrat în pachete cu dimensiuni care sunt în limita maximă reglementată pentru transportul rutier.

EN: The present invention relates to a demountable modular container for providing a space with an optimal microclimate for use in various fields of activity such as office workplaces, temporary housing, spaces for mobile hospitals and the like. The technical problem that the present invention solves is to make a fully demountable modular container that can be fully assembled by assembly tools, without involving welding operations and that can be delivered in packages with dimensions that are within the maximum regulated limit for road transport.





SOLUTIE TEHNICA

ASAMBLARE

IMBINARILE SE REALIZEAZA CU ORGANE DE ASAMBLARE, SURUBURI METRICE ZINCATE SAU DIN INOX

DETALII COLT

PROFILELE SUNT MONTATE IN INTERIORUL COLTARELOR, CARE SUNT DE TIP ISO

SOLUTIE TEHNICA



LIVRARE

LIVRAREA STRUCTURII

CADRUL SE LIVREAZA SUB FORMA DE PACHET CU DIMENSIUNILE
LUNGIME: 6058 mm
LATIME: 500 mm
INALTIME: 400 mm

GREUTATE

GREUTATEA TUTUROR PROFILELOR CARE FORMEAZA CADRUL, INCLUSIV A PROFILELOR DE PARDOSEALA ESTE DE 600 KG

ALTE DETALII

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CHARACTERIZATION METHOD OF THERMOPLASTIC COMPOSITE MATERIALS MADE BY CAFT TECHNOLOGY

Research project: My SMIS 121434

Authors: **Emilia Ciupan, Ioan Filip, Emanuela Pop, Mihai Ciupan**

B

Description:

The method consists through the following operations:

1. Elaboration of the composite material recipe: choice of constituents and their weight
2. Formation of the fibrous layer by Carding Air-laid Fusion Technology
3. Tailoring the material to the size of 400x400 mm;
4. Consolidation by thermoforming: Setting the parameters of the thermoforming process; Pressing into the mold and consolidation by cooling
5. Cutting and marking the samples
6. Testing the samples.

Material recipe:

S1: (50% willow and poplar;5% bicomp.; 45% PP)

S2: (60% willow and poplar;5% bicomp.; 35% PP)

S5: (40% willow and poplar; 20 hemp; 5% bicomp.; 35% PP)

No.	Samples	No. layers	Thermoforming process parameters			Results		
			T [°C]	p [daN/cm²]	t [min]	Rm [MPa]	E [MPa]	ε_M [%]
1.	S1	2 S1	210	25	3	13.4	754	2.1
2.	S2	2 S2	210	25	3	5.61	170	4.3
3.	S5.1	2 S5	210	50	4	13.0	456	3.4
4.	S5.2	(1* +S5)**	210	25	3	14	686	2.5
5.	S5.3	2S5	210	25	3	18.5	649	3.7
6.	S5.4	(1* +S5)**	210	50	2	16.3	829	2.2
7.	S5.5	3S5	210	50	5	13.4	399	3.6
8.	S5.6	2S5	210	50	3	16.5	538	2.9
9.	S5.7	2S5	210	25	1' +2'	13.2	414	4.3
10.	S5.8	TNT-S5-Feltru	210	25	3	9.73	501	2.9
11.	S5.9	(TNT-S5-Feltru) **	210	25	3	14.6	630	3.4
12.	S5.10	2S5	210	25	4	11.6	550	2.7
13.	S5.11	2S5	210	50	2	17.1	876	2.9
14.	S5.12	2S5	210	25	4	18.4	839	2.3

*aircot; ** interweaving;

Table 1. Results: physical and mechanical characteristics of the materials



Fig. 1. The samples

Legends	Nr	ε_{tB} %	b mm	h mm	A_0 mm²
	235	4.0	22.62	4.77	107.90
	236	3.3	22.08	4.77	105.32
	239	3.7	21.74	4.7	102.18

Series graph:

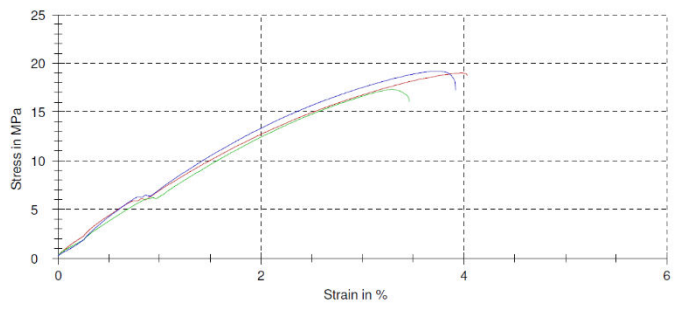

Fig. 2. Stress - strain diagram for S5.3

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STAND FOR THERMOFORMING SAMPLES FROM THERMOPLASTIC COMPOSITE MATERIALS

Project number: My SMIS 121434

B-Materials

Author/s: **Cornel Ciupan, Emilia Ciupan, Emanuela Pop**

Description: The invention consists in making a low cost and efficient stand intended for obtaining samples that are used for the characterization of thermoplastic composites with vegetable fibers. The stand (fig.1) consists of a Tefal convection oven, a ZOKURA Z1188 analog oven thermometer with a maximum temperature capability of 300 °C and a set of molds for obtaining the samples. Two different thermoforming molds were made. Each mold is made up of a base plate and a forming plate. The composite is inserted between two PTFE sheets.



Fig. 1 Stand components

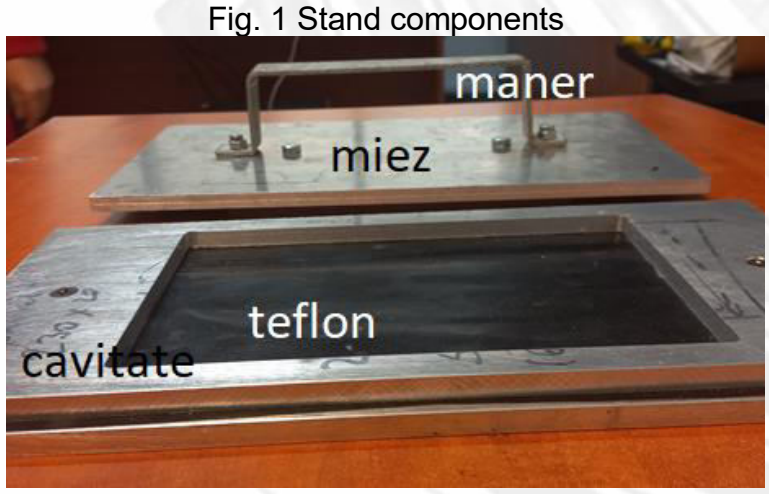

Fig. 2. The mold



Fig. 3. The mold with the composite material

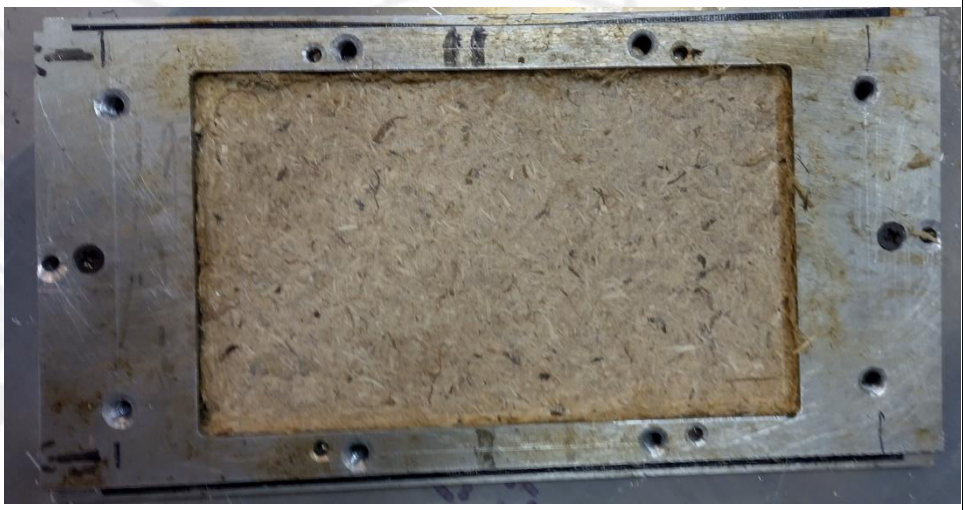

Fig. 4. Thermoformed samples

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Thermoforming process of samples made of composite materials with plant fibers and polypropylene

Project number: My SMIS: 121434

Author/s: **Emilia Ciupan, Emanuela Pop**
Emilia Campean

B-Materials

Description: The thermoforming process of the samples consists of the following stages:

1. The plant fiber is cut to lengths between 1 and 10 cm.
2. Polypropylene is cut to lengths of max. 10 mm (using manual scissors).
3. The fibers prepared in steps 1 and 2 are put together and mixed until homogenized (fig.1).
4. The mixture is placed in the mold and pressed by progressively tightening the clamping screws.
5. The oven is adjusted to a temperature between 190-220ºC (the optimal temperature is determined experimentally).
6. The mold is placed in the oven and the heating time is adjusted (experimentally).
7. The mold is removed from the oven and let to cool down.
8. The thermoformed sheet of composite is removed from the mold and the process is repeated for different samples or material formulations.



Fig. 1 Stages 1-3

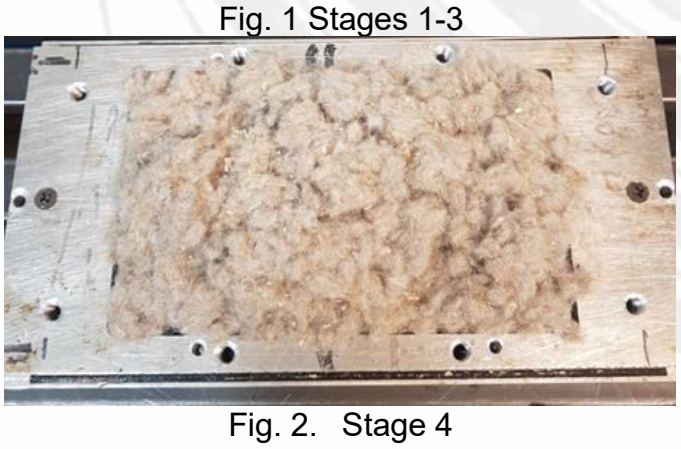

Fig. 2. Stage 4



Fig. 3. Stages 5-6



Fig. 4. Results after stage 7

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METHOD OF OPTIMIZATION OF EXPERIMENTAL DESIGN USING VORONOI DIAGRAMS, APPLIED TO POLYMER CONCRETE

Patent RO135128 (A2) - 2021-07-30

Author/s: **Ciupan Mihai**

B-Materials

Description:

The patent application describes a method of optimizing a two or multifactorial experimental design focused on determining the properties of polymer concrete (mineral casting) in order to find the optimum material formulation for a given application in the field of modern machine-tools. The invention solves the problem of maximizing the information regarding one or more of the properties of the material (the dependent variable/s) using only a limited number of tests defined by the independent variables.

An example is given for a two-factorial experimental design where the independent variables are p, the percentage of resin from the total formulation mass, and q, Funk and Dinger's equation coefficient. The method consists of the following steps: choosing the independent variables and their rectangularly shaped value domain, choosing 4 points (C1, C2, C3, C4) in the corners of the rectangle, choosing the remaining n-4 points (C5 to Cn), in a random way on the surface of the rectangle, calculating the Voronoi diagram for the points and then moving points C5 to Cn inside the rectangle until the corner surfaces are all equal to one another (S1=S2=S3=S4) and the inner surfaces are all equal to one another (S5=S6=...=Sn). The experiment is run for each of the conditions and the results are used to build a response surface for E, Young's modulus.

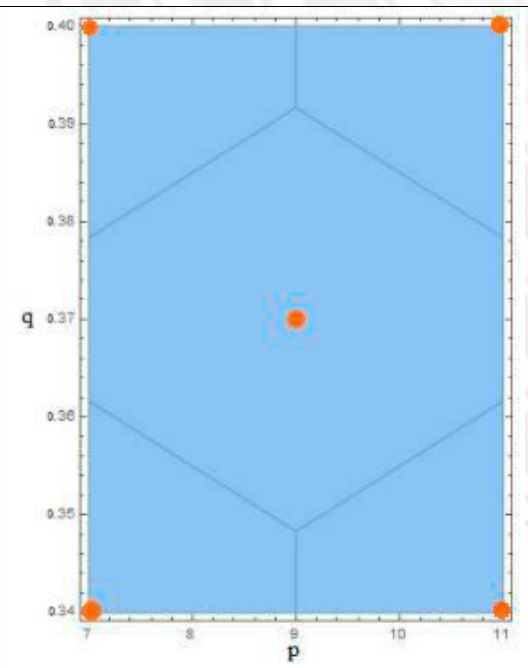

Fig. 1. Voronoi diagram of the (p;q) domain

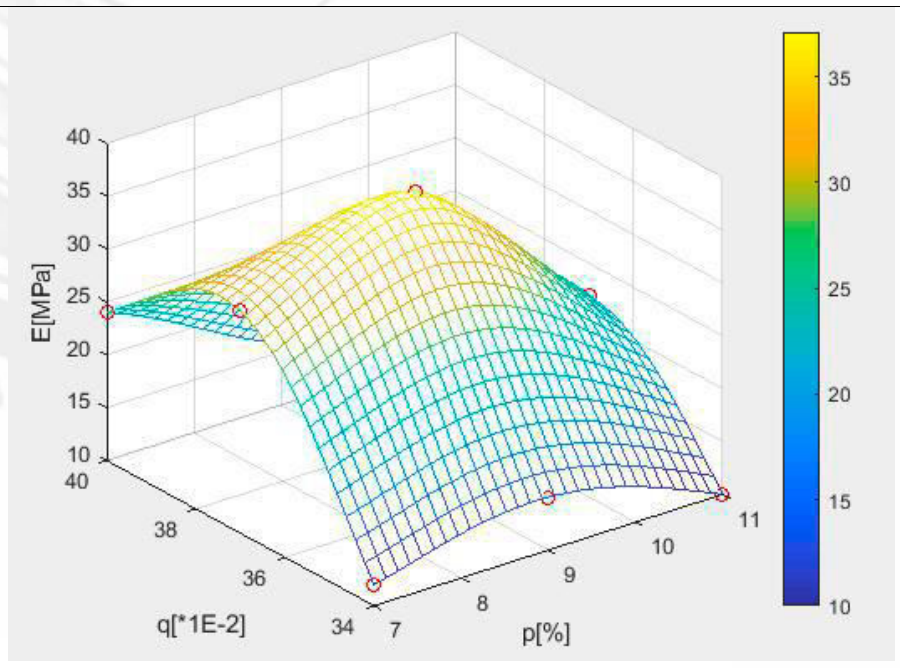

Fig. 2. Response surface E = f(p;q)

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Hydrophobic coating with self-cleaning and antimicrobial properties for artificial elements of vernacular constructions and method of obtaining it

Patent A00773/28.11.2022

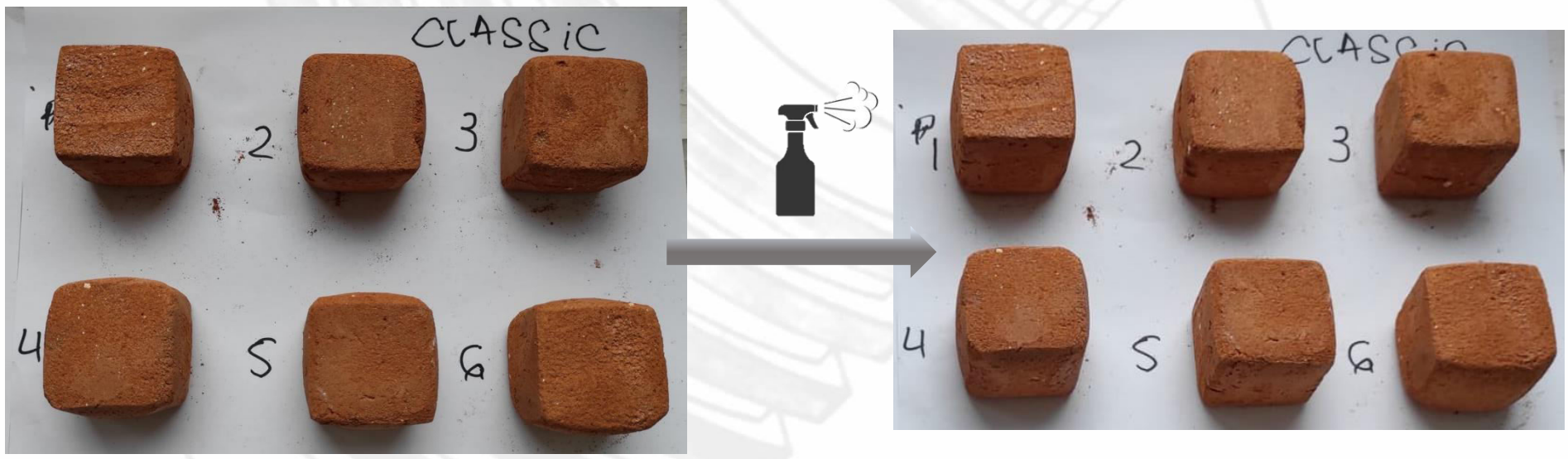
B

Toma Fistos, Radu Claudiu Fierascu, Roxana Ioana Brazdis (Matei), Anda Maria Baroi, Irina Fierascu, Alina Melinescu, Anton Ficai, Denisa Ficai, Lia Mara Ditu, Carmen Curutiu

The present invention relates to a nanocomposite coating material with self-cleaning, photodegradation and antimicrobial properties, which provides protection (consolidation) for artificial building elements in the composition of vernacular constructions (materials with high silica content), based on modified polymeric hydrophobic nanocomposites with amorphous silica (having a consolidating and self-cleaning role), a photocatalytic component (in order to reduce the accumulation of pollutants, biofilm and particles on these surfaces), to which is added a component with an antimicrobial effect, dispersed in an alcoholic solution.



	1	2	3	4	5	6
SiO2	X	X	X	X	X	X
HDTES	X	X	X	X	X	X
OTES	X	X	X	X	X	X
TiO2	X	X	X	X	X	X
ZnO		X		X	X	X
HAP			X	X	X	X
Acetic acid	X	X	X	X	X	X



Acknowledgements: This work was supported by a grant of the Romanian National Authority for Scientific Research and Innovation, CNCS/CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2021-0627, contract 591PED/2022, within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

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LASER ABLATION SYSTEM IN PRESSURIZED ENVIROMENTS

Ph.D. Thesis

Author: **IAMANDI Alexandru-Mihai**
Marian – Florentin GHENA, Liviu - Daniel GHICULESCU

B

Description: Laser ablation of metal targets in liquid, gaseous or supercritical fluid media is one of the most effective techniques available at the moment for the production of pure and durable nanoparticles or nanostructures with direct bio-medical applications. Understanding the fundamental aspects of this process can lead to better control of nanoparticle properties and their adaptation for medical products, pharmaceuticals, surface coatings, sensors of various gases, temperature, humidity, virus detection, smart labels, etc. Figure 1 shows different sizes of nanoparticles that can be obtained by laser ablation.

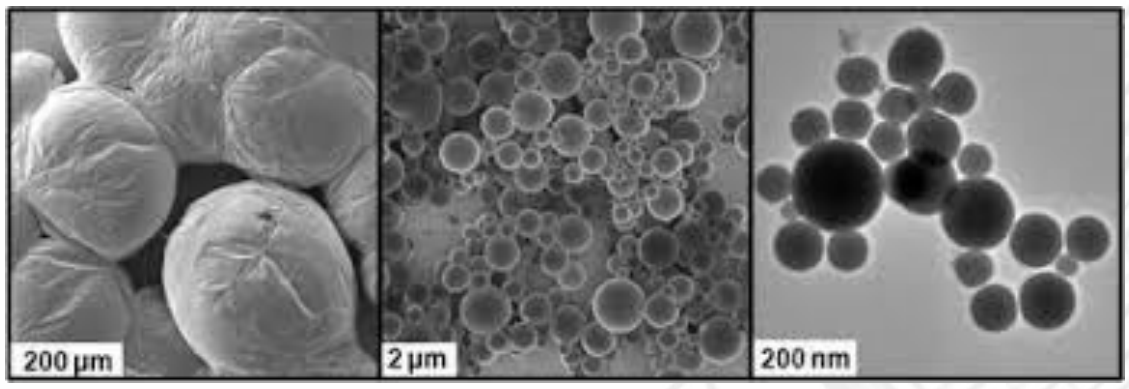

Fig.1. Nanoparticles formed in the laser ablation process [1].

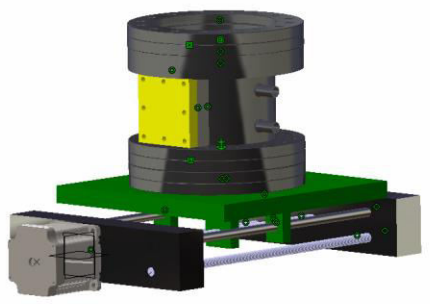

Fig.2 Isometric view of the laser ablation system

The aim of the work is to develop an ablation system in liquid/gas/supercritical environments at different pressure stations for the production of nanoparticles and nanostructures. In figure 2, you can see an isometric view of the sketch for the ablation chamber. Figure 3 highlights the slots for the intake and exhaust of the medium used during laser ablation, and in figure 4 you can see a schematic representation in section for the ablation chamber, with the red arrow the laser beam is represented.

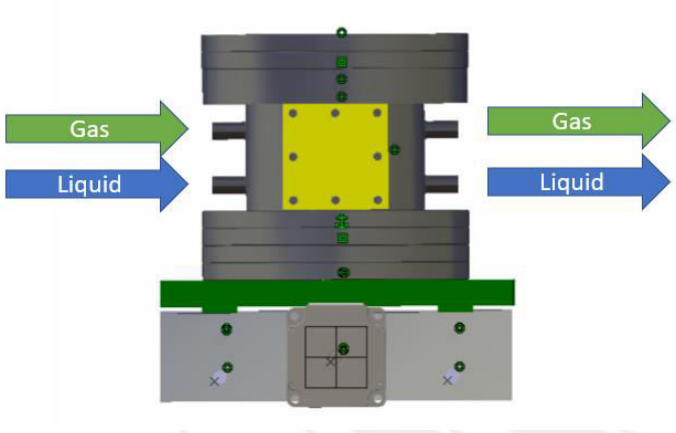

Fig.3. Representation of gas/liquid intake and exhaust slots

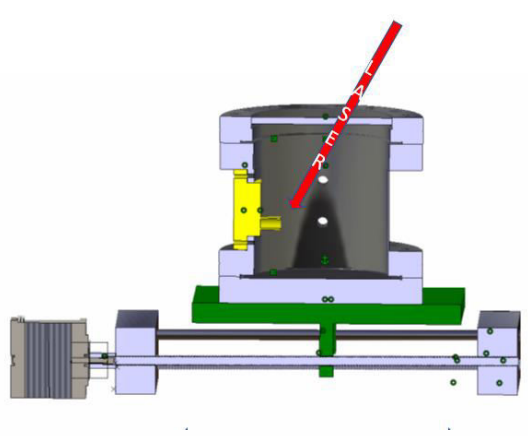

Fig.4. Sectional representation of the ablation enclosure

Reference: [1] https://www.nanowerk.com/what_are_synthetic_nanoparticles.php accessed on 24.09.2022

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Category: B

Project

Glass functionalisation and decoration with nanoparticles: A challenging way to induce new applications

Cornelia Ioana ILIE, Ludmila MOTELICA, Angela SPOIALĂ, Denisa FICAI, Ovidiu Cristian OPREA, Anton FICAI

Description: This project proposal aims to extend the use of glass surfaces and prove their versatility by functionalisation. To use these glass supports in developing such devices, they must be functionalised, and the most appropriate way is through silanisation. The support is the key factor, so from all the materials available and studied, glass was chosen due to its very good stability and suitability to functionalisation via the silanol groups, as presented in Figures 1 and 2. The project's main focus is related to the use of these glasses to which functional groups and various receptors will be attached. The purpose is to use them in applications such as forensics (for detecting various drugs, toxins and heavy metals, which are harmful to human health) and medical or environmental applications. The surface modification, the immobilisation or decoration with nanoparticles, and the functionality of the glass will be done using the most appropriate characterisation techniques, such as ICP-MS, FTIR, UV-VIS, DTA-TG, SEM, and/ or FTIR/ RAMAN microscopy.

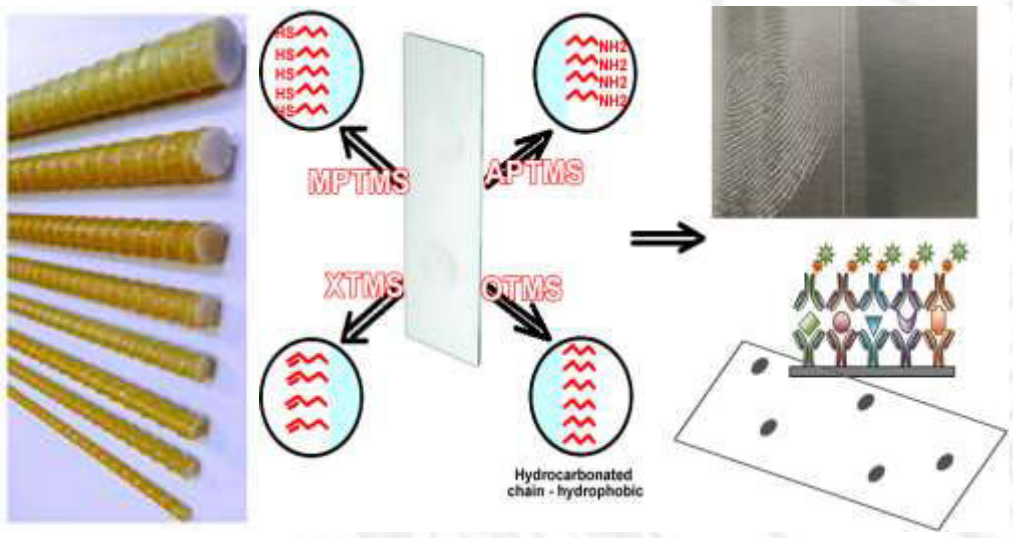

Figure 1. The general approach of the GLASS project

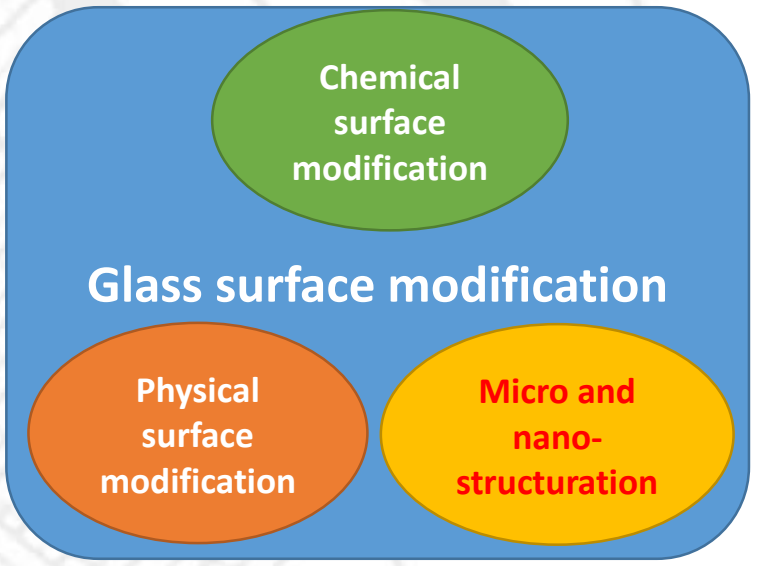

Figure 2. Functionalisation strategies

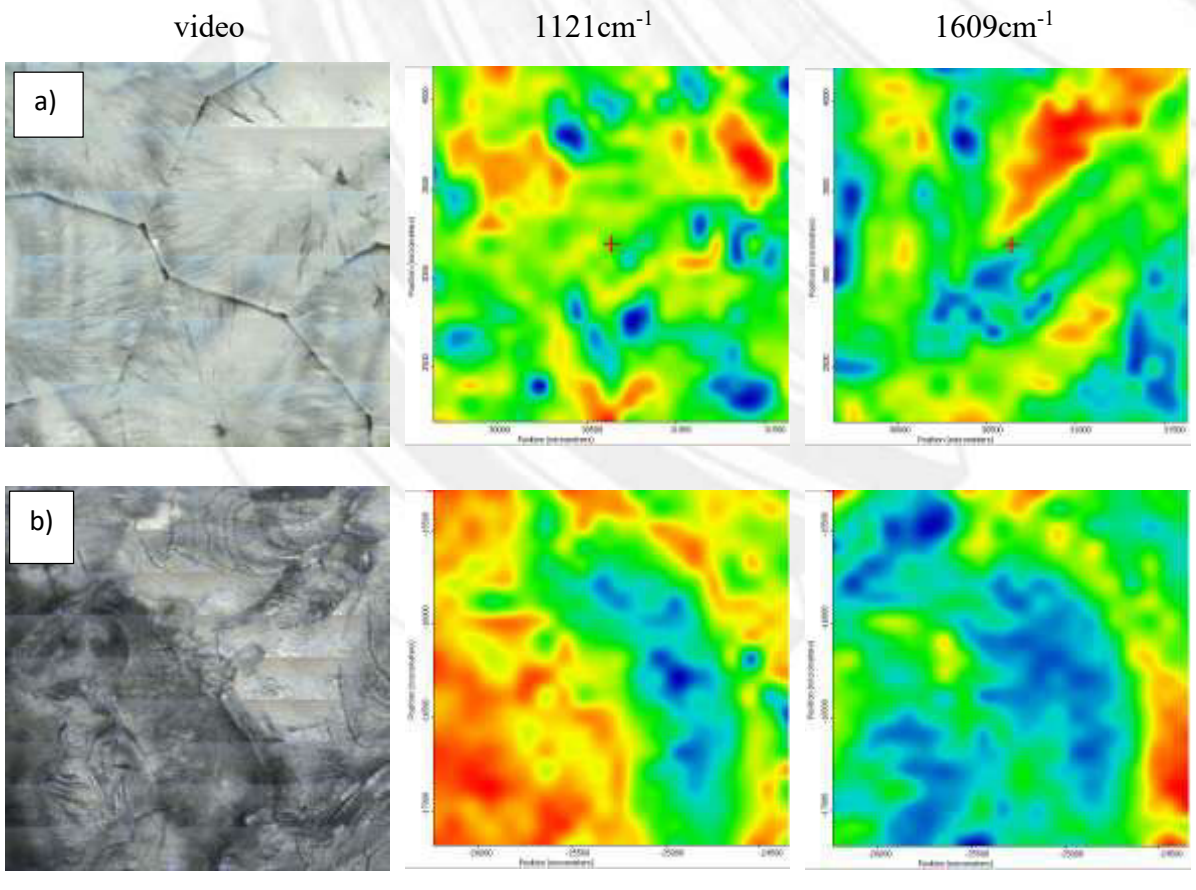

Figure 3. FTIR maps recorded for the glass slides modified with a) PEG 35 000 and b) PEG 35 000/Triton X-100.

Microscopy images reveal the changes occurred on the surface of the glass slides, which are a consequence of the deposition of PEG 35000 followed by the deposition of Triton X-100. The self-assembling occurs in a controlled manner as it can be seen from the FTIR maps recorded at specific wavelengths, belonging to PEG and Triton, respectively.

Conclusion: The surface of the glass can be modified by several physical and chemical routes; the microstructures, as well as the nature of the coatings is essential in designing the final characteristics and applications.

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Categoria

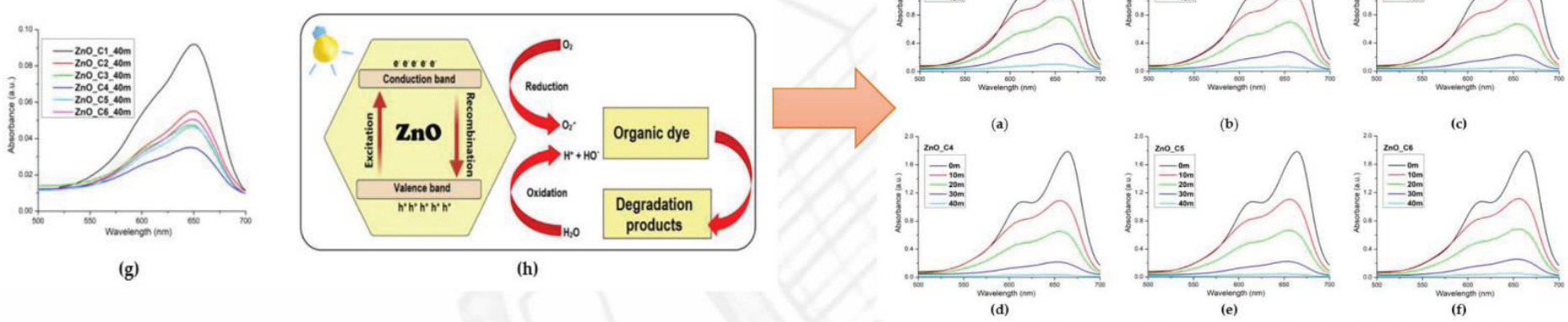
B

Modeling the photocatalytic and antimicrobial activities of ZnO by choosing the alcohol type in the synthesis.

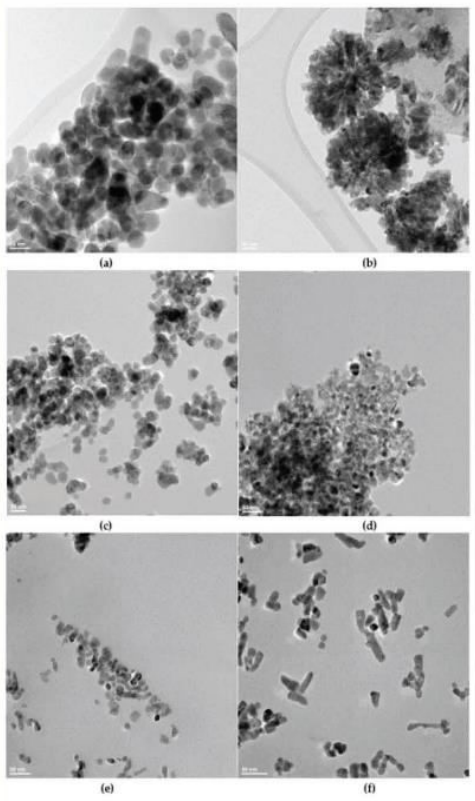
Authors: *Ludmila MOTELICA, Bogdan-Stefan VASILE, Anton FICAI, Adrian-Vasile SURDU, Denisa FICAI, Ovidiu-Cristian OPREA, Ecaterina ANDRONESCU, Dan Corneliu JINGA and Alina Maria HOLBAN*

Zinc oxide (ZnO) is one of the most important nanomaterials, which is used in various health-related applications, from antimicrobial textiles to wound dressing composites and from sunscreens to antimicrobial packaging. Purity, surface defects, size and morphology of the nanoparticles are the main factors that influence the antimicrobial properties. In this study we are comparing the properties of the ZnO nanoparticles obtained by solvolysis using a series of alcohols: primary from methanol to 1-hexanol, secondary (2-propanol and 2-butanol) and tertiary (*tert*-butanol). While the synthesis of ZnO nanoparticles is successfully accomplished in all primary alcohols, the use of secondary or tertiary alcohols does not lead to ZnO as final product, underlining the importance of the used solvent. The shape of the obtained nanoparticles depends on the used alcohol, from quasi-spherical to rods, and consequently different properties are reported, including photocatalytic and antimicrobial activities. In the photocatalytic study, the ZnO obtained in 1-butanol exhibited the best performance against methylene blue (MB) dye solution, attaining a degradation efficiency of 98.24%. The comparative study among a series of usual model dyes revealed that triarylmethane dyes are less susceptible to photo-degradation. The obtained ZnO nanoparticles present a strong antimicrobial activity on a broad range of microorganisms (bacterial and fungal strains), the size and shape being the important factors. This permits further tailoring for use in medical applications.

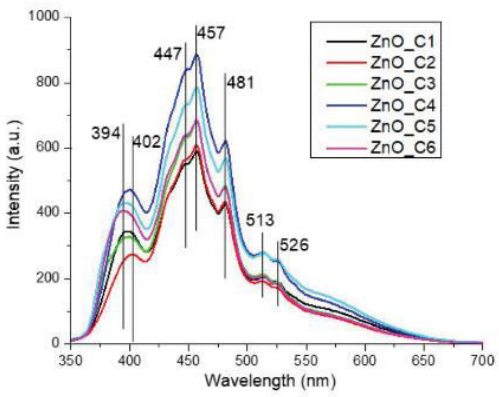
RESULTS AND DISCUSSION



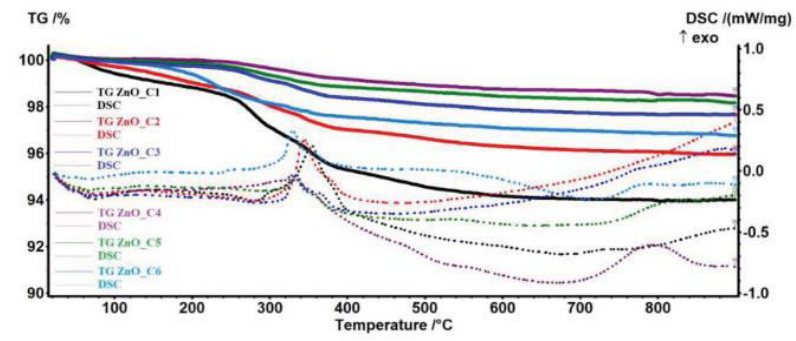
Photocatalytic activity against MB for: (**a**) ZnO_C1; (**b**) ZnO_C2; (**c**) ZnO_C3; (**d**) ZnO_C4; (**e**) ZnO_C5; (**f**) ZnO_C6; (**g**) detail for all samples after 40 minutes irradiation; (**h**) the proposed mechanism for photo-degradation of the dye



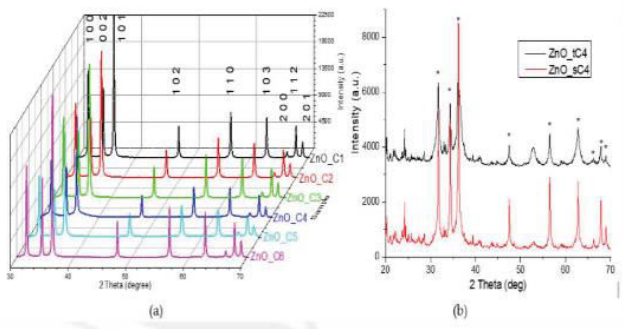
The transmision electron micrographs for: (a) ZnO_C1; (b) ZnO_C2; (c) ZnO_C3; (d) ZnO_C4; (e) ZnO_C5; (f) ZnO_C6 samples



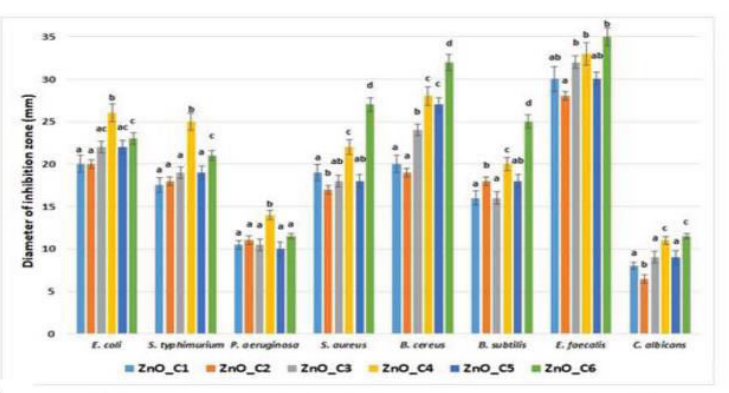
The photoluminescence spectra for ZnO_C1 – ZnO_C6 samples



The thermal analysis, TG-DSC curves, for the nanopowders obtained in C1-C6 alcohols



The XRD patterns for: (a) ZnO_C1 to ZnO_C6 samples; (b) ZnO_tC4, ZnO_sC4 nanopowders (* denotes ZnO peaks)



Antimicrobial activity for ZnO_C1 to ZnO_C6 samples.Different small letters indicate statistically significant differences between samples ($p < 0.05$)

CONCUSION

In this study we report the influence of the alcohol type on the ZnO synthesis by forced solvolysis. While the primary alcohols are suitable for obtaining ZnO nanoparticles, from spherical to rod-like shape, the syntheses in secondary and tertiary alcohols were not successful in yielding pure ZnO.

While the size of the nanoparticles was in the range 34-54 nm, with the lowest dimensions for the 1-butanol synthesis, the shape of the nanoparticles was found to be spherical for methanol, changing to polyhedral up to 1-butanol and becoming rod-like for 1-hexanol. This permits further tuning of the morphology as desired.

The highest photocatalytic activity against methylene blue was found for the ZnO obtained in 1-butanol, with a photo-degradation efficiency of 98.24% after 40 min.

The comparative study among a series of usual model dyes revealed that triarylmethane dyes are less susceptible to photo-degradation, especially gentian violet and rhodamine B, with an efficiency just above 50%.

Acknowledgment: This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CCCDI - UEFISCDI, project number PN-III-P2-2.1-PED-2021-3414, within PNCDI III; 573PED/2022 "Ambalaje inovative cu activitate antimicrobiana pentru siguranta alimentara".

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Category: B

Project

Long-lAsting Innovative NanoCoatings for hEriTage Preservation

Liliana Marinescu[1], Ludmila Motelica[1], Cornelia Ilie [1], Angela Spoiala[1], Denisa Ficai[1], Ovidiu Cristian Oprea[1], Viorica Maria Corbu[2,3], Marcela Popa[2,3], Irina Gheorghe-Barbu[2,3], Carmen Mariana Chifiriuc[2,3,4]Anton Ficai[1,4],

1. University Politechnica of Bucharest; 2. Faculty of Biology, University of Bucharest; 3. Research Institute of the University of Bucharest; 4. Academy of Romanian Scientists

Description: The project approaches an experimental and demonstrative research that aims to develop new innovative technologies for the treatment of various surfaces such as stone, composites based on cement, glass, wood, or other materials, to ensure anti-adhesion capacity; antibacterial and antifungal as well as the possibility of sealing cracks. For this purpose, new silica-based coatings (monosiloxane with different functional groups and disiloxane) will be used and will be further decorated with Ag, Au, Cu, ZnO, TiO_2 nanoparticles. Siloxane-based solutions called coupling agents can react with nanoparticles by chemically bonding Au, Cu, Ag nanoparticles by thiol groups or ZnO or TiO_2 nanoparticles by disiloxane agents, imparting complex surfaces with the specific properties mentioned above.

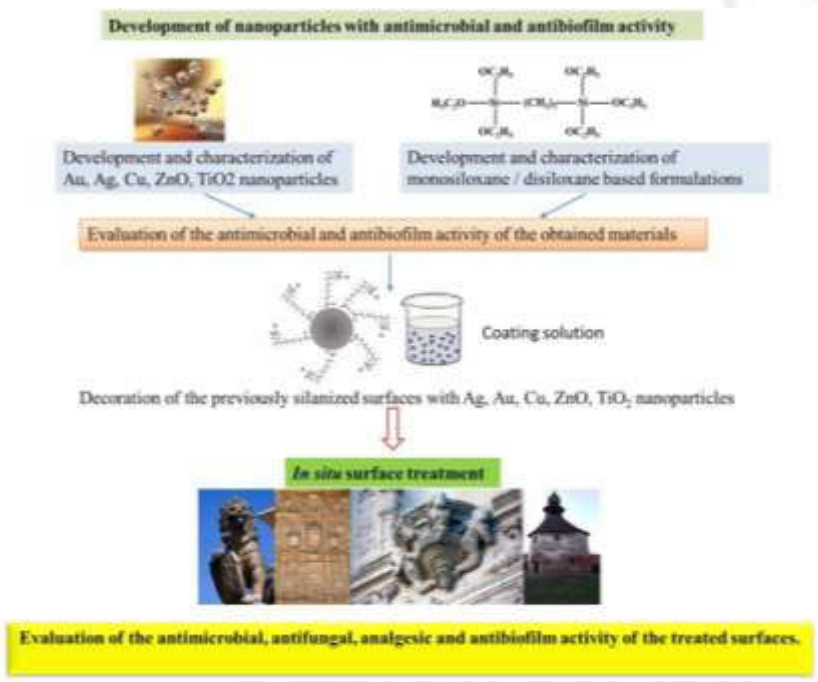

Figure 1. The general approach of innovative technologies for the treatment of various surfaces

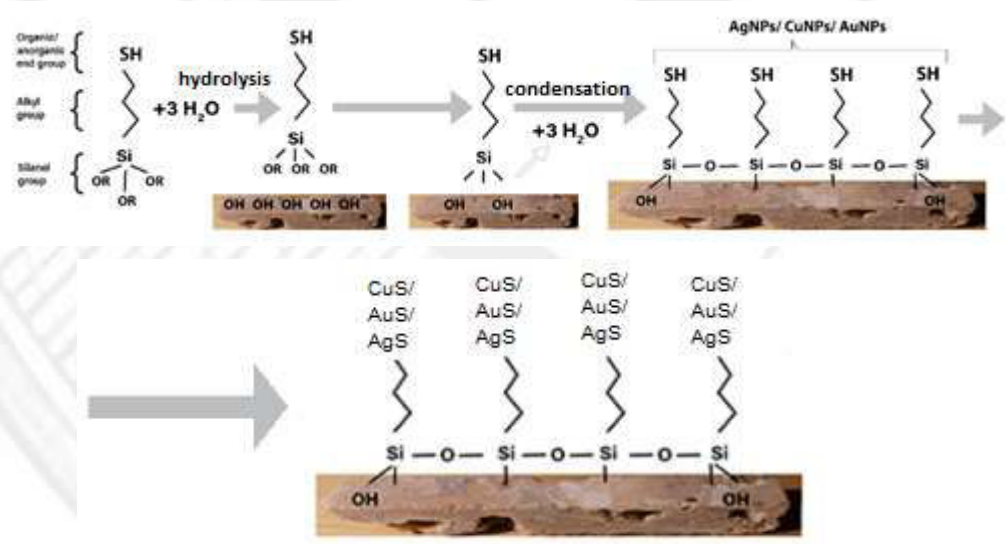

Figure 2. Natural stone surface functionalized with siloxane-based compounds and decoration with Ag, Au or CuNPs

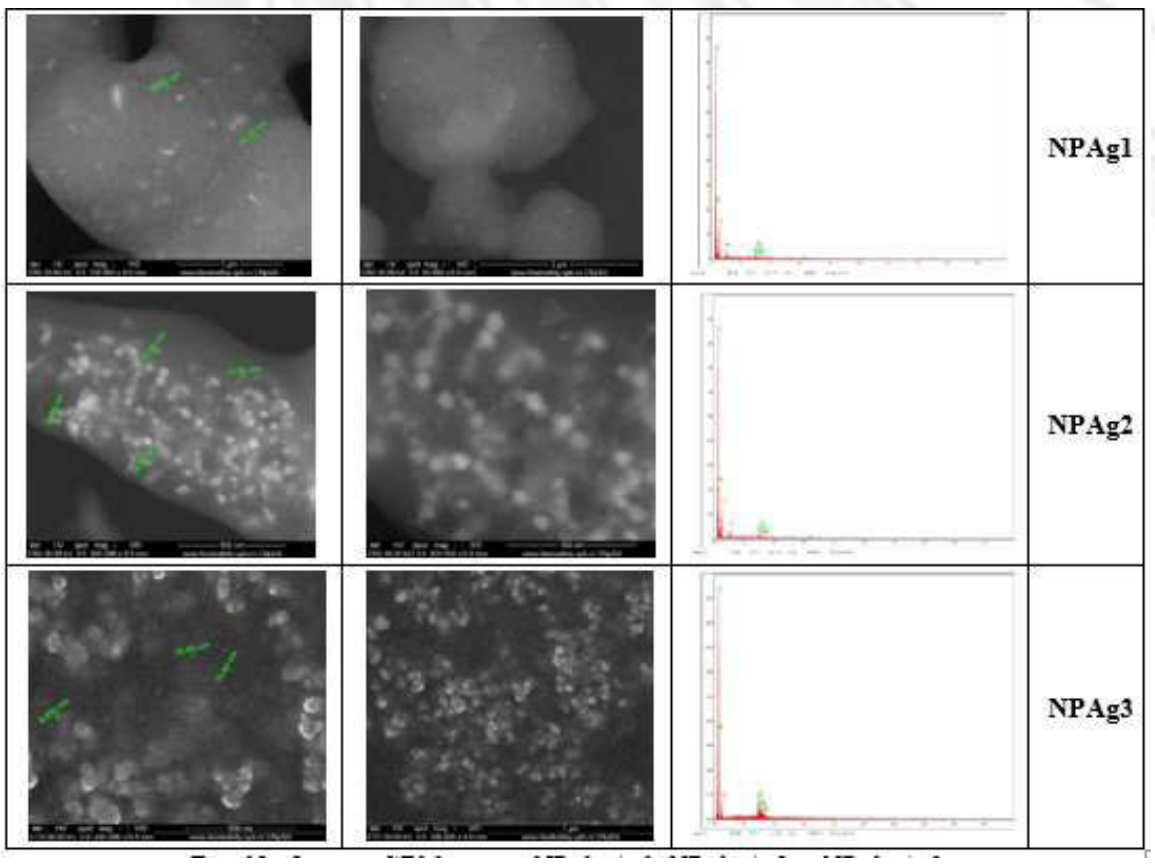

Figure 3. Natural stone surface functionalized with siloxane-based compounds and decoration with Ag, Au or CuNPs

The implementation of this research project can be an important source of technological innovations, because the project presents the development of new treatment solutions for different types of surfaces, which can have an important impact in the future of preserving monuments and constructions entered in national and even international heritage, by developing long-term treatment systems with specific properties (antimicrobial, antifungal, algaecides), which do not harm the support over time.

Acknowledgement:

This research was funded by UEFISCDI through PN-III-P2-2.1-PED-2021-2526 project: "Innovative long-lasting nanostructured coatings for heritage conservation " no. 736PED din 28/06/2022.

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Power of Creative Mind

Category: B

Project

Magnetic smart drug delivery systems for theranostic using a personalized approach

Denisa FICAI, Ludmila MOTELICA, Angela SPOIALA, Cornelia ILIE, Ovidiu Cristian OPREA, Anton FICAI

1. University Politechnica of Bucharest; 2. Academy of Romanian Scientists

Description: The project addresses an experimental and demonstration research aimed at developing new nanostructured systems for targeted cancer therapy, based on natural catabolism products (dicarboxylic amino acids, hydroxyacids and keto acids as coatings and natural or synthetic antitumor compounds) with improved cell internalization. For the implementation of the demonstration model, the project starts from a conceptual level which consists in designing new multifunctional compounds such as: Fe_3O_4 @ MC - Hydrophobic cytostatic, Fe_3O_4 @ MC - Hydrophilic cytostatic, using dicarboxylic amino acids (eg glutamic acid, aspartic acid or derivatives, hydroxyacids (eg tartaric acid, gluconic acid, vitamin C / ascorbic acid, folic acid) and ketoacids, compounds that will allow improved internalization because tumor cells are more active compared to normal cells and must satisfy increased need for nutrients and oxygen.

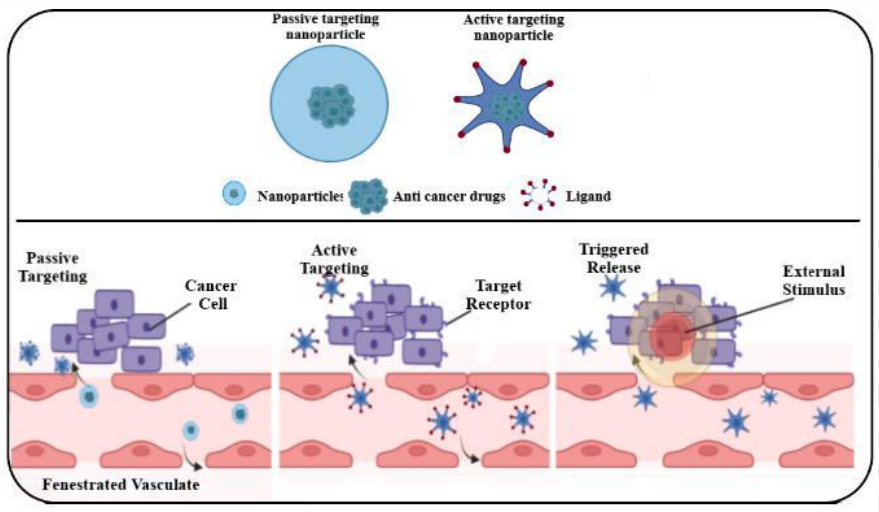


Figure 1. The general approach of the SMARTAct project

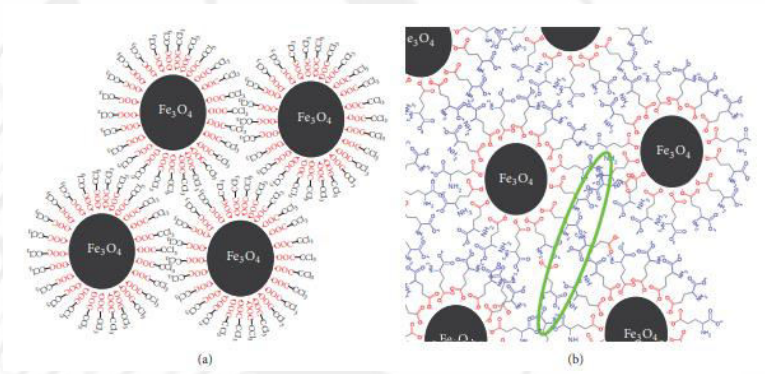


Figure 2. The functionalisation mechanism of *Fe_3O_4 @ MC*

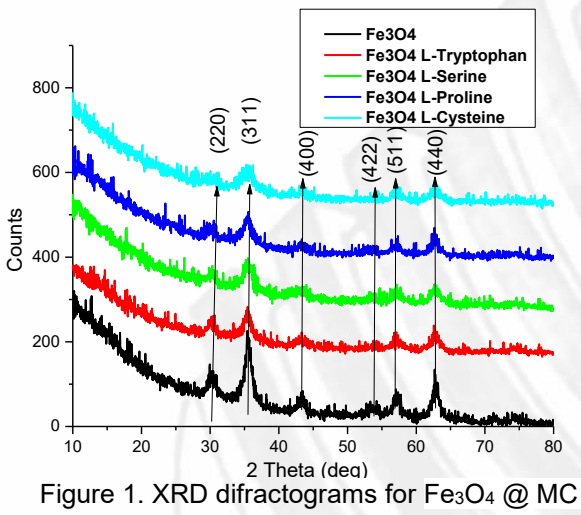
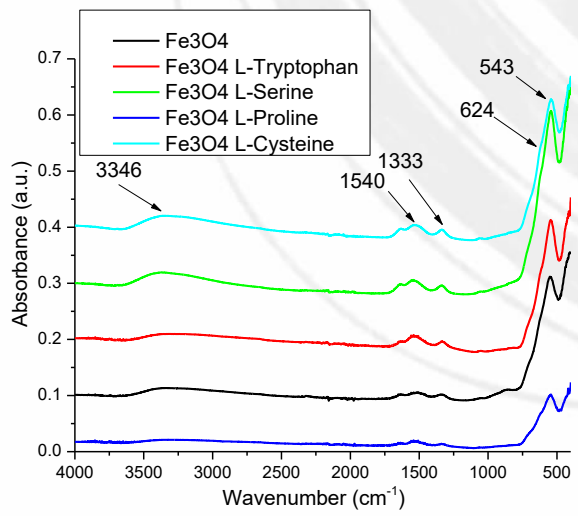


Figure 1. XRD difractograms for Fe_3O_4 @ MC

Nr crt	Tip Fe_3O_4@CM	Z (mV)	D (nm)	Pd_i
1	Fe_3O_4	-	-	-
2	Fe_3O_4@L-Triptofan	-32.34	137.23	0.23
3	Fe_3O_4@L-Serina	-23.01	167.76	0.23
4	Fe_3O_4@L-Prolina	-0.66	650.03	0.33
5	Fe_3O_4@L-Cisteina	-27.84	170.20	0.24
6	Fe_3O_4@α-ceto Glutaric	-4.90	504.36	0.23
7	Fe_3O_4@ Acid Tartic	-26.52	166.3	0.24
8	Fe_3O_4@L-Acid Usnic	-28.18	150.2	0.36

Table 1. DLS characteristic for Fe_3O_4 @ MC



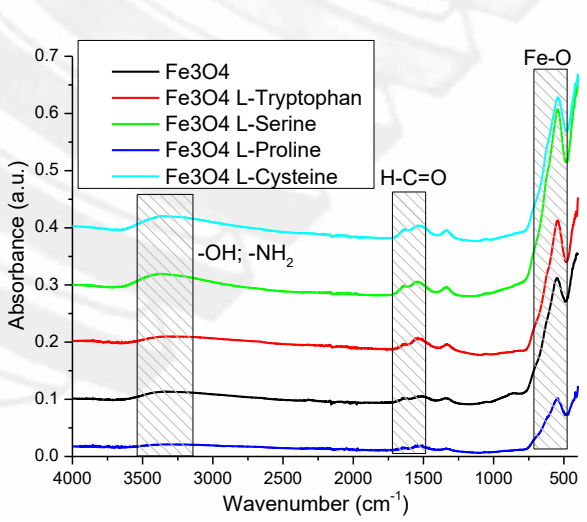


Figure 2. FTIR spectra for Fe3O4 @ MC

A series of multifunctional Fe_3O_4@amino acids, hydroxy acids and keto glutaric acid systems have been synthesized and characterized. The magnetic systems were characterized from a structural and morphological point of view with the help of the physico-chemical methods characteristic for this type of materials. Depending on the nature of the MC, the change in the morphology of the mesoporous magnetic nanoparticles can be observed. Following the biological evaluation of the obtained Fe_3O_4@MC systems, most of the magnetic systems stabilized with the biologically active substances presented a better antimicrobial activity compared to the controls, and a synergistic effect was also observed. Among them, Fe_3O_4@L-tryptophan determined the highest sensitivity of E. coli, P. aeruginosa and C. albicans, with MIC values of 0.001 mg/mL. Fe_3O_4@L-cysteine inhibited the adhesion of all strains studied. Cell viability, regardless of the nature of the stabilizer used (serine, tryptophan, cysteine, proline, glutaric, a-keto-glutaric, tartaric, usnic) is greater than 60%, which confirms good compatibility.

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Acknowledgement:
The authors acknowledge the financial support of the “Sisteme inteligente cu eliberare controlata pentru tratarea cancerului utilizand o abordare personalizata (SmartACT)” project **PN-III-P1-1.1-PED-2021-1342*, contract TE 96 din 17/05/2022***

FLASH CONCRETE©

Optimizing the Use of Fly Ash in Concrete

Category: B

This research focuses on morphology properties, mineralogy, physical and mechanical properties of fly ash mixed with concrete mixture.

Authors
Muhammad Akmal Aiman Uzair, Nur Liza Rahim, Roshazita Che Amat, Norlia Mohamad Ibrahim, Syakirah Afiza Mohammed, Mohd Mustafa Albakri Abdullah, Norazian Mohamed Noor

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INTRODUCTION

Power is mostly produced in Malaysia via hydroelectric and thermal power facilities. The ability generation from coal-fired power plants is on the rise, as shown in **Figure 1**. From 2008 to 2013, power generation increased by about 12.6%.

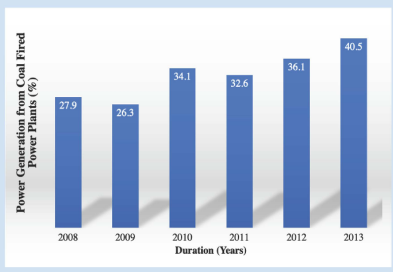

Figure 1. Coal-fired power station production percentages in Peninsular Malaysia

Problem: Various forms of coal ash, including fly ash, are created during the burning of coal during the electricity generating process.

OBJECTIVE

The main aim of this research is to improve the fundamental understanding of fly ash in the potential study of the physical & mechanical properties of concrete.

MATERIALS

The coal ash used in this research has been obtained from Sultan Azlan Shah Power Plant, Manjung Perak, Malaysia as shown in **Figures 2 and 3.**



Figure 2. Fly ash waste



Figure 3. Ground fly ash waste

INVENTION

Fly ash was replaced in 5%, 10% and 15 % as cement replacement and then tested for its physical and mechanical properties.

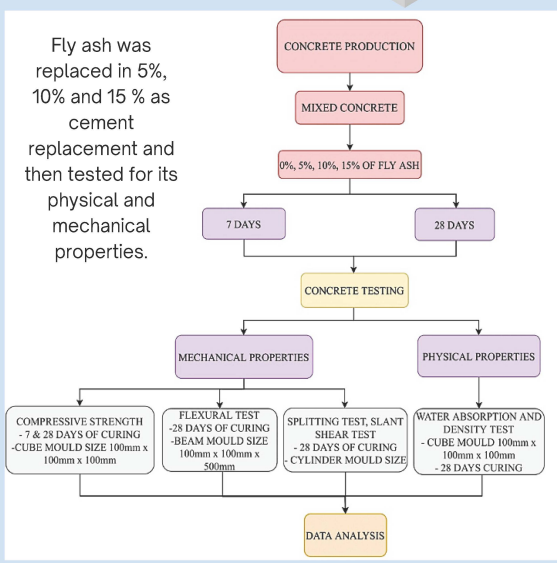

Figure 4. Flowchart of the methodology

SCIENTIFIC DISCOVERIES

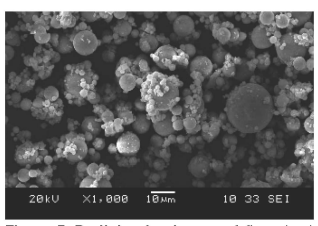

Figure 5. Particle size image of fly ash at 1000X magnification. Fly ash particles are uniform. Some of them are spherical and resemble as popcorn particles.

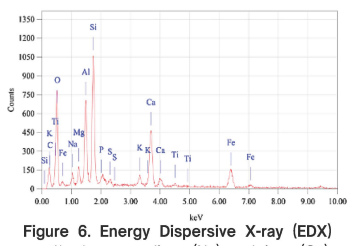

Figure 6. Energy Dispersive X-ray (EDX) result shows sodium (Na), calcium (Ca), titanium (Ti), iron (Fe), magnesium (Mg), potassium (K), and silicon (Si).

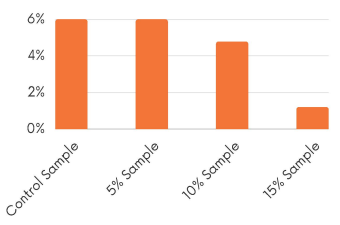

Figure 7. The water absorbent percentage of each sample. The result did not exceed 7%. So, it shows a positive result.

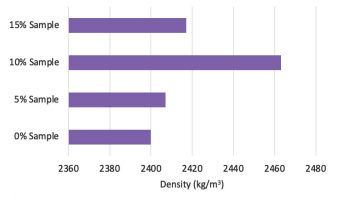

Figure 8. Density test result for all samples. Samples of 5%, 10% and 15% fly ash mixed with concrete show significant differences compared with the theoretical density. The addition of fly ash increase the density of the concrete

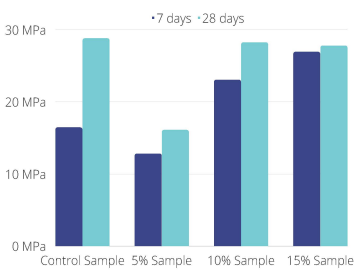

Figure 9. Compression test result for 7 and 28 days. Concrete that contains more fly ash has more compressive strength.

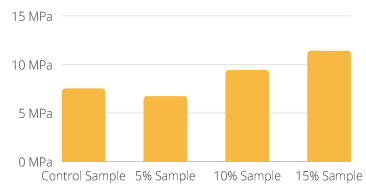

Figure 10. Flexural test result for all samples. 15% fly ash mixed with concrete shows a higher maximum load than other samples. This is because fly ash help cements to improve the strength of the concrete.

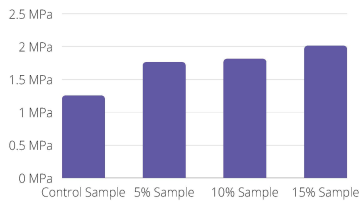

Figure 11. Splitting test result. The control sample that does not contain fly ash has a lower average force. When adding 5% of fly ash, the trend of average force increases positively. This is because fly ash help cements to improve the strength of the concrete and also acts as a glue to combine aggregates and sands.

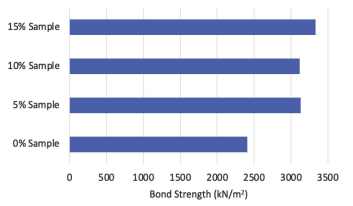

Figure 12. Slant shear test result. The addition of fly ash in concrete composition can increase the bonding strength of a material.



Figure 13. Flexural Test Setup

This study has found that samples that were combined with fly ash exhibit substantial differences from the control sample. The results were encouraging and addressed the study's goal.

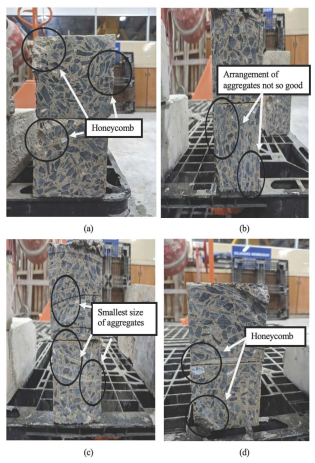

Figure 14. Cross section of beam sample (a) 0% fly ash beam sample, (b) 5% fly ash beam sample, (c) 10% fly ash beam sample, and (d) 15% fly ash beam sample

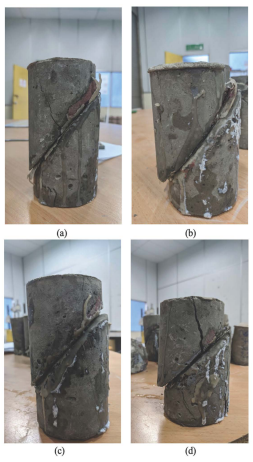

Figure 15. Slant shear sample (a) 0% fly ash sample (b) 5% fly ash sample (c) 10% fly ash sample (d) 15% fly ash sample

STRENGTH & OPPORTUNITIES

1. Use recycle material
2. Produce good concrete
3. Suitable to be used in construction industry
4. Sustainable and environmen -tally friendly

CONCLUSION

With suitable composition and material preparation, coal fly ash from the Sultan Azlan Shah Power Plant can be used as a cement replacement in concrete.

SDG

Flash Concrete is in line with SDG 9 & 11

Acknowledgment. This research was funded by Universiti Malaysia Perlis through the Research Materials Fund (RESMATE) Grant 9001-00623,

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Sustainable Environment Research Group (SERG), Centre of Excellence Geopolymer and Green Technologies (CEGeoGTech)

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Power of Creative Mind

The evolution of the alloys used in the manufacture of the gearbox

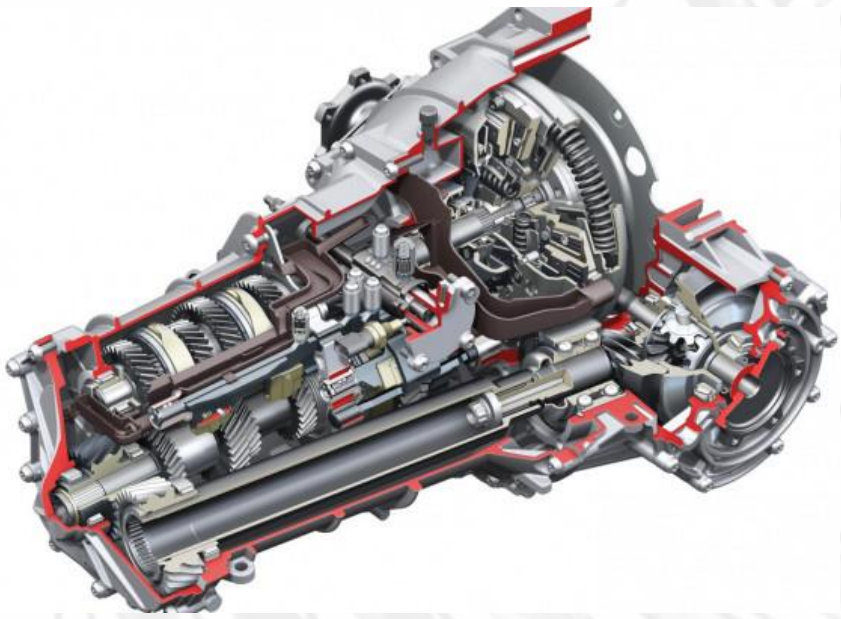
Student Project

Author: Ludvic Kasler
Coordinator: Corneliu Birtok Baneasa

B

The study traces the history and evolution of the gearbox which is an important part of the transmission system through which the power of an engine can be transformed into motion. The study starts from the utility of this component in the architecture of an automobile and considers the analysis of the materials and the alloys used for the construction of the gearbox. The weight of some elements in the composition of the alloys is followed from metals and non-metals to plastic and composite materials. How do this changes influence the performance increase of a car? How will it affect production costs and what will be the impact on the environment?

These are the questions to which this study seeks answers.



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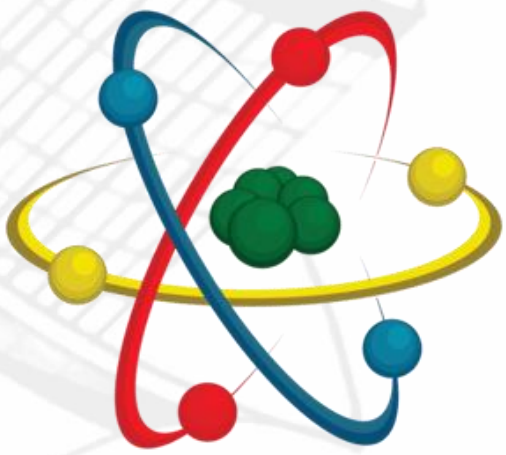

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Acest studiu urmărește istoricul și evoluția cutiei de viteze, aceasta fiind o componentă importantă a sistemului de transmisie prin care puterea unui motor poate fi transformată în mișcare.

Studiul pornește de la utilitatea acestei componente în arhitectura unui automobil și are în vedere analiza materialelor și a aliajelor folosite pentru construcția cutiei de viteze.

Se urmărește ponderea unor elemente în compoziția aliajelor de la metale și nemetale până la plastic și materiale compozite. Cum influențează aceste transformări creșterea performanțelor unui autoturism? Cum vor influența costurile de producție și care va fi impactul asupra mediului înconjurător? Iată întrebările la care acest studiu caută răspunsuri.

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C

Computer sciences

Electronics

Electrical engineering

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C

Title

ToF Normal estimation for pulse based ToF camera using CNN

Inventor/s - Contact

Szilard Molnar, Levente Tamas
Levente.Tamas@aut.utcluj.ro

Patent/ Application number

Patent application OSIM: A/00559/17.09.2021

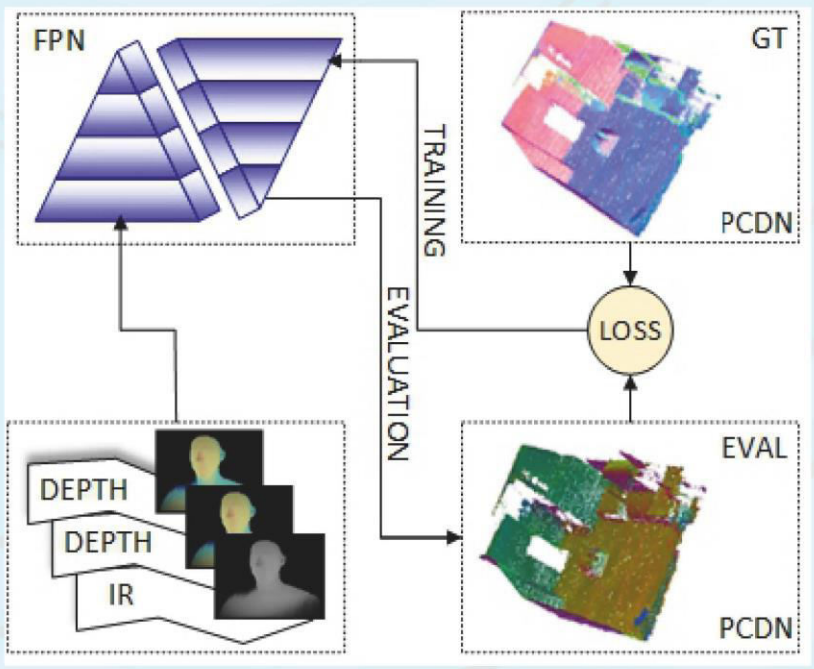
Short presentation

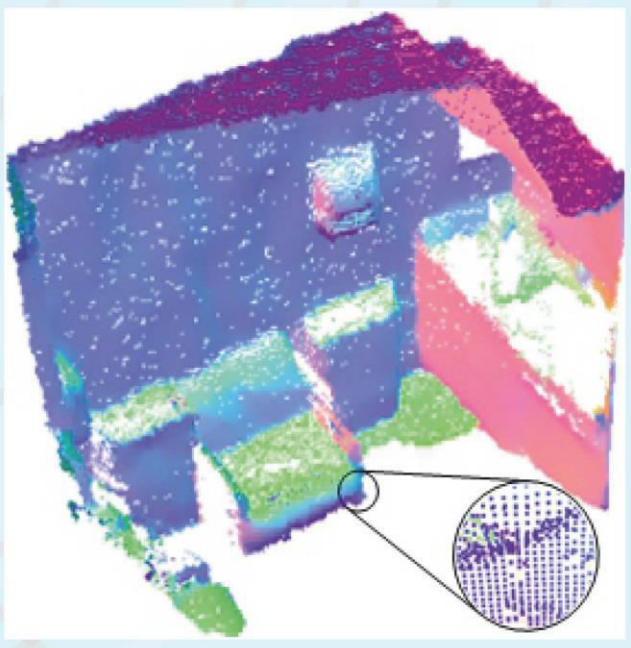
A system and method for automatically computing spatial surface normals in 3D data from the pulse based Time-of-Flight(ToF) cameras is provided. Moreover, the system comprises a component which is using convolutional neural network (CNN) for computing the normals of a 3D pointcloud sensed and returned from the ToF camera depth images. The CNN is based on the 3 channel composition of information which is trained on a large real and synthetic dataset, for which an automatic 3D point processing chain is used to determine the normals. During the evaluation mode, the CNN is able to compute the normals of the pointcloud from the ToF camera, ensuring a fast and robust normal estimation for the pointclouds.

Applicability

Robotics

Images





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C

Title

MPI Planar correction of pulse based ToF camera using CNN

Inventor/s - Contact

Marian-Leontin Pop, Levente Tamas
Levente.Tamas@aut.utcluj.ro

Patent/ Application number

Patent application OSIM: A/00560/17.09.2021

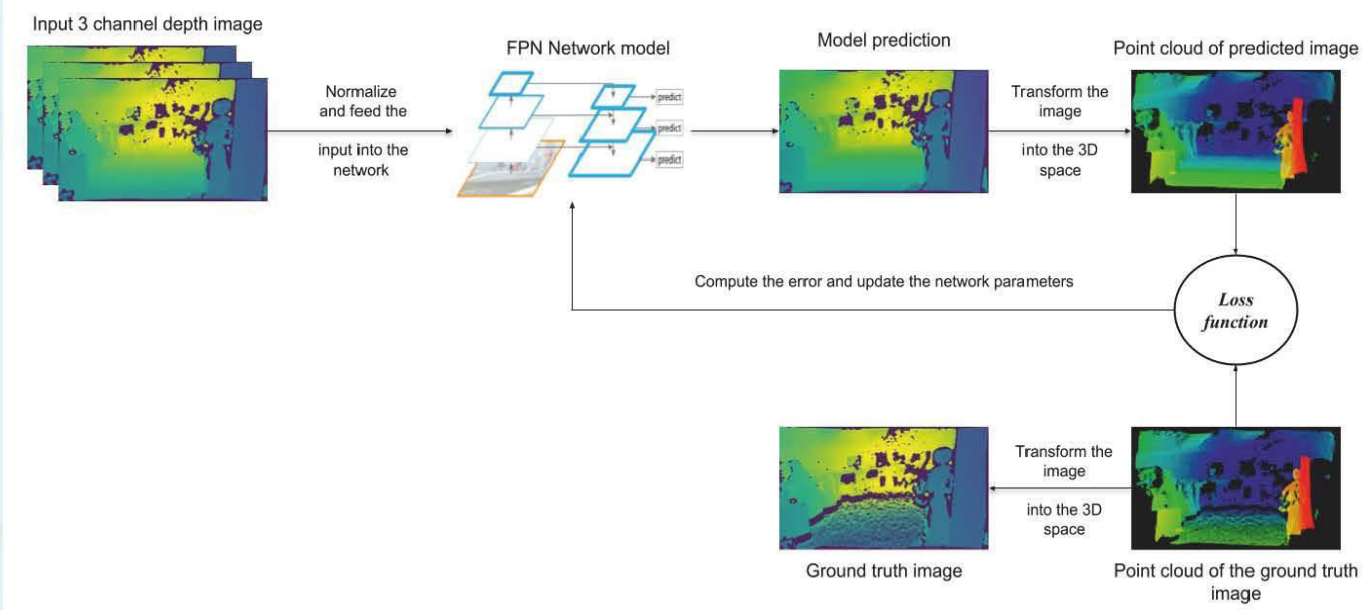
Short presentation

A system and method for automatically eliminating the multi-path interference on planar surfaces caused artifacts for the pulse based Time-of-Flight(ToF) cameras is provided. Moreover, the system comprises a component which is using convolutional neural network (CNN) for the elimination of the artifacts sensed and returned from the ToF camera depth images. The CNN is based on the 3 channel composition of information which is trained on a large real and synthetic dataset, for which an automatic 3D point processing chain is extracting and marking the correct ground planar information. During the evaluation mode, the CNN is able to correct in a seamless manner the artifacts on the planar patches from the ToF camera, ensuring a reduced MPI.

Applicability

Robotics, AI

Images



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NU ECO-SMART FAN

Ms. Sovanmonynuth HENG, Mr. Chhoeung Rachana, Mr. Luy Mithona
Dr. Mithona LUY (Advisor)
DEPARTMENT OF COMPUTER STUDIES
NORTON UNIVERISTY, CAMBODIA

C

INTRODUCTION

NU Eco-Smart Fan and also known as Mr. 360 is a new innovation fan that was designed to improve air movement of the traditional fan to 360 degrees swing. Additionally, it was built with multiple smart features and easily operated by the NU Fan applications.

OBJECTIVES

+ To break the rotation rule of the traditional fan
+ To provide more convenient features of modern technologies to people (elderly people and people with disability)
+ To introduce one-touch control
+ To support green energy

RESULTS

Speed Mode
NU Eco-Smart Fan has 3 fan speed controller (low, medium, and high speed) that allows the user to control the fan speed.

Temperature Mode
NU Eco-Smart Fan can understand the temperature and adjusts its speed automatically.

Security Camera
NU Eco-Smart Fan has a sensor that can be used for security for your house.



Smart Energy Mode
NU Eco-Smart Fan is able to detect the motion in order to serve the air for the user.

Normal Mode
The user can have an automatically swing around 360 degrees.

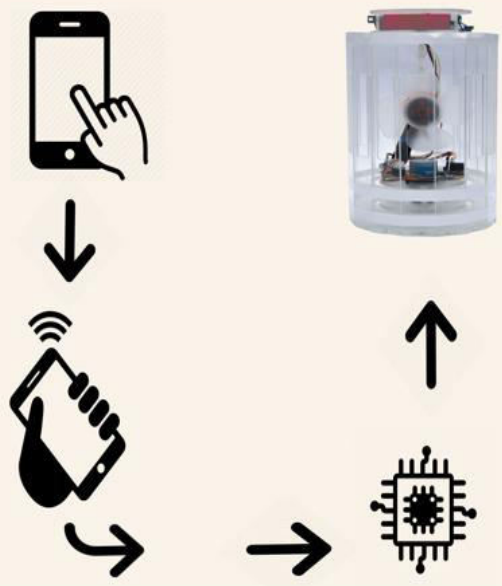
Angle Mode
The user can control NU Eco-Smart Fan with the specific fan angles.

Solar Energy Mode
We will equip with the solar panels for saving energy.

Sleep Mode
The user can set the fan to auto turn off the fan for the nightime.

Speech Mode
NU Eco-Smart Fan can recognize the voice to easily control the fan.

METHODS



CONLUSIONS

We have a high expectation that NU Eco-Smart Fan will be a new innovation fan that make people feel at ease, especially old people and incapacitated people with the 9 satisfaction features which can automatically turn around 360 degrees and remote by the mobile application. Moreover, it will reduce indoor air pollution and raw materials to support green energy and global warming emission.

St.Keo Chenda, Sangkat Chroy Changvar, Khan Chroy Changvar, Phnom Peng, Cambodia.
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Power of Creative Mind

The Road Surface Roughness Calculation

Patent no : EC00202274512

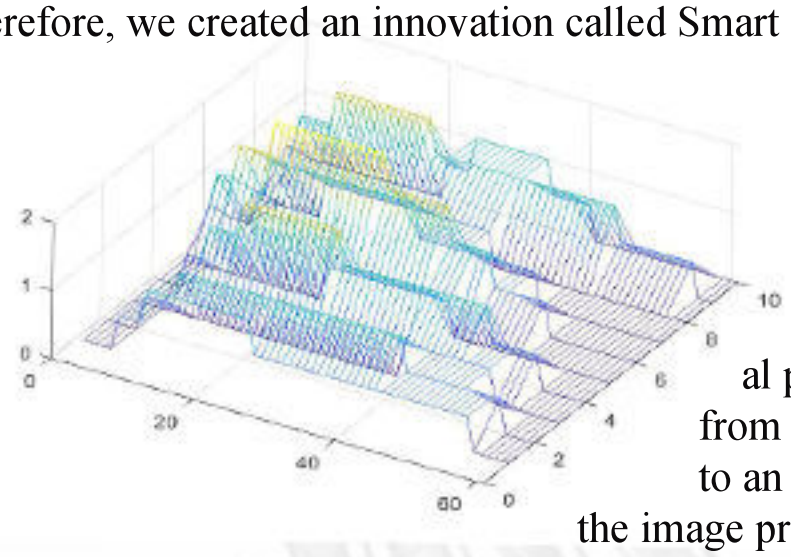
Author/s: Alifia Oriana Prabaswara, Sri Wahyu Ratna Sari

C

Road is a means of land transportation covering complementary buildings and equipment and facilitating a land traffic. It is located at ground level and above ground level. The road surface is declared as a safe and comfortable road as it is capable to carry the weight of the vehicle, withstand friction, wear, and tear due to the vehicle's wheels. Therefore, we created an innovation called Smart (Miu) Meter.

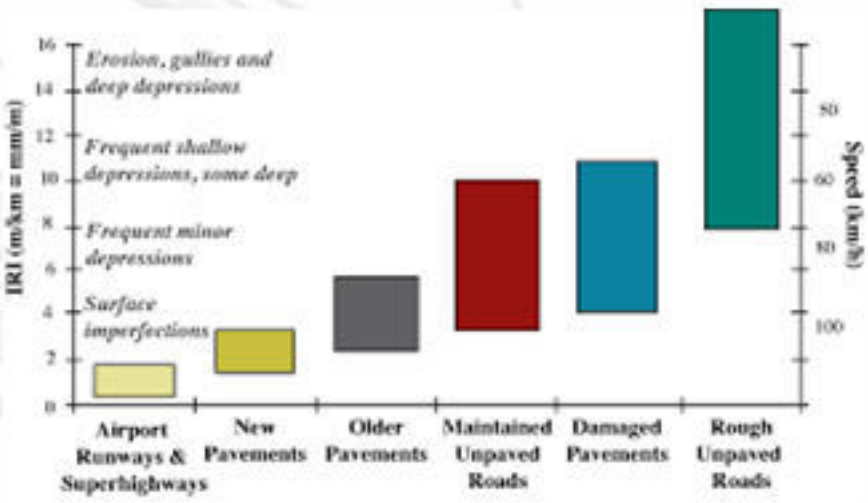


Description :
1. Drone
2. Waterpass laser
3. Gopro camera



The Smart (Miu) Meter works by taking photos of sever al parts of the road surface. The distance range of taking pictures from one another is 50 CM – 100 CM. then the image is transferred to an application called Image Image (CIGAM) and processed with the image processing method, which is a method of processing images and transforming them into other images. In the CIGAM application, the technique used is image representation and modeling which refers to the conversion of data from image processing results to data processing on a computer

The results of the analysis on the CIGAM application are in the form of a graph of the maximum point of each image, where each maximum point is entered into the formula to get the final result of road surface roughness. The final result is entered into the International Roughness Index (IRI) which can be used as a reference for the road surface whether it requires further maintenance or not.



IRI is an International Roughness Index as the international standart to measure the roughness of the surface road in the field of pavement management. IRI is used to define a characteristic of the longitudinal profile of a traveled wheeltrack and constitutes a standardized roughness measurement. The commonly recommended units are meters per kilometer (m/km) or millimeters per meter (mm/m).

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ANKARA ATATÜRK LİSESİ 1886

DDR SOFTWARE

C

Student Project

Author/s: Doruk BOZOĞLU

In this study, it is tried to develop a symmetric encryption algorithm. As it is known, the sender and receiver keys are the same in symmetric encryption algorithms. Based on the rule of finding the third point based on the two points taken on elliptic curves, it has been investigated whether this rule can be used in lines that intersect both axes. It has been found that the desired rule is also satisfied in the correct equations. In addition, when the rule of finding the third point is applied on lines that intersect both axes, it has been discovered that the same points come once again at three points. Symmetric encryption was possible with the help of this feature. In the encryption algorithm, the ASCII character code of each character to be encrypted is written as the sum of up to 20 numbers. Random keys consisting of up to 20 numbers were generated against these 20 numbers. In the key consisting of 20 numbers and 20 numbers representing the ASCII Character Code, the corresponding numbers will not be the same. In this way, the slope is prevented from becoming undefined or zero. The important thing here is that the key and ASCII Character Code must be written as the sum of even numbers, since the rule to find the third point from two points will be applied.

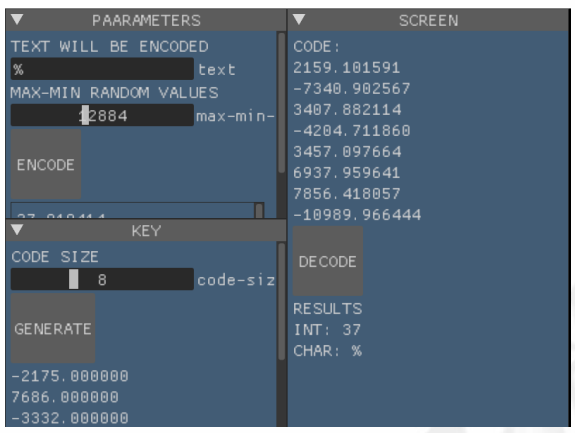

Figure-1 : Application picture

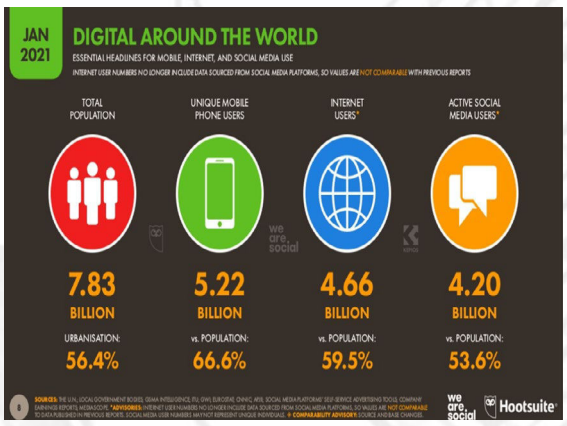

Figure-2: Target Grup

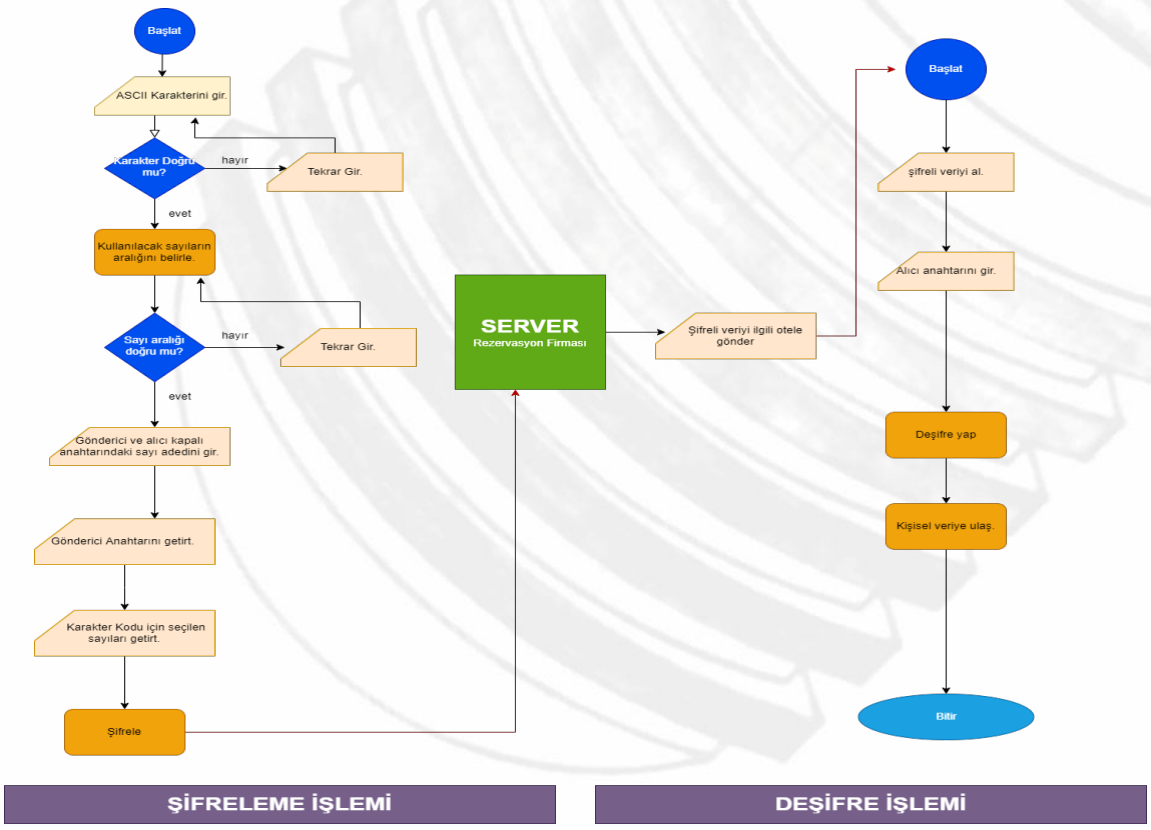

Figure-3 : Diagram of Algorithm

For simplicity in our algorithm, the character's ASCII Character Code is written as the sum of 20 numbers. When the software is made, it can be written as the sum of infinite numbers if desired, and in turn, infinite different keys can be created. In this respect, it differs from other symmetric encryption algorithms. In this algorithm, there are 10 different line equations, since the rule of finding the third point will be applied from the beginning to the binary numbers among the 20 numbers representing the 20 numbers in the key and the 20 numbers representing the character code. The deciphering process will be very complex, since a third person who finds the encrypted numbers cannot know neither the lines nor the slopes. software is made, it can be used in all areas where symmetric encryption algorithms are used. Software drive link is in the results. So you can examine software. But we use examples 10 numbers in this report so that it does not take up too much space in the report.

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ÇUBUK BİLİM VE SANAT MERKEZİ ANKARA 2019

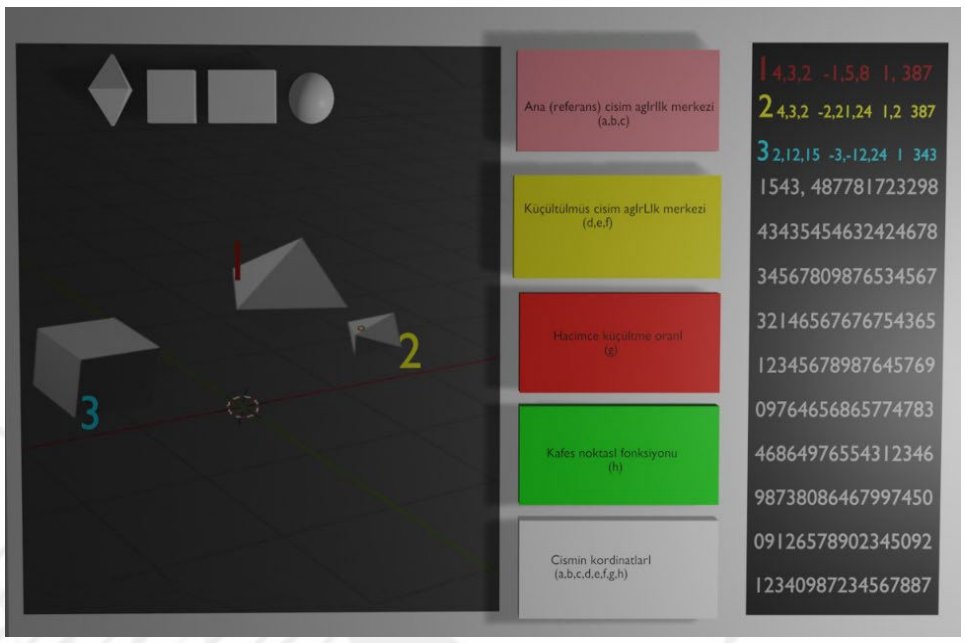
NEW GENERATION 3D DRAWİNG PROGRAM

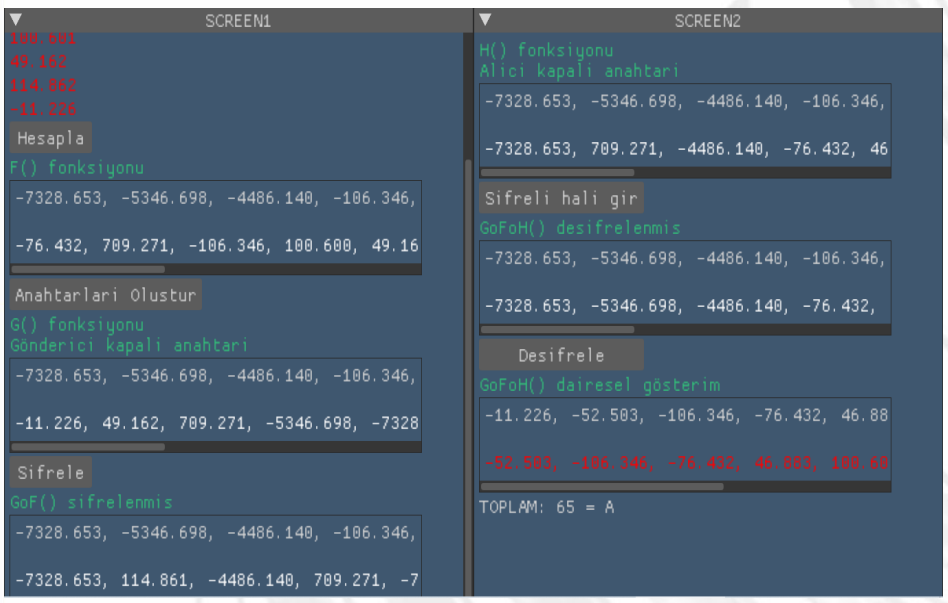
Project

C

Author/s: Remzi AKTAY

In this study, it is aimed to convert the three-dimensional drawings made into numerical data and to transmit these numerical data by encrypting. Sum formulas, translation in the orthogonal coordinate system, scale in the map, rules for finding the solution set of third-degree equations, permutation function, and derivative properties were used as a method. As a result of the studies, it has been found that the objects whose function giving the total number of points can be formed are cubes, rectangular prisms, spheres and regular octahedrons, with all coordinates of the points on and inside the 3-dimensional closed objects to be referenced as integers. It has been found that there should not be any two functions that give the same point number while the functions of these objects are being created, therefore only these objects should be taken as reference. As a result, the information of a three-dimensional object can be turned into numerical data by using the found reference objects and their





functions, by performing translation and scaling. In order to protect the confidentiality of these numerical data, it was possible to send it encrypted according to the characteristics of the permutation functions when transmitted. The encryption algorithm made was an asymmetric encryption algorithm. Today, drawings of a three-dimensional object can be made with laser tracking method. However, laser trackers enter all the coordinates of the object. In this study, all coordinates are created with less numerical data. Considering the safety of the three-dimensional drawing of a product made especially in domestic and national production, this method is thought to be healthier. The software of the encryption part of the study was made. Based on this study, closed objects that can be referenced differently and functions that give the total number of integer points on these objects can be found. More specific numerical data can be generated.

1. Finding properties of reference bodies;

When the value 387, which is the value in the 4th column of the 1st row, is written as the result of the functions determined for the cube, rectangular prism, regular octahedron and sphere to be referenced, it is seen that the value of n turns out to be a positive integer only for the regular octahedron, and this value is 4 when the equation is solved. This means: It is a regular octahedron with an edge n = 4 with a center of gravity (4, 3,2). The three numbers given in the 2nd column are randomly written just to provide the encryption algorithm.

2. Finding properties of objects that are translated and reduced with respect to reference objects

When the numerical data in the 2nd row is examined, it is seen that the values in the 1st column and 4th column are the same. According to these values, the properties of the reference object are found. It will be seen that this object has been reduced by ½ in volume and shifted to the center of gravity (-2, 21, 24).

4, 3, 2	**-1, 5,8**	**1**	**387**
4, 3, 2	**-2, 21, 24**	**1/12**	**387**
2, 12, 15	**-3, -12, -4**	**1**	**343**
2, 12, 15	**-4, 1/5, 7**	**1.25**	**343**
2, 12, 15	**5, -13, 8**	**0.785**	**343**
11, 2, 3,	**4, 5, 6**	**1**	**135**
11, 2, 3	**-5, -4, -8**	**0.12**	**135**
4, 5, 6	**7, 8, 9**	**1**	**469**
1, 2, 3	**4, 5, 6**	**1.89**	**469**
12, 13, 15	**17, 18, 19**	**0.72**	**469**

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HR EXCELLENCE IN RESEARCH

GENETIC ALGORITHM FOR SOLVING THE NON-LINEAR TRANSPORTATION PROBLEM ON NETWORK WITH ONE SOURCE AND ONE DESTINATION

PATENT: MD 7066/2021.09.28

AUTHORS: Tatiana PAȘA, Valeriu UNGUREANU

APPLICATION FIELDS: IT COMMUNICATIONS. **C**

AIM: Solving non-linear large scale transportation problem on network with one source and one destination described by concave cost functions.

SOLUTION: Using genetic algorithm to solve non-linear large scale transportation problem on network with one source and one destination.

The proposed genetic algorithm for solving the transportation problem consists of the following steps:

Step 1 *Initialization.* The initial population of $4n$ chromosomes is generated. Each chromosome is described by a set $Nr = \{nr_1, nr_2, \dots, nr_n\}$ which contains n integers and each element represents the number of arcs coming out of that vertex. So, for each position $i = \overline{1, n-1}$ a positive integer nr_i is generated between 1 and the number of arcs coming out of the vertex i, the number $nr_n = 0$ is placed on the last position (no arc leaves the destination). The nr_i, $i = \overline{1, n-1}$ arcs coming out of the peak i, on which the product flow is transported, are randomly selected. The part of the flow passing through the arc (i, j), of the total flow entering the vertex i, is given by the matrix of the distribution proportions $R = \{r_{ij} | i = \overline{1, n}, j = \overline{1, n}\}$ randomly generated, and for which condition $\sum_{j=1}^{n} r_{ij} = 1$, $i = \overline{1, n-1}$, and $r_{ij} = 0$, for $i = n$, $j = \overline{1, n}$ is respected.

Step 2 *Decoding and Evaluating Chromosomes.* Decoding involves associating each chromosome with an admissible solution of the form $x = (x_1, x_2, \dots, x_m)$, where x_h, $h = \overline{1, m}$ is the amount of flux passing through the arc (i, j) calculated as follows: $x_h = r_{ij} * cf_i$, where cf_i is the amount of flow that enters the vertex i and $x_h = 0$ if no flow passes through that arc. Evaluation involves determining the value of the objective function for each of the solutions obtained.

Step 3 *Selection.* Chromosomes are sorted in order of increasing the value of objective function in the solution associated with the chromosome. Chromosomes in the first half of the population, so $2n$ chromosomes, are transferred to the new population.

Step4 *Crossing chromosomes.* Crossing occurs between chromosomes transferred to population $P(i)$ from populat $P(i-1)$. The same cut is randomly applied to both parent chromosomes taken in pairs. After cutting, the sets Nr_1 and Nr_2, $Nr = Nr_1 \cup Nr_2$, $Nr_1 = \{nr_1, nr_2, \dots, nr_k\}$, $Nr_2 = \{nr_{k+1}, nr_{k+2}, \dots, nr_n\}$ are obtained. Nr_1 – the left side and Nr_2 - the right side of the chromosome.

Each pair of parent chromosomes generates two offspring chromosomes as follows:

- the first offspring chromosome receives the left side of the mother parent chromosome and the right side of the father chromosome;
- the second offspring chromosome receives the left side of the father chromosome and the right side of the mother chromosome.

Each pair of parent chromosomes generates two offspring chromosomes and the population size remains constant.

Step 5 *Mutation.* A mutation on a chromosome gene is likely to be applied $\varepsilon \in [0.001, 0.01]$, and consists in generating a random number nr_i, between 1 and the number of arcs coming out of that peak, for a gene of the successor chromosome. The other genes remain unchanged.

Step 6 *Check the stop condition.* Stopping the execution of the algorithm occurs if the condition $\left|f\left(x_{P(i)}\right) - f\left(x_{P(i-1)}\right)\right| \leq \varepsilon$ is met for the solutions associated with the first chromosome in two consecutive populations $P(i-1)$ and $P(i)$. As a solution to the problem serves the admissible solution that corresponds to the chromosome with the minimum value of the objective function in the last built population. Go to Step 2 if the stop condition is not met, otherwise STOP.

ADVANTAGES: The proposed genetic algorithm for solving the non-linear large scale transportation problem on network with one source and one destination significantly reduces the time to obtain the solution and problem can be solved in a reasonable time. It allows the exit from blockages in local solutions so that after a few iterations a chromosome with better characteristics is detected which is associated with a solution for which the transport cost is lower.

IMPLEMENTATION STAGE: The algorithm is implemented in the Mathematica System.

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Method for selective switching

Patent Application no. A 2021 00462/ EP 22464001.1

Ciprian Bejenar, Laurențiu-Dan Milici, Constantin Filote, Mihai Rață, Ciprian Afanasov, Elena-Daniela Lupu, Valentin Vlad, Constantin Ungureanu

C

The method for selective switching involves the introduction of the selective switching (connecting / disconnecting) capability of voltage sources and/or controllable and parallel connected converter modules from the composition of power systems through conditioned events with attenuated transition modeled in a specific way, so that it involves mathematics functions that compose a sigmoidal control logic approached differently, which gives it simplicity and performance along with malleability, without unpredictable, uncontrolled and unjustified compromises, which improves the switching process without additional implications, so that it does not involve the command of electromechanical devices because it improves compatibility, the performance and operational redundancy of the systems or parts thereof that implement it.

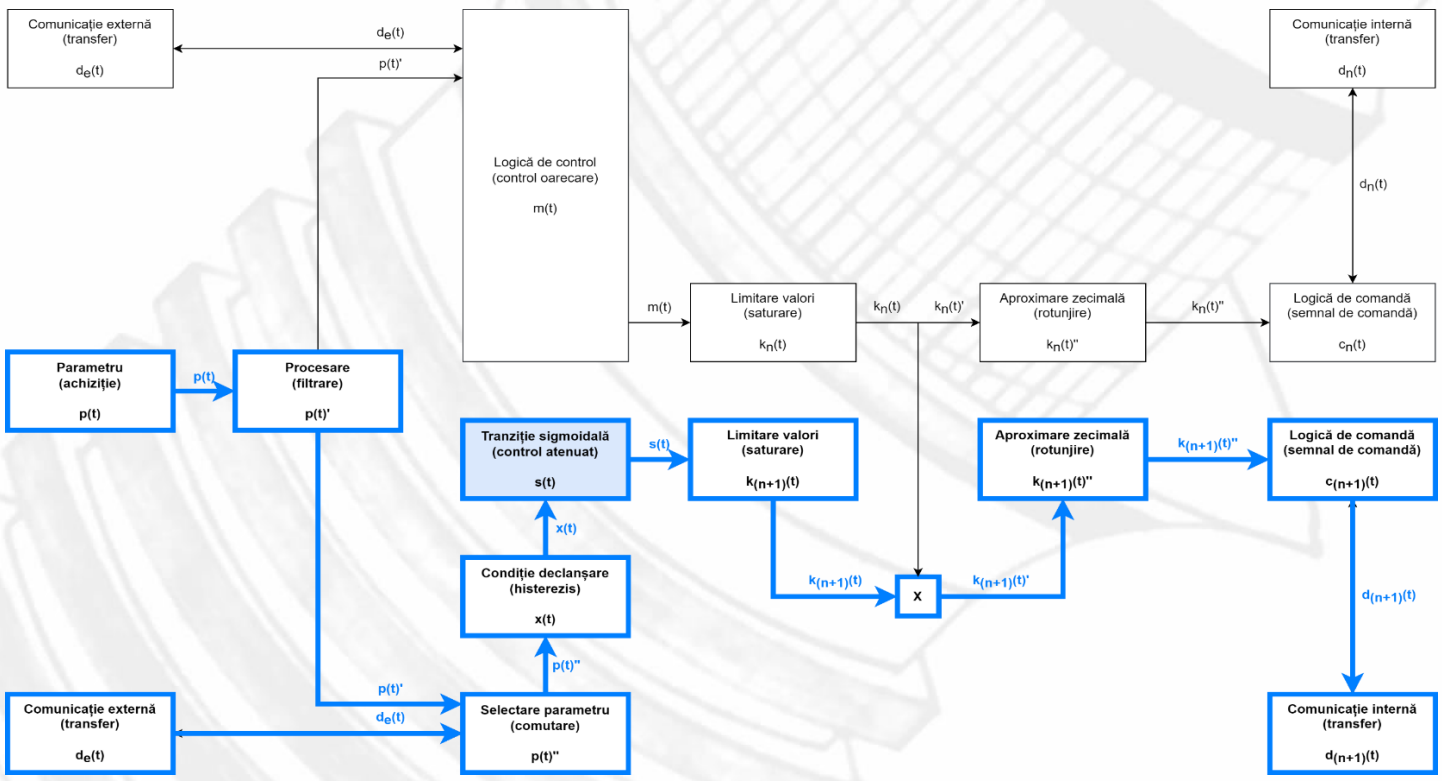

Fig. 1. General diagram of the method for selective switching

Advantages:

- characterized by less unforeseeable delays from the moment the trigger conditions are met until the actual switching time; decreases the disturbances of the electrical parameters and indicators relevant for the quality of electrical energy;
- facilitates the behavior of regulators in the process of power supplying an electrical load; improves the reaction and improves the response of associated protection equipment and/or systems;
- enables redundancy in operation of power supply systems or parts of them, through that it is extensible; compatible with other control methods, without limiting their performance.

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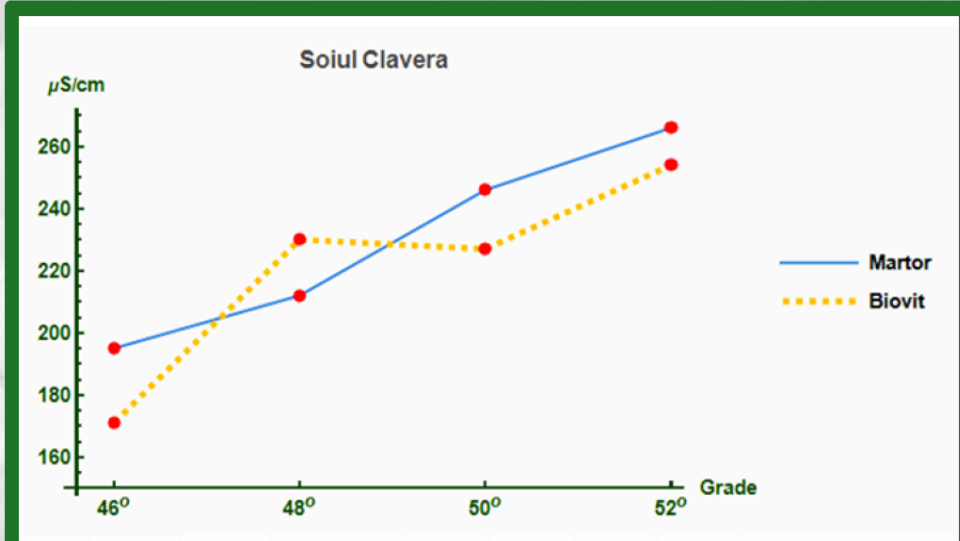
DATA ANALYSIS MODEL ON LEAKAGE OF ELECTROLYTES IN SOYBEAN PLANTS

AUTHORS: Ion GANEA, Ana BÎRSAN

APPLICATION FIELDS: Computer Science, Biology, Agriculture. **C**

AIM: Gaining knowledge on the influence of biologically active substances on plant development, productivity and plants adaptation to certain climatic conditions.

SOLUTION: Climate change, drought and high temperatures in recent times lead to the need to increase the adaptability of plants to cope with these changes. High temperatures have a significant impact on the physiological processes taking place in plants. An important indicator of these changes is the leakage of electrolytes which are chemicals essential in regulating the various processes that take place in plants.



Leakage of electrolytes

The data obtained experimentally regarding the leakage of electrolytes in the leaves of soybean plants (Glicine max Merrill) at the temperature of 46 °C, 48 °C, 50 °C and 52 °C in the Control group and in the foliar treated group with the humic compound Biovit.

The functions for the analysis of the influence of the Biovit compound on the leakage of electrolytes in the Clavera variety were developed.

The following results were obtained:

Comparație	Δ (%)	$\bar{d}$	$S_{\bar{d}}$	*t*	$lsd_{0.05}$	$lsd_{0.01}$
Clavera 46°C Martor vs Biovit	-14	24	6.18	3.88*	13.2*	23.2**
Clavera 48°C Martor vs Biovit	7.69	17.7	12.1	1.46	25.7	45.3
Clavera 50°C Martor vs Biovit	-8.68	19.7	6.43	3.06*	13.7*	24.1
Clavera 52°C Martor vs Biovit	-4.86	12.3	3.06	4.03*	6.52*	11.5**

A significant influence is marked with * (95% level of certainty),
** (99% level of certainty)
Negative values indicate less electrolyte leakage which is a positive result.

In conclusion

The use of the humic compound Biovit significantly reduces the leakage of electrolytes in the leaves of soybean plants, which suggests the involvement of this compound in the stabilization of biological membranes and the possibility of using Biovit in maintaining cellular homeostasis.

IMPLEMENTATION STAGE: Statistical models and a database for scientific research were implemented in the biological safety laboratory, Moldova State University, aimed at obtaining high-yielding soybean crops and adapting plants to climate change.

ACKNOWLEDGMENTS: This research was supported by the PhD project *"Models, techniques and products intelligent data analysis program in plant physiology"*.

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Extension device for the diagnosis of conductive charging systems

Patent Application no. A 2021 00368 / EP 21464002.1

Ciprian Bejenar, Marian Bejenar, Mihai Dimian, Laurențiu-Dan Milici,
Mariana-Rodica Milici, Ciprian Afanasov,
Constantin Ungureanu, Mihaela Pavăl

C

The invention uses a simple solution from a constructive point of view and allows it to be attached for diagnostic purposes in the extension of any conductive charging system, being suitable as an accessory regardless of the testing equipment and/or system and it has the capability to incorporate an incorporable source of electrical energy and/or universal terminals, facilitating the extension action without the strict need for a human operator, because the device constitutes a monobloc testing probe for the acquisition of the related signals corresponding to the electrical parameters of interest in the process of diagnosis the conductive charging of an electric vehicle.

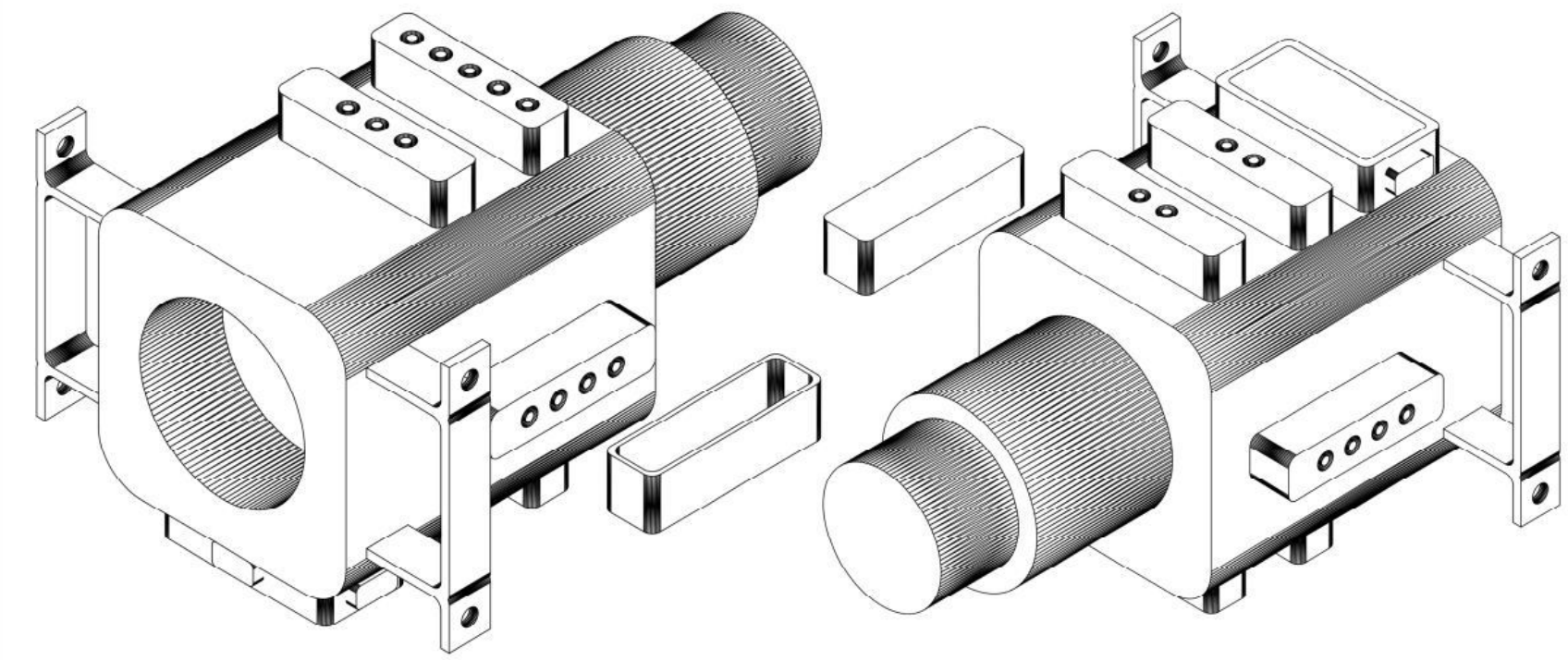

Fig. 1. Extension device (combined variant) for the diagnosis of combined conductive charging systems (front view and rear view)

Advantages:

- simplifies construction and extends the functionalities of the existing technical solutions; allows facile electrical access to the conductors involved in the process of power supplying an electric vehicle;
- allows the acquisition of data and/or testing of a conductive charging system regardless of the involved equipment and/or system in the acquisition and/or testing purposes;
- it is easily to be attached and used in automated (assisted and/or autonomous) acquisition and/or testing systems.

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Motion control system

Patent Application No. A 00397/2021, EP 21464003.9

Toader Eusebiu, Milici Mariana Rodica, Pavăl Mihaela, Nițan Ilie,
Bejenar Ciprian, Ungureanu Constantin,
Lupu Elena Daniela

C

The motion control system according to the invention consists mainly of a mobile system consisting of two motors which are fed simultaneously or separately, the braking being carried out by means of two nitinol springs, which once fed act on the system braking.

The movement of the mobile system is controlled by means of a joystick 5, and a braking system consisting of two nitinol springs 6 and 6' (powered by a battery provided with a charging system), which operates two clogs 9 and 9'.

The braking system is controlled by a microcontroller 12 and a relay module 13, the response speed of the braking system being improved by the use of a fan 14.

The travel controls are made with the help of a joystick 5 with five possibilities of operation (forward, reverse, left, right, braking).

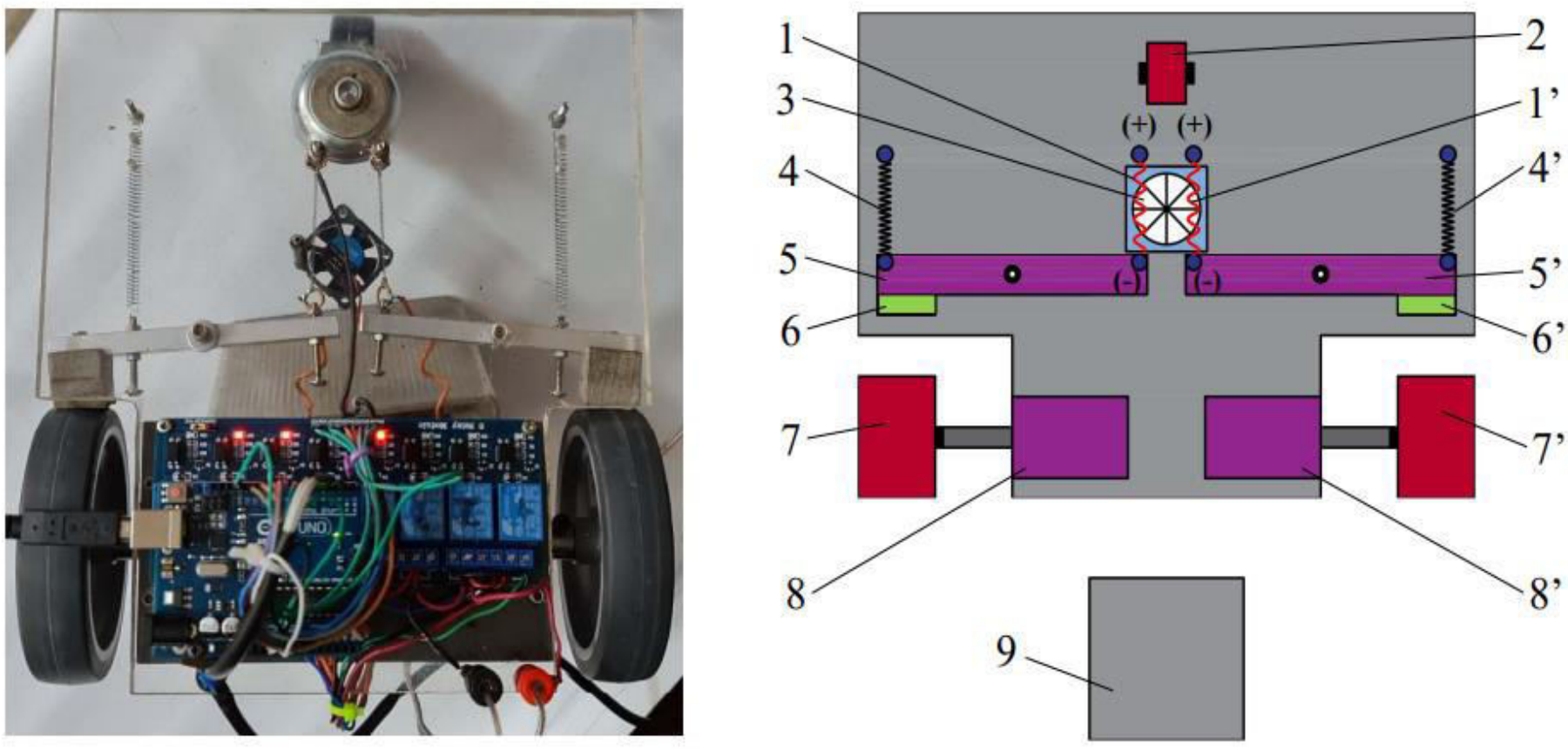

Fig. 1. Top view (left) and constructive detail of the experimental model:
1, 1' - Nitinol springs; 2 – wheel; 3 – fan; 4, 4' – springs; 5, 5' – levers; 6, 6' – clogs;
7, 7' - drive wheels; 8, 8' – DC motors; 9 – joystick.

Advantages:

- Immediate execution of orders.
- Constructive simplicity.
- High reliability.
- Reduced volume.

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Method for integrating real life assets in to the metaverse with real-time database security

Patent no. OSIM A / 00100 / 25.02.2022

Author: Andrei CRIȘAN

The proposed method relies on a digital model (of an existing monument) to serve two main purposes

Scope 1: BIM (Architecture, Engineering, Construction, …, Conservation)

Scope 2: Metaverse (Real-time interaction

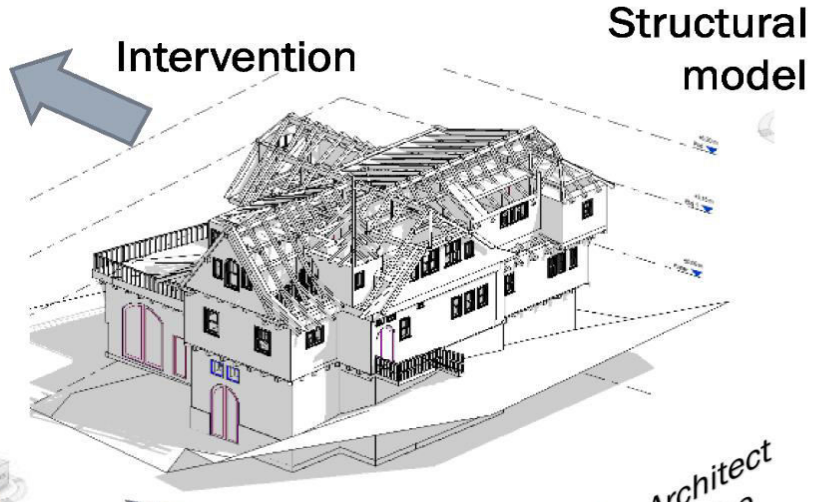
The BIM scope is aimed to

- Get the current state of the monument
- Use as basis for engineering studies (interventions)
- Future interventions will become an additional layer into the digital twin
- The model shall be protected using blockchain

The Metaverse scope

- Get a 3D replica of a castle to use in the metaverse
- Objects within the castle walls (in the market, in the rooms, …) will be accessible to users to view/interact/buy (via NFT / blockchain)
- Part of the fees will be given to the castle owner for castle maintenance, and repairs
- Specific rooms would be accessible for meetings (free or fee)









A creator with his NFT in the castle market





An original, signed NFT from the castle owner





The NFT buyer

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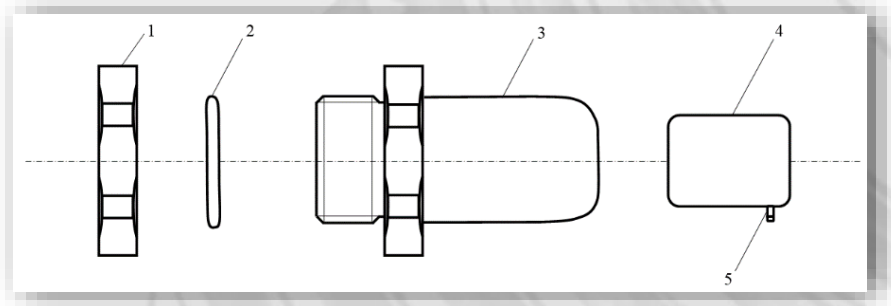
Metal gland for large diameter electrical cables

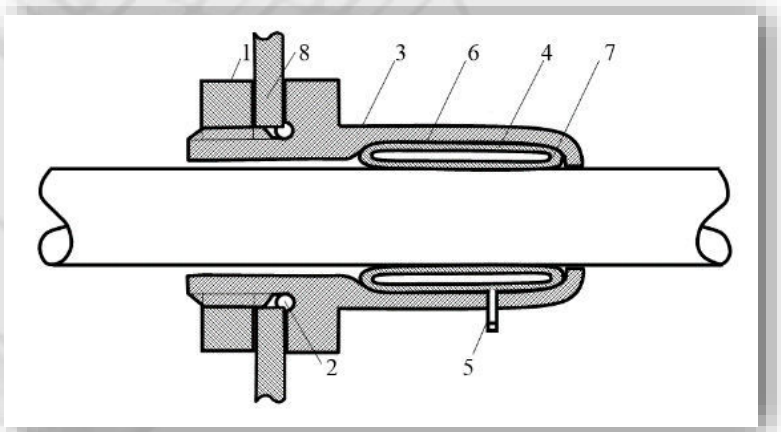
Patent *No.A/00303/30.07.2018*

Authors: Dan Ciortea, Gabriel Nicolae Popa

C

The invention relates to a single-body metal gland intended for sealing large-diameter cables or metal pipes when passing them through the wall of an enclosure. The gland consists of the metal body, the toroidal chamber with a filling-emptying valve, the rubber gasket and the locking nut. In the body of the gland is a rubber chamber with a valve. The rubber chamber with the valve is the sealing element between the outer surface of the electric cable and the inner surface of the gland body. An inert gel is inserted under pressure into the rubber chamber which inflates the toroidal chamber to its maximum contact with the outer surface of the cable or pipe. The deformation of the toroidal chamber allows perfect sealing regardless of the geometry of the large section of electric cable. The gland can have various fields of use: transport, distribution and use of electricity; the electrical machine and plant construction industry; - metal drive cabinets.





a. b.

Fig.1. a. The gland components for large diameter electrical cables; b. Longitudinal section by the gland after sealing a large diameter electric cable.

The metal gland has the following advantages: it is simple (only four components); it has a low-cost price; it adapts well to irregular surfaces; it is reliable in operation; the sealing process of the cable/pipe is performed in a very short time; the amount of air initially existing in the toroidal chamber acts as a buffer element and allows for maintaining the contact pressure between the toroidal chamber and the outer insulation.

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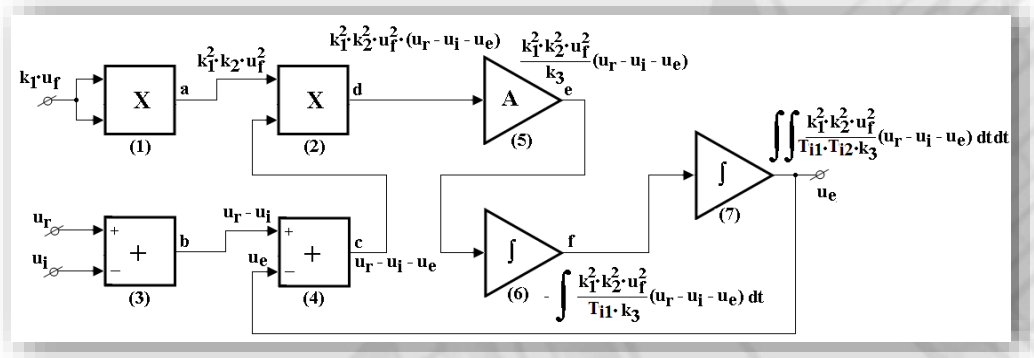
DC linear voltage-sinusoidal signal converter with adjustable frequency

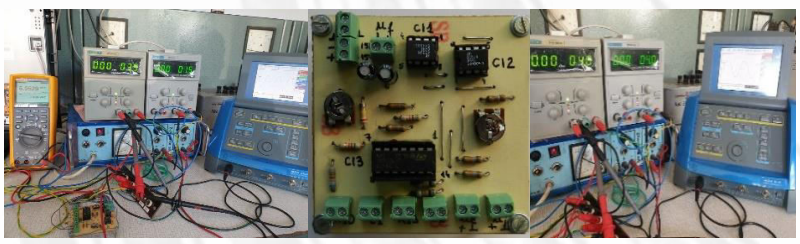
***Patent** No. 130458/30.05.2022*

Authors: Gabriel Nicolae Popa, Iosif Popa, Sorin Ioan Deaconu

C

The DC linear voltage-sinusoidal signal converter with adjustable frequency provides a periodic sinusoidal signal at the output that depends on the DC voltages applied on two inputs: a DC voltage is applied to one of the inputs, which linearly modifies the frequency of the output signal, and on the other of the inputs applies a DC voltage which linearly changes the amplitude of the signal from the output of the converter. The DC linear voltage-sinusoidal signal variable frequency converter comprises seven functional blocks: two analogue multiplication circuits, two analogue difference circuits, one non-inverting amplifier and two integrated circuits.





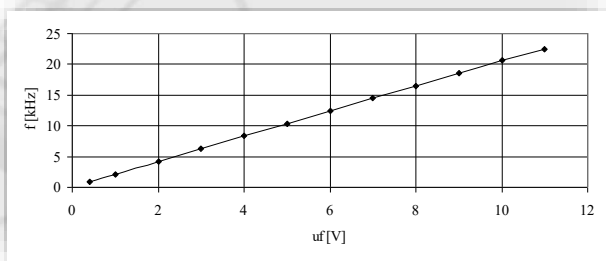


Fig.1. Block diagram of DC linear voltage-sinusoidal signal variable frequency converter and the prototype during experiments

Fig.2. The sinusoidal signal from the output converter, the frequency depending on u_f and the output peak to peak voltage depending on u_i

The DC linear voltage-sinusoidal signal converter with adjustable frequency has the following advantages: has a simple design (requires only three integrated circuits and a few resistors and capacitors); has two DC voltage inputs and one output; has a sinusoidal signal at the output which depends linearly on the DC voltage applied to input; the magnitude of the output signal can change linearly depending on the DC voltage applied to the other input; response time is very low due to analogue components; the output frequency is in the range of kHz, and the band width can be tens of kHz (this circuit can be used for remote signal transmission).

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Universitatea Politehnica Timișoara 2020

Experimental stand with two Arduino modules for serial data transmission - temperature measurement

Laboratory project

Authors: Gabriel Nicolae Popa, Corina Maria Diniș

C

The experimental stand contains an Arduino Nano module, an Arduino Uno, a 2x16 LCD shield (connected to the Arduino Uno to display the measured value), a DS 18B20 digital temperature sensor (connected to the Arduino Nano), and two serial transmission warning LEDs (each connected to one Arduino module at a time).
With the help of the stand, three variants of serial communication between Arduino modules can be checked: Rx-Tx communication (standard communication); communication without dedicated pins (soft serial); I2C communication.

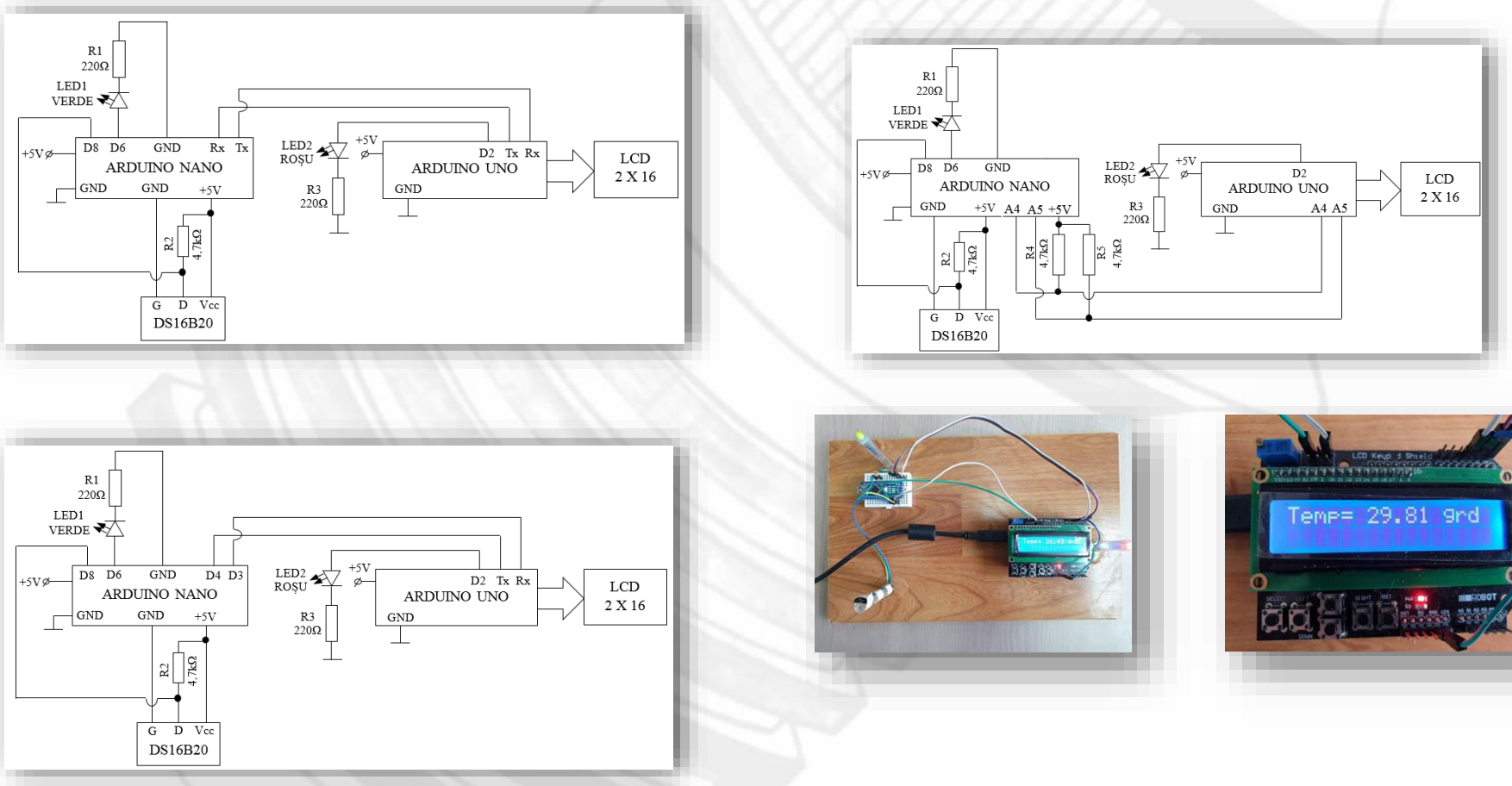

Fig.1. Experimental stand for serial data transmission: electrical diagrams (Rx-Tx communication; communication without dedicated pins (soft serial); I2C communication) and stand views

The Arduino Nano transmits the temperature values, measured with the DS18B20 digital sensor, to an Arduino Uno to which an LCD shield is connected to which the measured temperature value is displayed (with two decimal places). For the three types of serial communications, separate programs have been created for each Arduino.

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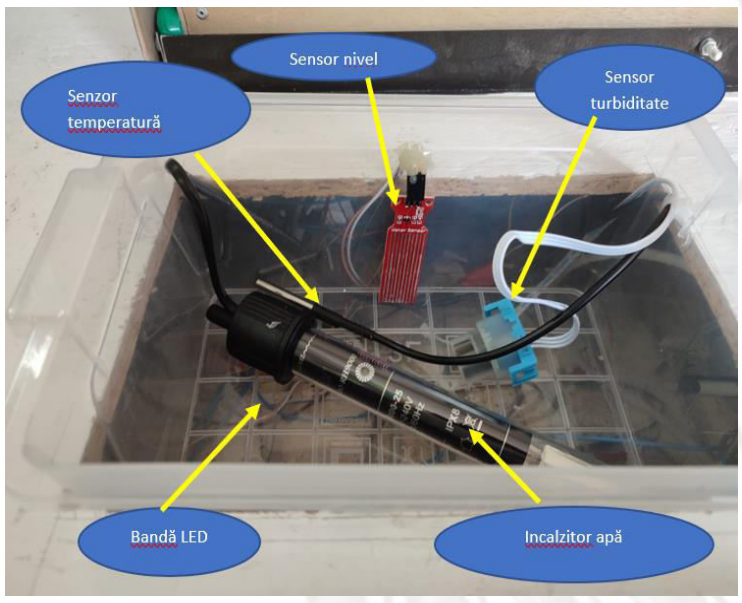
Sensors Monitoring and Data Logging

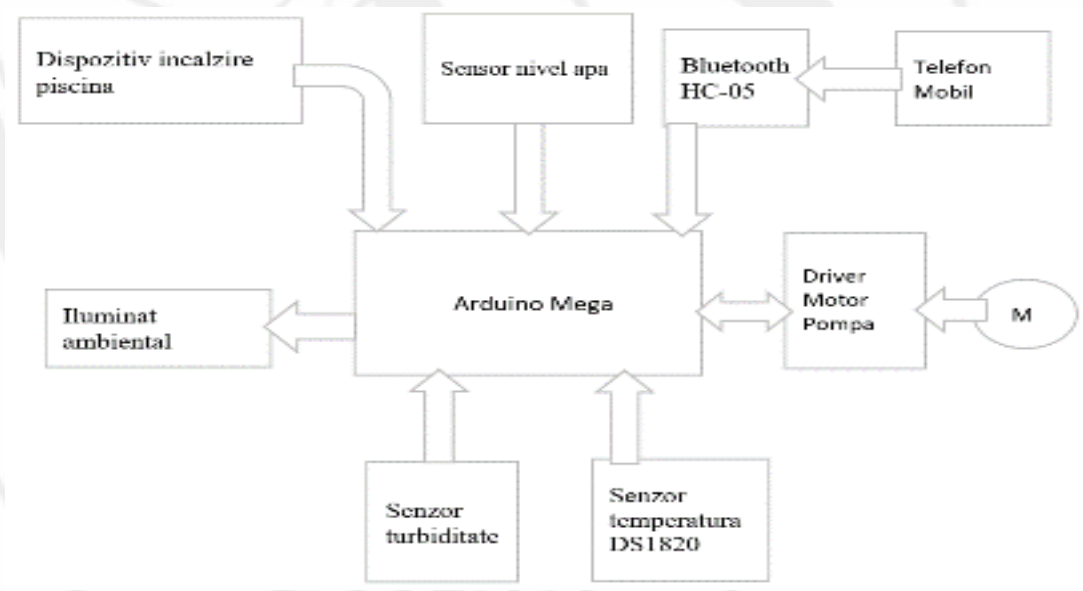
Project

Author: Raluca ROB

C

Sistemul de senzori este montat pe o machetă de tip Smart home. Controlerul folosit achiziționează datele de la senzori, le prelucrează, le afișează în timp real, le stochează și le transmite către dispozitive externe conectate cu controlerul prin bluetooth sau rețea wi-fi locală. Prin comandă vocală se poate controla funcționarea unei pompe care umple





cu apă o piscină. Macheta este echipată cu senzor de temperatură și umiditate aer, senzori de temperatură apă piscină, turbiditate apă, nivel apă. Macheta dispune de un garaj echipat cu sistem de iluminat automat cu senzori de proximitate și ușă acționată electric.



Proposed system is able to monitor a series of sensors connected to a digital controller programmed for measuring the air temperature and humidity, the ambient lighting and also for commanding different actuators: a water pump using level sensor, a dc motor for a sliding door. The application permits the acquiring, monitoring and logging data onto a local device connected to the controller via bluetooth or wi-fi.

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UNIVERSITATEA TEHNICĂ A MOLDOVEI

Contactless strain measurement sensor based on amorphous ferromagnetic microwires

Senzor fără contact de măsurare a deformării pe bază de microfire feromagnetice amorfe

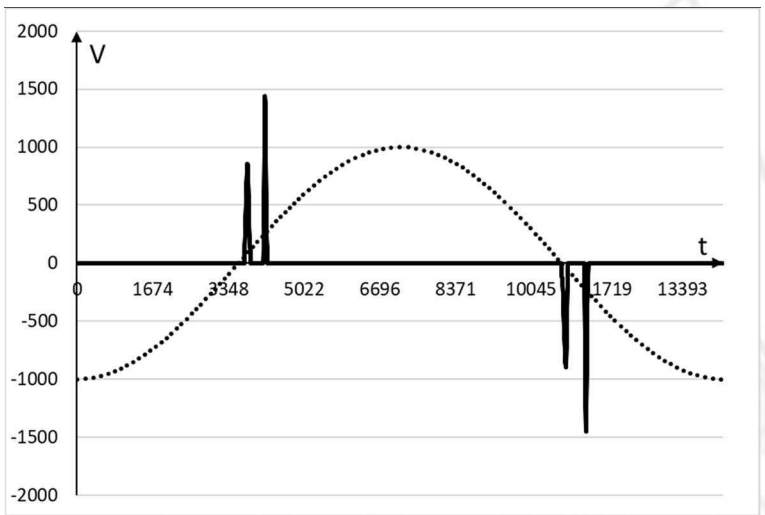
C

PS PROJECT no: 20.80009.5007.08.

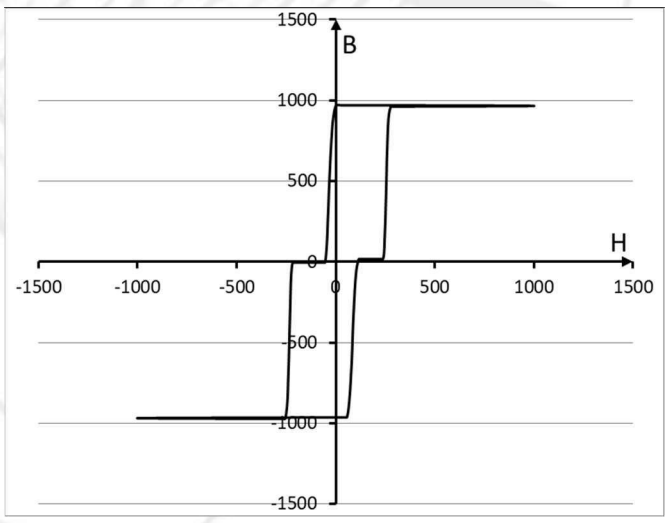
Patent application no.: a 20220020. Filed: 19.04.2022.

Author/s: Sergiu Zaporojan, Vladimir Larin, Vasile Tronciu, Eugeniu Munteanu, Victor Pavel, Lilian Chicu

Senzorul fără contact de măsurare a deformării este format din cel puțin două segmente de microfire feromagnetice amorfe – un fir sensibil și cel puțin un fir de referință, montate pe un corp solid. La aplicarea unui câmp magnetic alternativ senzorul răspunde cu impulsuri induse la remagnetizarea microfirelor. Aria buclei de histerezis și forța coercitivă a microfirului sensibil cu magnetostricție pozitivă ridicată cresc odată cu deformația la întindere. Parametrii microfirului de referință nu depind de deformație. Prin compararea caracteristicilor magnetice ale buclelor de histerezis se determină mărimea deformației. Senzorul poate fi aplicat în monitorizarea inteligentă a stării corpurilor/echipamentelor supuse solicitărilor mecanice.



Magnetic response of the sensor



Hysteresis loop during remagnetization

The contactless strain sensor consists of at least two segments of amorphous ferromagnetic microwires – a sensitive wire and at least one reference wire, mounted on a solid body. When an alternating magnetic field is applied, the sensor responds with impulses induced at the remagnetization. The hysteresis loop and coercive force of sensitive microwire with high positive magnetostriction increase with tensile strain. The parameters of reference microwire do not depend on the deformation. Comparing the magnetic characteristics of the hysteresis loops, the magnitude of deformation is determined. The sensor can be applied in condition-based monitoring of bodies/equipment subjected to mechanical stress.

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FLEXIBLE MANUFACTURING LINES
LINII FLEXIBILE DE FABRICAȚIE

ISBN: 978-606-554-140-5

Author: Tirian Gelu-Ovidiu

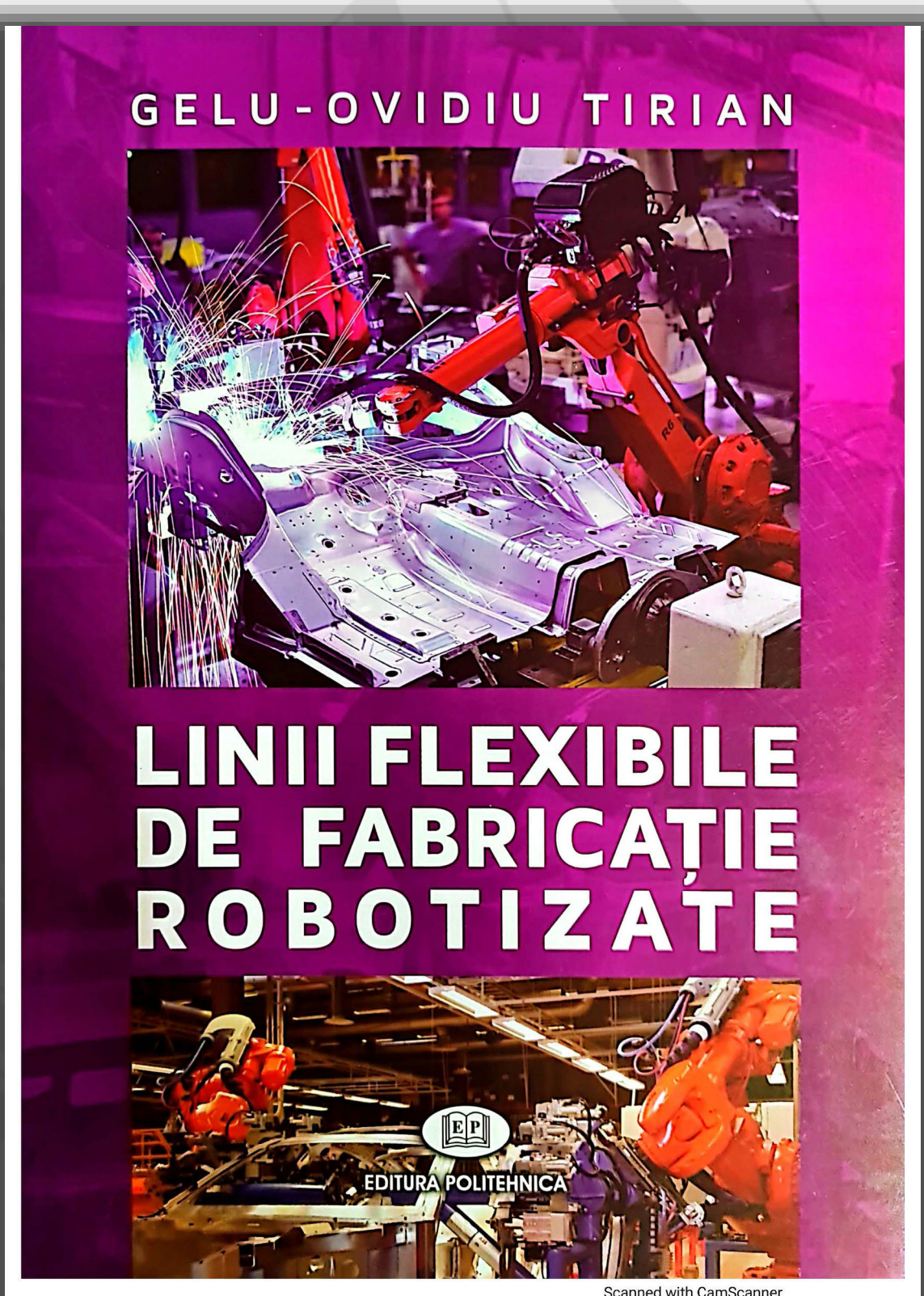
C

The production of natural goods has been the most constant preoccupation of people since antiquity and until now. Over time it evolved and became a permanent and organized activity that helped to satisfy the growing needs of people. The production of goods will continue, but there will be profound changes that are no longer compatible with the current production concepts and methods.

The significant development of production systems took place in a relatively short period, in the last hundred years. During this period, the production systems evolved to be able to face the changes in the economic environment.

The production process is fragmented into peace processes, phases, operations, specializing. In this context, the role of machines and equipment becomes predominant, and the role of man is greatly reduced, with only management and execution attributions returning to him. It thus increases the role of creativity, intelligence and spontaneity. It thus increases the role of creativity, intelligence and spontaneity.

The main problem of the new, more developed (advanced) systems is to respond to these needs in terms of efficiency and minimal response time. The establishment of advanced production systems was achieved only in strong economies. From the experience accumulated until now, the conclusion emerges that the main advantage of the new production structures is their almost total adaptability to changes in the economic environment. Many times there are similar products on the market but based on completely different production processes.



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Contact: ovidiu.tirian@fih.upt.ro

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ASOCIAȚIA Justin Capră

Dronă cu propulsie ionică

AUTOR: ARGHIRESCU Marius
E-mail: maris3a@yahoo.com

C

BREVET: RO134599 B1

Drona are un profil aerodinamic (**A**) în formă de delta din material metalic ușor sau compozit metalizat, cu două aripi (**w, w'**), o coadă (**C**) și o parte tip clopot (**P**) dispusă central și având o carcasă (**1**) metalizată și o bobină Tesla (**2**) de înaltă tensiune necesară încărcării electrice a carcasei (**1**), pe partea superioară de spate a profilului aerodinamic (**A**) fiind fixate prin izolatori electrici (**i**) două rețele (**R, R'**) electroconductive din plasă metalică, pentru atragerea electrostatică a ionilor pozitivi generați la nivelul clopotului (**P**) având în interior două părți rotative superioară (**5**) și inferioară (**6**) contrarotite ale unui motor (**M, M'**) magnetic sau magnetoelectric a cărui parte rotativă superioară (**5**) este prelungită marginal cu magneți rotorici (**7**) plați, partea rotativă inferioară (**6**) fiind prelungită marginal cu două coroane conductoare (**8a, 8b**) subțiri, preferabil- supraconductoare, formând un generator homopolar (**G**) împreună cu magneții (**7**) și cu un magnet inelar (**11**) subțire fixat de placa inferioară (**1c**) a clopotului (**P**), pe o placă-suport intermediară (**12**) fiind fixat un transformator inelar (**13**) ridicător de tensiune în jurul căruia se dispun părțile electronice ale unui invertor (**14**) tip cc-ac sau cc-cc pulsatoriu, deasupra acestui ansamblu fiind fixată o placă-suport finală (**17**) pe care se fixează un distribuitor (**18**) de curent electric conectat la blocul de alimentare și comandă (**19**) al unui generator de microunde (**20**) cu clistron (**h**) și pâlnie (**k**) tip antenă-horn dispus central și al unor lasere (**21**) dispuse circular în jurul acestuia, necesare ionizării aerului și respingerii electrice pulsatorii a ionilor formați sub profilul aerodinamic (**A**).

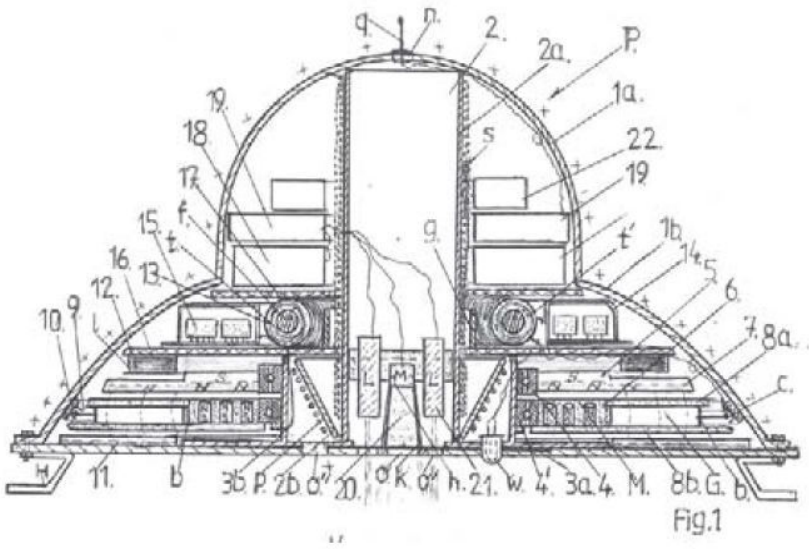


Fig.1

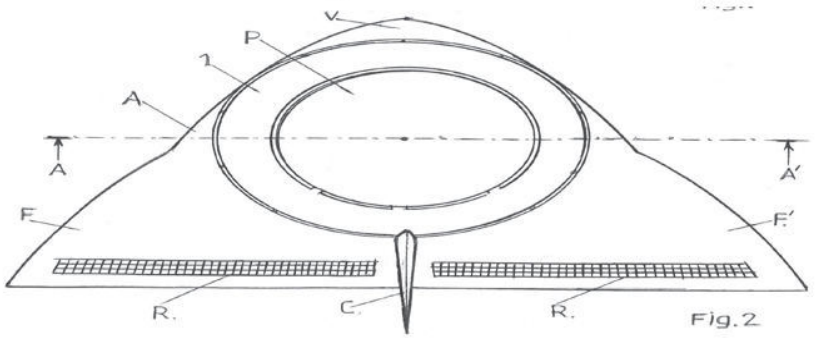


Fig.2

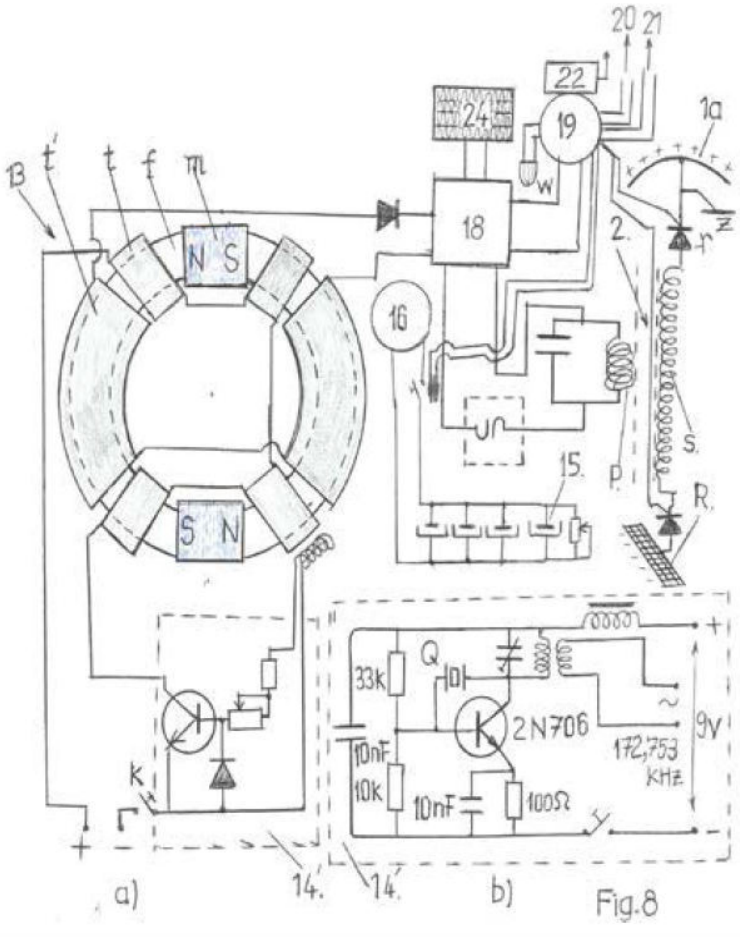


Fig.8

Parallel Parking upgrade for Arduino Bluetooth Car

Student Project

Author: Birtok Eugen
Coordinator: Rob Raluca

C

This project present some improvements to the Arduino Bluetooth Car project, a 4x4-powered robot that moves commanded and controlled by an Android application and programmed on the open-source MIT App Inventor platform.

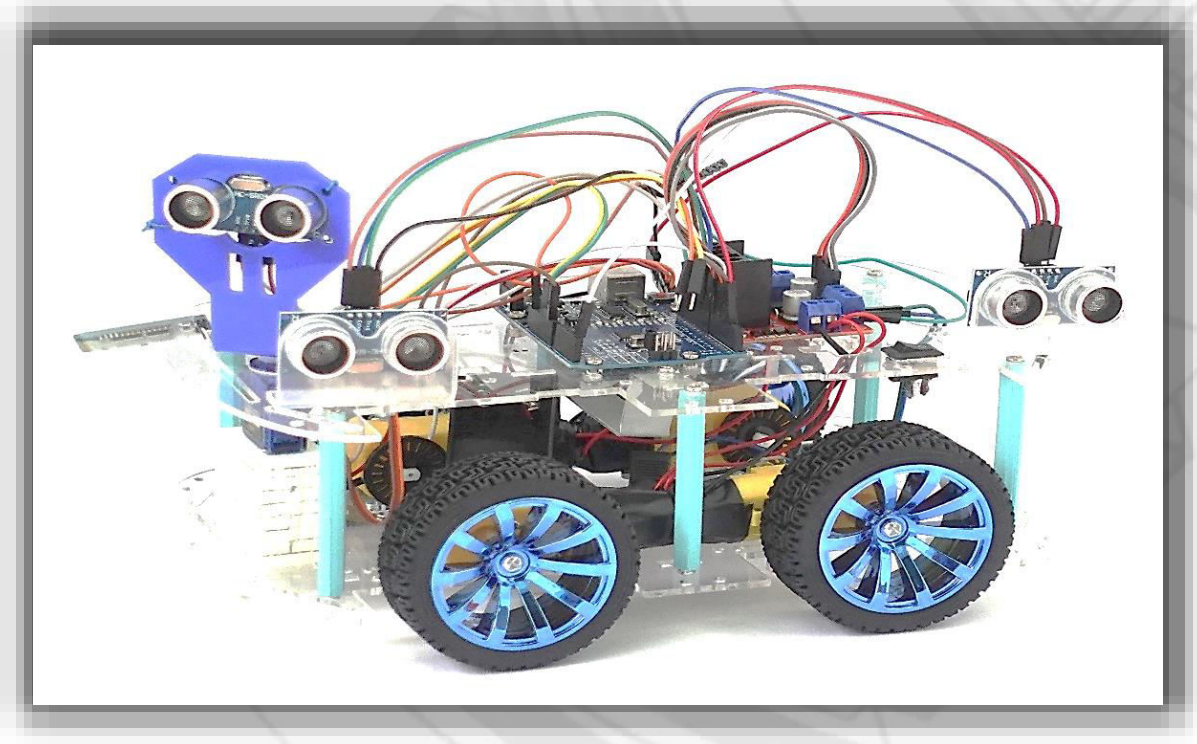
In the construction of this car were necesarry the following parts:
- Arduino Uno development board
- Driver for L298N integrated circuit motors connects to Arduino digital pins.
- HC-05 bluetooth module
- Ultrasonic sensor HC-SR04 (to avoid obstacles and parallel parking)
- SG90 servomotor (for sensor movement at a certain angle)
- DC 12V Battery Pack 3000mAh Rechargeable Lithium Battery Pack
- 65 mm Rubber Wheel RC Model Tires

Description of the Arduino program

A function has been programmed for each order. Thus, the *Forward () function* sends appropriate logic levels to the input pins in the driver, so that the wheels allow forward movement. To enable communication with the bluetooth module, the *#include <SoftwareSerial.h>* directive in the source code includes retrieving information about the bluetooth transmission in a *switch () structure*. The novelty consists in the implementation of two functions of modifying the engine speed. For parallel parking I make a function Parking.

Android app description

MIT App Inventor is an open-source web application developed by Google that allows you to create programs for two types of operating systems: Android and iOS. The platform uses a graphical user interface similar to the Scratch programming language, in which the programmer can create objects by drag-and-drop. Following the compilation, an application is created that can be transferred to the mobile device.







HC-SR04 ultrasonic distance sensor

This is the HC-SR04 ultrasonic distance sensor. This economical sensor provides 2cm to 400cm of non-contact measurement functionality with a ranging accuracy that can reach up to 3mm. Each HC-SR04 module includes an ultrasonic transmitter, a receiver and a control circuit. There are only four pins that you need to worry about on the HC-SR04: VCC (Power), Trig (Trigger), Echo (Receive), and GND (Ground). You will find this sensor very easy to set up and use for your next range-finding project!

This sensor has additional control circuitry that can prevent inconsistent "bouncy" data depending on the application.

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PLANNING PROCEDURE BASED ON AN ALGORITHM FOR OPTIMAL TASK DIVISION

PROCEDEU DE PLANIFICARE BAZAT PE UN ALGORITM DE DIVIZARE OPTIMĂ A SARCINILOR DE LUCRU

1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A/00168/2019, prototype
Andreea Cristina IONICĂ,
Monica LEBA, Raluca Anamaria DOVLEAC

Category
C

The invention refers to the development of an algorithm that allows the automatic distribution of work tasks in stages of development using an indicator called Offset, and is based on an iterative development cycle.

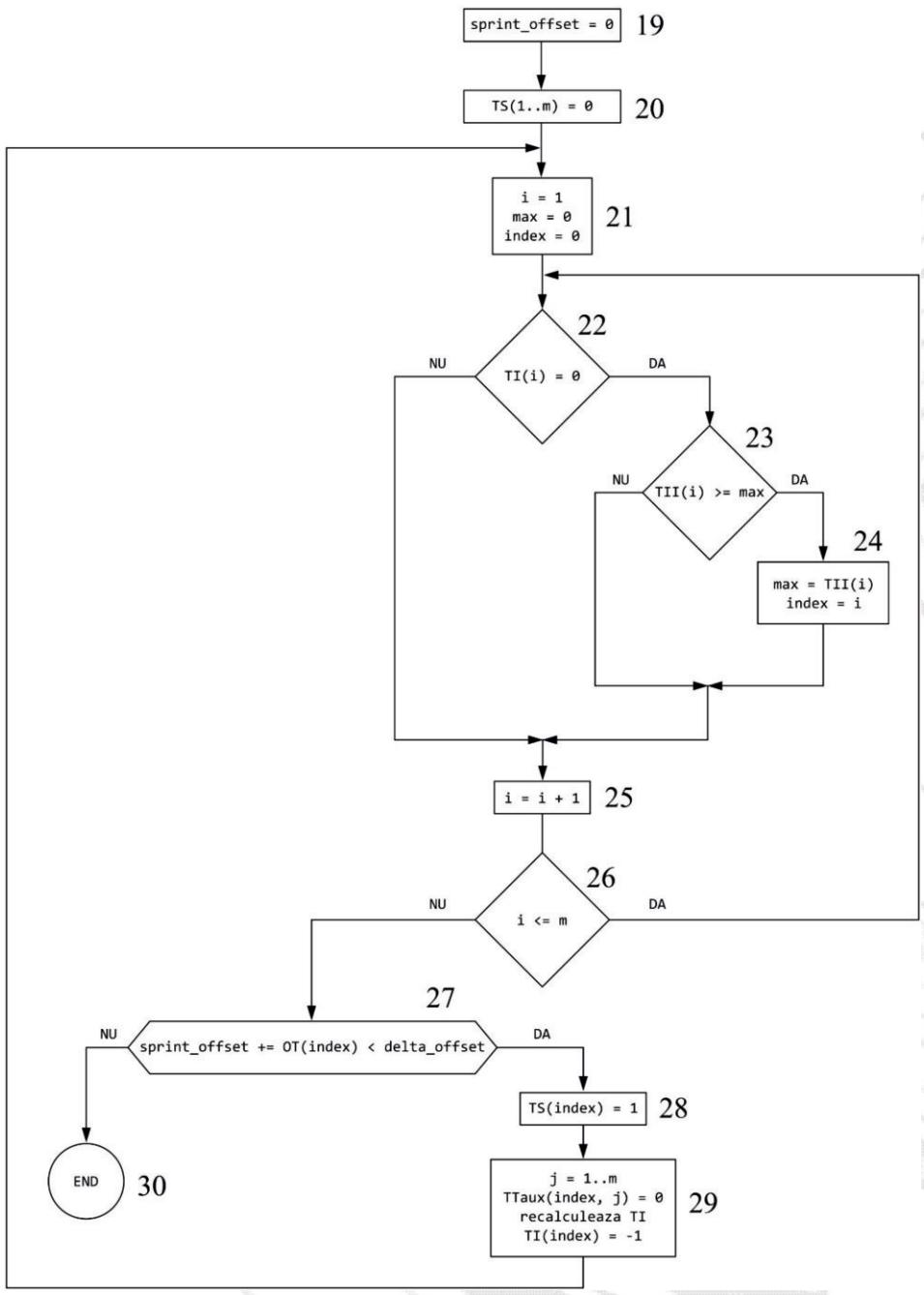

Figure 1. Algorithm

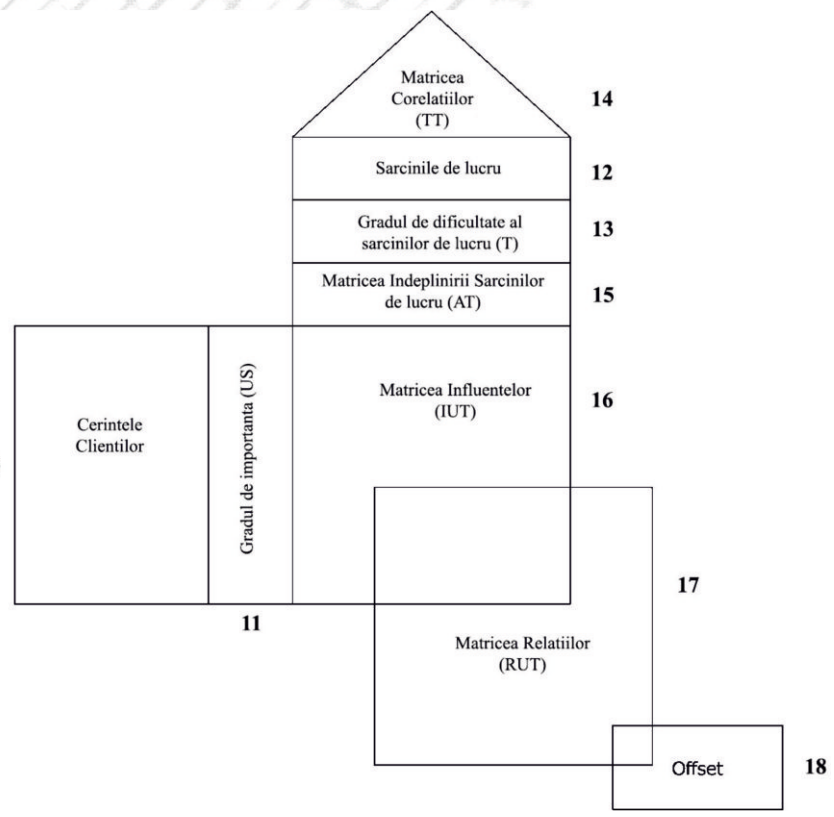

Figure 2. Modified QFD

Invenția se referă la dezvoltarea unui algoritm care permite distribuirea automată a sarcinilor de lucru în stadii de dezvoltare folosind un indicator numit Offset, și se bazează pe un ciclu de dezvoltare iterativ.

Asociația de Cercetare Doctorală Petroșani

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UNDERGROUND POSITIONING AND MONITORING SYSTEM BASED ON VISIBLE LIGHT COMMUNICATION TECHNOLOGY

SISTEM DE POZITIONARE ȘI MONITORIZAREA PERSONALULUI DIN SUBTERAN BAZAT PE TECHNOLOGIA DE COMUNICAȚIE ÎN SPAȚIUL DE LUMINĂ VIZIBILĂ

1948

UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00491/2.07.2018, prototype

Simona Mirela RÎUREAN,
Monica LEBA, Andreea Cristina IONICĂ

Category
C

The invention aims to determine the position of the personnel in the underground spaces. The communication is done through a transmission-reception system that uses the visible light of the miner's cap lamp LED.



Invenţia urmăreşte determinarea poziţiei personalului în spaţiile subterane. Comunicarea se face printr-un sistem de transmisie-recepție care folosește lumina vizibilă a LED-ului lămpii capac a minerului.

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METHOD AND ALGORITHM FOR ANTICIPATIVE AUTOMATIC PROTECTION AGAINST OVERCURRENTS IN ELECTRIC INSTALLATIONS

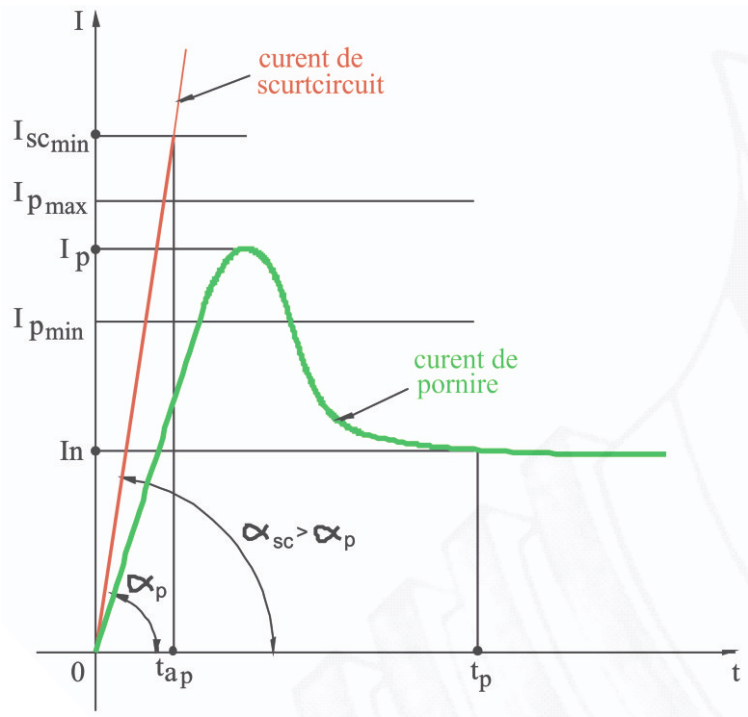
METODĂ ŞI ALGORITM DE PROTECŢIE AUTOMATĂ, ANTICIPATIVĂ, ÎMPOTRIVA SUPRACURENŢILOR DIN INSTALAŢIILE ELECTRICE

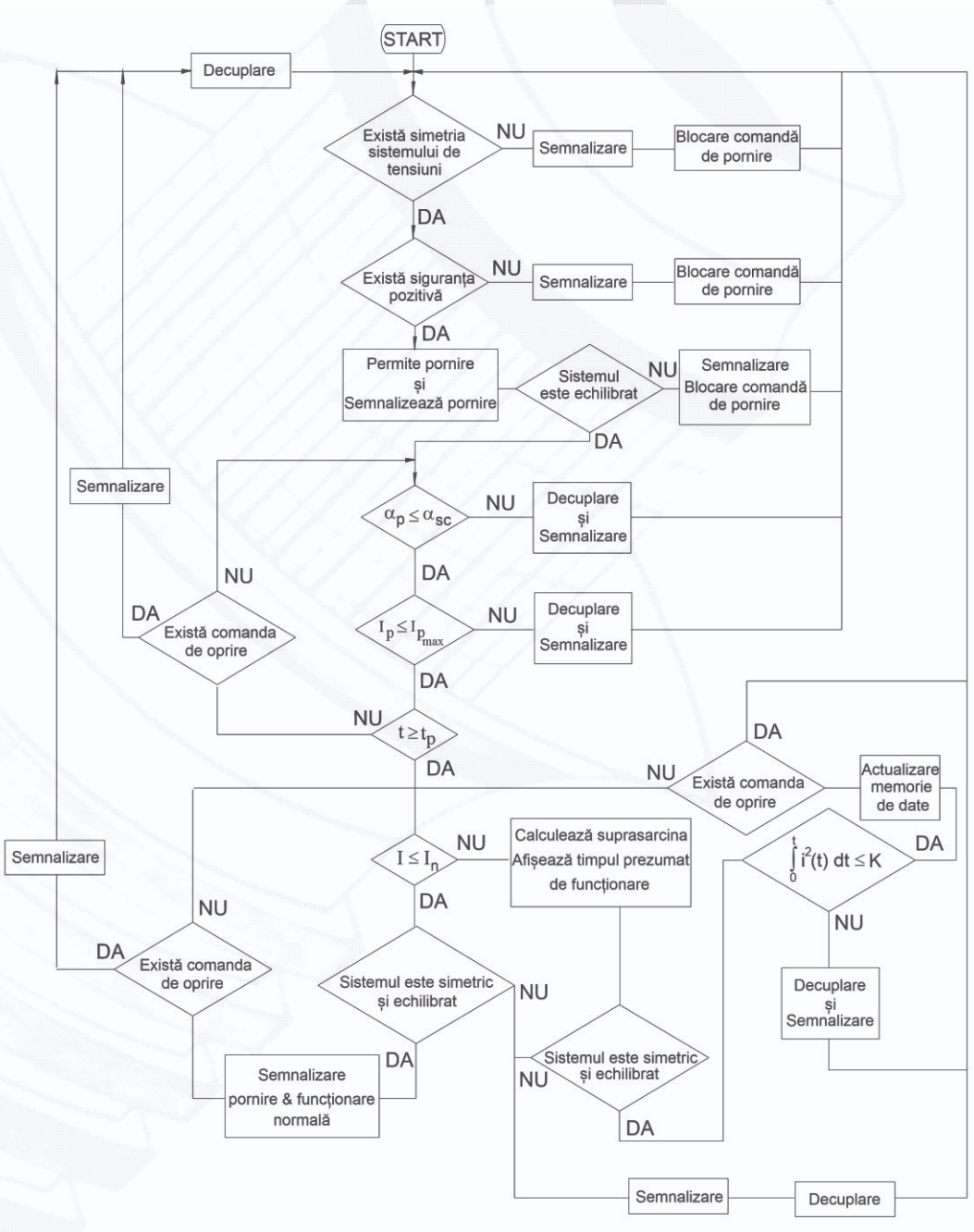
1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A/00246/07.04.2016, concept
Carol ZOLLER,
Dragoș PĂSCULESCU, Gheorghe MARC, Remus DOBRA

Category
C

The invention has as objective a method, respectively an automatic, anticipatory protection algorithm against over-currents, which can be used in electrical installations of any type.





Invenţia are ca obiectiv o metodă, respectiv un algoritm automat, anticipator de protecţie împotriva supracurenţilor, care poate fi utilizat în instalaţiile electrice de orice tip.

Asociația de Cercetare Doctorală Petroșani

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METHOD FOR OPERATIVE CONTROL OF SYMMETRICAL COMPONENTS OF THREE-PHASE ELECTRICITY SYSTEMS

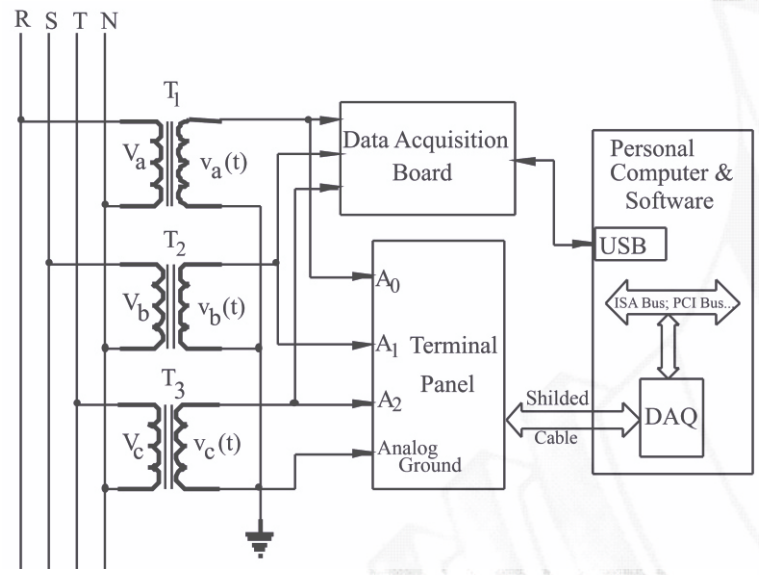
METODĂ DE CONTROL OPERATIV A COMPONENTELOR SIMETRICE DIN SISTEMELE ELECTROENERGETICE TRIFAZATE

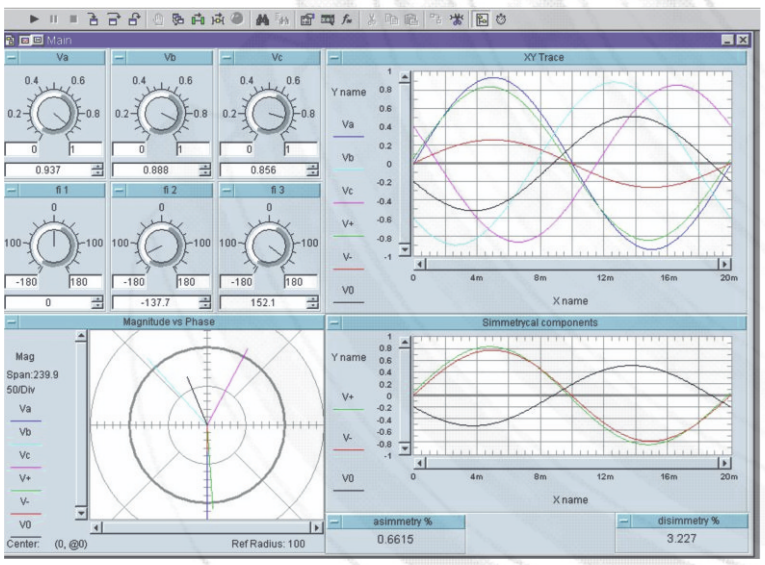
1948 UNIVERSITATEA DIN PETROȘANI

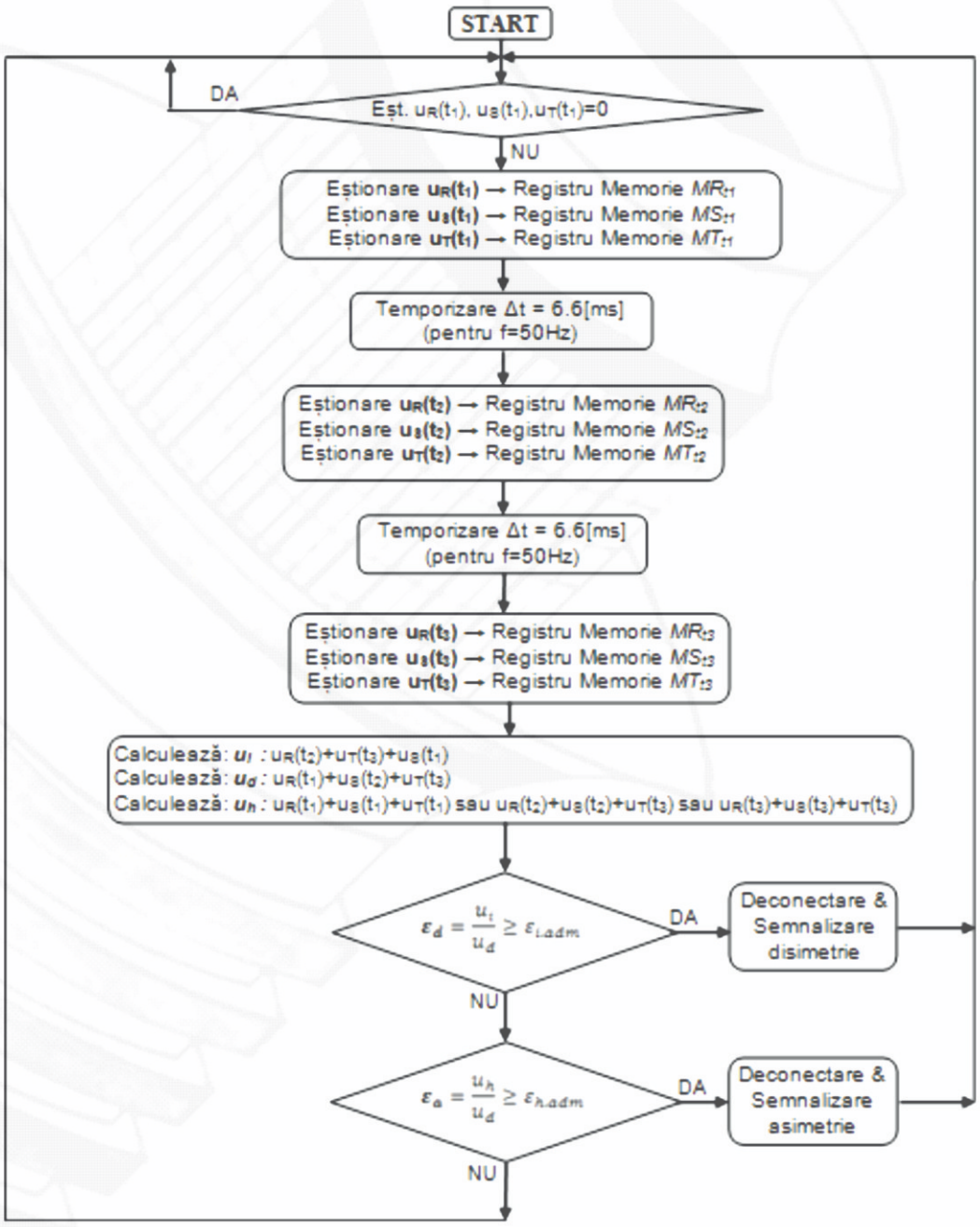
Patent number: OSIM 130884/2017, concept
Carol ZOLLER,
Sorina COSTINAȘ, Remus DOBRA, Gheorghe MARC, Dragoș PĂSCULESCU

Category
C

The invention relates to a method of operative control of symmetrical voltage (or current) components in three-phase sinusoidal power systems.







Invenţia se referă la o metodă de control operativ al componentelor simetrice de tensiune (sau curent) în sistemele de putere trifazate sinusoidale.

Asociația de Cercetare Doctorală Petroșani

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COLLABORATIVE MIND SENTINELS

1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Remus Constantin SIBIȘANU, Monica LEBA

Category
C

The system uses artificial intelligence to manage various terrestrial, aerial and submarine robots, which can be used to collect information from the environment, to collaborate, to transmit information and to learn together. The developed system is useful in applications for exploring unknown areas, search and rescue applications, in agriculture, as well as in alternative communication systems.



Sistemul folosește inteligență artificială pentru a gestiona diferiți roboți tereștri, aerieni și submarini, care pot fi utilizați pentru a colecta informații din mediu, pentru colaborare, transmitere de informații și pentru a învăța împreună. Sistemul dezvoltat este util în aplicații de explorare a zonelor necunoscute, aplicații de tip search and rescue, în agricultură, precum și în sistemele de comunicații alternative celor clasice.

Asociația de Cercetare Doctorală Petroșani

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PROGRAMMABLE BLOCK FOR SHEARER AND CONVEYOR CONTROL IN EXPLOSION-PRONE MINES

BLOC PROGRAMABIL PENTRU COMANDA COMBINEI ȘI TRANSPORTORULUI DIN MINELE CU PERICOL DE EXPLOZIE

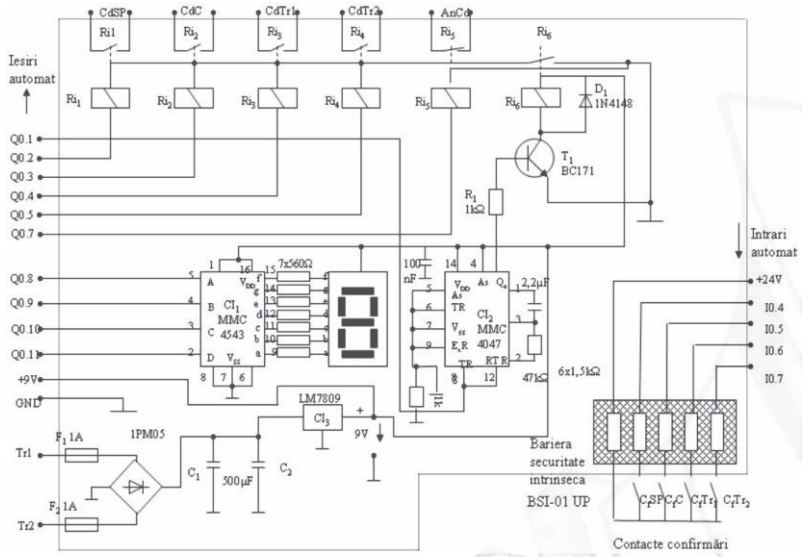
1948

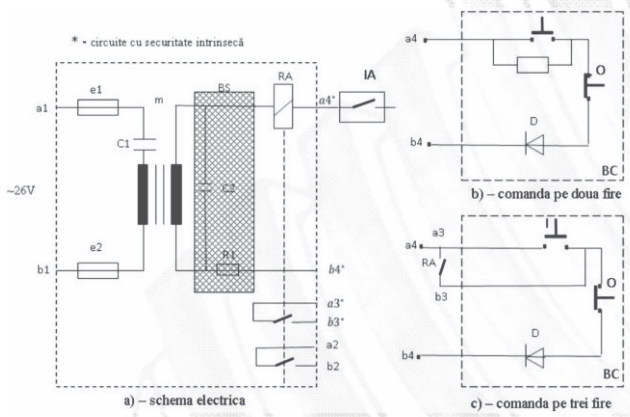
UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM 123641/2015, prototype
Titu NICULESCU,
Dragoș PĂSCULESCU, Florian Sorin RIDZI

Category
C

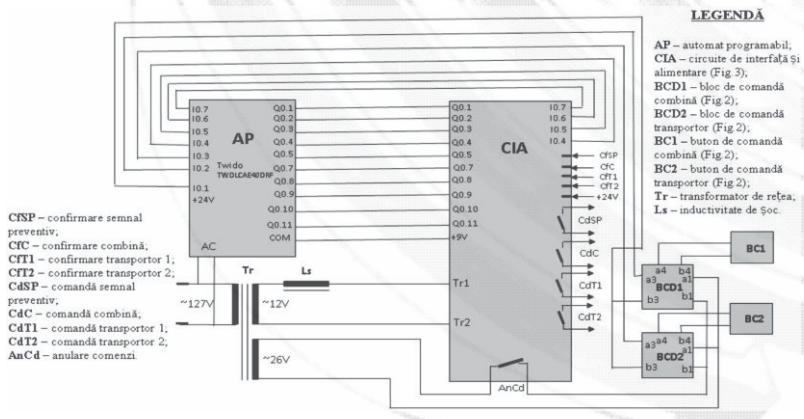
The invention relates to an electronic device with PLC, intended to control the exploitation and transportation processes in underground mining units with explosion hazard.





Legendă

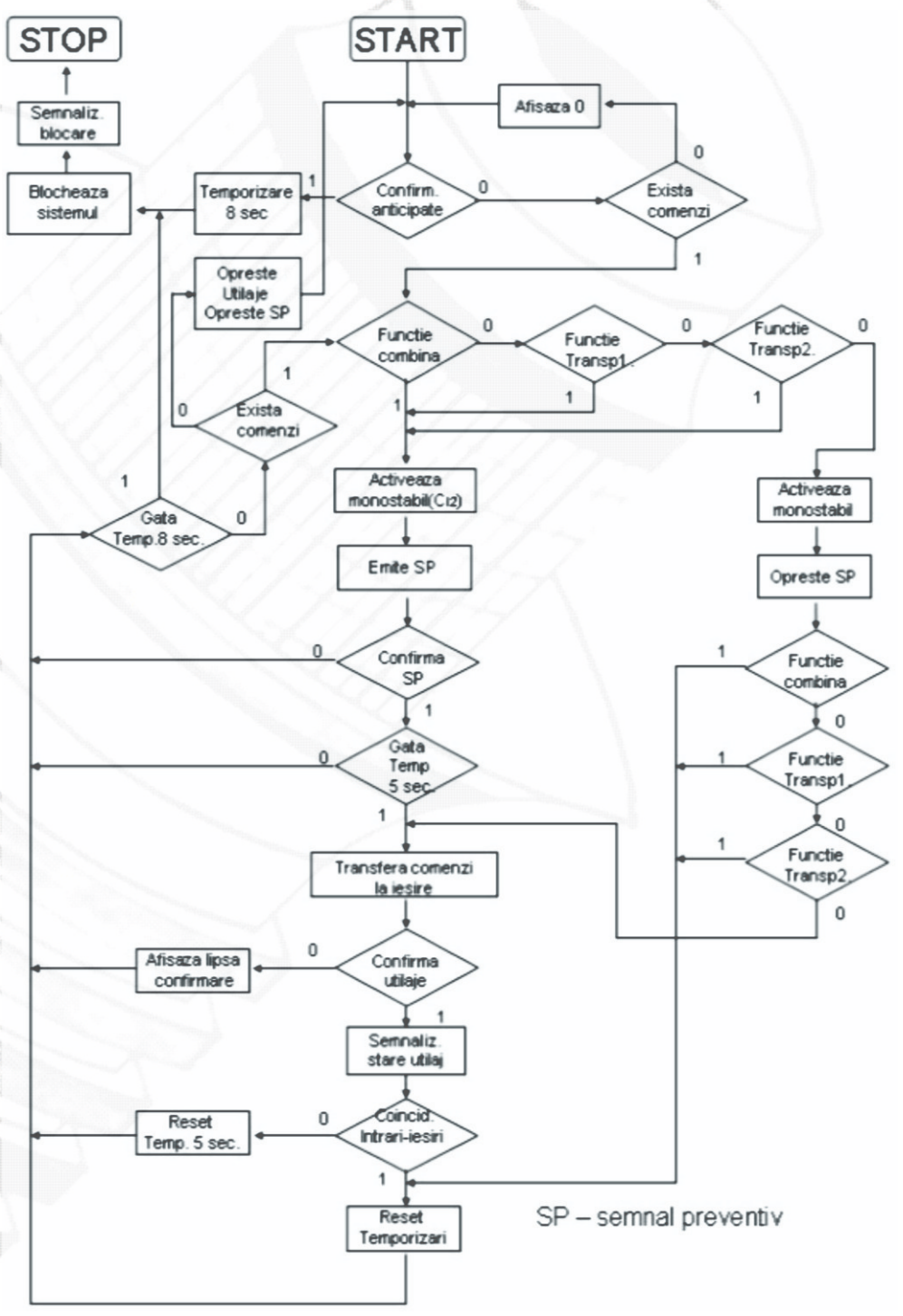
BC - buton de comandă;
I – buton de pornire;
O – buton de oprire;
R– rezistență de automenținere;
D – diodă cap de linie;
IA – contact de interblocaj cu transportorul din aval;
BS – barieră de securitate intrinsecă.



LEGENDĂ

AP – automat programabil;
CIA – circuite de interfață și alimentare (Fig 3);
BCD1 – bloc de comandă combină (Fig.2);
BCD2 – bloc de comandă transportor (Fig.2);
BC1 – buton de comandă combină (Fig.2);
BC2 – buton de comandă transportor (Fig.2);
Tr – transformator de rețea;
Ls – inductivitate de șoc.

CfSP – confirmare semnal preventiv;
CfC – confirmare combină;
CfT1 – confirmare transportor 1;
CfT2 – confirmare transportor 2;
CdSP – comandă semnal preventiv;
CdC – comandă combină;
CdT1 – comandă transportor 1;
CdT2 – comandă transportor 2;
AnCd – anulare comenzi.



Invenţia se referă la un dispozitiv electronic cu PLC, destinat controlului proceselor de exploatare şi transport în unităţile miniere subterane cu pericol de explozie.

Asociația de Cercetare Doctorală Petroșani

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PROGRAMMABLE BLOCK FOR DELAY-STAGE CONTROL OF CONVEYORS IN EXPLOSION-PRONE MINES

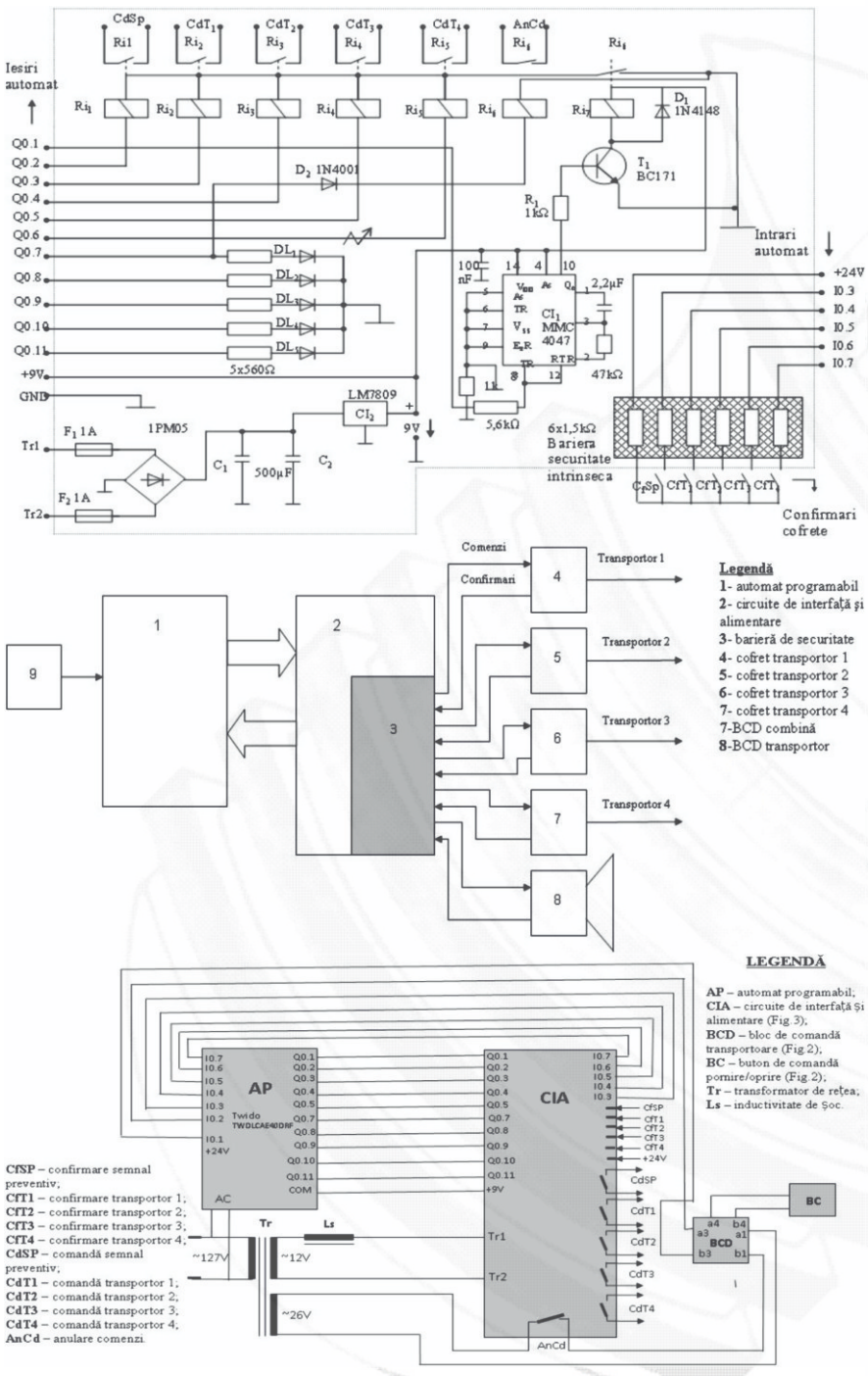
BLOC PROGRAMABIL PENTRU COMANDA ÎN TREPTE TEMPORIZATE A TRANSPORTOARELOR DIN MINELE CU PERICOL DE EXPLOZIE

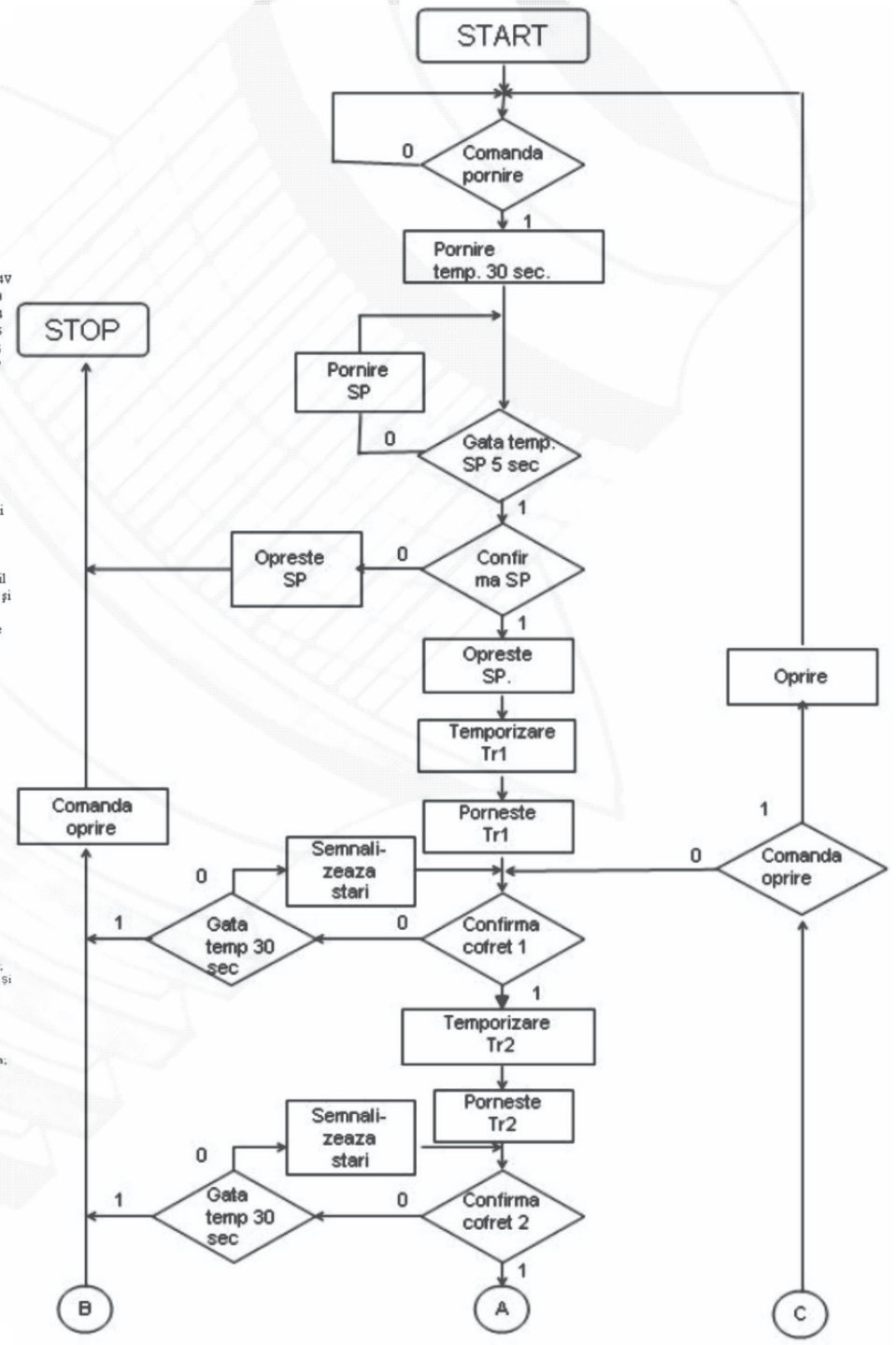
1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM 123640/2015, prototype
Dragoș PĂSCULESCU,
Titu NICULESCU, Florian Sorin RIDZI

Category C

An electronic device intended to organize the process of exploitation in explosion-prone mining operations, which controls four conveyors, in compliance with the starting order and safety rules specified.





Un dispozitiv electronic destinat organizării procesului de exploatare în operațiuni miniere predispuse la explozie, care controlează patru transportoare, cu respectarea ordinii de pornire și a regulilor de siguranță specificate.

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ALGORITHM BASED DEVELOPMENT OF PETRILA THEME PARK

1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Ionela SAMUIL,
Andreea Cristina IONICĂ, Monica LEBA

Category
C

In view of the functional reconversion of the Petrila mining perimeter, Jiu Valley, a study is developed on the creation of a theme park and the results support the idea that post-industrial tourism is a solution applicable to the area. For the successful development of tourism in an area it is necessary to obtain a positive attitude of the locals, which would increase the chances of success of the zonal reconversion project. In order to obtain the best results, it is necessary that the Petrila Theme Park be established on the basis of the destinations considered to be the most suitable for the buildings proposed for transformation, taking into account the location, positioning and function currently held. In this sense, we have developed and applied a selection algorithm with the help of which the future destinations are allocated for the existing buildings in the Petrila mining perimeter. Thus, obtaining the configuration of the Petrila Theme Park, its development is desired in a form of community-based tourism, a type of development that has often been cited as an alternative to mass tourism so that tourism becomes sustainable.

C 1 - DISPENSAR
- **D1** Spațiu expoziție/prezentare
- **D2** Cafeterie
- **D3** Magazin

C 2 – CLĂDIRE PRINCIPALĂ
- **D3** Magazin
- **D4** Spațiu entertainment
- **D5** Restaurant
- **D6** Cinematograf
- **D7** Muzeu

LEGENDĂ
COD CULOARE — SOLUȚIE
Destinație alocată
Destinație respinsă

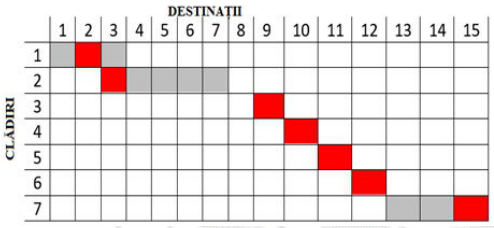
C 3 – CLĂDIRE LÂNGĂ MINA ȘCOALĂ
- **D8** Sală conferințe
- **D9** Spațiu educație

C 4 - MINA ȘCOALA
- **D9** Spațiu educație
- **D10** Mină muzeu

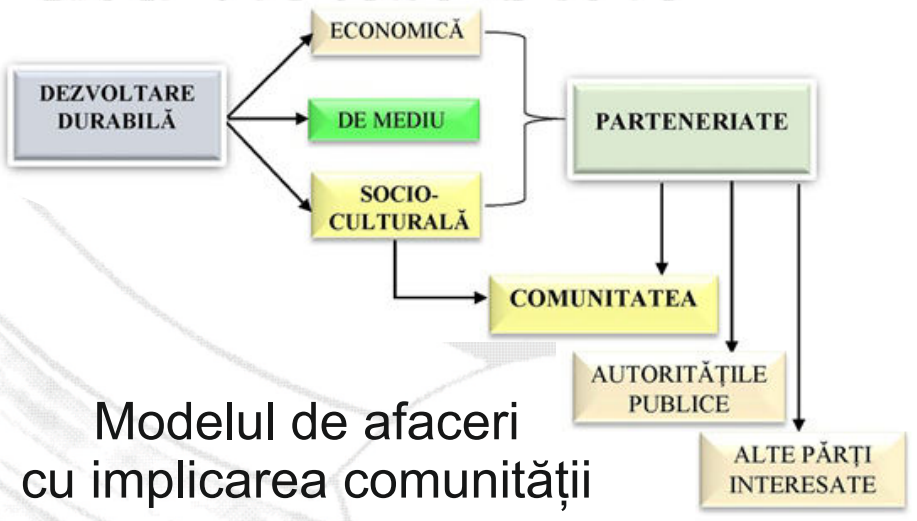
C 5 - ATELIER MECANIC
- **D9** Spațiu educație
- **D11** Atelier mecanic muzeu

C 6 – PUȚ CU SCHIP
- **D12** Puț schip muzeu

C 7 – PUȚ CENTRU CU TURN
- **D13** Puț centru muzeu
- **D14** Puț centru muzeu + restaurant
- **D15** Puț centru muzeu + spațiu educație







Modelul de afaceri cu implicarea comunității

În vederea reconversiei funcționale a perimetrului minier Petrila, Valea Jiului, este dezvoltat un studiu privind realizarea unui parc tematic iar rezultatele susțin ideea că turismul postindustrial este o soluție aplicabilă zonei. Pentru dezvoltarea cu succes a turismului într-o zonă este necesară obținerea unei atitudini pozitive a localnicilor, care ar crește șansele de reușită a proiectului de reconversie zonală. Pentru obținerea celor mai bune rezultate, este necesar ca Parcul Tematic Petrila să fie constituit pe baza destinațiilor considerate a fi cele mai potrivite pentru clădirile propuse spre transformare, ținând cont de amplasamentul, poziționarea și funcția deținută în prezent. În acest sens, am dezvoltat și aplicat un algoritm de selecție cu ajutorul căruia sunt alocate viitoarele destinații pentru clădirile existente în perimetrul minier Petrila. Fiind astfel obținută configurarea Parcului Tematic Petrila se dorește dezvoltarea acestuia într-o formă de turism bazat pe comunitate, tip de dezvoltare care a fost adesea citat ca o alternativă la turismul de masă astfel încât turismul să devină durabil. Cele mai importante realizări în turismul comunitar sunt participarea comunității la întregul proces de dezvoltare, redistribuirea beneficiilor economice, în principal în rândul localnicilor, conservarea mediului și, nu în ultimul rând, conservarea culturii locale.

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NONINVASIVE SYSTEM FOR HUMAN BODY MOTION CAPTURE

1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Arun Fabian PANAITE, Monica LEBA

Category
C

This system is using multiple technological elements to capture the motion of the human body. In comparison with the multitude of available systems, the key feature of our system is that it can render the motion in real time (considered a very immediate virtual reproduction). The motion capture system is noninvasive, eliminating special motion capture clothing that consists of sensor networks, or wearable body markers. It is consisting of cameras and infrared emitters, being capable to capture and synthesize the depth of field and distance perception. The cameras are connected to a high-performance computer, capable of reproducing the motion capture, by rigging the motion capture's moving skeleton, to an animated 3D character. The uses of such a system can be employed in multiple domains, where motion capture can be essential to further developments, for instance, in Medicine, Entertainment, Robotics and so on.



Acest sistem folosește mai multe elemente tehnologice pentru a capta mișcarea corpului uman. În comparație cu multitudinea de sisteme disponibile, caracteristica cheie a sistemului nostru este că poate reda mișcarea în timp real (considerată o reproducere virtuală imediată). Sistemul de captare a mișcării este neinvaziv, eliminând îmbrăcămintea specială de captare a mișcării care constă din rețele de senzori sau markeri corporali purtabili. Este format din camere și emițători de infraroșu, fiind capabil să capteze și să sintetizeze percepția adâncimii de câmp și a distanței. Camerele sunt conectate la un computer de înaltă performanță, capabil să realizeze mișcarea capturată, prin manipularea scheletului în mișcare, la un personaj animat 3D. Utilizările unui astfel de sistem pot fi în mai multe domenii, unde capturarea mișcării poate fi esențială pentru dezvoltarea ulterioară, de exemplu, în Medicină, Divertisment, Robotică și așa mai departe.

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Asociația de Cercetare Doctorală Petroșani

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CONTRIBUTIONS REGARDING THE USE OF NEURAL HEADSET FOR ARTIFICIAL ARM CONTROL

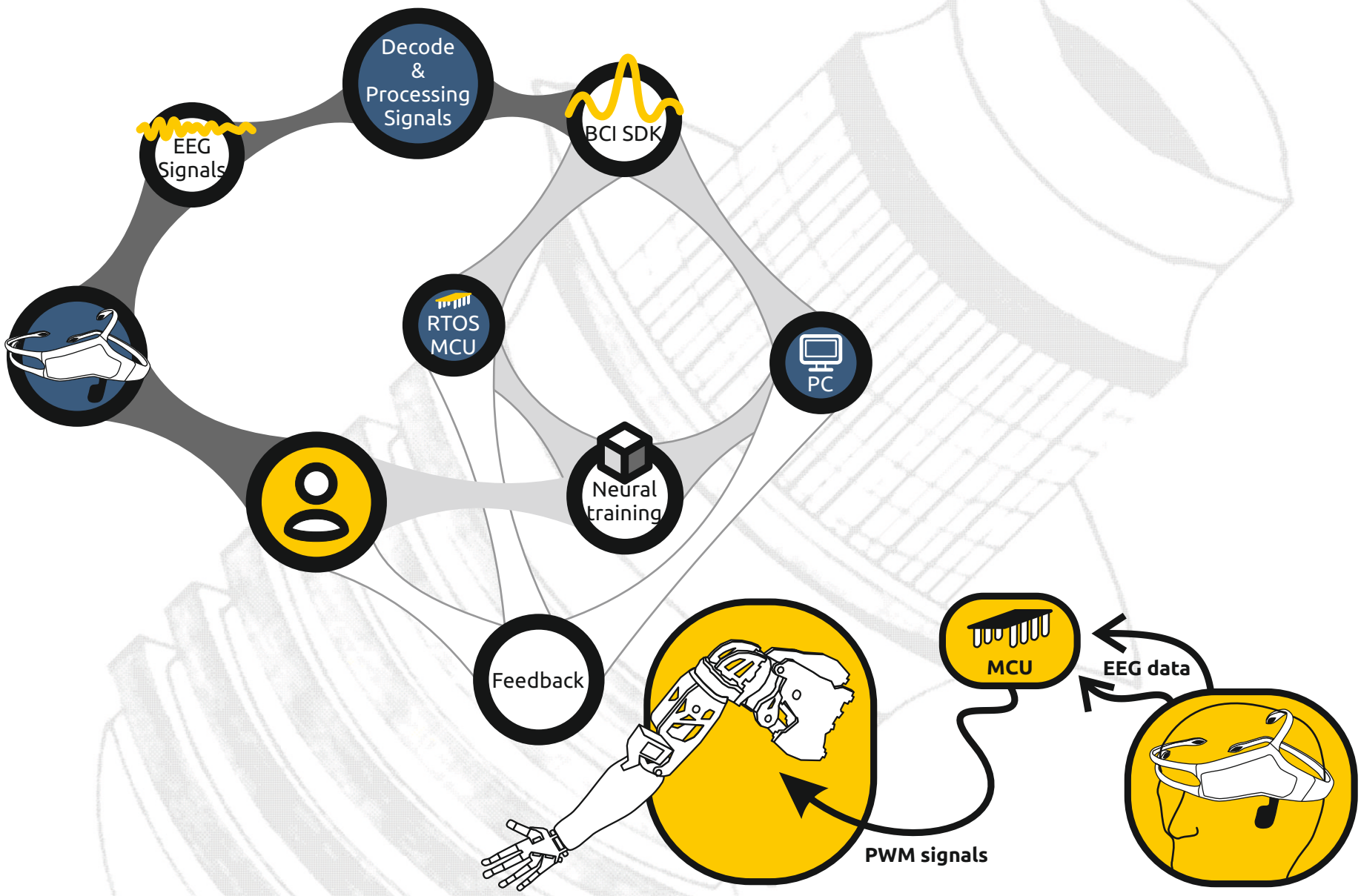
1948

UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Sebastian Daniel ROȘCA, Monica LEBA

Category
C

The BCI based on neural interface headset is able to reproduces conscious thoughts of the user using electroencephalography principle to convert brain signals into binary code to be understood by the computer or by a microcontroller with real-time operating system. The functional block diagram of the electroencephalogram signal acquisition and processing system is shown in the figure below. Due to BCI training it can be created a database with all mental patterns of each user resulted from each mental command imagined in part that correspond to a certain revolute motion of kinematic coupling of an 3D printed robotic upper limb prosthetics used for medical purpose or in manipulation of dangerous substance based on the system presented below.



Sistemul BCI bazat pe cască neuronală este capabil să reproducă gândurile conștiente ale utilizatorului folosind principiul electroencefalografiei pentru a converti semnalele creierului în cod binar pentru a fi înțeles de computer sau de un microcontroler cu sistem de operare în timp real. Diagrama bloc funcțională a sistemului de achiziție și procesare a semnalului electroencefalogramei este prezentată în figură. Datorită antrenamentului BCI se poate crea o bază de date cu toate tiparele mentale ale fiecărui utilizator rezultate din fiecare comandă mentală imaginată parțial care corespunde unei anumite mișcări de rotație a unei cuple cinematice a unei proteze robotizate pentru un membru superior imprimată 3D, utilizată în scop medical sau în manipularea unei substanțe periculoase.

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Asociația de Cercetare Doctorală Petroșani

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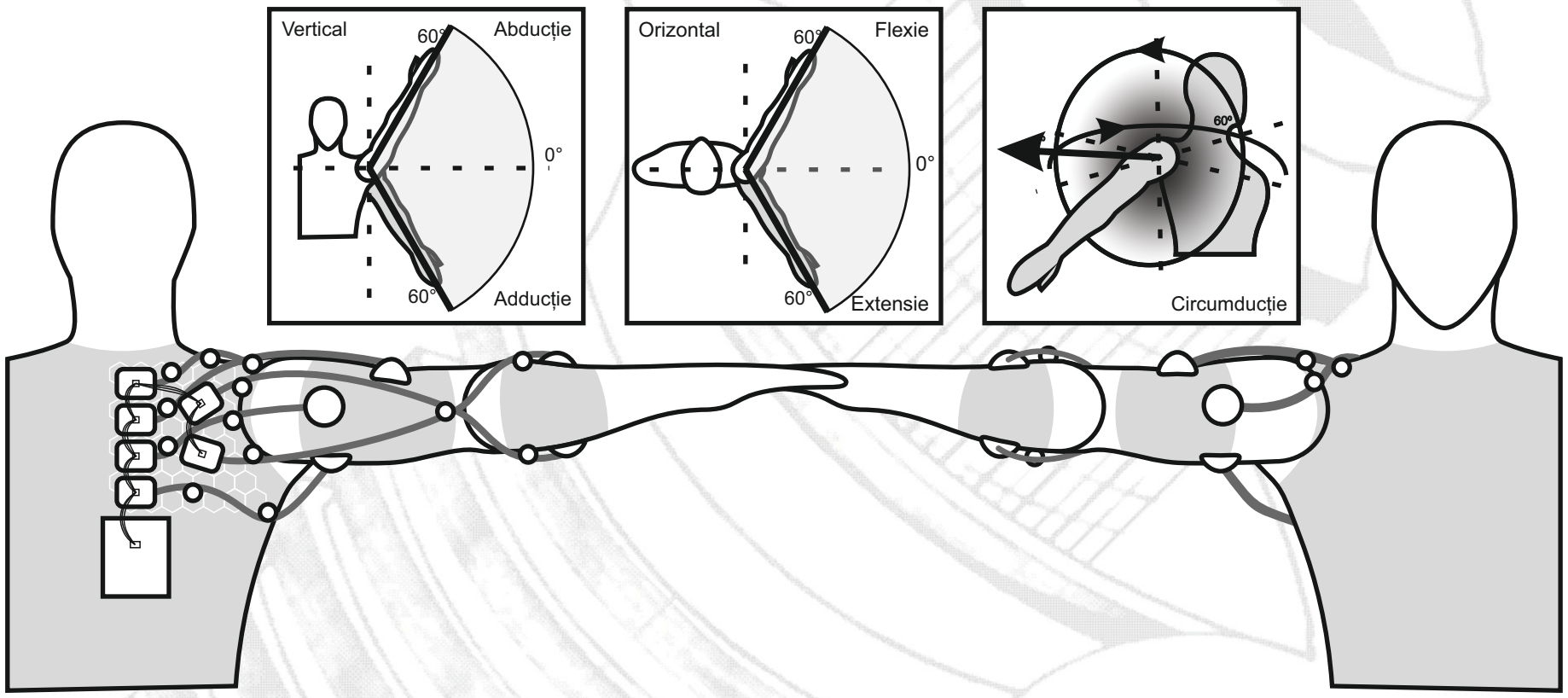
CONTRIBUTIONS TO THE DEVELOPMENT AND CONTROL OF AN EXOSKELETON FOR THE RIGHT ARM

PhD student project, prototype
Marius Leonard OLAR,
Monica LEBA, Remus Constantin SIBIȘANU

1948 UNIVERSITATEA DIN PETROȘANI

Category
C

The purpose of this project is to create an exoskeleton to be worn on a human garment, in the form of a vest, which is autonomous and can be worn by a user along with other personal clothing. This exoskeleton will ensure the mobility of a human upper arm, which has become totally or partially immobile following an accident or medical conditions. It will act on the upper arm, in the shoulder area, leading the arm close to the maximum mobility of a healthy human arm, in the Glenohumeral joint. The control of this exoskeleton can be achieved by several methods, with the help of a neural headset, or vocally by interpreting the commands by artificial intelligence algorithms, voice recognition, using a video camera and an algorithm for recognizing surrounding objects, or physically, by remote control of actions performed by a third party. This exoskeleton can be a medical tool used in treatments for the upper limb mobility recovery, especially the shoulder joint, or a support in the daily life of people with reduced upper limb mobility.



Scopul acestui proiect este realizarea unui exoschelet care să fie montat pe un veșmânt uman, în forma unei veste, care să fie autonom și să poată fi purtat de un utilizator împreună cu alte obiecte de vestimentație personale. Acest exoschelet va asigura mobilitatea unui braț superior uman, care a devenit total sau parțial imobil, în urma unui accident sau a unor afecțiuni medicale. Acesta va acționa în partea superioară a brațului, în zona încheieturii umărului, conducând brațul într-o arie apropiată de maximul mobilității unui braț uman sănătos, în articulația Glenohumerală. Conducerea acestui exoschelet se va putea realiza prin mai multe metode, cu ajutorul unei căști neuronale, sau vocal prin interpretarea comenzilor de către algoritmii de inteligență artificială, de recunoaștere vocală, cu ajutorul unei camere video și a unui algoritm de recunoaștere a obiectelor înconjurătoare, sau fizic, prin telecomandarea acțiunilor realizate de o terță persoană. Acest exoschelet poate fi un instrument medical utilizat în tratamentele de recuperare a mobilității membrelor superioare, în special a articulației umărului, sau un sprijin în viața de zi cu zi, al persoanelor cu mobilitatea membrelor superioare diminuată.

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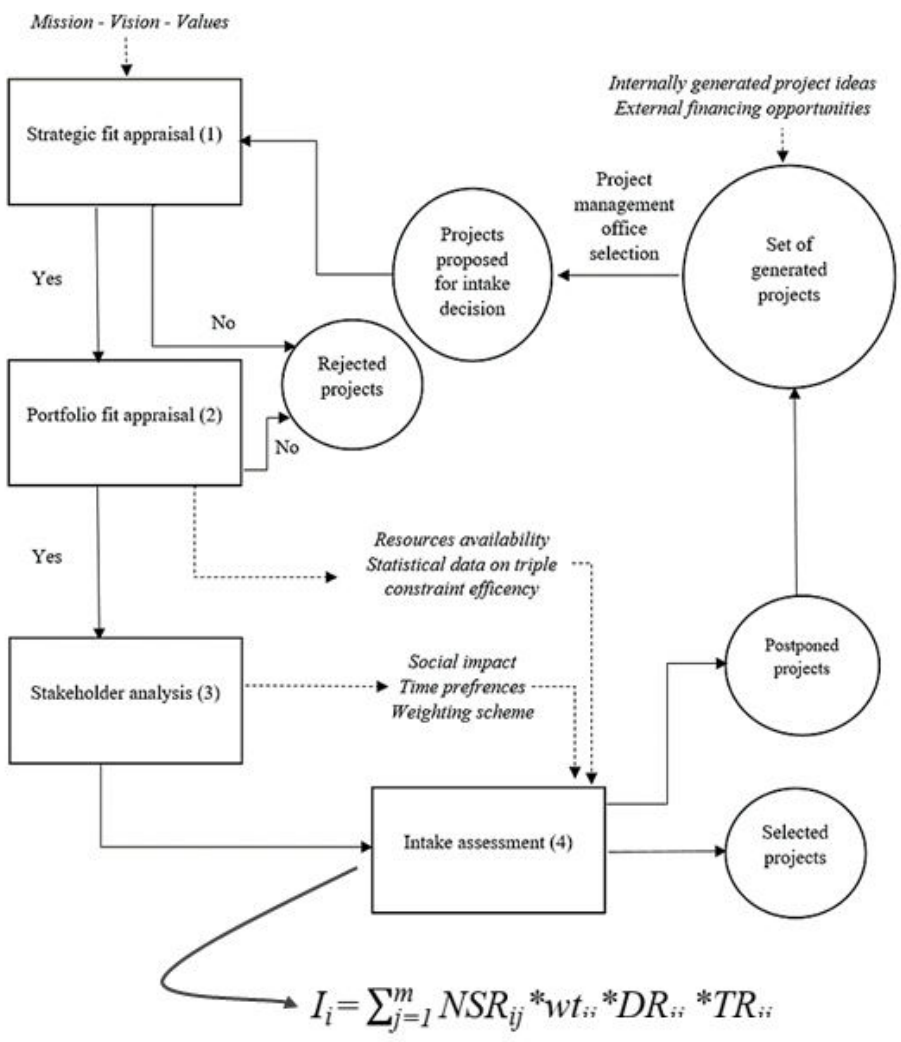
A PROTOTYPE FOR THE PROCESS OF PROJECT INTAKE DECISIONS IN NONPROFIT ORGANIZATIONS

1948 UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Ibrian Vasile CĂRĂMIDARU, Andreea Cristina IONICĂ

Category
C

The prototype aims at balancing the triple constraint and stakeholder needs in project intakes for nonprofit organizations. The process handles proposals in four steps, targeting a score function. some projects shall be excluded from the outset, an exclusion which is performed on two levels – the strategic and the portfolio level *(steps (1) & (2))*. A stakeholder analysis – *step (3)* – is required to determine the value the stakeholders put on the alternative project outcomes and their time preference for the outcomes. The *Intake assessment – step (4)* is going to be based on calculating a score function for each proposed project. Starting with the goal of pursuing a value as high as possible of the social result, this has to be conjugated with the causal relationship between deliverables and results, which in their own turn, should take into account the efficiency of deadlines. This function of the intake score for a project – I_i is given by the multiplication of three factors, which can be interpreted as measures of the influence of the three constraints of the projects - purpose, time, budget upon the social value of the project. The factor DR_{ij} is an average of a statistical series of ratios of execution efficiency for deliverables – using a series for deliverables similar to the ones needed in project *i* to obtain the social result *j*. Similarly, expressing the time constraint, the factor TR_{ij} is an average of a statistical series of ratios of deadline efficiency. After the hierarchy of projects is established, according to the value of the intake scores, projects are chosen in descending order until the consumption of the budget available for the strategic planning horizon.



$$I_i = \sum_{j=1}^{m} NSR_{ij} * wt_{ij} * DR_{ij} * TR_{ij}$$

$$NSR_i = \sum_{j=1}^{m} NSR_{ij} = \sum_{j=1}^{m} (r_{ij} - c_{ij}) \qquad wt_{ij} = \frac{\sum_{o=1}^{k} wt_{ijo} * ws_o}{\sum_{o=1}^{k} ws_o}$$

Project	Result	Cost	Net result	Stakeholder	Results weights	Stake-hodler weight	Result	Deliverable efficiency	Time efficiency
Project 1	r11	c11	nsr11	Stakeholder 11	w111	w1	r11	d111	t111
	r12	c12	nsr12		w112	w1		d112	t112
	r13	c13	nsr13		w112	w1		d113	t113
	r14	c14	nsr14		w114	w1		d114	t114
	r15	c15	nsr15		w115	w1		d114	t114

Prototipul urmărește echilibrarea triplei constrângeri și a nevoilor părților interesate în selecția proiectelor în organizații nonprofit. Procesul gestionează propunerile în patru pași, țintind o funcție de scor. Unele proiecte vor fi excluse de la început, excludere care se realizează pe două niveluri – nivelul strategic și cel de portofoliu *(pașii (1) și (2))*. O analiză a părților interesate – *pasul (3)* – este necesară pentru a determina valoarea pe care părțile interesate o acordă rezultatelor alternative ale proiectului și preferința lor de timp pentru rezultate. Evaluarea *în scopul adoptării – pasul (4)* - care se va baza pe calcularea unei funcții scor pentru fiecare proiect propus. Pornind de la scopul vizării unei valori cât mai ridicate a rezultatului social, acesta trebuie conjugată cu relația cauzală dintre livrabile și rezultate, care, la rândul lor, ar trebui să țină cont de eficiența termenelor limită. Această funcție a punctajului de admisie pentru un proiect – I_i este dată de multiplicarea a trei factori, care pot fi interpretați ca măsuri ale influenței celor trei constrângeri ale proiectelor - scop, timp, buget asupra valorii sociale a proiectului. Factorul DR_{ij} este o medie a unei serii statistice de rapoarte ale eficienței execuției pentru livrabile – folosind o serie de livrabile similare cu cele necesare în proiectul *i* pentru a obține rezultatul social *j*. În mod similar, exprimând constrângerea de timp, factorul TR_{ij} este o medie a unei serii statistice de rapoarte ale eficienței termenului limită. După stabilirea ierarhiei proiectelor, în funcție de valoarea punctajelor de adoptare, proiectele sunt alese în ordine descrescătoare până la consumarea bugetului disponibil pentru orizontul de planificare strategică.

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D

Automotive

Space science

Aviation

Ships

Mechanics

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Title

ACTUATOR WITH TELESCOPIC SLIDERS

D

Inventor/s - Contact

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Patent/ Application number

Patent OSIM: RO130517 -B1/30.07.2021

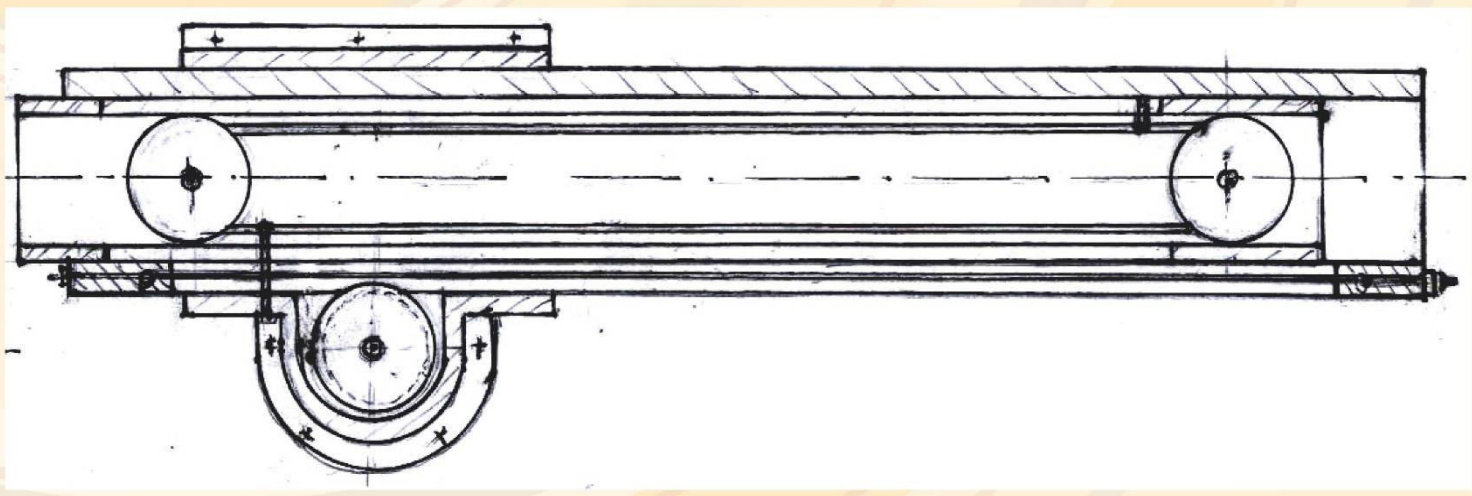
Short presentation

Telescopic slide actuator is equipped with a gear motor that drives a transmission cable attached to a sliding support which slides another slide. The slide has a transmission cable that is connected to the body of the actuator lower branch and upper branch to the next slide. Extension mechanism is obtained by simultaneous translational motion of both runners with a race speed and increased, having a small size and constructive simplicity. Electromechanical linear actuators are superior to other elements of actuation or control of the movements of some mechanisms.

Applicability

Areas of application: robots, automotive, aerospace, various equipment, lifting platforms, elevators, manipulators and especially for automatic sliding doors.

Images



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D

Title

Automatic thermal management device of a battery that equips an electric vehicle

Inventor/s - Contact

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florin.mariasiu@auto.utcluj.ro

Patent/ Application number

Patent application OSIM: A/00403/14.07.2021

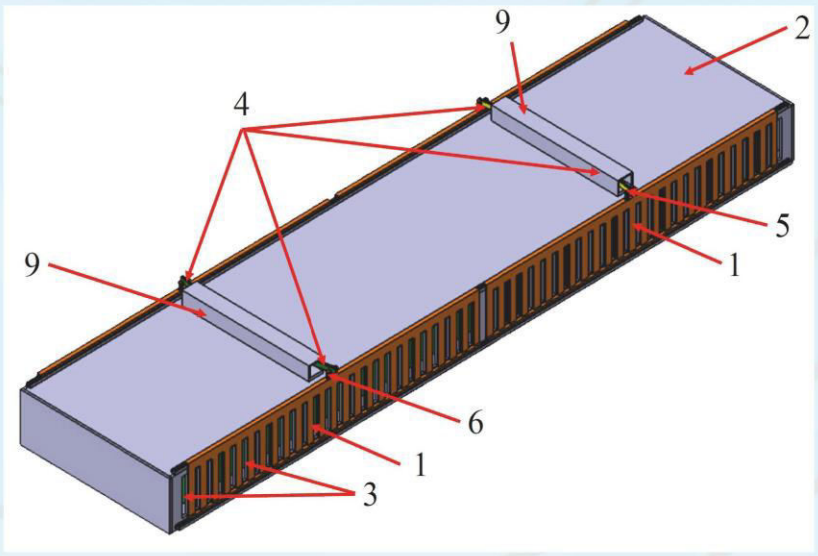
Short presentation

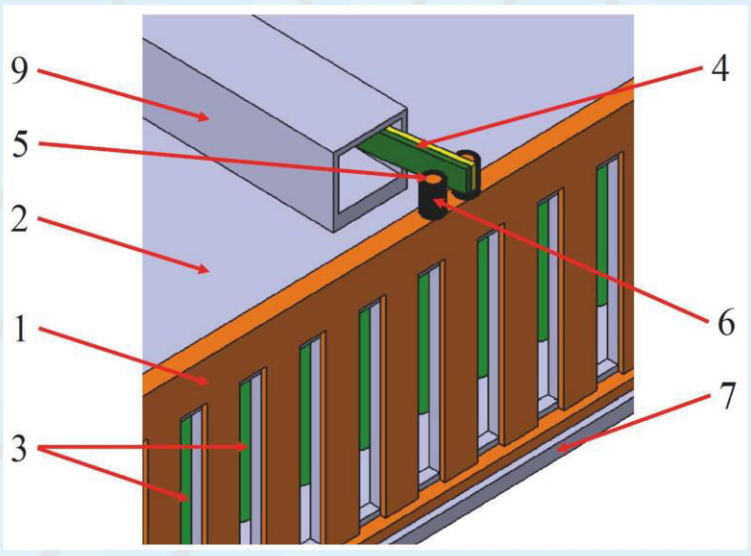
The problem solved by the invention of the automatic thermal management device of a battery equipped with an electric vehicle is the maintenance of a predetermined temperature (desired by the manufacturer according to the dynamic performance of the electric vehicle) inside the battery housing by natural ventilation of the electrochemical cells, due to adjustable ventilation slots as opening according to the thermal stress inside the battery housing. The automatic thermal management device of a battery equipped with an electric vehicle is characterized in that the opening or closing of the ventilation slots is done sequentially by a bimetallic lever, depending on the temperature inside the battery, without external energy consumption.

Applicability

Automotive industry, Energetic industry, Energy storage devices equipped with electrochemical cells

Images





1-movable grille, 2-battery housing, 3-ventilation slots, 4-bimetallic lever,
5-guide, 6-rotating cylinder, 7-guide profile, 8-slot, 9-cover.

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TECHNICAL UNIVERSITY OF CLUJ-NAPOCA ROMANIA

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D

Title

THERMOPLASTIC COMPOSITE SELECTION METHOD FOR POWERING AN AUTOMATIC THERMOFORMING LINE

Inventor/s - Contact

Ciupan Cornel, Filip Ioan, Ciupan Emilia, Ciupan Mihai
Cornel.ciupan@muri.utcluj.ro

Patent/ Application number

Patent application OSIM: A/10063/2021

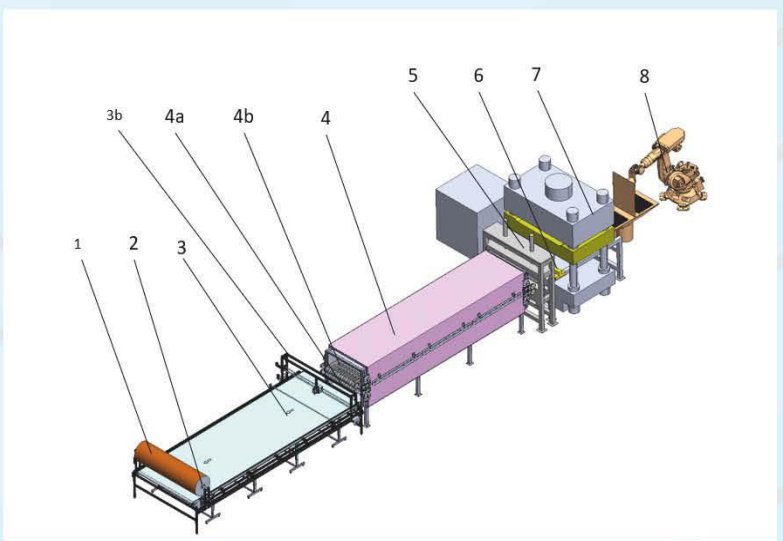
Short presentation

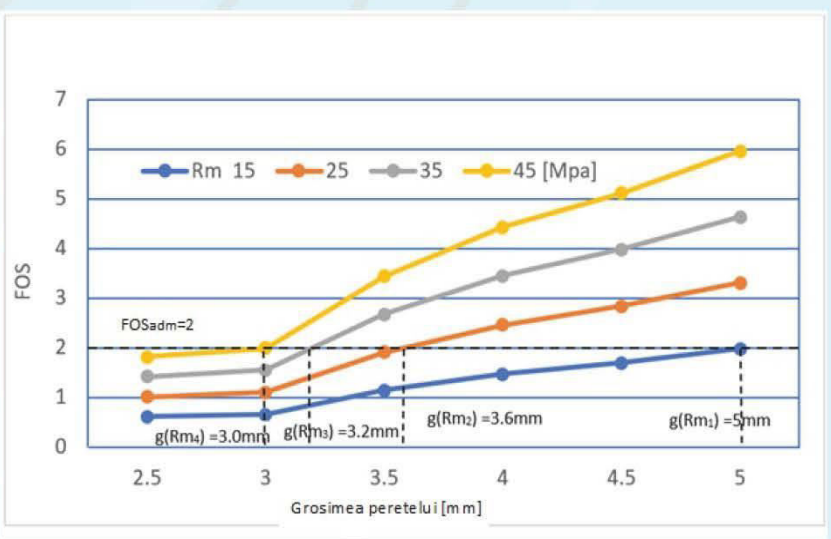
Composite material 1 from a feed drum 2 is spun on the cutting table 3 then transferred to the furnace 4, where it is heated until it reaches a temperature higher than the melting temperature of the thermoplastic matrix. A feeding mechanism 6 takes the material and transfers it to the forming press 7 where it is consolidated by cooling in a mold. Finally, the consolidated part is taken over by the robotic cell 8, for finishing the contour. The method involves the division of products into classes with a representative benchmark, then static studies are performed by the finite element method and the minimum wall thickness is determined so as to simultaneously meet the requirements of the permissible safety factor and deformation for each available composite material, after which determine the department cost of the representative part for each available material and select the composite that offers the minimum department cost, and for any other part of the representative part group the FEA analysis will be done only with the material selected for the representative part and the wall thickness will be determined which satisfies the technical restrictions, and then the number of overlapping layers will be determined, and the data that will be transmitted to the automatic thermoforming line.

Applicability

The method was developed for the efficient choice of a thermoplastic composite as a fibrous layer, that will be consolidated in parts, on an automatic thermoforming line. The invention is intended to choose the most suitable composite material taking into account the requirements of the part, the properties and cost of the material as well as the manufacturing costs. The object of the invention is to select the available material which best satisfies the technical-functional requirements of the part at the lowest cost.

Images





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RECYCLING USED BATTERIES IN THE CONTEXT OF THE CIRCULAR ECONOMY OF THE INDUSTRIAL ERA 4.0

PhD thesis

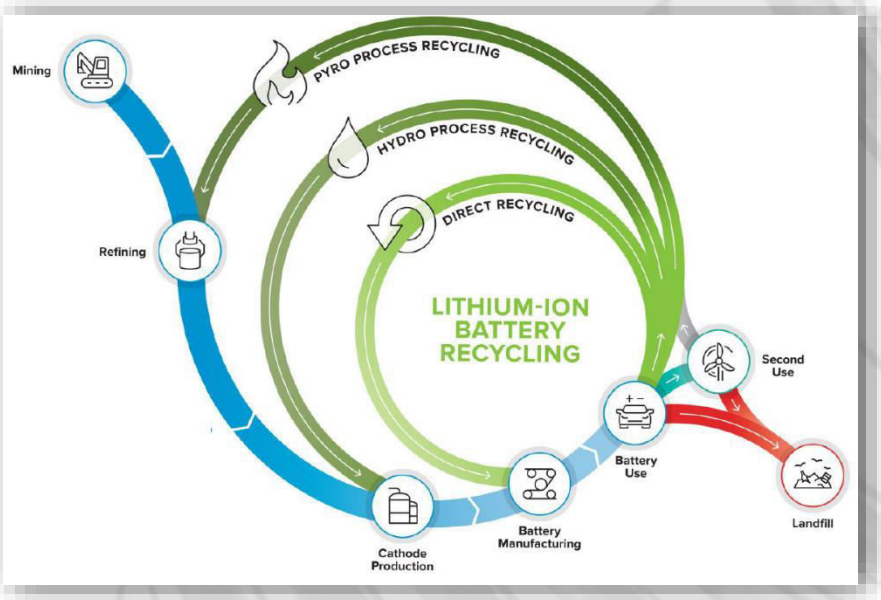
D

Author: RUS Ioan Alexandru

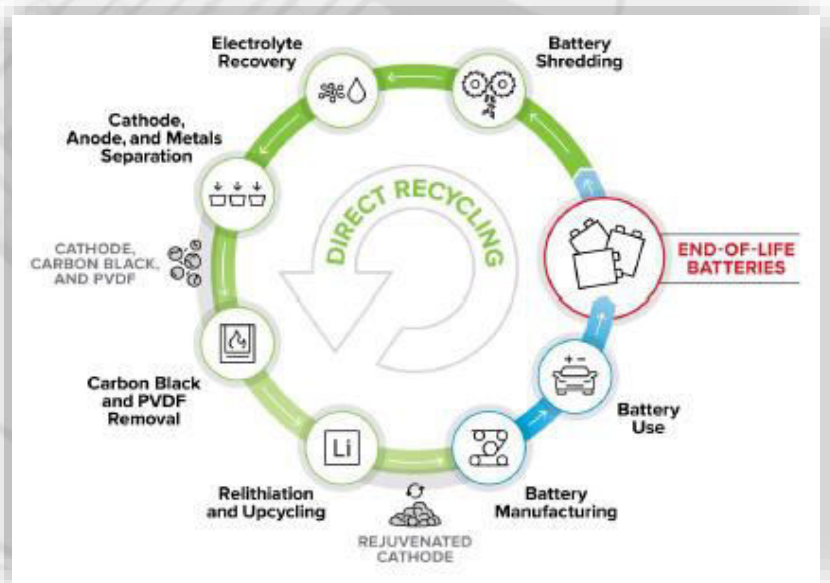
Mentors: NICOLAE Viorel, BIRTOK-BANEASA Corneliu

Electric car batteries are a challenge for the world's electrified future. Automakers are investing billions in electrification, with the hope that the next generation of vehicles will be cleaner than their gasoline-powered predecessors.

The International Energy Agency estimates that there will be 148-230 million battery-powered vehicles worldwide, representing up to 12% of the global car fleet. Used batteries can be an opportunity for a greener car future. Global demand for batteries is expected to grow 14-fold by 2030, and the EU could account for 17% of this demand. This is mainly due to the evolution of the digital economy, renewable energy and low-carbon mobility.



LI-ION battery lifecycle



Typical Direct Recycling Process Flow

The increasing use of battery electric vehicles will make this market a strategic one globally. Li-ion battery recycling concerns exist in China, South Korea, Japan, the US, Canada and the European Union. Recycling processes include several stages: mechanical (shredding, cutting), pyrometallurgical (melting, pyrolysis) and hydrometallurgical, through which useful metals are separated and recovered.

Currently, the amount of batteries that end up being recycled is estimated at 100,000 tons. This leads to the creation of an important market for recyclers or opportunities for material companies to become recyclers. The recycling of batteries from electric vehicles alone could reach 10% of the total recyclable volume in 2030, higher than the contribution of the mining sector.

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ISIM TIMIŞOARA

National Research&Development Institute for Welding and Material Testing - ISIM Timisoara

Sonotrode for ultrasonic applications

Patent application no.: A/00335 of 15.06.2021

D

Authors: **Nicușor-Alin SÎRBU, Gabriela-Victoria MNERIE**

Object of the invention:

Development of innovative sonotrodes for industrial applications. According to the patent request, the sonotrode is manufactured by combining two subassemblies, especially through the Friction Stir Welding (FSW) process.

Current technical specification:

Materials used to manufacture the sonotrodes:

- for similar materials are: titanium alloys (ex.: Ti grade 5), high resistance aluminum alloys, tool steel, heat treated carbon steels, especially materials with minimum internal friction losses;
- for dissimilar materials the body of the sonotrode (1) can be made by usual material (ex.: low alloyed carbon steel, high alloy carbon steel) and the active zone (2) of the sonotrode it is made by special materials (ex.: titanium alloys, high speed tool steel and high alloyed steels). The present solutions increase the lifetime of the ultrasonic tools (sonotrode) by replacing the deteriorated active zone (2) of the sonotrode.

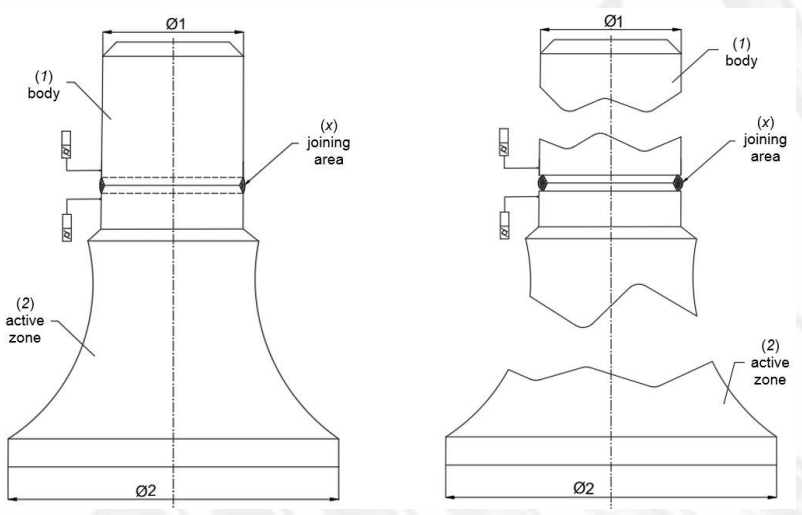

Figure 1. Constructive solution 1

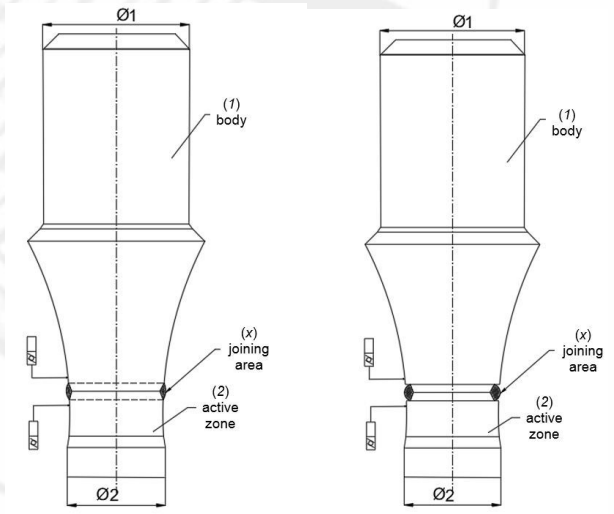

Figure 2. Constructive solution 2

(1) Sonotrode body; (2) Active zone; (x) Joining area

Description:

Figure 1 presents a sonotrode developed by similar materials subassemblies (1) and (2), connected by a median joining area (x), without any addition of material, especially trough friction stir welding (FSW) process, without machining the edges (figure 1a) or by machining the edges of the joining area (figure 1b).

Figure 2 presents a sonotrode developed by dissimilar materials joined by friction stir welding (FSW) process, without machining the edges (figure 2a) or by machining the edges of the joining area (figure 2b).

Advantages:

- Developing ultrasonic tools (sonotrodes) that are economically improved, while maintaining their technical performances;
- Increasing the lifetime of the ultrasonic tools (sonotrode) by replacing the deteriorated active zone of the sonotrode.

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Study of in-cylinder combustion pressure characteristics fueled with Methyl Ester for Split Injection with square and tangential Piston with 0% and 10% EGR

D

Mr. Shrikant Vishnu Baste, Research Scholar, Sardar Patel College of Engineering Mumbai-58, India
Dr. Sudhakar Umale, Former Head and Associate Professor, Sardar Patel College of Engineering Mumbai-58, India

Square figure 2(A) and tangential figure 2(B) groove top piston were used to study the combustion characteristics of Methyl Ester. The CR for a single-cylinder CI was maintained at 18. Trinity methyl ester (behada+chicken fat oil+turmeric oil) was blended with diesel fuel. The blend proportion was kept at 20%, representing B20 and B00 indicating pure diesel fuel. In order to control and reduce the harmful emission of NOx EGR technology was used up to an extent of 10% to improve the combustion quality. The split injection strategy was used to inject methyl ester. Split injection gives better atomization of fuel and the more surface-to-volume area will be covered. The split injection angle for pilot injection at 7 deg bTDC with a mass of pilot injection 27% and main injection fuel of 73% mass at 14 deg bTDC timing. Figure 1 represents In-cylinder combustion pressure and crank angle. The combustion behavior, cylinder pressure peak, and combustion duration can be studied from the graph. It can be seen in figure 1 that the cylinder pressure curve for fuel B20 with tangential groove piston shows a steep slope with maximum cylinder pressure of 83 bar with 0% EGR followed by EGR10% of B20 fuel of 81bar. Further, B00 with 0% EGR and 10% EGR have shown inferior results compared to the former. Also, the effect of the split injection strategy with B20 and EGR10% has improved combustion with rapid premix, re-burning of fuel with EGR10%, and oxygenated fuel combustion of B20 fuel. The improved combustion has reduced the NOx, CO, and HC levels which helped to achieve complete combustion.

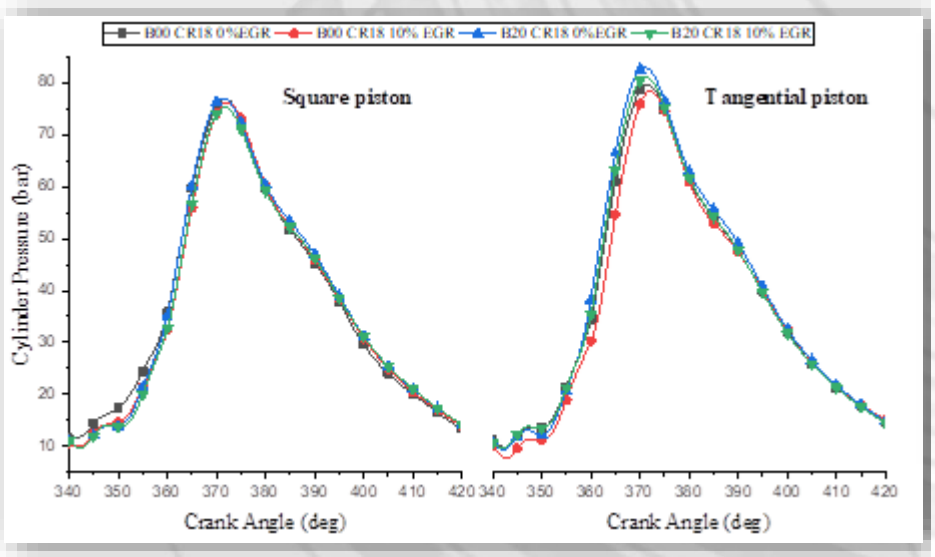
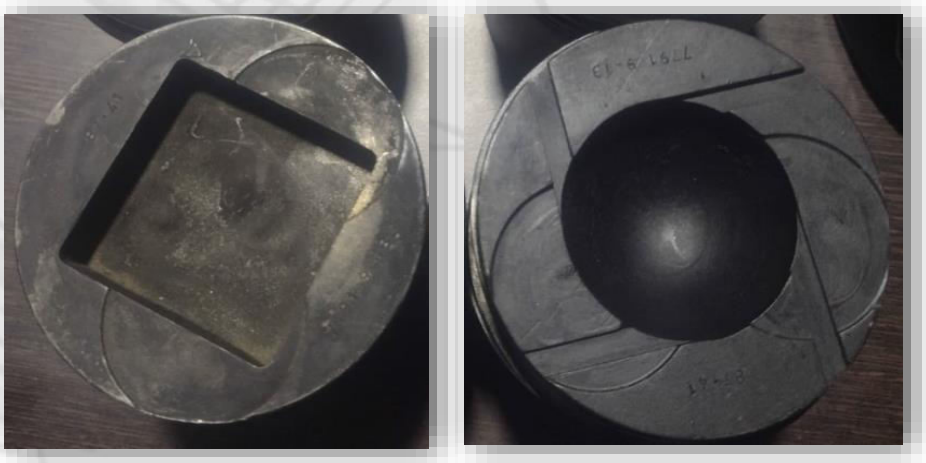


Figure 1. In-cylinder Pressure crank angle behavior



(A) Square (B) Tangential

Figure 2. Square and Tangential groove top piston

Abbreviation

B00- 100% Pure Diesel fuel, **B20**- 20% Methyl Ester + 80% Pure Diesel Fuel, **bTDC**- Before Top dead Center, **CR**- Compression Ratio, **CI-** Compression Ignition, **CO-** Carbon Monoxide, **EGR**- Exhaust Gas Recirculation, **HC-** Hydrocarbon

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Experimental stand for automotive CAN network

Laboratory project

Authors: Gabriel Nicolae Popa, Corina Maria Diniș

D

The stand contains a simulation block with digital and analogue inputs (which simulates a normally open switch - kick down acceleration and normally closed switch for the door; lighting measurement for light control; fuel level measurement; ambient temperature measurement; car battery voltage measurement) connected to an Arduino Uno (simulates an ECU 1), which is connected to a MCP 2515 CAN, which is a node for the CAN network that connects via two wires (CAN-L, CAN-H) to another MCP 2515 CAN node in connection with an Arduino Nano (simulates ECU 2). A laptop is connected to the Arduino Nano (ECU 2, to display the information on several lines of information), through the serial port, to analyze the data transmitted from the Arduino Uno (ECU 1).

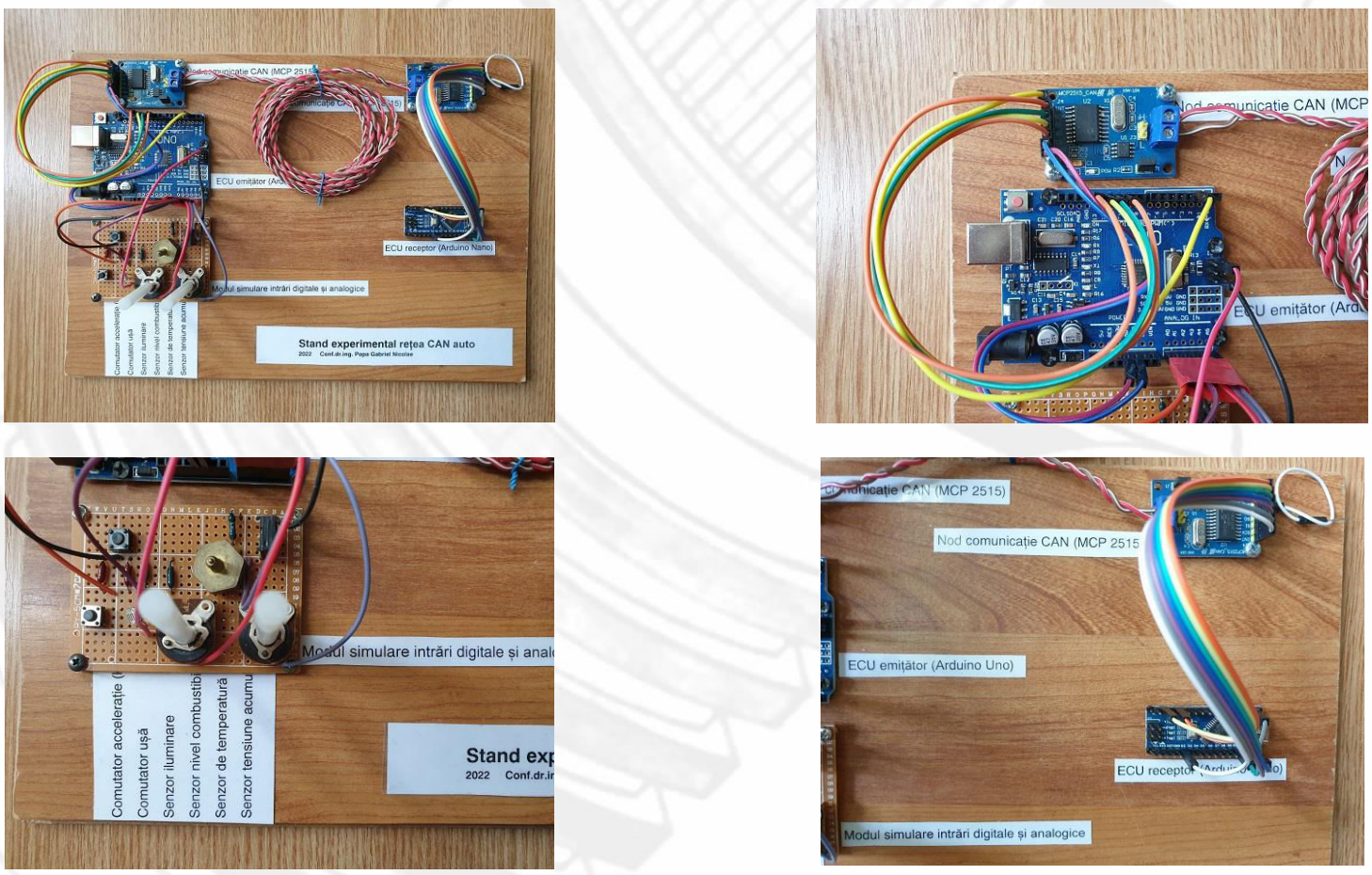

Fig.1. Experimental stand for automotive CAN network

To achieve communication, different programs have been implemented for the two Arduinos. With the help of the experimental stand, studies (related to data integrity) can be carried out on the speed of data transmission (which can be changed through Arduino programs), the length of the CAN cable (short and long), the importance of the resistors (120 W) at the ends of the cable when transmitting the information.

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Cast iron used in rolling stock braking systems

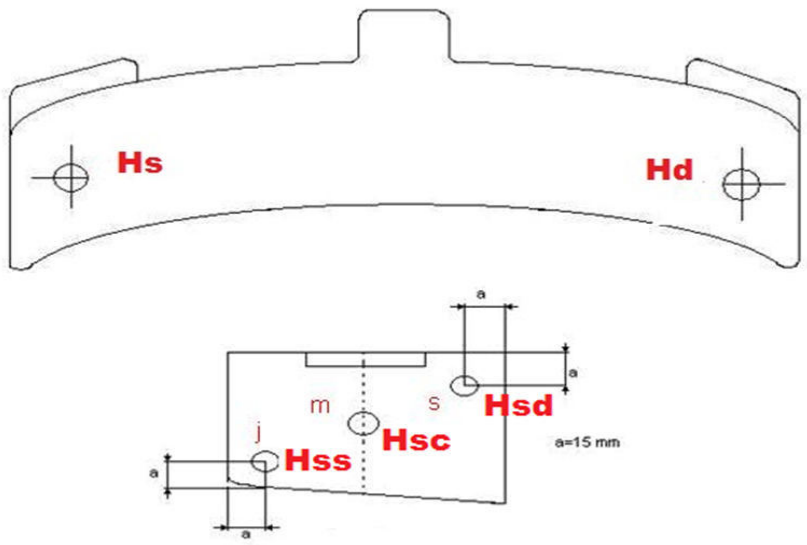
PhD Thesis

Authors: Bucur Flavius, Socalici Ana

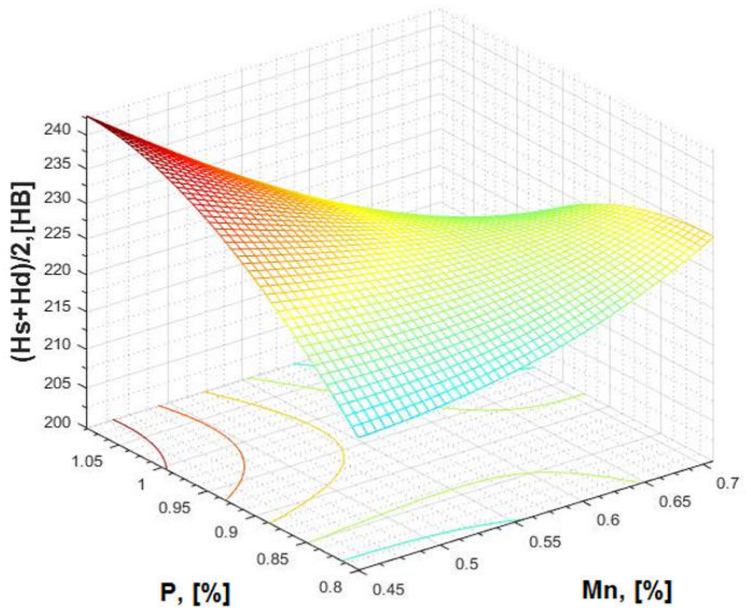
ACKNOWLEDGMENT: *This paper was financially supported by the Project "Network of excellence in applied research and innovation for doctoral and postdoctoral programs / InoHubDoc", project co-funded by the European Social Fund financing agreement no. POCU/993/6/13/153437*

The brake blocks of the rolling stock are obtained by casting from phosphorous cast iron P10 type In the structure of phosphorous cast iron, a phosphorous ternary eutectic is formed, called steadite, consisting of perlite, cementite and iron phosphide, it is distributed at the limits of the grain in the form of isolated separations, discontinuous network or continuous network, depending on the phosphorus content. Phosphorous eutectic is characterized by a high hardness and high fragility, which is why it has a great influence on the properties of cast iron.

Experimental research has focused on the influence of the chemical composition on the mechanical hardness characteristics of phosphorous cast irons. The experimental data were processed in the Matlab computer program, obtaining a series of graphical and analytical correlations. The regression surfaces and level curves obtained allow the determination of the optimal ranges of variation of the chemical composition of the cast irons in order to obtain a hardness in the technological range.



Areas of brake blocks hardness sampling



Hardness of sampled brake blocks

Values	According to the tender specifications No.1/SFMR/SDT/2000 [HB]	Hardness according to SR EN ISO 6506-1:2006, [HB]				
		HB_s	HB_d	HB_{ss}	HB_{sc}	HB_{sd}
maximum	255	255	255	248	230	255
minimum	197	197	198	197	198	200
average	226	225.87	226.00	222.66	212.90	225.91

Average hardness and hardness difference for the experimental samples

Values	Hardness, average values on the side surface and cross section		Hardness, differences on the side surface and cross section	
	(HBs+HBd)/2	$(HB_s+HB_m+HB_j)/3$	$\lvert HB_s-HB_d \rvert$	$\lvert HB_{ss}-HB_{sd} \rvert$
maximum	264.50	243.30	18.00	19.00
minimum	197.50	197.30	0.00	0.00
average	226.36	217.16	5.50	5.30

In order to obtain a hardness in the range 197-255 HB, the chemical composition of the cast iron must vary within narrow limits: C = 2.95-3.2%, Mn = 0.6-0.7%, Si = 1.45- 1.95%, S = 0.06-0.09%; P = 0.85-0.95%.

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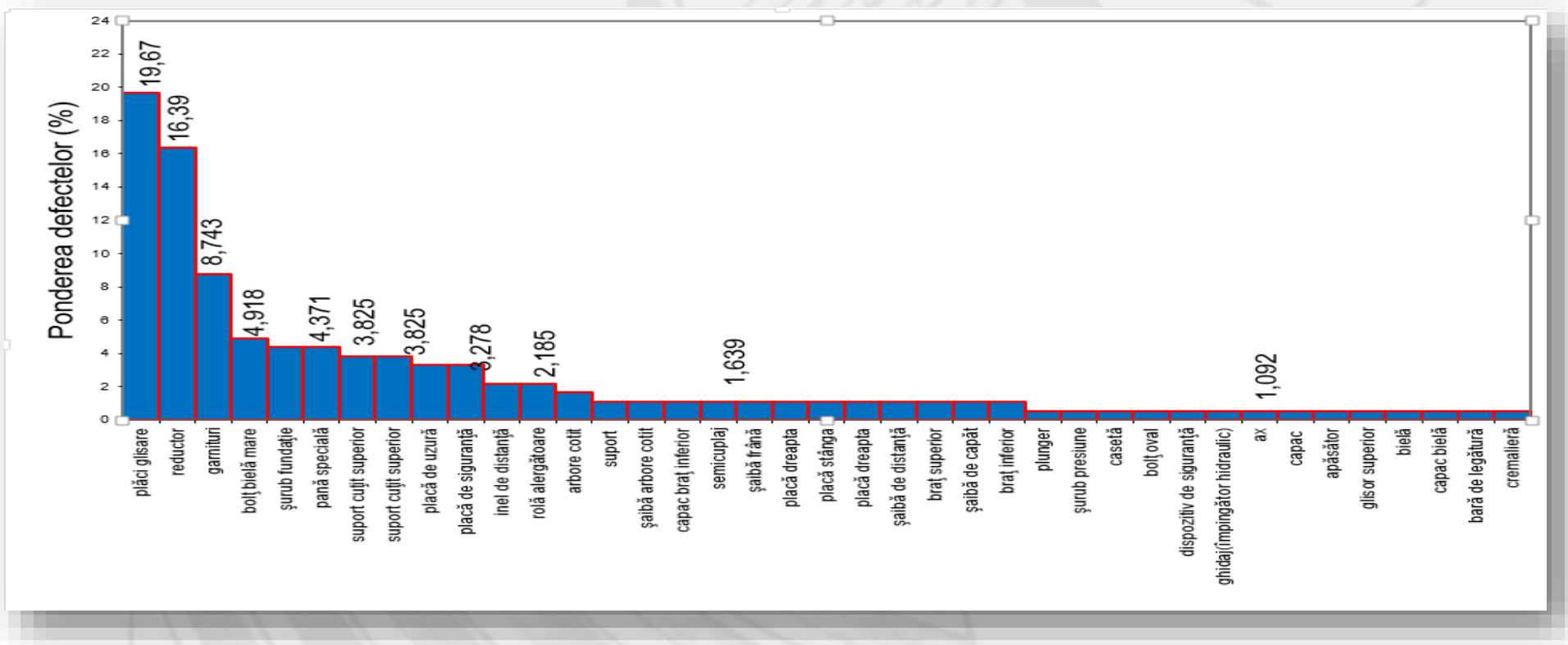
Solutions for breed the availability of the parallel gang shears assigned for cutting the metallurgical products

Scientific Paper

Author: ADINA BUDIUL BERGHIAN

D

In this paper proposed some solutions for the decrease of the unschedule stops of the 8000Kn shear with parallel gang assigned for cutting the metallurgical products. Analysis of data collected through observation of operation/failure of the shear allow construction of the so-called Pareto diagram, which is an analysis and assessment method that at the same time allow identification of several failures on which should be droved with priority.



According to the results obtained by *Pareto diagram*, elements with the highest percentage of failure weight observation (19,67%) are the *sliding plates* which are mounted on the shear body, at the contact area of the upper slide.

Sliding plates are performed currently from CuZn37. As per gives obtained from exploitation and through the determination reaction from the translational couple is can caused the speed of effeteness volumetrically scilicet $v=0,42380 mm^3/s$.

A proposal for the decrease of the speed of coupled respectively is the execution sliding plates from steel OL60 and these veneering with an alloy a cast-iron appointed sormait.

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UNIVERSITATEA LUCIAN BLAGA DIN SIBIU

DESIGNING A LABORATORY STAND FOR FIXATING FORCES OF WORKPIECES IN TIGHTENING MECHANISMS USING WEDGE AND PLUNGERS

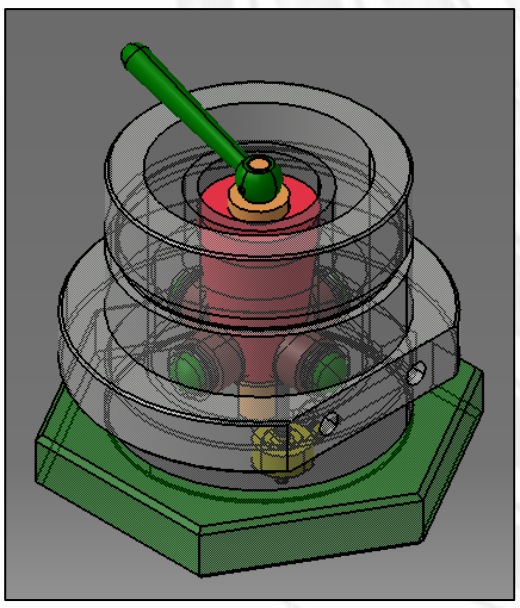
Student Project

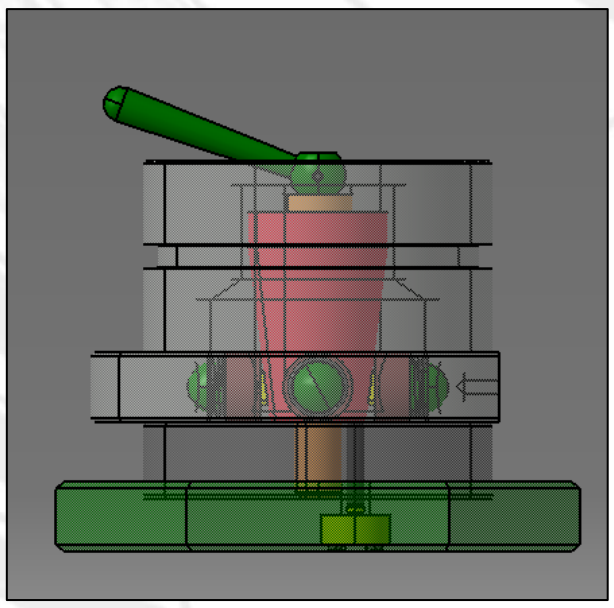
Author/s: VERGU Constantin-Alexandru

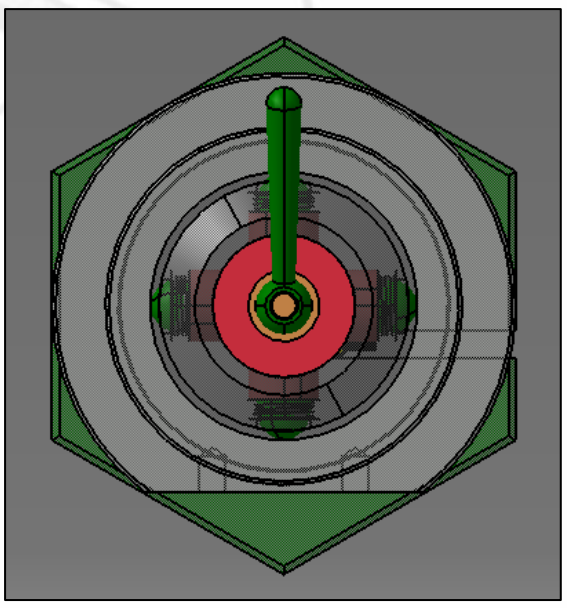
D

The project proposes a device specifically designed to study the fastening forces of parts in clamping mechanisms using wedges and pistons. It consists of a motherboard (1); a force sensor (2); a supporting body (3); the stem (4); four pistons (5); four springs (6); four cylinders (7); four wedges (8); a conical cord (9); a threaded shaft (10); a handle (11); the part on which the study is being carried out (12) and some screws and fixing pins.

The semi-finished product is fixed by operating the threaded shaft (10) using the handle (11) and the part (12) to be examined. It moves to the cone (9), which further engages the pistons (5), with the help of which the attachment is made. The clamping force is determined by the force sensor (2) and displayed on a computer monitor.







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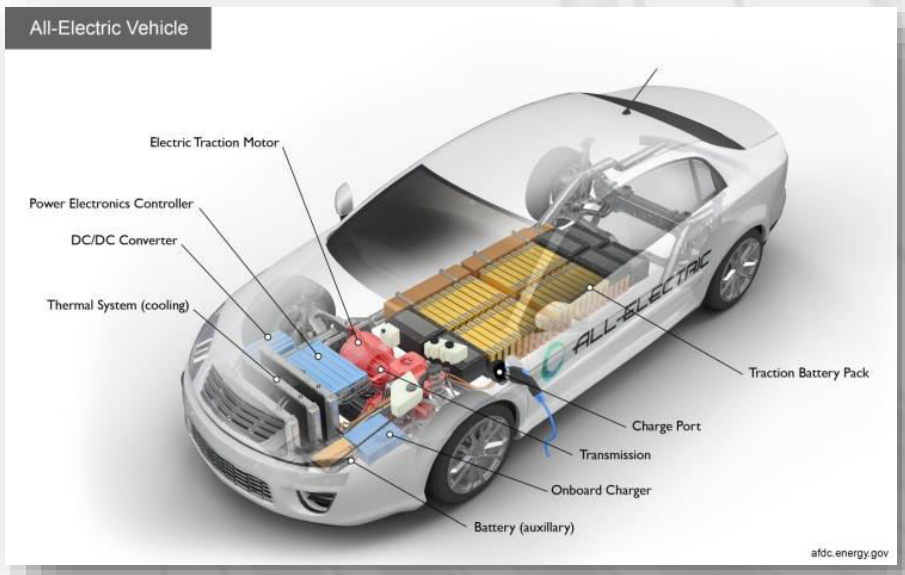
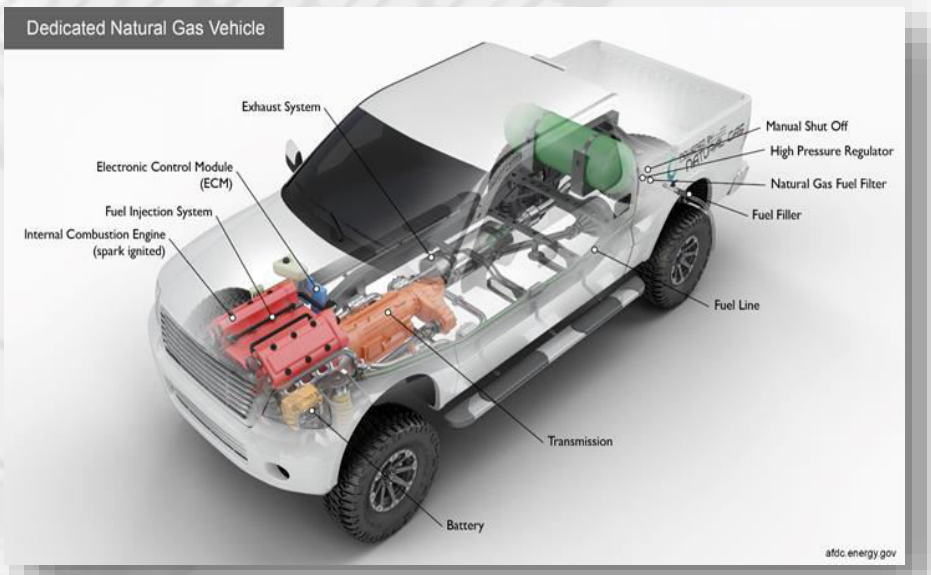
Electric engines vs Internal combustion engines

Author/s: POPESCU Alin-Andrei, SAMSON Karina
Coordinator: BIRTOK-BANEASA Corneliu
Student project

D

When it comes to choosing a new car you are faced with the ultimate decision, gas or electric. There are so many factors to consider that it would be a lie to say there is a clear answer that everyone would agree with, but here is a breakdown of the most important considerations which should allow you to make an informed call. First of all, acceleration. Electric cars can accelerate far more quickly than internal combustion engine vehicles because they generate instantly available torque and they are able to deliver it to the weels more efficiently. For IEC powered cars, maximum torque is achieved at the point where the combination of fuel, air and spark coincide to produce the largest vertical force. The IEC massive drawback here is the lag in reaching maximum torque, starting from low RPM the engine speed has to slowly rise to it's maximum torque threshold. In case of electric motors, maximum torque is produced from the get-go. About the price tag, in relation to it, gas cars are currently a lot less expensive than other options. The average cost of an electric car is about 19.000$ higher than a IEC-powered one altough electric vehicles may cost more, but they have lower maintance cost than a IEC vehicle.





Since the drivers don't need to worry about collant, oil or transmission fluid. Over their lifetime electric vehicles tipically cost one-third the price of IEC-powered cars. Some are even offer an electric vehicle tax credit, for example owners can get as much as 7500$ in credit in some U.S states. Now, when it comes to fuel, there are gas stations every few miles and filling up a tank takes just a few minutes. In contrast, electric vehicles have limited charging options especially in rural areas. If that is not enough, fully charging an electric car can take up to 20 hours depending on the model. Also we want to talk about sustainability, electric cars are advertised as a great way to combat climate change and they are better for the environment. This is because all-electric vehicles have an electric motor instead of an internl combustion engine and they use a large traction battery pack to power the electric motor. Because they run on electricity they don't have exhaust gases, however, while the vehicle itself may be better for the environment the electricity that powers it could still come from burning gas or cole. For the greatest reduction in emissions, the elctricity also come from a renewable source such as hydropower, wind or solar.

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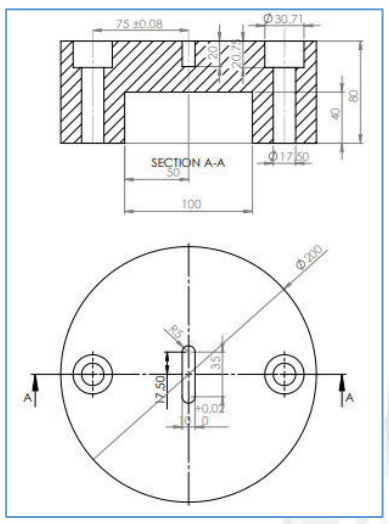
Tehnological device for clamping parts on machine tools

Student Project

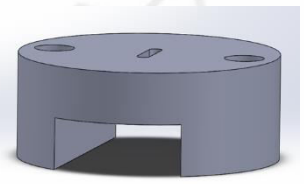
Author: Pinca-Bretotean Alexandru Mihai

D

The part holder device designed represents the mechanical interface between the machine tool and the semi-finished product. It performs the relative positioning of the semi-finished product to the cutting tool in the technological process of mechanical processing by cutting and control.

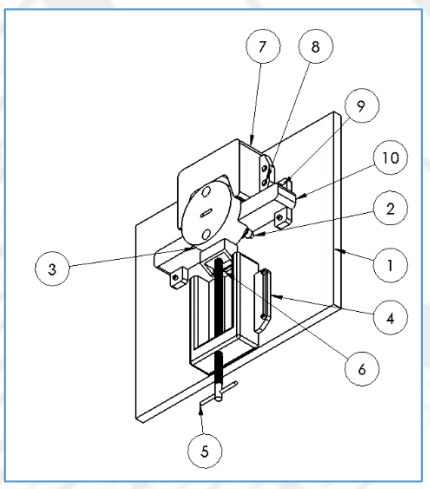


Workpiece dimensions

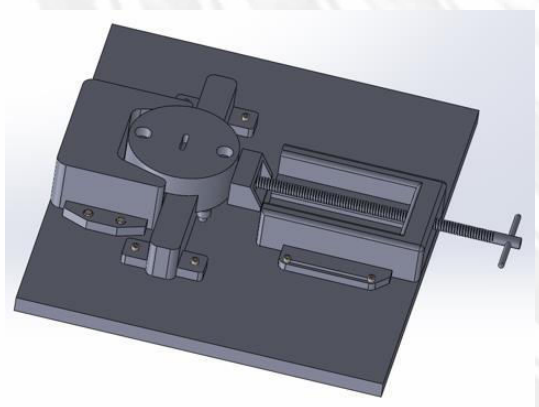


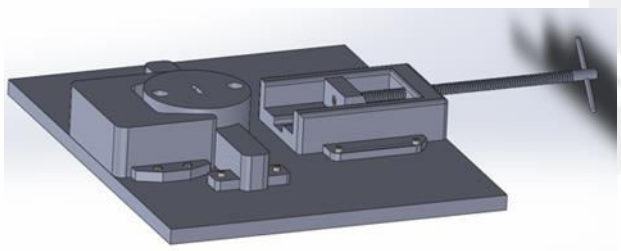
3D part model

Machined piece by chipping

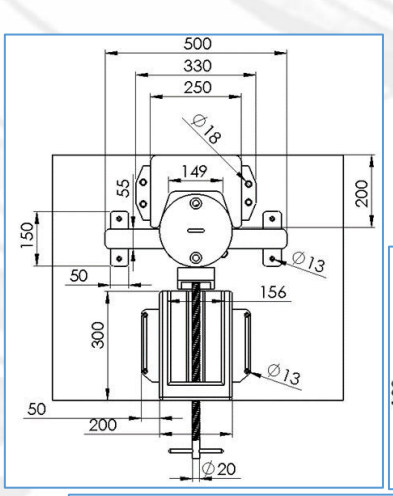


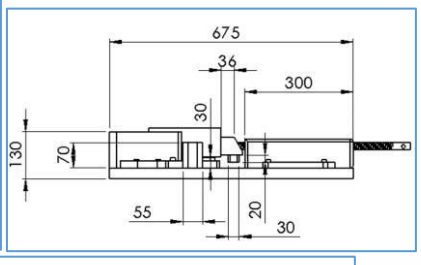
1-Support plate; 2- Spigot; 3-Workpiece; 4- Body vise; 5- Handle vise; 6-Had vise; 7- Fastening system; 8- Screw M8x1x40x40-N; 9- Screw M 8x30-30C; 10- Fixing block

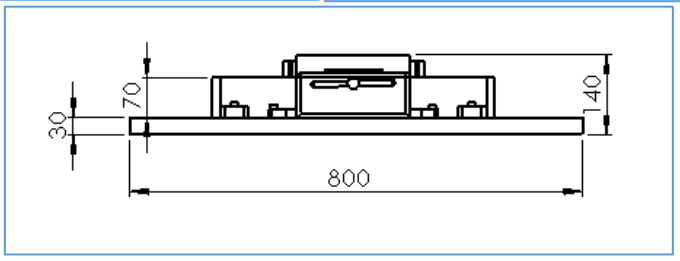




3D part model - holder device







Technological device dimensions

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CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

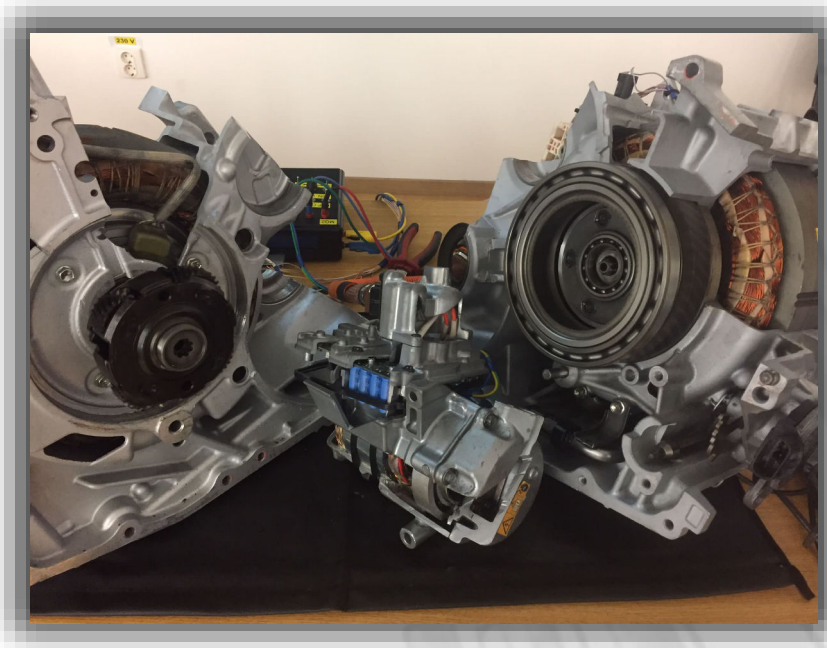
Charge/discharge/check characteristics of Ni-MH and Li-ion batteries

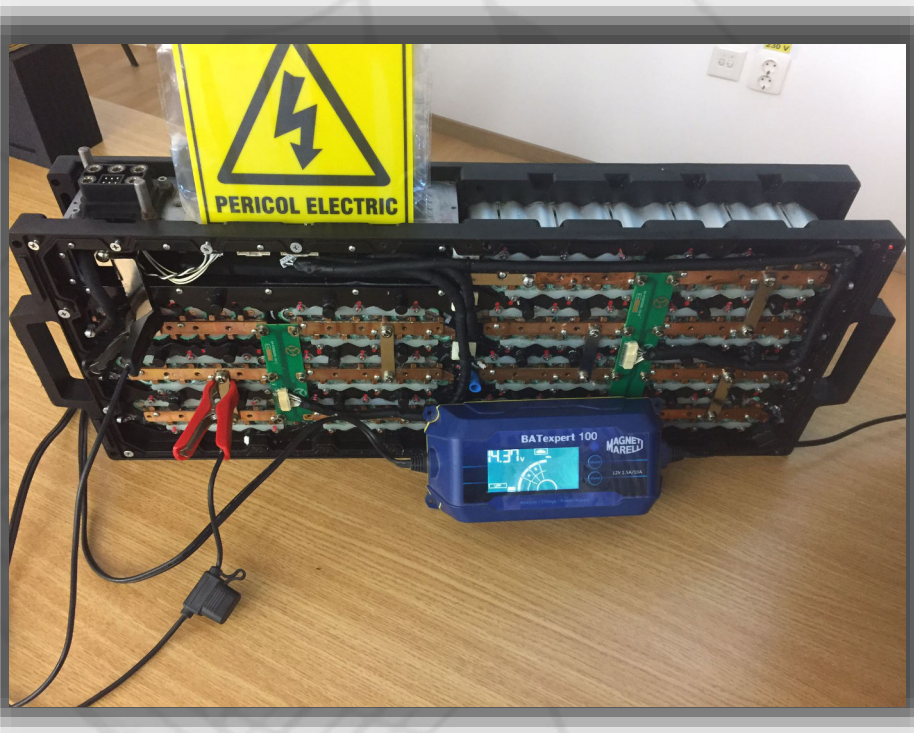
Authors: Gidali Adrian, Simon Florin

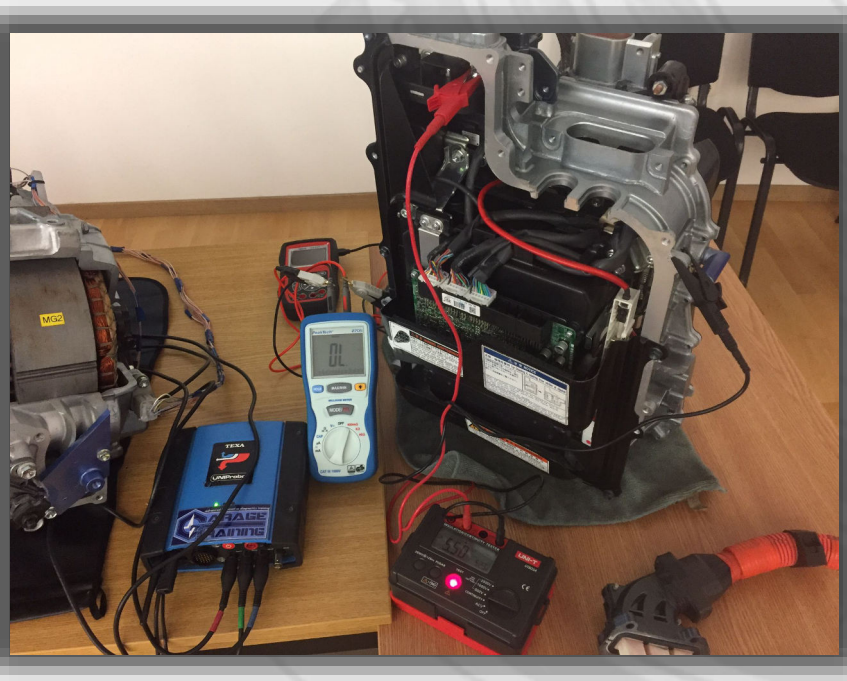
D

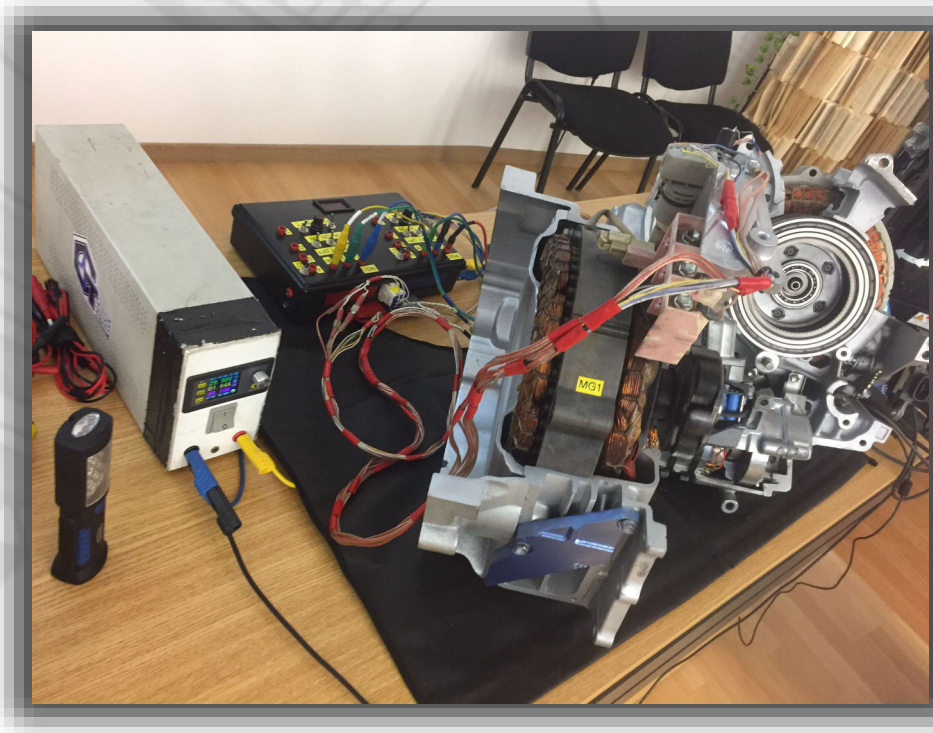
Didactic simulator Hybrid Vehicle System (Toyota HSD - Hybrid Synergy Drive - serial/parallel), dedicated to the study and understanding of the operating modules of the various configurations existing in the structure of electric and hybrid vehicles:

-functional electric motors/generators MG1/MG2, synchronous-permanent magnets,
- PowerSplit gearbox mechanism,
- MG1 and MG2 control unit,
-inverter/converter,
- functional air conditioning electric compressor,
-high voltage battery+ECU BMS - Battery Management System.
- Li-ion 50.4V battery pack with built-in BMS (Porsche e-Formula).









Practical application:

-measurement of activation voltages/currents for HV electric motors.
-determining the state of the stator windings by the method of generating alternating currents.
-measuring resistances using the high-precision Milli-Ohm-meter.
-determining the integrity of high voltage insulations by using the giga-ohmmeter.
- determination of current losses in the HV installation, using the method of voltage drops and unwanted currents.
-determining the state of health (SOC-State of Health) of the modules in the high-voltage battery.
-checking the messages from the CAN-bus network between the control units of the HV system.
- performing the balancing operation (balancing) of the HV battery modules.

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CORNELIUGROUP research-innovation association

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Power of Creative Mind

Mercedes AMG-One

D

Student Project

Authors: Certejan Vlad-Nicolae-Cosmin, Cătană Andrei Alexandru
Coordinators: BIRTOK-BANEASA Corneliu, BUDIUL-BERGHIAN Adina

Mercedes-Benz, a brand of the Mercedes-Benz Group, has been involved in Formula One as both team owner and engine manufacturer for various periods since 1954. The Mercedes-AMG Petronas F1 Team, which is based in Brackley, England, and possesses a German licence, as of 2022 majority owned by the Mercedes-Benz Group with Toto Wolff having a significant shareholding. Mercedes returned to Formula One in 1994 as an engine manufacturer in association with Ilmor, a British independent high-performance autosport engineering company, which developed their engines. The company won one constructors' title and three drivers' titles in a works partnership with McLaren which lasted until 2009.

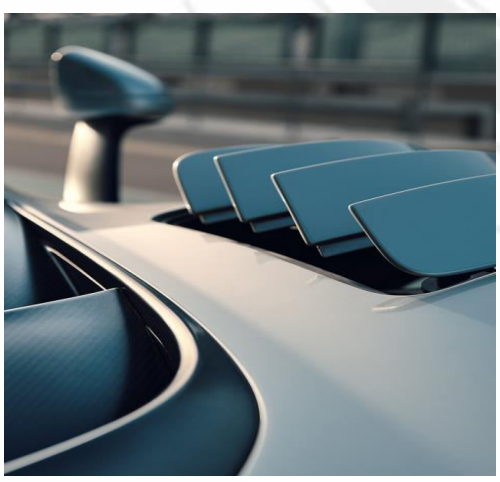
Now, Mercedes-Benz works on a vehicle that is inspired by the Formula 1 engine technology, peppered with superlatives road-legal racing car to emerge from Affalterbach.

Incredible performance, brought directly to the road. With an acceleration of 0-200 km/h in 7.0 seconds or 0-300 km/h in 15.6 seconds, this hypercar sets the direction: the electronically regulated maximum speed of 352 km/h. Breathtaking figures that are made even more powerful thanks to driver programmes for the racetrack drawn from Formula 1. In the Strat 2 programme, the active aerodynamics, the tighter chassis tuning, the lowering of the vehicle and the full performance of all its motors all operate just as in the Formula 1 qualifying.





The newly-developed, automated 7-speed manual transmission with its 4-disc carbon racing clutch is perfectly matched to this high-performance Formula 1 hybrid – and can perfectly translate the maximum speed of the combustion engine of 11,000 rpm in order to always draw maximum power. Journeys with speeds over 300 km/h, extreme acceleration out of curves, and always perfect road holding. Only if you understand the limits of physics can you master them. The best demonstration of this is the spectacular aerodynamics of the ONE that seeks a unique balance between maximum drive and actively optimised aerodynamics for greater contact pressure. To achieve this, moveable slats were developed for the front wheelhouses, along with a two-part extendable rear wing and active flaps on the front diffuser, which can be adjusted to suit the driver’s wishes and chosen driving programme for optimal racing conditions.







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Power of Creative Mind

GOLF 4 1.9TDI

MY PROJECT FOR MORE HORSEPOWER

Student Project

Author: Ardeu Razvan Antonio

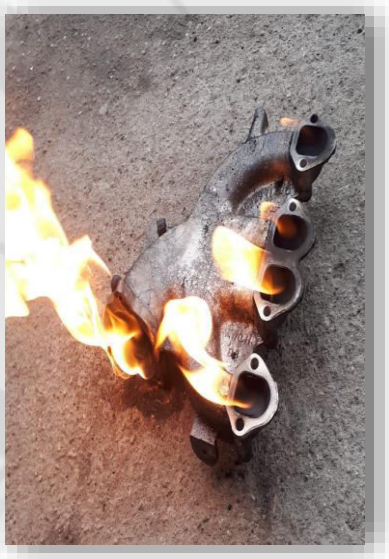
Coordinators: BIRTOK-BANEASA Corneliu, BUDIUL-BERGHIAN Adina

D

My project starts with buying a new car, a simple Volkswagen Golf 4 with a 1.9Liter Diesel engine. Stock, it measured 116 horsepower (AJM engine code).
This engine has a very good reputation in terms of modifying it for more horsepower as well as a very good reliability.







The first things I did to the car were to make sure that the enginein very good condition, so I changed the following parts for maintenance:
-Timing belt;
-Camshaft lifters upgrade;
-Camshaft upgrade;
-Cylinder-head bolt set upgrade;
- Vacuum hoses.







The stock clutch can`t support so much power, so it also needed a change. I decided to go from a double mass flywheel to a single mass flywheel, but the rest of the clutch parts are also brand new. This new flywheel is 7kg ligher than the stock one, so the car will have a faster acceleration.

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GOLF 6 GTI EDITION 35
THE BEGINNING OF MY PROJECT

Student Project

Author: Răbulea Ștefan

Coordinators: BIRTOK-BANEASA Corneliu, BUDIUL-BERGHIAN Adina

D

The Volkswagen Golf 6 GTI Edition 35 is a special edition of the normal Golf 6 GTI, the anniversary for 35 years of the Golf GTI. It comes with the 2.0L engine from the Golf 6 R that outputs 235 horsepower (30hp less than the R to differentiate them). It also has a different turbocharger (K04) than it`s normal version, gaining 25 more horsepower.



The car is a forward-wheel-drive (FWD), but the Edition 35 also has a limited slip differential which helps with the traction. This specific car has a DSG automatic gearbox.

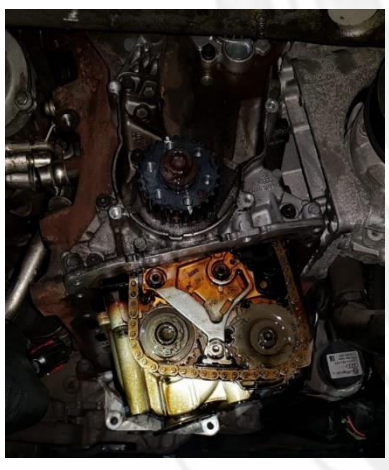
My goal is to maintain the car in the best condition while I`ll do some modifications to gain more horsepower and a better exterior look.

After a very careful maintainence service, we started doing some modifications for extra horsepower :

-Remus sport exhaust system. Sport exhaust systems provide more horsepower because the exhaust gases are released at a higher speed. We installed a Remus exhaust system from the middle of the car to the back of it.

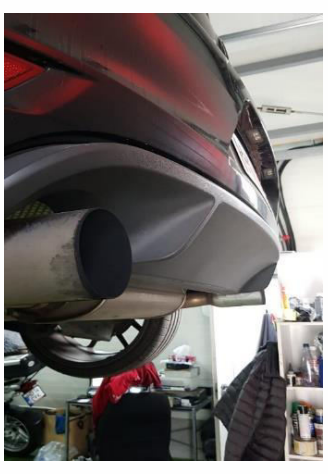
-New oil pump chain and new sprocket for balance shaft delete. I bought the new sprocket from VisMotorsport. We also changed the oil pumps chain with a new one, because at the end of the day it`s a chain and it loosens with time.

BEFORE AFTER









In the near future, I plan to install a new cold air intake with a conical filter and a termic shield to increase the air flow that goes in the engine, so the car will also receive a few horsepower from that.

Also, it will receive a Stage 1 software performance upgrade for the engine as well as a Stage 1 software performance upgrade for the DSG gearbox, which will increase the horsepower to approximately 330 (100 more than stock).

The modifications I did until now are required if you want to do a Stage 1 software upgrade so the car will maintain it`s reliability.

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Power of Creative Mind

Automotive tuning history

Student Project

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Coordinator: BIRTOK-BANEASA Corneliu

D

Tuning is basically as old as the automotive industry, if you consider the various decorations on horse saddles and the improvement of carriages, you can risk the statement that he is even older than the automotive industry. However, it was only the popularization of the car as a means of transport that influenced the development of this industry.





Car tuning appeared almost immediately and went through many stages. Tuning was associated with adapting cars to individual needs or it met the owners' aesthetic needs. Hot rods are one of the more characteristic examples. These types of light and tuned vehicles come from cars modified by American alcohol smugglers of the Prohibition era. They needed vehicles to transport contraband that would enable them to escape from law enforcement. Their impact on the automotive industry was twofold.

On the one hand, he laid the foundations for the style that is still popular today, and on the other, the smugglers' races have become the starting point for the birth of the Nascar series and oval races.

The next stage of tuning were lowriders, which also in the United States began to appear at the turn of the 1940s and 1950s. Reduced to the limit, popular cars among Latin American youth gained even more interest in the late 1980s and early 1990s when they appeared in American rap music videos.



A car leaving the factory will usually be a relatively convenient tool to move from point A to points B and C. However, this can be done faster and more efficiently. Series production forces producers to make certain concessions. Rally and racing teams know this. By preparing their vehicles for winning they improve the factory, and we can later apply some of their experience and knowledge to our cars.



Engineers, competing with other teams, are developing increasingly better ways of extracting power from engines. The tuning also changes according to these advances. Several revolutionary solutions have emerged over the years. An example would be turbochargers or injection systems commonly used today. Although this has not always been the case, today hardly anyone except enthusiasts plays in the adjustment of carburetor or ignition angle. Because the engine's operation has been controlled by increasingly advanced computers for years, tuners also use advanced technologies in their work. Today, the use of chiptuning has at least two aspects. In the advanced version, it is the next stage of work on engine modifications.

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CORNELIUGROUP research-innovation association

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Power of Creative Mind

Experimental stand for the study of helical conveyors

Laboratory prototype

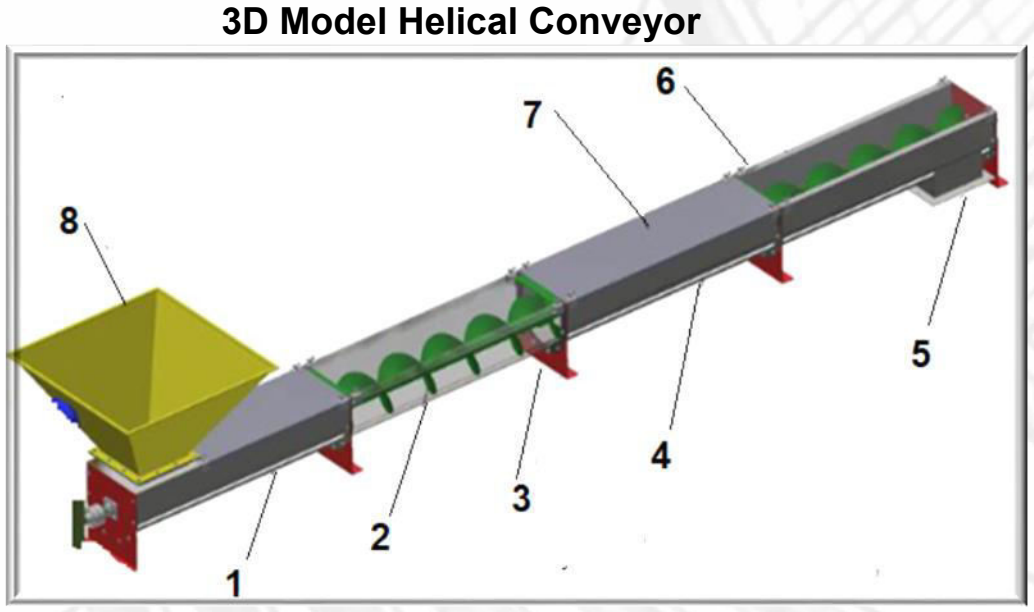
Author: Pinca-Bretotean Camelia

D

The experimental stand is intended for the study in laboratory conditions of helical conveyors in order to optimize their parameters to obtain high productivity and low energy consumption. It consists of a helical conveyor, electric motor, reducer, electromagnetic shoe brake and short stroke.

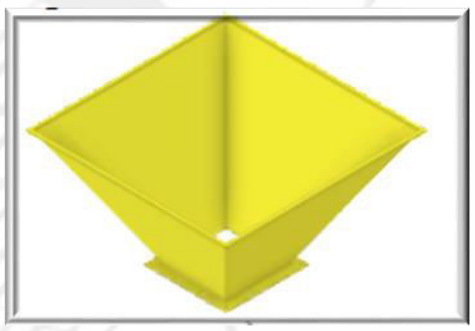
The operating principle is based on the pushing movement of the material to be transported inside the metal casing of the feeder by means of a helicoid, integral with a horizontal axis in rotational motion. The rotary motion of the auger and shaft allows the uniform movement of the material from the feed point in the hopper to the discharge point where the material is discharged. The stand presents the advantage of a closed and sealed construction that offers the possibility of conducting experiments at the laboratory level.

3D Model Helical Conveyor

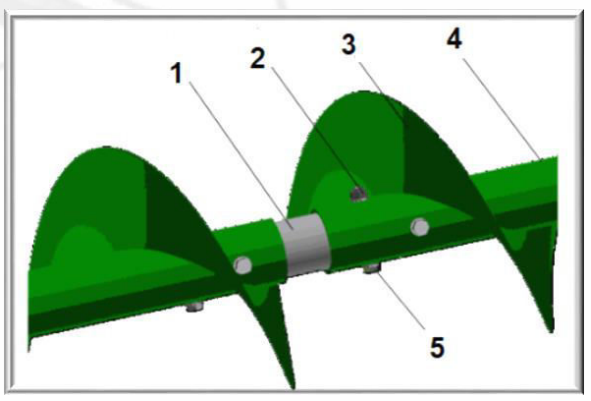


1-section for feed tank; 2-helical; 3-support sole; 4-intermediate trough; 5- exhaust mouth; 6-chute section with outlet; 7-protective cover; 8-feed tank

3D Model for feed tank



Helicoid sections assembled with coupling shaft



1-coupling shaft; 2- fixing nut; 3-helix of the snail; 4-tubular shaft; 5-fixing screw



Drive group electric motor -brake-reducer



Helical conveyor assembly



Exhaust mouth

Research directions:

- the influence of the diameter and speed of rotation on the performance characteristics of the helical conveyors, during the process of handling different materials;
- optimization of functional parameters to obtain high productivity and low energy consumption;
- the influence of specific parameters on the performance of conveyors.

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CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

UNIVERSITATEA LUCIAN BLAGA DIN SIBIU

Study and analysis of sandwich panels for cabin roofs in construction field

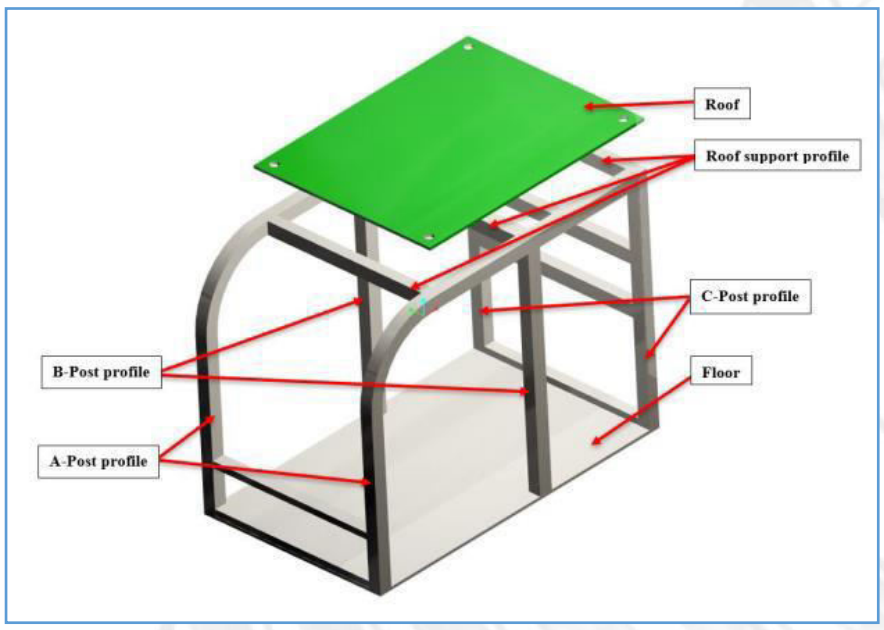
Scientific Paper

Authors: BLEOTU Robert-Marian, PREDA Cosmin

D

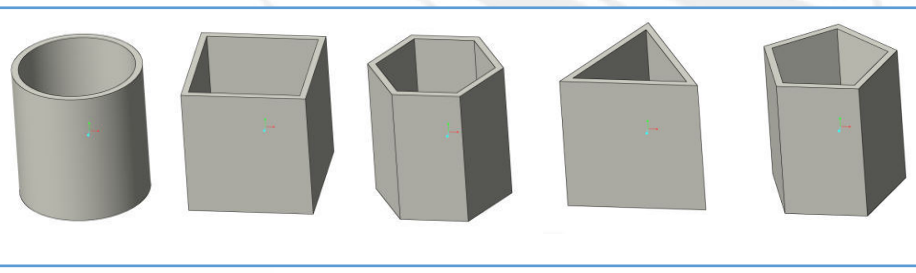
Summary

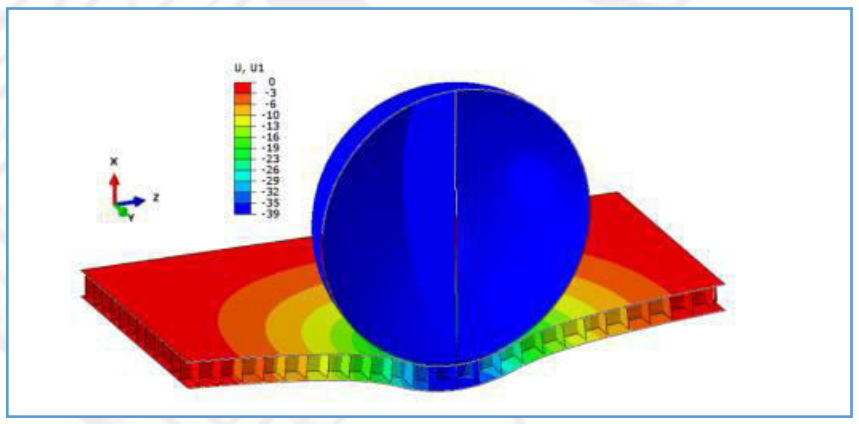
The aim of this study is to replace the classic cabin roofs with lighter roofs and better material properties. A first objective of this work is to adapt different types of cells and analyze them in terms of energy absorption while a compressive force is applied. The best result in terms of values obtained have been further used in the construction of the sandwich plates core. The second objective is the static analysis of sandwich plates that contain cells and walls of different thicknesses. Simulations of hitting the sandwich plate with a moving object, by creating a simulation with a finite element method, were performed.

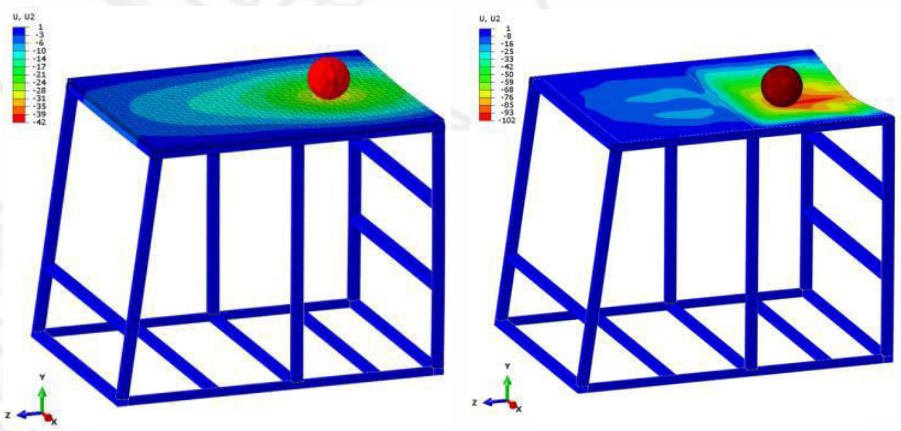


SHAPES AND MATERIAL

Five tube models with different cross-sections: circle, square, hexagon, triangle and polygon. The material used to make the tubes is Aluminum 6063, and the wall thickness is 1 mm. All tubes were constructed with a height of 20 mm.

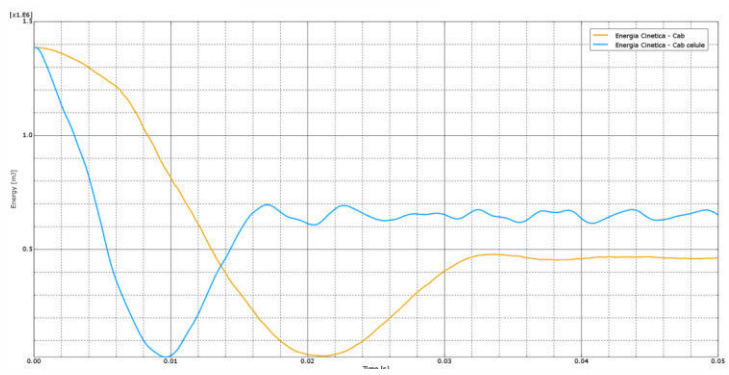






Simple roof

Sandwitch pannels roof



ADVANTAGES: The roof model made of sandwich panel presents a major improvement for the safety of operators who use construction equipment in a dangerous environment.

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MacPherson suspension study through numerical simulations

Scientific Paper

Authors: PREDA Cosmin, BLEOTU Robert-Marian,
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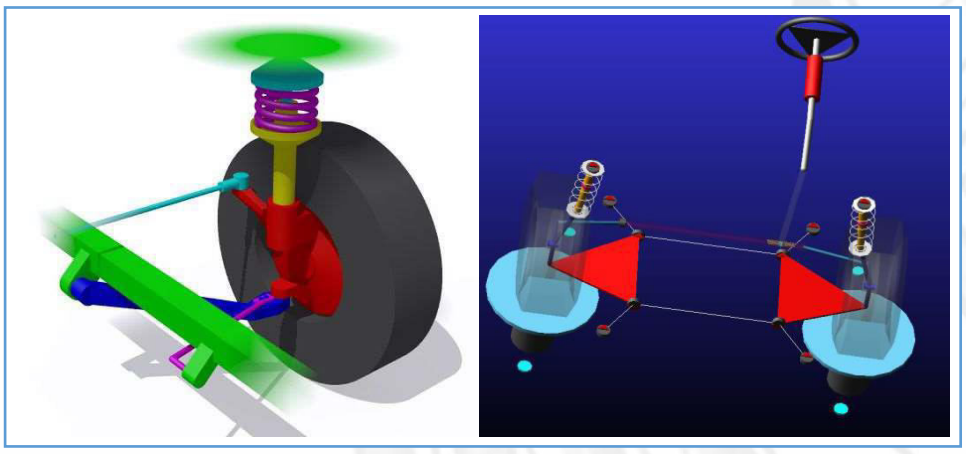
D

Summary

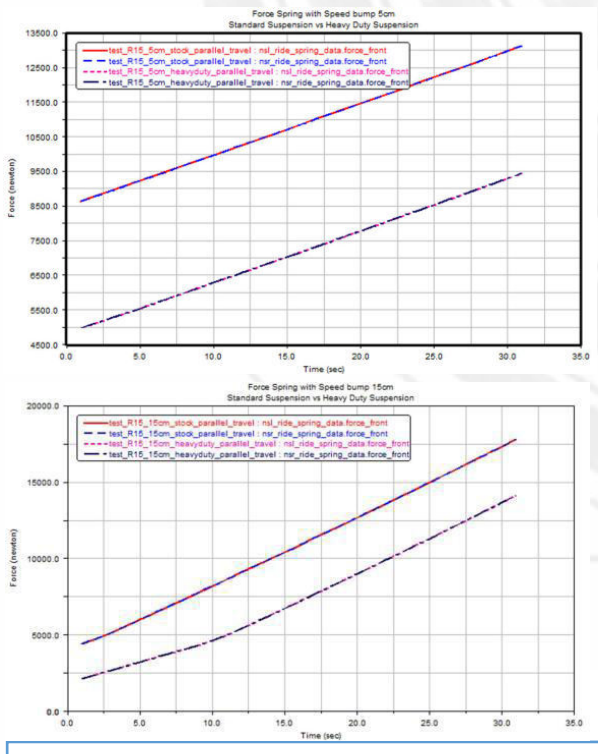
The purpose of this dynamic study by numerical simulations of the MacPherson strut suspension is to highlight the dynamic differences between the stock and heavy MacPherson suspension duty for the Volkswagen Jetta.

One of the specific objectives of the paper is to compare the two types of springs, the stock with which the car is equipped at the factory and the modified one, the heavy duty variant. The second specific objective is to compare the two types of springs in relation to the two heights of the speed limiter (5 and 15 centimeters,) and the two types of tires (175/65 / R14, 195/65 / R15). The third objective of this paper is to perform a comparative analysis of the main components of a shock absorber assembly, statically through tests.

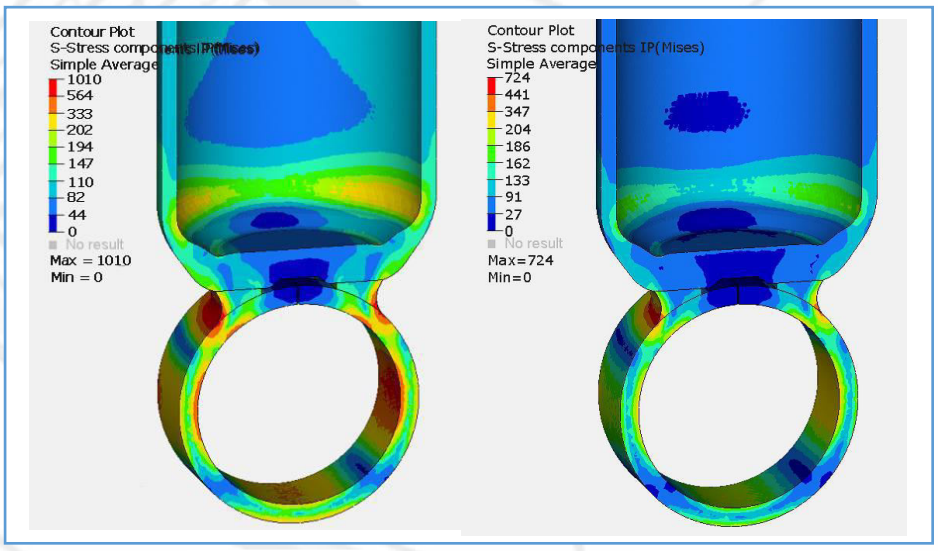


ANALYSIS METHOD AND RESULTS

The analysis of the displacement of the wheels with parallel displacement will be performed.

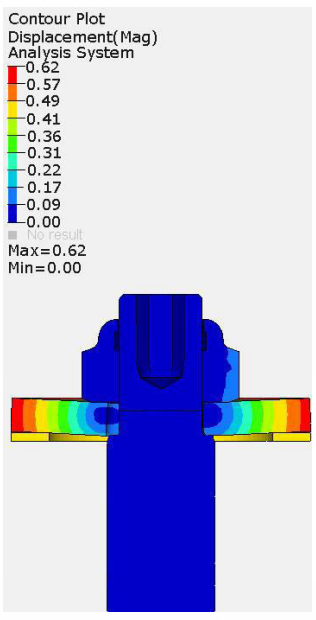


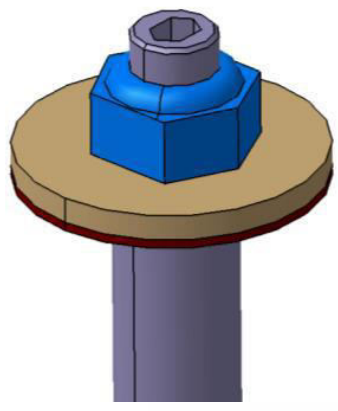
The graphs related to the analysis of wheel displacement resulted from the analysis.



20 kN force **50 kN force**

FEA: Finite element analyses will be performed for the main components that make up the shock absorber assembly. These analyses are of significant importance for the entire suspension assembly, as it is subjected to high forces during its operation, once mounted on the vehicle.





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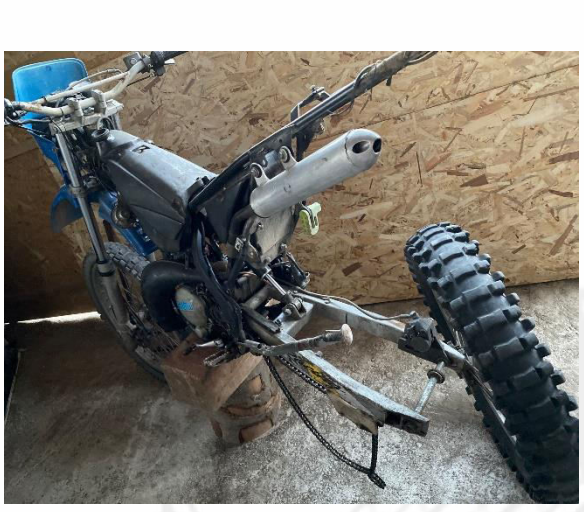
Power of Creative Mind

Moto Cross Enduro Beta by Razvan

Patent: Student Project

Author: Magdut Razvan Dorian
Coordinator: BIRTOK-BANEASA Corneliu

D





Motocicletele Beta sunt cunoscute mai ales pentru modelele enduro, cross si trial. Beta cu origine italiană se deosebește prin producerea propriilor motoare. Beta și-a făcut un nume când in 1997 marca a lansat primul său enduro Beta RR 50. Pentru început s-au tratat micile probleme mecanice cât și electrice, estetice prin înlocuirea pieselor deteriorate cu unele noi. La final a fost vopsit pentru a avea un aspect cât mai plăcut și pentru a prelungi durata de viață a motocicletei. Rezultatul este unul deosebit.





Beta motorcycles are known especially for enduro, cross and trial models. Beta, of Italian origin, is distinguished by the production of its own engines. Beta made a name for itself when in 1997 the brand launched its first enduro Beta RR 50. At first, small mechanical as well as electrical, aesthetic problems were solved by replacing the damaged parts with some new ones. In the end, it was painted to have a more pleasant appearance and to extend the life of the motorcycle. The result is a special one.

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Power of Creative Mind

Tractor Same Corsaro 70 by Lucian

Patent: Student Project

Author: Hențiu Lucian Nicolae
Coordinator: BIRTOK-BANEASA Corneliu







Tractoarele joacă un rol important în dezvoltarea omenirii.

Same, cu origine italiană, se deosebeste prin durabilitate ridicata și mentenanță simplistă indiferent de anotimp, datorită sistemului de racire cu aer.

Modelul în cauză este un Corsaro70 din anul 1981, care prin grijă sporita reușeste să șnvingă provocările la care este supus în munca agricolă. Pentru început s-au reparat problemele tehnice, atât mecanice, cât și electrice. Ulterior s-a confecționat o semi-cabină pentru protejarea suplimentrară a conducătorului, formată din cadru, geamuri frontale si acoperiș superior rigid. In final, întreg ansamblul a fost vopsit pentru a avea un aspect cât mai apropiat de starea nouă. Rezultatul este unul deosebit, prelungind astfel durata de viață a utilajului.





Tractors play an important role in the life and development of mankind. Same, of Italian origin, stands out for its high durability and simple maintenance regardless of the season, thanks to the air cooling system. The model in question is a Corsaro70 from 1981, which through increased care manages to overcome the challenges to which it is subjected in agricultural work. To begin with, the small technical problems, both mechanical and electrical, were solved. Later, a semi-cab was made for the additional protection of the driver, consisting of a frame, front windows and a rigid upper roof.

Finally, the whole assembly was painted to have an appearance as close as possible to new condition. The result is a special one, thus extending the life of the machine.

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Implementation of SMART AIRPORT in King Abdulaziz Airport, Jeddah, Saudi Arabia

Bashair Alghamdi, Taghreed Alqarni, Ezdihar Aljarrash

Supervised by: Dr. Neyara Radwan

D

Airport digital transformation process is a continuous improvement process called "Digital Maturity Model" and it identifies four stagesthat an airport can go through,

- **Stage1:** Where most of the processes are performed manuallyby staff.
- **Stage2:** When digital technologies such as check-in, security control and passenger information system begin to be used.
- **Stage3:** Digital technologies are widely used in most airport processes and to add value to airport functions beyond basic operational requirements such as ecommerce, self-service check-in…etc.
- **Stage4:** Known as 'Smart Airport' where value is created from data that is captured and shared with key stakeholders and used in real time via smart data functionality.







Main airports in Europe, USA, Middle East, and Asia are well-equipped with new technologies and ready for digital transformation while some of the airports in developing countries are still struggling with the traditional airport infrastructure & processes. Airports Council International (ACI) has prepared a document called "The Airport Digital Transformation Best Practice" which includes a set of recommendations and solutions ready for implementation for airports to be digital ready.



Airports Council International (ACI) has prepared a document called "The Airport Digital Transformation Best Practice" which includes a set of recommendations and solutions ready for implementation for airports to be digital ready, starting from the easiest one which is "Free Wifi"

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MODULAR AND RECONFIGURABLE STRUCTURE FOR A ROUTER GANTRY CNC MACHINE

Patent number: A/10073/02.12.2022

Author/s: **Cornel Ciupan, Claudiu-Ioan Rusan, Mihai Ciupan**

D

Description: The router consists of a bed (A), with the role of supporting the fixed and mobile elements of the machine, a table (B) for the workpiece, and a gantry (G) with the milling head C can move in three perpendicular directions under the action of the kinematic axes X, Y, Z. In this invention, the role of the mobile "U"-shaped gantry from the known solutions is taken over by a gantry in the form of a straight beam.
The mechanical structure of the machine is designed from modules, having the bed A, the table B and the axes X, Y, Z, designed in the form of modules from typed elements. The machine is reconfigurable in that the table of the M machine can be mounted in different positions, depending on the maximum height of the workpiece, and the milling head can be replaced with a cutting unit for laser or water jet cutting.

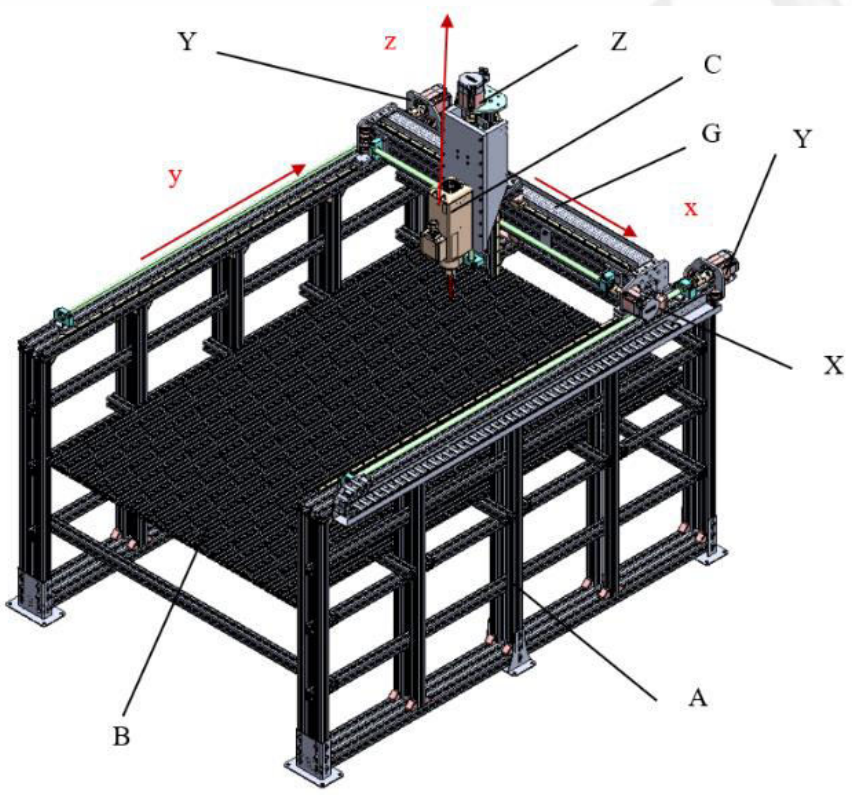

Fig. 1. The router structure



Fig. 2. Router gantry UTCN – V1

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INTENSIFIER SYSTEM FOR HIGH PRESSURES

Patent number: RO131458-B1/30.10.2019

Author/s: **Cornel Ciupan, Emilia Ciupan, Rareş Petrus**

D

Description: The invention relates to an intensifier system for high pressures, which can be used in the manufacturing of water jet cutting machines or in other industrial applications requiring high pressure. According to the invention, the system consists of the following components:

- a sonic generator comprising a camshaft which moves a rod that pushes on a membrane fixed with some screws between a lower casing and an upper casing that generates pressure waves in a liquid (oil) found in the pipe connected to the sonic amplifier;
- a sonic amplifier made of a chamber having the membrane (D-oil) coupled, by a rod to another membrane (d-water), where the pressure waves generate a reciprocating motion of the two membranes, the pressure amplifying ratio being given by the square of the ratio between the diameters (D/d).

The system is recommended for waterjet cutting machines and offers the following advantages:
technological and constructive simplicity; high reliability and easy maintenance; high volumetric efficiency due to avoiding leakage losses through seals; possibility of making membranes from materials resistant to corrosion or to different chemical agents, depending on the specific application.

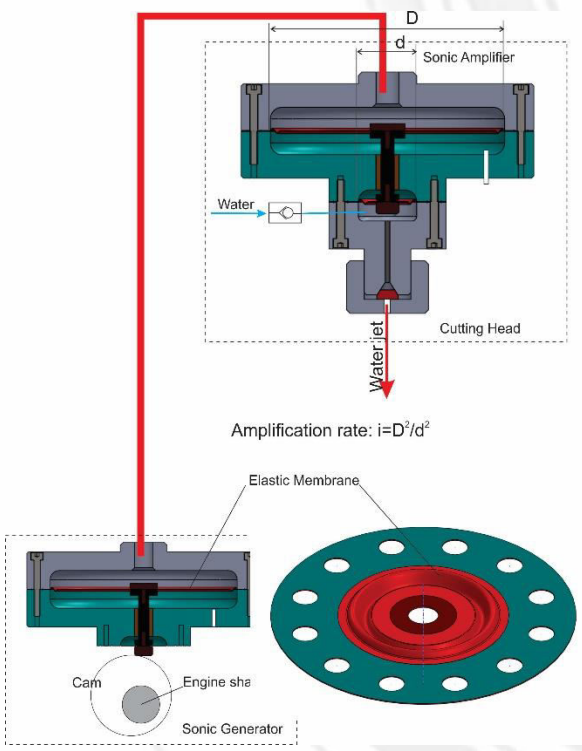

Figure 1

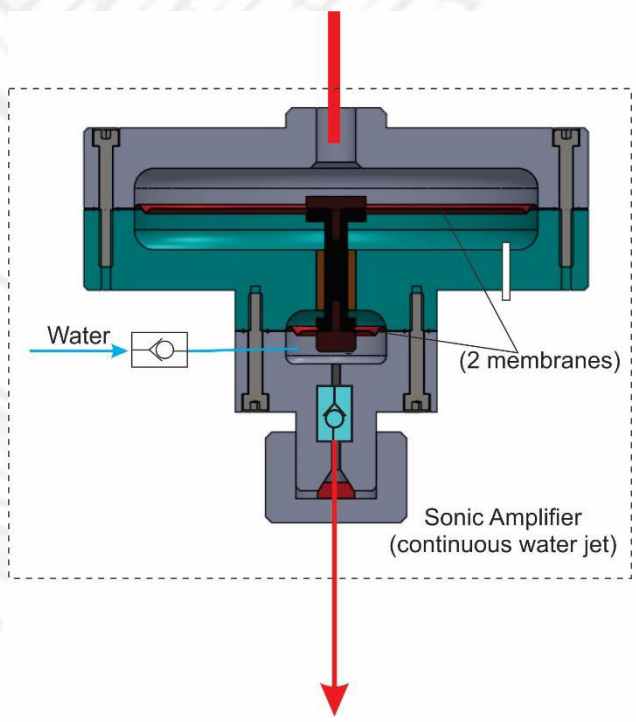

Figure 2

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METHOD FOR PRODUCING WORK AND ROTARY HEAT ENGINE FOR APPLYING SAID METHOD

Patent number: RO129731 (B1)/2020-03-30

Author/s: **Cornel Ciupan, Mihai Ciupan, Emilia Ciupan**

D

Description: The present invention solves the technical problems by developing a simple and efficient internal combustion rotary engine, with low vibration levels, that can operate efficiently at speed over 10,000 rpm, providing a power-to-weight ratio higher than that of all known engines and that can be designed and manufactured for a wide range of power and applications.

The invention describes an internal combustion rotary engine designed for the operation of vehicles or certain tools, machinery, or equipment.

Internal combustion rotary engine comprising of a volumetric blade rotary compressor (1), a volumetric blade rotary engine (2) consisting of a housing (12), which holds rotor (13), which is equipped with some slots (13a), on which blades (14) are mounted. Housing (12) is built inside with a complex bore consists of two cylindrical bore (12a), (12b), concentric with rotor (13). The compressed air or mixed fuel is taken in by the constant volume chambers (a0) and (b0) through the engine supply channel (AM) located in the secondary bore (12b) area. The constant volume chambers (a0) and (b0) go to the ignition channel (I), the ignited gas acting upon the blades and thus produces useful work. Internal combustion rotary engine designed for the operation of vehicles or certain tools, machinery, and equipment. Building a rotary internal combustion engine according to the model described by this invention brings the following advantages:

- small and compact engines which generate high power
- high efficiency
- very low levels of vibration and noise
- simplicity of construction by eliminating valves and using a continuous burning.

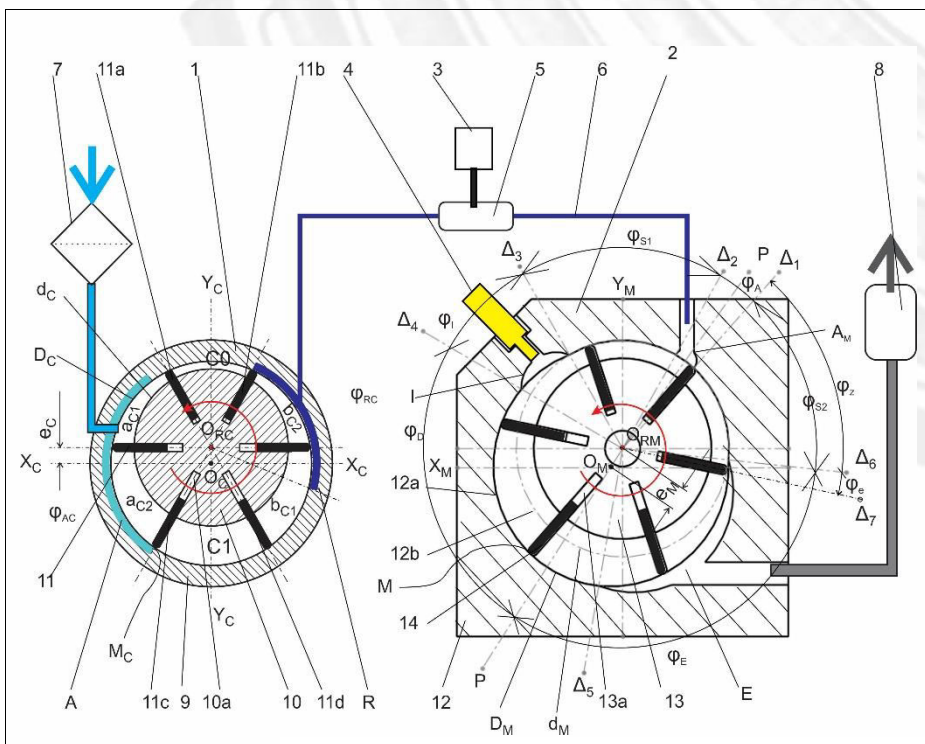

Figure 1

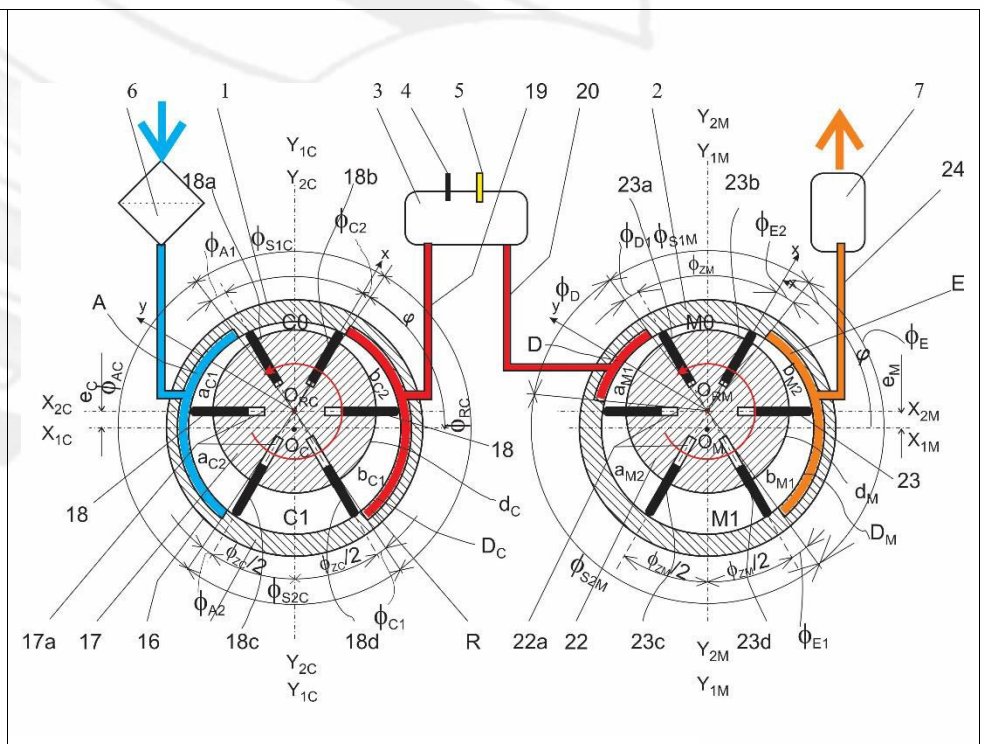

Figure 2

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MOTOR VEHICLE SIGNALING SYSTEM

Patent RO132649 (A2)/2018-06-29

Author/s: **Moldovan Ioan, Ciupan Mihai**

D

Description:

The invention relates to a signaling system for motor vehicles intended to provide information both to the motor vehicle's driver and the following motor vehicle's driver within a column of motor vehicles. The system is comprised of a signaling subsystem (1) for the road users, having a rear signaling system (6) which is provided with two light tapes (10 and 11) offering dynamic information about braking and acceleration and of a driver's signaling subsystem (2) consisting of a module (12) which monitors vehicles or pedestrians approaching the door opening area and of a module (13) verifying the presence of an obstacle in the door opening area, which is used when the motor vehicle is stopped and when opening the door is desired. Benefits: increased traffic safety; avoidance of accidents related to door opening after stopping the car; avoidance of obstacles when opening the doors; it can be adapted to all types of vehicles authorized to travel on public roads.

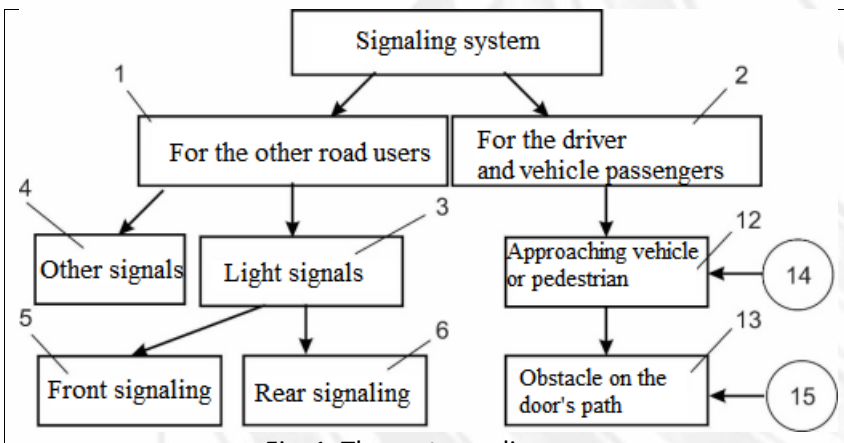

Fig. 1. The systems diagram

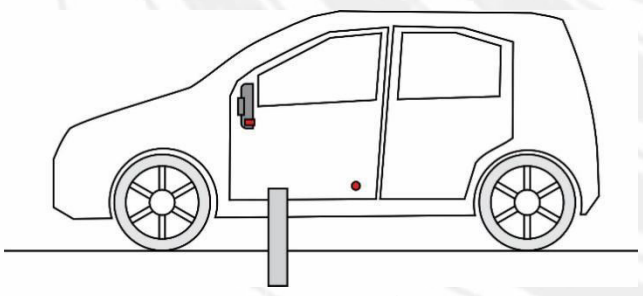

Fig. 2. The side view of a vehicle

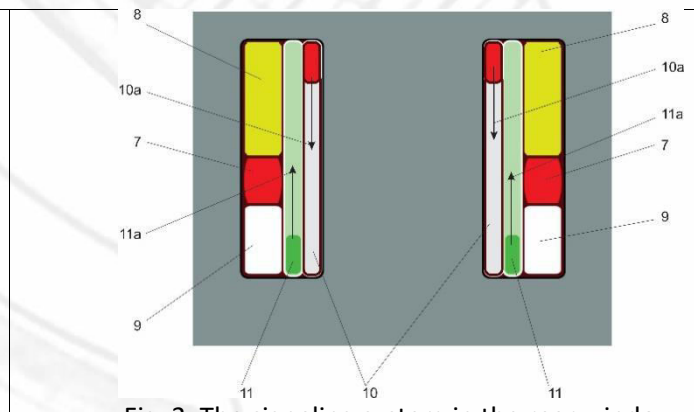

Fig. 3. The signaling system in the rear window

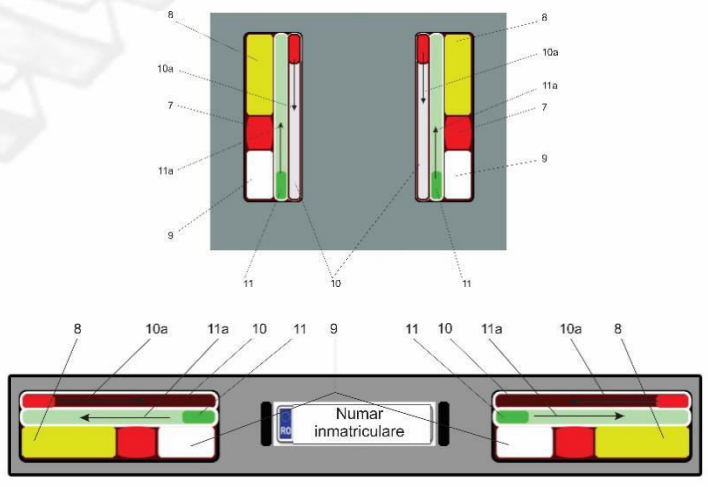

Fig. 4. The signaling system in the bumper and taillights

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ERGONOMIC AND SAFETY DESIGN OF A DRILL HAND POWER TOOL

Ph.D. Thesis

Authors: **Marian – Florentin GHENA,**

Alexandru – Mihai IAMANDI, Liviu - Daniel GHICULESCU

D

The hand drill is one of the most used power tools both by professionals and do-it-yourself (DIY) consumers because of its efficiency and the multitude of applications in which it can be used such as drilling, assembling, raw material processing, etc.

Therefore, in recent years, special attention has been paid to the design of these instruments to provide safety in operation. Two trends were highlighted by studying the available power tools:

- creation of light and compact tools to be used with one hand (figure 1), but cannot generate a high drilling or assembly force. Due to the low processing power, these types of hand drills can only be used in limited activities;
- the need to be able to perform complex processing in fields such as civil constructions or automobiles by using portable tools, the second trend was generated, the creation of instruments that can generate a greater force to carry the tasks for which they are used.



Fig. 1. Compact drill hand [1].



Fig. 2. Instrument with attached handle [2].

However, this trend has led to an increase in operational risk because the user must assemble a tool handle to be able to use it with both hands (figure 2). The vibrations generated when the power tools are working lead to a possible disassembly or even breakage of the attached handle. There is also the possibility that during processing different particles may come off that could injure the user.

Thus, to solve the two possible work accidents during the use of such tools, two design solutions are proposed (figure 3):

- to make a handle incorporated into the body of the hand drill so that the user can have a better grip;
- to assemble a drill bit barrier capable of not allowing the particles to ricochet into the user of the instrument.

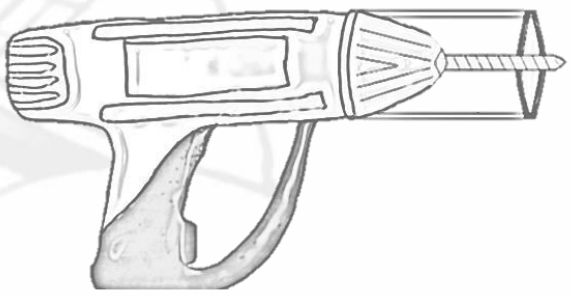

Fig. 3. Concept of power tool with an incorporated handle and drill bit barrier.

The designer must be able to develop a hand drill suitable for the user and more convenient by combining ergonomics and operational safety.

References:

[1] https://media.screwfix.com/is/image//ae235?src=ae235/855HP_P&$prodImageMedium$ (accessed on 16/10/2022 at 7:48 PM);

[2] https://www.bosch-professional.com/lb/en/ocsmedia/325722-54/application-image/1434x828/impact-drill-gsb-570-06011b70l0.png (accessed on 16/10/2022 at 7:52 PM).

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The drive system of Adaptive Exhaust Cover AbyC

D

Student Project

Authors: Marinuț Gabriel Paul, Golcea Julia Daiana,
Stoianov Alin Ioan
Coordinators: BIRTOK-BANEASA Corneliu, BUDIUL-BERGHIAN Adina

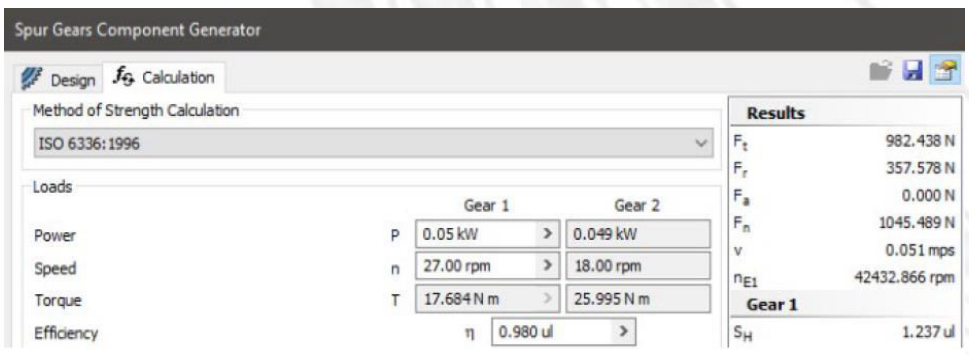
The project presents the calculation of the drive system of the exhaust cover. Competition engines are equipped with exhaust systems that aims to eliminate the gases as quickly as possible with a minimum resistance.

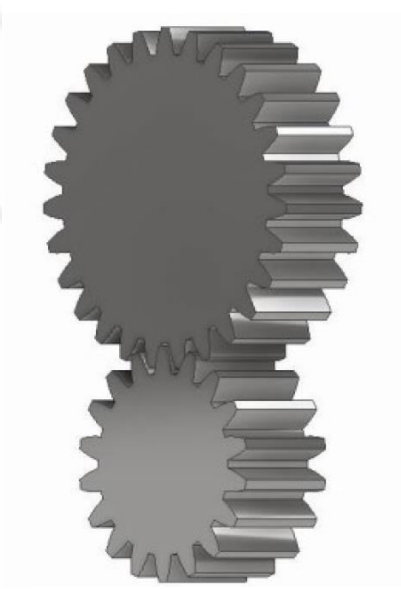
In the case of Puma AbyC, the car is equipped with a direct exhaust, meaning it's going upwards through the hood leaving the exhaust manifold open for impurities.

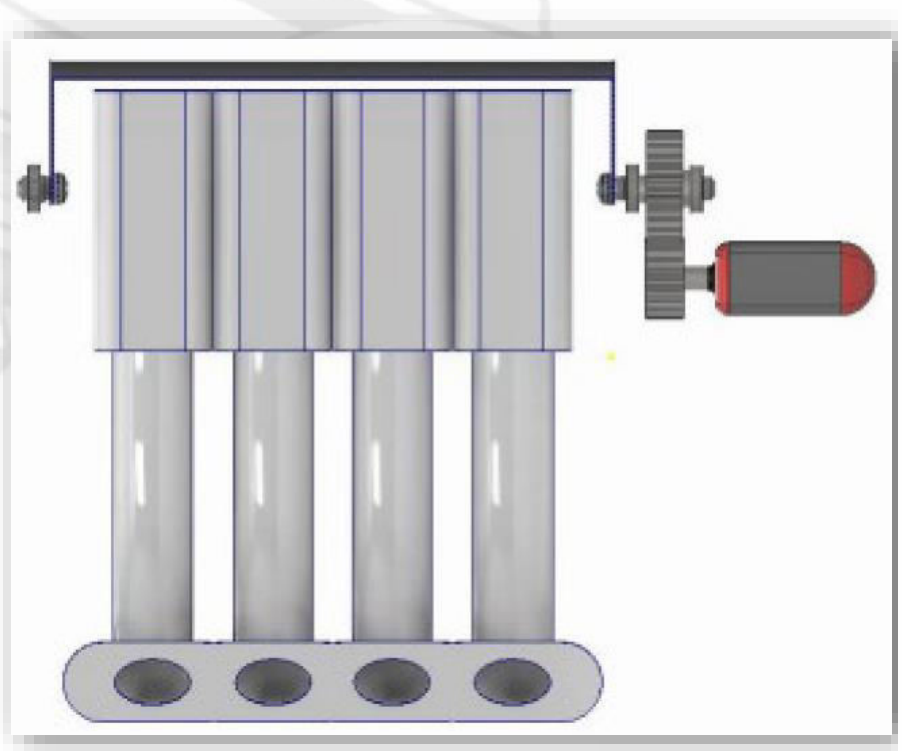
This cover helps to protect the engine from impurities when it's stopped, and the drive system of the exhaust allows for a easy usage, it can be automated with sensors making the electric engine to move the cover system.

In the begging of the calculation process the geometric calculation of gears was needed, then the forces that are appearing in the gears, finishing with the calculation of the shaft minimum diameter.

All this calculations were checked in Autodesk Inventor making the exact same gears and checking if all parameters and forces are the same. The 3D model of the drive system and exhaust cover AbyC were also realised using Autodesk Inventor.







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SMART ELECTRIC VEHICLE WITH LoRa COMMUNICATION SYSTEM AND RECOVERY OF A PART OF THE ELECTRICITY CONSUMED IN ORDER TO INCREASE AUTONOMY

AUTOVEHICUL SMART ELECTRIC CU SISTEM DE COMUNICAȚIE LoRa ȘI RECUPERAREA UNEI PĂRȚI A ENERGIEI ELECTRICE CONSUMATE ÎN VEDEREA CREȘTERII AUTONOMIEI

1948

UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00201/28.03.2019, prototype

Răzvan-Marcel MĂRCUȘ,
Cosmin-Neluțu RUS, Monica LEBA

Category
D

An intelligent electric vehicle with a LoRa communication system that monitors the quality of the environment, taking over the data of the various sensors located on the vehicle, also having the functionality of energy recovery.



Figure 1. Arrangement of generators on the functional platform of the smart electric vehicle

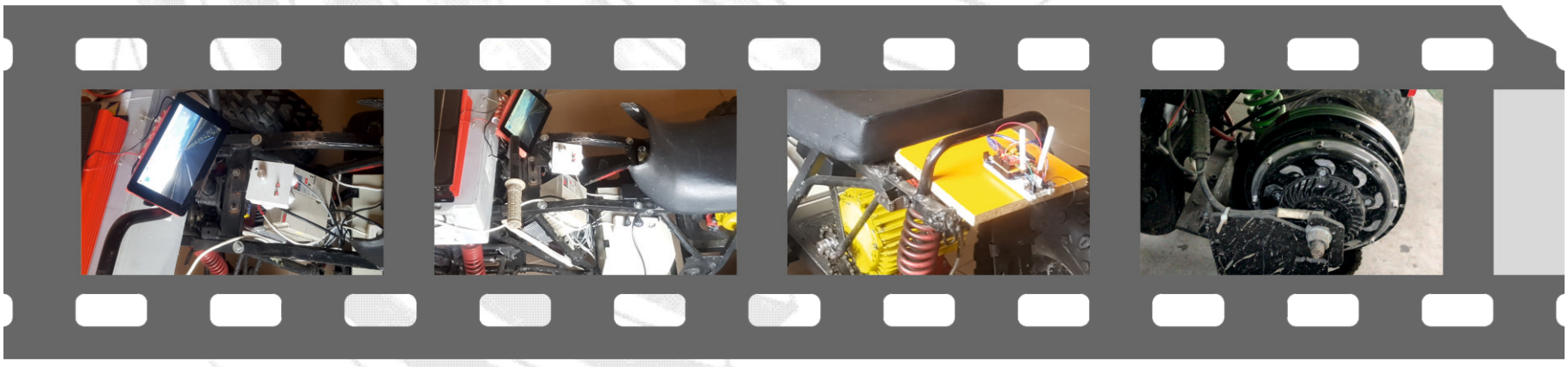

Figure 2. Command, control and monitoring elements implemented

Un vehicul electric inteligent cu un sistem de comunicație LoRa care monitorizează calitatea mediului, preluând datele diferiților senzori amplasați pe vehicul, având și funcționalitatea de recuperare a energiei electrice.

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MODULAR TECHNOLOGY TO SUPPORT UNDERGROUND EXCAVATIONS

TEHNOLOGIE MODULARĂ DE SUSȚINERE A EXCAVAȚIILOR SUBTERANE

1948

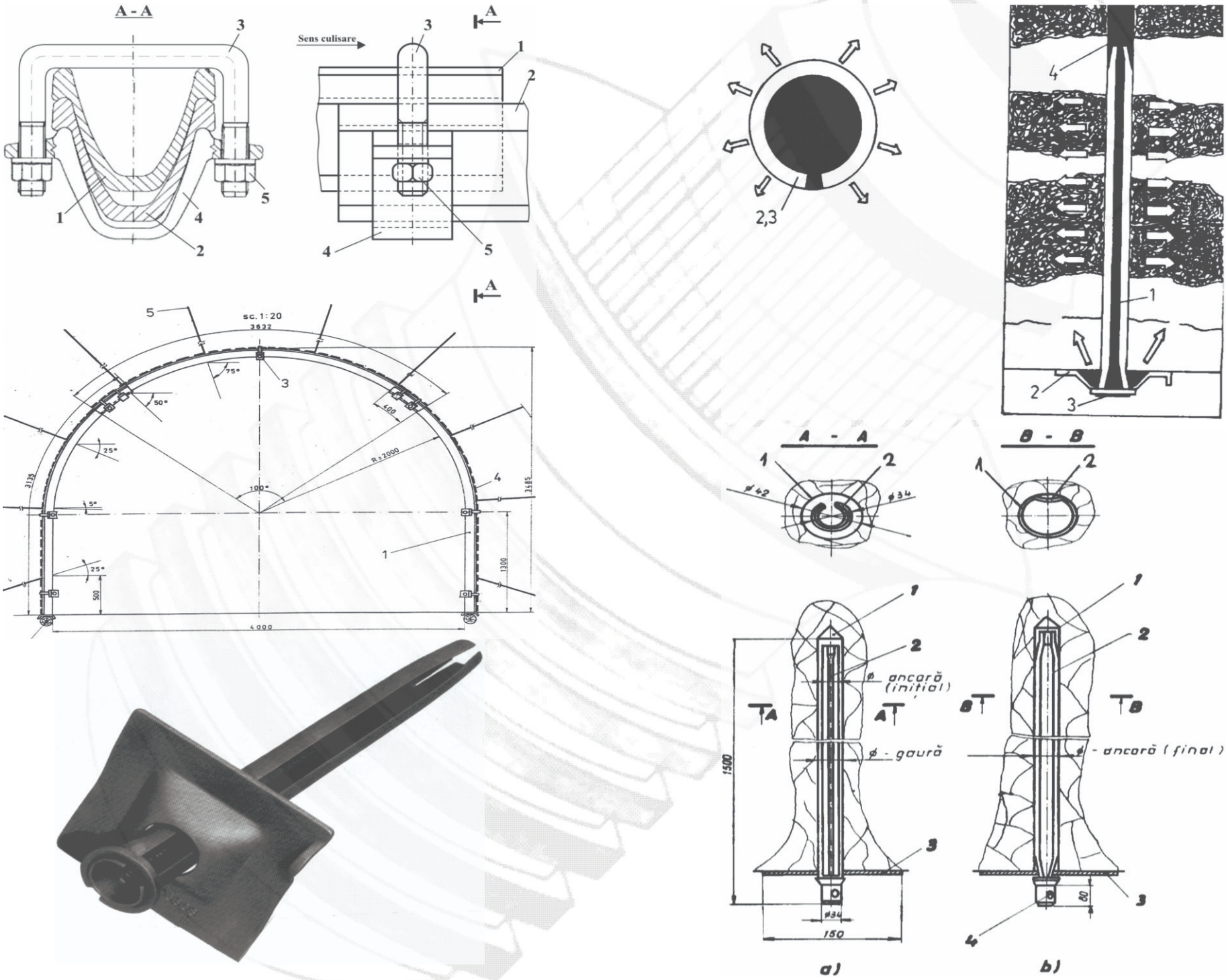
UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00596/25.08.2016, prototype

Ioel Samuel VEREȘ,
Mihai Sorin RADU, Sorinel Ștefan GHIMIȘI, Valeriu PLEȘEA

Category
D

The invention consists in the development of a support technology that ensures the stability of underground excavations for much longer periods of time.



Invenția constă în dezvoltarea unei tehnologii de sprijin care asigură stabilitatea săpăturilor subterane pentru perioade mult mai lungi de timp.

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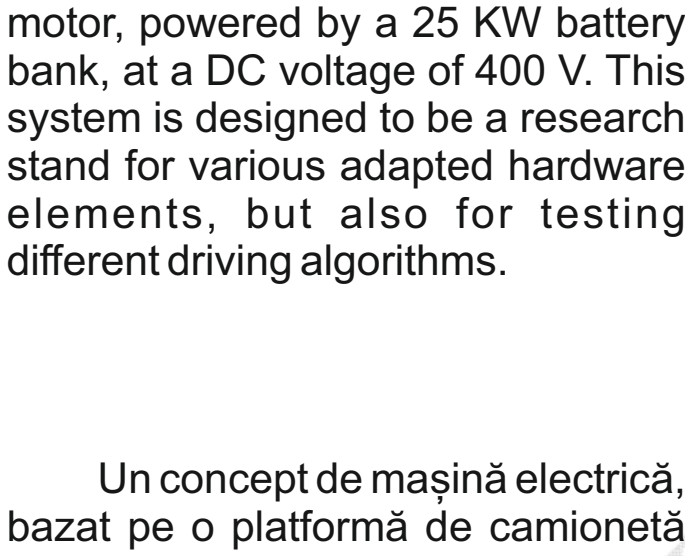
UNIVERSITATEA DIN PETROȘANI

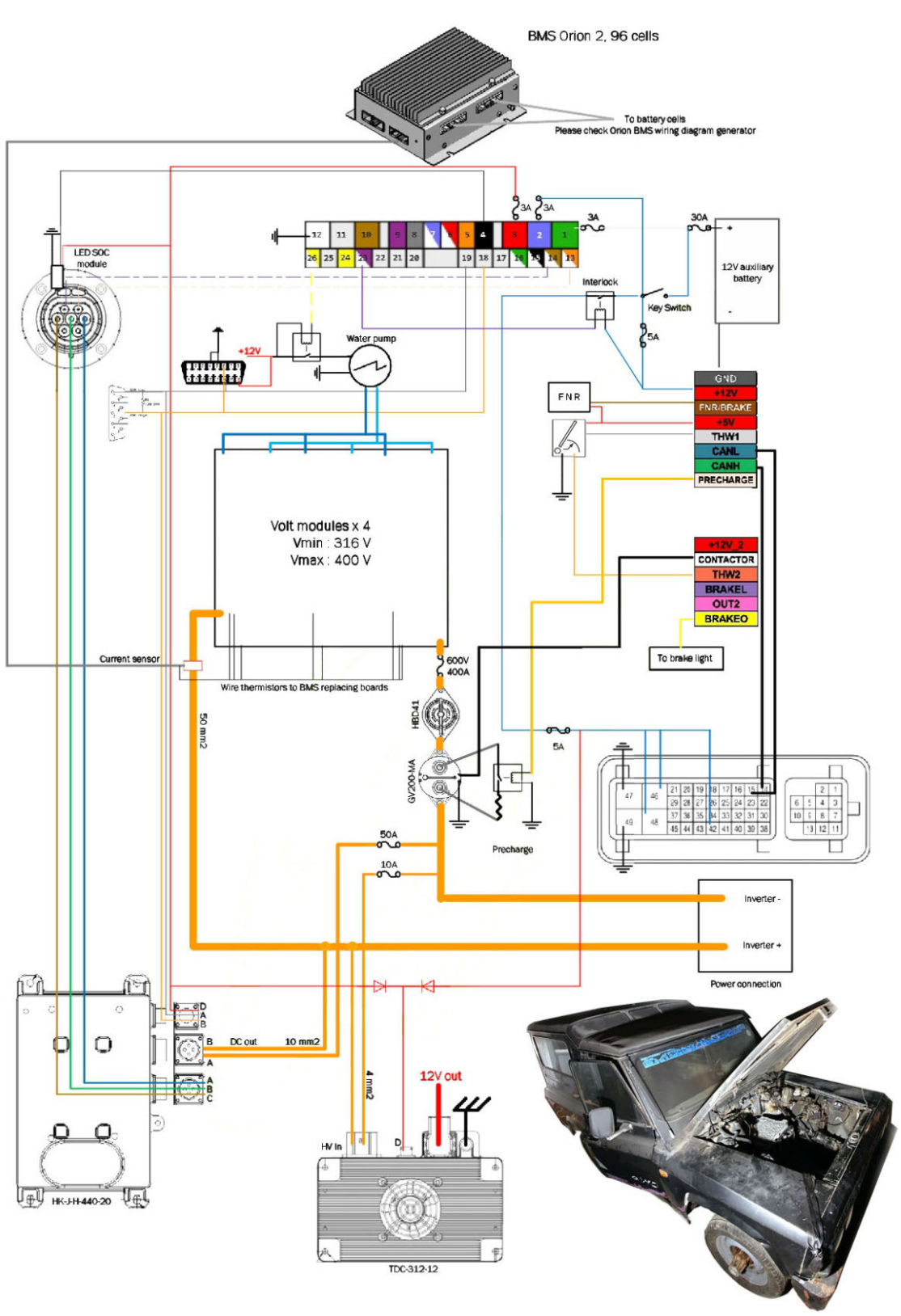
PhD student project, prototype
Răzvan-Marcel MĂRCUȘ, Monica LEBA, Marius-Nicolae RISTEIU

Category
D

The project relies on an electric car concept, based on a classic Romanian truck platform, designed based on the open-source principles. The basic system developed contains an 80 KW BLDC motor, powered by a 25 KW battery bank, at a DC voltage of 400 V. This system is designed to be a research stand for various adapted hardware elements, but also for testing different driving algorithms.

Un concept de mașină electrică, bazat pe o platformă de camionetă românească clasică, concepută de tipul open-source. Sistemul de bază dezvoltat conține un motor BLDC de 80 KW, alimentat printr-un banc de acumulatori de 25 KW, la o tensiune de 400 V, current continuu. Acest sistem este în așa fel conceput încât să fie și un stand de cercetare pentru diverse elemente hardware adaptate, dar și pentru testarea diferiților algoritmi de conducere.





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1948

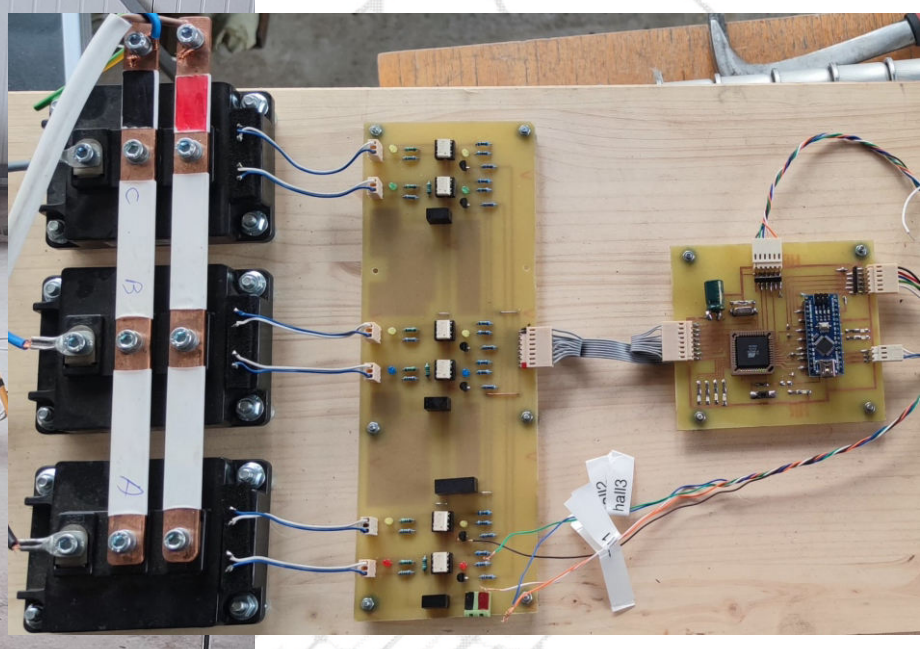
UNIVERSITATEA DIN PETROȘANI

PhD student project, prototype
Marius Nicolae RISTEIU, Monica LEBA, Mărcuș-Marcel RĂZVAN,
Remus Constantin SIBIȘANU, Alexandru CHIUDA, Alexandru STOICA

Category
D

The project presents a small electric car, which can be used on various types of terrain, including in urban centers, to reduce pollution. The developed platform offers the possibility to test several types of electric motors, together with their controllers. The engines are powered both from dedicated batteries and from alternative sources resulting from regenerative braking, as well as from solar energy sources.





Automobilul electric de mici dimensiuni, care poate fi utilizat pe diferite tipuri de teren, inclusiv în centrele urbane, pentru a diminua poluarea. Platforma dezvoltată oferă posibilitatea testării mai multor tipuri de motoare electrice, împreună cu controlerele acestora. Alimentarea motoarelor se face atât de la acumulatorii dedicați, cât și prin surse alternative rezultate din frânarea recuperativă, precum și din surse de energie solară.

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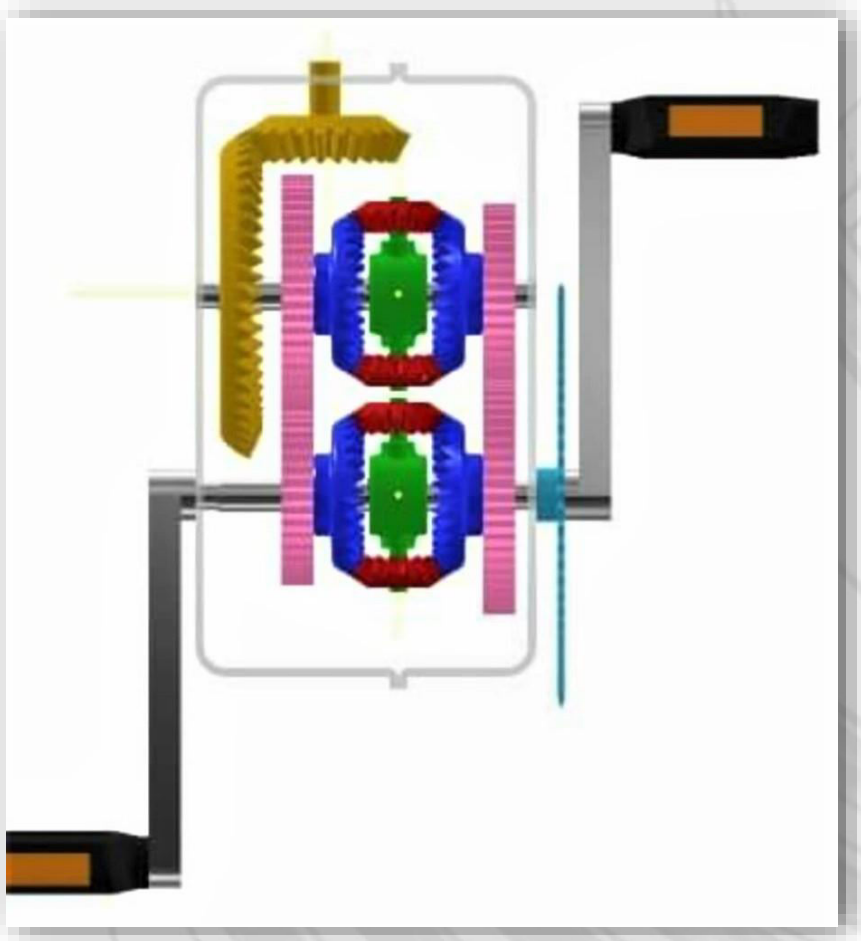
Electric assisted self-adaptive hybrid transmission

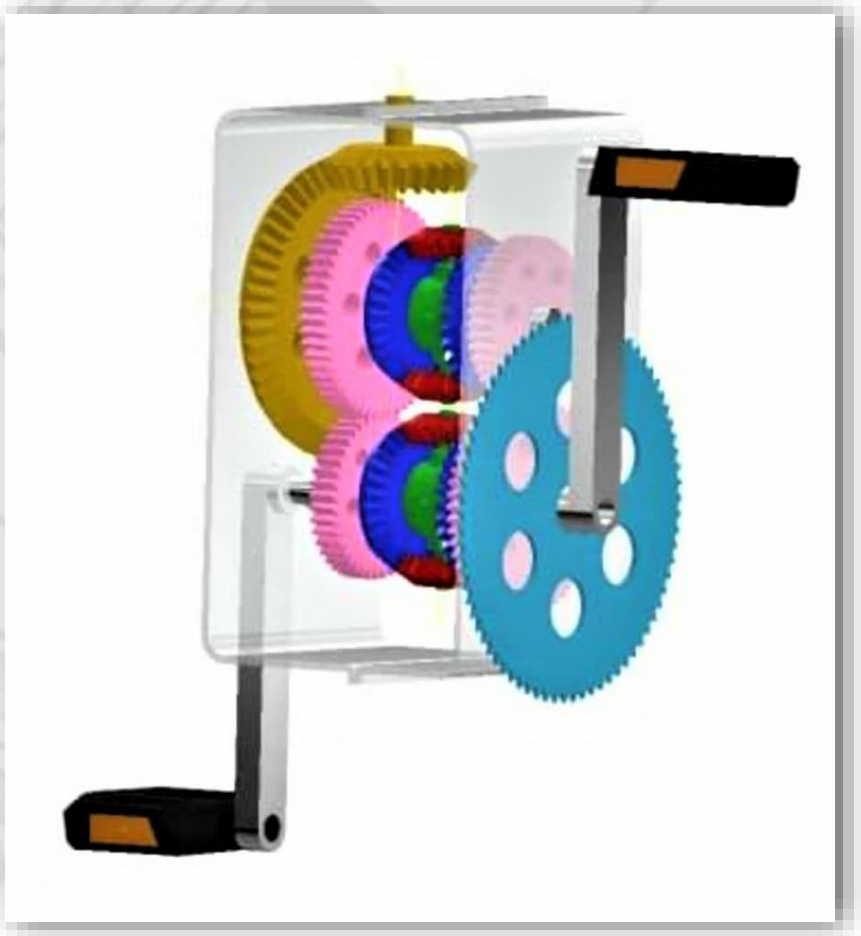
Concept

Authors: ROMEO CĂTĂLINOIU,
SORIN AUREL RAȚIU, IMRE ZSOLT MIKLOS

D

The proposed solution refers to an implementation of patent application no. 00889/12.12.2019 and consists of a gearbox intended to equip vehicles with pedals.





The gearbox is a mechanical reducer characterized by the fact that it provides assistance when pedaling through an electric motor, assistance that can be achieved in three modes: low, medium and high, self-adaptive depending on the value of the load torque that must be overcome. The major advantage is that changing gears becomes unnecessary.

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INTERNAL COMBUSTION ENGINES AND DOWNSIZING PHENOMENON

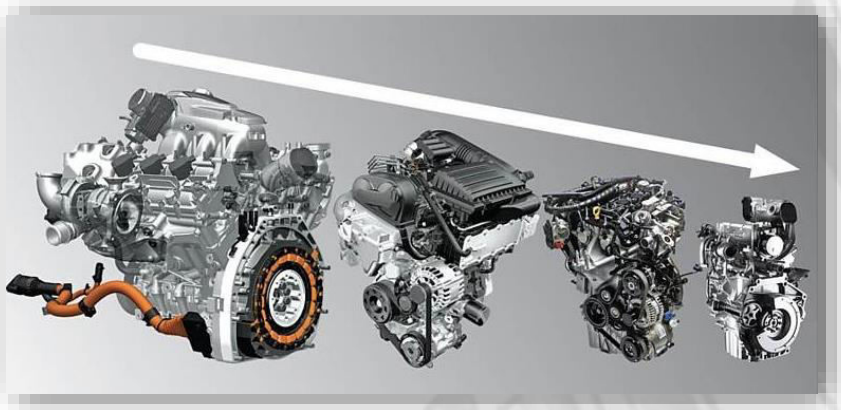
Student Project

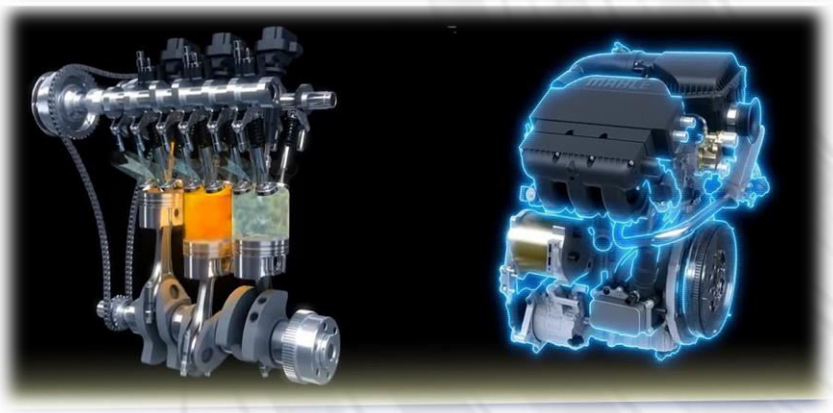
Authors: Carp Andrei, Buta Andrei-Ionut
Coordinator: BIRTOK-BANEASA Corneliu

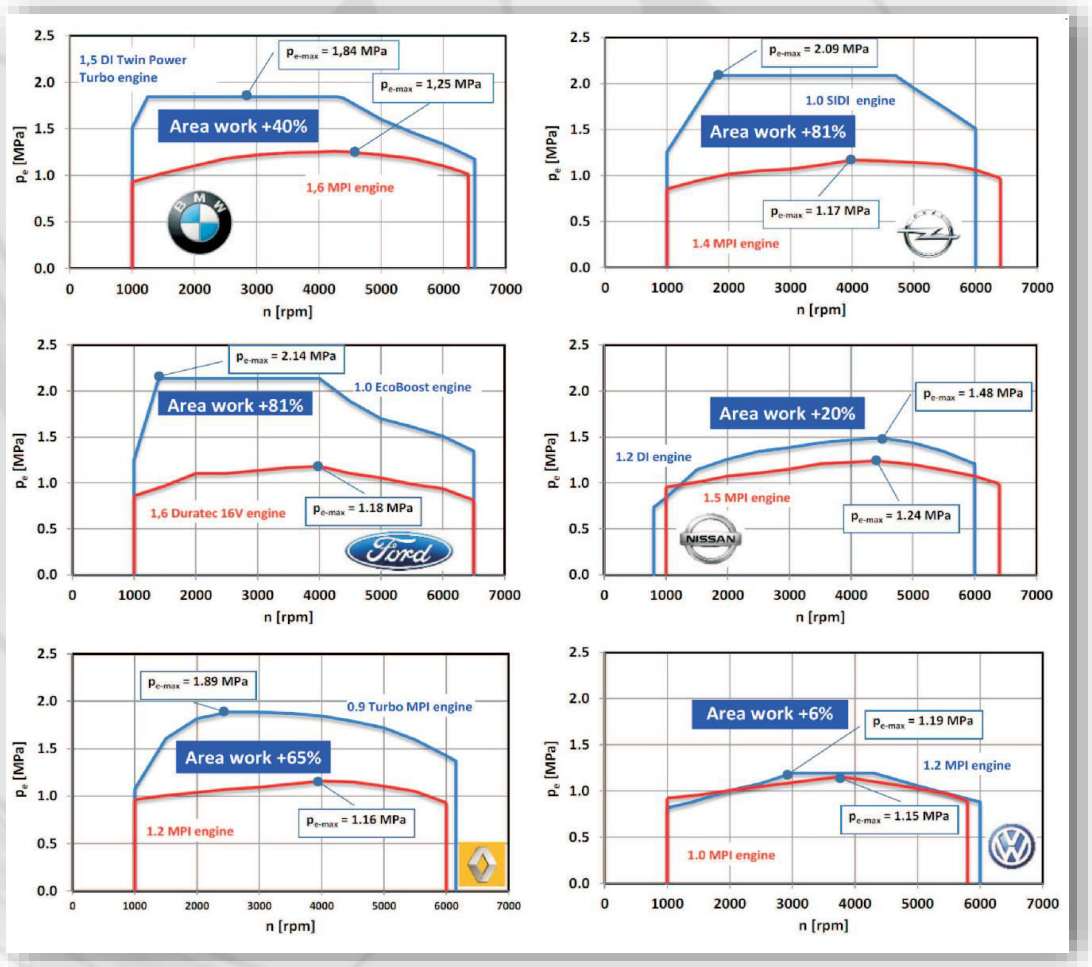
D

For the past 100 years, its principle has remained the same: air and fuel go in, an explosion happens in the cylinders, and power shoves you onward. But every year, engineers hone the internal combustion engine to go faster and farther, developing it to be more efficient than before, producing the kind of power you used to only see on supercars.

Automotive engines have traditionally been oversized for regular operation so that they can meet the peak performance demands of a given vehicle application. Such engines were naturally aspirated and operated at far less than peak engine efficiency when operating on the relatively lightly loaded fuel economy drive cycles.







The characteristics of the selected 3-cylinder engines compared to their 4-cylinder equivalents

To improve performance and engine efficiency, pressure-charged engines were developed that can generate higher torque levels at lower relative engine speeds. Such engines can offer comparable vehicle performance from a smaller engine. These smaller displacement engines, often with fewer cylinders, run in a more efficient region of the engine's speed and load map during normal operation owing to lower throttling and frictional losses.

On the other hand, boosted engines are more prone to knocking owing to the higher density air/fuel charge and therefore tend to be tuned with a lower compression ratio than modern naturally aspirated engines with gasoline direct injection. The result is a lower peak efficiency for downsized/boosted engines than that of a naturally aspirated engine, but more time spent operating in the higher efficiency region. Downsized/boosted engines are ICEs where the swept volume (displacement) of the engine has been reduced, while vehicle performance is maintained by pressure charging the intake air using a turbocharger or supercharger.

Such engines represented 34% of the market in 2019. In 2015, the National Research Council described the next steps toward turbocharged/downsized engines as turbocharging and downsizing Level 1 (33% downsized), stoichiometric direct injection, variable valve timing, dual cam phasing, and idle stop-start. In 2019, engines with these technologies ware available from most manufacturers and found in all light-duty vehicle segments. In particular, turbocharged engines with gasoline direct injection enabling engine displacement reduction have achieved a market penetration rate of 24% in 2017, and are likely to be a predominant engine type in 2025.

Contact: deyu_ere@yahoo.com

Model of handling oversized vehicles with limited tank size, using image processing technology and iodine self operation on highways in Vietnam

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SUMMARY

Along with the socio-economic development, the traffic of goods between localities is taking place strongly, daily and continuously has created more and more traffic on the road to meet the needs of the society.
Therefore, some vehicle managers, driving for personal benefits, and enterprises have allowed oversized and loose goods vehicles to circulate in order to save costs, causing many unfortunate traffic accidents to occur affecting the health and lives of road users and lack of traffic officials
For the reasons mentioned above, their team conducted the project research: "Model of handling oversized vehicles limited to the size of the trunk, application of image processing technology and iodine self operation on the highway in Vietnam" in order to create a system of handling oversized and smartly overloaded vehicles that do not stop on the highway in Vietnam to reduce the situation of violating vehicles and ensure traffic safety

D

INTRODUCTION

Solution to prevent oversized and overloaded vehicles from entering



Oversized vehicles, loosening barrels on the road





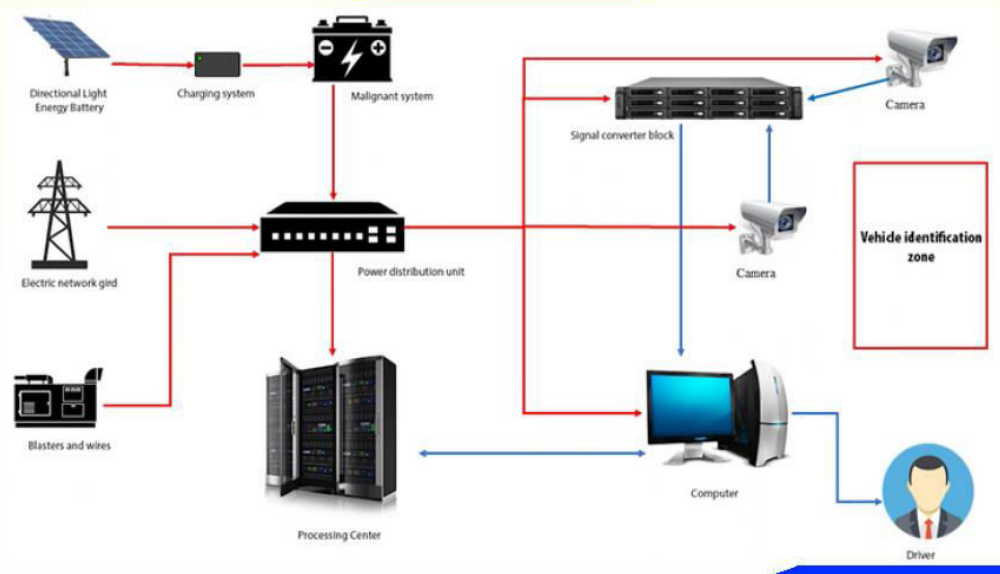




- Image recognition technology has great potential for widespread application in various industries. Large companies such as Tesla, Google, Uber, Adobe Systems etc. also use image recognition technology. To demonstrate that this technology is around the world
- IoT technology makes it easy to connect things to the network and develop apps to control and manage them. The mission of the IoT platform is to make connectivity, service delivery and cloud for these devices

EXPERIMENT

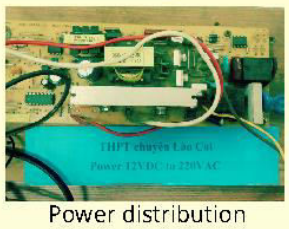
Structure of the system



RESULTS AND DISCUSSION



Registration data



Power distribution



Center Geographic



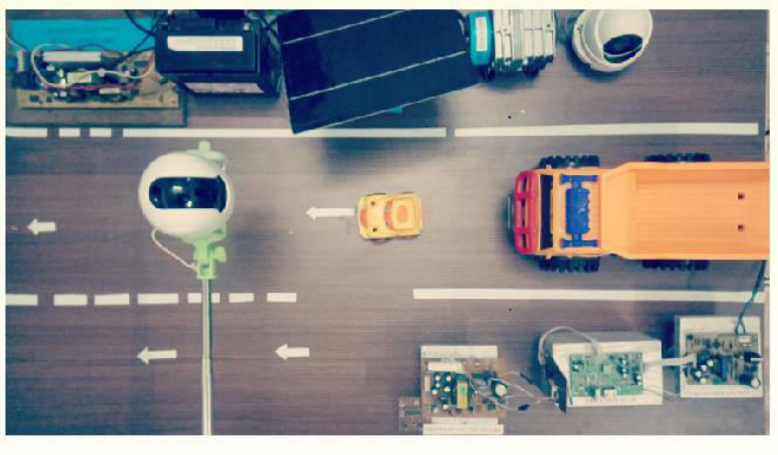
Generator



Malignant System



Directional Light Energy Battery



The overall system model

CONCLUSION

This project fully applies effectively in practice, the project achieves the group's stated research objectives
Do not miss any offending vehicles while on the road
The system operates automatically through renewable energy sources, always stable

Protect the road surface according to technical standards, keep the road surface always flat to prevent traffic, reduce traffic accidents and bring happiness to people and vehicles participating in traffic

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Upgrade Volkswagen Golf 5 GT

Patent: Student Project

Author: IANCU Catalin Corneliu
Coordinator: BIRTOK-BANEASA Corneliu

D

I am a student at FIH UPT specializing in Road Vehicles and I am passionate about Volkswagen cars. I started my career in the mechanical field in 2005, helping my father to repair and maintain Romanian Dacia vehicles, then I realized that this job is suitable for my potential. Through this project, I brought some improvements to my GOLF 5 car as follows: Conversion from Continental injectors to Bosch injectors, upgrade of the oil pump drive mechanism and the implementation of a reliable distribution kit with a high lifespan Brand GATES etc. Also made improvements on the ergonomic side by implementing a multifunctional steering wheel.











Sunt student la FIH UPT specializata in Vehicule Rutiere si sunt pasionat de masinile Volkswagen. Mi-am început cariera în domeniul mecanic în anul 2005, ajutându-l pe tatăl meu la repararea și întreținerea vehiculelor Dacia românești, apoi mi-am dat seama că acest job este potrivit potențialului meu. Prin acest proiect, am adus câteva îmbunătățiri mașinii mele GOLF 5, după cum urmează: Conversia de la injectoare Continental la injectoare Bosch, modernizarea mecanismului de antrenare a pompei de ulei și implementarea unui kit de distribuție fiabil cu o durată de viață mare Brand GATES etc. pe partea ergonomică prin implementarea unui volan multifuncțional.

Contact: cornelutiancu@yahoo.com

E

Teaching methods

Books

History and Cultural studies

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Center for Research in Theoretical Philosophy, Practical Philosophy, and Applied Epistemology
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Tel.: +373 786 81 179; E-mail: eugenia.*bogatu@usm.md*

HR EXCELLENCE IN RESEARCH

Reason, Language, Communication. Some Aspects of Pragmatic Knowledge

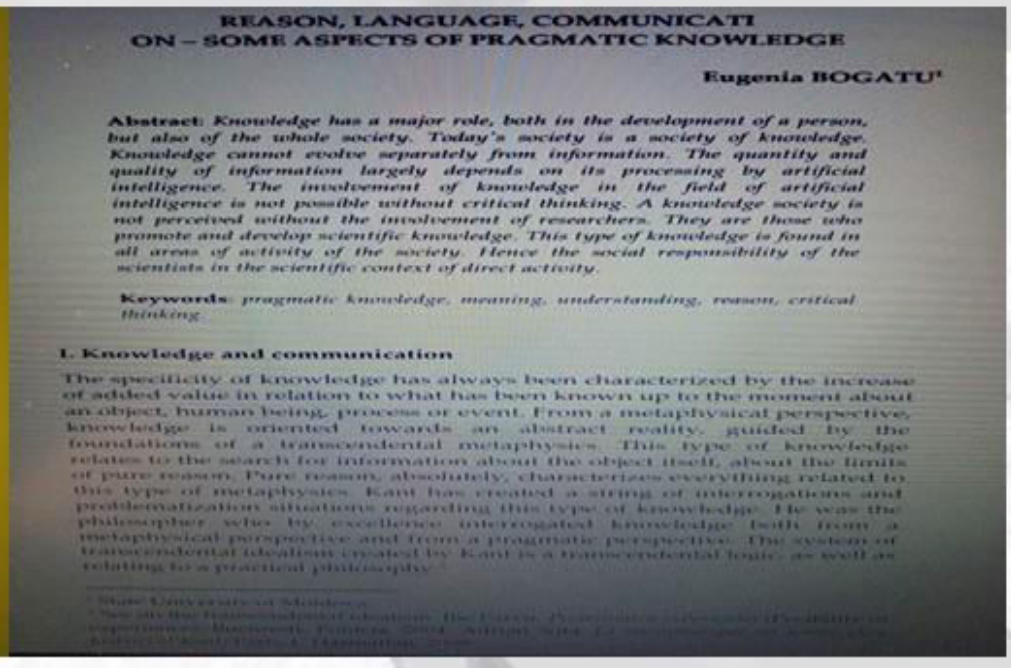
AUTHOR: Conf. univ. Eugenia Bogatu

APPLICATION FIELDS: Teaching, Books, History and Cultural Studies | **E**

Abstract: Knowledge has a major role, both in the development of a person, but also of the whole society. Today's society is a society of knowledge. Knowledge cannot evolve separately from information. The quantity and quality of information largely depends on its processing by artificial intelligence. The involvement of knowledge in the field of artificial intelligence is not possible without critical thinking. A knowledge society is not perceived without the involvement of researchers. They are those who promote and develop scientific knowledge. This type of knowledge is found in all areas of activity of the society. Hence the social responsibility of the scientists in the scientific context of direct activity.


Analele Universităţii din Craiova
Seria: Filosofie
Nr. 49 (1/2022)

Anton ADĂMUŢ — *Cicero - Un scurt episod alethic (Tusculanae Disputationis, I, XVII, 39)*
Adriana NEACŞU — *Subiectul ca existenţă la Maurice Merleau-Ponty*
Kathrin BOUVOT, Gianluigi SEGALERBA — *Transcendence and Ideas*
Eugenia BOGATU — *Reason, Language, Communication – Some Aspects of Pragmatic Knowledge*
Cătălin STĂNCIULESCU — *„Contradicţia unilaterală" în practica argumentării*
Gianluigi SEGALERBA — *Battle for Minds. Elements of Critical Pedagogy*


REASON, LANGUAGE, COMMUNICATI ON – SOME ASPECTS OF PRAGMATIC KNOWLEDGE

Eugenia BOGATU[1]

Abstract: *Knowledge has a major role, both in the development of a person, but also of the whole society. Today's society is a society of knowledge. Knowledge cannot evolve separately from information. The quantity and quality of information largely depends on its processing by artificial intelligence. The involvement of knowledge in the field of artificial intelligence is not possible without critical thinking. A knowledge society is not perceived without the involvement of researchers. They are those who promote and develop scientific knowledge. This type of knowledge is found in all areas of activity of the society. Hence the social responsibility of the scientists in the scientific context of direct activity.*

Keywords: *pragmatic knowledge, meaning, understanding, reason, critical thinking*

1. Knowledge and communication

The specificity of knowledge has always been characterized by the increase of added value in relation to what has been known up to the moment about an object, human being, process or event. From a metaphysical perspective, knowledge is oriented towards an abstract reality, guided by the foundations of a transcendental metaphysics. This type of knowledge relates to the search for information about the object itself, about the limits of pure reason. Pure reason, absolutely, characterizes everything related to this type of metaphysics. Kant has created a string of interrogations and problematization situations regarding this type of knowledge. He was the philosopher who by excellence interrogated knowledge both from a metaphysical perspective and from a pragmatic perspective. The system of transcendental idealism created by Kant is a transcendental logic, as well as relating to a practical philosophy.

IMPLEMENTATION STAGE: Paper published in *The Annals of the University of Craiova. Sery Philosophy*, vol 49, no 1, 2022, pp. 103-116 – ERIH Plus Journal, Scopus etc

ACKNOWLEDGMENTS: This research was supported by the research project: 20.80009.1606.08

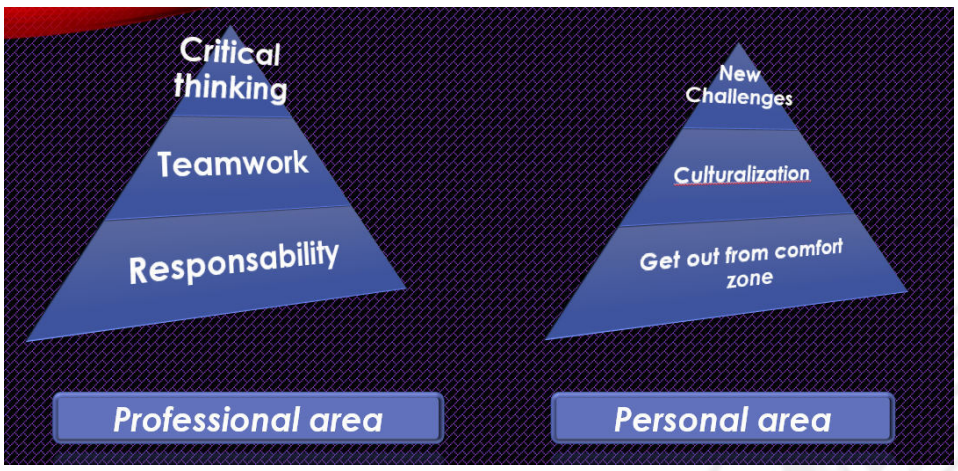
Erasmus Projects - the Path for a Successful Career

E

Student Project

Author/s: Mihail-Alexandru Stanescu, Mihai-Florian Miu

Today, the phenomenon of globalization is developing more and more. Each country has traditions that deserve to be considered, which can be models of inspiration for others. Through international projects, motivated people could develop beneficial skills in a specialization, also being in a favorable academic environment.



Thus, the foundations of a successful career can be built. This project highlights the benefits of participating in Erasmus experiences for relatively short periods of time, with great significance. The target group is focused on young people.



The project is based on the testimonies of successful people who have been able to assert themselves both culturally and technically by participating in such projects. At the same time, a case study of a person from the target group will be presented - his evolution in terms of personal development and career. This resulted in starting social research. We take interviews with people from different work areas (IT, arts, psychology, and engineering). Based on their answers about their Erasmus experiences and career, we observe that they also improve their soft skills after the international experiences. The most important thing that we promote is public speaking and critical thinking. With these skills, now honed, we are able to have many achievements in the national and international area. People who know how to sell their goods have a better view from the others.





This project shows how to develop your skills for a good career. If people participate in Erasmus projects, they can build the foundation of a successful career more easily. In every good career, you should know how to express your message, how to be a good a team player and have good management.

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Mihai Miu +40727104191 miumihai31@gmail.com

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Power of Creative Mind

"Gheorghe Asachi"
Technical University of Iasi, Romania
Faculty of Industrial Design and
Business Management

DIMA

CONFIGURATOR OF TECHNICAL DOCUMENTATION FOR LEARNING IN THE VIRTUAL ENVIRONMENT

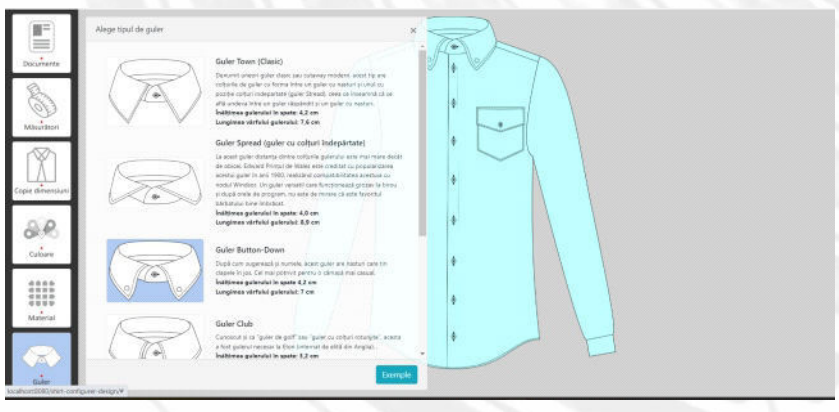
PhD Thesis

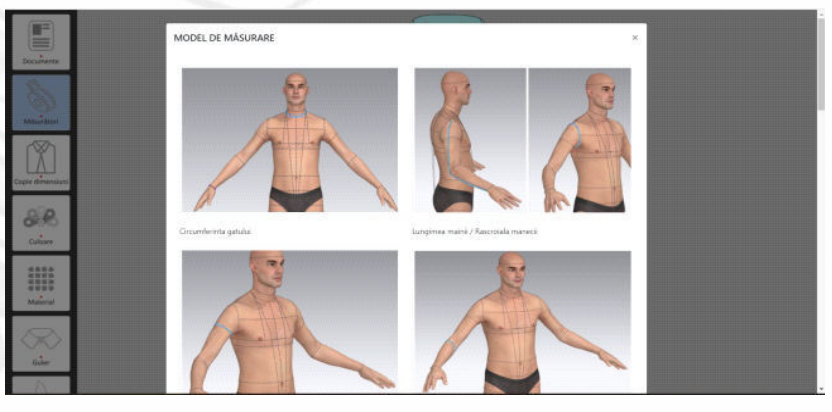
assist. univ. dr. eng. **Carmen TIȚĂ**

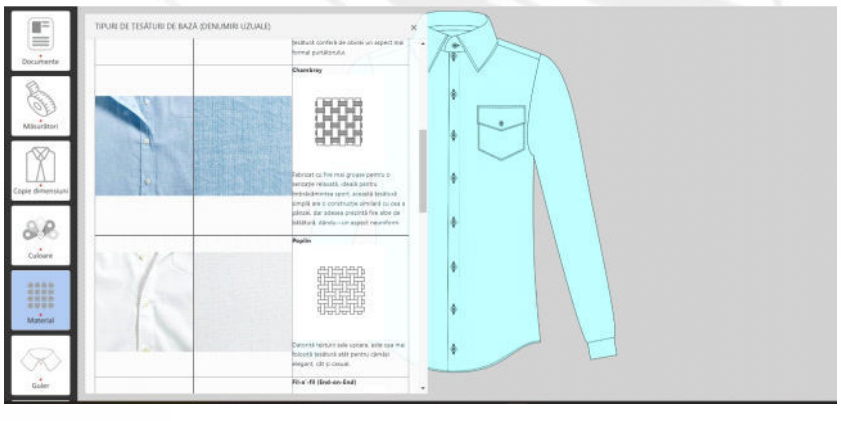
Category
E

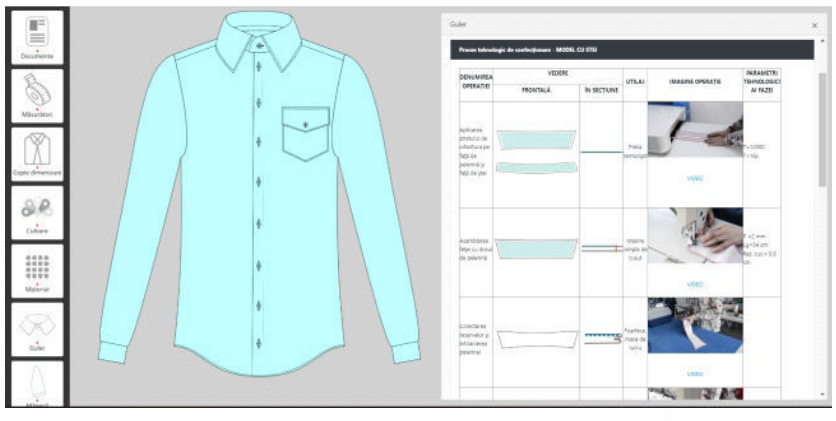
The Covid-19 pandemic has produced an important impact in education. The developed soft application has the accessibility of its students to the learning platforms, the quality of the information, the degree to which the materials have been adapted to the online format.

The configurator of technical documentation for learning in the virtual environment has the role to facilitate the students' understanding of the links that are made between several disciplines within the Faculty-DIMA: Textile Structures, Weaving, Basics of Textile Technology, Construction and Modeling of Clothing, Technologies for Textiles, Design of Technological Processes for Textiles, Processes and Machines for Textiles, Quality Assurance in Garments, Patents have appeared for various elements of the product of men's shirt at EPO.









Contact: **carmen.tita@academic.tuiasi.ro**

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IGPPP

Universalitatea viței-de-vie

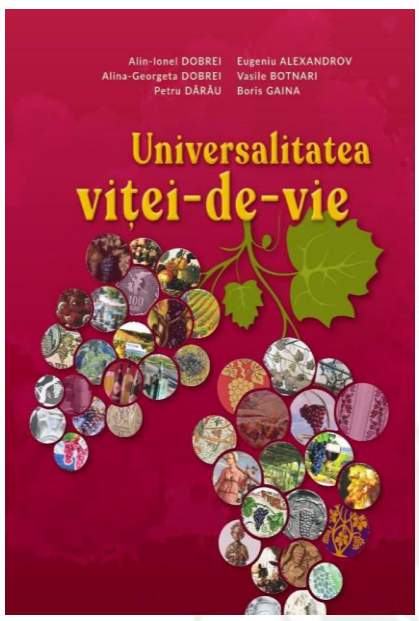
The Universality of grapevine

ISBN 978-9975-62-435-0

Dobrei A., Dobrei Alina, Dărău P., Alexandrov E., Botnari V., Gaina B.

E

The Universality of grapevine. Second edition, revised and completed. Chisinau, 2021. 331 p. ISBN 978-9975-62-435-0. Author: Dobrei A., prof., Dobrei Alina, prof. Darau P. - University of Agricultural Sciences and Veterinary Medicine of Banat "Regele Mihai I al Romaniei", Timisoara. Alexandrov E., dr. hab., Botnari V., dr. hab. - Institute of Genetics, Physiology and Plant Protection, Chisinau, Republic of Moldova; Găina B. acad. - Academy of Sciences of Moldova. Through this work an attempt was made to demonstrate the universal character of the grapevine: fascinating and miraculous, the grapevine has been for man throughout time a permanent attraction, a mystery and a blessing, coming to satisfy, through the grapes and the wines produced from them the most refined tastes and to soothe troubled souls.



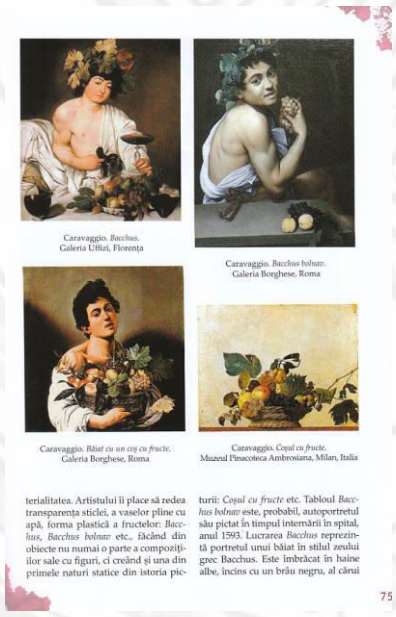

5.3. VIȚA-DE-VIE ȘI MONUMENTELE ARHITECTURALE

Strugure. Or. Tbilisi, Georgia

Strugure. La Rioja, Spania

Strugure. Israel

142


Caravaggio. *Bacchus*. Galeria Uffizi, Florența

Caravaggio. *Bacchus bolnav*. Galeria Borghese, Roma

Caravaggio. *Băiat cu un coș cu fructe*. Galeria Borghese, Roma

Caravaggio. *Coșul cu fructe*. Muzeul Pinacoteca Ambrosiana, Milan, Italia

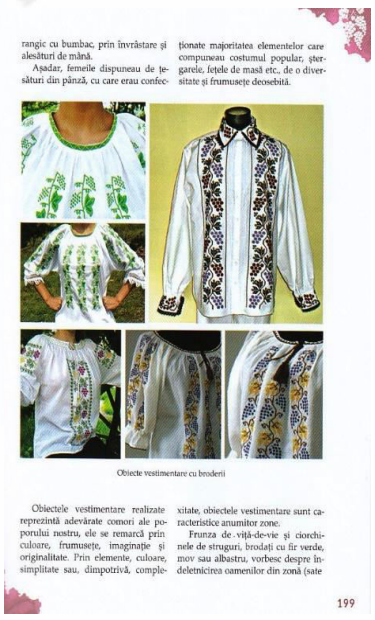
75


„Tradiția populară – oțăritul", Republica Moldova, 2007

Moneda „Butnărițul". Republica Moldova, 2008

„Schimbarea la Față". Ucraina. 2010

225


Obiecte vestimentare cu broderii

199

The work is structured in 14 chapters: 1. Grapevine and religion. 2. Grapevine and mythology. 3. Grapevine and art. 4. Grapevine and wine în movies and ballet. 5. Grapevine aș anornamental plant. 6. Grapevine în handicraft and artisanship. 7. Grapevine and philately. 8. Grapevine ornaments on traditional costumes. 9. Grapevine and sigillography. 10. Grapevine and numismatics. 11. Grapevine and heraldry. 12. Traditions and manners. 13. Oenotourism (Wine tourism). 14. Ampelotherapy, oenotherapy, oenogastronomia.

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Power of Creative Mind

FLORA OF BESSARABIA / FLORA BASARABIEI, vol. IV

ISBN: 978-9975-47-199-2

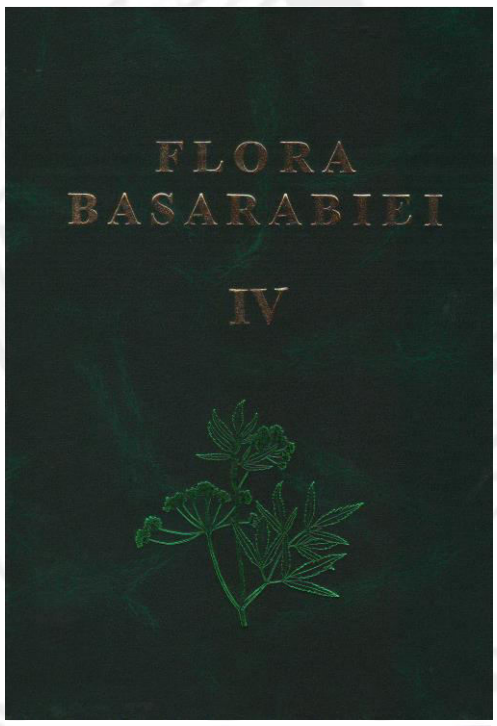
Authors: A. Negru, Valentina Cantemir, V. Ghendov, Gh. Gînju, Stela Gînju, Olga Ioniţa, A. Istrati, Tatiana Izverscaia, P. Pînzaru, A. Ruschuk, Ana Ştefîrţă, Elena Tofan-Dorofeev

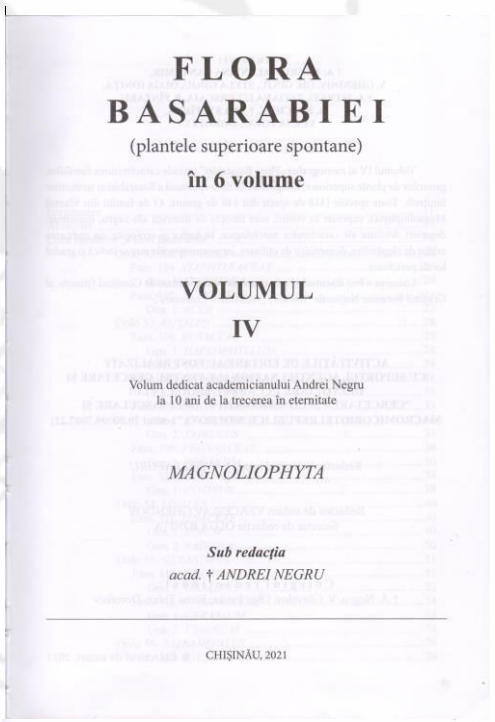
E

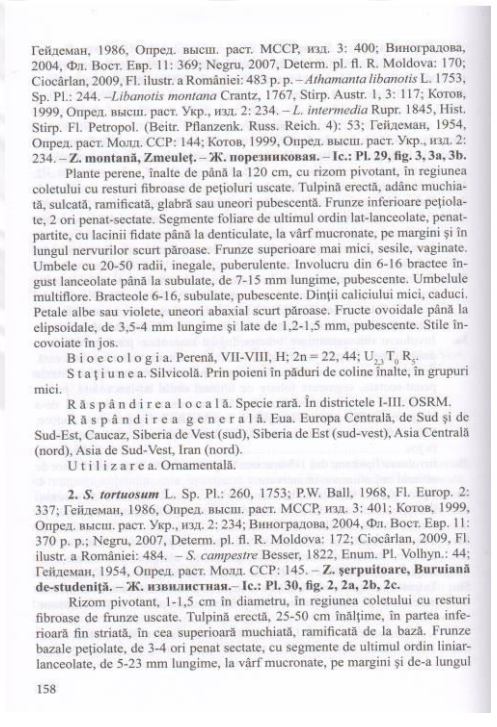
The monographic work "Flora of Bessarabia", volume IV includes the general characterization of families, genera and species of vascular plants (418 species, 148 genera, 43 families of the Magnoliophyta phylum), recorded in the spontaneous flora of Bessarabia. The species, included in the volume – 624 pages, are accompanied by synonyms, detailed descriptions of morphological, biological and ecological characters, general distribution, areas of use, as well as their original drawings. The conservation status of rare species is also indicated.

The monograph "Flora of Bessarabia" (vol. IV) is edited in 1000 hard copies and distributed through the international book exchange of the "A. Lupan" National Library to the main botanical institutions throughout the world, as well as to the educational institutuons of the Republic of Moldova.

The book will serve as a scientific and informational foundation for pupils and students, teachers, in order to carry out training programs, education and conservation of floristic diversity. The monograph will contribute to: the improvement of the legislation regarding the conservation of rare plants; elaboration of the Cadastre of the vegetal world; completion and enrichment of the *in vivo* collections of the Botanical Garden; development of the activities of education and information of the population regarding the conservation and protection of the environment.







Гейдеман, 1986, Определ. высш. раст. МССР, изд. 3: 400; Виноградова, 2004, Фл. Вост. Евр. 11: 369; Negru, 2007, Determ. pl. fl. R. Moldova: 170; Ciocârlan, 2009, Fl. ilustr. a României: 483 p. p. – *Athamanta libanotis* L. 1753, Sp. Pl.: 244. –*Libanotis montana* Crantz, 1767, Stirp. Austr. 1, 3: 117; Котов, 1999, Определ. высш. раст. Укр., изд. 2: 234. – *L. intermedia* Rupr. 1845, Hist. Stirp. Fl. Petropol. (Beitr. Pflanzenk. Russ. Reich. 4): 53; Гейдеман, 1954, Определ. раст. Молд. ССР: 144; Котов, 1999, Определ. высш. раст. Укр., изд. 2: 234. – **Z. montană, Zmeulеţ.** – **Ж. порезниковая.** – **Ic.: Pl. 29, fig. 3, 3a, 3b.**

Plante perene, înalte de până la 120 cm, cu rizom pivotant, în regiunea coletului cu resturi fibroase de peţioluri uscate. Tulpină erectă, adânc muchiată, sulcată, ramificată, glabră sau uneori pubescentă. Frunze inferioare peţiolate, 2 ori penat-sectate. Segmente foliare de ultimul ordin lat-lanceolate, penat-partite, cu lacinii fidate până la denticulate, la vârf mucronate, pe margini şi în lungul nervurilor scurt păroase. Frunze superioare mai mici, sesile, vaginate. Umbele cu 20-50 radii, inegale, puberulente. Involucru din 6-16 bractee îngust lanceolate până la subulate, de 7-15 mm lungime, pubescente. Umbelule multiflore. Bracteole 6-16, subulate, pubescente. Dinţii caliciului mici, caduci. Petale albe sau violete, uneori abaxial scurt păroase. Fructe ovoidale până la elipsoidale, de 3,5-4 mm lungime şi late de 1,2-1,5 mm, pubescente. Stile încovoiate în jos.

B i o e c o l o g i a. Perenă, VII-VIII, H; 2n = 22, 44; U_{33} T_6 R_5.

S t a ţ i u n e a. Silvicolă. Prin poieni în păduri de coline înalte, în grupuri mici.

R ă s p â n d i r e a l o c a l ă. Specie rară. În districtele I-III. OSRM.

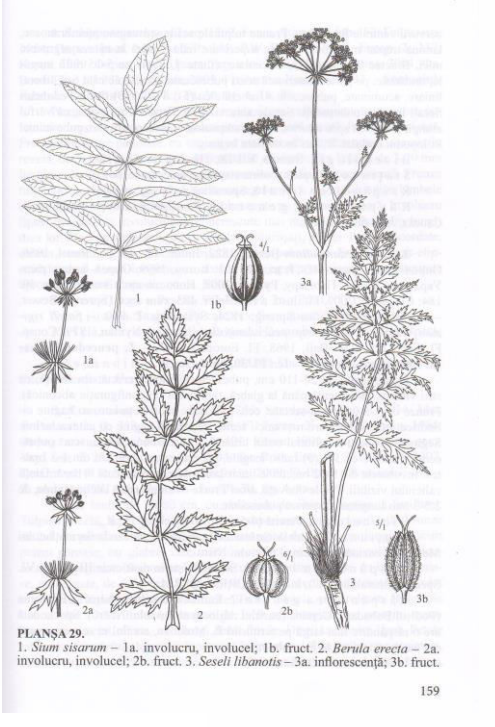
R ă s p â n d i r e a g e n e r a l ă. Eua. Europa Centrală, de Sud şi de Sud-Est, Caucaz, Siberia de Vest (sud), Siberia de Est (sud-vest), Asia Centrală (nord), Asia de Sud-Vest, Iran (nord).

U t i l i z a r e a. Ornamentală.

2. *S. tortuosum* L. Sp. Pl.: 260, 1753; P.W. Ball, 1968, Fl. Europ. 2: 337; Гейдеман, 1986, Определ. высш. раст. МССР, изд. 3: 401; Котов, 1999, Определ. высш. раст. Укр., изд. 2: 234; Виноградова, 2004, Фл. Вост. Евр. 11: 370 p. p.; Negru, 2007, Determ. pl. fl. R. Moldova: 172; Ciocârlan, 2009, Fl. ilustr. a României: 484. – *S. campestre* Besser, 1822. Enum. Pl. Volhyn.: 44; Гейдеман, 1954, Определ. раст. Молд. ССР: 145. – **Z. şerpuitoare, Buruiană de-studenţă.** – **Ж. извилистная.**– **Ic.: Pl. 30, fig. 2, 2a, 2b, 2c.**

Rizom pivotant, 1-1,5 cm în diametru, în regiunea coletului cu resturi fibroase de frunze uscate. Tulpină erectă, 25-50 cm înălţime, în partea inferioară fin striată, în cea superioară muchiată, ramificată de la bază. Frunze bazale peţiolate, de 3-4 ori penat sectate, cu segmente de ultimul ordin liniar-lanceolate, de 5-23 mm lungime, la vârf mucronate, pe margini şi de-a lungul

158



PLANŞA 29.
1. *Sium sisarum* – 1a. involucru, involucel; 1b. fruct. 2. *Berula erecta* – 2a. involucru, involucel; 2b. fruct. 3. *Seseli libanotis* – 3a. inflorescenţă; 3b. fruct.

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Contacts: gradinabotanicachisinau@gmail.com; v_ghendov@mail.ru; +373 69607791

Published with support of NARD, Project no. 20.80009.7007.22

CORNELIUGROUP research-innovation association

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Power of Creative Mind

Kniphofia în Republica Moldova

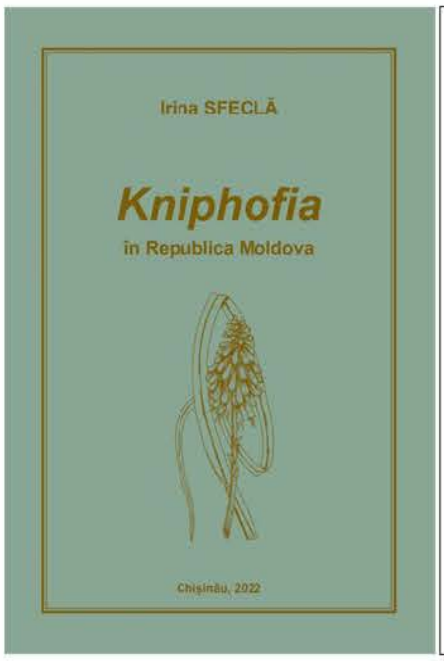
BOOK

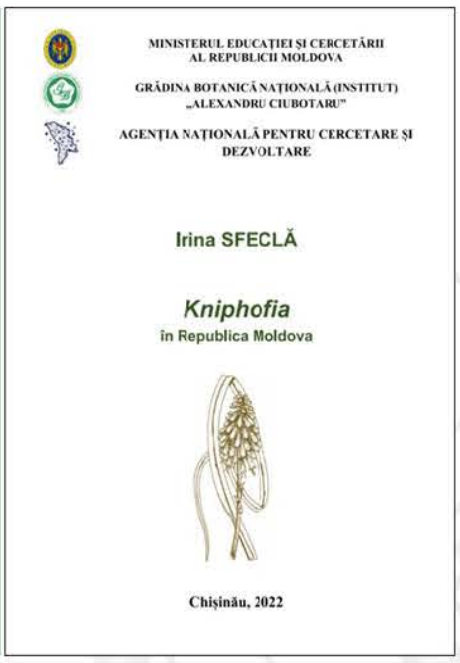
Patent/project number: ISBN 978-9975-64-339-9

Autor: Irina Sfeclă

E

The accumulated and recorded knowledge in the work „*Kniphofia* în Republica Modova" represents a significant contribution for the vast process of introducing and ameliorating flowering plants. The results of studying the ontogenetic cycle facilitate the accurate cultivation, the favorable development of the plant, and the efficient fructification with obtainment of a qualitative seed material consequently. The studies of the flowering's particularities enable the sustainable use of the studied species in landscaping green spaces and flower production.




MINISTERUL EDUCAȚIEI ȘI CERCETĂRII AL REPUBLICII MOLDOVA

GRĂDINA BOTANICĂ NAȚIONALĂ (INSTITUT) „ALEXANDRU CIUBOTARU"

AGENȚIA NAȚIONALĂ PENTRU CERCETARE ȘI DEZVOLTARE

Irina SFECLĂ

Kniphofia
în Republica Moldova

Chișinău, 2022


CZU 582.572.2:635.92
S 51

Irina Sfeclă. *Kniphofia* în Republica Moldova. – Chișinău, 2022.

Datele acumulate și consemnate în lucrarea „*Kniphofia* în Republica Moldova" constituie un aport semnificativ pentru vastul proces de introducere și ameliorare a plantelor floricole. Rezultatele privind studiul ciclului ontogenetic vor permite asigurarea unei cultivări corecte și dezvoltării favorabile a plantei, în consecință și fructificării eficiente, cu scopul obținerii unui material semincer local de calitate. Cercetările privind particularitățile înfloririi, oferă posibilitatea utilizării susenabile a speciilor luate în studiu în amenajarea spațiilor verzi și producția floricolă

Cartea se adresează specialiștilor din ramura științelor biologice. profesorilor, studenților și tuturor amatorilor de plante.

Redactor științific:
Tatiana Sîrbu — doctor în științe biologice, conferențiar cercetător

Recenzenți:
Adelina Dumitraș — doctor, profesor universitar
Ion Roșca — doctor în științe biologice, conferențiar cercetător
Iachim Gurraniuc — doctor în științe biologice, conferențiar cercetător

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DESCRIEREA CIP A CAMEREI NAȚIONALE A CĂRȚII

Sfeclă. Irina.

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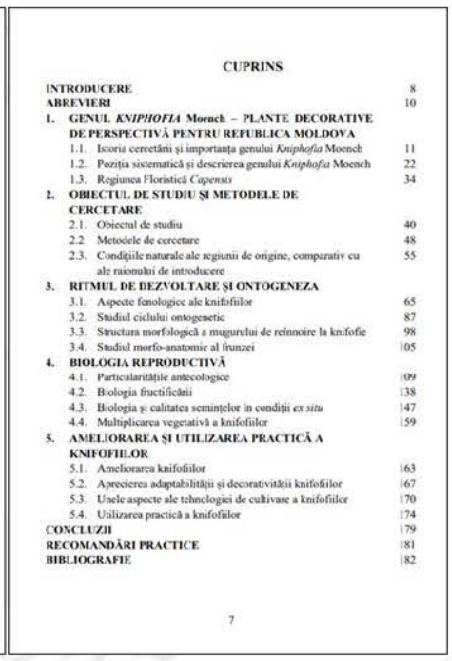
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„Schimbările ce survin în procesul de adaptare a organismului vegetal la condițiile noi de viață, confirmă ipoteza, conform căreia viabilitatea speciei în afara arealului natural, poate fi mult mai amplă sau mult prea sumară..."

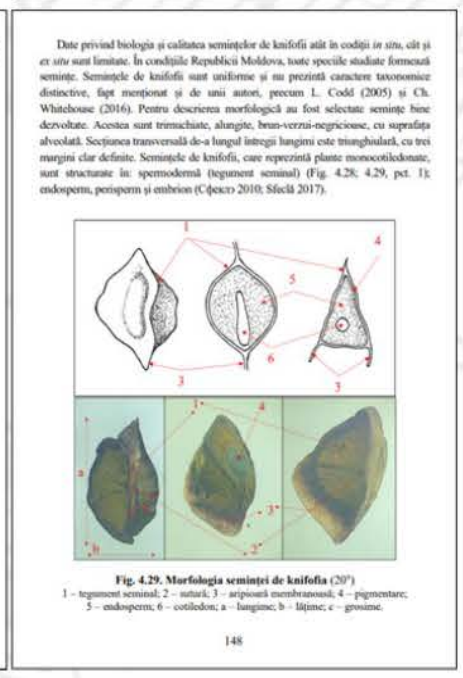
Date privind biologia și calitatea semințelor de knifofii atât în condiții *in situ*, cât și *ex situ* sunt limitate. În condițiile Republicii Moldova, toate speciile studiate formează semințe. Semințele de knifofii sunt uniforme și nu prezintă caractere taxonomice distinctive, fapt menționat și de unii autori, precum L. Codd (2005) și Ch. Whitehouse (2016). Pentru descrierea morfologică au fost selectate semințe bine dezvoltate. Acestea sunt trimuchiate, alungite, brun-verzui-negricioase, cu suprafața alveolată. Secțiunea transversală de-a lungul întregii lungimi este triunghiulară, cu trei margini clar definite. Semințele de knifofii, care reprezintă plante monocotiledonate, sunt structurate în: spermoderm (tegument seminal) (Fig. 4.28; 4.29, pct. 1); endosperm, perisperm și embrion (Ефеєто 2010; Sfeclă 2017).

Fig. 4.29. Morfologia seminței de knifofia (20×)
1 – tegument seminal; 2 – sutură; 3 – aripioară membranoasă; 4 – pigmentare; 5 – endosperm; 6 – cotiledon; a – lungime; b – lățime; c – grosime.

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The book appeals to specialists in biological sciences, teachers, students and plant lovers.

The work was approved and recommended for publication by the Scientific Council of the „Alexandru Ciubotaru" National Botanical Garden (Institute) .

Published with the financial support of the project „Research on mobilizing plant diversity with ornamental potential for ex situ conservation"- 20.80009.7007.14.

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Research and Science Today

Scientific paper / research project

Author/s: Flavius Cristian Mărcău

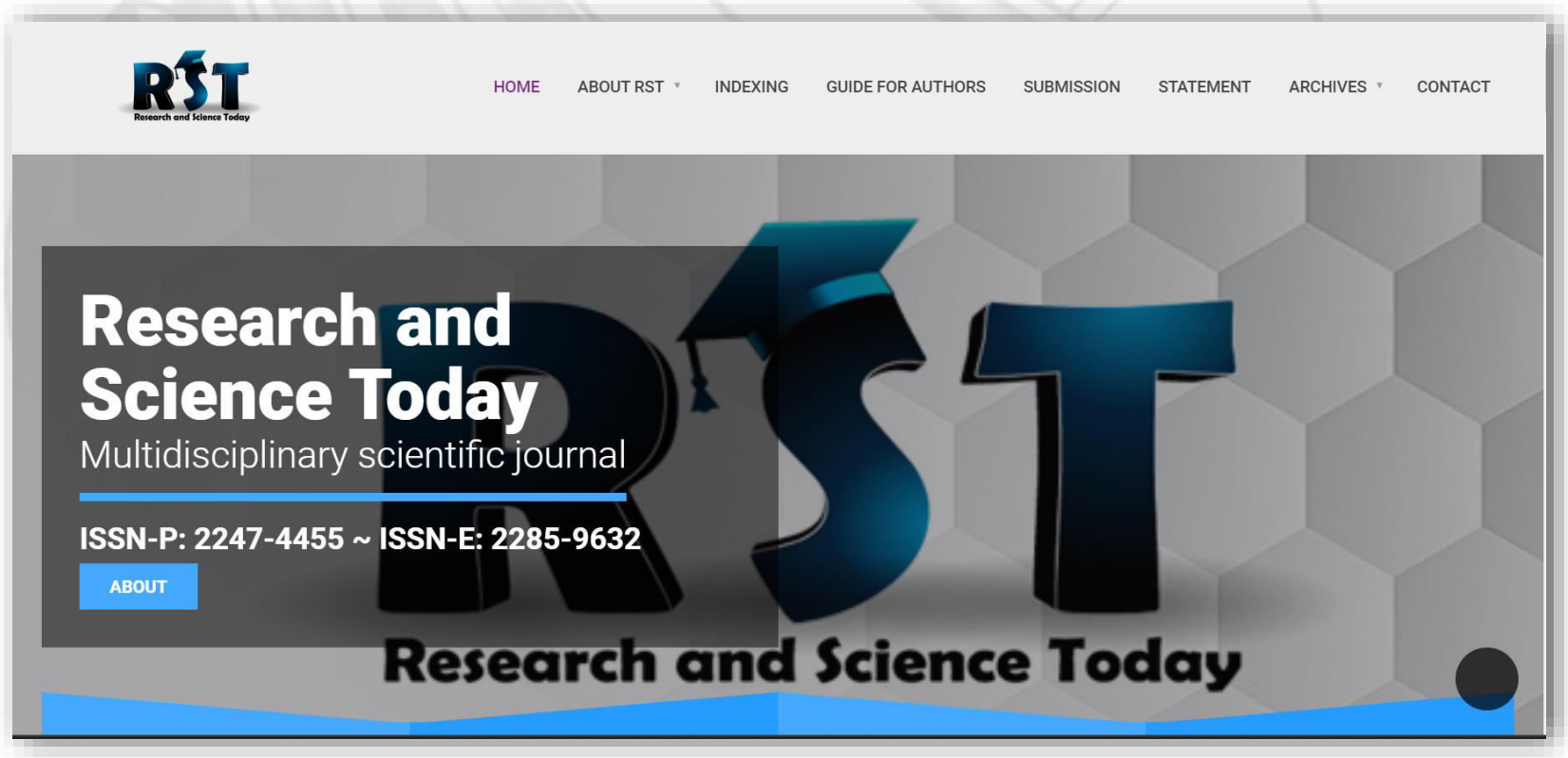
E

RESEARCH AND SCIENCE TODAY is a biannual science journal established in 2011. The journal is an informational platform that publishes assessment articles and the results of various scientific research carried out by academics.

We provide the authors with the opportunity to create and/or perfect their science writing skills. Thus, each issue of the journal (two per year and at least two supplements) will contain professional articles from any academic field, authored by domestic and international academics.

The goal of this journal is to pass on relevant information to undergraduate, graduate, and post-graduate students as well as to fellow academics and researchers; the topics covered are unlimited, considering its multi-disciplinary profile.

Regarding the national and international visibility of Research and Science Today, it is indexed in over 40 international databases (IDB) and is present in over 200 online libraries and catalogues; therefore, anybody can easily consult the articles featured in each issue by accessing the databases or simply the website. More informations about abstracting and indexing here: http://www.rstjournal.com/indexari-2/



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HR EXCELLENCE IN RESEARCH

INTEGRATED STUDY ON GOVERNANCE AND HUMAN RIGHTS IN THE REPUBLIC OF MOLDOVA

RESEARCH PROJECT: # 20.80009.1606.15

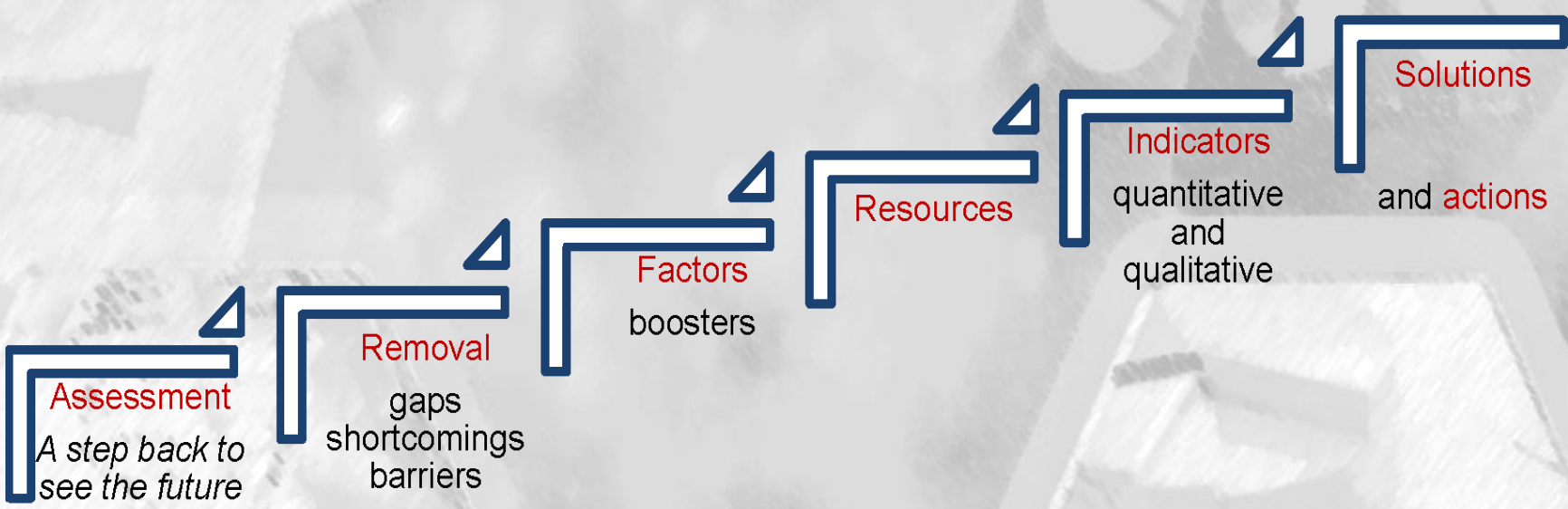
AUTHORS: Rodica CIOBANU, Iordanca-Rodica IORDANOV, Veronica MOCANU, Mariana ROSCA

APPLICATION FIELDS: Teaching methods, Books, History and Cultural studies. **E**

AIM: To identify the barriers to the modernization of governance focused on the protection of human rights in the Republic of Moldova through the application of integrated assessment methodologies of citizens' and state institutions' opinions.

SOLUTION: Design of a guide to modernize the governance focused on the protection of human rights based on the interdisciplinary research methods.

The design/architecture of the modernization project



ADVANTAGES: The research goes beyond sectoral, fragmented and narrow approaches by providing an integrated and coherent view of the gaps related to the good governance and protection of human rights in Moldova. The research design points out some dependencies and steps that need to be taken in order to achieve the transition to a human rights governance. The research provides the pathway to exploit effective platforms for interaction between the stakeholders to ensure human rights protection and good governance.

IMPLEMENTATION STAGE: At the laboratory and university level, for authorities.

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HR EXCELLENCE IN RESEARCH

INTERDISCIPLINARY METHODOLOGY IN THE PARADIGMATIC RECONSTRUCTION OF LAW

RESEARCH PROJECT: # 20.80009.1606.15

AUTHOR: Rodica CIOBANU

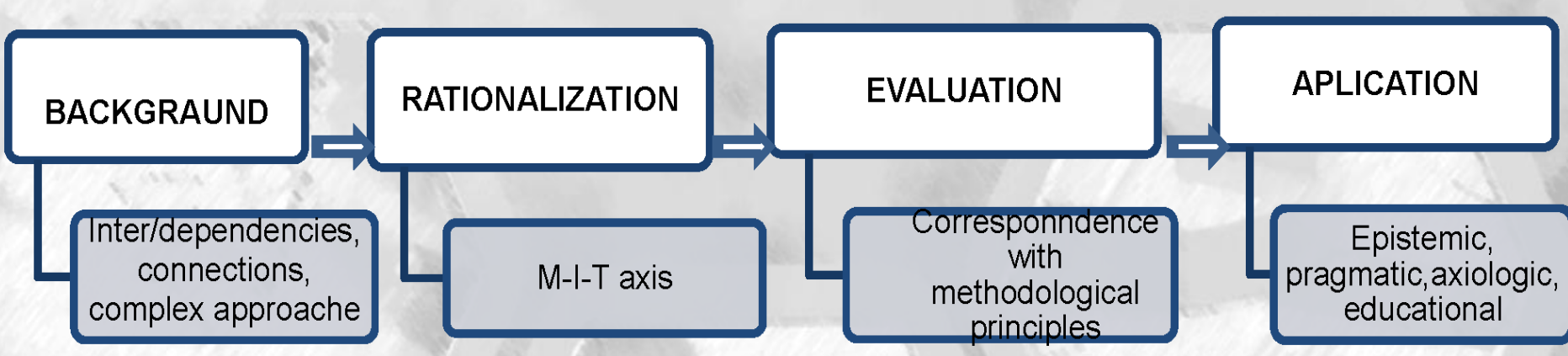
APPLICATION FIELDS: Teaching methods, Books, History and Cultural studies. **E**

AIM: To re-conceptualize the epistemic status of law, under the current standards, through a convergent perspective of law theory and practice, to identify, establish and strengthen the interdisciplinary methodological framework of the general theory of law, which may help to identify the possible solutions to overcome the crisis in law science.

SOLUTION:

- ✓ Shaping the interdisciplinary, complex and pluralistic nature of general legal theory, based on the person-state-law relationship;
- ✓ Developing a model of the reconceptualized paradigm of law, based on the interdisciplinary methodology;
- ✓ Identifying the priority areas of the interdisciplinary methodology of law;
- ✓ Formulating the methodological foundations of the interdisciplinary paradigm of law.

Way of usage



ADVANTAGES:

- ✓ Resource of learning and teaching;
- ✓ Strong methodological support for scientific legal research;
- ✓ Support in carrying out projects on legal research;
- ✓ Platform for interdisciplinary dialogue and link between legal theory and practice;
- ✓ Solutions to streamline the law and to overcome the crises;
- ✓ Tools to address the complex approach to the *person-state-law* configuration axis.

IMPLEMENTATION STAGE: At the laboratory and university level, research centers.

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HR EXCELLENCE IN RESEARCH

TRANSITION TOWARDS GOOD GOVERNANCE AND EFFICIENT PROTECTION OF HUMAN RIGHTS AND FREEDOMS

RESEARCH PROJECT: # 20.80009.1606.15

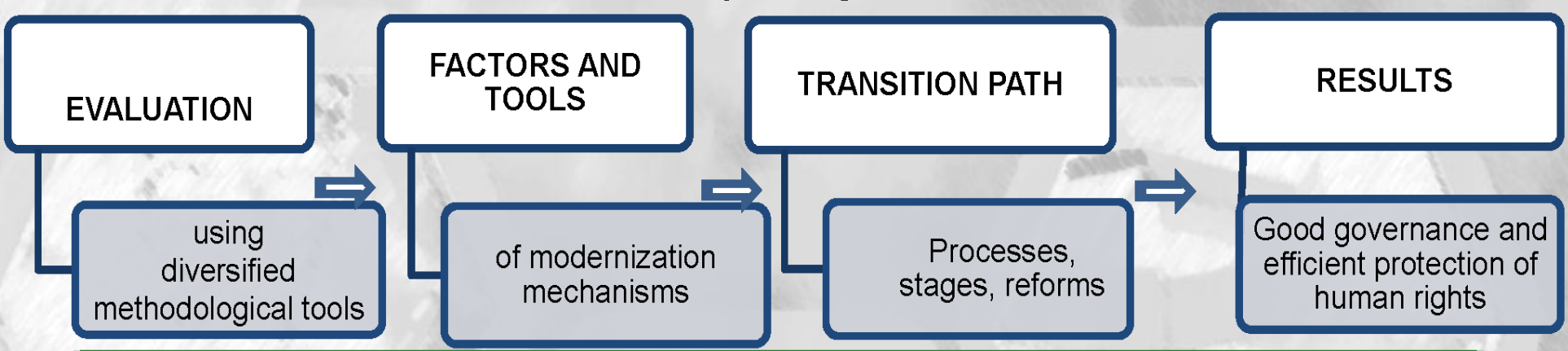
AUTHORS: Rodica CIOBANU (coord.), Ion GUCEAC, Elena ARAMA, Andrei NEGRU, Veronica MOCANU, Iordanca-Rodica IORDANOV, Natalia CRECIUN, Oleg PANTEA, Svetlana SLUSARENCO

APPLICATION FIELDS: Teaching methods, Books, History and Cultural studies. **E**

AIM: Identification of the factors, tools and dimensions of the transition towards efficient governance focused on the protection of human rights.

- ✓ SOLUTION: Objective evaluation of the governance and of the degree of protection of the person through a diversified methodological arsenal;
- ✓ Identification of the factors, of the instruments of afirmation of good governance and of human rights;
- ✓ Streamlining the transition path towards good governance and efficient protection of human rights;
- ✓ Implementation of actions of building a society in which human rights and freedoms are protected and the governance responds to the citizens` needs.

Way of usage



ADVANTAGES: Provide theoretical, methodological and empirical support concerning the transition process;
Identify needs for intervention to generate an increase of the governance quality and efficiency;
Determine an increase of the degree of protection of citizens, of the safety and trust in authorities, of professionalism of the officials and of the ability to persevere in achieving the assumed objectives;
Facilitate the development of a performant public management, which capitalizes on experiences of good governance and of social, political and legal practices of other states.

IMPLEMENTATION STAGE: At the laboratory and university level, for authorities.

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Acta Technica Corviniensis – Bulletin Of Engineering:

15th Year in Scientific Publishing

Book/Journal Development

E

Author/Manager/Editor-in-chief/Editor: Imre KISS

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is an international and interdisciplinary journal which reports on scientific and technical contributions and publishes invited review papers covering the full spectrum of engineering.

We are very pleased to inform that our journal ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering completed its 14 years of publication successfully [2008–2021, Tome I–XIV]. In a very short period it has acquired global presence and scholars from all over the world have taken it with great enthusiasm.

This year, 2022, marks ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering' 15th year in scientific publishing! Our ability to adapt has allowed us to prosper over the years. I look forward to new challenges, new technology and to seeing what the next 15 years will bring. We look forward to the next 15 years of service excellence!

Contact: Imre Kiss/UPT /Faculty of Engineering Hunedoara/Dept. Engineering&Management/imre.kiss@fih.upt.ro

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Annals of Faculty Engineering Hunedoara – International Journal of Engineering: 20th Year in Scientific Publishing

Book/Journal Development

E

Author/Manager/Editor-in-chief/Editor: Imre KISS

ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering is an international and interdisciplinary journal which reports on scientific and technical contributions and publishes invited review papers covering the full spectrum of engineering.









We are very pleased to inform that our journal ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering completed its 19 years of publication successfully [2003–2021, Tome I–XIX]. In a very short period it has acquired global presence and scholars from all over the world have taken it with great enthusiasm.

This year, 2022, marks ANNALS of Faculty Engineering Hunedoara – International Journal of Engineering' 20th year in scientific publishing! Our ability to adapt has allowed us to prosper over the years. I look forward to new challenges, new technology and to seeing what the next 20 years will bring. We look forward to the next 20 years of service excellence!

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CCOC-FIH

Centrul de Consiliere și Orientare în Carieră

Career Counseling and Guidance Center 2022

E

Author: Mihaela Popa

The Career Counseling and Guidance Center is a structure that has a teaching staff representing each of the 10 faculties of the Polytechnic University of Timisoara. The mission of this structure is to support students to improve their skills and start living more aware and aligned lives with themselves. Within the Career Counseling and Guidance Center, the services offered are adapted to the needs and requests of each generation of students. The portfolio of activities, found on the CCOC website of the faculty, merges into a coherent, perfectable puzzle, full of challenges, patience, enthusiasm, collaboration, results, satisfactions and hope.





This academic year the CCOC-FIH initiated and carried out the following activities:

1. Building and updating the CCOC website on the faculty page;

2. From October 2020, the students of the first and second years went through the recommended episodes of the Neuroscience Project in the classroom, launched by Paul Olteanu and his team, with the support of MECTS.

3. Organization and participation in the Hunedoara 2022 graduation celebration.

4. Organization and participation in the event "Career Days" Timișoara XX and XXI editions, with 40 students in May 2022 and 70 students in October 2022.

5. 70 of the first-year students in weeks 1-3 of the academic year 2022-2023 participated in the successful implementation of the knowledge game Icebreaker, taken from the student affairs counseling at the Faculty of Engineering and Technology Narvik/Norway.

4. Initiating, organizing and participating in the "Socialization through movement" event. Starting in October 2022, on Mondays and Wednesdays between 18-20, students come to socialize through movement in the premises of the faculty gym. Friendly football game 4+1 with representatives of students from Hunedorian high schools.

5. Involvement of student volunteers in the Caravan to promote the UPT educational offer 2023-2024 in high schools.

Contact: https://ccoc.fih.upt.ro/ elapopa60@gmail.com

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University of Belgrade
Faculty of Mechanical Engineering

DYNAMICS

University Book

Authors:
Nikola Mladenović, Nataša Trišović

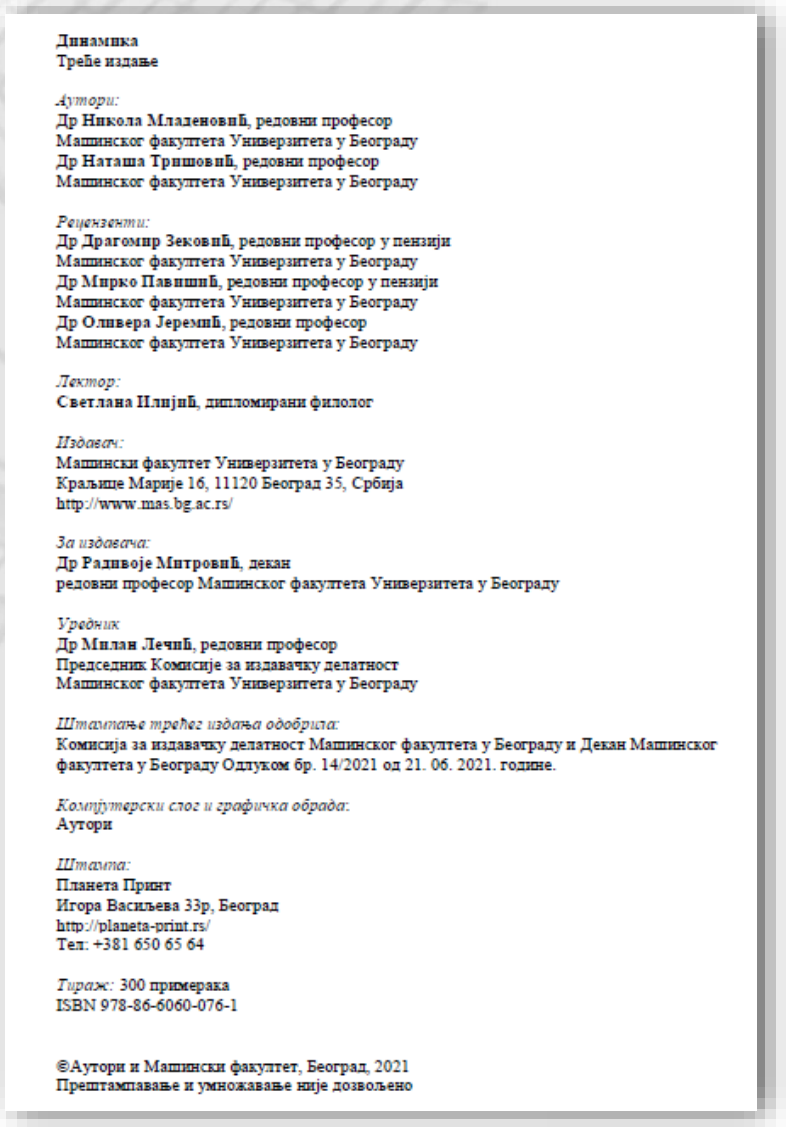
E

Mladenović N., Trišović N.: Dynamics, Faculty of Mechanical Engineering, University of Belgrade, 2015, 2017- 335 pages, ISBN 978-86-7083-884-0.

A textbook intended for undergraduate, master's and doctoral students, according to reviewers, written in high-quality scientific language. The most important chapters in Dynamics, including the dynamics of a material particle and the dynamics of a material system, have been done concisely and in detail.

The chapters in the book are: Differential equations of a material particle, Basic theorems of dynamics, Motion of a particle under the action of a central force, Linear oscillations of a material particle, Dynamics of relative motion of a material particle, Dynamics of a particle of variable mass, Differential equations of motion of a material system, Fundamentals of analytical mechanics, Gyroscope theory, Impact theory.





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Scratch programming language

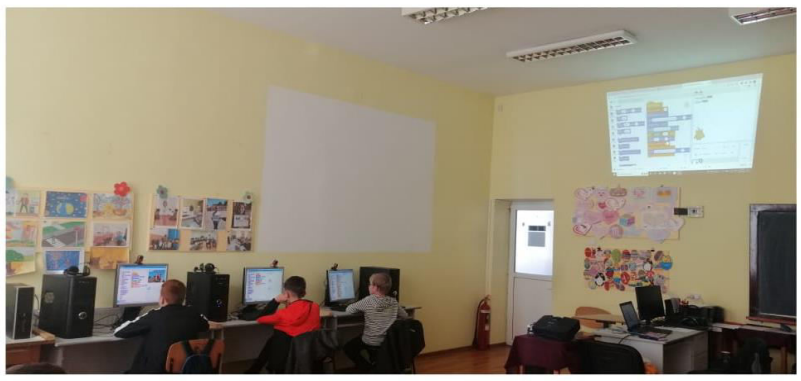
Palatul Copiilor Deva

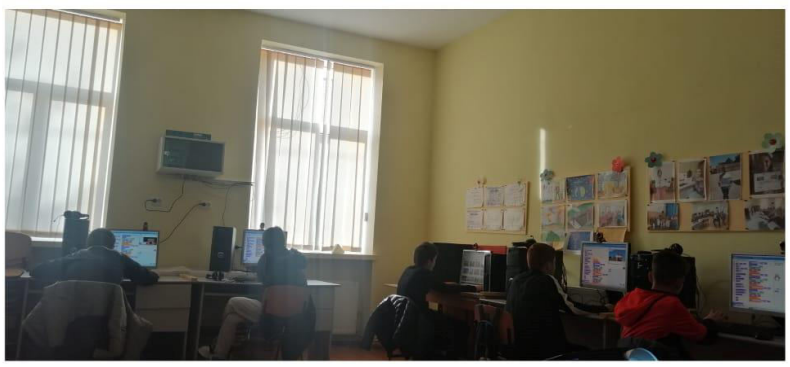
Prof. Popescu Bianca Claudia

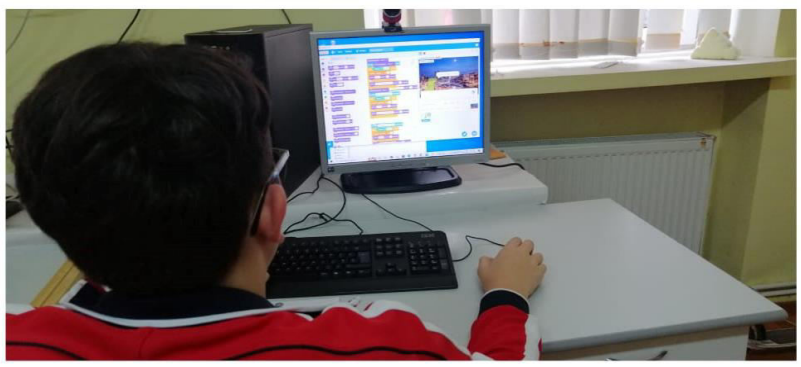
E

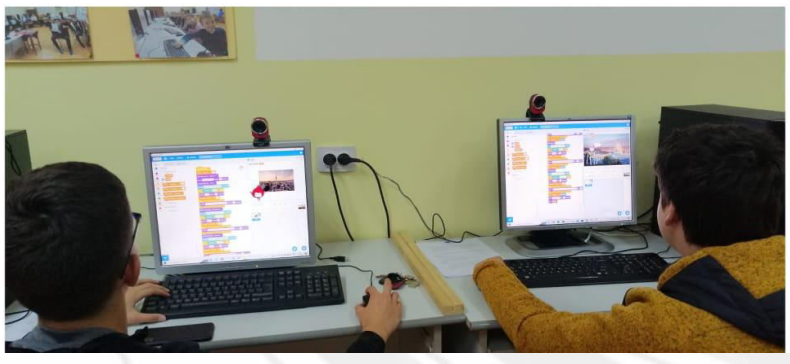
At the Informatics circle at Palatul Copiilor Deva, primary school children are introduced to programming language. This language is very attractive because it gives children the opportunity to understand the concepts of programming, coding in a fun way. Using Scratch, you can make animations, interactive stories and games. This is how children's algorithmic thinking, imagination and creativity develop. Scratch can be accessed in over 40 languages. The interface of the application is very user-friendly. Its menu consists of different colored buttons. Pressing any button, opens a list of instruction blocks colored in the same color as the selected button, which makes the application even easier to use. Scratch can be used online or offline by downloading the application to your computer. Using it online, has the advantage that you can share your projects with other users around the world.













Children can choose from the app's library a variety of characters with various built-in aspects, backgrounds and sounds, with which to create the most varied animations. In the Informatics circle from Deva și Hunedoara, the children created animations, games and interactive stories from Romanian and international folklore, with which they successfully participated in various profile competitions and presented them as part of Erasmus+ projects. So, I could say that Scratch helps childrens learn the basic principles of programming in a very attractive way. At the end of the lesson the chiled is very pleased to have created somethig functional, wich moves, flies, makes sounds, interacts with the others characters. It's the satisfaction I see on my students'faces after every Scratch project they create.

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Centrul Judetean de Excelenta Hunedoara

Telepresence robot for online courses

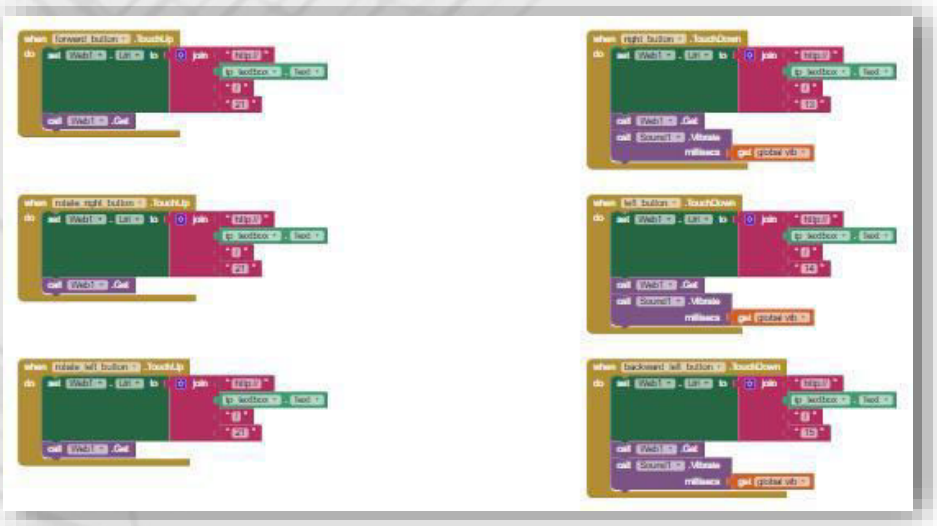
Prototype

Authors: Mariș Sebastian Daniel, Paul Țoța (coordinator)

E

Proiectul este prototipul unui kit robot de teleprezență util pentru cursurile online ale școlilor.
Kit-ul robot este echipat cu diverși senzori, poate fi folosit pentru lucrul de laborator la distanță iar software-ul propus constă dintr-o aplicație mobilă și programarea plăcilor de dezvoltare cu microcontrolere.
Partea mecanică conține componente modulare imprimate 3D, iar complexitatea acesteia poate fi adaptată nevoilor.
Aplicația mobilă poate fi modificată cu ușurință, chiar și de către persoane fără prea multă experiență de programare, fiind creată în blocuri de cod.





The project is the prototype of a telepresence robot kit useful for online courses of schools.
The robot kit is equipped with various sensors, it can be used for remote laboratory work and the proposed software consists of a mobile application and programming of development boards with microcontrollers.
The mechanical part contains 3D printed modular components and its complexity can be adapted to needs.
The mobile application can be easily modified, even by people without much programming experience, being created in code blocks.

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Open Educational Resources as innovative teaching tools in mechanical engineering classes

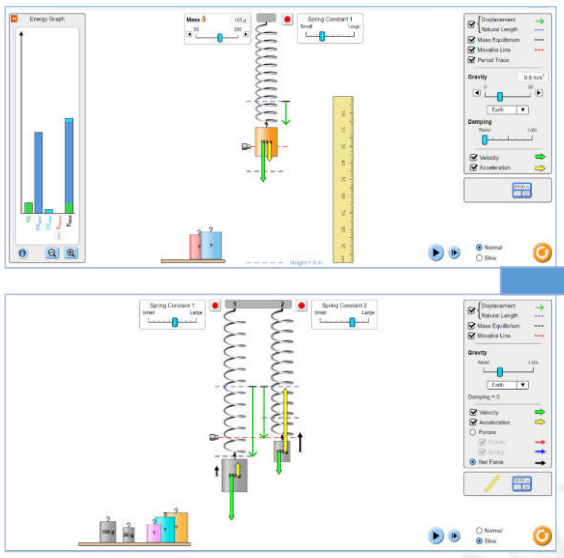
Project

Authors: ALIC Daniela Delia[1)], RACKOV Milan[2)]

[1)] Politehnica University of Timisoara, Faculty of Engineering Hunedoara, Romania
[2)] University of Novi Sad, Faculty of Technical Sciences, Serbia

E
Teaching methods

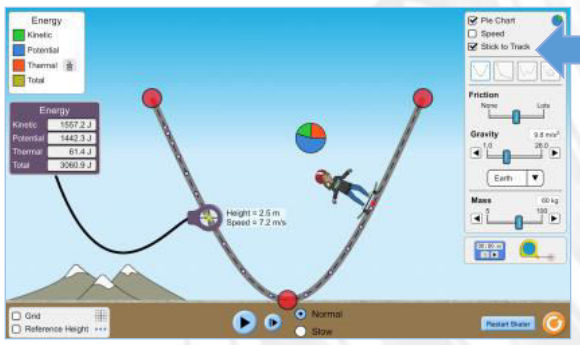
Description: In the frame of this project currently in progress in our faculty, *Open Educational Resources/OER*, interactive simulations and animations are used in a blended learning approach, in order to improve student's understanding of classical mechanics concepts and laws, as well as to develop their inquiry skills by exploring cause-and-effect relationships. The openness and flexibility allowed by open licensing of OER's, empower educators to become more innovative in their pedagogical practices, as the *OER's 5R Concept* gives the course designer the opportunity to adapt the resources according to the course objectives and requirements: *R*etain (the right to make, to own and control copies of content), *R*euse (in many ways), *R*evise (adaptation, adjustments, and changes), *R*emix (combinations with the original or revised content, with other open content) and finally, *R*e-distribute (sharing the new content with others).
In this context, for the interactive simulations selected to effectively explain and illustrate course topics, our challenge as teachers consists in creating the most appropriate scenario, which requires students to predict and then interpret the effect of manipulating related variables. Thereby, we can encourage student participation and involvement in active learning activities and facilitate the development of their problem-solving skills.



a. Mases and springs
(https://phet.colorado.edu/sims/html/masses-and-springs/latest/masses-and-springs_en.html)

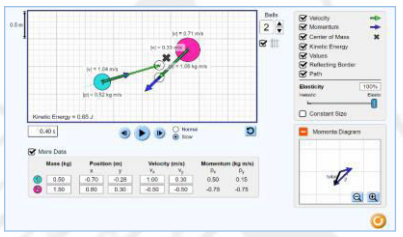
Topics
✓Periodic Motion
✓Hooke's Law
✓Conservation of Energy
✓Newton's Laws
✓Measurement
✓Vectors

Learning Goals
✓Determine the factors which affect the period of oscillation
✓Find the value of g on Planet X
✓Design an experiment to determine the mass of an unknown object
✓Describe the relationship between the velocity and acceleration vectors, and their relationship to motion, at various points in the oscillation
✓Explain how the free-body diagram of the mass changes throughout its oscillation
✓Explain the Conservation of Mechanical Energy using kinetic, elastic and gravitational potential.



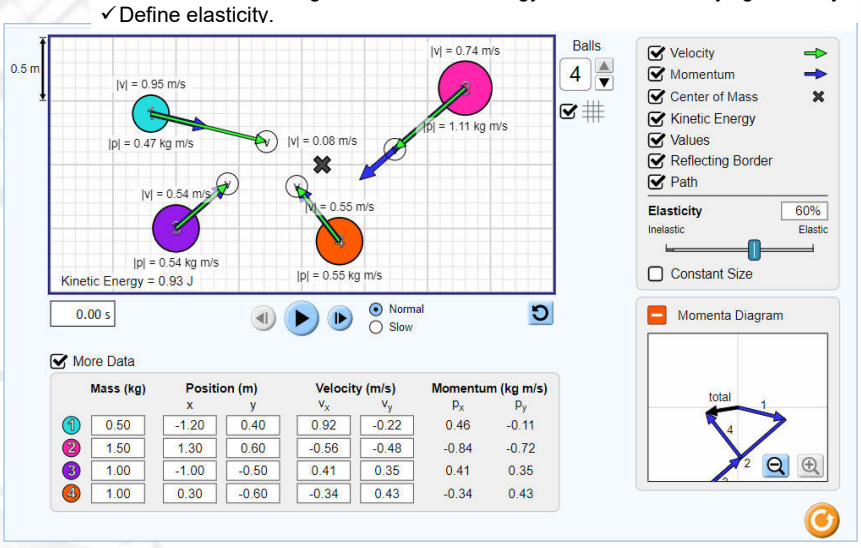
c. Energy Lab. Interactive simulation
(https://phet.colorado.edu/en/simulations/energy-skate-park)

Learning Goals:
✓Explain the Conservation of Mechanical Energy concept using kinetic and potential energy.
✓Describe Energy -Pie, -Bar, and -Position Charts from position or selected speeds.
✓Predict position or estimate of speed from Energy -Pie, -Bar, and -Position Charts
✓Calculate speed or height from information about a different position.
✓Calculations with Conservation of Mechanical Energy using energy-time graphs.



Topics
✓ Collisions
✓ Conservation of Energy
✓ Conservation of Momentum
✓ Elasticity

Learning Goals
✓Draw "before-and-after" pictures of collisions.
✓Construct momentum vector representations of "before-and-after" collisions.
✓Apply the law of conservation of momentum to solve collision problems.
✓Determine the change in mechanical energy in collisions of varying elasticity.
✓Define elasticity.

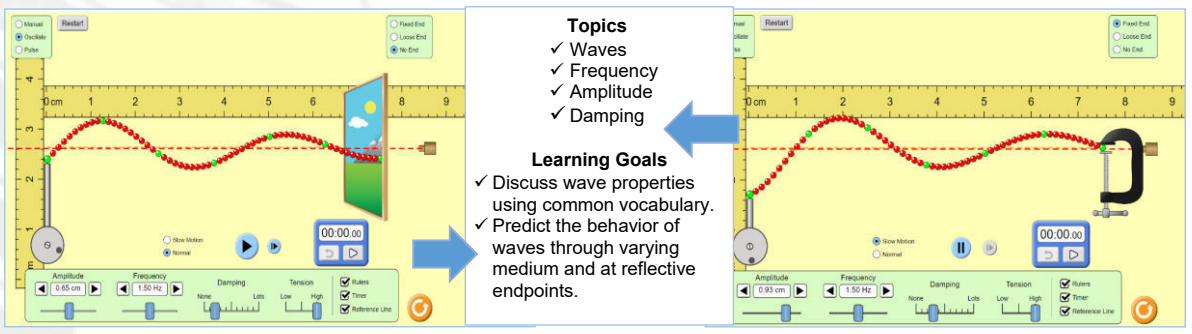


b. Collision Lab (https://phet.colorado.edu/sims/html/collision-lab/latest/collision-lab_en.html)

Teachers: *create a student-centered classroom and foster a supportive, goal-oriented learning environment.*
Students: *engage in scientific exploration with multiple, positive learning outcomes, direct their own learning through exploration, monitor and reflect on their own understanding, achieve conceptual learning.*

"With all of the open science resources available now, graduates can't afford to ignore it; whatever their field, the information is available to their competitors as well."

[https://creativecommons.org/2022/11/02/cc-certificate-alumni-interview-with-jennifer-miller/]



Topics
✓ Waves
✓ Frequency
✓ Amplitude
✓ Damping

Learning Goals
✓ Discuss wave properties using common vocabulary.
✓ Predict the behavior of waves through varying medium and at reflective endpoints.

d. Wave on a String (https://phet.colorado.edu/sims/html/wave-on-a-string/latest/wave-on-a-string_en.html)

Figure 1a - e. *Open Educational Resources* used as teaching tools in mechanics blended learning courses
(*PhET* Interactive Simulations https://phet.colorado.edu/, covered under the Creative Commons - Attribution license, http://creativecommons.org/licenses/by/3.0/)

Conclusions:

Our recent survey results indicate the current use of interactive simulations in blended learning activities as an innovative exploration environment for mechanics concepts, highly effective in classroom, laboratory and homework activities, extremely well received by our students and helpful in understanding the instructional material in mechanical engineering subjects.

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INDUSTRIAL PROCESS MANAGEMENT PROBLEMS
PROBLEME DE CONDUCERE A PROCESELOR INDUSTRIALE

ISBN: 978-606-554-305-8

E

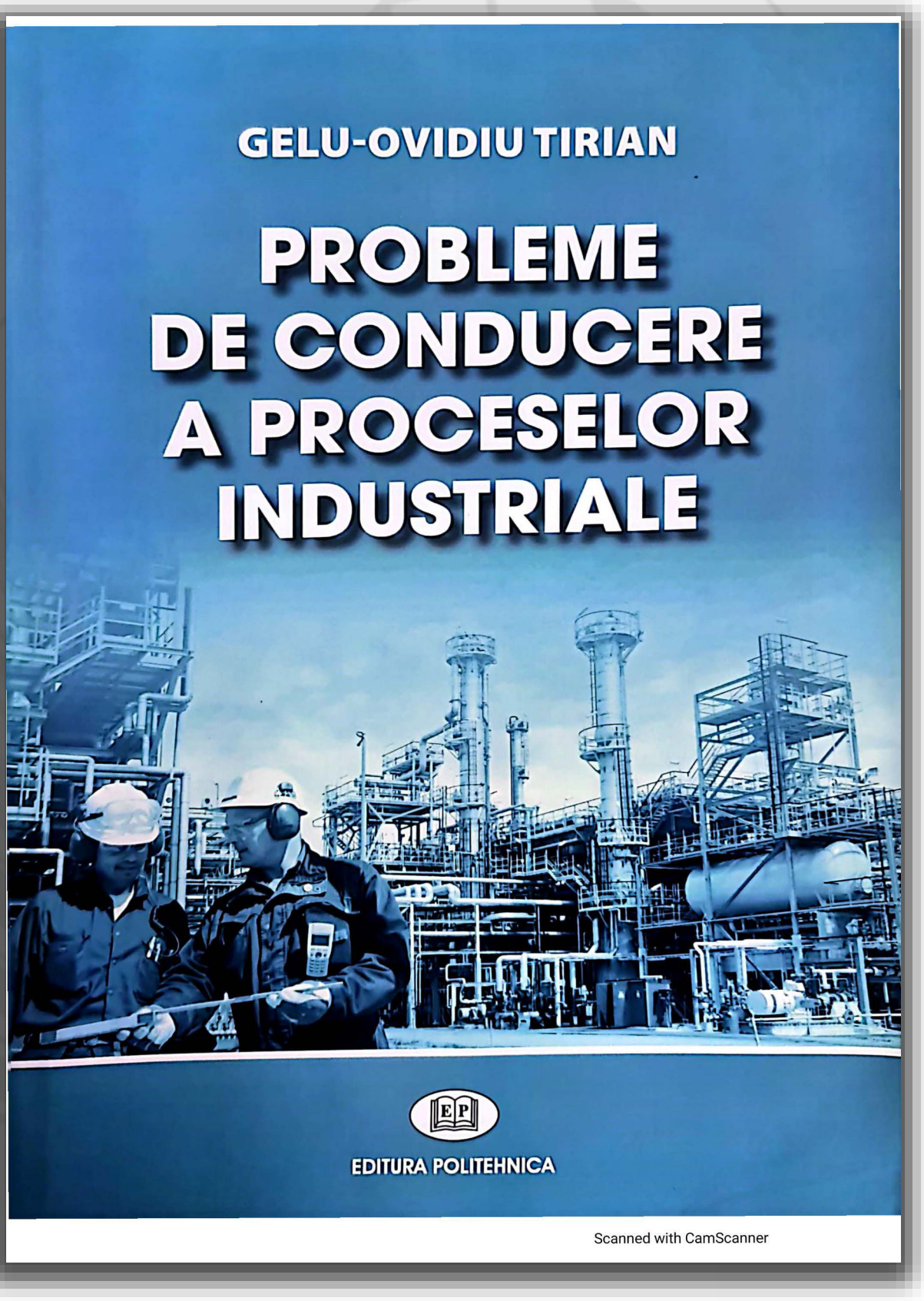
Author: Tirian Gelu-Ovidiu

Automation is one of the fields with the most spectacular developments in recent times, especially related to the development of computer systems and, respectively, new equipment, new concepts and approaches in managing processes. These developments occurred in parallel with the increase in complexity, precision, quality and economy of technological processes.

The main objective of this work is the synthesis, development and implementation of some management structures of the continuous rolling process that will practically lead to the elimination of cracks in the semi-finished product, with the previously mentioned consequences.

In the context of this objective, the following research directions are developed:

- mathematical modeling of the steel solidification process in order to know more accurately the phenomenon of crack formation;
- development of a structure of neural networks to detect in real time the appearance of a crack;
- the synthesis and development of solutions for managing the continuous rolling process based on fuzzy logic, which would allow the elimination of cracks detected by the neural network and at the same time prevent the formation of potential cracks;
- simulation and practical implementation of research results.



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ROBOTICS
ROBOTICĂ

ISBN: 9786065545960

Author: Tirian Gelu-Ovidiu

E

Mechatronics is currently the intersection point of top results in a series of fields: mechanics, automation, computers and actuation systems.

This concentration of such different scientific and technological branches is reflected in the particular complexity of the robot, both in terms of mechanical architecture and in terms of the driving system.

Actually, the robot is the natural result of the evolution from the automated machine tools, the machines with program control, the automatic manufacturing lines, etc.

At the moment when their rigidity and inflexibility no longer corresponded to the current requirements of productivity and quality, and man tried to perform direct, immediate actions on the processes, acquiring a role of supervision and control.

So the robot, as a result of these technical-scientific developments, is able to replace man and perform tasks that are too difficult or too dangerous for humans and represents a positive element for society, because they help people.

In this context, the complexity of the problems regarding both the construction and operation of robots as well as their management is evident.



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UNIVERSITATEA HYPERION
Editura Transversal

Annals Geographical Series Magazine

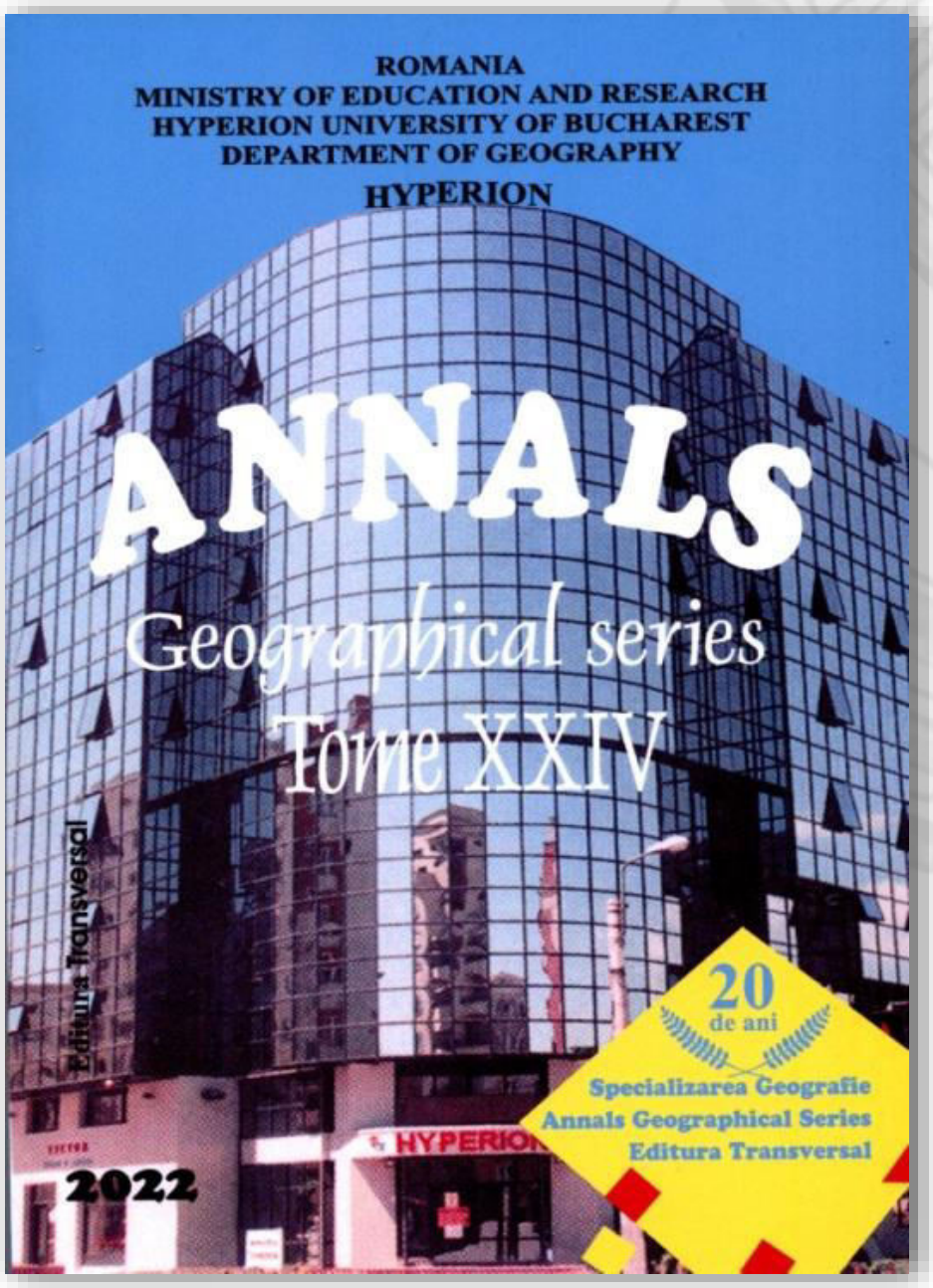
Scientific Review

E

Author/s:
Editor: PhD Associate Professor Elena Toma and
Assistant Professor, Ph.D. candidate Eduardt Samoilă.
Scientific editorial secretary: Assistant Professor, Ph.D. candidate Eduardt Samoilă

The Annals Geographical Series magazine appeared in 2004, 2 years after the establishment of the geography specialization, within the Faculty of History - Geography of the Hyperion University in Bucharest. From the very beginning, the magazine aimed to help young teachers, researchers, students, and master's students to publicize their research projects and to facilitate their contact with university environments in the country and abroad.

In 2022, the Annals Geographical Series magazine has completed 18 years of life being edited and printed throughout this period by the Transversal publishing house, CNCSIS accredited and specialized in the field of Geography and History.



Over time, the scientific committee has included academics, university professors, professors, specialists in: geography, history, ethnography, personalities who gave the magazine deep scientific approaches and special visibility in the Romanian university and scientific space. The studies published by these outstanding personalities gave special importance to the magazine, contributing at the same time to the enrichment of the Romanian geographic scientific heritage.

The Annals Geographical Series magazine presents to people who are passionate about geography a series of information, some unique, related to the chosen theme or the results of the scientific research undertaken by the authors.

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Telephone: 0745 172 509, Email: transversaldifuzare@yahoo.com

The League of Students from the Faculty of Engineering Hunedoara

E

Authors: Olar Claudiu, Rif Raluca, Ciobanu Sergiu

The League of Students from the Faculty of Engineering Hunedoara was born in 1991, having 31 years of seniority in representing students. We are members of ANOSR, (National Alliance of Student Organizations from Romania) which brings together under the same name most of the student organizations in Romania and aims to represent students both from the country and from abroad (ESU member), by carrying out several activities, such as be training workshops, student camps, and many others, activities in which active LSH members can also participate. Also, LSH is a founding member of COSPOL (Convention of Polytechnic Student Organizations).







The League of Students from the Faculty of Engineering Hunedoara - abbreviated LSH, is a legal entity under private law, without governmental, patrimonial purpose, which brings together, on the basis of free consent, students from all forms of education from the Faculty of Engineering in Hunedoara or other interested persons who comply with the provisions the statute.

Contact: https://instagram.com/lsh.ligastudentilorhunedoara?igshid=YmMyMTA2M2Y=

Contract nr. 2021-1-RO01-KA220-YOU-000029554

Vertical farming for youth in rural & urban communities
Agricultura verticală pentru tineri din comunități rurale si urbane

Ciceoi Roxana, Venat Oana, Ivan Elena, Jerca Ovidiu, Mâcnea Cristina-Electra, Butcaru Ana, Vlad Ionela Mituko, Lagunovschi-Luchian Viorica, Temocico Georgeta, Draghici Maria, Bădulescu Liliana, Asănică Adrian, Stănică Florin

Verti4You

The project is a strategic partnership between **HEIs, R&D institutions and NGOs** working with **fewer opportunities (FO)** and **NEET youth from RO, BG, GR, and IT.**

Vertical farming deals with growing crops vertically to maximize space, usually in a controlled indoor environment. This method results in high crop yields, allows for year-round food production in any climate, and enables farms to focus on goals ranging from food safety to quality.

Verti4You project aims to guide the NEET and fewer opportunities youth from Romania, Bulgaria, Italy and Greece to start a business in vertical farming, by delivering them 2 training materials, 5 hands-on training sessions, 5 modular, ready to use, vertical modules to produce microgreens and continuous guidance and support





*2 digital training packs on ”**Vertical farming**” and ”**Social entrepreneurship**”;
*1 **Youth Workers & Trainers Mentoring Event**, involving at least 16 youth workers and 8 trainers;
*4 blended **learning, teaching, and training mobilities** for building vertical modules and producing vegetables with those modules, involving at least 50 different young participants;
*4 **multiplier events**, to reach a minimum of 320 people outside partners organizations;
*ongoing management of the project including 3 online and 3 physical **transnational meetings**; creation and launch of **project webpage** and **social accounts**; four **local stakeholders activities** (1/partner) etc.

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+40 721816194
http://vertifarms.eu

Partners

Romania ∗*Universitatea de Științe Agricole și Medicină Veterinară București,* ∗*Asociația Copiii în Sânul Familiei,* ∗*Institutul Național de Cercetare Dezvoltare pentru Mașini și Instalații destinate Agriculturii și Industriei Alimentare,* ∗*Institutul de Cercetare-Dezvoltare pentru Protectia Plantelor*
Bulgaria ∗*University of Forestry,* ∗*AGROLINK Asociation*
Italy ∗*Scambi Socio-Culturale Giovanili "World Net"*
Greece ∗*Hopeland*







Verti4You motto is ”**Solving East and South Eastern NEET/FO youth challenges beyond border, by vertical farming”.**







The 10 biggest advantages of vertical farming

1. Reliable year-round crop production;
2. Unaffected by adverse weather conditions;
3. Better use of space;
4. Minimise water usage;
5. Environmentally friendly;
6. No chemicals or pesticides;
7. Reduced transport costs;
8. Highly energy efficient;
9. Safe for staff;
10. Low labour costs.

The benefits of cooperating with transnational partners from Romania, Bulgaria, Italy and Greece resides in the similarities these four countries have in their relation to the NEETs and their previous experience in working with fewer opportunities youth.

This project has been funded with support from the European Commission. The European Commission support for the production of this publication does not constitute endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein

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ICECHIM

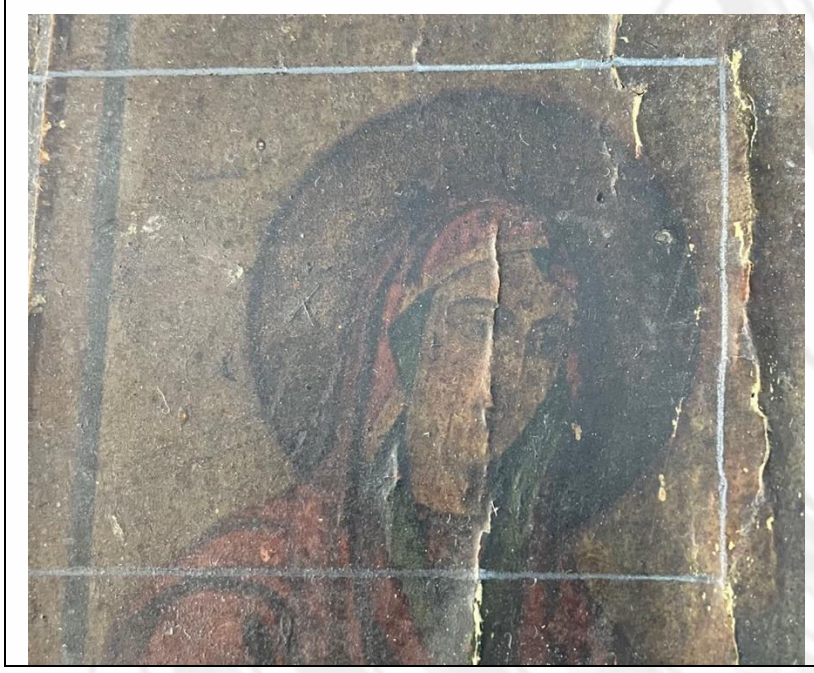
Magnetic gel for cleaning of painted surfaces and the process of obtaining and using it

***Patent* A 2022- 00542 /06.09.2022**

Ion Rodica Mariana, Iancu Lorena, Grigorescu Ramona Marina, Ion Nelu

E

The invention refers to a magnetic gel, made of alginate, glycerin, chitosan, carboxymethyl cellulose and cobalt ferrite. Magnetic gel is used for cleaning / restoration/ preserving the artifacts from the cultural heritage with painted surfaces, with the improvement of the chromatic characteristics of the painting surfaces, especially of the paper paintings.





The present invention refers to alginate microcapsules with built-in magnetite for the photocatalytic degradation of antitumor drugs and the process of obtaining them. Alginate microcapsules with built-in magnetite, according to the invention, have in their composition sodium alginate powder, powder magnetite nanoparticles with a content of phytocomponents with oxidizing character.

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Acknowledgements: *This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CCCDI - UEFISCDI, project number PN-III-P2-2.1-PED-2021-3885, within PNCDI III and PN 23/2019".*

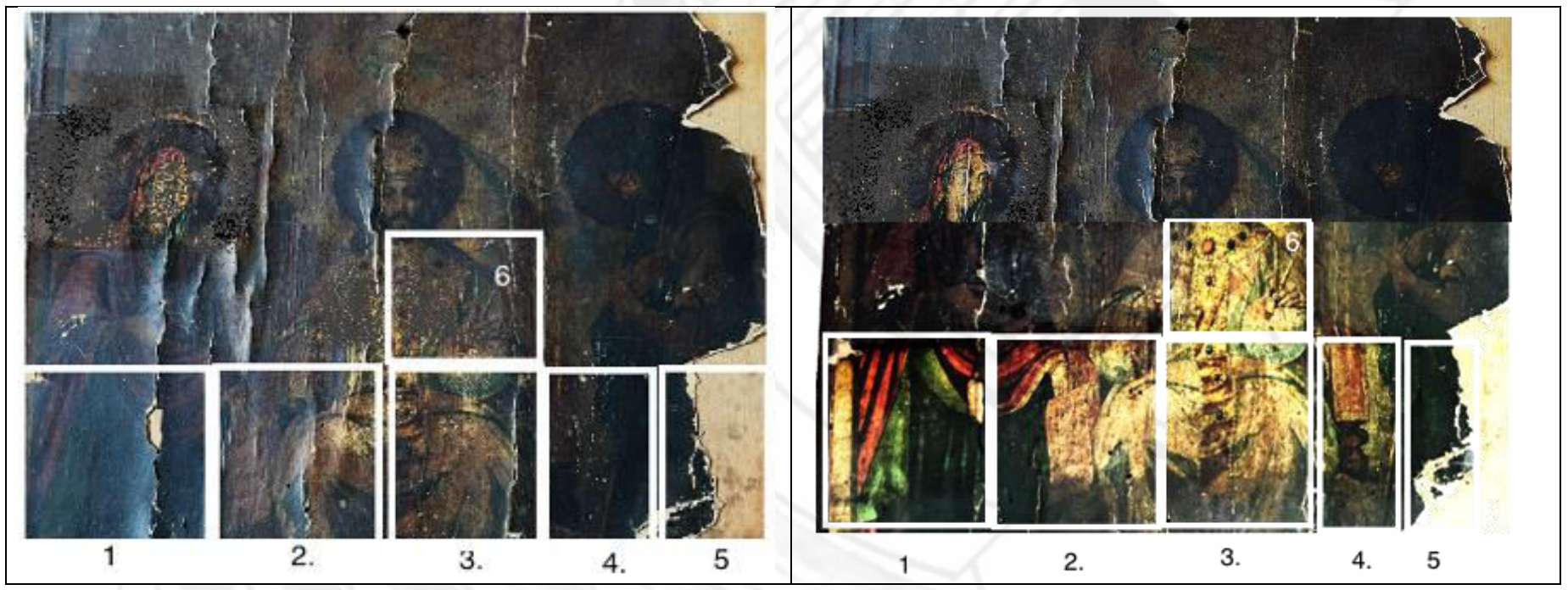
CLEANING COMPOSITIONS OF PAINTED SURFACES AND PROCEDURE FOR THEIR USE

***Patent* A 2022- 00744 /18.11.2022**

Ion Rodica Mariana, Tierean Mircea Horia, Croitoru Catalin, Munteanu Daniel, Iancu Lorena, Grigorescu Ramona Marina, Ion Nelu

E

This invention refers to cleaning compositions of the painted surfaces, to the procedure of their use. Cleaning compositions include an ionic liquid based on phosphonium or ammonium salts or imidazolium or imidazolium or piperidinium, an aminoalcool, a non-ionic surfactant, with or without hydroxycellulose, and an amount of distilled water.



The process of obtaining, according to the invention, consists in mixing the constituents at room temperature resulting in the cleaning compositions in the form of a solution or gel that can be kept cold in the covered vessel, at a temperature of 8 ^{o}C, until they are used by application on the surface of the paintings previously dedusted, and the cleaning, by hand, is carried out by using sticks with at least one of the ends covered with cotton material moistened with water, through movements of light rotations and with great care so as not to damage the fragile portions of the paintings.

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Acknowledgements: This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CCCDI - UEFISCDI, project number PN-III-P2-2.1-PED-2021-3885, within PNCDI III and PN 23/2019".

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UMF UNIVERSITATEA DE MEDICINĂ ŞI FARMACIE IULIU HAŢIEGANU CLUJ-NAPOCA

Your Guide in Chemistry

Book

Author: DRAGOȘ BUDIUL-BERGHIAN

E

The material entitled "Ghidul tău în chimie" (Your Guide in Chemistry) is dedicated to the students who want to pass the entrance exam to Medicine, but also to the ones who wish to pass the Bacalaureat exam with 10 in a more effective way.



The material represents an easier way to deepen the knowledge in chemistry by its way to provide information. In addition, the material includes exercises for each chapter, in order to fix the knowledge.

The summary represents an opportunity to the young students to gain the necessary knowledge in order to become a part of the most prestigious fields.

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Importance of VET - Vocational Education & Training

Educational Project

Author: Prof. Dr. Anuja Malik

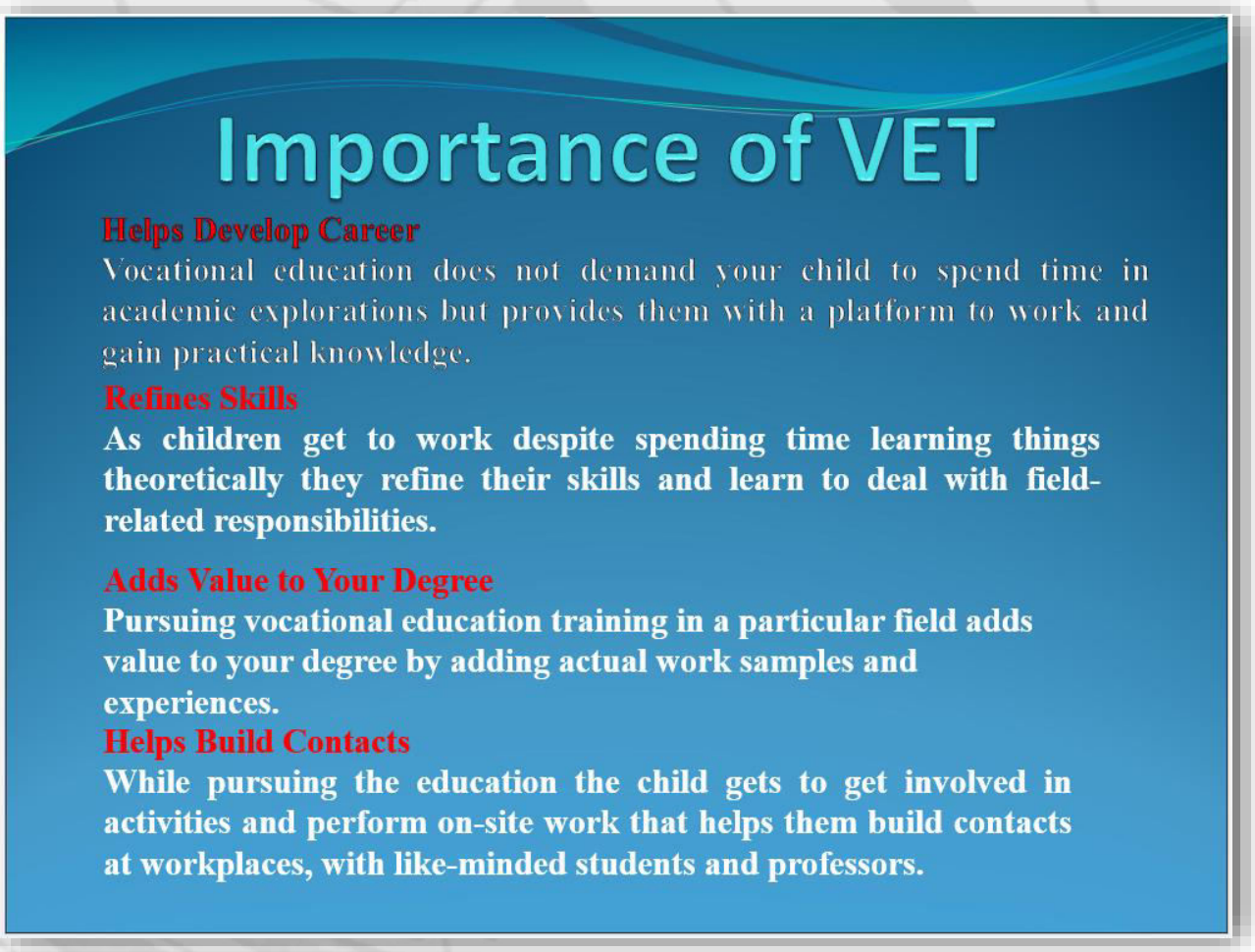
E

The term vocation indicates a particular industry or profession that defines a person's employment. Vocational education is regarded as technical teaching where youth gets to acquire practical skills and knowledge related to a particular trade. Vocational education generally circles a specific field and helps the child gain related aptitude in a knack of time.

The secondary and tertiary educational stages are determined to be the best period to receive this training. An educational firm providing vocational education is termed a vocational school or a college of further education.



"Vocational education and training, allows students to gain practical experience in their chosen career path before they even graduate."



Benefits of vocational education

* Development of Practical Skills over Theoretical
* Children come out with in-hand experience and field knowledge
* They get to work on their interests
* Educating them and making them skilled at a very young age

➢Vocational Training can really help students who had to drop out of school and colleges due to numerous reasons but desires to become professional and get a well-paid job, Vocational Training provides them with all the required knowledge as well as training and makes them job-ready. Companies also look for candidates with vocational training as they are more reliable than a normal degree holder without any relevant experience.

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F

Medicine

Paramedical

Pharmacy

Cosmetics

Hygiene

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HR EXCELLENCE IN RESEARCH

Reason, Language, Communication. Some Aspects of Pragmatic Knowledge

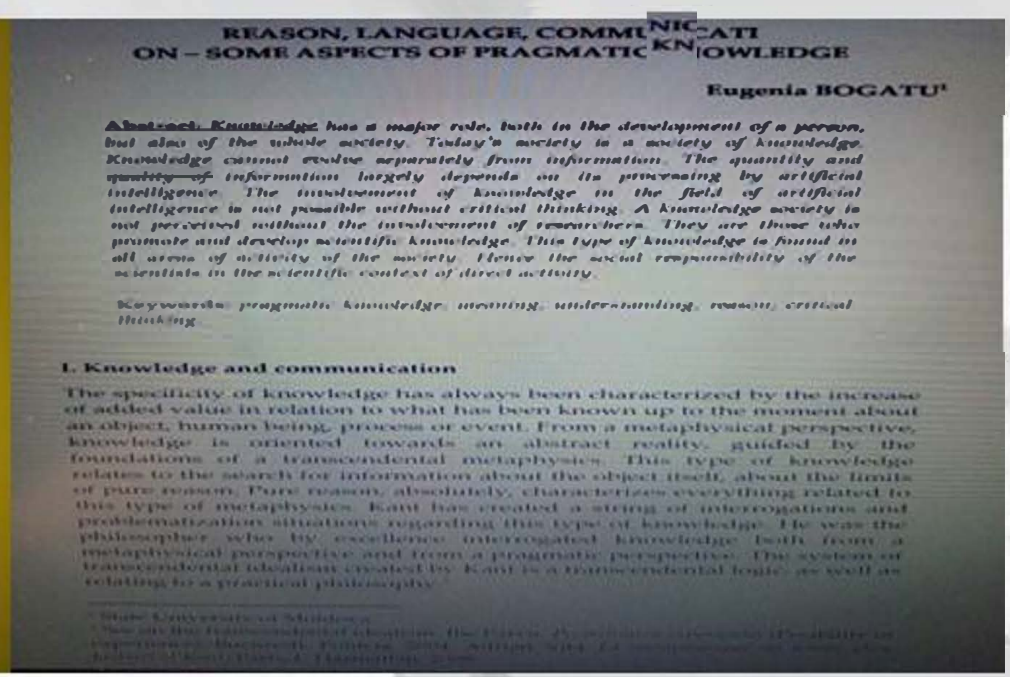
AUTHOR: Conf. univ. Eugenia Bogatu

APPLICATION FIELDS: Teaching, Books, History and Cultural Studies | F

Abstract: Knowledge has a major role, both in the development of a person, but also of the whole society. Today's society is a society of knowledge. Knowledge cannot evolve separately from information. The quantity and quality of information largely depends on its processing by artificial intelligence. The involvement of knowledge in the field of artificial intelligence is not possible without critical thinking. A knowledge society is not perceived without the involvement of researchers. They are those who promote and develop scientific knowledge. This type of knowledge is found in all areas of activity of the society. Hence the social responsibility of the scientists in the scientific context of direct activity.


Analele
Universităţii din Craiova
Seria:
Filosofie
Nr. 49 (1/2022)

Anton ADĂMUT — *Cicero - Un scurt episod aletic (Tusculanae Disputationes, I, XVII, 39)*
Adriana NEACŞU — *Subiectul ca existenţă la Maurice Merleau-Ponty*
Kathrin BOUVOT, Gianluigi SEGALERBA — *Transcendence and Ideas*
Eugenia BOGATU — *Reason, Language, Communication – Some Aspects of Pragmatic Knowledge*
Cătălin STĂNCIULESCU — *„Contradicţia nulităţii" în practica argumentării*
Gianluigi SEGALERBA — *Battle for Minds: Elements of Critical Pedagogy*


REASON, LANGUAGE, COMMUNICATION – SOME ASPECTS OF PRAGMATIC KNOWLEDGE

Eugenia BOGATU[1]

Abstract: Knowledge has a major role, both in the development of a person, but also of the whole society. Today's society is a society of knowledge. Knowledge cannot evolve separately from information. The quantity and quality of information largely depends on its processing by artificial intelligence. The involvement of knowledge in the field of artificial intelligence is not possible without critical thinking. A knowledge society is not perceived without the involvement of researchers. They are those who promote and develop scientific knowledge. This type of knowledge is found in all areas of activity of the society. Hence the social responsibility of the scientists in the scientific context of direct activity.

Keywords: pragmatic knowledge, meaning, understanding, reason, critical thinking

1. Knowledge and communication

The specificity of knowledge has always been characterized by the increase of added value in relation to what has been known up to the moment about an object, human being, process or event. From a metaphysical perspective, knowledge is oriented towards an abstract reality, guided by the foundations of a transcendental metaphysics. This type of knowledge relates to the search for information about the object itself, about the limits of pure reason. Pure reason, absolutely, characterizes everything related to this type of metaphysics. Kant has created a string of interrogations and problematization situations regarding this type of knowledge. He was the philosopher who by excellence interrogated knowledge both from a metaphysical perspective and from a pragmatic perspective. The system of transcendental idealism created by Kant is a transcendental logic as well as relating to a practical philosophy.

IMPLEMENTATION STAGE: Paper published in *The Annals of the University of Craiova. Sery Philosophy*, vol 49, no 1, 2022, pp. 103-116 – ERIH Plus Journal, Scopus etc

ACKNOWLEDGMENTS: This research was supported by the research project: 20.80009.1606.08

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F

Title

PARALLEL ROBOT FOR THE RECOVERY OF LOWER LIMB MOBILITY

Inventor/s - Contact

Pîslă Doina, Bîrlescu Iosif, Vaida Călin, Gherman Bogdan, Tucan Paul, Plitea Nicolae
e-mail: Doina.Pisla@mep.utcluj.ro

Patent/ Application number

Patent OSIM: RO133814 -B1/29.10.2021

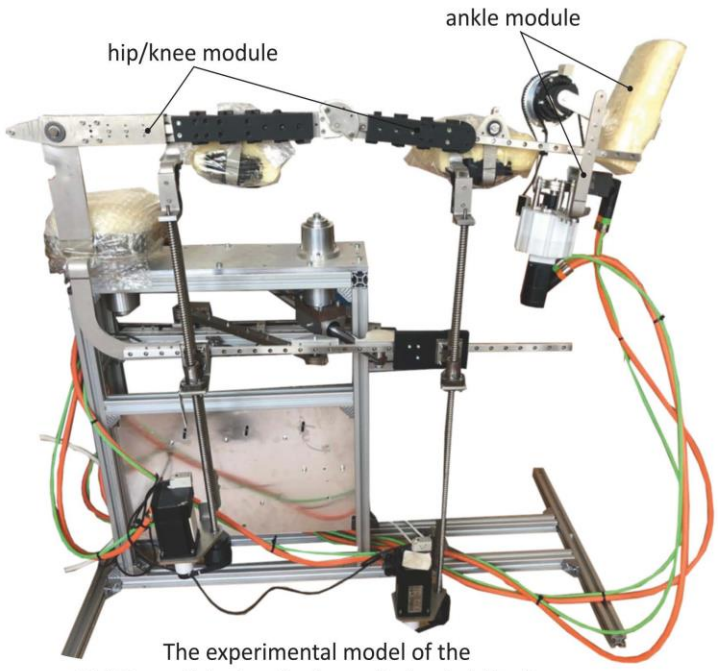
Short presentation

The present invention relates to a robotic system for the rehabilitation of the lower limb of post stroke patients, a system consisting of two robotic modules that are coupled to perform the medical rehabilitation process of the entire lower limb. The first module is designed for the rehabilitation of the hip and knee joints whereas the second module is designed for the rehabilitation of the ankle joint. The hip and knee module has 3 degrees of freedom for the recovery of the flexion / extension and abduction / adduction of the hip and the flexion / extension of the knee and the ankle module has 2 degrees of freedom for the recovery of dorsiflexion / flexion and inversion / eversion of the ankle. The specific application of the robotic system proposed in the present invention is the recovery of the mobility of the lower limb by moving the anatomical joints with the aid of the robotic system that supports and moves each segment of the lower limb in a controlled manner. The novelty brought by the robotic system proposed in this patent has a modular structure, with an improved rigidity compared to the existing ones (in particular the serial ones), allowing the mobilization of the joints of the lower limb in a controlled way which offers the therapeutic advantage of allowing a wider range of recovery exercises compared to existing systems.

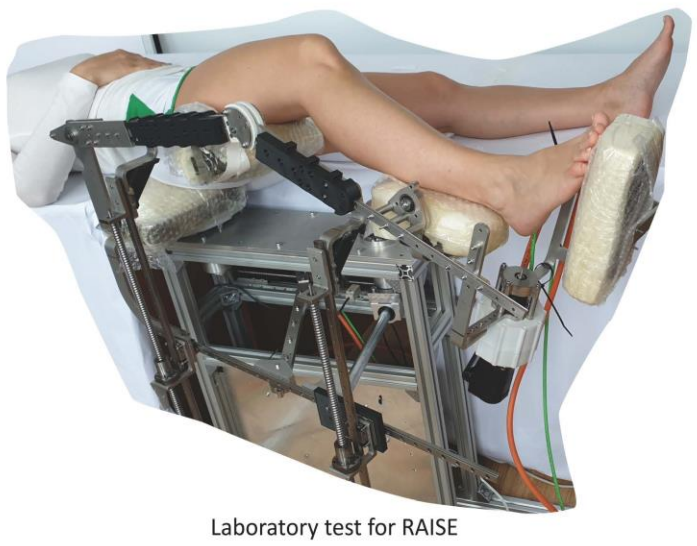
Applicability

Robotics, Medical Robotics, Post-Stroke Rehabilitation of Bedridden Patients, Paralel Robots

Images



The experimental model of the
RAISE parallel robot for lower limb rehabilitation



Laboratory test for RAISE
(with healthy subjects)

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F

Title

PARALLEL ROBOT FOR THE MOTOR REHABILITATION OF THE LOWER LIMBS

Inventor/s - Contact

Pîslă Doina Liana, Gherman Bogdan George, Nadăș Iuliu Adrian, Pop Nicoleta Maria, Crăciun Cristea Florin, Tucan Paul George Mihai, Vaida Liviu Calin, Carbone Giuseppe, Bîrlescu Iosif, Plitea Nicolae.
e-mail: Doina.Pisla@mep.utcluj.ro

Patent/ Application number

Patent OSIM: RO133815 -B1/29.10.2021

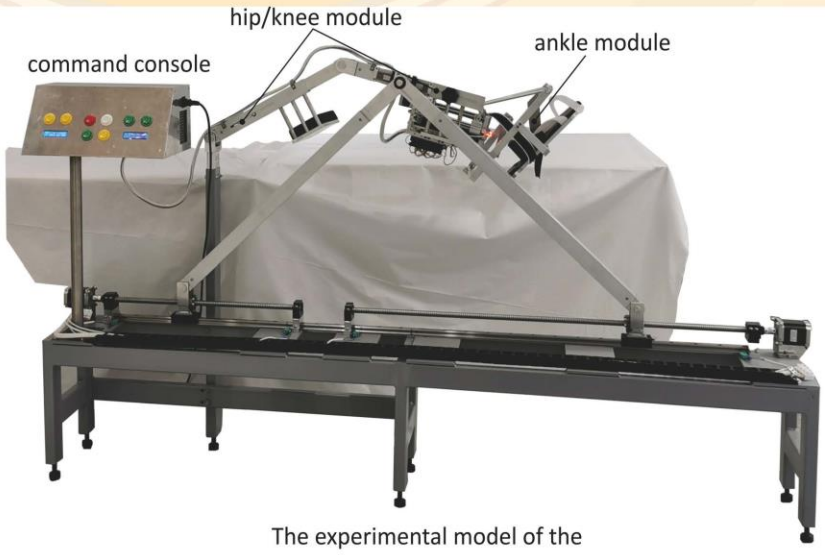
Short presentation

The present invention (RECOVER) is a parallel robotic system designed for the post stroke rehabilitation of the lower limb for bedridden patients. The robotic system consists of two parallel robotic modules which are connected to each other to achieve the rehabilitation of the main joints of the lower limb (the hip, the knee, and the ankle). The first rehabilitation robotic module (the hip/knee module) is based on a 2-DOF (degree of freedom) planar mechanism and it is designed for hip and knee flexion and extension. The module incorporates a passive motion kinematic chain (with no active joints) on which the lower limb of the patient is mounted and guided by two input motion kinematic chains. The second rehabilitation robotic module (the ankle module) is based on a 2-DOF spatial mechanism which guides a mobile platform together with the patients' foot in spherical motion achieving the ankle flexion/extension and inversion/eversion motions. The lower limb main segments are entirely supported by the robotic system and can achieve various rehabilitation exercises in a reliable manner with very low risk of joint injury.

Applicability

Medical Robotics, Post Stroke Rehabilitation of Bedridden Patients

Images



The experimental model of the
RECOVER parallel robot for lower limb rehabilitation



Testing RECOVER with human (healthy) subject
(laboratory tests)

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Title

LAPAROSCOPIC INSTRUMENT FOR ACCURATE EXTRALUMENAL LOCATION OF A COLORECTAL TUMOR

F

Inventor/s - Contact

Bogdan Mocan, Vasile Bintintan
bogdan.mocan@muri.utcluj.ro, vasile.bintintan@umfcluj.ro

Patent/ Application number

Patent OSIM: RO131186 -B1/29.04.2021

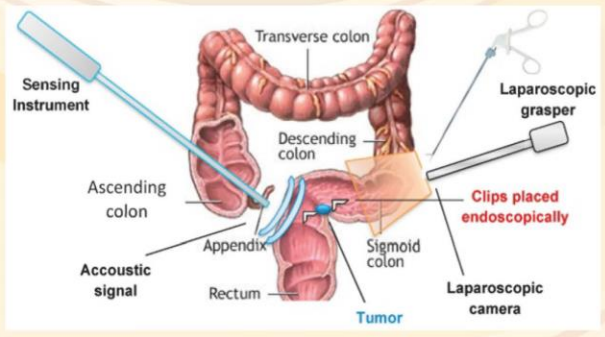
Short presentation

The precise location of gastric and colorectal tumours is of paramount importance for the oncological surgeon as it dictates the limits of resection and the extent of lymphadenectomy. However, this task proves sometimes to be very challenging, especially in the laparoscopic setting when the tumours are small, have a soft texture, and do not invade the serosa. In this view, our invention refers to a new instrument adapted to minimally invasive surgery and manipulated solely by the operating surgeon which has the potential to precisely locate the tumours of the digestive tract. It consists of an inductive proximity sensor and an electronic block encapsulated into an autoclavable stainless-steel cage that works in tandem with an endoscopic hemostatic clip whose structure was modified to increase detectability. By scanning the serosal side of the colon or stomach, the instrument is capable to accurately pinpoint the location of the clip placed previously during diagnostic endoscopy on the normal bowel mucosa, adjacent to the tumour. Using a laparoscopic approach, the detection rate of this system reached 65% when the sensor scanned the bowel at a speed of 0.3 cm/s and applying slight pressure on the serosa. This value increased to 95% when the sensor was guided directly on the point of clip attachment. The detection rate dropped sharply when the scanning speed exceeded 1 cm/s and when the sensor-clip distance exceeded the cut-off value of 3 mm.

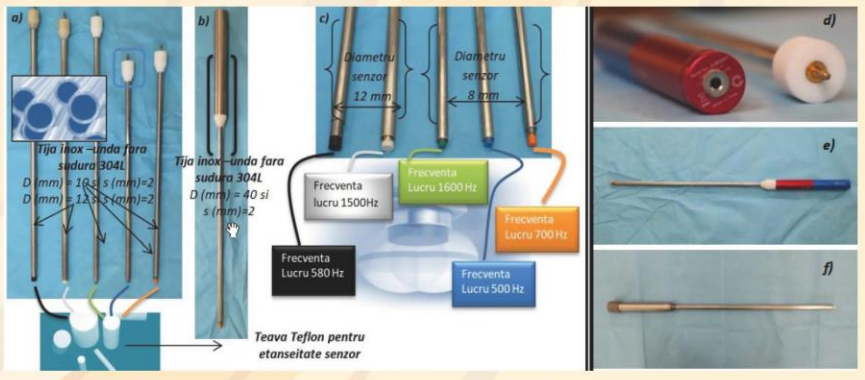
Applicability

The application of the present invention is represented by the possibility of precise location of the tumour in the colon, its maximum axial dimensions and marking of tumour boundaries to facilitate resection surgery by laparoscopic surgery, and in the case of rectal tumours an additional advantage is given by accurate determination. of the position of the lower pole of the tumour and thus the establishment of the optimal operating strategy (if the position of the tumour is not identified exactly then the whole surgery may be compromised from an oncological point of view, with adverse consequences on the patient's prognosis and long-term survival).

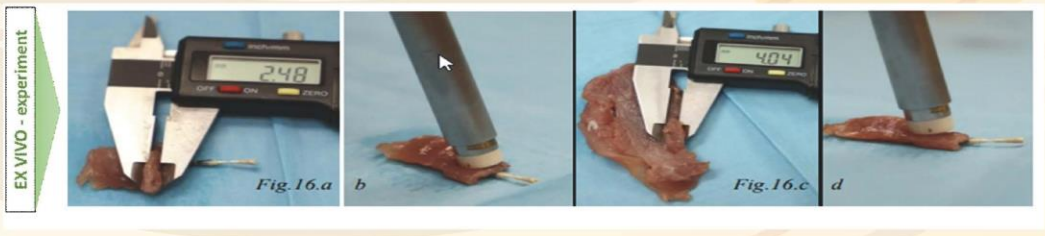
Images



Functional diagram of the laparoscopic sensory instrument



Physical prototype of the laparoscopic instrument





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Title

FAMILY OF PARALLEL MODULAR ROBOTS WITH ACTIVE TRANSLATION JOINTS FOR SILS SURGERY

Inventor/s - Contact

Pîslă Doina Liana, Bîrlescu Iosif, Vaida Călin, Tucan Paul George Mihai, Gherman Bogdan George, Plitea Nicolae
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Patent/ Application number

Patent application OSIM: A/00733/03.12.2021

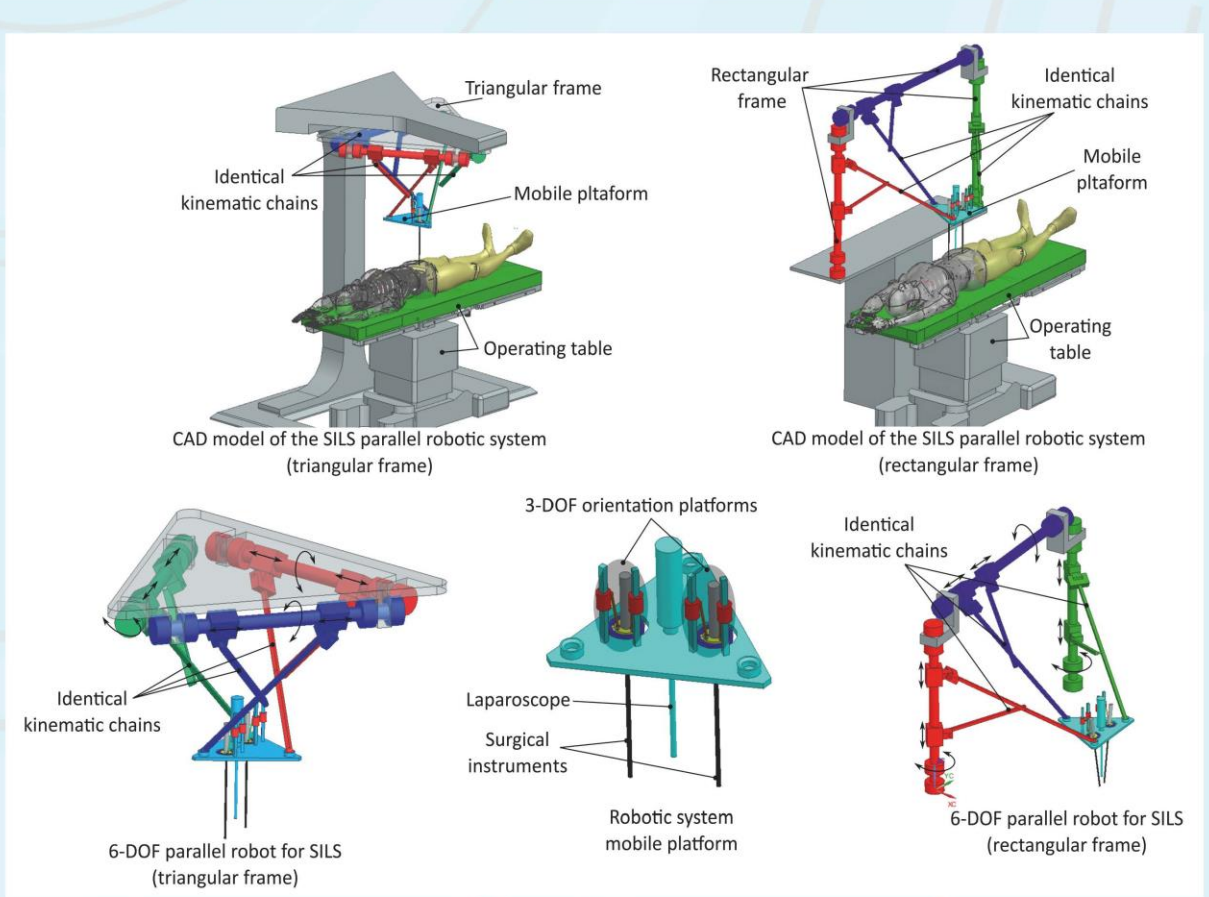
Short presentation

The present family of robots is designed for the single incision laparoscopic surgery (SILS), which is a type of minimally invasive surgery where the surgical instruments are inserted within the operating field through a single trocar (port). The main feature of this family of robots is the use of parallel modules with 6-DOF (degrees of freedom) for the positioning of a mobile platform that guides the laparoscope. Furthermore, the mobile platform holds (mounted) two orientation platforms with 3-DOF for the surgical instruments' manipulation. The first solution represents a 6-DOF parallel robot with triangular frame and three identical kinematic chains mounted in a horizontal plane using a triangular configuration. The second solution of the family represents a 6-DOF parallel robot with rectangular frame and three identical kinematic chains, two of which are positioned vertically and the third in a horizontal position. The present family for SISL robots was designed to ensure patient safety and ergonomics and eliminate the collision risks that emerge when using multi-arm serial robotic systems for the SILS task.

Applicability

Medical robotics, robotic-assisted single incision laparoscopic surgery.

Images



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F

Title

FAMILY OF MODULAR ROBOTS FOR SILS SURGERY WITH KINEMATIC CONSTRAINT OF THE INSERTION POINT IN THE BODY

Inventor/s - Contact

Vaida Călin, Pîslă Doina Liana, Bîrlescu Iosif, Gherman Bogdan George, Tucan Paul George Mihai, Plitea Nicolae
e-mail: Doina.Pisla@mep.utcluj.ro

Patent/ Application number

Patent application OSIM: A/00734/03.12.2021

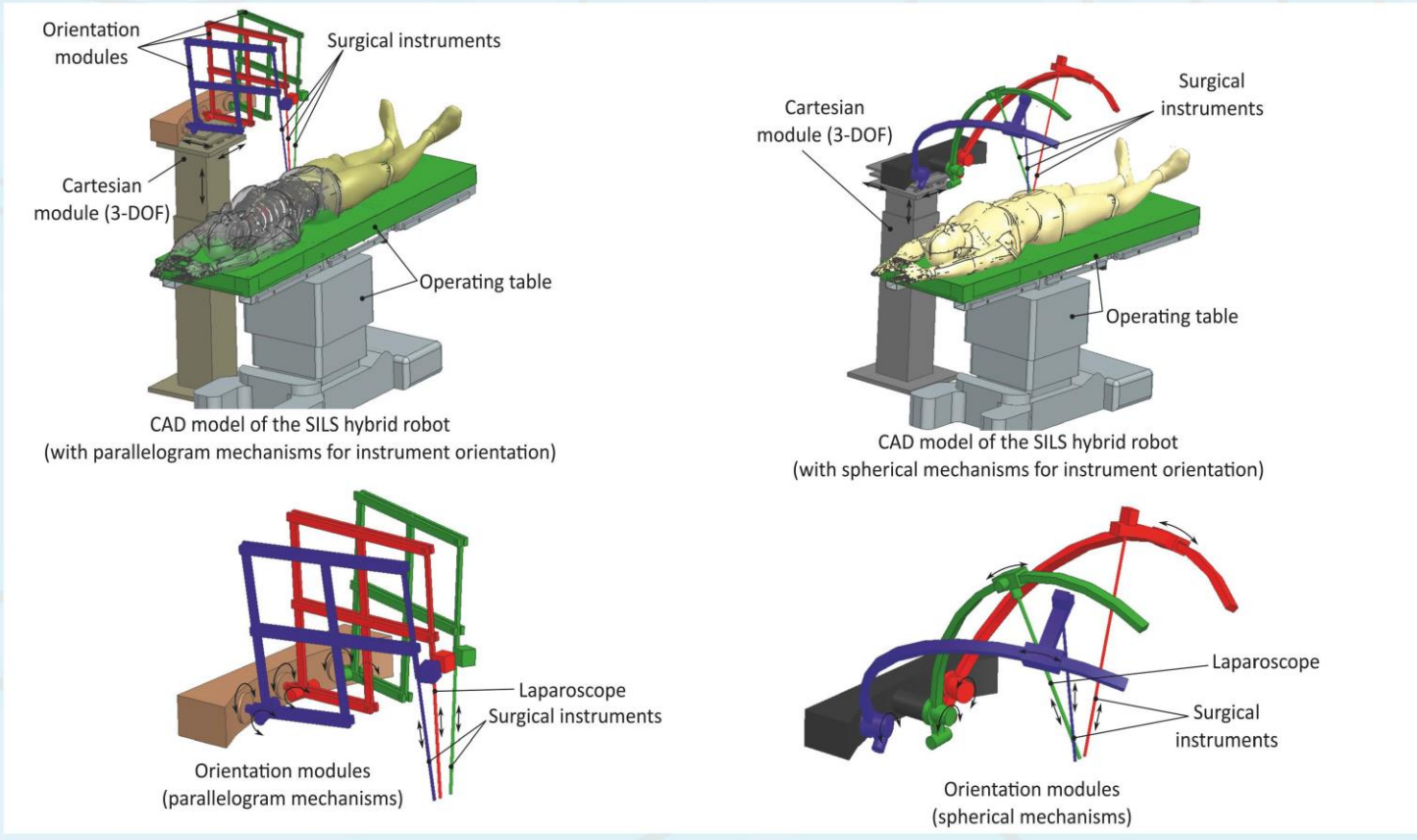
Short presentation

The present invention relates to a family of hybrid robotic systems designed for single incision laparoscopic surgery (SILS), which is a type of minimally invasive surgery, where all the surgical instruments are inserted through a single trocar, reducing trauma and speeding patient recovery time. The main feature of this family of robots is the use of a cartesian module with 3-DOF (degrees of freedom) for the positioning of the mobile platform, which in turn holds (mounted) three platforms with 3-DOF for the surgical instruments' orientation. The first solution of the family is a robotic system composed of a Cartesian module and three parallelogram modules for the instruments orientations. The second solution of the uses the same Cartesian positioning module and three spherical modules for the orientation of the instruments. Both solutions are designed to ensure patient safety and the procedure ergonomics, while minimizing the collision risk for the orientation modules.

Applicability

Medical robotics, robotic-assisted single incision laparoscopic surgery

Images



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IGFPP

**Institut of Genetics, Physiology and Plant Protection,
Republic of Moldova**

Early Clary sage (*Salvia sclarea* L.) variety AMBRIELA

Patent no.: MD 392/2022.04.30

Authors: **Gonceariuc Maria, Balmus Zinaida, Cotelea Ludmila, Botnarenco Pantelimon, Butnaras Violeta**

F

Ambriela **variety are distinctive by:** ***Physiological properties*****: Very good resistance to wintering; high resistance to drought; resistant to foliar diseases and root system diseases.**

Quality properties: **Essential oil content: first year of vegetation: 0.353% (standard humidity, 70%); 1.175% (dry substance); second year of vegetation: 0.335% standard humidity; 1.185% dry substance. Major components in essential oil: linalyl acetate 61.06%, linalool- 8.59%; sclareol- 5.25%.**





REPUBLICA MOLDOVA

Agenția de Stat pentru Proprietatea Intelectuală

BREVET
PENTRU
SOI DE PLANTĂ

Nr. 392

Eliberat în temeiul Legii nr. 39/2008 privind protecția soiurilor de plante

Denumirea comună: SERLAI

Taxonul botanic: *Salvia sclarea L.*

Denumirea soiului: AMBRIELA

Titular: INSTITUTUL DE GENETICĂ, FIZIOLOGIE ȘI PROTECȚIE A PLANTELOR, MD

Data acordării: 2022.04.30

Descrierea soiului constituie parte integrantă a prezentului brevet pentru soi de plantă

Director General

CHIȘINĂU



Production capacity**: variety of 2-3 years of vegetation; flowering capacity in the first year of vegetation. Average harvest of raw material in 2 years of plantation operation – 16.1 t / ha, average production of essential oil - 55.6 kg/ha. Yield – 3.1-4.1 kg essential oil/ton of inflorescences.**

Applications: Agriculture, perfumery, cosmetics, medicine.

Advantages: Resistance to biotic and abiotic factors, high productivity, high quality.

Research was carried out within the project of the State Program 20.80009.5107.07

Contact: IGFPP, Padurii Str. 20, MD 2002, Chisinau, Republic of Moldova
Tel.: (+373 22) 77 04 47; Fax: (+373 22) 55 61 80;
E-mail: institut.gfpp@gmail.com; zinaidabalmus@yahoo.com Web: www.igfpp.md

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E-LITE NUTRITIA

Apinatur - Regina Stupului Românesc

Superforte Ovulin E-lite Apicoplant Nutriforte Ovulin

Products

Author/s: Adriana Vlad & E-LITE Team

F

E-lite Nutrition came into existence after Adriana Vlad laid the scientific foundations of natural preparations tested and experienced by her, as a result of serious health conditions, such as sterility.

It started from the principle that "any therapeutically active substance is much stronger and more valuable if it is combined with honey". Thus, he demonstrated that "therapeutically active substances from plants, if they are well dosed and if they are combined in bee honey, are assimilated much more easily by the body, because they enter the blood more quickly".



Gama de E-LITE ovule sunt produse 100% naturale care ajută la atenuarea manifestărilor în dereglările aparatului genital feminin. Cu o puternică acțiune antiinflamatorie, antitumorală, antiinfecțioasă, decongestivă, calmantă, cicatrizantă, trofică, antimicotică, de reglare hormonală și a PH-ului vaginal.

Prin compoziția lor unică și deosebit de complexă contribuie semnificativ la reglarea nivelului hormonal și a PH-ului vaginal, previn și acționează benefic asupra simptomelor aparatului genital feminin, au efecte pozitive în cazurile de infecții, inflamații, chisturi și fibroame la nivelul aparatului genital feminin.



Sunt benefice în afecțiuni precum Candida, Tricomonas, E-coli, cistită, rană de col uterin, polip vaginal și uterin, tumoră în zona genitală, vaginită, infecție cu Papiloma virus, dereglări menstruale, sterilitate, micoză, fibromastoză.

The range of E-LITE solid creams (ovules) are 100% natural products that help alleviate the manifestations of disorders of the female genital system. With a strong anti-inflammatory, anti-tumor, anti-infective, decongestive, soothing, cicatrizing, trophic, antimycotic, hormonal and vaginal PH regulating action.



Through their unique and particularly complex composition, they contribute significantly to the regulation of hormonal levels and vaginal PH, they prevent and have a beneficial effect on the symptoms of the female genital system, they have positive effects in cases of infections, inflammations, cysts and fibroids in the female genital system.

They are beneficial in conditions such as Candida, Trichomonas, E-coli, cystitis, cervical wound, vaginal and uterine polyp, tumor in the genital area, vaginitis, Papilloma virus infection, menstrual irregularities, sterility, mycosis, fibromastosis.

Contact: elite.nutritia@yahoo.com +40726 761 557 https://elitenutritia.ro/

Management algorithm for pregnant women with hepatic impairment

Authors: Cristina-Daciana Oana Teodorescu[a], Gabriel Petre Gorecki[b], Andrei George Teodorescu[c]

a "Saint John" Emergency Clinical Hospital - Bucur Maternity, Department of Anaesthesia and Intensive Care, Bucharest Romania
b "Titu Maiorescu" University, Faculty of Medicine and Pharmacy, Bucharest, Romania
c University of Oradea, Faculty of Medicine and Pharmacy, Department of Morphological Sciences, Oradea, Romania

This invention consist in the development of a management algorithm for pregnant women with hepatic impairment, having the main goal to evaluate (from an epidemiologic point of view) obesity in pregnancy and the impact of this condition on all the connected issues that will be seen in the newborn during peri and postpartum period.

This project wishes to create a management algorithm for obese parturient with hepatic impairment for an easy and rapid monitoring of the pregnant woman. It will be used as a mobile app especially by the specialists, but it can be used by the patients as well.

Novelties:

1. The development of an early diagnosis protocole for hepatic impairment for the obese pregnant women.
2. Mobile app with an easy interface, with comprehensive informations.
3. Promotion of a tracking system for newborn complications due to hepatic impairment of the mother.
4. First epidemiologic system for tracking and evaluating obesity for pregnant women.





This management algorithm for tracking the hepatic impairment in pregnant obese population will be used by gynecologists, but it will be a mobile app so that this patient monitoring will be set in real time for both the pregnant women and newborn wellbeing.



Contact: cristina.teodorescu2001@gmail.com

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S M U I S
„Dr. Iacob Czihac”
Military Emergency Clinical Hospital
Iasi, Romania

T U I A S I
“Gheorghe Asachi”
Technical University of Iași
Iasi, Romania

F

Biomechanical analysis application useful in the development of customized prostheses

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“Gheorghe Asachi” Technical University of Iasi, 67 Professor Dimitrie Mangeron Boulevard, 700050, Iasi, Romania
„Dr. Iacob Czihac” Military Emergency Clinical Hospital of Iasi, 7-9 General Berthelot Henri Mathias Street, 700483, Iasi, Romania
dimitrie-cristian.fodor@student.tuiasi.ro

INTRODUCTION

In order to customize prostheses for amputees, it is necessary to determine the patient's biomechanical parameters. Currently, these parameters can be measured by clinical, direct, radiological, and experimental methods, but no application does this automatically.

MATERIAL AND METHODS

In this paper, a software application designed and tested in LabVIEW™ was developed.

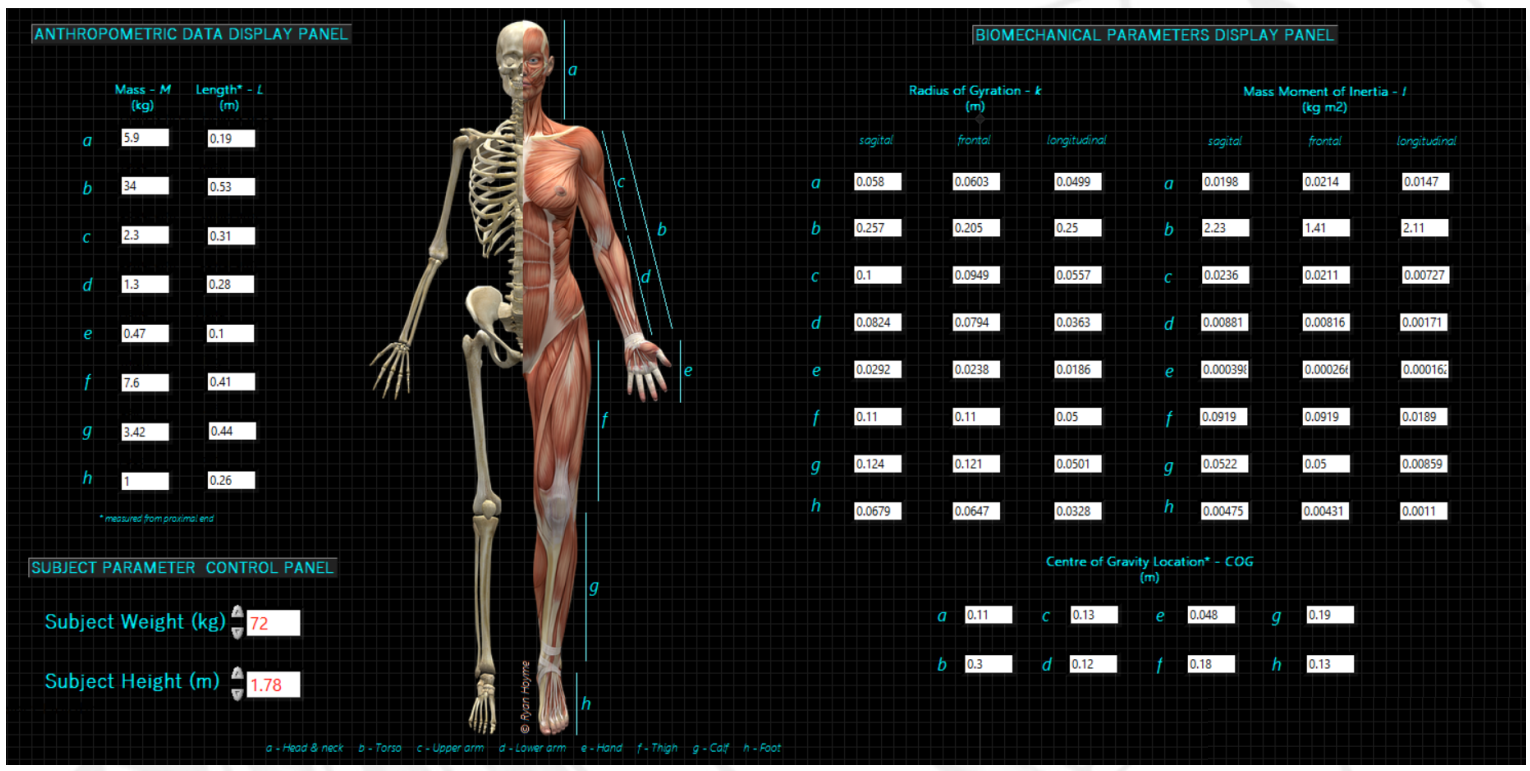

Fig. 1. Graphical user interface of the application

RESULTS

The application allows entering the anthropometric data of the patient (height and weight) and can provide a series of results in strict connection with the three result areas of the graphical interface of the application: *Subject parameter control panel* (input data is entered - the weight and height of the patient); *Anthropometric data display panel* (displays the weight and length of the following segments of the human body: head&neck, torso, upper arm, lower arm, hand, thight, calf, foot); *Biomechanical parameters display panel* (displays the values of the following parameters: radius of gyration – k (m), moment of inertia of the mass – I (kg·m^2), location of the center of gravity – COG (m)).

CONCLUSIONS

The digital system can come to the aid of specialists in the field of prosthetics in order to quickly estimate some biomechanical parameters, without resorting to expensive and time-consuming equipment.

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"Alexandru Ioan Cuza" University of Iași
Faculty of Biology

Blood group detection and prediction tool with applications in biology

F

Student Project

Stud. Elena-Iuliana FODOR
Faculty of Biology
"Alexandru Ioan Cuza" University of Iași
bch2124.fodor.elena.iuliana@biologieuaic.onmicrosoft.com

INTRODUCTION

For medical reasons, it is very important to know the blood group, especially in the case of transfusion when it is necessary that the recipient is compatible with the donor. The determination of this parameter is done by biomedical blood analysis, but digital blood group prediction applications are also useful.

MATERIAL AND METHODS

In this paper, an application was developed to find out the blood group and predict the blood groups of the children of parents with known A, B, O blood group. The application was implemented in Microsoft Office – Excel.

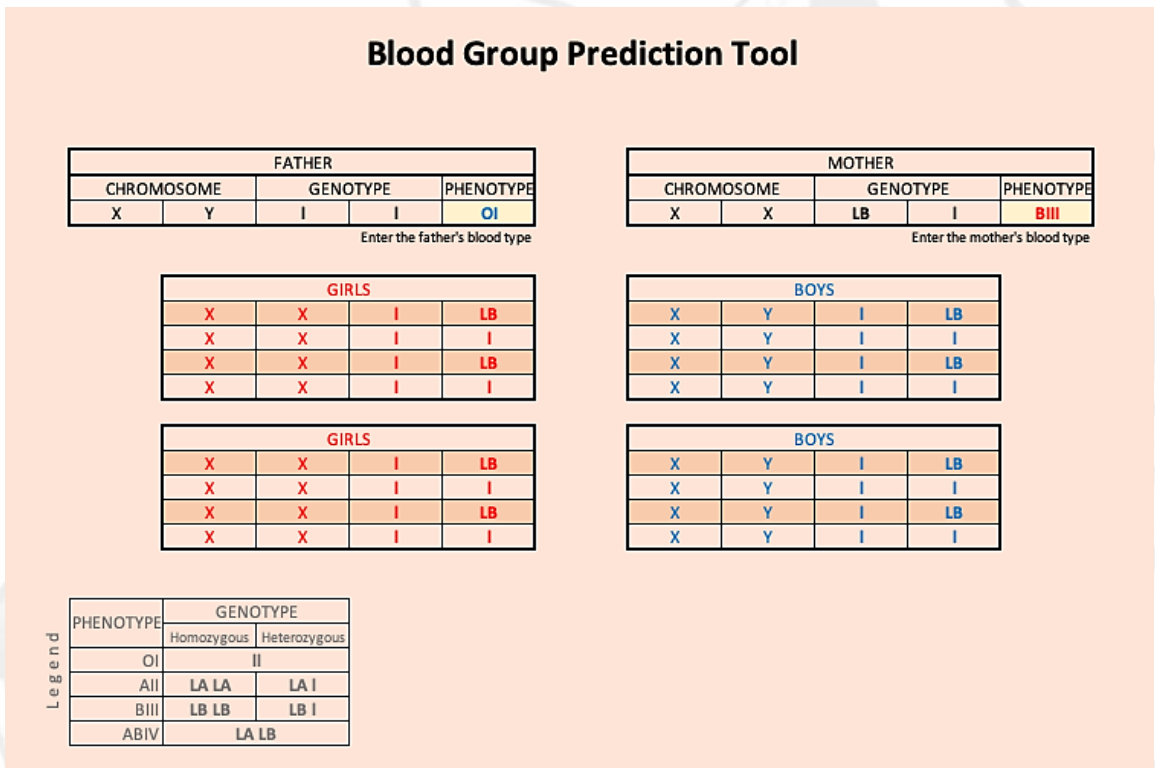

Fig. 1. Graphical user interface of the tool

RESULTS

The application presents a user-friendly graphical interface (Fig. 1) and comprises two important areas. The first is a panel for entering the known data of the parents (male and female): the blood group phenotype, the genotype which can be homozygous or heterozygous and the chromosomes specific to the individuals (XX – female; XY – male). The second area refers to the results obtained by combining the previously mentioned input data and these indicate the possible sex or blood type in the A, B, O system of the individual based on the known blood types of the parents.

CONCLUSIONS

The application can be useful in counseling individuals planning to start a family. Thus, possible fatal complications for the fetus or mother can be avoided by simply determining the compatibility of the individuals.

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4. *Blood Group Calculator*, 2021, https://www.medindia.net/, accessed at: 16.11.2022.

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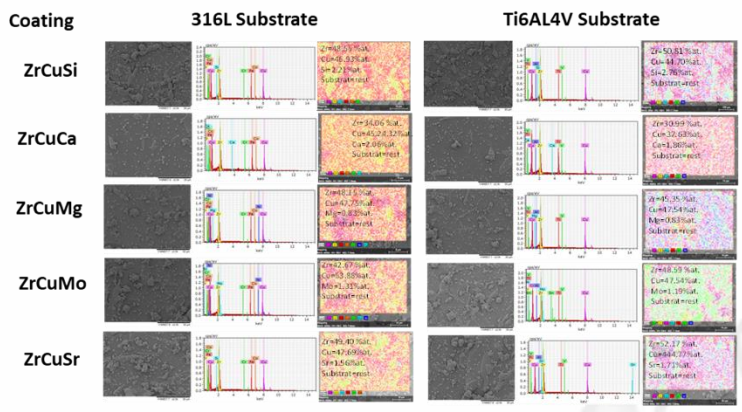
Biocompatible thin films based on thin metallic glasses used in orthopedy

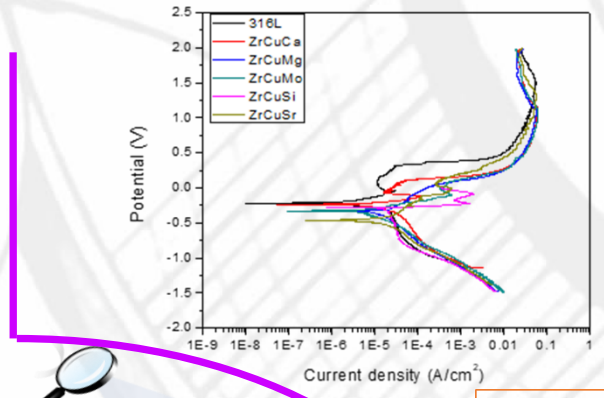
F

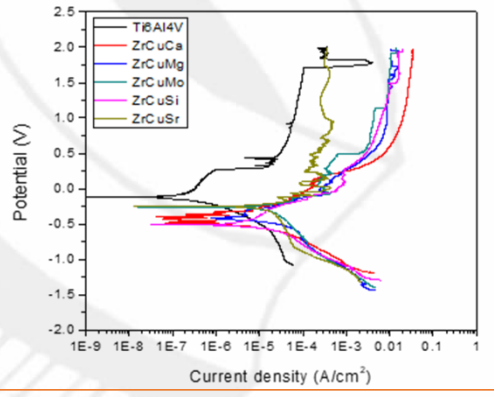
Patent: A100544/07.09.2022

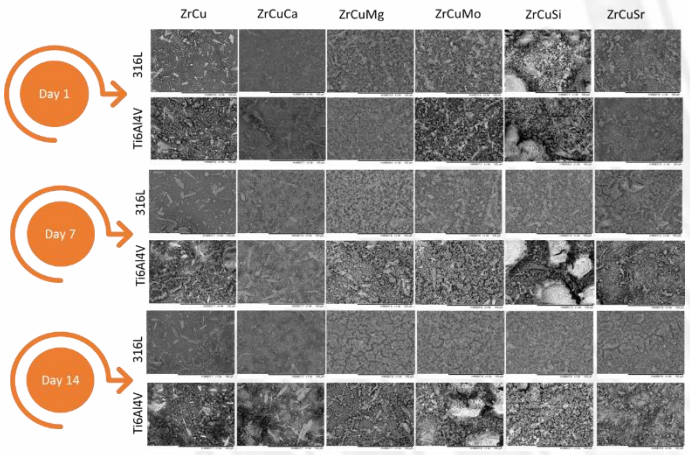
Alina Vladescu, Anca C. Parau, Catalin Vitelaru, Lidia R. Constantin, Iulian Pana, Mihaela Dinu

Investigating ZrCu-based thin film metallic glasses as biomaterials for covering metallic orthopaedic implants was the aim of this study. ZrCu coatings with minor additions of Si, Mg, Ca, Sr, and Mo are used.The films were deposited with a high deposition rate by cathodic arc method. The films were deposited on two distinct substates, including Ti6Al4V alloy and 316L stainless steel, both of which are frequently utilized for orthopaedic implants.





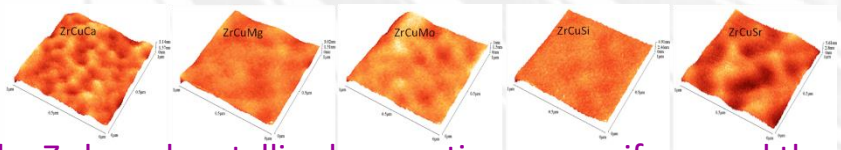




According to the SEM data, the cracks can be seen on the surface both coatin gs, being more evident in the case of those on 316L substrate. EDS mapping also showed that there is more amount of elements of coatings on the surface with Ti6Al4V.

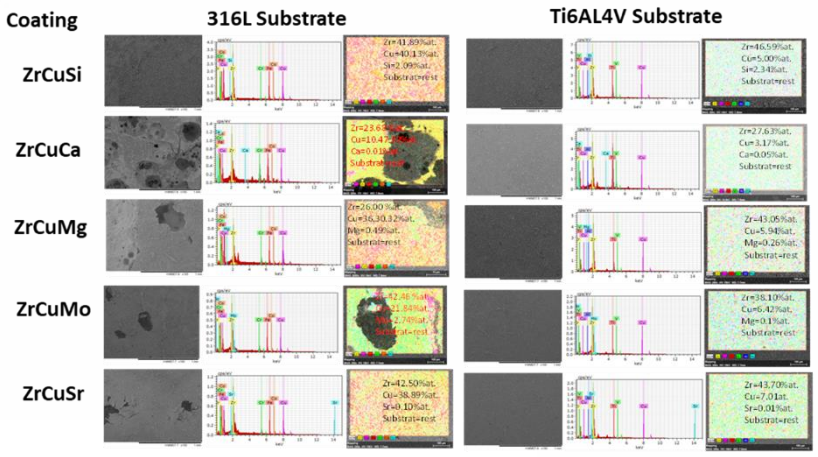
Coating	Substrate	E_{corr} (mV)	i_{corr} (nA/cm²)	R_p (Ωx cm²)
	316L	-216	242.1	122.008
	Ti6Al4V	-119	284.465	204.82
ZrCuCa	316L	-235	36.35	3690.82
	Ti6Al4V	-468	18.304	2425.75
ZrCuMg	316L	-286	74.34	94.197
	Ti6Al4V	-476	90.042	492.24
ZrCuMo	316L	-326	7.685	5234.34
	Ti6Al4V	-264	31.523	2057.92
ZrCuSi	316L	-357	3.184	30459.6
	Ti6Al4V	-510	7.051	8982.28
ZrCuSr	316L	-462	99.642	3550.22
	Ti6Al4V	-246	10.208	3175.88

In fact, the coatings appears to be smooth, formed by many and agglomerate sharp peaks, thus indicating an uniform growth. The presence of air-pockets on surface of ZrCuSr confirms the rougher surface.



The electrochemical behavior analysis of the coatings have indicated that the coatings deposited on Ti6Al4V substrate present lower values of the corrosion current density as well as a higher polarization resistance.

- The Zr-based metallic glass coatings are uniform and they are covering the entire surface, regardless of the substrate.
- The coatings deposited on Ti6Al4V substrate showed a better corrosion behaviour than those on 316L substrate
- The cracks can be seen on the surface both coatings, being more evident in the case of those on 316L substrate
- The presence of air-pockets on surface of ZrCuSr shows the rougher surface



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This work was supported by grants of the Romanian Ministry of Education and Research, CNCS - UEFISCDI, project PN-III-P4-ID-PCE-2020-1264 (PCE95/2021), within PNCDI III, and Romanian National Core Program no.PN18N-01-02/2019.

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• INTERNATIONAL STANDART SCHOOL AMANATULUMMAH

GREEN COCONUT (*cocos viridis*) SOAP

Author:Adelardo Tsabat
Project no:20-09-2022

F

Green coconut (Cocos viridis) is a tree that is versatile both from its fruit, its trees, roots and even its leaves can be used by humans in order to meet the needs of human life. In addition, the affordable price of green coconut (Cocos viridis) also does not make people think twice about buying it. In addition, the rise of the COVID-19 pandemic made people think twice about just buying household needs. As we know, one of the prevention of the spread of COVID-19 is to maintain the cleanliness of the entire body.



SOAP

Green coconut has an excellent content for the skin, especially in its water, both in caring for the skin and maintaining skin hygiene from bacteria and viruses The proximal composition is 92.70% and 8.01% water content, 0.39% and 27.95% fat, 0.97% and 19.9% protein, 0.75% and 10.72% ash and 5.19% and 33.42% carbohydrates. K and Cl are tall. Green coconut water contains about 95% water, 2.08% total sugar, 0.56% phosphoric acid, 6.60% potassium, and 0.62% minerals (Yong et al., 2009). In addition, green coconut water also contains sucrose, fructose, glucose 1.3 diphenylurea, seatin, zeatin glucoside, zeatin ribocide, high K and Cl levels, protein, carbohydrates, minerals, vitamins, little fat, Ca and P, potassium up to 17%, sugars ranging from 1.7-2.6%, protein 0.07-0.55%, sodium, calcium, magnesium, ferum, cuprun, phosphorus and sulfur (Sutarminingsih, 2004).



green coconut
(cocos viridis)

Contact:hadi12prasetyo@gmail.com

This study used the hot procces method, where the hot procces method. Before undergoing the process of making soap, use protective equipment, such as protective clothing, gloves, masks, and glasses. Use used paper or newspaper to be a table mat or surface where you will make liquid soap. Then, pour the coconut water into a stainless steel bowl. Then, add the alkali to the same bowl slowly. After a few moments, stir in the alkali and coconut water until smoky. And add a few drops of olive oil, coconut, and stearic acid using a pipette. After a while, put the solution into the oven with a temperature of 95-120 degrees Celsius. If the temperature in the solution has risen, add back a few drops of olive oil and coconut oil and stir for 5 minutes until it thickens. Wait a while to then pour a liquid soap solution into the container. Liquid soap is ready to use.

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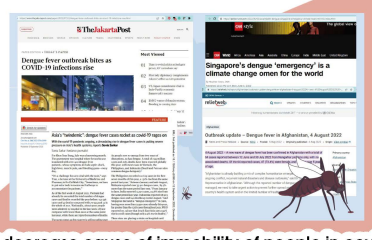
HERCIDE (Herbal Larvicide)

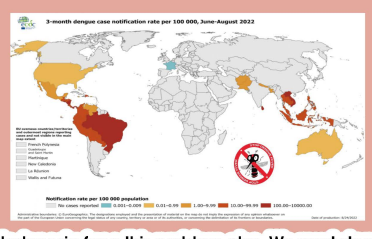
The potential of Herbal Medicine Leaves as Larvicide and The Morphology of Instar 3 Larvae Dengue Vector Aedes Aegypti

Kevan Vallerio Anwar, Brian Alvarico Anwar, Dilan Cyrillo Anwar

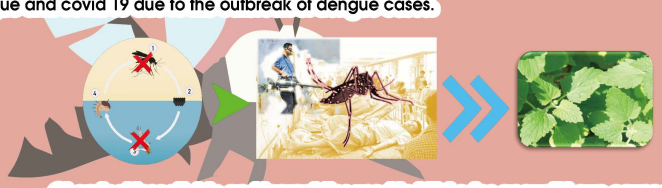
Background



After decrease cause of immobility of people in covid-19 pandemic quarantine in the last two years, dengue began to increased, become an outbreak in many country, from one of the journal in BMJ stated that Asia's face twindemic dengue and covid 19 due to the outbreak of dengue cases.



Indonesia face this problem also. We must stop the dengue fever.

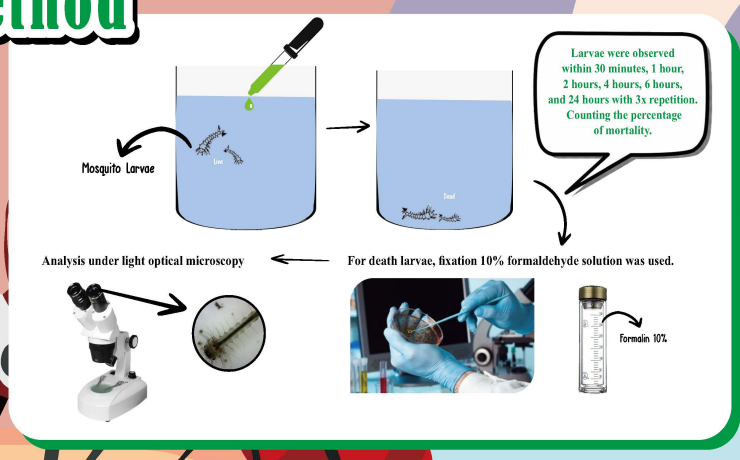


Chemical insecticide and larvacidies used to kill Aedes aegypti have caused a resistand population. Higherdoses are needed, which certainly have toxic impacts on animals, humans, and the environment. Naturallarvicides are used to obtain alternative larvicides.

Purpose

1.To Prove the Potential of Catnip Flowers (Nepeta cataria), Moringa Leaves (Moringa oleifera), and Purut Orange Leaves (Citrus hystrix) as mosquito larvicides (aedes aegypti).
2.To find the differences in morphology of instar 3 aedes aegypti mosquitoes given Catnip Leaf extract (Nepeta cataria), Moringa Leaf extract (Moringa oleifera), and Purut Orange Leaf extract (Citrus hystrix).
3.To Prove the comparison of metabolite compounds; flavonoids, alkaloids, and tannins in Catnip Flowers (Nepeta cataria), Moringa Leaves (Moringa oleifera), and Purut Orange Leaves (Citrus hystrix) as mosquito larvicides (aedes aegypti)

Method



Result

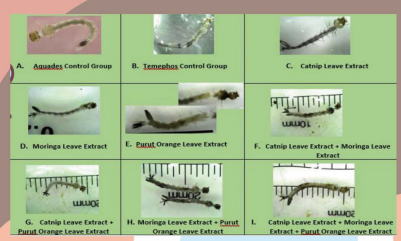
Extract	Time (percent mortality)					
	30 min	1 h	2 h	4 h	6 h	24h
Control Aquades	0	0	0	0	0	0
Control Temephos	6,67	70,67	100	100	100	100
Moringa 1%	0	0	0	1,33	4	62,67
Moringa 2%	0	0	0	6,67	20	77,33
Moringa 4%	0	0	5,33	13,33	14,67	93,33
Moringa 8%	10,67	29,33	49,33	69,33	78,67	94,67
Catnip 0,5%	1,33	2,67	2,67	4	6,67	37,33
Catnip 1%	1,33	1,33	1,33	1,33	1,33	66,67
Catnip 2%	1,33	1,33	1,33	8	16	100
Catnip 4%	8	18,67	33,33	77,33	94,67	100
Purut Orange 0,5%	2,67	8	32	40	69,33	69,33
Purut Orange 1%	9,33	54,67	92,0	86,67	93,33	98,67
Purut Orange 2%	24	82,67	92	100	100	100
Purut Orange 4%	17,33	100	100	100	100	100
Catnip-Moringa 2%	4	29,33	44	62,67	72	98,67
Catnip-Purut 2%	26,67	64	84	100	100	100
Moringa-Purut 2%	18,67	60	85,33	97,33	100	100
Moringa-Purut-Catnip 2%	22,67	84	100	100	100	100

Mortility of Larvae

- Repeated measure ANOVA was analysed using the concentration and mortality between experimental and control groups.
- Homogeneity of variance was tested using Shapiro- Wilk.
- Since the data is not normally distributed, the analysis continue with the parametric Friedman test.
- The resulting test was <0.05.
- There are significant differences in mortality between groups.

Extract	Flavonoids	Alkaloid	Tannin	pH
Moringa Leave Extract	4,13	6,37	55,12	5,9
Catnip Leave Extract	6,383	1,08	58,84	5,44
Purut Orange Leave Extract	2,566	4,68	53,52	6,03

- The pH of the extracts is acid, with a closed range.
- The highest secondary metabolite of the three extract is tannin compared to alkaloids and flavonoids.



This toxicity was concentration -dependent and showedvariations by extracts. From the morphology, the damage to the body includes the fragmented or fragile part, and the bodypart becomes transparent, smaller and skinner.

Discussion

- The ideal insecticide must be effective, efficient, environmentally friendly, and not have a high toxicity effect on non-target organisms.
- The effect of natural insecticides can be found in the active metabolite substances of alkaloids, saponins, flavonoids, and tannins.
- The larvae that contact with the extract showed a variation of death hours, the showing signs of death, i.e., the larva does not move when touched, the larva's body is a white or pale yellow, the body shape is elongated or smaller, and stiff.
- Tannins; make protein absorption in the digestive system disturbed. Alkaloid; cause nerve damage. Flavonoid; Respiratory inhibitors to inhibit the respiratory system of mosquitoes.

Conclusion

The results suggest that secondary metabolite: flavonoids, alkaloid and tannin of Catnip Leaves (Nepeta Cataria), Moringa Leaves (Moringa Oleifera), And Purut Orange Leaves (Citrus Hystrix) extract caused larvicidal activity via disrupting effects in larvae organ or organ system

Future Recomendation

For future research, we can test the extract to non-target organisms such as shrimp, snails, or fish and test the extract to larvicide resistance larvae

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E-LUINEENSIS: UTILIZATION OF PALM OIL UMBUT WASTE AS AN ALTERNATIVE TO BEANCURD AND AS A LOWERING CHOLESTEROL LEVEL IN THE BLOOD

EC00202271463, STUDENT PROJECT

Author/s: Jesalyn Grecya Rasnitara

Category F
Medicine, Paramedical, Pharmacy, Cosmetic, Higiene

Description

Beancurd is a product of the food industry that has a sales level that continues to increase every year in Indonesia. Along with the development of the times, food consumption in this day and age is more likely to consume beancurd food as a companion in food. This side dish has dominated the diet and lifestyle of modern humans. One alternative to this beancurd substitute is *Elaeis guineensis* Jacq. which has the potential to be developed as a functional food in order to reduce LDL cholesterol levels in the blood of hypercholesterolemic patients.

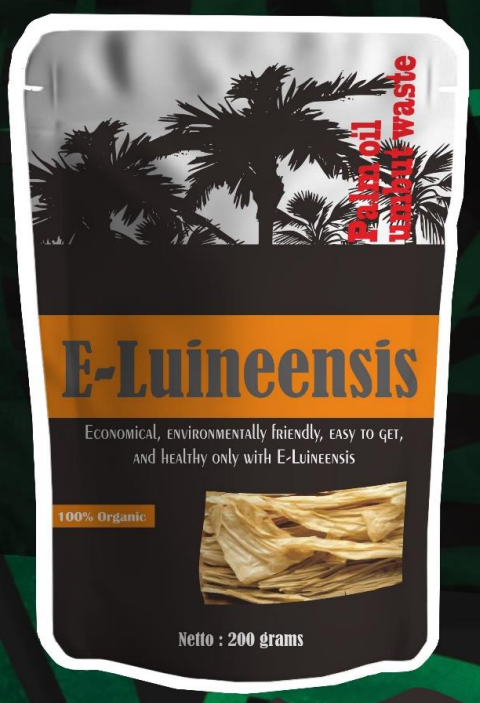
This type of research is experimental research, namely: Phase I by conducting organoleptic tests of semi-trained panelists of at least 80 people who were carried out on processed products of *Elaeis guineensis* Jacq. were hedonic quality tests and hedonic tests. Phase II uses the exploratory method and the maceration method. Furthermore, phytochemical tests were carried out. Phase III used the Completely Randomized Design (CRD) method. The object of this research is hypercholesterolemic male landrace pigs. Phase IV uses a quasi-experimental method.

The results of this study, namely: (1) The formulation of *Elaeis guineensis* Jacq umbut waste as an alternative to beancurd which is the best for consumption in terms of panelists' preferences is P2 treatment; (2) *Elaeis guineensis* Jacq umbut waste contains a secondary metabolite profile of alkaloids; (3) The results of statistical tests showed that treatment group 6 (K4) in reducing LDL cholesterol levels in male landrace pigs had a significant effect ($p < 0.05$) from the ANOVA statistical test and the results of the Multiple Comparison test; (4) The treatment of processed products of *Elaeis guineensis* Jacq. umbut waste products with variations in drying for 3 days gave a significant effect in reducing LDL cholesterol levels of subjects with an average of 76.96 mg/dl.

Keywords: Beancurd, Umbut, LDL Cholesterol



E-Luineensis
Wet product packaging



E-Luineensis
Dry product packaging

Description product

E-Luineensis is a product made from 100% palm oil umbut waste, without any mixture of other ingredients. This product is used as an alternative to beancurd and can reduce LDL cholesterol levels in the blood through the 3-hydroxy-3methylglutaryl-CoA (HMG-CoA) inhibitor process.

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HOLISTIC LOUNGE SRL

QVibe- frequency generating device

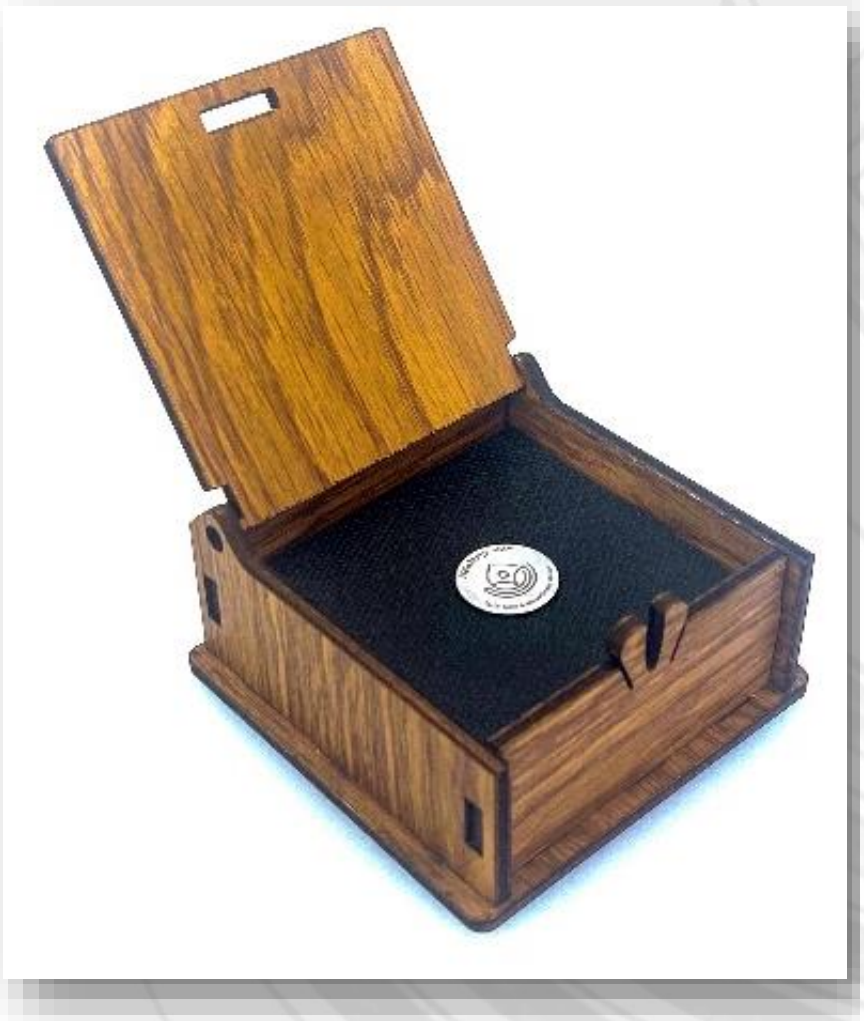
Patent No 009015340-0001, 06/05/2022

Author/s: **Senior Lecturer Dr. Miloicov Bacean Oana Codruta**

F

Q Vibe is a frequency generating device an inovative concept made out of vibrations/frequencies that are imprinted on it, the final result is a special, unique algorithm, modified according to the pathologies of the patients.

It is successfully used în balanceing certain pathologies, it contributes to the state of health' s optimization, according to the improvement of the clinical and paraclinical paramethers.





The algorithm is a unique concept, made out of special frequencies, imprinted in a special order, according to the patient’s pathologies; Q Vibe is a unique device, energetically imprinted, that will optimize the state of health.

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CLUJ-NAPOCA

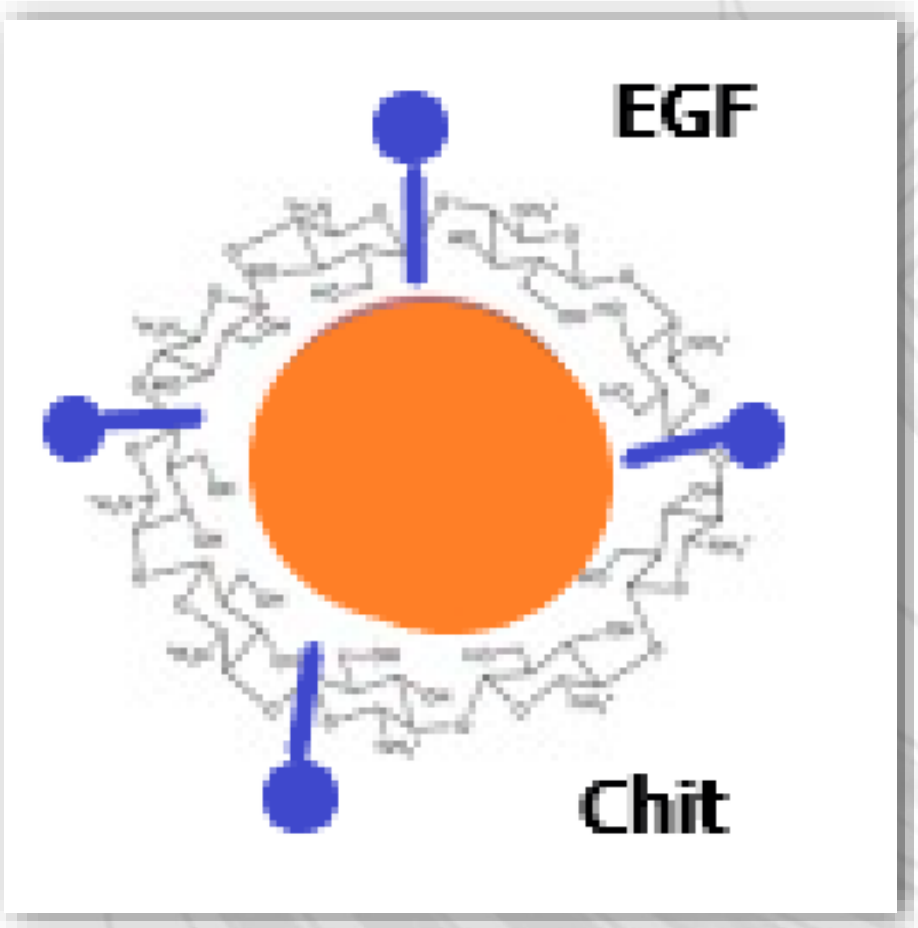
Nanomediated strategies for Treatment of Chimiotherapy-Induced Cardiac Remodelation in HER-2 Positive Breast Cancer Patients.

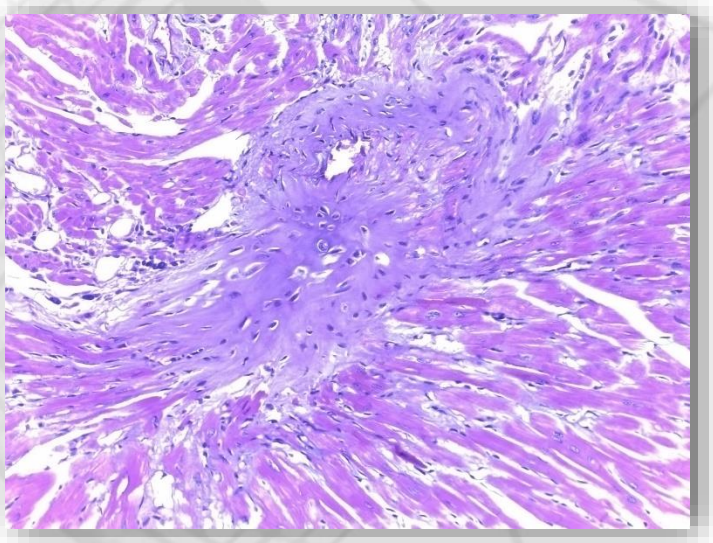
PhD Thesis

Authors: **Diana Rus- Gonciar, Teodora Mocan, Carmen Cionca, Lucia Agoston-Coldea**

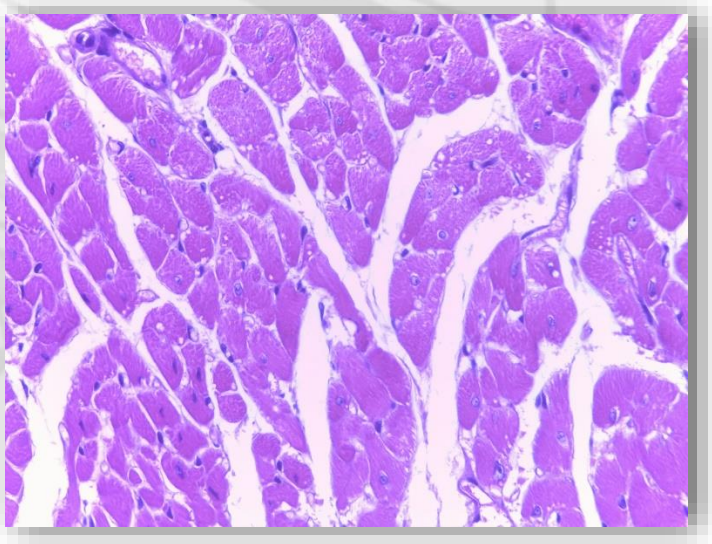
F

Chemo-therapy is known to induce cardiac remodelation , with various intensities of fibrosis development. We herely propose a nanostructured approach consisting in administration of gold nanoparticles functionalized with chitosan (Chit) and epidermal growth factor(EGF). The combination demonstated efficiency in reducing fibrosis formation in cardiac mucle during chemotherapy. The effects are targetted to intensely HER-2 positive cells, enabling EGF binding. Also, the therapeutic benefit is brought by chitosan.





Chemotherapy, no nanomediated treatment



Chemotherapy, nanomediated treatment

Figure 1.Effect of designed treatment in vivo (animal experiement)

Comparation of effects reveal intense fibrosis areas in the lack of designed treatment, and absence of fibrosis development, in control group.

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UMF UNIVERSITATEA DE MEDICINĂ ŞI FARMACIE IULIU HAŢIEGANU CLUJ-NAPOCA

Potential Uses of Nanoparticles in Inflammatory Anemia of Critical Illness

F

PhD Thesis

Robert Szabo[1,2], Teodora Mocan[1,3]

Physiology Department, "Iuliu Hatieganu" University of Medicine and Pharmacy, 400000 Cluj-Napoca, Romania.

Inflammation on Intensive Care Unit is initiated by an insult. The process relies on cellular response and is cytokine mediated.

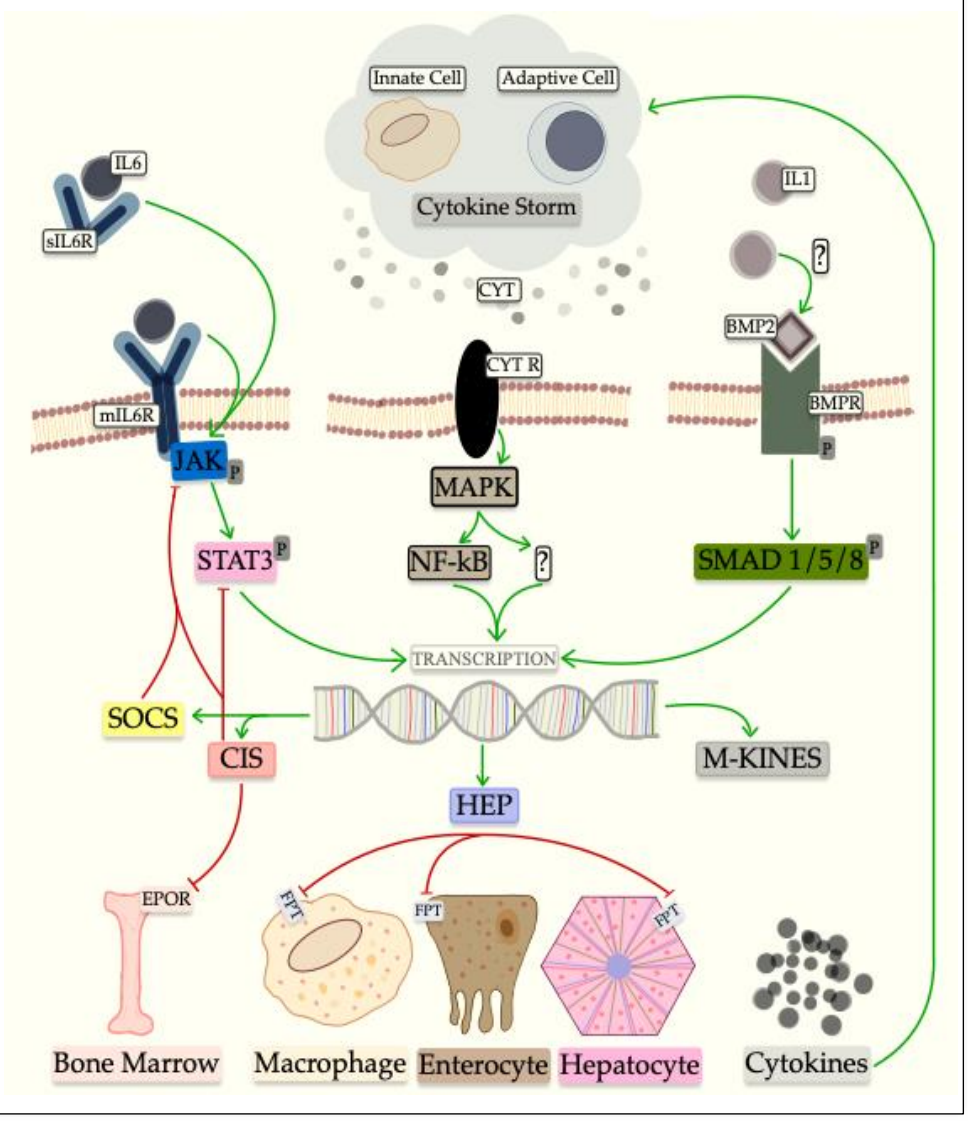
Cytokines exert an effect locally as well as at distance. In the liver for example, a protein called hepcidin is transcribed which blocks ferroportin, the sole cellular iron exporter and results in hyperferritinemia and ***inflammatory anemia*** (IA).

If not controlled, inflammation produces ***cytokine storm*** (CS) with devastating results. Although IL 6 is believed to be central, figure 1 shows other potential mechanisms for IA and CS, as well.

Figure 1 shows inflammation cascade initiated by innate and adaptive cells at the site of insult. Alternative pathways are MAPK mediated. However, the cytokines involved are less known.

Potential therapeutic targets are cytokines and their receptors, as well as the signaling mechanisms and their downstream products:

- IL 6 (interleukin 6), IL 1 (interleukin 1), BMP2 (bone morphogenic protein) and their receptors
- JAK (Janus kinase), STAT3 (signal transducer and activator of transcription 3)
- SOCS (suppressor of cytokine signaling proteins), CIS (cytokine inducible SH2)
- EPOR (erythropoietin receptor)
- CYT (cytokine) and CYT R (cytokine receptor)
- MAPK (mitogen activated protein kinase)
- NF-κB (nuclear factor kappa B)
- SMAD1/5/8
- HEP (hepcitin), FPT (ferroportin)



Nanoparticles (NPs) have targeting capabilities given by specific coating which make NPs versatile. The potential uses of NPs are:

- Visualization of cellular migration using imaging techniques such as magnetic resonance, fluorescence, and Raman spectroscopy
- Measurement of specific proteins in biological fluids
- Targeted drug delivery such as interference RNA, peptides, and nitric oxide

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Multiple Nanomediated Targetting approach for Colorectal Cancer

PhD Thesis

Author/s: Stefan Titu[1,2], Teodora Mocan[1,3], Alexandru Irimie[1,2]

[1]*"Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania.*

[2]. *"I.Chiricuta" Oncology Institute, Cluj-Napoca, Romania*

[3]. *"Prof.Dr.O.Fodor" Regional Institute of Gastroenterology and Hepatology, Cluj-Napoca, Romania.*

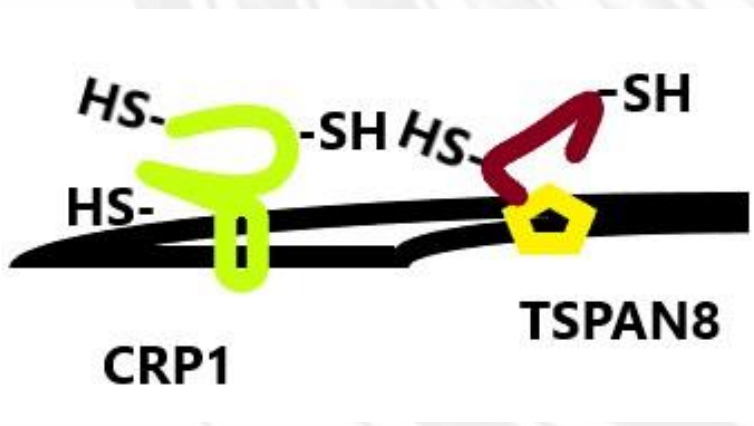
Recently discovered and characterised colorectal cancer-associated structures have demonstrated signifficant impact in disease evolution, progression and cancer-associated death. Higher metastatic behaviour, increased progression is assocated with several newly discovered membrane domains. Interestingly, many of them present a large cysteine-rich functional segment . Among them, we have identified membrane domains such as

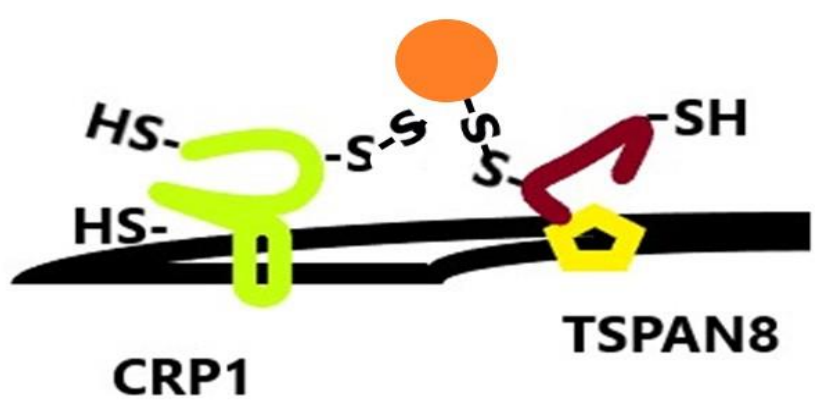
-Tetraspanin 8
- Cysteine-rich intestinal protein 1
- Cysteine-rich protein 3
- Cysteine-rich protein 61

We hereby propose a multiple-target strategy based on binding gold nanoparticles through –S-S-groups to the Cys moieties of signifficant membrane cassettes.



GNPs





After passing through reduction steps, dithiol-conjugated gold nanoparticles will be administred to stabilized intestinal cancer cel lines. Dual targeting, among the Cys-rich cassette tumorigenessis promoters, will be made possible due to –S-S- binding. By mised attachments to various Cys-rich cassettes, the systems enables multiple targeting, wiht increased tumor cell selectivity .

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Multi specialized mental health treatment techniques

Author: Țârlea Luiza Tudora

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Psychologist Țârlea Luiza Tudora is specialized in mental health treatment techniques, combining five psychology methods from various environments to improve the wellbeing of its clients.

Psychologist specialized in Defence and national security psychology, clinic psychology, work and organisational psychology, transport psychology, detection of simulated behavior by polygraph technique.





Mental health is at least as important as physical health. Digitalization has led humanity in a direction opposite to human nature, where there are no feelings, there is no affection, there are only codes, people's appreciations are numbers, and politeness or respect can be avoided by masking us in a profile that can allow us to discharge some pulsations, while being protected.

Latest studies show us that we live in a time of the pinnacle of evolution and yet we are sadder than ever. We find now information on all sites, these are declarative knowledge... but how many of us have that procedural knowledge (how to do what we have read)? Specifically how many of us know the theory, but can't put it into practice? That's what psychologists and therapists, are for.

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HR EXCELLENCE IN RESEARCH

NEW MOLECULAR INHIBITORS OF PROLIFERATION OF HUMAN RHABDOMYOSARCOMA RD CELLS

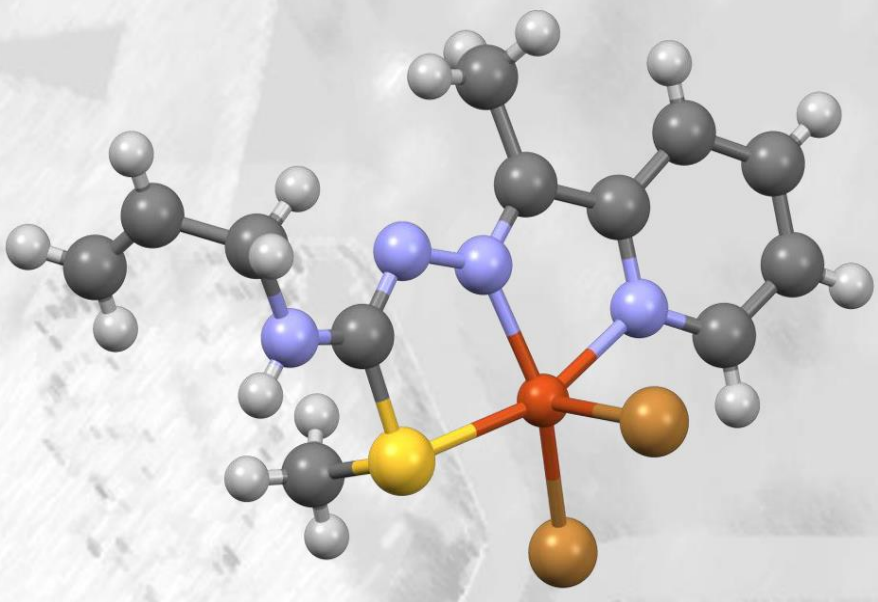
PATENT: MD 4764/2021.08.31; MD 4778/2022.07.31

AUTHORS: Aurelian GULEA, Vasilii GRAUR, Olga GARBUZ, Emil CEBAN, Irina USATAIA, Victor ŢAPCOV, Lilia ANDRONACHE, Valentin GUDUMAC

APPLICATION FIELDS: Medicine – Pharmacy – Cosmetics. **F**

AIM: Chemical synthesis, characterization of new synthetic inhibitors of human rhabdomyosarcoma RD cells that may find application in medicine.

SOLUTION: New copper coordination compounds with thiocarbamide ligands have been obtained using the directed synthesis method.



The IC_{50} values towards RD cells

Compound	IC_{50}, μmol/L
Prototype	1,4
Structural analog	0,68
Claimed substance 1	0,16
Claimed substance 2	0,05

ADVANTAGES: The described copper coordination compounds inhibit the growth and multiplication of human rhabdomyosarcoma RD cells. These agents exceed 8.75-28 times the analogous characteristics of the prototype that is used in medical practice, and 4.25-13.6 times analogous characteristics of the structural analog. The discovered properties of these substances are of interest for medical practice for enhancement of the arsenal of human rhabdomyosarcoma inhibitors.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project: #20.80009.5007.10*

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HR EXCELLENCE IN RESEARCH

NEW ANTIBACTERIAL AGENT AGAINST *Acinetobacter baumannii*

PATENT: MD 4810/2022.06.30

AUTHORS: Aurelian GULEA, Vasilii GRAUR, Victor ŢAPCOV, Greta BĂLAN, Vasile LOZAN

APPLICATION FIELDS: Medicine – Pharmacy – Cosmetics. | F

AIM: Chemical synthesis, characterization of copper coordination compound and its antibacterial evaluation against *Acinetobacter baumannii*.

SOLUTION: New copper coordination compound with thiocarbamide ligand has been obtained using the directed synthesis method.

Antibacterial acitivity of the claimed substance against *Acinetobacter baumannii* (µg/mL)

Compound	MIC, µg/mL	MBC, µg/mL
Gentamicin (Prototype)	16.0	32.0
Structural analog	40.0	-
Claimed substance	0.98	1.95

MIC - minimum inhibitory concentration; MBC - minimum bactericide concentration

ADVANTAGES: The activity of claimed compound against bacteria of the species *Acinetobacter baumannii* exceeds by 16 times analogous characteristics of the Gentamicin and 41 times the characteristics of the structural analog. The discovered properties of this substance are of interest for medical practice in terms of expanding the arsenal of antibacterial remedies.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project: #20.80009.5007.10*

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HR EXCELLENCE IN RESEARCH

METHOD FOR PRODUCING ANTIBACTERIAL POLYMERIC MATERIAL

PATENT: MD 4799/2022.10.31

AUTHORS: Stefan ROBU, Paul GHIOCA, Lorena IANCU, Viorel PRISACARI, Veronica SAVA, Petru SPATARU, Pavel TIULEANU

APPLICATION FIELDS: Medicine – Pharmacy – Cosmetics. **F**

AIM: Obtain a polymeric material with antibacterial properties through direct interaction of chlorhexidine solutions with block-polymers styrene-butadiene grafted with 3% maleic anhydride, in a quantitative ratio of copolymer and chlorohexidine of 1:(0.3-0.6).

SOLUTION: The development of a process for obtaining an antibacterial polymeric material which would exclude the toxic and tearful effects and would ensure the use of a shorter and efficient synthesis process that results in a lower cost price.

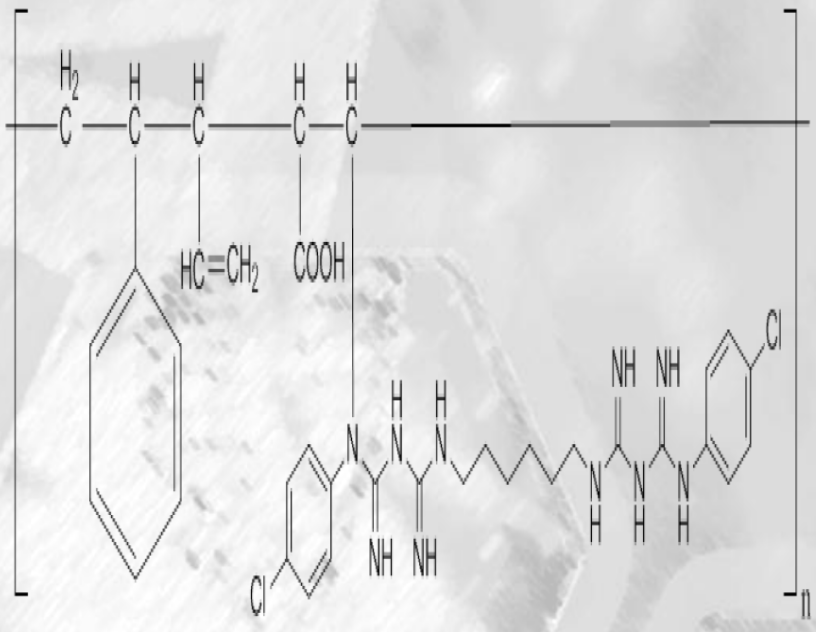

Fig.1. Molecular structure of bacterial polymer analog

Table 1. Antibacterial activity of polymeric materialStyrene: butadiene: maleic anhydride functionalized with CHLORHEXIDINE

Subtance	Bacterial culture test									
	S.aureus (t.209)		E. faecalis		E.coli (t.ATCC25922)		Ps.aeroginosa (t.ATCC 27853)		Pr. vulgaris (t.HX 19222)	
	*MIC	**MBC	MIC	MBC	MIC	MBC	MIC	MBC	MIC	MBC
3% chlorhexidine functionalized support polymer	150	160	150	300	235	300	> 300	> 300	150	300
6% chlorhexidine functionalized support polymer	95	135	105	145	190	300	300	> 300	140	275
Chlorhexidine	75	125	75	115	150	250	300	> 300	125	150

* MIC - minimum inhibition concentration ** MBC - minimum bactericidal concentration

ADVANTAGES: The result will be an antibacterial polymeric material synthesized at a 4-5 times lower cost than those known in the literature, by reducing the synthesis time of the final product. It has been demonstrated that the antibacterial polymeric material possesses antibacterial activity close to the activity of chlorohexidine with a 2-3 longer action time than that of chlorohexidine. The bactericidal activity time lasts for up to 3 days.

IMPLEMENTATION STAGE: In private business.

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HR EXCELLENCE IN RESEARCH

MODULATION OF THE IMMUNE STATUS USING NATURAL BIOACTIVE PRINCIPLES FOR THE PREVENTION AND PROPHYLAXIS OF ACUTE INFECTIONS IN THE CONTEXT OF THE COVID-19 PANDEMIC

PROJECT NUMBER: 20.70086.06/ COV(70105)

AUTHORS: Iurie BACALOV, Elena CHIRIŢA, Adriana DRUŢA, Ana BÎRSAN, Ana ILIEŞ, Victor CIOCÎRLAN, Aurelia CRIVOI

APPLICATION FIELDS: Medicine, Paramedical, Pharmacy, Cosmetics, Hygiene. **F**

AIM: Prophylaxis of acute infections in the context of the COVID-19 pandemic with the help of natural biopreparations against the background of carbohydrate metabolism disorders.

SOLUTION: The purpose of the investigations consisted in the valorification of biologically active substances with an immunomodulatory effect, the strengthening of the immune system by them, with the possibility of further use in medicine, for the prevention of diseases and the prophylaxis of acute infections, determined by COVID-19, on the background of carbohydrate metabolism disorders. The development of preparations based on biologically active compounds from plants and beekeeping products have allowed their use for medicinal and food purposes, a fact that argues the importance of scientific studies within the addressed problem. Thus, the natural solutions for maintaining the immune response represent, at present time, a special interest and have become the object of study of the present researches.



ADVANTAGES: As a result of the given study, we can conclude the following: One of the risk groups in the context of SARS COV-2 infection is diabetes mellitus, a pathology characterized by dysregulation of metabolism, as well as immunity. The administration of natural phyto- and apipreparations contributes to their normalization, which is expressed by the reduction, until the disappearance, of the primary symptoms and, respectively, reduces the risk of complications, caused by acute infections. The clinical-functional results highlighted the hypoglycemic and immunomodulatory effect of biopreparations, which are very important both in diabetes and in some viral infections.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: *This research project: 20.70086.06/ COV(70105).*

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UNIVERSITATEA DE MEDICINĂ, FARMACIE, ȘTIINȚE ȘI TEHNOLOGIE „GEORGE EMIL PALADE” DIN TÂRGU MUREȘ

The formation of the medical language

PhD Thesis

Author/s: Oana Găianu-Luca

F

„Medicina disciplina antiqua est”. Medical terminology includes in its system the following compartments: anatomical, histological, clinical and pharmaceutical. The word "clinical" comes from the Greek language, "kline" which translates to "bed", "inclination". According to Hippocrates' conception, the bed of the sick one had to be arranged, tilted so that the head was in a plane higher than the legs, in order to favor the functioning of the cardiovascular system (although this idea was later challenged by doctors). According to Greek tradition, the bedridden patient was put out on his way, so that he could talk to passers-by, explaining to them the states he has, asking if they had heard of people who were in his situation and how they were healed. The sufferer was encouraged by people, who also offered him advice, showing him how to treat himself. This leads to the appearance of the term "clinicus" which has several meanings, such as a person who comes to visit the sick person, suffering bedridden or even a person who prepares the grave of the sick person in bed.





The Romanian medical language was formed by virtue of The Romanian traditions under the influence of universal medicine. The first words in the Romanian medical language can be found in documents and chronicles. Here a great contribution was brought to the beginning by the three chroniclers, Grigore Ureche, Miron Costin, Ion Neculce. The one who is considered to have laid the foundations of romanian medical terminology is Dimitrie Cantemir. He makes an analysis of the human body from the point of view of life. Romanian medical terminology is based both on international terms, especially in English, but especially on words of Greek or Latin origin that have retained their form. Here are some examples: "carotica arteria" that comes from the Greek language, "karoun" and means to faint, to amaze. Dr. Galenus notes that a small pressure exerted on the arteries leads to a state of fainting, from which their name also comes from. Another example is the "aorta"; this term was first used by Hippocrates, having as its definition "a duct, whose lumen was filled with air and on which the lungs hung", in Aristotle's conception it meant an artery to which it is connected, "hangs" the heart, and for Galenus it is "the maximum arteria".

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F

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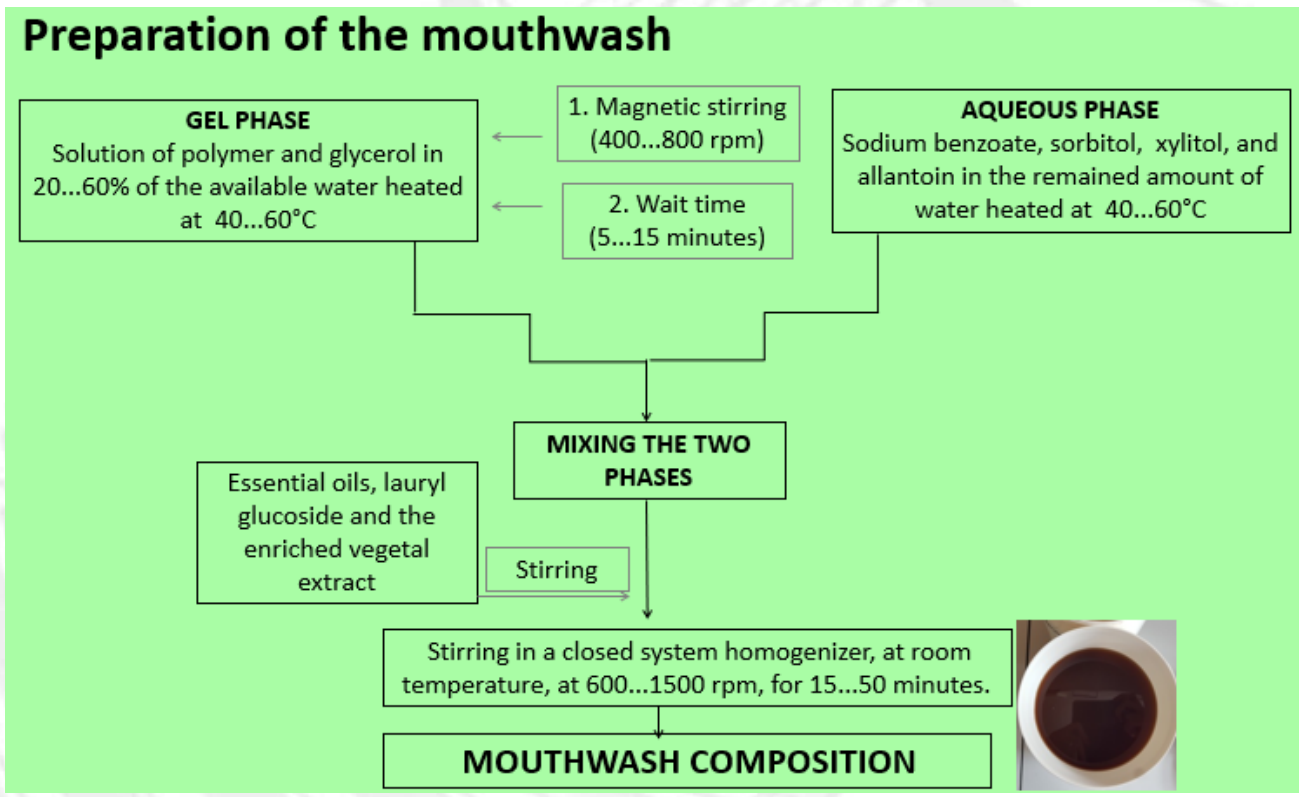
CONCENTRATED MOUTHWASH CONTAINING AN EXTRACT ENRICHED WITH ACTIVE INGREDIENTS OBTAINED FROM GRAPE POMACE, LEAVES, AND TENDRILS FROM *VITIS VINIFERA*

Patent application No. A/00730/16.11.2020

F

Authors: Mirela-Liliana Moldovan, Cătălina Bogdan,
Daniela Benedec, Sonia Meda Iurian
"Iuliu Haţieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania

- The invention represents a concentrated mouthwash containing a new combination of biocompatible and biodegradable ingredients with an extract enriched in antioxidant, antimicrobial, and anti-inflammatory phytocompounds obtained from white pomace, red pomace, tendrils, and leaves from *Vitis vinifera*. The concentrated mouthwash is intended to maintain the health of the oral cavity and improve early symptoms of periodontal disease.



The elements of novelty consist of the following:

- The extract enriched with active ingredients, obtained from white pomace, red pomace, leaves, and tendrils of *Vitis vinifera*;
- The combination of substances with a protective action on the oral cavity mucosa;
- The content of active ingredients with an anti-inflammatory, antioxidant, and antimicrobial activity which reduce the early symptoms of periodontal disease;
- The method developed to obtain the extract, from different by-products derived from the winery industry;
- The extract enriched with active ingredients obtained from grape pomace and *Vitis vinifera* leaves and tendrils has multi-target activity in the prevention and progression of several oral conditions by modulating the inflammatory response and the underlying oxidative stress imbalance induced by the pathogenic bacteria and inhibiting periodontal pathogens.

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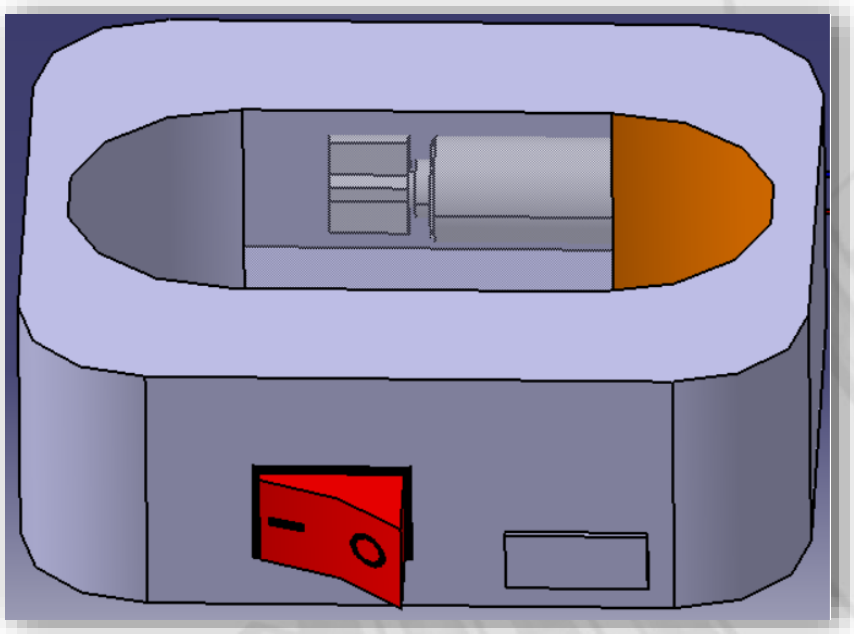
Ultrasonic Cleaner

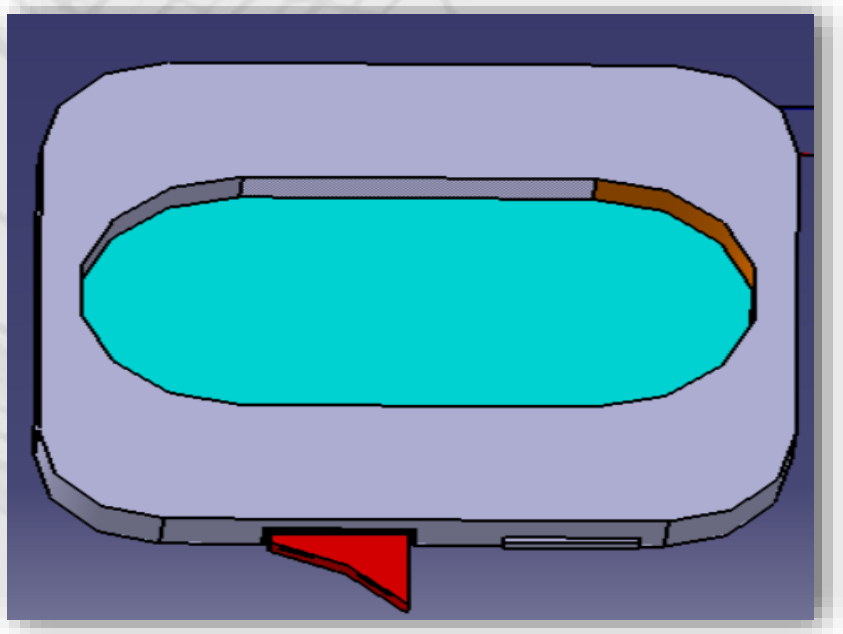
Student Project

Author/s: Babii Mihai, Dragomir Sebastian, Vira Andrei

F

The device is shaped like a parallelepiped with a pocket inside. A certain amount of water is introduced into this space. In the water, insert the object we want to clean. Using the same principle of creating vibrations as a mobile phone, we using a small electric motor with a shaft that is provided at the end with a device with an unevenly distributed weight (such as a cylinder cut in half). When the shaft rotates, vibrations (up to 35 thousand sound pulses per second) occur in one of the walls. This produces strong waves that move through the water and clean the deposits on the object.





An electronic timer will be displayed on an exterior wall of the cleaner for the duration of the process. After the cleaning process is completed, the water is removed from the cleaner. By pressing a button on the outside, a small fan installed inside a wall will blow air through two vents that open when the button is pressed to dry the object. The cleaner must be constantly connected to a power source

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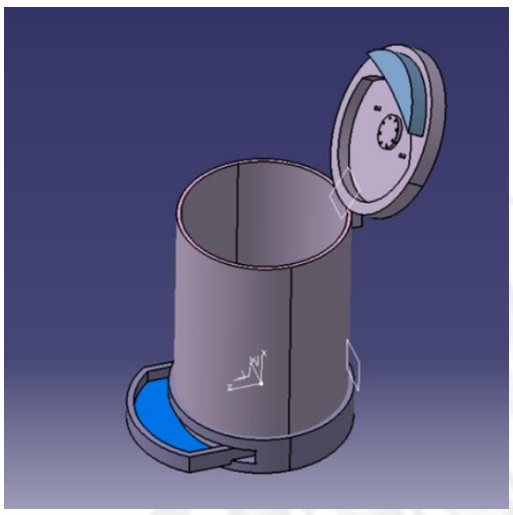
UNIVERSITATEA LUCIAN BLAGA DIN SIBIU

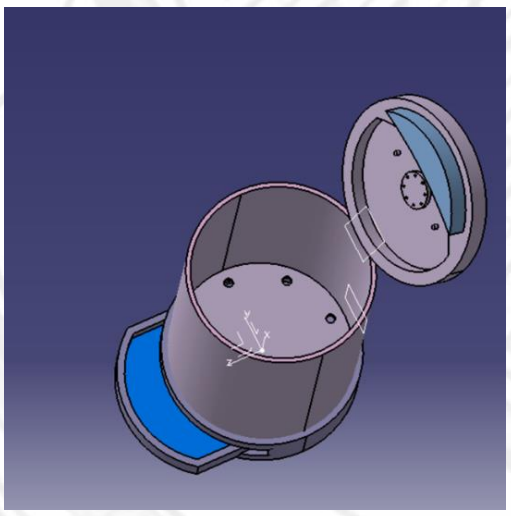
Auto-cleaning and sterilization garbage can

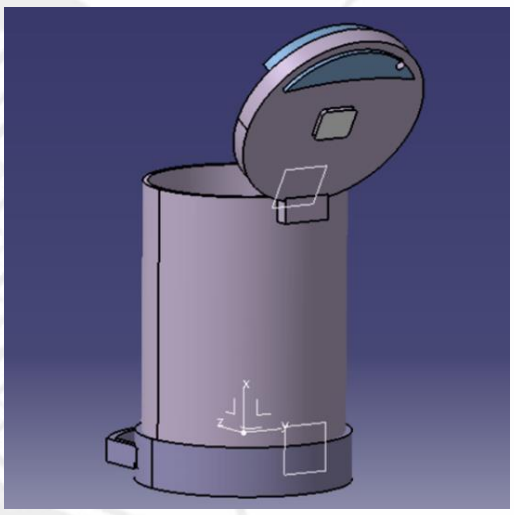
Student Project

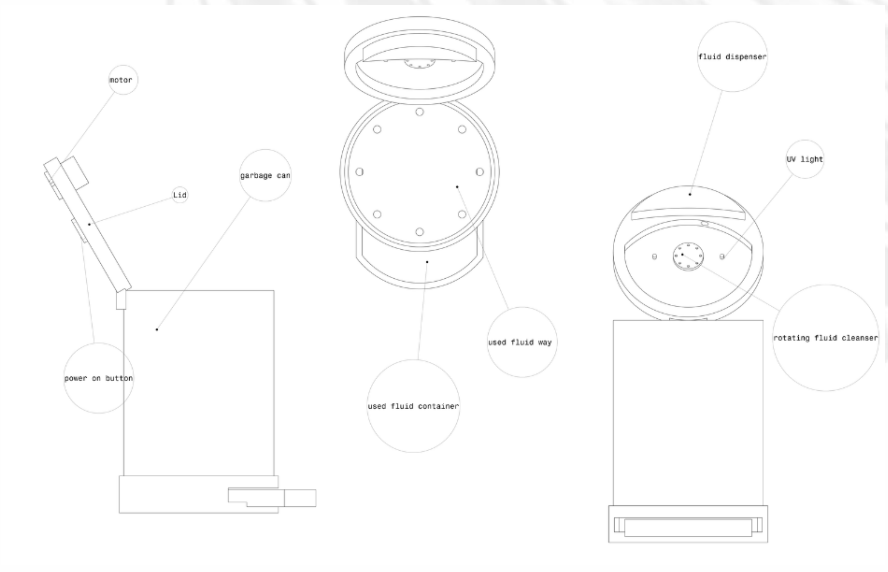
Author/s: **Gaston Maria- Cristina, Horga Bogdan- Dumitru, Hera Stefan- Danut**

This project aims to make the medical system cleaner by providing a self-cleaning and sterilizing garbage can, using UV lights and a special washing fluid to kill all bacteria and viruses. The garbage comes with 2 UV lights on the interior of the cover near the fluid dispenser, which will rotate to fully clean all surfaces. The fluid is to be introduced from outside of the cover in the dispenser.









After the washing stage, the fluid will be eliminated in the lower part from where it should be thrown out. The cleaning process ends within 5 minutes, 1.5 minutes for washing and 3.5 minutes for the UV lights to sterilize. The advantages of this project include a cleaner medical system, a lower chance of spreading diseases and also an easier way of washing garbage cans considering the fact that even with disposable garbage bags they can get contaminated.

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Skin care range-Neemioli

Student Project

Author: Panduru Simona-Luci

F

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   Acțiune:
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   -antifungic potent;
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   -regenerarator cutanat;
   -repulsiv pentru căpușe, muște, țânțari și purici.
2. Cremă nutritivă și cicatrizantă cu ulei de Neem și dafin.
   Recomandări:
   – adjuvant in tratamentul infectiilor cutanate bacteriene sau fungice;
   – ameliorarea problemelor de piele: acnee, eczeme, psoriazis, herpes;
   – vindecarea/cicatrizarea rănilor minore, erupții cutanate, micoze.
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   Action:
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   - skin regenerator;
   - repellent for ticks, flies, mosquitoes and fleas.
2. Nourishing and healing cream with Neem oil and laurel oil.
   Recommendations:
   - adjuvant in the treatment of bacterial or fungal skin infections;
   - improvement of skin problems: acne, eczema, psoriasis, herpes;
   – healing of minor wounds, rashes, mycoses.
3. Moisturizing cream with Neem oil
   Recommendations: hand and heel care.

Contact: simona.dumitru@student.upt.ro https://www.youtube.com/channel/UCeohOZajLuT44HrpToQF9hw;

https://www.facebook.com/profile.php?id=100057329783574

Meditation and Yoga for Concussion Recovery

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By Herdiana Dewi nurfika

Entrepreneur, Certified NLP Master Practitioner, Life Coach, Trainer Emotional Intelligence, Certified Soundwave Healing Therapy, Certified Energy & Boundaries Practitioner, Certified Meditation Teacher and Mental Health Advocate



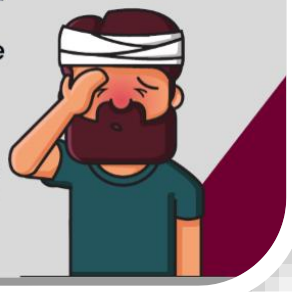
F

What is a Concussion?

A concussion is a form of traumatic brain injury, caused by a bump, blow or jolt to the head that causes the brain to move rapidly inside the skull. It can affect you physically, emotionally and mentally.



You might have heard the term before in connection with professional athletes, but the fact is that concussions are much more common than most people realize. In fact, according to the CDC, approximately 1.4 to 3.8 million sports and recreation-related concussions occur in the United States each year--that's about one every 10 seconds!



What Will Happen if I Don't Take Care of Myself After a Concussion?

After suffering a concussion, you may be worried about what will happen if you don't take care of yourself. The truth is, there are risks to not properly recovering from a concussion, including:

-Temporarily experiencing more sensitivity to light, sound, and feeling like your head is moving when it's not

-Increased risk of being injured again



Taking care of yourself after a concussion is much more than just resting. In fact, the rest required to recover from a concussion isn't really rest at all, because you'll actually have to be quite active in order to heal properly.





The brain is an organ, and like other organs it needs oxygen-rich blood to survive. Without it, cells start to die within minutes, and with severe enough hypoxia (a lack of oxygen), permanent damage can occur within minutes or hours. When you suffer a concussion, your brain suffers mild hypoxia because the neurons are no longer receiving as much blood as they need. If you don't give your body time to heal this damage, the hypoxia will turn into cerebral hypoxia (when blood flow is low enough that even neurons dependent on less oxygen begin to die) which can cause irreversible brain damage.

How to Recover from a Concussion with Meditation and Yoga

Research by Rebecca Acabchuk and colleagues at the University of Connecticut found that yoga, meditation or other mindfulness-based interventions resulted in significant improvement of symptoms compared with controls, as improvements seen in mental health, physical health, cognitive performance and quality of life.

physiologic pain after a brain injury may contribute to disordered sleep and anxiety, which can then exacerbate the physical symptoms in a continuous feedback cycle.

Yoga and mindfulness can interrupt those feedback loops by acting on both the emotional processes (stress, anxiety, depression) and physiological mechanisms. For example, yoga has been shown to increase brain-derived neurotrophic factor, a protein that helps heal neurons in the brain. It also activates the vagus nerve, which regulates internal organ functions and vasomotor activity, and affects immune, inflammatory and other pathways. Taken together, these actions can prime the body and brain for healing.



CONCLUSION

There is no evidence that yoga and meditation compete with physical therapy. As a matter of fact, there is research evidence that shows that patients who used mindfulness techniques had better outcomes than those who did not. It's imperative that patients suffering from MTBI should be mindful of their well-being. Yoga and meditation are powerful tools for achieving this balance. Patients are encouraged to find the form of yoga or meditation that best suits them, and to persevere in their daily practice. These momentary gleanings can have a positive lasting effect on the rest of our days if we do it consistently even in these moments when we fail and drop out completely.

In other words, yoga and meditation are not one day wonders but our everyday activities which can keep us healthy and prevent mental disorders from happening again in our lifetime.

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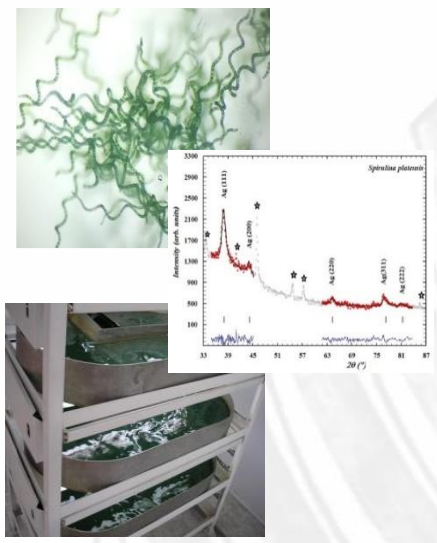
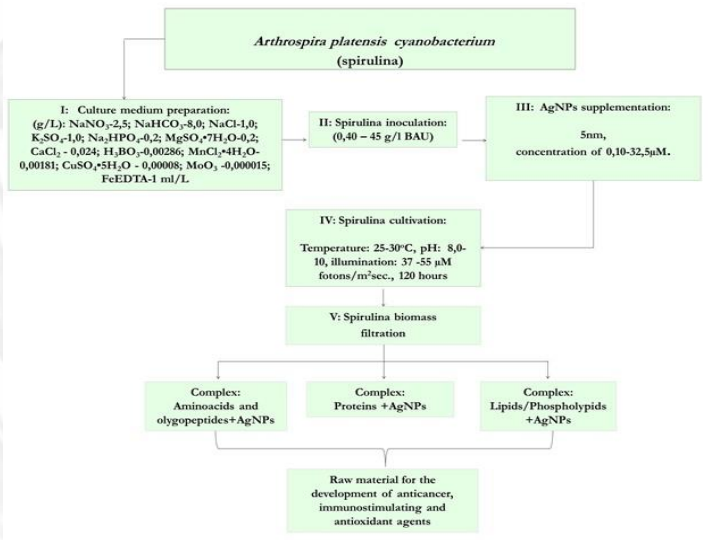
Processes for spirulina biomass production - raw material for the development of antioxidant, antibacterial and immunomodulating agents

Authors: **Rudi Ludmila, Chiriac Tatiana, Cepoi Liliana, Rudic Valeriu, Djur Svetlana, Zinicovscaia Inga, Valuța Ana, Miscu Vera, Rotari Ion, Cepoi Anastasia,Tașcă Ion, Iațco Iulia, Iushin Nichita**

Patents no.: **4796 MD/2022.02.28** and no. **4542 MD/2018.07.31**

The inventions refer to bionanotechnology, in particular to processes for biomass production of cyanobacterium *Spirulina platensis.* The proceedings provide the cultivation of *Spirulina platensis* using water soluble silver nanoparticles - AgNPs with a size of 5 nm in a concentration of 0,10-32,5μM. The result of the inventions consists in increasing the production of safety spirulina biomass and biologically active compounds content in biomass.







The result of the inventions consists in increasing the production of safety spirulina biomass and biologically active compounds content in biomass. In addition, the processes ensure the obtaining of biofunctionalized silver nanoparticles with properties that can be distinguished from the unmodified ones, and also to benefit to the maximum from the unique biological properties of the biomolecules in spirulina. This allows to obtain raw material for the development of antioxidant, antibacterial and immunomodulating agents.

Areas of application: Nanotechnology, Bionanotechnology, Medicine - Health Care-Cosmetics and Pharmaceutical Industry.

The research was carried out within the project 20.80009.5007.05 "Biofunctionalized metal nanoparticles - obtaining using cyanobacteria and microalgae", funded by NARD.

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Justin Capră

”Survival Therapy Kit” – Kit for the treatment of ailments, through therapies based on classical acupuncture (TCM – Traditional Chinese Therapy), applied with the help of passive resonant devices ”EMCOPAD Doctor Tech”

F

Authors: VELCEA Marian, MOLDOVAN Ion-Corneliu,
PLOTOG Ioan, MIHĂILESCU Bogdan, HIDEG Cătălin
E-mail: marian.nicolae.velcea@gmail.com

The "Survival Therapy Kit" contains a "Practical Guide" for recommending therapeutic procedures (organized alphabetically for more than 100 common conditions), a set of 200 pieces of EMCOPAD devices (Doctor Tech passive resonant electromagnetic patches) and adhesive rolls for attaching the devices to the body of the treated person.

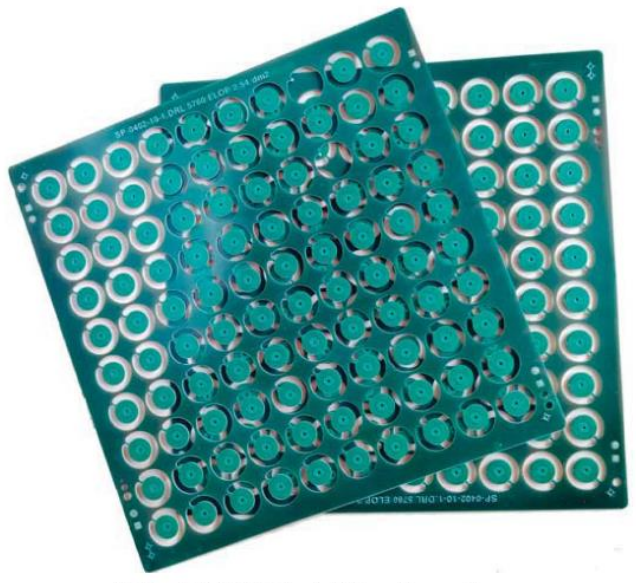
The devices are applied periodically on the acupuncture points recommended in the therapy of the diagnosed condition. The application period is 21 days and is followed by a 10-day break. The procedure is repeated, if necessary, twice more.

EMCOPAD Doctor Tech devices are used indefinitely. It is recommended to disinfect them with alcohol before each use.

The advice of a doctor or acupuncturist is recommended.

(TCM is officially approved by the WHO)





EMCOPAD devices
(Doctor Tech passive resonant electromagnetic patches)

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Justin Capră

Bioresonant kneepad for functional recovery

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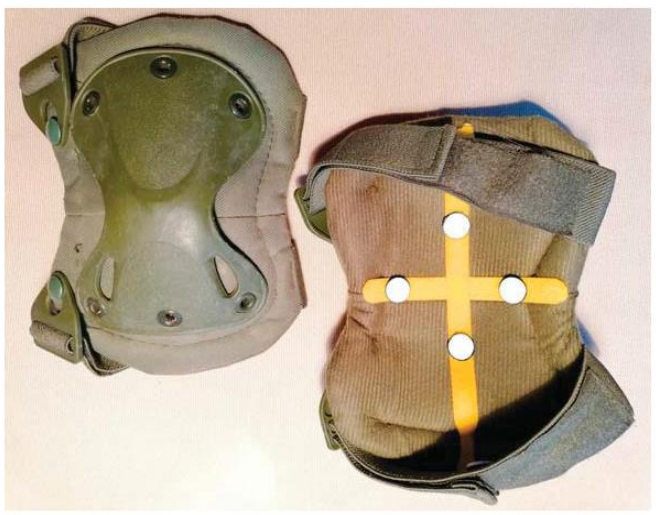
The bioresonant kneepad is a device designed for the functional recovery of the knee consisting of an elastic support that surrounds the knee, on which two groups of bioresonant devices EMCOPAD Doctor Tech are assembled.

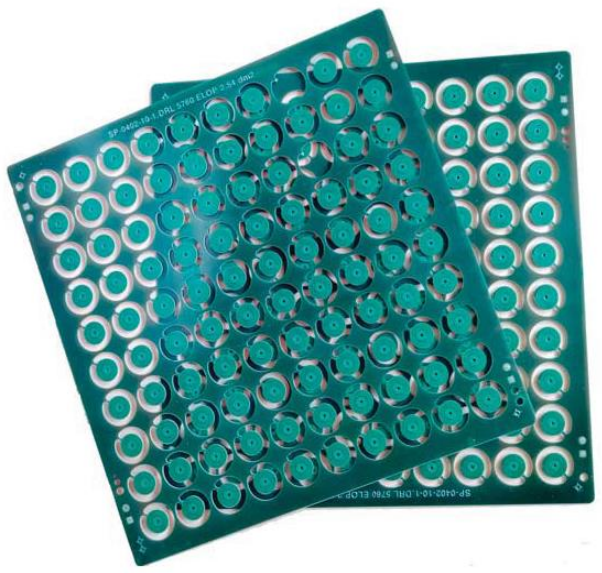
The first group of four devices is positioned on the inside of the elastic support for front contact with the ball joint - on its contour, both at the intersection with the axis of symmetry (vertical) up/down, and at the intersection with the horizontal drawn through the centre of the ball joint, outside/inside.

The second group of devices is located in the popliteal fossa, also on the axis of symmetry. Regular use of the device in a supervised recovery procedure ensures a faster return to previous performance.

Energy measurements performed with specialized equipment confirm the improvement of the state of the knee after the use of bioresonant knee.







EMCOPAD devices
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Gama de produse cosmetice "Col-Kefir-Milk Therapy"– A 00826/2019

F



Gama de cosmetice COL-KEFIR-Milk Therapy contine probiotice. Probioticele sunt microorganisme vii, care populează tenul și influențează sănătatea acestuia în mod benefic (Lactobacillus brevis- producator de acid succinic care are proprietati antibacteriene, antiinflamatorii, hidrateaza pielea, ofera protectie antioxidanta si totodata accelereaza reinnoirea celulara). Pielea noastră găzduiește milioane de bacterii, de virusuri și de drojdii, care ofera protectie fata de influențele nocive ale mediului (poluare, bacterii dăunătoare, radiații UV etc.). Dacă susținem funcția de protecție a pielii și menținem aceste culturi în echilibru, pielea va fi protejată împotriva radicalilor liberi și a substanțelor nocive iar calitatea, textura și capacitatea de hidratare a tenului se vor îmbunătăți. S-a demonstrat, de asemenea, că probioticele reduc sensibilitatea pielii la o diversitate de alergeni.

Colostrul bovin – este bogat in substante nutritive, fiind compus dintr-un amestec de factori antivirali, antibacterieni (lactoferina), imunitari (IG), factori de crestere, precum si alte substante nutritive importante. Factorii de crestere epiteliala, lactoferina, imunoglobulinele (EgF, TgF si IgF-1) care compun colostrul stimuleaza regenerarea pielii, cresterea celulara si repararea tesuturilor prin actiune directa la nivelul ADN-ului. De asemenea, colostrul actioneaza ca un factor anti-imbatranire, accelereaza vindecarea si are efecte antiinflamatorii asupra tesuturilor epiteliale. Ajuta la vindecarea ranilor si la reducerea cicatricilor asigurand regenerarea stratului germinal al epidermei. Kefirul traditional – contine vitamine (B, K), minerale (calciu si magneziu) si acizi alfa-hidroxilici (acid lactic) cu efecte remarcabile impotriva imbatranirii premature a pielii. Chefirul este un probiotic natural ce conţine simbioze din sute de bacterii si drojdii vii, dar si bacteriofagi benefici pentru sanatate. ColKefir® are o excepțională valoare nutritivă și manifestă un puternic efect de regenerare (este compus din proteine, biopeptide, vitamine, minerale, enzime, lactoferină, imunoglobuline, factori de transfer și antitumorali). Prin stimularea factorilor imunitari, pot fi recunoscuți și distruși agenții patogeni (bacterii, viruși, paraziți, ciuperci).

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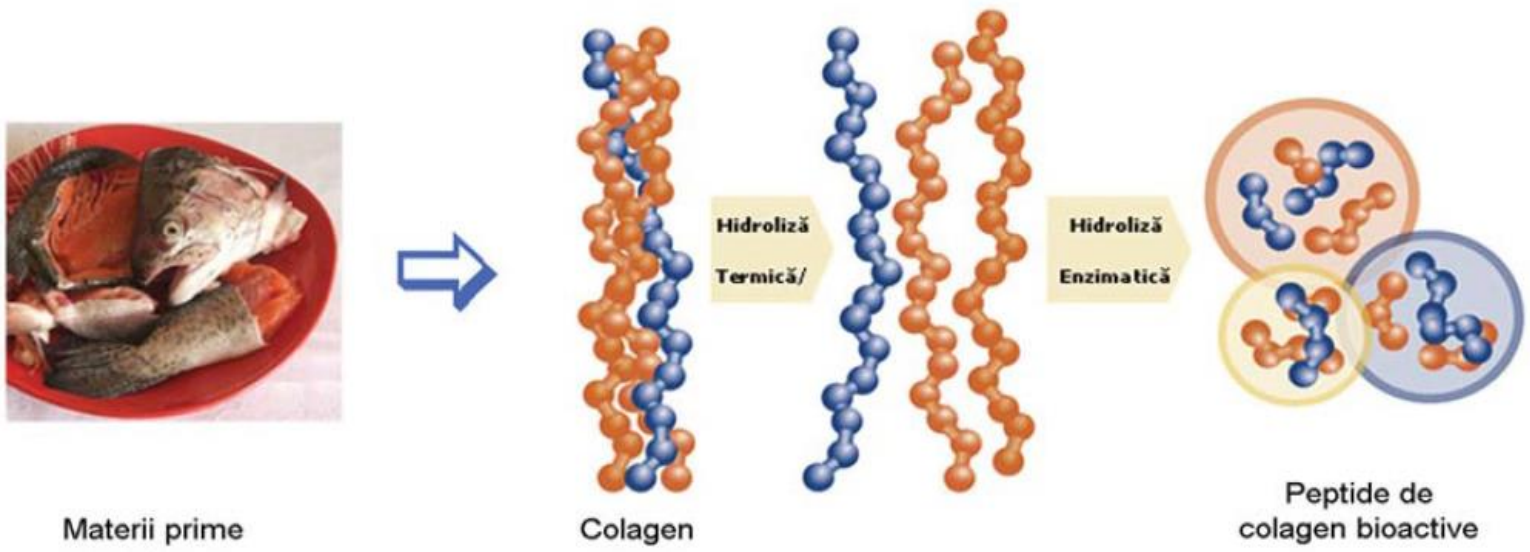
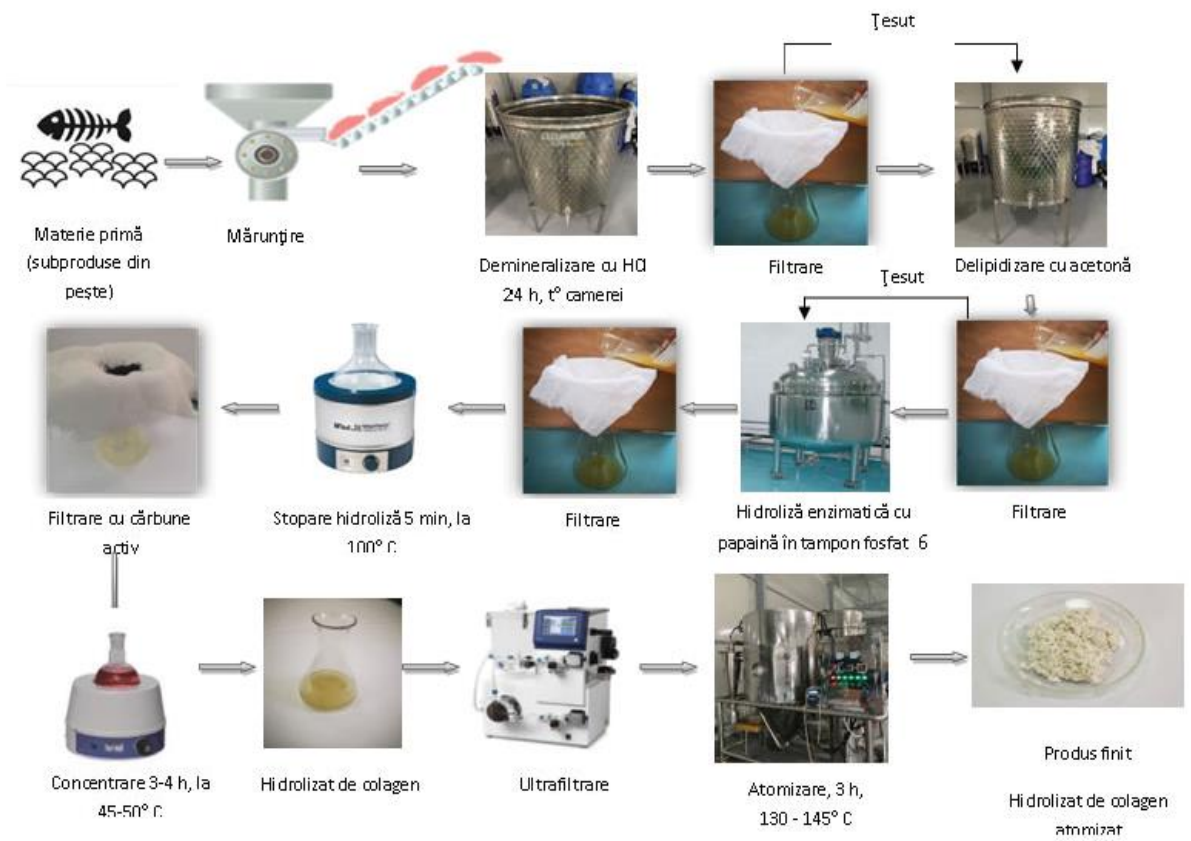
BioRafinarea fluxurilor laterale rezultate din comercializarea Ciprinidelor

F

Scopul proiectului. Proiectul propune o biotehnologie prin care se recuperează din fluxuri laterale ale procesarii industriale a pestilor de apa dulce: hidrolizat de colagen – peptide (nutraceutic de uz uman) și polipeptide de tip gelatină – biostimulanți pentru plante.



Fluxul tehnologic la nivel pilot, pentru obtinerea hidrolizatului de colagen sub forma de peptide colagenice cu diferite mase moleculare este prezentata in schema de mai jos:





Ecological extracts from burdock waste - obtaining process and potential therapeutic use

F

Patent application No. A00187/12.04.2022

Alina Ortan, Simona Spinu, Radu Claudiu Fierascu, Anda Baroi, Irina Fierascu, Toma Fistos

The present invention relates to a plant extract obtained from a species of the genus Arctium, with concomitant antioxidant and antimicrobial properties. The process according to the invention involves the use of the microwave-assisted extraction method, followed by concentration on a rotary evaporator and freeze-drying. The plant extracts are obtained through a process with good extraction efficiency of the active principles, the product obtained is ecological and natural, it presents simultaneously two types of therapeutic action: antioxidant and antimicrobial, it has potential applications in natural treatments for topical use.

BIO-ACTIVE COMPOUNDS

Volatile compounds
Tannin
β-eudesmol
Caffeic acid
Chlorogenic acid
Inulin
Tracheogenin
Sitosterol-β-d-glucopyranoside
Lappaol
Terpenes
Arctigenin
Diarctigenin, etc.

POTENTIAL THERAPEUTIC USE

anti-inflammatory effect
antitumor effect
antidiabetic effect
antimicrobial properties
antiviral properties
antihyperlipidemic properties
antioxidant properties



EXTRACTION METHOD

Microwave-assisted extraction method
↓
concentration - rotary evaporator
↓
freeze-drying

AIM

Evaluation of antioxidant and antimicrobial activity on the lines of *Staphylococcus aureus* (ATCC 25923) and *Escherichia coli* (ATCC 25922)

EXTRACTION CONDITIONS

- hydroalcoholic mixture ratio 30:70 - 70:30 (EtOH: H2O);
- ratio of plant material:solvent 1:5 - 1:11;
- extraction time 60 - 100 min;
- microwave power 700 - 1000W, without stirring.

RESULTS

- TPC: 8.5 - 10.5 mg GAE/g dry extract;
- Antioxidant activity determined by DPPH test: 85 - 95%;
- Antimicrobial activity determined by measuring the inhibition zone: 10 - 14 mm for *Staphylococcus aureus* and 11 - 15 mm for *Escherichia coli*.

NEW PLANT MATERIAL EXTRACT

- obtained by a process with good extraction of active ingredients,
- ecological and natural,
- two types of therapeutic action: antioxidant and antimicrobial,
- potential applications in natural treatments for topical use,
- does not involve the use of synthetic substances against which increased resistance has developed over time.

Acknowledgements: This work was supported by a grant of the Romanian Ministry of Education and Research, CCCDI-UEFISCDI, project number PN-III-P3-3.5-EUK-2019-0226, contract 220/2020 within PNCDI III. It is also acknowledged the support of Ministry of Research, Innovation and Digitization through Program 1 - Development of the national research-development system, Subprogram 1.2-Institutional performance- Projects to finance excellence in RDI, Contract no. 15PFE/2021.

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ROMANIAN INVENTORS FORUM
organizers of EUROINVENT - European Exhibition of Creativity and Innovation, Iaşi - Romania

PROCEDURE FOR OBTAINING OF MOUTH-WASH FOR PREGNANCY GINGIVITIS

Authors:
Stoleriu Gabriela,
Branisteanu Daciana Elena,
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Sandu Andrei Victor,
Balan Gheorghe, Sandu Ioan Gabriel,
Fratila Dragos Nicolae

RO135708 A2

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THE INVENTION RELATES TO A PROCESS FOR OBTAINING MOUTHWASH FOR PREGNANCY GINGIVITIS, WITH MULTIPLE IMPLICATIONS IN THE HYGIENE OF THE ORAL CAVITY AND FOR THE PREVENTION OF DENTAL CARIES AND THE TREATMENT OF DISEASES OF THE ORAL CAVITY, FOR USE IN THE PHARMACEUTICAL AND COSMETIC INDUSTRIES.






Advantages:

- *has no contraindications, allows use by pregnant women, especially those with symptoms of vomiting, being recommended for the entire period of breastfeeding;*
- *is indicated for pregnancy gingivitis;*
- *the association of compatible natural principles that have an immuno-modulatory effect through non-specific mechanisms;*
- *has a good topical tolerance and does not induce hypersensitivity reactions, being much safer and healthier for the oral cavity;*
- *has an antiseptic and calming effect on the gums;*
- *reduces inflammation of the gums and has an astringent and healing effect on them;*
- *allows the prevention of harmful activity of bacteria and yeasts;• allows the removal of tartar / dental plaque;*
- *stabilizes the pH values in the oral cavity;*
- *allows you to keep your breath fresh;*
- *after rinsing, mouthwash may be swallowed;*
- *maintains the local oral health, but also the whole body, through harmless and stable components;*
- *has a pleasant taste.*




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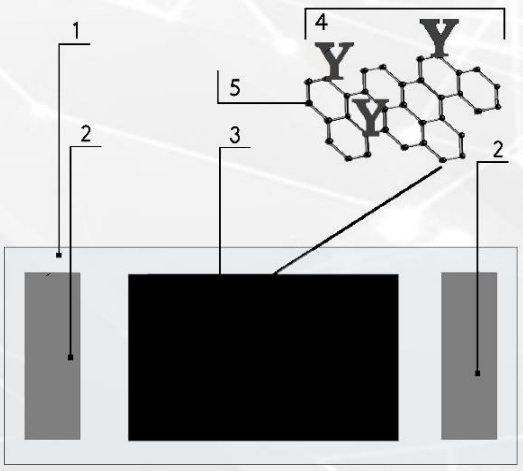
SURFACE ACOUSTIC WAVE BIOSENSOR BASED ON GRAPHENE FUNCTIONALIZED WITH ANTI-ALPHA-FETOPROTEIN MONOCLONAL ANTIBODY FOR THE DIAGNOSIS OF LIVER CANCER

F

I. S. VOICU, A. PALLA-PAPAVLU, V. I. ANTONIAC, F. MICULESCU, A. SEMENESCU, M. C. COSTOIU, I.-M. MATES, D.A. PRISECARU

The invention refers to a biosensor for the rapid and easy diagnosis of liver cancer by qualitatively and quantitatively determining the tumor marker – alpha-fetoprotein (AFP) directly from the blood (without the need for serum separation). The sensor-sensitive part is represented by the functionalized graphene with anti-alpha-fetoprotein monoclonal antibody that is deposited on the surface of the surface acoustic wave sensor (SAW) by direct laser-induced transfer (LIFT). The procedure for making the sensor for the detection of AFP, according to the invention, consists in the fact that the technique of direct transfer induced by the laser, in the air, is used for the transfer of a thin pixel of graphene functionalized with monoclonal anti-alpha-fetoprotein antibody to the golden electrodes following irradiation with the laser beam with KrF in the UV at the fluency of 100 mJ/cm2.



In the above figure the biosensors with surface acoustic waves covered with activated material graphene functionalized with anti-alpha-fetoprotein monoclonal antibody are made up of the following elements: (1) Quartz plate with a thickness of 500 µm on which au electrodes (2) with a thickness of 100 nm have previously been deposited. The quartz surface was treated with hexamethyldisylazane by retro-spreading at a rotational speed of 2000 rpm, and the electrodes were masked with a 20 nm layer of paraffin; By the laser-induced transfer technique, a functionalized graphene film with anti-alpha-fetoprotein monoclonal antibody (3) was deposited on the surface of the biosensor; Sensory coating (4), consisting of graphene (5) functionalized with monoclonal antibody for alpha-fetoprotein (6)

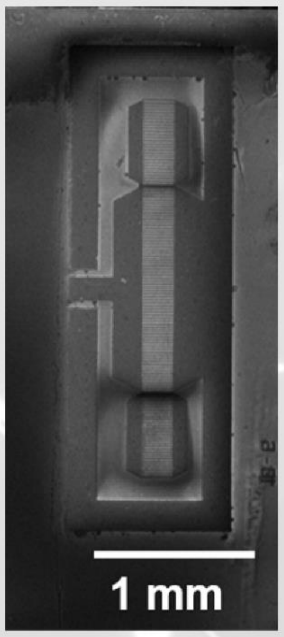
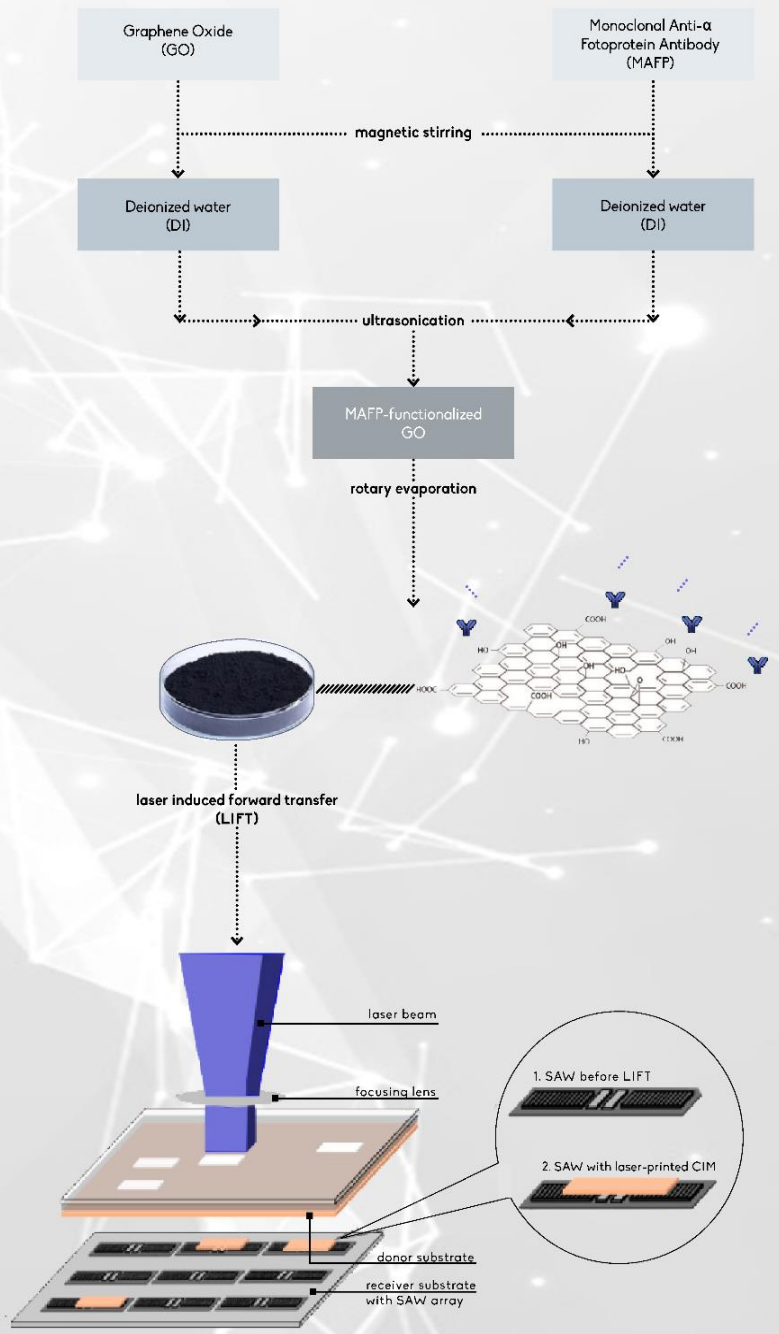


Image obtained with the scanning electron microscope of a acoustic wave biosensor of the surface covered with active material graphene functionalized with anti-alpha-fetoprotein monoclonal antibody that is deposited on the surface of the biosensor by direct transfer induced by the laser at the laser fluency of 100 mJ/cm2;

The problem that the invention solves is to obtain a biosensor for the detection of small amounts of AFP by an easy and inexpensive method compared to the methods currently used for the detection of this protein. Also, the invention will allow the monitoring of the concentration of this protein in other environments, than the hospital one, and may lead to continuous monitoring of the concentrations of this protein with major effects in the diagnosis of cancer.

The sensor's sensitive part is represented by the graphene functionalized with anti-alpha-fetoprotein monoclonal antibody that is deposited on the surface of the sensor with surface acoustic waves by the laser-induced direct transfer (LIFT) technique. The procedure for making the sensorfor the detection of AFP, according to the invention, consists

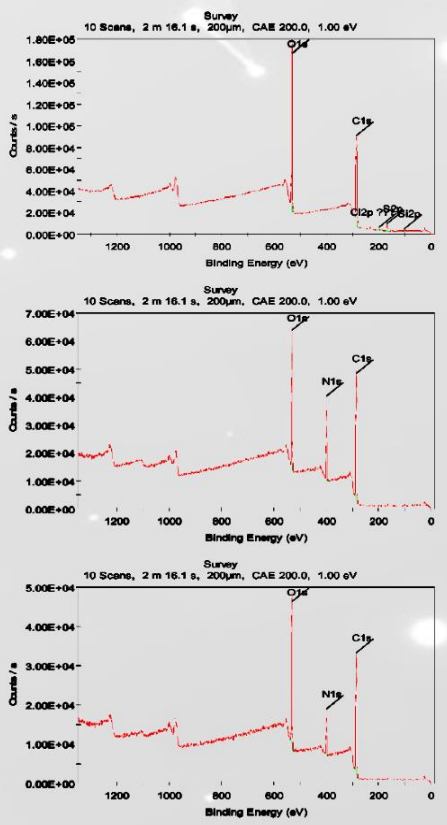
Working procedure for the functionalization of GO with MAFP and SAW sensors assembly α



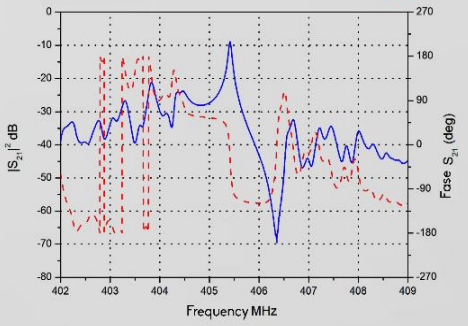
in using the technique of direct transfer induced by the laser, in air, for the transfer of a liquid pixel with graphene functionalized with monoclonal anti-alpha-fetoprotein antibody on the golden electrodes following irradiation with the laser beam with KrF in UV at the fluency of 100 mJ / cm2 .

The LIFT technique allows the deposition of small volumes (femtoliters) of material from a donor substrate (quartz plate covered with a 20 nm titanium film) on a receiving substrate (receiver). On the donor substrate is deposited a liquid film containing a mixture of solution with graphene (factionalized and / and non-functionalized) and glycerol (20% v / v). The thickness of the liquid film is about 10 µm, determined by measuring the dispersed volume. During the LIFT process, a laser beam is focused on the interface between the donor substrate and the liquid film containing the solution mixture with graphene and glycerol. Each laser pulse causes a rapid increase in pressure at the donor-liquid film substrate interface that causes the formation of a jet that reaches the receiving substrate. The donor and receiver are placed parallel at a distance of 100 µm.

To improve the efficiency of the process and protect the material to be transferred, an intermediate metal layer (titanium with a thickness of 20 nm) was added. The graphene solution was deposited in the form of liquid film by blade coating technique.



Above, is presented the 4 XPS survey spectra obtained for GO, MAFP and MAFP-functionalized GO



Graph that represents the frequency of response of a biosensor with surface acoustic waves covered with active material graphene functionalized with monoclonal anti-alpha-fetoprotein antibody that is deposited on the surface of the biosensor by direct transfer induced by the laser.

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SALONUL INTERNATIONAL DE INVENTII INOVATII „TRAIAN VUIA" TIMIȘOARA

SELF-INJECTION SYRINGE FOR THE ADMINISTRATION OF ANTIDOTES WITH AN INNOVATIVE ACTIVE SUBSTANCE RELEASE SYSTEM

Cristina Anca SECARĂ, Ionuț DUMITRACHE, Bogdan PĂTRINICHI, Adrian Claudiu POPA, Aurelian ZAPCIU, Cătălin Gheorghe AMZA, Diana Popescu, Augustin SEMENESCU

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OSIM A/00232 / 7.05.2021

NATIONAL INSTITUTE OF INVENTICS, IASI, ROMANIA

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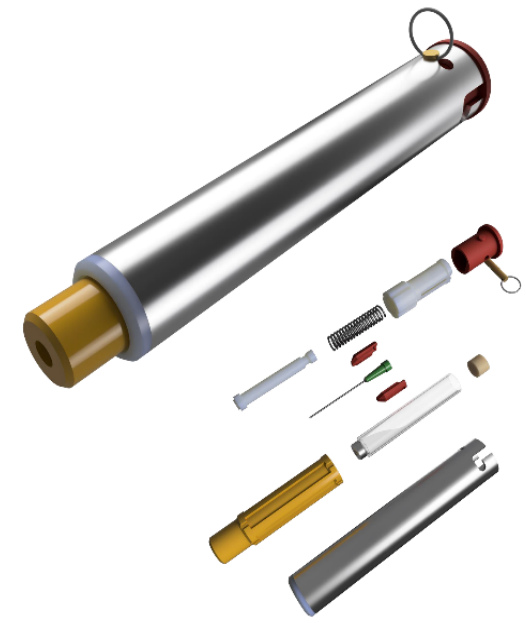
BACKGROUND



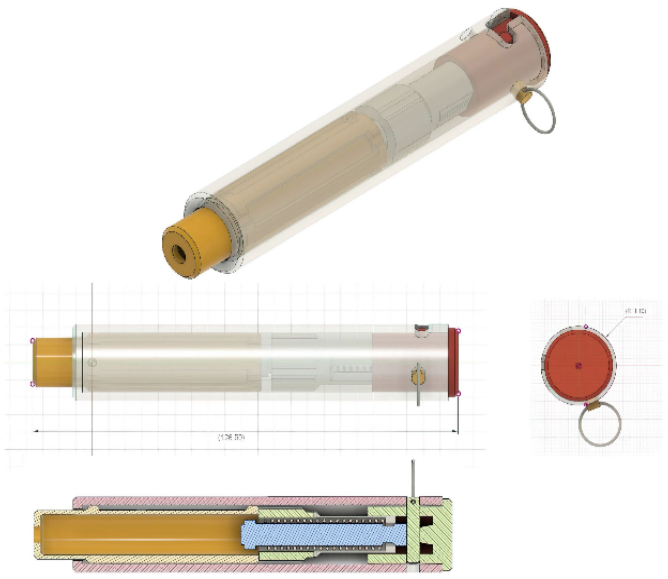
The risk of CBRN ((chemical, biological, radiological and nuclear) attack remains current, despite international law, which prevents the proliferation of weapons and CBRN agents and formally prohibits the use of weapons of mass destruction in the form of biological weapons (Geneva 1972) and chemical weapons (Geneva 1993).

The need for fast and easy administration of antidotes with high efficacy and broad spectrum and the achievement of a shorter absorption time of active substances were technological challenges that led to the design and development of a device to enable self-help and mutual aid in situations of risk.

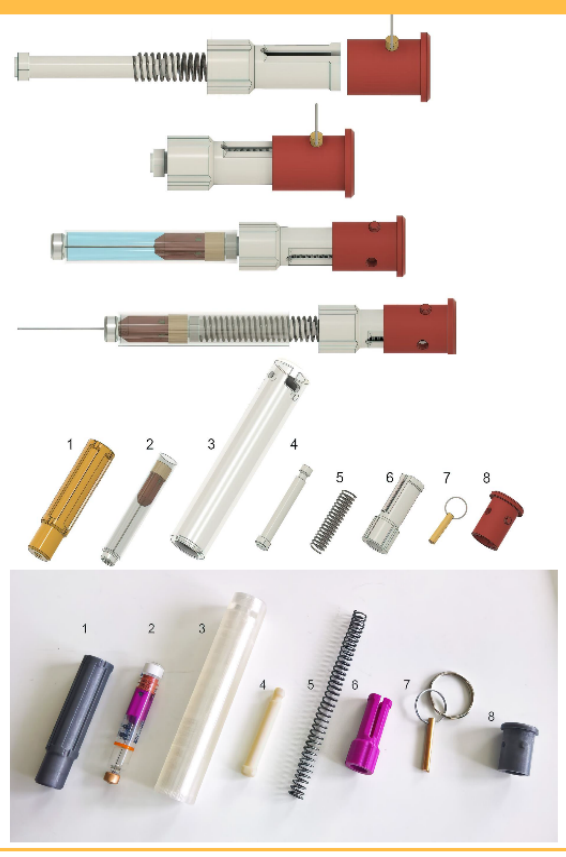
PROBLEM SOLVED

❖The main object of the present invention is to present an innovative solution for an intramuscular injection antidote delivery device which is compact, robust and versatile, and can be provided with various volumes of active substance for injection.

❖The technical problem solved by the invention consists in the realization of an auto-injector type device for the administration of antidotes in the post-exposure treatment in case of chemical attacks. This device must be easy to handle and carry (compact) and be made of a sturdy construction to be reliable.



ADVANTAGES



- Increased robustness by limiting the number of components and their complexity using the trigger mechanism based on the release of a piston actuated by a prestressed spring;
- Reducing the maximum size of the device (length) by using a helical spring with an outer diameter smaller than that of the carpula, the spring partially entering the carpula during injection;
- The triggering system is self-guided due to the cylindrical construction of the components;
- The injection needle is maintained in an optimal orientation during the injection due to the guide elements, unlike solutions that use the needle integrated in the carpula without guidance;
- The dosage can be adjusted at the factory by modifying a minimum number of specific components.

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E-LITE NUTRITIA

Apinatur - Regina Stupului Românesc

Revitalizing Therapy

through massage techniques

Author/s: Adriana Vlad & E-LITE Team

F

Revitalizing Therapy includes several combined massage techniques:

To diagnose :
1. Acupressure and Reflexology

To unlock circulatory system:
2. Lymphatic massage

To treat rheumatic pains:
3. Therapeutic massage

To relax the body:
4. Relaxation massage

To dissolve fat and cellulite:
5. Anti-cellulite massage

To stimulate the good functioning of the internal organs:
6. Visceral massage







All in one session of approximately 1 hour, restores all systems and the whole body.

Acupressure and reflexology

Each organ has a corresponding reflex point in the sole or on the face or back.

Pressing these points detects certain health conditions at an early stage - energy blockage.

The consistent massaging of these points stimulates the proper functioning of the corresponding organs.

The same happens with internal organelles. Visceral massage involves a technique of stimulation and good functioning of the organs (liver, bile, kidneys, pancreas, uterus, ovaries, etc.).

Lymphatic, therapeutic and relaxation massage bring well-being to a person with health conditions or very stressed.

It is recommended this therapy to all people who feel devitalized, tired, sick.

The technique is applied together with special oils and body butters, BIO, with suction cups and bamboo sticks.

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MOVEMENT IDENTIFICATION AND SUPPORT DEVICE FOR THE RIGHT ARM FOR PERSONS WITH MOBILITY PROBLEMS

1948 UNIVERSITATEA DIN PETROȘANI

DISPOZITIV DE IDENTIFICARE ȘI SUSȚINERE A MIȘCĂRII BRAȚULUI DREPT PENTRU PERSOANELE CU PROBLEME DE MOBILITATE

Patent number: OSIM A00101/18.02.2019, prototype
Marius-Nicolae RÎSTEIU,
Monica LEBA, Andreea Cristina IONICĂ

Category
F

The invention aims to provide a device for identifying and supporting the movement of the right arm for people with mobility problems.

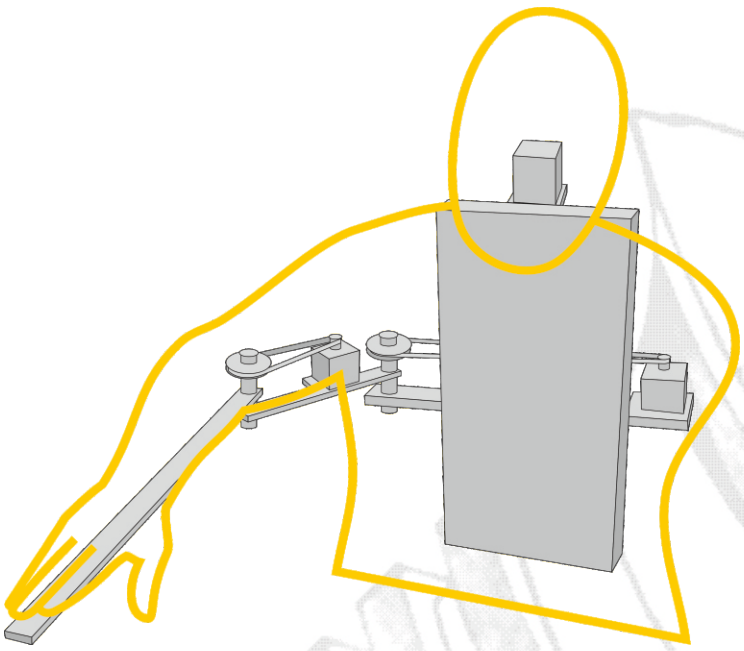

Figure 1. Exoskeleton scheme – front view

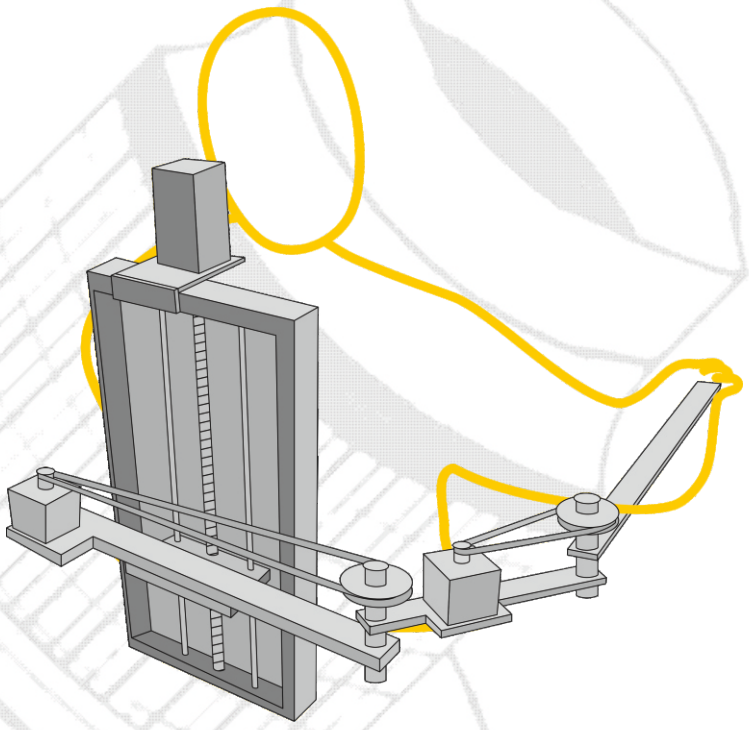

Figure 2. Exoskeleton scheme – rear view

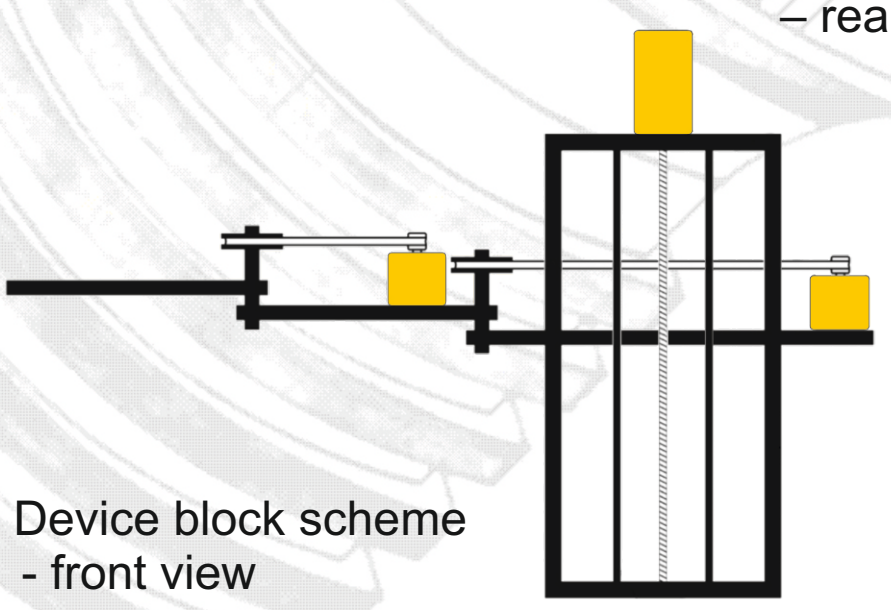

Figure 3. Device block scheme - front view

Invenţia îşi propune să ofere un dispozitiv pentru identificarea şi susţinerea mişcării braţului drept pentru persoanele cu probleme de mobilitate.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
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Post code: 332006 City: Petroșani Country: Romania
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BURNOUT STATUS IDENTIFICATION AND ALARMING SYSTEM

SISTEM DE IDENTIFICARE ȘI ALARMARE A STĂRII DE BURNOUT

1948 UNIVERSITATEA DIN PETROȘANI

Category F

Patent number: State of Israel Patent Office, no. 270751 / 18.11.2019, prototype
Yonnis NASSAR,
Andreea Cristina IONICĂ, Monica LEBA

A system consisting of two devices, one portable for identifying and alarming the occurrence of burnout and the second for setting / reading the initial / measured data, by the specialist.

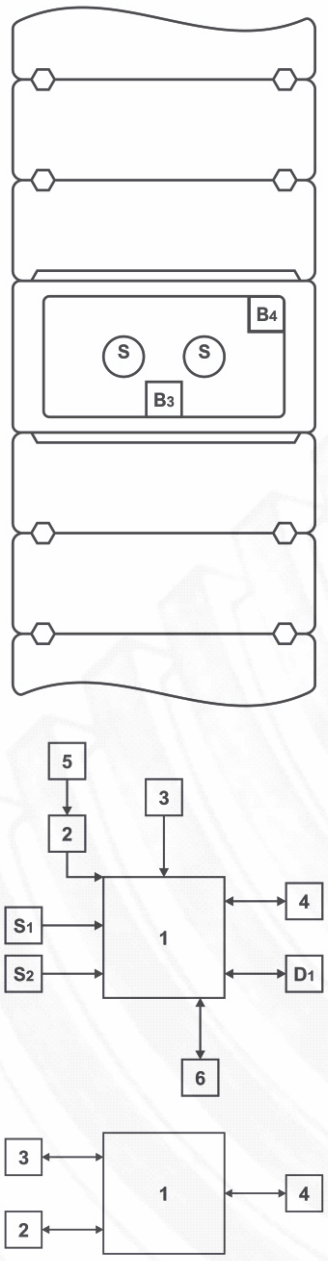

Figure 1. Hardware

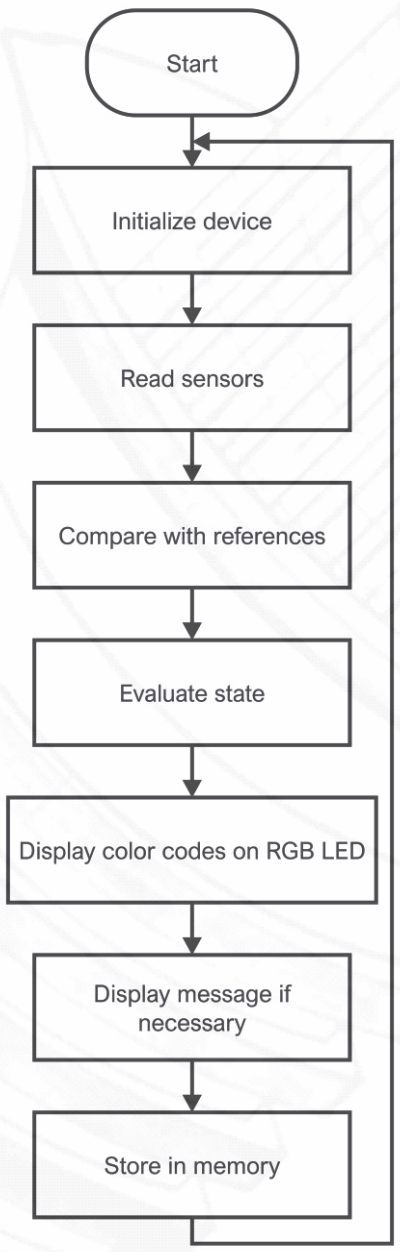

Figure 2. Algorithm

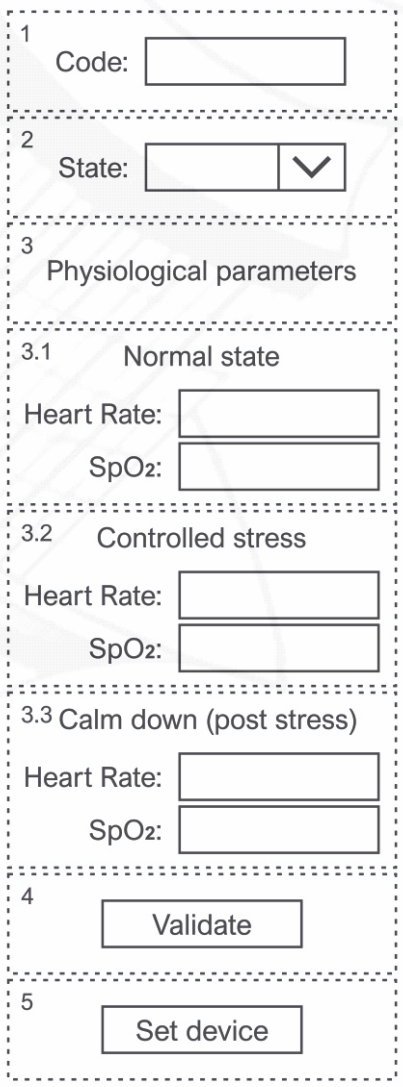

Figure 3. Software

Un sistem format din două dispozitive, unul purtabil pentru identificarea și alarmarea apariției stării de burnout și al doilea pentru setarea/citirea datelor inițiale/măsurate, de către specialist.

Asociația de Cercetare Doctorală Petroșani

Contact: **Name of the institution:** University of Petroșani
Address: Universității, no. 20
Post code: 332006 City: Petroșani Country: Romania
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IDENTIFICATION OF MUTATION IN GBA GENE WITH VIETNAMESE PARKINSON'S DISEASE PATIENTS: Reveals one novel mutation

INTRODUCTION



GBA mutations are to date the most common genetic risk factor for Parkinson's disease. The GBA gene encodes the lysosome enzyme Gcase. Parkinson's disease patients with GBA mutations have a modest reduction in age-of-onset of disease and a greater incidence of cognitive decline. GBA gene mutation accounts for 2-30% of Parkinson's disease patients, based on much research with different ethnicities and geologic regions. GBA gene mutation search on Parkinson's disease patients holds great importance in finding disease conditions as well as serves as a basis for clinical doctors to make prognosis and give consultation. This study was performed in a cohort of 35 Parkinson's disease patients, diagnosed based on the UK Parkinson's Disease Society Brain Bank Diagnostic Criteria at the National Geriatric Hospital and Bach Mai Hospital. The mean age of participants is 55.3 ±8.7, the ratio of male to female patients is 1.19. The Sanger sequencing method was used to identify GBA mutations.

RESEARCH

Methodology

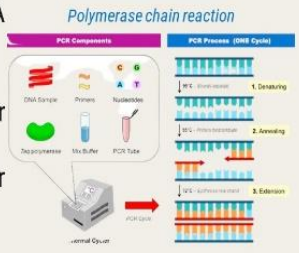
Subject: 35 Parkinson's disease patients at National Geriatric Hospital and Bach Mai Hospital, diagnosed based on The United Kingdom Parkinson's Disease Society Brain Bank (UKPDSBB) Criteria.

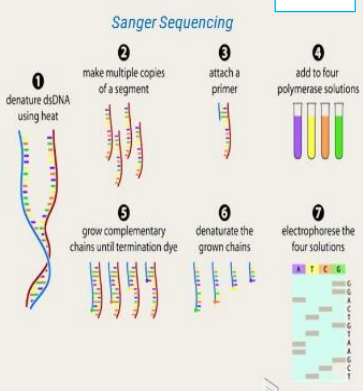
Methods:

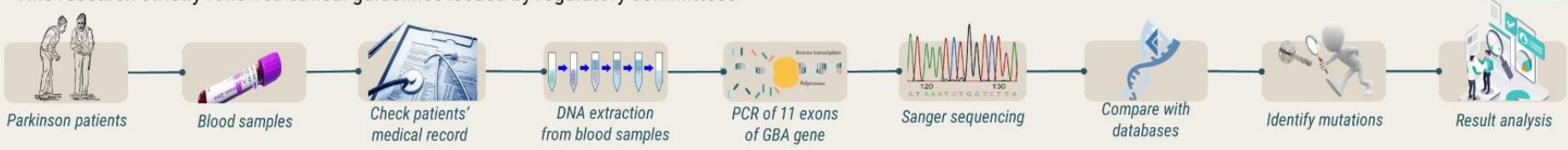
- Convenience sampling
- DNA extraction: Total DNA was extracted from whole blood samples using The Wizard® Genomic DNA Purification Kit of Promega (USA)
- Polymerase chain reaction (PCR) technique: Amplify the entire GBA gene
- Sanger sequencing for the entire coding region of the SCN5A gene was carried out using BigDye terminator sequencing (Applied Biosystems, Foster City, USA).
- Data were compared with the GBA gene reference on large databases, such as GenBank (National Center for Biotechnology Information), or ClinVar.

* This research strictly followed ethical guidelines issued by regulatory committees









Results

Table 1. *The characteristics of the study samples by gender and age group (n=35)*

Ages	Male		Female		Total	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
<60	13	68.42	11	68.75	24	68.57
>=60	6	31.58	5	31.25	11	31.43
Summarize	19	100	16	100	35	100

The ratio of male/female = 1,19

The distribution of age groups in this study is respectively: The rate of Parkinson's patients was highest in the age group <60 years old (68.75%). The mean age of the disease was 56.3±8.7 years old. The youngest age is 36 years old; the oldest age is 73 years old. The ratio of male/female was 1.19

Figure 1. *Sanger sequencing results of mutant c.814G>T (Glu272*/c.814G>T) in exon 8 of GBA gene*

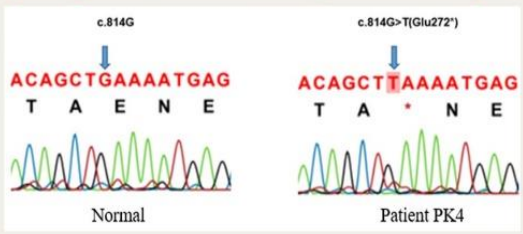


Figure 1 illustrates a missense mutation G>T at the site of nucleotide 814 on the cDNA of GBA genes of patient PK4. The substitution of nucleotide G by nucleotide T led to a change in the codon 272, Glutamic acid (encoded by GAA) was converted to a stop codon (encoded by TAA).

Table 2. *Detected mutations in GBA gene*

Patient code	Gender	Age	Location on the gene	Nucleotide substitution	Amino acid alterations	Zygosity
PK13	Female	51	Splicing site	c.115+1G>A		Heterozygous
PK14	Male	57	Splicing site	c.115+1G>A		Heterozygous
PK6	Male	52	Splicing site	c.762-1G>C		Heterozygous
PK4	Female	47	Exon 8	c.814G>T	p.Glu272*	Heterozygous
PK27	Male	43	Exon 8	c.946C>T	p.Arg316Cys	Heterozygous

Sequencing results revealed: 5/35 patients carry GBA gene mutation (taking up 14.29%) with 4 different types of mutation, including, two splicing site, one missense, and 1 nonsense mutations. All variables are mutant zygotes, nucleotide substitutions. There were one novel mutations c.814G>T (Glu272*), which have not been reported in the ClinVar database.

Figure 2. *Sanger sequencing results of mutant c.946C>T (p.Arg316Cys/c.946C>T) in exon 8 of GBA gene*

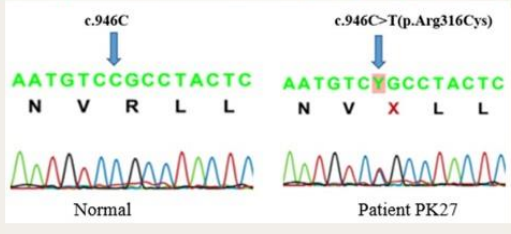


Figure 2 illustrates a missense mutation G>T at the site of nucleotide 946 on the cDNA of GBA genes of patient PK27. The substitution of nucleotide C by nucleotide T led to a change in the codon 316, Arginine (encoded by CGC) was converted to Cysteine (encoded by TGC).

DISCUSSION

Parkinson's disease is the most common among elderly people. In our research, the mean age of this study is around 55.3 ±8.7. We recognized that a high number of Parkinson's disease occurred in the groups under 60 years old (68.57%), but almost all patients have been found with PD at over 50 years old; otherwise, 1 patient has been found at 36 years old. In our research, PD occurred in both males and females, the ratio of male/female seems to be similar at 1.19/1. Corresponding to this study, the author Nguyen Thanh Binh et al.2017 also showed the ratio male/female of Vietnamese PD is 1,27/1. Thus, sex discrimination maybe not have influenced the rate of getting PD.

The GBA gene, which encodes the lysosome enzyme Gcase, is located on chromosome 1q21 including 11 exons and 10 introns. GBA mutations are to date the most common genetic risk factor for Parkinson's disease. Parkinson's disease patients with GBA mutations have a modest reduction in age-of-onset of disease and a greater incidence of cognitive decline. GBA gene mutation search on Parkinson's disease patients holds great importance in finding disease conditions as well as serves as a basis for clinical doctors to make prognosis and give consultation.

In this research, we determined 5/35 PD patients with heterozygous mutations in the GBA gene (14.29%), higher than in previous studies in China, Japan, and Jewish, accounted for 4.3%, 9.4%, and 13.7%, respectively (Ziegler et al. 2007; Mitsui et al. 2009; Clark et al.2007). The multiform situation may be due to the differences in genes and race in Vietnamese people. In the study by Sidranski et al. 2009, Data collected from 16 centers demonstrate that the frequency and distribution of GBA mutations vary among populations.

4 different GBA variants were successfully identified by direct sequencing. All the mutations belonged to heterozygous and mostly replacement of nucleotide substitution mutations. 1 novel variants c.814G>T (Glu272*) located in Exon 8. The consequence of this 1-nucleotide substitution mutation changes the translation framework, The corresponding nucleotide G in normal humans has been replaced by nucleotide T leading to 272 triplets encoding the Amino acid Glutamic to stop codon. So, this mutation causes GBA to have 272 amino acids instead of 536 amino acids. The remaining amount of amino acids is not enough to undertake translation into a complete protein, so Gcase loses most of its function and causes disease.

On the other hand, three known variants containing c.115+1G>A (rs104886460), c.762-1G>C (rs1237637353), and c.946C>T (p.Arg316Cys) (rs1264734195) have been found in our study. The mutations identified in this study were demonstrated to contribute to PD pathogenicity by clinical or in vivo trials and were recognized in the ClinVar database.

CONCLUSION

This study found that 5/35 patients carried GBA gene mutation with 4 mutations of 3 different types: two splicing sites , one missense, and one nonsense mutation. In detail:

Splicing site (n=2): c.115+1G>A (PK13, Pk14); c.762-1G>C (PK6)

Missense (n=1): c.946C>T / p.Arg316Cys (PK27)

Nonsense (n=1): c.814G>T / p.Glu272* (PK4)

There was one novel mutations c.814G>T (Glu272*), which have not been reported on large databases of gene mutation.

ASSOCIATION OF NASOPHARYNGEAL *ACE2* AND *TMPRSS2* EXPRESSION TO SEVERITY OF COVID-19

F

ABSTRACT

TMPRSS2 are two crucial proteins of host cell membrane helping SARS-CoV-2 viral infection to cause COVID-19 disease. TMPRSS2 cleaves the S protein at the S1/S2 and S'2 sites for membrane fusion after the binding of the viral spike (S) protein to ACE2 is a receptor. *Aim:* This study aimed to evaluate the expression of nasopharyngeal TMPRSS2 upon admission in relationship with the subsequent clinical course during hospitalization of COVID-19 patients. *Methodology:* Representative 29 and 23 nasopharyngeal fluid samples collected upon admission from typical severe and mild COVID-19 patients hospitalized in the National Hospital for tropical diseases (Vietnam), respectively, were relatively compared RNA expression of TMPRSS2 by using Realtime-PCR with specific primers. SARS-CoV-2 cases were diagnosed clinically, blood and biochemical parameter, X-ray/CT and confirmed by RT-PCR. *Results*: The RNA expression of TMPRSS2 was relative higher (1.36 fold) in severe group in comparison with mild patients (p = 0.0004). *Conclusion*: TMPRSS2 gene expression in the nasopharyngeal mucosa may promote the severity of COVID-19 patients but requires further study in larger samples.

PROCEDURE

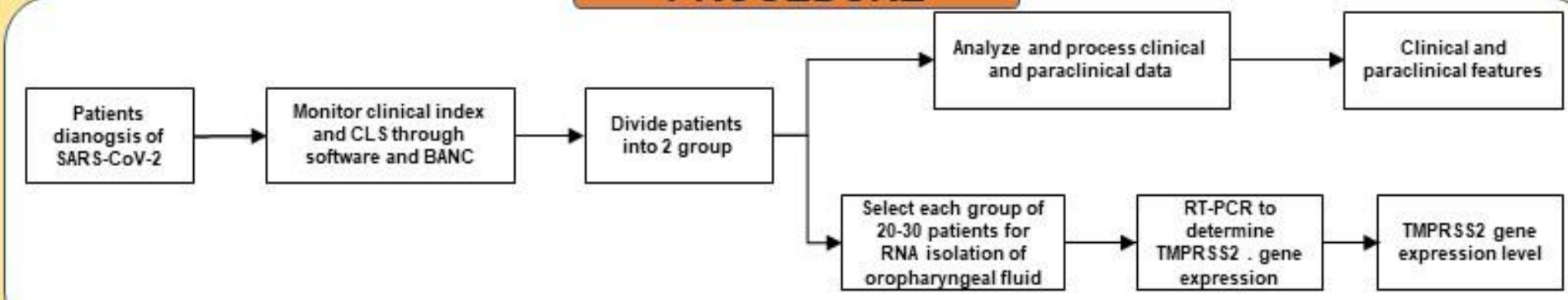


Fig 1: Proccess of research

RESULTS

1. COVID-19 characters

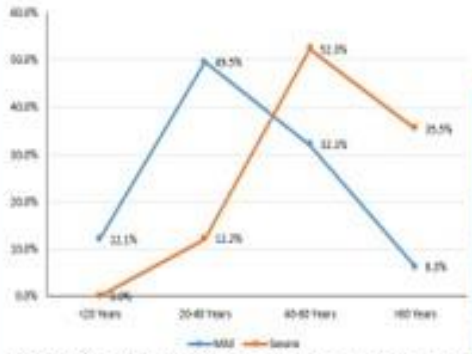


Fig 2: Characteristics of age and gender with COVID-19

Table 1: Characteristics of age and medical conditions

Age		Gender				P
		Mild (N=190)		Severe (N=107)		
		Male (N=100)	Female (N=90)	Male (N = 64)	Female (N=43)	
< 20 years		19 (10%)	4 (2,1%)	0	0	< 0,01
20 – 40 years		45 (23,7%)	49 (25,8%)	6 (5,7%)	7 (6,5%)	< 0,01
40 – 60 years		33 (17,4%)	28 (14,7%)	35 (32,7%)	21 (19,6%)	< 0,01
>60 years		3 (1,6%)	9 (4,7%)	23 (21,5%)	15 (14%)	< 0,01
years	Xtb ± D	36,9 ± 13,9		55,1 ± 14,7		< 0,01
	Min - Max	9 - 89		22 - 89		

2. Clinical features

Table 2: Clinical characteristics of the two groups of patients

Features	Mild N = 190	Severe N = 107	P
Feve ≥ 38,5°C (%)	30 (15,8%)	39 (36,4%)	< 0,001
Dyspnea (%)	3 (1,6%)	12 (11,2%)	< 0,001
Pneumonia (XQ,CT) (%)	84 (44,2%)	68 (63,6%)	< 0,001
Number of days in hospital when mild (X±SD)	25,9 ± 8,3	7,7 ± 4,2	< 0,001
Number of days in hospital when severe (X±SD)	0	17,3 ± 14,2	< 0,001
Total hospital days (X±SD)	25,9 ± 8,3	33,5 ± 16,1	< 0,001

3. Characteristics of medical history

Table 3: Comorbidities among research groups

Features	Mild N = 190	Severe N = 107	P
Hypertension	8 (4,21%)	14 (13,08%)	< 0,001
Diabetes	3 (1,58%)	8 (7,48%)	< 0,001
Hepatitis B	7 (3,68%)	6 (5,61%)	
Cancer	5 (2,63%)	24 (22,43%)	< 0,001
Other	12 (6,23%)	8 (7,48%)	
Total	35 (18,42%)	60 (56,07%)	< 0,001

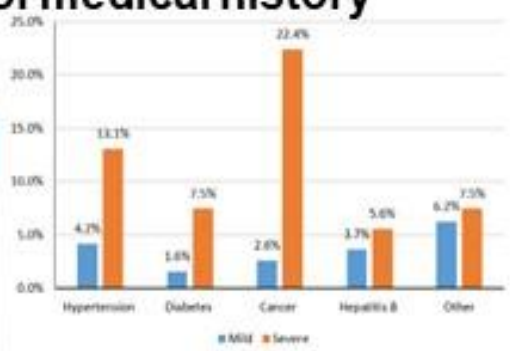


Fig 3: Medical History

Table 4: Paraclinical characteristics at the time of hospital admission

Features	Mild N = 190	Severe N = 107	p [95% CI]
CRP (mg/L) N=101	5,7 ± 8,6	24,1 ± 28,0	0,000 [-23,4 -10,8]
PCT (ng/mL) N=93	0,06 ± 0,05	0,22 ± 0,27	0,000 [-0,19 -0,06]
FERRITIN (ng/mL) N=57	397,1 ± 389,6	883,0 ± 580,2	0,000 [-562,2-256,2]
MAGIE (mmol/L) N=83	0,84 ± 0,11	0,84 ± 0,10	0,368 [-0,04-0,10]
LDH (UI/L) N=83	205,3 ± 62,1	262,0 ± 139,4	0,005 [-155,8-29,2]
UREA (mmol/L) N=100	4,1 ± 1,2	5,0 ± 1,9	0,000 [-1,37-0,44]
CREATININ (umol/L) N=105	75,2 ± 16,4	87,9 ± 25,7	0,000 [-18,0-7,2]
AST (UI/L) N=105	51,0 ± 17,8	51,7 ± 47,4	0,000 [-29,5-9,1]
ALT (UI/L) N=105	26,0 ± 21,4	41,0 ± 48,0	0,031 [-22,1-0,63]
CALCI (mmol/L) N=19	2,23 ± 0,09	2,22 ± 0,09	0,765 [-0,06-0,07]
GGT (UI/L) N=76	41,3 ±48,4	107,6 ± 164,0	0,025 [-68,6-4,7]

4. Some paraclinical indicators have severe prognostic value of COVID-19 disease

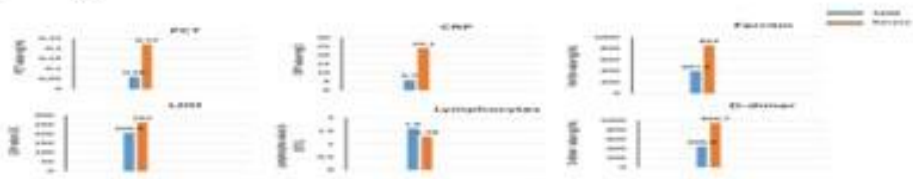


Fig 4: Some paraclinical indicators have prognostic value for COVID-19 disease at the time of admission without serious clinical developments.

5. Results summary

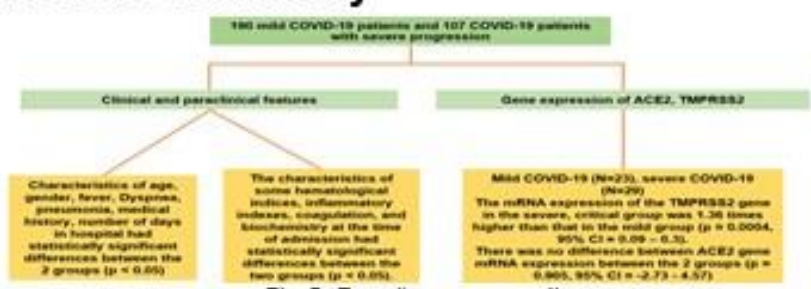


Fig 5: Results summary diagram

CONCLUSIONS

- Elderly and/or critically ill COVID-19 patients are at high risk for severe and critical complications requiring close monitoring and intensive care.
- Some indicators such as PCT, CRP, Lymphocytes, Ferritin, LDH, D-dimer have early prognostic value for severe progression of COVID-19 disease.
- Expression of the TMPRSS2 gene in the nasopharyngeal mucosa may be a good biomarker for predicting the severity of COVID-19 disease.

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Power of Creative Mind

Researching the antibacterial ability of Helicobacter pylori and making hard capsules to support the treatment of stomach diseases from Sanchezia speciosa.

F

TRƯỜNG THPT CHUYÊN LÀO CAI

Introduction

Helicobacter pylori is identified as the primary cause of the most stomach-related diseases, thus killing HP is considered as an important therapy in the treatment of stomach diseases. Based on traditional remedies to treat stomach diseases, we chose the research topic: Researching the antibacterial ability of Helicobacter pylori and making hard capsules to support the treatment of stomach diseases from Sanchezia speciosa.

Purpose and content of research

- Optimizing the extract process of active ingredients to support and treat stomach diseases from Sanchezia speciosa.
- Completing the producing process of hard capsules from the leaves of Sanchezia speciosa and some herbs to support and treat stomach diseases.
- Testing HP resistance ability of the extract from Sanchezia speciosa, and the product

Content 1: Research on morphological characteristics of Sanchezia speciosa and Oldenlandia eapitellata Kuntze.

Content 2: Research on active ingredients isolated and extracted from Sanchezia speciosa and nightshade trees.

Content 3: Optimize the active ingredients from Sanchezia speciosa that effect in killing HP.

Content 4: Research on the mixing ratio of Sanchezia speciosa and Oldenlandia extract and excipients.

Content 5: Make capsule preparations.

Experimental methods

Analytical methods for physicochemical criteria include:
+ Determination of moisture by drying method to constant weight
+ Quantification of total flavonoids by weighing method
+ Quantification of tannin content by Lowenthal method
+ Research method for antibacterial ability: Diffusion method on agar

EXPERIMENTS & RESULTS

1: Research the effect of extract solvent concentration
2: Research the effect of extract time
3: Research the effect of extract temperature
4: Research the effect of material/solution ratio.
5: Optimize Sanchezia speciosa extract conditions
6: Solid extract mixing
7: Research to determine drying temperature for products.
8: Analyse product quality.













CONCLUSIONS AND RECOMMENDATIONS

- Conclusion:

The expected function method is applied to optimize the flavonoid content obtained by Design -Expert 7.0 software.

+ The best solution is applied to predict the concentration of 69.72%, the time of 92.76 minutes, the temperature of 79.88°C, then the flavonoid content is 17.53%.

+ Determine mixing ratio of Sanchezia speciosa extract: Oldenlandia eapitellata Kuntze extract: Herb extract [%] for the best effect at: 50:30:20

+ Select the drying temperature for the product at 70°C.

Survey the ones who have used effective remedies locally.

- Concentrate in vacuum conditions
- Analyse flavonoid content by better methods
- Take clinical product against Helicbacter pylori in mass test
- Test product toxicity
- Research other active ingredients in the product that well effect on the health of other patients.

G

Agriculture

Veterinary medicine

INVENTORS
MUHAMMAD IKMAL SIROZI
DR NOOR HASYIERAH MOHD SALLEH
PROF MADYA DR ZARINA ZAKARIA
NORHIDAYAH ABDUL AZIZ
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UNIVERSITI MALAYSIA PERLIS

POTENT FUNGICIDE FROM MOMORDICA CHARANTIA WASTE FOR MUSHROOM PROTECTION

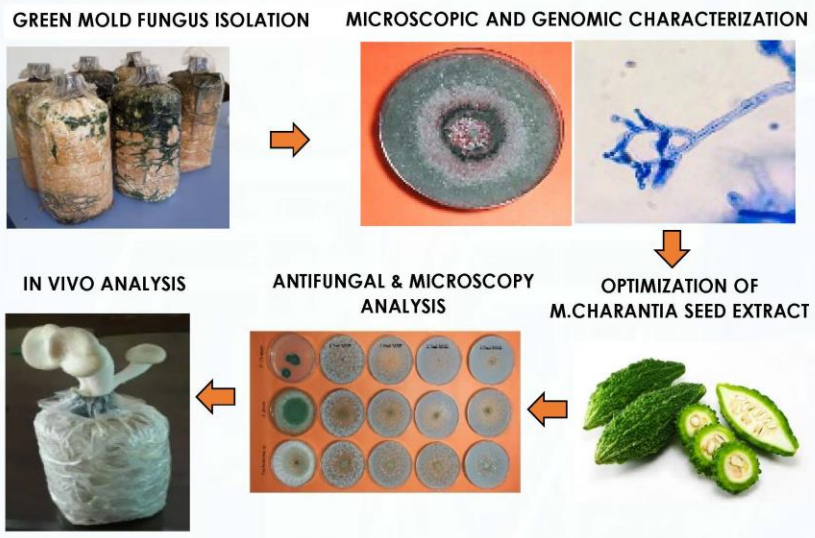


01 RESEARCH SUMMARY

Mushroom is well known for their great taste and amazing health benefits. This superfood was listed as one of the high-value crops under Malaysia's National Agro-Food Policy (2021-2030). In Malaysia, the grey oyster mushroom (GOM), *Pleurotus pulmonarius* receives the highest demand due to its great flavor and easy cultivation. However, it is constantly affected by a group of devastating green mold fungi such as *Thricoderma spp. Aspergillus flavus and Penicilium citrinum*. The infection has caused dramatic losses in grey oyster mushroom production, qualitatively and quantitatively.

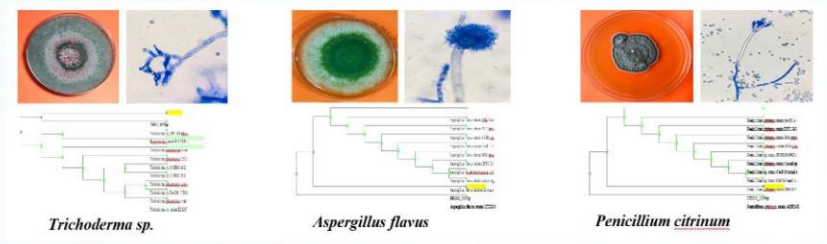
Conventional infection control method relies heavily on chemicals that spark controversies due to harmful effects on health and the environment. The green control method using *Momordica charantia* seed extract (MSE) is a good alternative as the extract contains a rich amount of antioxidant and antifungal protein of alpha momorcharin. The protein-based bio fungicide is effective against those grey oyster pathogens in a dose-dependent manner. MSE provides an alternative green control method for the protection of GOM.

02 METHODOLOGY



03 RESEARCH OUTCOME

ISOLATION AND CHARACTERIZATION

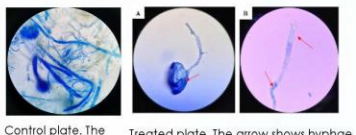


OPTIMIZATION OF M.CHARANTIA SEED EXTRACT

Protein (%)	52.43
Antioxidant (mg GAE/g)	16.69 ± 0.25

ANTIFUNGAL AND MICROSCOPY ANALYSIS

Pathogen strain	Inhibition (%)
Thricoderma sp.	79.0
A. flavus	89.2
P. citrinum	63.1



Control plate. The hyphae and spore are well developed

Treated plate. The arrow shows hyphae breaking down

IN VIVO ANALYSIS



Before treatment

After treatment: development of pinhead

04 NOVELTY

Protein-based bio fungicide from *Momordica charantia* (MMC) waste against green mold disease for mushroom protection.

G

05 INNOVATION IMPACT

- Provide eco-friendly solutions of natural protein-based biofungicide and support the demand for organic farming.
- Minimizing dependency on chemical fungicides, thus; reducing risk and concern on human health.
- Effectively inhibit the green mold fungi infection and induce the mushroom's pinhead development.
- Increase the productivity of mushrooms.
- Support SDG 2: Zero hunger

06 COMMERCIALIZATION IMPACT

- Easy to use.
- From waste to wealth.
- Help to contain the infection and minimize the spread.
- Minimize profit loss to entrepreneurs by preventing the loss of mushroom bags.

07 MARKET TARGET

- Mushroom entrepreneurs.
- Goverment bodies such as the Department of Agriculture.
- Practical treatment application for various agricultural sectors that are faced with green mold disease infection such as in papaya and tomato production.
- Small and medium industries for supply of raw materials.

08 COLLABORATOR

- Beseri Mushroom Farm Enterprise, Beseri, Perlis, Malaysia

09 PUBLICATION

M. K. Nahar, Z. Zakaria, U. Hashim, M. F. Bari. 2015. Green Synthesis of Silver Nanoparticles Using *Momordica charantia* Fruit Extracts. Advanced Materials Research Vol. 1109, pp 35-39.

N.H.Mohd Salleh, Z. Zakaria, N.H.Aziz, A.A.N. Gunny, A.R.Mohamed and T.Munusamy, Inhibition of *Aspergillus flavus* by *Momordica charantia* ethanolic leaves extract for mushroom protection, International Conference of Chemical Science, Engineering and Technology, 2021.

10 ACKNOWLEDGEMENT

FRGS 9003-00705-Inhibitory mechanism of alpha momorcharin on the structure and metabolism of *Thricoderma harzianum* for the protection of grey oyster mushroom (2019-2022).

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Method of recovery from whey of protein concentrates enriched with beta-lactoglobulin

Patent number: MD 1637Y, 2022.08.31

G

Authors: Bologa Mircea, Vrabie Elvira, Sajin Tudor, Paladii Irina, Policarpov Albert, Vrabie Valeria, Stepurina Tatiana, Sprincean Catalina

Description: The invention relates to the dairy industry and, in particular, to a method for producing a protein-mineral concentrate (PMC) from whey enriched with beta-lactoglobulin (β-Lg) at the electroactivation of whey carried out in two variants:

1. The electroactivation of whey was carried out ***by cyclic power supply of the electrolyzer with a current with a cycle duration of 60s and an interval between cycles of 10s***, while the PMC was collected from the foamy phase at pH values of 8.00 - 11.00, which allows the recovery of β-Lg of about **72%** at the current density j=10mA/cm^2 (fig.1. E_1) and of about **57%** at j=20mA/cm^2 (Fig.1. E_2).

2. The electroactivation of whey was carried out ***by a continuous power supply of the electrolyzer with current***, while the PMC was collected from the foamy phase at pH values of 8.00 - 9.00, which allows the recovery of β-Lg of about **59%** at the current density j=10mA/cm^2 (Fig.1. E_3) and of about **38%** at j=20mA/cm^2 (Fig.1. E_4).

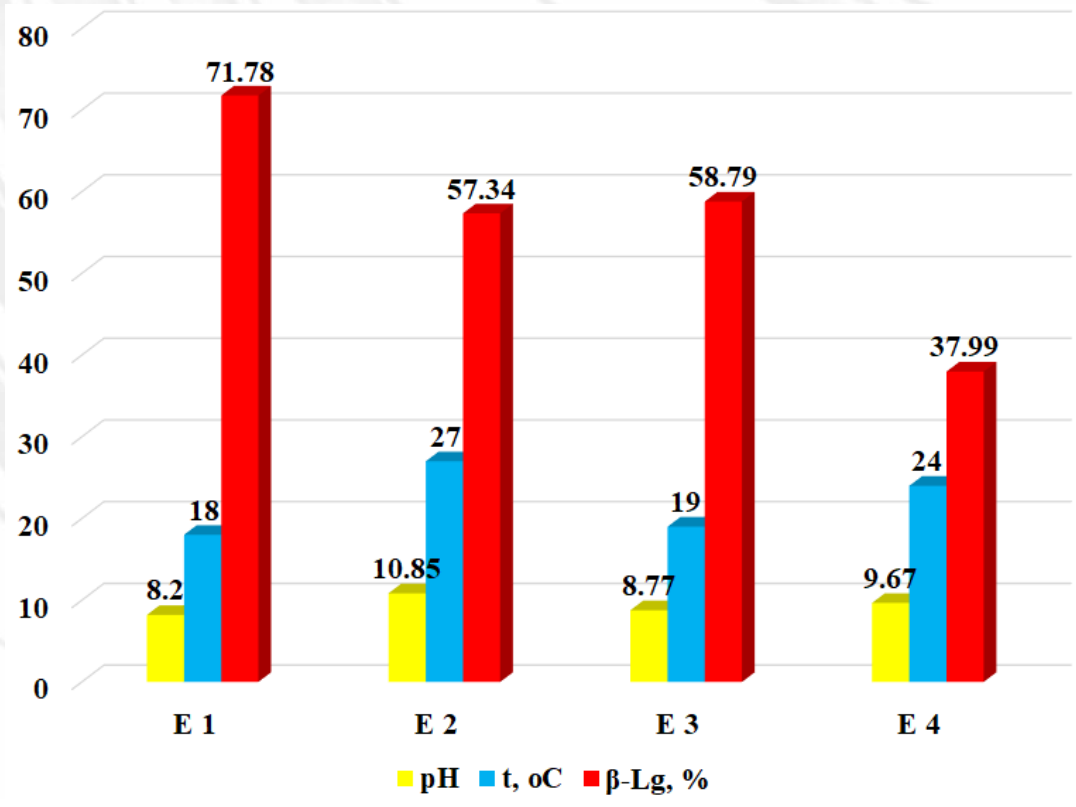

Figure 1.

Contact: vrabie657@yahoo.com; elvira.vrabie@ifa.md

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AMETIST

rhizogenic interspecific genotype (*V. vinifera* (2n=38) x *M.rotundifolia* (2n=40))

Patent no.: 364 / 2021.06.30

ALEXANDROV Eugeniu, BOTNARI Vasile, GAINA Boris

G





Amethyst - interspecific grapevine genotype resistant to phylloxera and can be grown on its own roots, as well as for expanding the northern limit of grapevine plantations. The created variety withstands extreme temperatures during the winter period and can be grown vertically, pergolas, arches, etc. It shows good growth and ensures the formation of competitive harvests even in conditions with high temperatures above the multi-annual norms with low precipitation during the summer, on lands with low creditworthiness, etc. The Ametist variety can be used in the creation of ecological grapevine plantations.

Research was carried out within the project of the state Program 20.80009.5107.03 „Efficient use of plant genetic resources and advanced biotechnologies to increase the adaptability of crop plants to climate change", financed by the Național Agency for Research and Development.

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PROCESS FOR INCREASING THE STORAGE CAPACITY (STORABILITY) OF PLUM FRUITS

Patent no.: 2021.12.21/s 2021 0107

Authors: BUJOREANU Nicolae, NICUTA Alexandru, HAREA Ivan

G

The invention relates to agriculture, in particular to horticulture, and can be used to increase the harvest, the quality and the storage capacity of fruit, as well as the reduction of the process of dehydration of the fruits of autumn plum varieties during the storage period.

The essence of the invention consists in treating the plum trees (after the fall of the juvenile fruits) during the vegetation period with the biologically active substance Reglalg - 0,05%, the microelements B, Zn, Mn, Mo - 0,05% and in the pre-harvest phase (August) with 0,1% $CaCl_2$, at the rate of 800-1000 l/ha.

The technical result of the invention consists to increase the productivity, the quality, storage capacity and resistance of plum fruits to fungal diseases and tissue dehydration, as a result of their directed growth for long-term storage.

Stanley variety Variants /Storage methods		Fruits standard, %	Tissue dehydration, %	Degree of damage with *Botrytis cinerea* Pers, %
Experimental lots	Treatments: m.e.+$CaCl_2$+Reglalg / Fitomag - NA	97,67	6,72	2,33
	Control: untreated / Fitomag - NA	93,50	6,96	6,50
Standard: Control: untreated / Normal atmosphere (NA)		88,50	7,32	11,50
LSD, 5%		1,62	0,09	1,62





Research was carried out within the project 20.80009.5107.18/PS financed by the NARD.

APPLICATIONS: Agriculture - Horticulture

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**Institut of Genetics, Physiology and Plant Protection,
Republic of Moldova**

NEW TOMATO VARIETIES *Solanum lycopersicum* L. MIA

Patent no.: 308 from 2019.08.31

**SIROMEATNICOV Iulia, BOTNARI Vasile, COTENCO Eugenia,
CHIRILOV Eleonora**

G

The vegetation period is 89-105 days; it is the medium early variety. The fruit is orange color, round-slightly elongated with weigh 49.0-52.0 g, 2-3 seminal lodges. Fruits with high taste qualities, the dry substance content of the fruits is 5.9-6.5%, sugars 6.2-7.6%, ascorbic acid 42.7 - 50.1 mg/%, titratable acidity 0.29-0.35 mg/%. The total harvest of tomato fruit consists 50.2-55.8 t/ha and standard fruit yield 44.9-53.7 t/ha.





Research was carried out within the project 20.80009.5107.03/PS financed by the NARD

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BIOLOGICAL, CHEMICAL AND BIOTECHNOLOGICAL RESEARCH OF SAFFLOWER

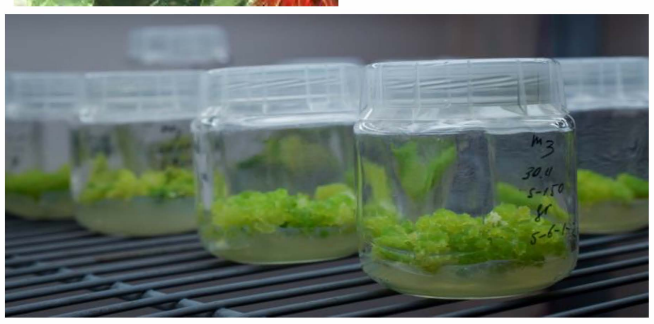
Research project 6097 supported by Science & Technology Center in Ukraine

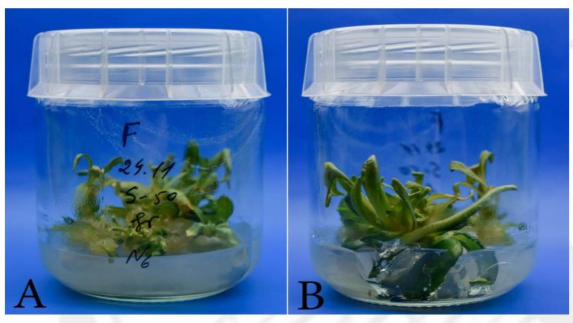
Authors: Raisa IVANOVA, Svetlana SMEREA, Larisa ANDRONIC

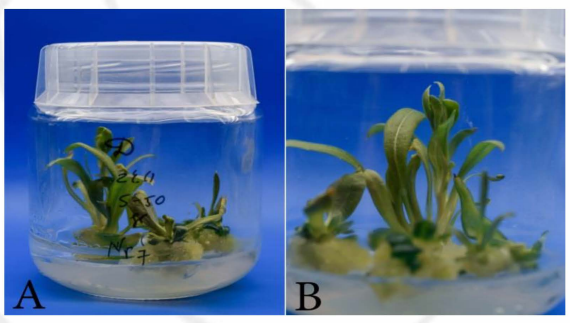
G



THE PURPOSE of this research was diversification of safflower germplasm by *in vitro* culture and experimental mutagenesis in order to increase the bio-morphological characters and content of biologically active substances.







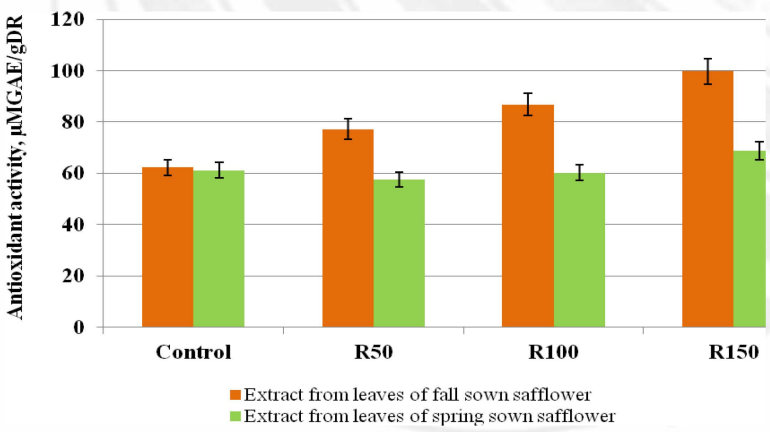
Subcultivation of regenerative calluses on different culture medium (variant S-50Gy, leaves as source of explant)

THE RESEARCH RESULTED in new genotypes of safflower which were obtained by seeds irradiation with different doses of gamma rays and selection by *in vitro* culture, field and greenhouses cultivation of plants. There was developed the scheme for obtaining of proliferative callus, *in vitro* induction of morphogenesis in order to diversification of the morphological characters. The variation of quantitative indexes of safflower plants was influenced by both the radiation dose and cultivation conditions. The most important practical results of this study are the description of morpho-physiological and biochemical characteristics of new genotypes and methodology of safflower multiplication.



Safflower plantlets obtained in vitro culture at flower-bud phase (variant S-50Gy, leaves as source of explant)





Antioxidant activity of leaves extracts: control - safflower growing from intact seeds, R50, R100 and R150 - from seeds irradiated by 50Gy, 100Gy, 150Gy.

APPLICATIONS: Agriculture.

ADVANTAGES: Safflower is alternative of other oilseeds crop.

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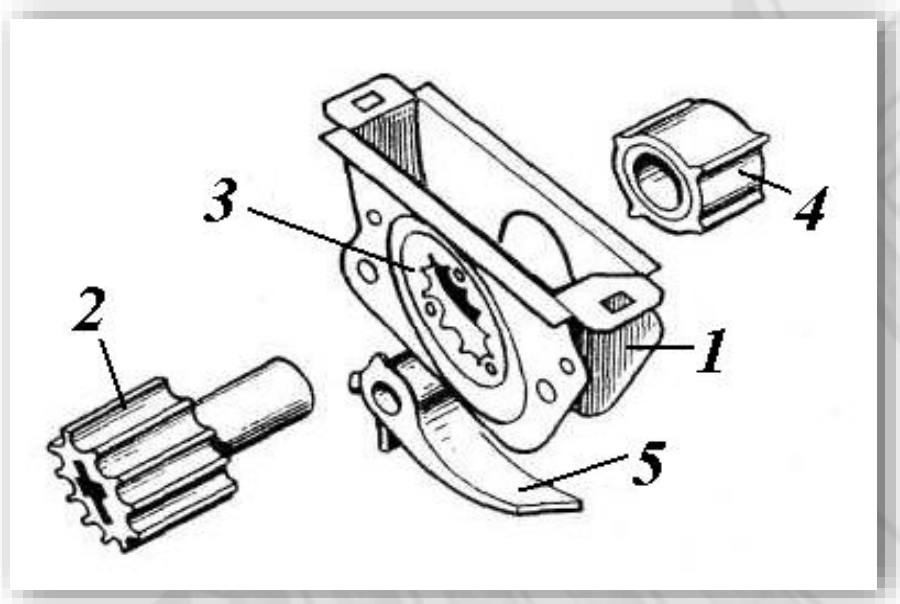
METHOD OF ADJUSTMENT OF THE SEED METERING DEVICES WITH GROOVED CYLINDERS

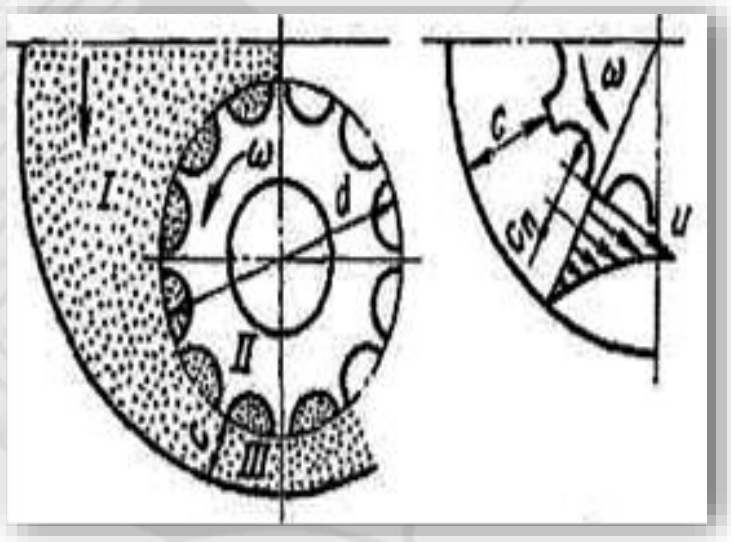
Institution: **„Alexandru Ciubotaru" National Botanical Garden (Institute) Chisinau, Republic of Moldova**

Authors: Dr. hab. Valerian CEREMPEI,
Dr. Victor ŢÎŢEI,
Dr. Mihai GADIBADI

G

The invention refers to methods of adjustment of the seed metering devices with grooved cylinders that are used in seed drills and differ from others in the simplicity of their design and their reliability, as well as functional universality, being intended to adjust the seeding rate of new and non – traditional grass, cereals, legumes, technical and vegetable crops, and to adjust the amount of fertilizers applied in the agri-food sector and grasslands cultivation, particularly,mthe invention refers to the method of determining the optimal interval of parameter configuration of metering devices with grooved cylinders.





The method of adjustment of the seed metering devices with grooved cylinders that are used in seed drills includes the preliminary adjustment of the metering device at the seeding rate QN (kg/ha); the measurement of the quality indices on a stand (the unevenness of the rates of the seeds/fertilizers in the metering devices of the seed drill Nd; the general instability of sowing along rows Ii; the degree of seed crushing gs), the verification of the compliance of the values of these indices to the agro-technical requirements and the final adjustment of the metering devices.

The preliminary adjustment of the metering devices is done in two stages, measuring the technological indices (the adjustment coefficient Kreg of the metering devices, which is calculated from the ratio of the functioning parameters of the grooved cylinders after the adjustments made at the second stage (the working length L2, the rotational speed n2) and at the initial stage (L1, n1): Kreg=(L2·n2)/(L1·n1); the evolution coefficient Kq of the quantity of seeds/fertilizers metered after the adjustments of the configuration of the device at the first and second stage Kq=q2/q1; the efficiency coefficient Ke of the adjustments made: Ke=Kq/Kreg); with the help of the efficiency coefficient, the optimal interval of parameter configuration (Lopt, nopt) can be determined and the metering devices can be adjusted to it. The final stage consists in measuring the quality indices and checking their compliance to the agro-technical requirements.

Financially supported, National Agency for Research and Development of the Republic of Moldova, project no. 20.80009.5107.02

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The cultivar ‘MIHAELA’ of plume poppy *Macleaya cordata* (Willd.)R.Br.

„Alexandru Ciubotaru” National Botanical Garden (Institute) Chisinau, Republic of Moldova

Patent MD 00014/2022.05.05

Author: Victor ŢÎŢEI

G

The cultivar ‘MIHAELA’ has been created by individual breeding of introduced vigorous rhizomatous perennial plant taxa of *Macleaya cordata* (Willd.) R.Br., plant height reached 280-300 cm with attractive flower panicles, large scalloped leaves and spreading habit. The yield of fresh leaves mass leaves 29-34 t/ha, stem dry energy mass13-17 t/ha.

Multi-purpose crops: medicinal, melliferous, ornamental, energy mass



Medicinal applications - herbs possess antitumor, anti-inflammatory, insecticidal and antibacterial activities, leaves content of BAS: sanguine 7.3-9.0 mg/g and chelerythrine 6.0-8.0 mg/g. Melliferous plant—beekeeping season July-August, production potential 180-200kg/ha honey. Energy stem dry biomass for solid biofuel - briquettes with specific density 780-830 kg/m^3 and pellets—960-975 kg/m^3, with gross calorific value 18.8-19.1 MJ/kg alue and 1.5-2.0% ash, as well as utilized as a substrate to obtain cellulosic ethanol with a potential of 533 l/t.

The cultivar ***‘MIHAELA’*** is suitable for the phyto-amelioration and the use of marginal, eroded and polluted lands.

Financially supported, National Agency for Research and Development of the Republic of Moldova, project no. 20.80009.5107.02
“Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”

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The new cultivar „VIGOR”

of milkvetch, *Astragalus galegiformis* L.

„Alexandru Ciubotaru” National Botanical Garden (Institute) Chisinau, Republic of Moldova

Patent 0006/2019.02.19

Author: Victor ŢÎŢEI

G

The cultivar „Vigor” of milkvetch, *Astragalus galegiformis* L., *Fabaceae* family, is highly growth and development rate perennial crop, suitable for the phyto-amelioration and the valorification of marginal, eroded and polluted lands. In the flowering stage (middle May), it grows about 165-175 cm tall, the productivity (2-3 cuts per season) is 55-70 t/ha green mass with 49-57% leaves.





The forage value: 23.4% CP, 24.8% ADF, 40.1% NDF, 3.1% ADL, 12.6% ash, 18.8 % total soluble sugars, 16.1 % hemicellulose and 21.7% cellulose, with 87.5 % digestible dry matter, 87.5 % organic digestible matter, relative feed value 161 with 11.1 MJ/kg metabolizable energy and 7.18 MJ/kg net energy for lactation. The harvested green mass may be used as natural and fermented fodder for farm animals, and co-substrates in biogas plants with methane potential 370 L /kg VS.





The stems after harvesting the seeds may be used for production of the densified biofuel (briquettes) with specific density 810-848 kg/m3, gross calorific value 18.1-18.8 MJ/kg and 1.5-2.3% ash content. The cultivar ‘Vigor’ of Astragalus galegiformis can be considered as a promising forage legume to restore degraded soils and create temporary grasslands, is a source of pollen and nectar for bees in May –June that makes it possible to obtain 90-100 kg/ha of honey.

Financially supported, National Agency for Research and Development of the Republic of Moldova, project no. 20.80009.5107.02
“Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”

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“Mobilization of plant genetic resources, plant breeding and use as forage, melliferous and energy crops in bioeconomy”

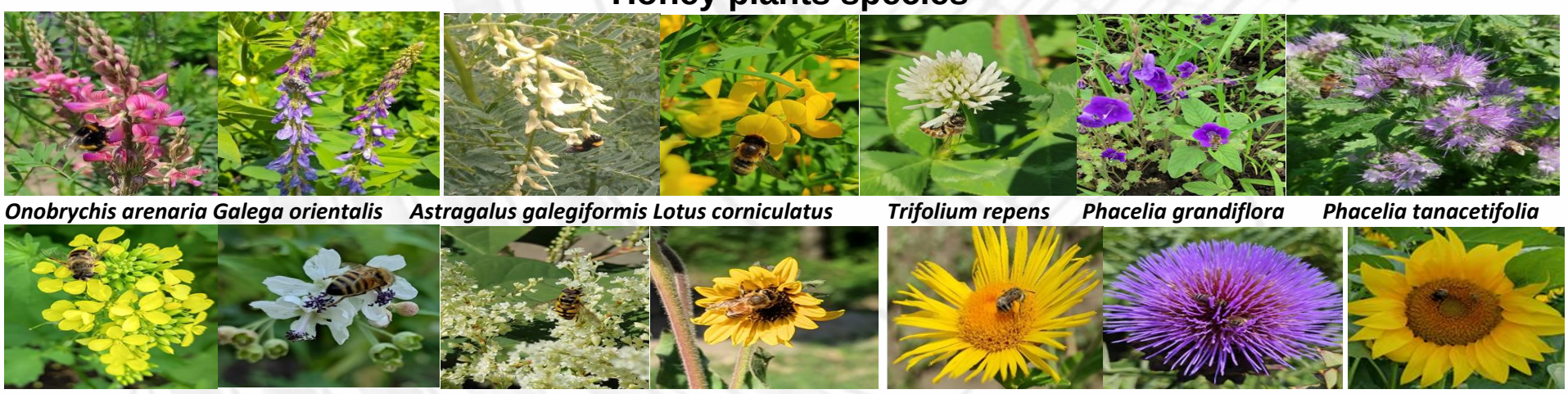
„Alexandru Ciubotaru” National Botanical Garden (Institute) Chisinau
National Agency for Research and Development, Republic of Moldova

Project Manager: Dr. Victor ȚÎȚEI

G

During the implementation of the research project (2020-2022), the collection of honey plants was founded, the collections of fodder and energy plants mobilized from different floristic regions were enriched with new taxa, the agrobiological peculiarities and quality indices were evaluated. Four new cultivars with multiple uses were registered in the Catalogue of Plant Varieties and patented by the State Agency on Intellectual Property of the Republic of Moldova; two cultivars of non-traditional crops were submitted for state testing and patenting. The results of scientific and innovative research were presented at 20 scientific events and 11 editions of international and national invention salons; 3 guides for agricultural producers were drafted and edited, and 70 scientific articles were published, including 2 articles in ISI journals and 26 articles in indexed journals from the Web of Science Core Collection databases, and were awarded 18 gold medals, 2 silver medals, 2 bronze medals and a 2 special prizes.

Honey plants species



Onobrychis arenaria *Galega orientalis* *Astragalus galegiformis* *Lotus corniculatus* *Trifolium repens* *Phacelia grandiflora* *Phacelia tanacetifolia*

Brassica nigra *Sida hermaphrodita* *Reynoutria japonica* *Helianthus mollis* *Inula helenium* *Cynara cardunculus* *Helianthus annuuss*



Solid fuel from energy crops



Medals and prizes



Forage from new and non traditional crops

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INTELLIGENT SYSTEM FOR OPTIMIZING THE APPLICATION OF PHYTOSANITARY TREATMENTS IN FIELD CROPS

Patent Application No. A-00712 / 2022

G

Gabriel GHEORGHE, Eugen MARIN, Dragoș MANEA, Carmen VASILACHI, Dragos ANGHELACHE
INMA Bucharest - ROMANIA

ABSTRACT:

The invention refers to an intelligent system for optimizing the application of phytosanitary treatments in field crops, intended for the landing, charging of batteries and the liquid tank of unmanned aerial vehicles (drones) for the application of phytosanitary treatments.

DESCRIPTION:

The majority of drone users for the application of phytosanitary treatments use the field around the crop in order to land, causing a lot of dust in the area, due to the currents produced by the drone, for filling the tank they use a classic system without precise dosage control and for the battery charging system most use a charging system using an electric generator.

The technical problem solved by the invention consists in creating a system that helps to optimize the process of using drones to apply phytosanitary treatments in field crops, by using a towed platform, which provides support for landing, energy independence and a semi-automated system for filling tank without coming into contact with the phytosanitary substance.

The system is made in the form of a platform and can be adapted for almost any model of drone to apply phytosanitary treatments in field crops.

The intelligent system for optimizing the application of phytosanitary treatments in field crops aims at the targeted application of fertilizers and herbicides with an unmanned aerial vehicle (drone) equipped with a spraying system above the crops and down to the soil level, which allows, simultaneously with a creation of air currents to lift and shake the plants, the efficiency of the work and on the underside of the leaves of the plants, not only on top of them. The unmanned aerial vehicle (drone) within the technology has a high stability fixed point system to take off and land vertically at a fixed point on a general purpose trailer that is equipped with a solution tank for refilling the drone's liquid tank and a charging station for the drone's batteries using a power generation system using photovoltaic panels to ensure the energy independence of the technology.

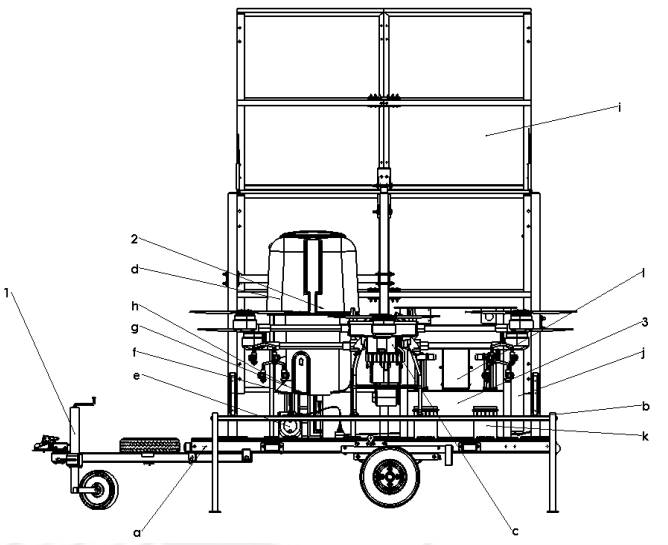


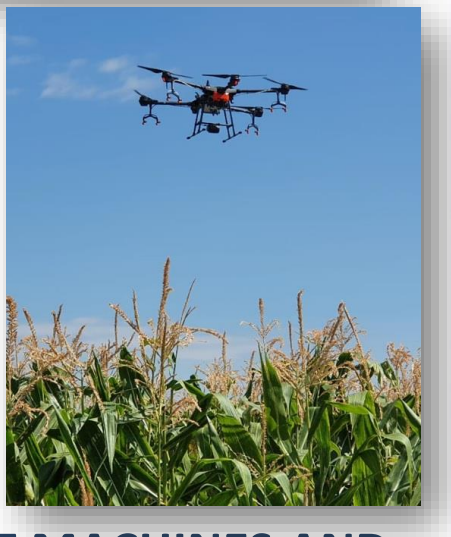
Fig.1 – General layout of the components



COMPONENTS:

The intelligent system for optimizing the application of phytosanitary treatments in field crops, according to the invention, consists in that it is composed of a subsystem (**1**) for transporting and landing the drone consisting of a general purpose trailer (**a**) with a folding platform (**b**) in order to land the drone (**c**), a subsystem (**2**) for filling the tank of substances of the drone from the large tank (**d**) by means of the pump (**e**) which is actuated by means of a level sensor (**f**) using a microcontroller (**g**) and a relay (**h**) and a subsystem (**3**) for charging the drone's batteries, consisting of photovoltaic panels (**i**), which are connected to an inverter (**j**) that charges the batteries (**k**) and, converting solar energy into electricity transmits it to the multi-charge hub of the drone's batteries (**l**) to provide operational independence to the drone.





CONCLUSIONS / ADVANTAGES:

The main advantages of the proposed solution are:

- ❑ reducing the risk of damage to the drone upon landing;
- ❑ reducing contact with the substance used in phytosanitary treatments;
- ❑ the use of renewable resources for the production of electric current instead of electric generators.

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BLACK-BOX FOR ELECTRIC VEHICLES WITH ENCRYPTED DATA STORAGE ON SD-CARD

Patent Application No. A-00690 / 2022

G

Perișoară Lucian-Andrei[(1)], **Matache Mihai[(2)],** Săcăleanu Dragoș-Ioan[(1)], **Voicea Iulian[(2)],** Dănișor Cosmin-Răzvan[(1)], Vasile Alexandru[(1)]
[(1)]University Politehnica Bucharest, [(2)]INMA Bucharest - ROMANIA

ABSTRACT:

The invention refers to an electronic device of the black box type, indestructible and infallible, which is mounted on an electric vehicle, and which allows the acquisition from the CAN (Controller Area Network) communication bus of the operating parameters of the ECU electronic control units (Electronic Control Units), as well as the encrypted storage of data on a high-capacity, non-volatile memory support such as an SD (Secure Digital) card, for further analysis, interpretation and diagnosis of the vehicle.

DESCRIPTION:

The technical problem that the proposed solution solves, according to the invention, consists in making an electronic device of the black box type for the acquisition and long-term encrypted local storage, on a high-capacity SD memory card, of the operating parameters of a electric vehicle, with the purpose of further analysis and interpretation of the acquired data.

Due to the long-term storage of data, the main application of the electronic black box device according to the invention can be predictive maintenance in the case of periodic vehicle overhauls or technical inspections. Other secondary applications can be determining the causes, context and dynamics of an accident, monitoring vehicle fleets, etc.

The black box electronic device, according to the invention, is customized for an electric vehicle, which has in its architecture many more electronic control units (electric motor controller, battery management system, battery charger, direct current power converters, etc.), which generates a larger volume of data, compared to a classic vehicle with a thermal engine.

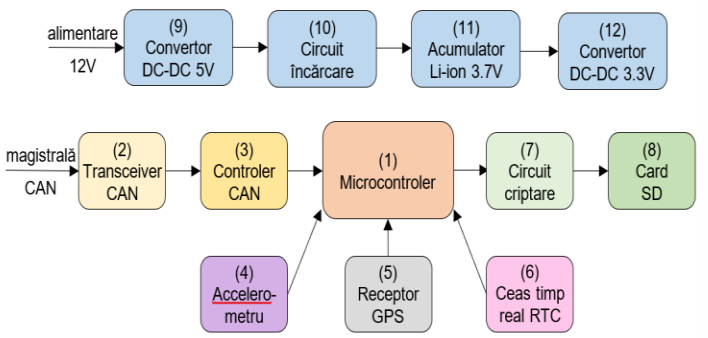

Fig.1. - Block diagram of black box electronic device with encrypted SD card data storage

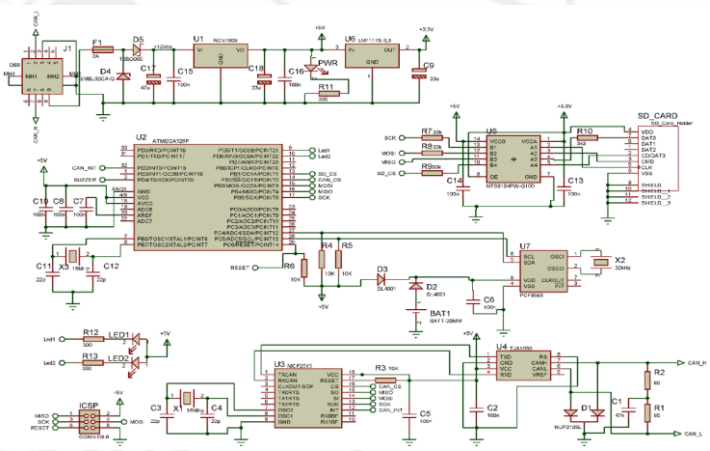

Fig.2. - Electronic circuit example for black box electronic module with encrypted SD card data storage.

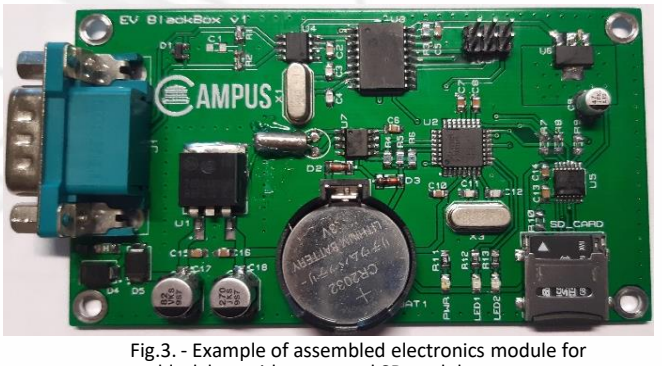

Fig.3. - Example of assembled electronics module for black box with encrypted SD card data storage

COMPONENTS:

The main component of the black box electronic device with encrypted data storage on the SD card is the central processing unit (**1**) of the microcontroller type, which receives messages from the CAN bus of the vehicle via the CAN transceiver (**2**), with the role of level conversion of voltage, and of the CAN controller (**3**), with the role of decoding and filtering CAN messages. After identifying the messages of interest, the microprocessor (**1**) decodes the operating parameters and states of the various electronic units of the electric vehicle, as well as the associated fault codes. By means of the accelerometer and gyro sensor (**4**), the microcontroller (**1**) identifies the acceleration and inclination of the vehicle with respect to the road. Using the GPS receiver (**5**), the microcontroller (**1**) identifies the location of the vehicle and receives the universal time. If the GPS receiver does not receive signals from the satellites, then the microprocessor (**1**) reads the time from the real time clock RTC (**6**). All information received from the vehicle via the CAN bus (**2**)-(**3**), from the accelerometer sensor (**4**), from the GPS receiver (**5**) and from the RTC clock (**6**) are multiplexed by the microcontroller, then encrypted and secured with a private key by means of the dedicated encryption circuit (**7**), finally being saved on the high-capacity non-volatile SD memory card (**8**). Powering the device from the 12V vehicle battery is provided both permanently and via the ignition key via two high efficiency 5V (**9**) and 3.3V (**12**) DC-DC converters. In the event of disconnection of the vehicle battery or faults in the supply circuit, the device is powered by means of a dedicated charging circuit (**10**) from an internal, rechargeable Li-ion 3.7V battery (**11**), which is recharged while the electronic device is powered.

CONCLUSIONS / ADVANTAGES:

The main advantages of this invention are:

- ❑ easy integration on any vehicle that has the CAN communication bus between the electronic control units, without the need to install dedicated sensors or cables for wired communication;
- ❑ ensuring the confidentiality, integrity and security of the data stored on the SD card, by using SHA-256 encryption algorithms, with a private key, known only to the interested parties;
- ❑ to store relevant data only in case of events of interest and not continuously, artificial intelligence algorithms (Machine Learning) are applied to detect only dangerous events that may endanger the life of the driver or other traffic participants;
- ❑ constructive simplicity, both in terms of hardware and software, leading to a low production cost.

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MOUNTING AND PROTECTION SYSTEM OF THE PHYTOSANITARY PRODUCT RECOVERY PANEL OF THE SPRAYING MACHINES FOR VINEYARDS

Patent Application No. A-00507 / 2022

G

Eugen MARIN, Dragoș MANEA, Marinela MATEESCU, Gabriel GHEORGHE
INMA Bucharest - ROMANIA

ABSTRACT:

The invention refers to a system for mounting and protecting the phytosanitary product recovery panel from vineyard spraying machines, intended in agriculture for carrying out phytosanitary treatments with spraying machines equipped with spray panels on both sides of the vine row.

DESCRIPTION:

Currently, there are various spraying machines equipped with a spraying system with panels placed on either side of the row of vines, through which the solution is sprayed from opposite sides, achieving a complete and effective treatment, and the excess substances trickle down these panels at the bottom, from where they are recovered and transferred back to the tank without losing a large amount of solution to the atmosphere or to the soil. All of these sprayers use pesticide recovery panels that are mounted on a support frame support bar using a screw, washer and nut clamp type fastening system.

The main disadvantage of these machines is that during operation, upon accidental impact with an obstacle, the recovery panels can be damaged. The technical problem that the invention solves is to create a system for mounting and protecting the phytosanitary product recovery panel that allows the easy mounting of some recovery panels on a supporting frame of the spraying machine, on the one hand and on the other another of the row of plants, without damaging them when they accidentally encounter an obstacle during the phytosanitary treatments in the vineyards.

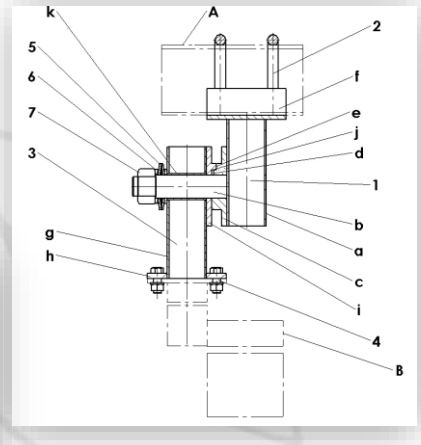

Fig.1 - Main view

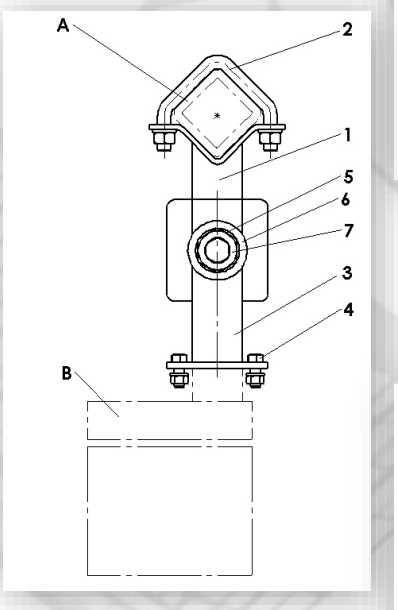

Fig.2 – General View – in working position

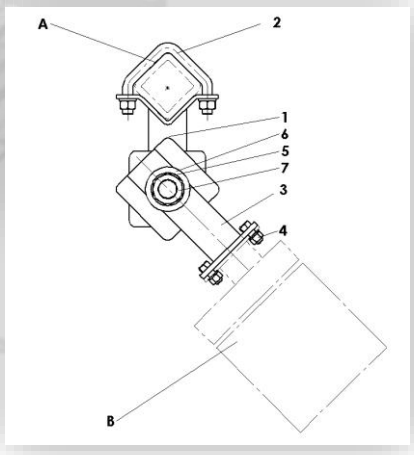

Fig.3 - General View -in position displaced by rotation when accidentally hitting an obstacle

COMPONENTS:

The mounting and protection system of the phytosanitary product recovery panel from the vineyard spraying machines according to the invention consists of a support (**1**) consisting of a pipe (**a**) which has a bolt (**b**) and a plate on the side (**c**) provided with an inclined profile (**d**) in which there is a clearance (**e**), and at the top another plate (**f**) for its rigid mounting on the frame (**A**) of the spraying machine with the help of clamps (**2**), another support (**3**) composed of another pipe (**g**) on which it is provided at the bottom with a flange (**h**) for mounting with known elements of screw-nut type (**4**) a recovery panel (**B**), and the upper side a plate (**i**) that has a protrusion (**j**) and a bushing (**k**) for the hinged assembly of the support (**1**) with the bolt (**b**) and fixed with some disc springs (**5**), some washers (**6**) and a nut (**7**).

In the working process, the support (**1**) is rigidly mounted on the frame (**A**) of the spraying machine with clamps (**2**), hinged in the bushing (**k**) of the support (**3**) with the bolt (**b**) and fixed due to the positioning of the protrusion (**j**) in the clearance (**e**) by the action of the disc spring assembly (**5**), washers (**6**) and nut (**7**). If there is an accidental impact with an obstacle of the recovery panel (**B**), the protrusion (**j**) moves by rotation on the inclined profile (**d**) of the support (**1**) leading to the rotation of the support (**3**) and implicitly of the recovery panel (**B**) protecting it from damage. After passing the obstacle, the axial forces developed in the disc springs (**5**) together with the weight force of the recovery panel (**B**) cause the protrusion (**j**) to rotate in the opposite direction on the inclined profile (**d**) and position itself in the clearance (**e**), thus leading to fixing the recovery panel (**B**) for the working position.

CONCLUSIONS / ADVANTAGES:

The advantages of this invention are:

- ❑ simple and easy assembly by a single operator;
- ❑ safety in exploitation;
- ❑ increasing the duration of operation.





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METHOD FOR MOBILIZING AND LOOSENING THE SOIL AND TECHNICAL EQUIPMENT FOR ITS APPLICATION

Patent Application No. A-00506 / 2022

Eugen MARIN, Dragoș MANEA, Marinela MATEESCU, Gabriel GHEORGHE
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ABSTRACT:

The invention refers to a process for mobilizing and loosening the soil and to a technical equipment for its application, intended in agriculture for the mechanized execution of cultivation works between rows of plants, by which the soil is dislocated, mobilized, overturned, mixed and loosened on desired depth in one pass.

COMPONENTS:

The technical equipment according to the invention consists of a frame (**1**), on which is mounted, with the help of a rotating support (**2**), an active working organ (**3**), which is placed on the direction of travel inclined at an angle (**α**) to the bottom of the furrow, being equipped with a cylindrical support shaft (**a**), a conical tip (**b**) arranged in the axial plane, a knife (**c**) with a continuous (smooth) edge arranged under a cutting angle (**β**) and angle of inclination (**γ**) with respect to the forward direction, one conical helical conveyor (**d**) with the constant pitch conical propeller generator, another conical helical conveyor (**e**) with the constant pitch conical propeller generator, the ends of which are in the same plane with the conical tip (**b**), a baffle (**f**) for directing the displaced soil layer and a clamping flange (**g**) with safety element, for transmitting the rotational movement (**h**) around its own axis from a hydraulic motor / electric (**4**), a suspension farm (**5**) on an agricultural tractor and a wheel (**6**) for support and adjustment of the working depth (**i**).

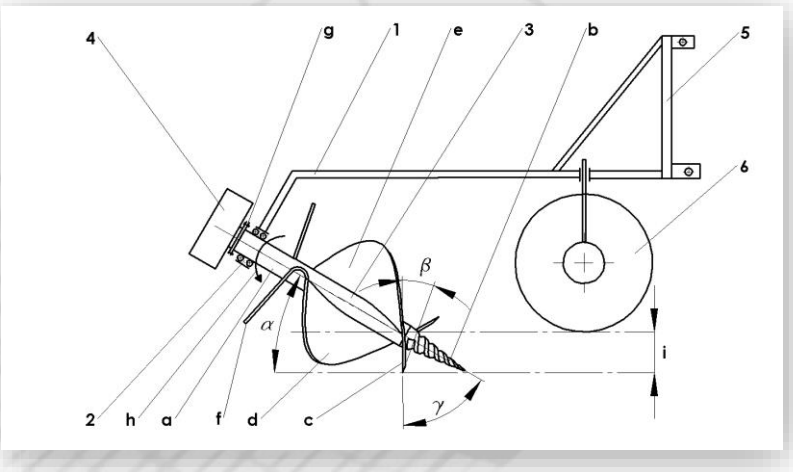

Fig.1 - Kinematic scheme of the technical equipment

In the working process, the conical tip (**b**) excavates the soil in the immediate vicinity of the knives (**c**) with the continuous (smooth) edge that cuts one layer of parallelepiped-shaped soil at a time, with the cross-section A-B-C-D and the thickness equal to the advance of the working organ (**3**), and moves the conical helical conveyor (**d**) and conical helical conveyor (**e**) along conical propeller generators to their upper part, where it detaches in the form of a parallelepiped and, under the influence of gravity, rotates around the side A-B, strikes the screens (**f**) where the soil fragment (**7**) will turn, consecutively occupying the position (**7'**) and finally, breaking away from the screen (**f**), will fall with the surface upper B-C at the bottom of the furrow, remaining with the lower face A-D on top and occupying the final position (**7''**), thus, from the respective soil fragments forming the expected layer and turned 180° of the cultivation process (**8**) of the soil.

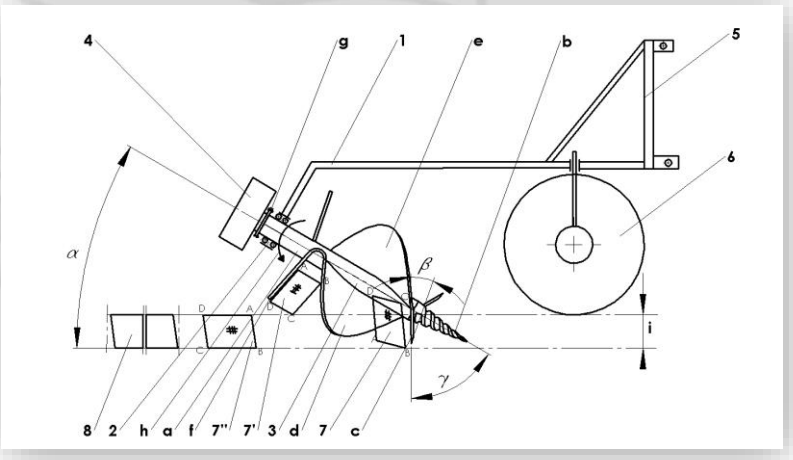

Fig.2 – Working diagram of the technical equipment

CONCLUSIONS / ADVANTAGES:

- ❑ increasing the process of water infiltration into the soil from precipitation and/or irrigation;
- ❑ increasing the capacity of the soil to store and preserve water;
- ❑ increasing the ability of plant roots to easily access the necessary nutrients from the soil, so that they can absorb them adequately;
- ❑ increasing organic matter and nutrients in the soil;
- ❑ reduction of traction resistance due to the drive of the working body.

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CUTTING APPARATUS FOR LARGE HEMP STEMS

Patent Application No. A-00270 / 2022

G

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Valentin VLĂDUȚ[(1)], Mihai MATACHE[(1)], George BUNDUCHI[(1)],
Diana-Lorena POPA[(2)], Victoria-Larisa IVAȘCU[(3)], Lucian-Ionel CIOCA[(4)], Mihai NICOLESCU[(5)]
**[(1)]INMA Bucharest, [(2)]ICDA Secuieni - Neamț, [(3)]University Politehnica Timișoara,
[(4)]University "Lucian Blaga"-Sibiu, [(5)]Academy of Agricultural and Forestry Sciences-Bucharest**

ABSTRACT:

The technical problem that the invention solves consists in the design of an efficient equipment that performs the cutting of hemp stalks - especially large sections with lignified part at the bottom of the stalks -using a system consisting of 2-5 chain saws with applied teeth and guide rail.

DESCRIPTION:

The tensioning of the saw chain is done with a tensioner and its drive is done with a special sprocket for the chain and a spindle on which is mounted and a sprocket for a toothed belt transmission between each of the 3-5 chain saws. The entire system is driven by an appropriately sized hydraulic motor and drive belt.

COMPONENTS:

The cutting device for hemp stalks, according to the invention shown in figures 1-6, consists of a support (1) on which a number of 2-5 cutter subassemblies (2) with saw chain (3) are mounted in series and special guide rail (4), the saw chain (3) is driven by a pinion (5) mounted on a shaft (6). The tensioning of the saw chain (3) is done with a tensioner (7) which consists of the bolt (8) mounted solidly with one end on the support (1) and the other end of the bolt (8) has a threaded hole through which the adjustment (9) which is positioned in the plate (10) which is mounted with two screws on the special chain guide rail (4).

The saw chain (3) has semi-chisel teeth that generate low vibration, providing an aggressive cutting edge that stays sharp for a long time. By turning the adjustment screw (9) and locking it with the nuts (11), the saw chain (3) is stretched. A hydraulic motor (12) is used to drive the cutter subassemblies (2) and transmissions with toothed belts (13) and pinions (14) integrally mounted on the axles (6) which drive the pinions (5) which are connected to the saw chains (3). To stretch the toothed belts (13), tensioners (14) are used, which are made up of rollers (15) mounted in the axles (16) and supported by adjustable supports (17) that are locked with some screws (18), the rotation being carried out around the bolts (19). A cover (20) mounted on the support (1) is used to protect the entire system. The hydraulic power for the hydraulic rotary motor (12) is received from a hydraulic group driven by the cardan shaft of a tractor. This cutting machine system is mounted on a height-adjustable stand of a tractor with a power of at least 80 HP.

The cutting machine is equipped with an oil pump driven by the hydraulic motor and thus the lubrication of the saw chain (3) is ensured through some holes made in the guide rail (4) and which are not shown in the sketches. The special guide rail has a specific constructive form to allow:

- retention of chain oil; thus, with each pass of the drive sprockets the oil is dispersed around the guide rail and chain;
- lubrication hole construction effectively injects oil into the saw chain during cutting to improve lubrication and reduce the likelihood of hole clogging.

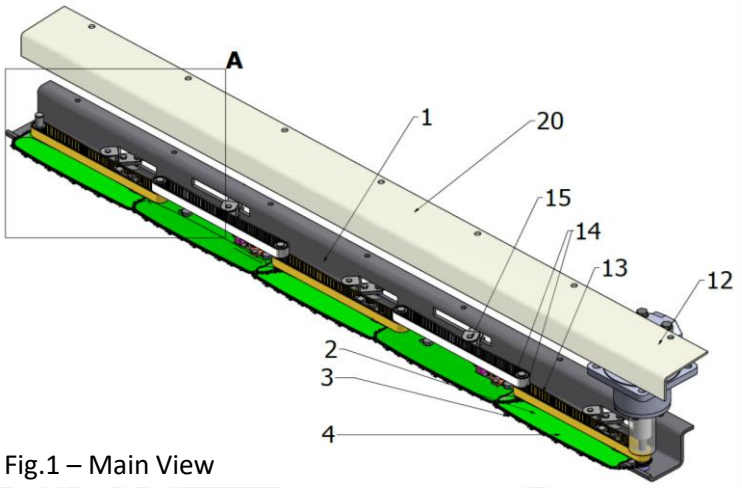
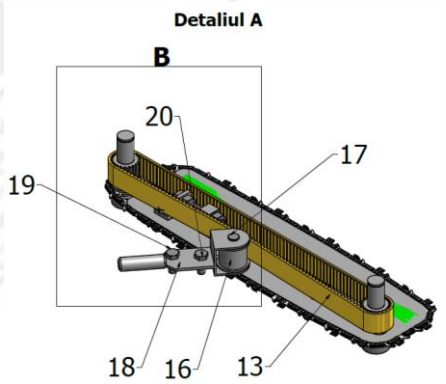
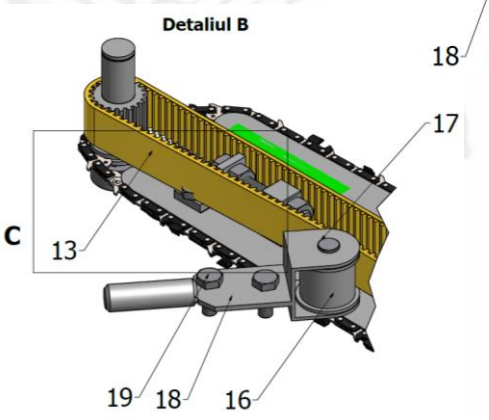
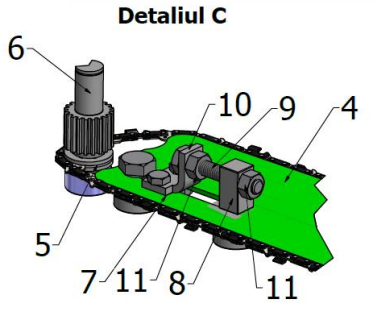


Fig.1 – Main View









CONCLUSIONS / ADVANTAGES:

- ❑ it is a robust equipment,
- ❑ low manufacturing costs
- ❑ allows the cutting of hemp stems with large sections and which have a lignified stem;
- ❑ becomes operational in a short time – basically, it just need to be connected to a properly sized hydraulic power source;
- ❑ it has a safe and robust construction that works without jams.

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AUTOMATED AND ENERGY INDEPENDENT VENTILATION SYSTEM FOR AQUATIC POOLS

Patent Application No. A-00237 / 2022

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ABSTRACT:

The invention refers to an automated aeration system by micro-diffusion of air in the water of concrete aquariums or natural ponds in the ground, in order to achieve the growth of edible fish in a controlled environment, with an appropriate aeration-oxygenation of the growing water, allowing a unitary growth of fish species that are raised in a polyculture system, using a wind-photovoltaic renewable hybrid source for power supply.

DESCRIPTION:

The main disadvantage of the already existing solutions is that, although these installations essentially carry out the aeration-oxygenation operation of the pool water, they produce a wave-like current, which is often harmful for the activity of feeding the fish material in the pool and with harmful effects on the shore, especially at the natural earth slopes.

Another disadvantage of the existing systems is the fact that these systems are quite high consumers of electricity and, not having the possibility of automated remote control, they have a continuous operation, even if the dissolved oxygen requirement of the water has reached a level sufficient for a proper growth of the fish stock.

COMPONENTS:

The technical problem that the proposed solution solves, according to the invention, consists in creating an automated and energy-independent aeration system for aquatic pools by microdiffusion of the air coming from an air intake pump and passing it through a High Density Polyethylene pipe (PEHD), which can be placed both in the depth of the pool and on its surface.

The air supplied by the air pump is passed through the PEHD pipe, and the air-water micro-diffusion takes place through specific aeration stone nozzles, with a maximum size of Ø216x26 mm, which can ensure a very fine distribution of air in the pool water, to achieve superior aeration. A dissolved oxygen sensor is mounted in the aquarium to continuously have data on the oxygen concentration in the water, which is linked to a PLC automated command and control system, which is set by the operator to turn on sequentially whenever it is need air pump.

The entire system is powered by a mixed renewable energy source consisting of a wind vane and a photovoltaic panel system. Depending on the location, a power supply from a single renewable source can be achieved, but in the framework of the invention a hybrid system is used, which compensate each other in a beneficial way, knowing that the big problem in the aquaculture field is energy consumption very high, which also determines a high final cost of fish material developed in this sector of activity.

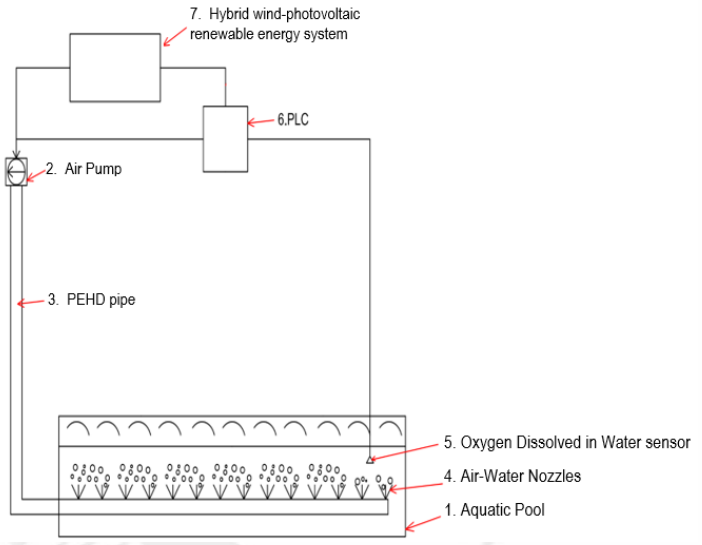

Fig.1 – System Operation Diagram



Aeration - Oxygenation System

CONCLUSIONS / ADVANTAGES:

- constructive simplicity;
- safety in operation;
- ease of use and performance;
- the possibility of increasing fish stock without energy consumption from conventional sources, with the possibility of reducing the production cost of fish stock,- optimal growth yields of fish material, by ensuring an optimal amount of oxygen in the water, leading to the reduction of mortality caused by oxygen deficits,
- the supply of oxygen constantly and without large differences in concentrations significantly improves the water quality of the aquatic basins, thus reducing water loss.

ACKNOWLEDGEMENT:

This work is financed by Project no. PN 19 10 02 03 Contract no.: 5N/07.02.2019-AA NO. 8/2022: "*Research on intensive fish farming in a polyculture system and complex utilization of aquatic bioresources (plants)*".

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HEMP SEED CONDITIONING EQUIPMENT

Patent Application No. A-00236 / 2022

European Patent Application No. 22020413.5 / 2022

Gheorghe STROESCU, Mihai OLAN, Anișoara PĂUN,
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G

ABSTRACT:

The invention relates to an equipment for conditioning hemp seeds used mainly on experimental plots belonging to specialized agricultural research stations. The technical problem solved by the invention consists in the design of an equipment that performs the threshing of the hemp inflorescences harvested at maturity and the separation of the impurities from the mass of beaten seeds. Conditioned seeds can be used as seed material or for extracting hemp oil.

DESCRIPTION:

The Hemp Seed Conditioning Equipment eliminates the disadvantages of the known solutions as it consists of a movable support provided with wheels for movement and a processing module consisting of the housing in which some drums are mounted by means of front bearings. Underneath these drumsticks are mounted countertops that are adjustable in distance from the drumsticks, with the help of axes and adjusting rods, which are positioned on supports. After adjusting the distances between the counterblenders and the blenders, the axles of the counterblenders are locked in the working position on some channels made in the equipment housing, with the help of nuts and washers.

After this technological stage, the seeds are taken over by a vibrating sieve for sifting and a pneumatic separator composed of the separation chamber, an axial fan and a cyclone with an air filter bag and a bag for collecting waste in the form of fine powder resulting from the process of vibrating and sifting. The selected hemp seed will be collected in a tank mounted under the pneumatic separation chamber.

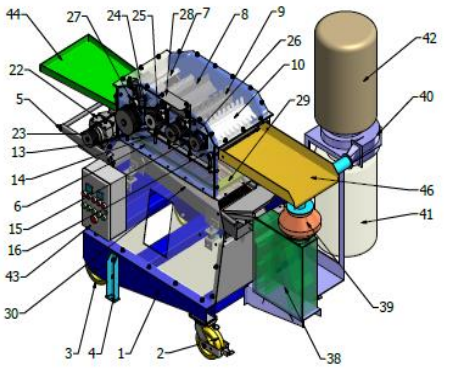

Fig.1

COMPONENTS:

The ***equipment for conditioning hemp seeds***, according to the invention shown in Figures 1-5, consists of a movable support (**1**) which is provided with two self-locking adjustable wheels (**2**) and two fixed wheels (**3**). Two adjustable legs (**4**) are used to lock the equipment in the working position on the floor and a handle (**5**) is used to move the equipment. A processing module consisting of the housing (**6**) is fitted on the support (**1**) in which drums (**7**), (**8**), (**9**) and (**10**) are mounted by means of bearings (**11**) and (**12**). Underneath these drumsticks (**7-10**) are mounted some countersinks (**13**), (**14**), (**15**) and (**16**) which are adjustable in distance from the drumsticks by means of axes (**17**) and adjusting rods (**18**) which are positioned on supports (**19**). After adjusting the distances between the counterblenders and the blenders, the shafts (**17**) are locked in the working position on channels made in the housing (**6**) by means of nuts (**20**) and washers (**21**).

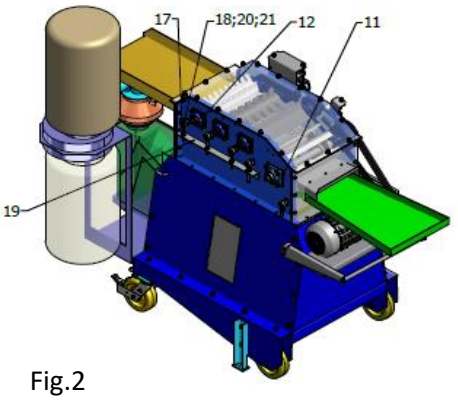

Fig.2

The drums are driven by an electric gear motor (**22**) which is properly sized and which transmits the rotational motion by means of a V-belt drive (**23**) to the drum (**7**) and of some belt drives (**24**), (**25**) and (**26**) on the drums (**8**), (**9**) and (**10**). The tension of the drive belts is made with special tensioners (**27**) and (**28**). Under the housing (**6**) is a frustoconical tank (**29**) which discharges the mixture of seeds and hemp powder into a vibrating sieve (**30**) which is actuated by a motor vibrator (**31**) and which is inclined towards the end of the discharge by means of rubber pads (**32**) and threaded rods (**33**), nuts (**34**) and Grower washers (**35**) of supports (**36**) of the movable support (**1**). The selected sieve product (**37**) is discharged into the pneumatic separator consisting of the separation chamber (**38**), an axial fan (**39**) and a cyclone (**40**) with a textile air filter bag (**41**) and a bag (**42**) made of plastic material for waste collection in the form of a fine powder resulting from the process of beating and sifting by vibration. The selected hemp seed will be collected in a tank mounted under the separation chamber (**38**) of the pneumatic separator. The control of the gear motor (**22**), the motor vibrator (**31**) and the axial fan (**39**) is done through an electrical panel (**43**). The equipment for conditioning hemp seeds is equipped with a feed hopper (**44**) and a discharge hopper (**45**).

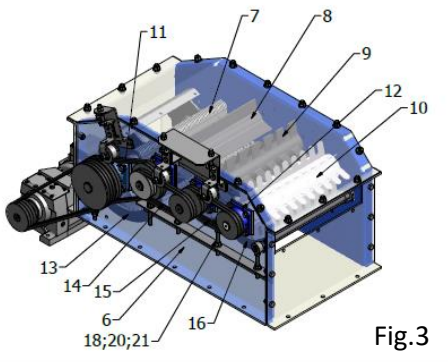

Fig.3

CONCLUSIONS / ADVANTAGES:

- ❑ it is a small equipment, with a low execution price but which performs all the necessary operations for the conditioning of hemp seeds, hemp inflorescence threshing, separation of impurities from hemp seeds;
- ❑ the equipment becomes operational in a short time, basically only needs to be connected to the properly sized power source;
- ❑ it is a mobile device that can be used in various locations, depending on needs;
- ❑ it has a secure and robust construction that works without blockages.

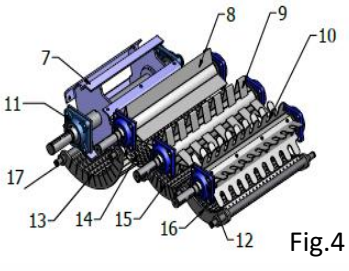

Fig.4

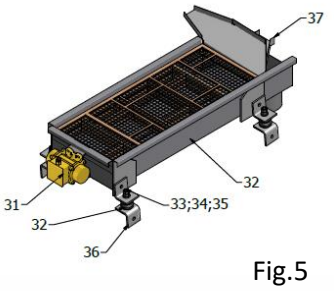

Fig.5

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FISH FEED PELLETIZER WITH INTEGRATED SPRAYING KIT FOR ADDED INGREDIENTS

Patent Application No. A-00664 / 2021

Iulian VOICEA, Valentin VLĂDUȚ, Gabriela MILIAN,
Cătălin PERSU, Dan CUJBESCU, Iuliana GĂGEANU
INMA Bucharest – ROMANIA

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ABSTRACT:

The invention refers to a fish feed pelletizer with an integrated additive kit by spraying liquid additives in order to increase the nutritional quality of the food produced (pellets - fish feed) as well as to increase their durability / completeness over time.

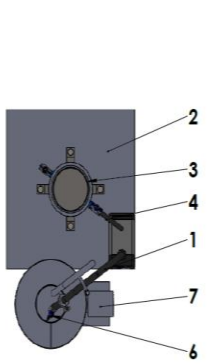
DESCRIPTION:

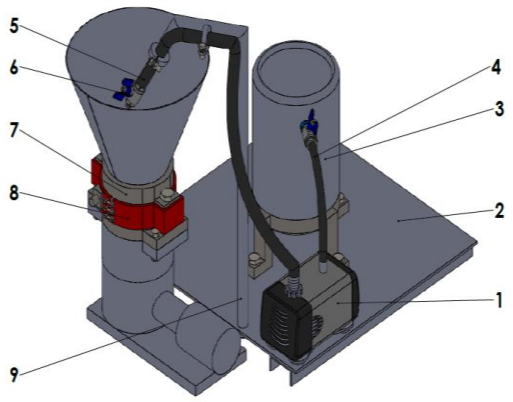
Currently, the equipment for pelletizing / granulating fish material has the ability to make pellets / granules for feeding fish with optimal nutritional properties, but the recipe mixture is additionally made by integrating into the technology to obtain homogenization systems independent of compaction / pelletizing operation.

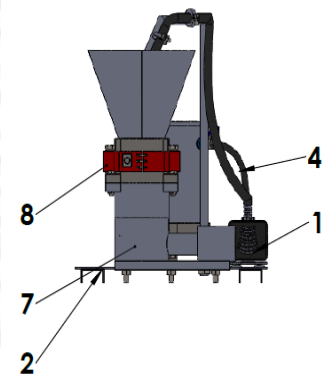
The main disadvantage of the already existing solutions consists in the fact that these installations carry out the sequential control of the homogenization and correct additive process of the fish feed mixture recipes, and some part of the additive material until the extrusion / pelletization process loses part of its nutritional or conservation value of the finished product made, the phenomenon of evaporation over time or even catalytic oxidation due to the time until the pelletizing operation takes place.

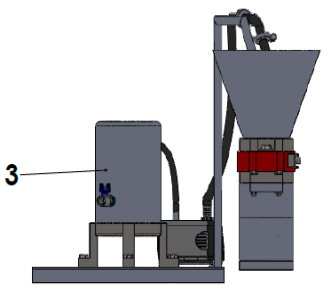
Another disadvantage is the fact that the integration into the manufacturing technology of specialized equipment for the homogenization of powdery and liquid materials leads to a high energy cost and implicitly to a significantly higher final cost of the finished product.

The technical problem that the proposed solution solves, according to the invention, consists in making an integrated kit for the direct addition by spraying of the raw materials that enter the manufacturing process of feed pellets for feeding fish. Thus, a system of distribution-spraying of raw materials and liquid additives adjacent to a classic fish feed pelletizer was created.









COMPONENTS:

The spraying distribution system of the liquid additives included in the manufacturing process of feed pellets for fish material in the aquaculture sector with the help of the experimental pelletizing model consists of: a pump with a liquid additive mixing bowl and a nozzle distribution-spraying system. A nozzle is used that allows the distribution of liquid additives in very fine microparticles that allow their easy integration into the powdery material, usually a mixture of cereal flour.

The mixture made in this way at the feed hopper of the feed pelletizer enters directly into the manufacturing cycle without material loss or the possibility of denaturation through oxidation over time.

The system consists of:

- (1) - additive spraying system subassembly consisting of pump,
- (2) - pump support subassembly and bowl,
- (3) - additive bowl,
- (4) - pump suction,
- (5) - pump discharge,
- (6) - faucet-nozzle subassembly,
- (7) - the pelletizing system subassembly,
- (8) - heating mantle,
- (9) - spray support subassembly.

CONCLUSIONS / ADVANTAGES:

The equipment has the following advantages:

- ❑ - constructive simplicity;
- ❑ - safety in operation;
- ❑ - ease of use and performance;
- ❑ - the possibility of making feed pellets for fish farming at a lower production price due to the elimination of the classic homogenization phase in the pelletizing / granulation technology.

NATIONAL INSTITUTE FOR RESEARCH - DEVELOPMENT OF MACHINES AND INSTALLATIONS DESIGNED FOR AGRICULTURE AND FOOD INDUSTRY - INMA
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METHOD OF TREATMENT OF AURICULAR MANGE AT RABBITS

ISPBZMV

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Patent: s 2021 0087 from 2021.10.08

Authors: MOSCALIC Roman, CARAMAN Mariana, MASHNER Oleg, PETCU Igor, LUPASHCU Tudor, EFTENIUC Iulia, COJUSHNEANU Oleg

Description: The invention provides for the spraying on the surface of the auricular pinna or in the auditory canal affected by mites of the rabbit of a ecological curative liniment LEC 5.0%, obtained by mixing 5 g of water-soluble enotannins (Enoxil), obtained by oxidizing enotannins with hydrogen peroxide, 40 ml of glycerin and 60 ml of water. Enoxil was obtained from tannins from grape seeds of the black Fraga variety, through the depolymerization process of enotannins. The result of the invention consists in ensuring an acaricidal, bactericidal, regenerative action of the preparation used and reducing the duration of the treatment.



Way of ussage: To obtain the curative effect, only one administration of LEC 5.0% liniment with 1-3 sprays is sufficient, depending on the degree of affection of the auricle and the auditory canal.



Advantages of LEC 5.0% liniment:

◄ecological
◄efficient
◄cheap
◄has no side effects
◄no waiting time for meat







The research was carried out within the project 20.80009.5107.12 Strengthening the "food-animal-production" chain by using new feed resources, innovative methods and schemes of health care.

Contact: v. Maximovca, d. Anenii Noi, MD-6525, tel./fax: (022) 359-350, e-mail: izmv56@mail.ru

DEVICE FOR ARTIFICIAL INSEMINATION OF SHEEP AND GOAT

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ISPBZMV

Patent: MD 4715 C1 din 2021.05.31

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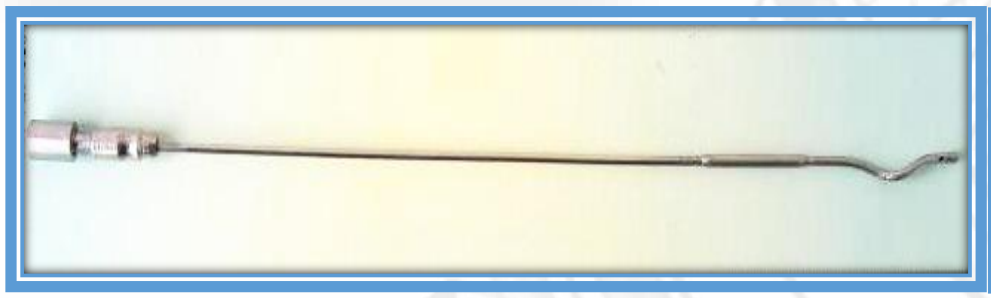
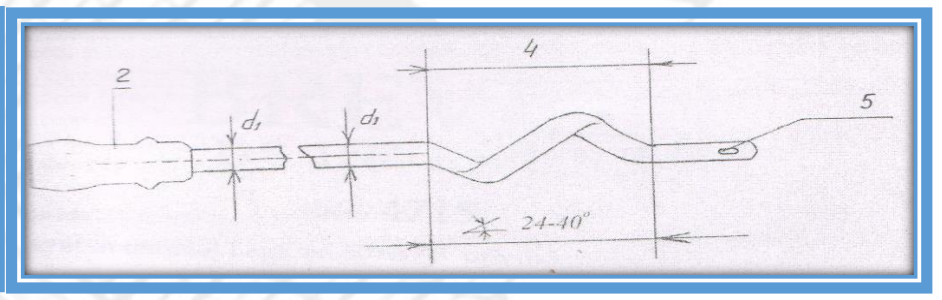
Authors: DARIE Grigore, Vacevschii Serghei, BRADU Nina, DJENJERA Irina, OSIPCIUC Galina, MAȘNER Oleg

Description. The device, according to the invention, comprise a body of a length of 230…235 mm, made of stainless steel, assembled from a cannula (2) for fixing the syringe with seminal material, a rod (1) and a spiral tip (4), the outer diameter d_1 of which is 1.6 mm, connected by means of a sleeve (3) with an outer diameter d_2 of 1.8 mm, at the same time, a lateral hole is made at the end of the spiral tip, the angle of inclination of the spiral tip is 24 ... 40˚, its length is 30 ... 32 mm, and the number of turns of the curved part of the tip is 1.5…1,7.







Way of ussage. The syringe with seeding material is attached to the cannula 2. The genital tract of the sheep or goat is opened by vaginal mucus. The free end of the device is inserted into the cervical canal by gentle clockwise rotation movements and in the opposite direction of the slight movement, thus allowing penetration into it at a depth of 2.5...3 cm, after which, by pressing the piston of the syringe, the material to be seeded is deposited.

Advantages:

√ the spiral-shaped tip allows atraumatic penetration of the cervical canal to the required depth;

√ the device is made of stainless steel, resistant to mechanical, thermal and chemical influences during seeding, cleaning, sterilization and transportation.



The research was carried out within the project 20.80009.5107.12 Strengthening the "food-animal-production" chain by using new feed resources, innovative methods and schemes of health care.

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Compound feed for broilers

Patent decision 4.2/87 din 30.06.2022

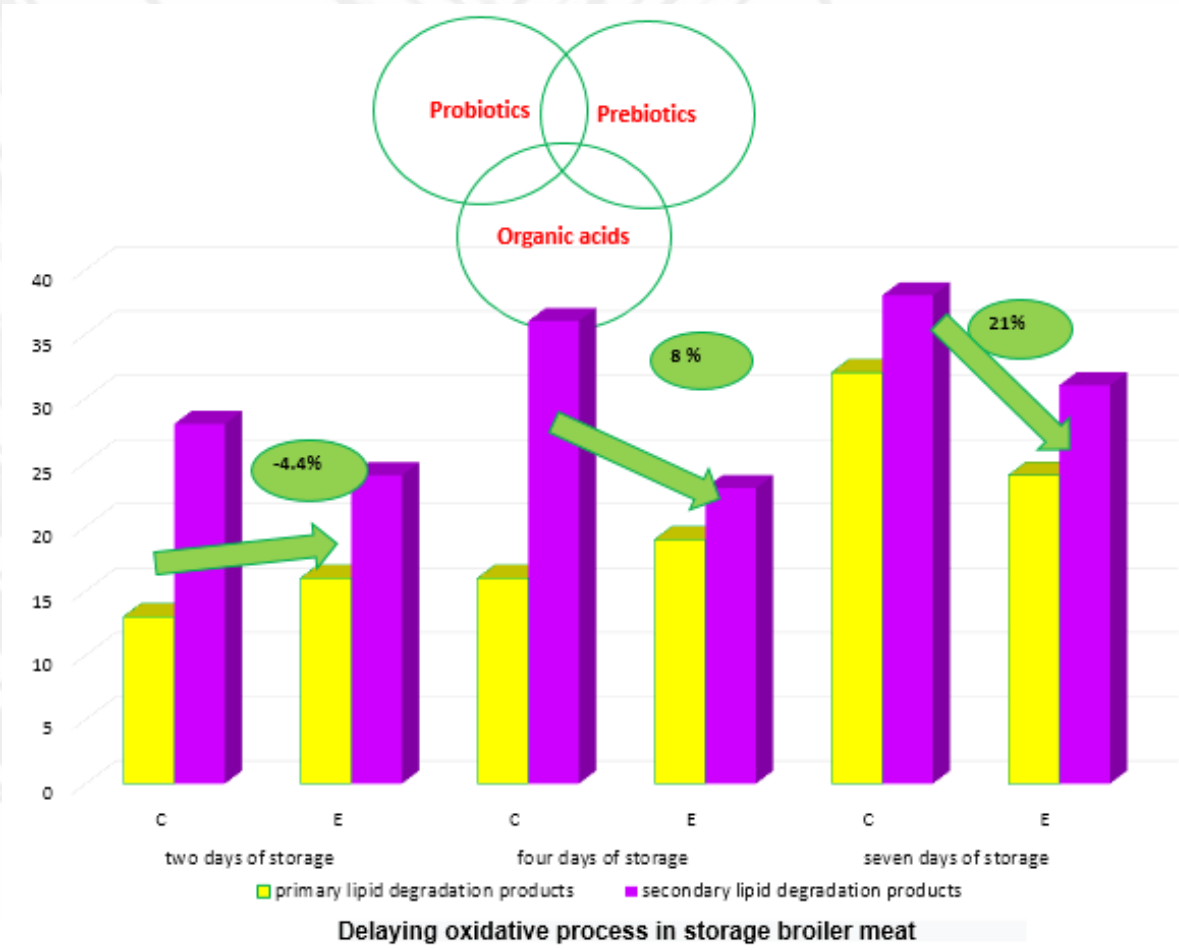
UNTEA Arabela Elena, PANAITE Tatiana Dumitra,
PANAITE Cristinel, OLTEANU Margareta

G

The invention refers to a combined feed supplemented with prebiotics, probiotics and organic acids for broiler chicks raised in an intensive system. By using the combined feed presented in broilers' diets, a delayed effect is obtained in the oxidation of lipids from the muscular structure, leading to foods of animal origin (chicken meat) with increased nutritional quality.

Ingredients	Starting phase	Growing phase	Finishing phase
Corn	52.09	53.63	52.05
Soybean meal	38.70	36.79	38.7
Vegetal oil	3.06	4.34	3.06
Concentrate 5%	5.00	5.00*	5.00*
Pre/probiotics	1	1	1
Organic acids	0.15	0.15	0.15

The technical problem that the invention solves consists in removing the disadvantages brought by the use of synthetic antioxidants in the mineral premixes of the combined feeds for broiler chickens, by using natural supplements, capable of stimulating the endogenous antioxidant mechanisms of the animals.



Delaying oxidative process in storage broiler meat

Contact: Arabela Elena Untea

arabela.untea@ibna.ro

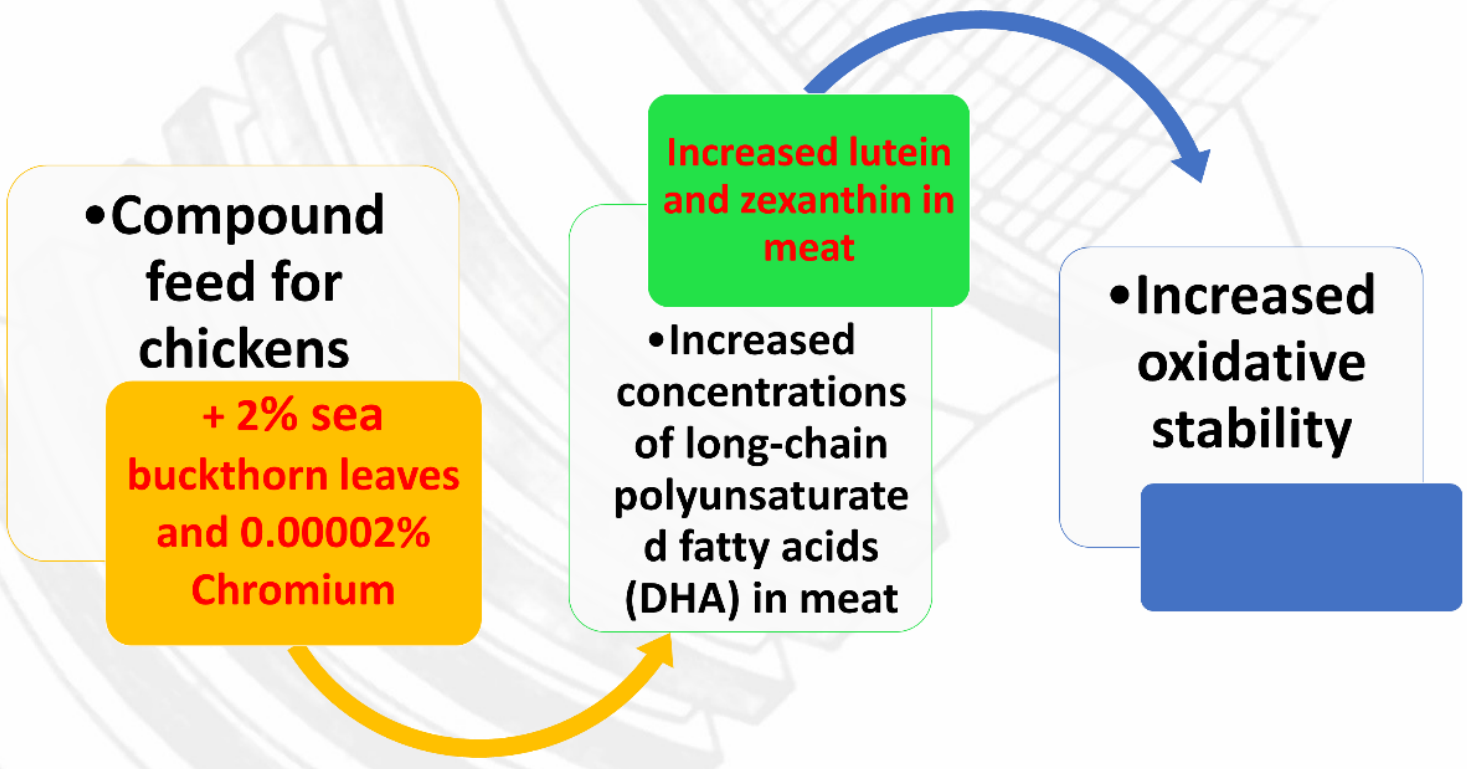
Compound feed for chickens (28-42 days) whose structure contains compounds with antioxidant potential

Patent A/00348/ 20.07.2022

SARACILA Mihaela, UNTEA Arabela Elena, PANAITE Tatiana Dumitra, VARZARU Iulia, TURCU Raluca Paula, VLAICU Petru Alexandru, OANCEA Alexandra, ROPOTA Mariana

G

Enriching the nutritional quality of chicken meat is an intensely debated field of research, especially in the current conditions where some foods are seen as food medicine. More and more, there is a trend to replace food supplements purchased from pharmacies with natural sources that are a regular part of the human diet in order to provide him with the daily requirement of nutrients. Fatty acids mainly long-chain polyunsaturated fatty acids (LC-PUFA), carotenoids, polyphenols, minerals and vitamins are the most studied nutrients suitable for meat enrichment. But the enrichment of meat with nutrients such as fatty acids can also bring some disadvantages, such as the acceleration of lipid oxidation, which negatively affects their quality and shelf life. Considering the above, a new feed compound is necessary to be able to obtain chicken meat with improved nutritional properties.



The invention refers to an innovative compound feed (28-42 days) for broilers containing the addition of 2% sea buckthorn leaves and 0.00002% Chromium. The compound feed provides consumer health benefits by increasing the concentrations of long-chain polyunsaturated fatty acids (DHA), lutein and zeaxanthin in chicken meat under conditions of increased oxidative stability.

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Compound feed for broilers, enriched in PUFA and natural antioxidants

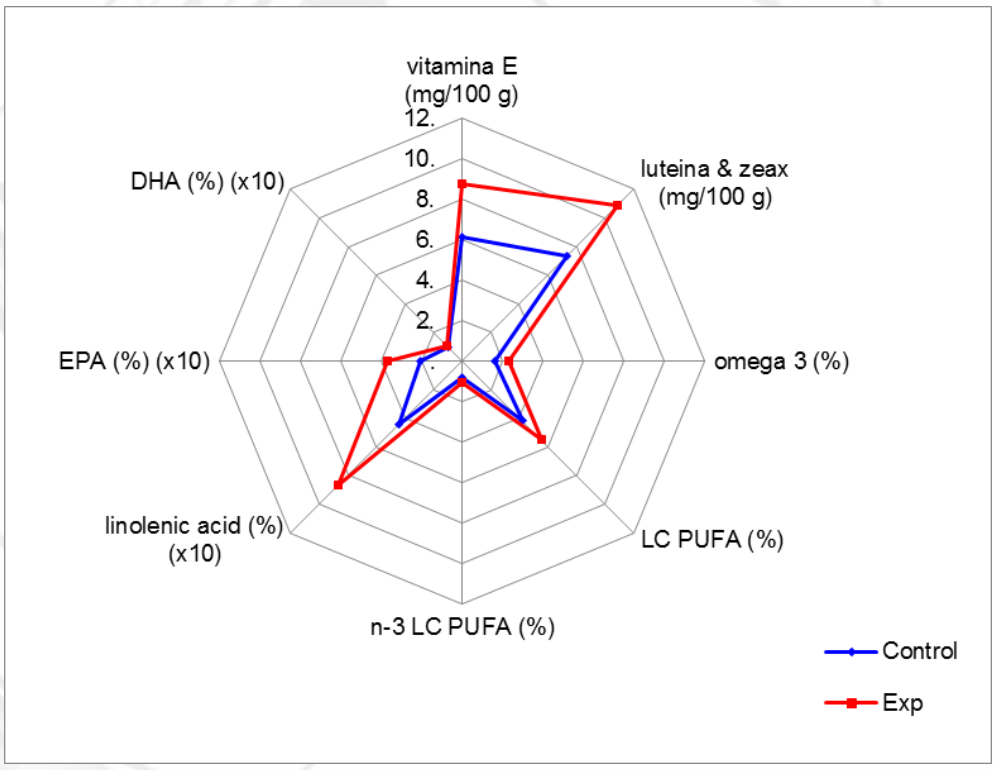
Patent A/00789 din 27.11.2020

UNTEA Arabela Elena, PANAITE Tatiana Dumitra,
VARZARU Iulia, TURCU Raluca Paula,
SARACILA Mihaela, OANCEA Alexandra

G

The invention refers to a new feed recipe for broilers, enriched in polyunsaturated fatty acids and antioxidant compounds by including two phytoadditives: walnut meal and cranberry leaves. The feed composition offers the possibility of obtaining food products rich in omega 3 (chicken meat) and with an extended shelf life.

The technical problem that the claimed invention solves consists in the use of a new feed composition for broilers (28-42 days) with the aim of improving the nutritional quality of chicken meat (increasing the concentration of polyunsaturated fatty acids) under conditions of oxidative stability raised.



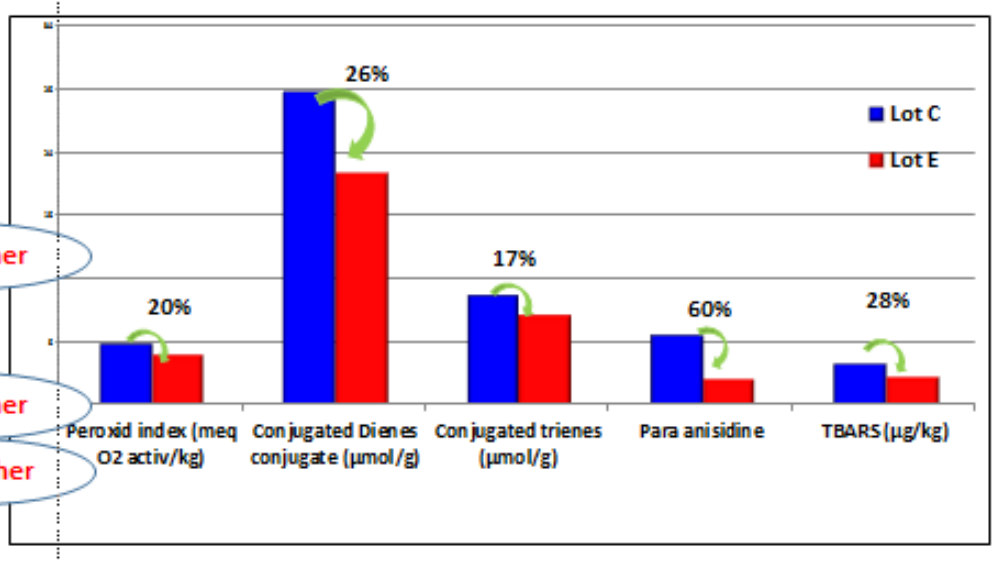
The effect of the new feed structure on nutritional quality and oxidative stability of meat

	Control group	Exprim. group
	Fatty acids (g % g FAME)	
SFA (%)	31.11a	29.26b
MUFA (%)	36.56a	31.23c
PUFA (%)	31.99c	38.98a
n-3 (%)	1.59d	2.32a
n-6 (%)	30.32c	36.47a
n-6/n-3	19.08a	15.73b
	Liposoluble antioxidant compounds	
Vitamin E (mg/kg)	61.52	87.60
Lutein and zeaxanthin (mg/kg)	0.735	1.088

46% higher

42% higher

48% higher



Contact: arabela.untea@ibna.ro

Compound feed for the growth phase of chickens raised in high-heat stress

Patent decision no. 4.2/ 89 30.06.2022

CRISTE Rodica Diana, PANAITE Tatiana Dumitra, TABUC Cristina, VLAICU Petru Alexandru, SARACILA Mihaela, OLTEANU Margareta, TURCU Raluca Paula, PAPUC Puia Camelia

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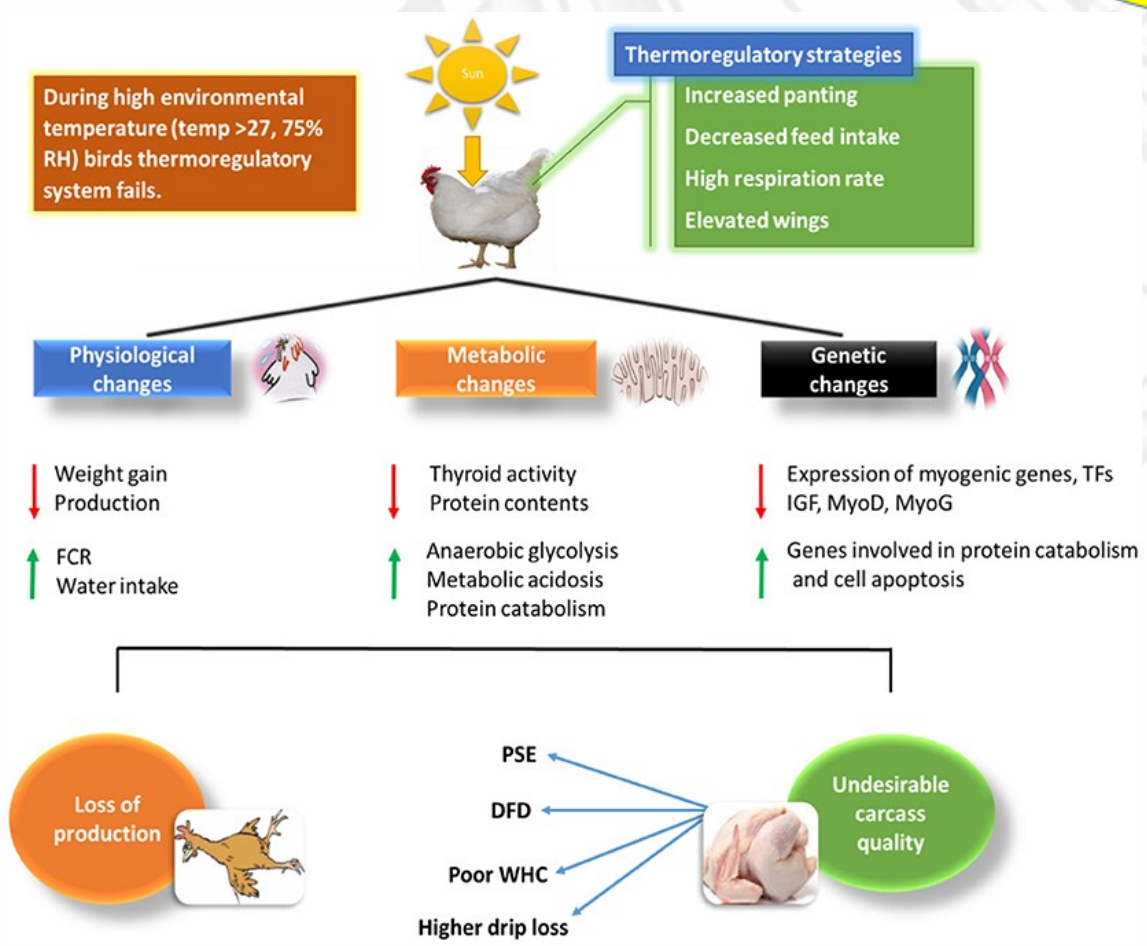
Maintaining the balance of the intestinal microflora is an essential condition for meat production and the use of conventional feed compounds is the second disadvantage caused by the ban on the use of antibiotics as growth promoters in poultry feed (January 1, 2006, EC regulation No 1831/20031). In this context, feeding broilers with new compound feed that respond to the limitations imposed by certain specific growth situations, is the natural way with a direct effect in reducing economic losses by maintaining the health of the digestive tract and research on this topic has become a priority in the field zootechnical research.



The patent (compound feed) represents a nutritional solution for mitigating the adverse effects of high heat stress on performance and on the balance of the intestinal microflora.



The invention refers to a feed compound for the growth phase of broilers raised in high heat stress that contains 1% powder and 0.005% Artemisia annua oil. The compound feed for the growth phase of broilers raised in heat stress is characterized by: 87.94% dry matter; 22.32% crude protein; 4.98% crude fat; 4.03% cellulose; 6.63% ash; 3,140.03 kcal/kg metabolizable energy.

Contact: Mihaela Saracila

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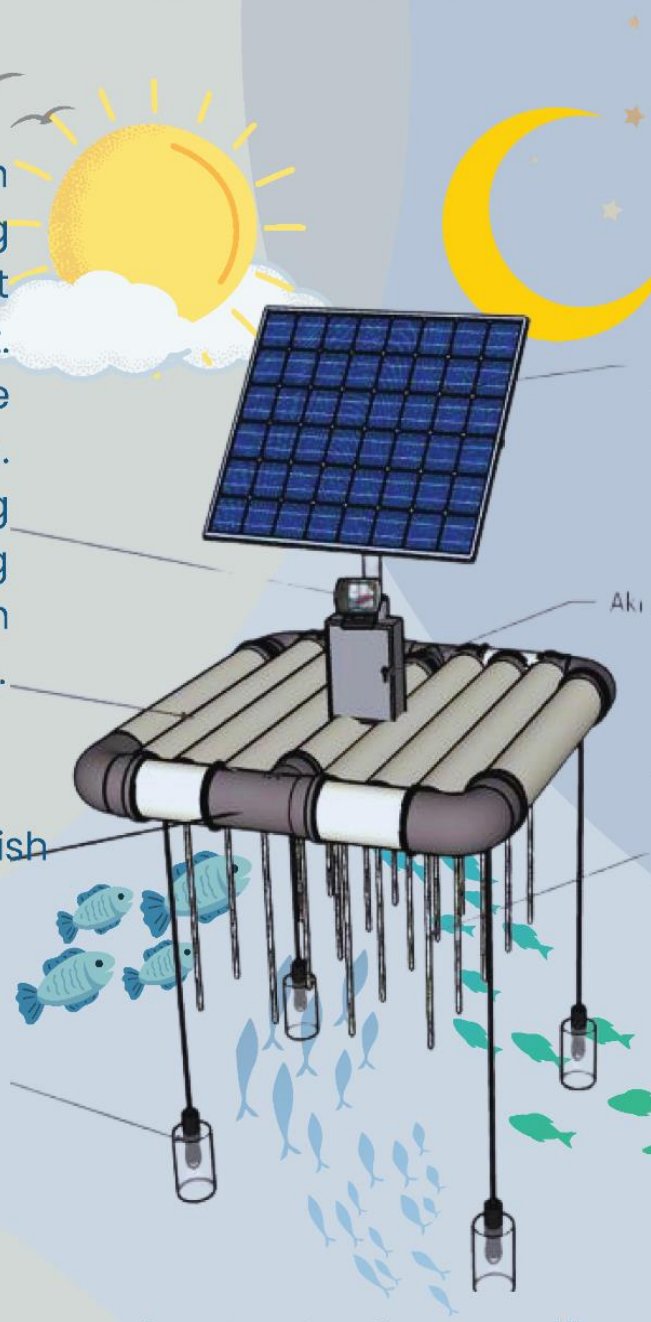
FISH MAGNET EYE

A Tool for Collecting and Detecting Fish to Increase Fishermen Catches

Author: Ahmad Satari Idris

Patent no.: 336/UN4.22.13/PT.03.01/2021

Fishing is an activity to get fish from the waters. Fishing activities can be carried out during the day and the night. When catching fish, it can be easier if using fishing tools. There are several fishing equipments, including Fishing Aggregating Devices (Rumpon in Indonesian) and light fishing.



Fish Magnet Eye is a fishing tool that combines FADs, light fishing and fish finder tools to facilitate fishermen in fishing activities and increase fisherman catches, help fishermen detect the presence of fish and shorten the time of fishing activities carried out by fishermen. This tool is equipped with a meter raft which will be a place for attaching the battery, raffia rope, fish finder and LED dip light.

The main components of Fish Magnet Eye Tool:

- Solar Cell
- Light Sensor
- Light Emitting Diode (LED)
- Attractor
- Fish Finder
- Arduino

Fish Magnet Eye Tool can be used for fishing done during the day and the night.



During the day, it uses raffia to attract fish to gather them in a fishing area.

During the night, it uses light to attract fish to gather them in a fishing area



The effect of using Fish Magnet Eye on the length of fishing time:
By using Fish Magnet Eye , it will shorten the time of fishing operations. This is because they don't need to be tire themselves out to find school anymore, because the fish will automatically gather in the Fish Magnet Eye. Fish Magnet Eye will quickly gather around Fish Magnet Eye, the raffia rope can reflect light of the lamp so fish can easily see the raffia rope.

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RESEARCH AND DEVELOPMENT STATION FOR POTATO TARGU SECUIESC

S.C.D.C. TG. SECUIESC

ROMANIAN POTATO VARIETY: *EVOLLETE*

Patent APPLICATION: No. 9450 / 10.11.2022

G

Authors: Anca – Mihaela BACIU, Luiza MIKE

Description: Potato variety obtained by sexual hybridization between *Colette* x *Laura*, followed by individual clonal selection in the hybrid population. It is maintained by vegetative propagation, which gives it stability and homogeneity.

The plant is of medium height, intermediate foliage structure and erect habit. The inflorescence is of medium size. The flowers have a medium-sized, light purple corolla. The tubercle is short-ovate with shallow eyes. The color of the skin is light red and the color of the flesh medium yellow.

The variety belongs to the semi-early variety group and is classified in use class C.

The *Evollete* variety has a high production capacity, with an average yield of 53.8 t/ha.

The variety is highly resistant to leaf spot, leaf curl virus and resistant to virus Y.



Applicability: Fall – Winter consumption and processing





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RESEARCH AND DEVELOPMENT STATION FOR POTATO TARGU SECUIESC

S.C.D.C. TG. SECUIESC

ROMANIAN POTATO VARIETY: *NEIL*

Patent APPLICATION: No. 9452 / 10.11.2022

G

Authors: Anca – Mihaela BACIU, Luiza MIKE

Description: Potato variety obtained by sexual hybridization between Astral x Bellarosa, followed by individual clonal selection in the hybrid population. It is maintained by vegetative propagation, which gives it stability and homogeneity.

The plant is of medium height, intermediate type and semi-erect habit. The inflorescence is of medium size. The flowers have a medium-sized white corolla. The tubers are round with shallow eyes. The color of the skin is red and the color of the flesh light yellow.

The variety belongs to the semi-early variety group and is classified in use class B.

The NEIL variety has a high production capacity, with an average yield of 42.3 t/ha.

The variety is highly resistant to leaf spot attack, resistant to leaf curl virus and virus Y.



Applicability: Fall – Winter consumption and processing





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RESEARCH AND DEVELOPMENT STATION FOR POTATO TARGU SECUIESC

S.C.D.C. TG. SECUIESC

ROMANIAN POTATO VARIETY: *NEVIN*

Patent APPLICATION: No. 9451 / 10.11.2022

G

Authors: Anca – Mihaela BACIU, Luiza MIKE



Description: Potato variety obtained by sexual hybridization between Bellarosa x Laura, followed by individual clonal selection in the hybrid population. It is maintained by vegetative propagation, which gives it stability and homogeneity.

The plant is of very tall height, leaf-like foliage structure and prostrate (spreading) habit. The inflorescence is of medium size. The flowers have a medium-sized, light purple corolla. The tuber is oval - elongated, with shallow eyes. The color of the skin is red and the color of the flesh cream.

The variety belongs to the semi-early variety group and is classified in use class B.

The NEVIN variety has a high production capacity, with an average yield of 48,5 t/ha.

The variety is highly resistant to leaf spot, leaf curl virus and resistant to virus Y.

Applicability: Fall – Winter consumption and processing





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HR EXCELLENCE IN RESEARCH

PROCESS FOR OBTAINING BIOORGANOMINERAL FERTILIZERS

Patent application: a 2022 0036/2022.07.18

AUTHORS: Gheorghe JIGĂU, Nicolai SPRÎNCEAN, Eugeniu SPRÎNCEAN, Sergiu DOBROJAN, Marin SPRÎNCEAN, Boris TURCHIM

APPLICATION FIELDS: Agriculture, Veterinary medicine. | **G**

AIM: Obtaining polycomposite organomineral biofertilizers used in agriculture for the cultivation of crop plants.

SOLUTION: Obtaining a new bioorganomineral fertilizer as a result of the dosed combination of fresh manure, straw, soil (humifer layer), waste from the thermoelectric industry, biomass, waste from the bakery industry, green biomass and bioorganomineral addition.







ADVANTAGES: Biofertilizer is obtained by recycling waste. The biofertilizer is biological in nature, it is easily obtained, it is effective, it is administered in small quantities and it is obtained in a short period of time.

IMPLEMENTATION STAGE: Large scale production.

ACKNOWLEDGMENTS: The research was carried out with the support of the technological transfer project*: 21.80015.5807.253T.*

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DESIGN MANAGEMENT OF AN ECOLOGICAL FARM

Student Project

Author: ALB IUSTINA LUCRETIA CRISTINA

G

The design of the organic farm requires from the farmer:

• knowledge regarding ecological agriculture;
• a strong motivation for a way of production in harmony with the laws of nature, which protects the environment, the health of the agro-ecosystem and the consumers of agricultural products;
• the conviction that what he is doing is good, both on the part of the farmer and his family;
• an agricultural holding that lends itself to ecological agriculture, and includes several crops and preferably also a zootechnical sector;
• a very good organization and planning of agricultural activities.





The farmer who wants to practice organic farming must design his own farm according to the requirements and rules of organic agriculture. The organization of the farm should be based on an analysis of strengths, weaknesses, opportunities and threats.

Before starting the process of ecological transformation of traditional farms, it is necessary to take samples of soil (from the arable layer) and water from the household, to determine if these two vital sources are not polluted. Since the process of organizing and forming an ecological farm takes at least 3-4 years, at least a rotation of employment is necessary, and the "business" must start with establishing the profile of the farm.

Contact: alb.cristina2000@gmail.com https://www.facebook.com/cristina.alb.33

Augmented reality on mobile game-based learning applications for veterinary students: Canine head

Pawana Chuesiri Phakdee Sutthanom Jantima Intarapunya Gridtayoch Chuesiri

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Background & Importance

According to the survey of students at the Faculty of Veterinary Science, Chulalongkorn University found that learning media in three dimensions (Augmented Reality: AR) is a simulation with virtual media technology, which helps learners to use it conveniently. Therefore, the researchers aim to develop a mobile virtual reality game learning (ARGBL) application for veterinary students about canine head anatomy using AR technology as a proactive teaching media in the form of active learning, which be effective and suitable for use. It stimulates learning with fun, including can be enlarged the details to be close to the content learned in the laboratory. The game is divided into 2 levels, from easy to hard. Points are accumulated to compete with friends and increase motivation for learners to play the game. In addition, teachers can use the scores to analyze their learning efficiency.

Problems



Due to the epidemic situation of COVID-19, teaching and learning have changed to online. Teaching materials have been developed in various forms, such as documents, pictures, videos, and mockups. These materials may not be consistent with online teaching because the content in the lesson is quite difficult to remember in the limited time and the lack of surgical skills to study the animal organs used in the teaching. Therefore, innovators try to create innovations that allow learners to learn and gain experience by understanding the shape, characteristics, relationships of organ structures and functions within the body, including applying them in further study.



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Solution

Game-based learning, learners are more interactive than just listening, analyzing, and having fun together (Edutainment), which learners will gain knowledge through playing games. It is a learning media that helps learners to learn at both memory and understanding levels. It creates a sense of fun, encourages self-learning, and is easier to understand.

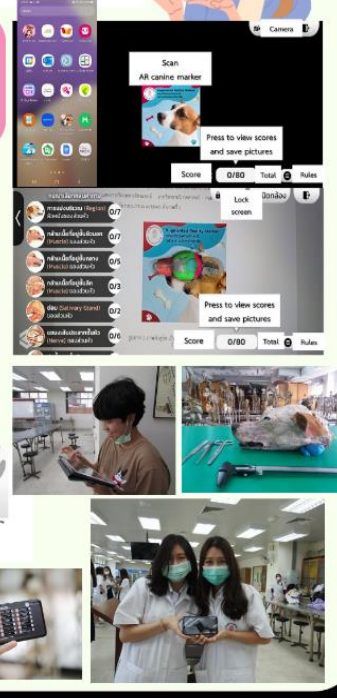


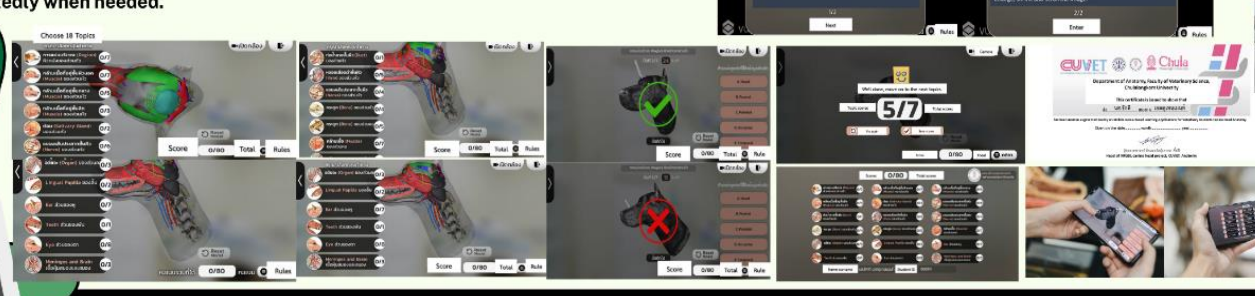
Features and Characteristics

An application of Augmented Reality on Mobile Game-Based Learning Applications (ARGBLA) for Veterinary Students: Canine Head Anatomy, It is an active learning tool for teaching veterinary anatomy in three dimensions by creating a virtual world with a real canine head with important anatomical structures, similar to make learners interact through teaching media coupled with the effective use of three-dimensional media programs to better understand the content within the lesson, enhancing the imagination to see the virtual images of the internal structures of various organ. It was used with a canine head anatomy model to review the lesson content by themself from anywhere as needed. Starting from downloading the application via a mobile device, registering and scanning the image of the canine's head, which is an AR marker, then a 3D image of the canine's head will appear. Choose questions according to the categories in the game that interest you, consisting of skin, bones, muscles, salivary glands, lymph nodes, nerves, salivary ducts, veins, arteries, and special sense organs: tongue, ears, teeth, eyes, meninges, and spinal cord. Choose the correct answer within a limited time. The game has several levels from easy to hard. It has accumulated points with scores visible when playing is over, can record total score and will receive a certificate certifying that. The student has successfully completed the game, and can play the game repeatedly when needed.











Benefit

Spatial

Researchers have applied to veterinary students at Chulalongkorn University. In the future, we will develop into other educational institutions, and develop for application at the clinical level, animal hospitals, government, and private agencies.

Academic

Used as supplementary teaching material and instead of providing teaching aids for the use of real animals' bodies. Solve online teaching and learning management problems. It will help students to understand the lesson on their own in a more three-dimensional form. It helps to enhance the image to see the virtual image of the internal structures of various organs in the animal's body. It can be used with a canine head anatomy model, which helps increase teaching efficiency more than studying from listening to lectures online alone.

Community/Society

Benefits to the quality of life of veterinary students, teachers, and educational personnel are improved, for example, reducing the risk of exposure to chemicals and various diseases in preparing the body and the organ of the canine head. It reduces the risk of mental health problems and stress from learning. Help promote and increase the efficiency of teaching and learning. Moreover, it helps students understand the content easily and be ready to have fun learning as well. Stimulating creativity increases the imagination of the learners, attracts the attention of learners resulting in increased academic achievement, and helps reduce the cost of importing teaching materials from abroad.

Department of Anatomy, Faculty of Veterinary Science, Chulalongkorn University, Bangkok, Thailand
Chulalongkorn University Demonstration Secondary School, Bangkok, Thailand.
This innovation is currently in the process of applying for a copyright from IP Thailand. 2022
E-mail Pawana.u@chula.ac.th

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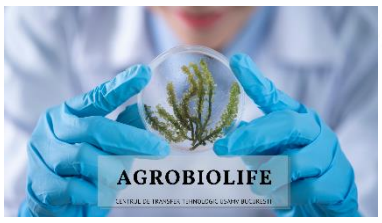
UNIVERSITATEA DE ȘTIINȚE AGRONOMICE ȘI MEDICINĂ VETERINARĂ DIN BUCUREȘTI



One-Health approach of animal diseases with high risk of spreading from areas under military conflicts

G

Concept

Authors: Ciprian Florin Furnaris, Gabriel Predoi, Stelian Bărăităreanu

Nowadays, Europe is facing a significant military conflict that has led to a large number of forced displacements and to the driving of wildlife to the quieter surrounding areas. Along with the refugees, many companion animals were relocated in the neighbouring countries and wild animals were forced out.

Identification of the inputs belonging to different areas of influence, with major effects on the diseases' spreading is possible by reviewing published studies for evidence of high risk of transboundary animal diseases' spreading from areas under military conflicts (with worse Global Peace Index - GPI scores) to those with better GPI scores.

Our concept mostly focuses on the main human population related inputs, animal or livestock related inputs and environment related inputs, leading to the increasing of the diseases incidence in the regions affected by military conflicts, worsened by a significant reduction or even disappearance of active and passive surveillance of animal diseases in these

Particular areas of interests

- the emergence of animal diseases in neighbouring countries (pathogen spreading);
- the increased number of infected animals in the conflict areas (high infectious pressure);
- the zoonoses' risk in the refugee population due to poor living conditions.

Combining diseases spreading patterns, wildlife migrations charts, and latest reports of contaminated animal populations will enable a better transboundary monitoring of animal diseases, including zoonoses.

Future researches should address comparatively GPI (or other synthetic indices for social and military statuses) and the diseases' incidence and prevalence, in order to obtain scientifically based forecasts helpful to prevent the evolution of major outbreaks of disease in both human and animal populations.

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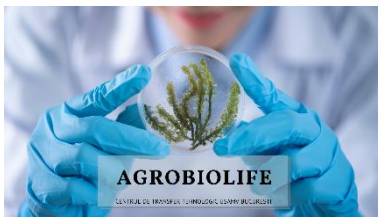

BIOTECHNOLOGICAL SOLUTION FOR SUSTAINABLE PLANT WATER AND BIOSTIMULANTS SUSTAINABLE DELIVERY SYSTEM – HYDROBIOGEL

Research project 663PED/2022

G

Amalia Carmen Mitelut[1], Elena Manaila[2], Silvana Danaila-Guidea[1], Mihaela Draghici[1], Paul Alexandru Popescu[1], Elisabeta Elena Popa[1], Gabriela Craciun[2], Mihaela Geicu-Cristea[1], Calina Petruta Cornea[1], Mona Elena Popa[1]

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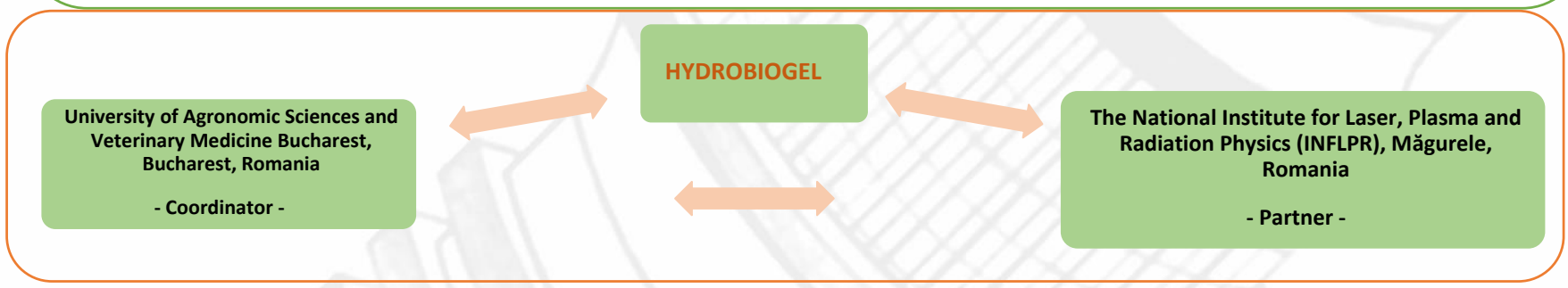
[2]The National Institute for Laser, Plasma and Radiation Physics (INFLPR), Magurele, Romania

PROJECT DESCRIPTION

The project has as objectives the obtaining by electron beam processing and testing at laboratory level and protected spaces (greenhouse), of a new superabsorbent and biodegradable polymeric product (BSP), proposed to be used in plant culture, as a sustainable system for efficient delivery of water and biostimulators in soil-plants system. The BSP will be tested on three species of vegetable plants at the laboratory level (seedlings in pots) and in protected spaces in order to demonstrate the ability of retention and controlled release of the water and biostimulators under different environmental conditions and for different requirements (plant species, type soil, soil moisture, outdoor humidity, temperature), in order to establish a sustainable delivery technology regarding inputs to agriculture.



OBJECTIVES

O.1. Developing of biodegradable superabsorbent polymers for agriculture application, for water stress reduction and for improving the nutritional status in plant cultivation, in order to assure the protection and improvement of natural resources and to increase safety and security of agricultural production.

O.2. To test and validate at field level of a new biodegradable superabsorbent hydrogel based on acrylic acid (AA), sodium alginate (NaAlg) and organo-montmorillonite clay (OMMT) obtained by a new method, nonpolluting (i.e. irradiation with electron beam, EB).

EXPECTED RESULTS

1. The obtaining by a new, non-polluting method (electron beam processing) of a superabsorbent and biodegradable polymer product (BSP).

2. Establishing technology for using this product, as a sustainable system for efficient delivery of water and biostimulators in the soil-plant system.

3. Validation of applied potential at the greenhouse/solarium level of BSPs materials, using as target three species of Solanaceae family, with a major impact in the agricultural sector (tomatoes, peppers and eggplants).

4. Dissemination of the project results by: publication in indexed ISI journals, participation in conferences, seminars, symposia, congresses, workshops, filing a patent.

ACKNOWLEDGEMENTS

This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CCCDI-UEFISCDI, project number PN-III-P2-2.1-PED-2021-2151, within PNCDI III, Contract No. 663PED/2022 (HYDROBIOGEL).

Contact: Miteluț Amalia Carmen, amaliamitelut@yahoo.com

HYDROBIOGEL

NOVEL PROCEDURE FOR MAKING WIRE CLAMPS USED IN THE CONSTRUCTION OF MOBILE GREENHOUSE FRAME WITH WIND AND STORM RESISTANCE

Abstract

The invention describes a procedure for manufacturing wire clamps used for connection in building a greenhouse frame which is windproof and movable. A greenhouse is a structural combination consisting of a truss frame, nylon film and clamps essential to protect plants against the effects of weather and other external conditions and to create an excellent environment for plants to grow and develop for good productivity. A steel wire clamp is an accessory that helps connect parts to form a frame. The clamp design has the shape of semi-circular curves so it does not tear the nylon film and the net surrounding the greenhouse suitable materials and tempering methods help has hardness, durability, and elasticity, so it creates a spur to help the steel bars not be broken or pushed together when facing storms, but also helps to remove, install and relocate quickly. Appropriate materials and tempering methods help increase hardness, durability, and resilience thus provide flexibility to prevent steel bars from being broken or pushed in case of storms, but it also helps disassemble and remove the whole frame quickly.

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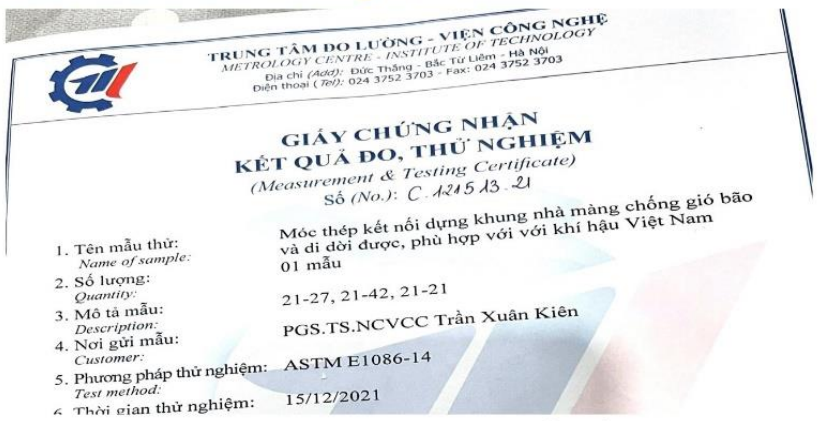
Procedure and results

1. Measurement and Testing Certificate



TRUNG TÂM ĐO LƯỜNG - VIỆN CÔNG NGHỆ
METROLOGY CENTRE - INSTITUTE OF TECHNOLOGY
Địa chỉ (Add): Đức Thắng - Bắc Từ Liêm - Hà Nội
Điện thoại (Tel): 024 3752 3703 - Fax: 024 3752 3703

GIẤY CHỨNG NHẬN
KẾT QUẢ ĐO, THỬ NGHIỆM
(Measurement & Testing Certificate)
Số (No.): C.A245.A3.21

1.	Tên mẫu thử: *Name of sample:*	Móc thép kết nối dựng khung nhà màng chống gió bão và di dời được, phù hợp với với khí hậu Việt Nam
2.	Số lượng: *Quantity:*	01 mẫu
3.	Mô tả mẫu: *Description:*	21-27, 21-42, 21-21
4.	Nơi gửi mẫu: *Customer:*	PGS.TS.NCVCC Trần Xuân Kiên
5.	Phương pháp thử nghiệm: *Test method:*	ASTM E1086-14
6.	Thời gian thử nghiệm:	15/12/2021

Fig 1: Measurement and Testing Certificate

2. Hardening and Tempering spring clip for install greenhouse

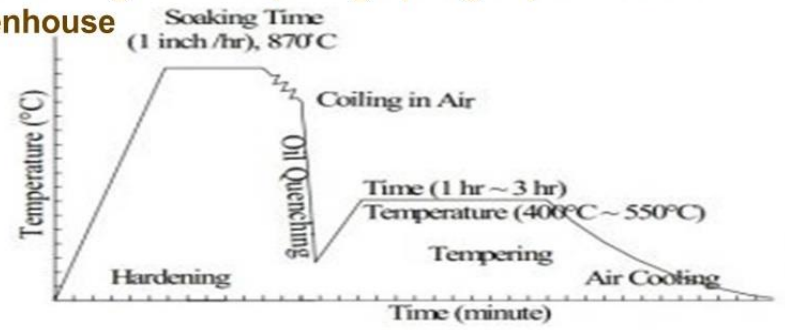


Fig 2: Hardening and Tempering spring clip

3. Example of spring clip and tube

Table 1: Spring clip and the round tube value

Spec. of spring clip	Outer diameter of the round tube (mm)
1/2"	21.5mm
3/4"	26.7mm
1"	33.4mm
1-1/4"	42.2mm
1-1/2"	48.3mm

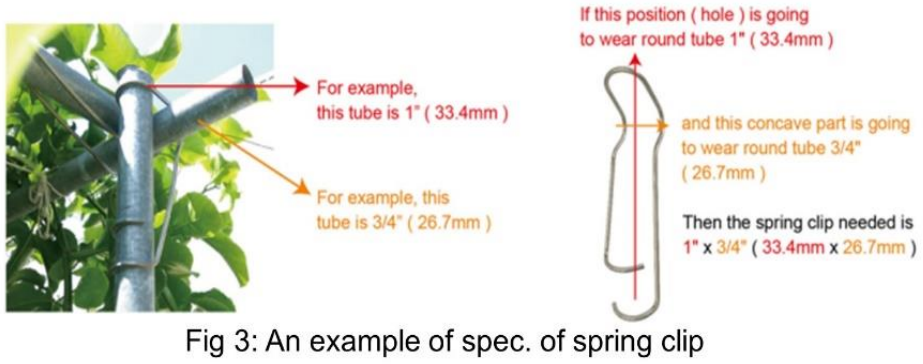


Fig 3: An example of spec. of spring clip

4. Connecting part to form a frame greenhouse

Put the spring clip into the position of round tube cross connection → the end of the spring clip shall be pressed backwards.



Fig 4: Connection of spring clip and the round tube



Fig 5: The shape of semi-circular curves of spring clip

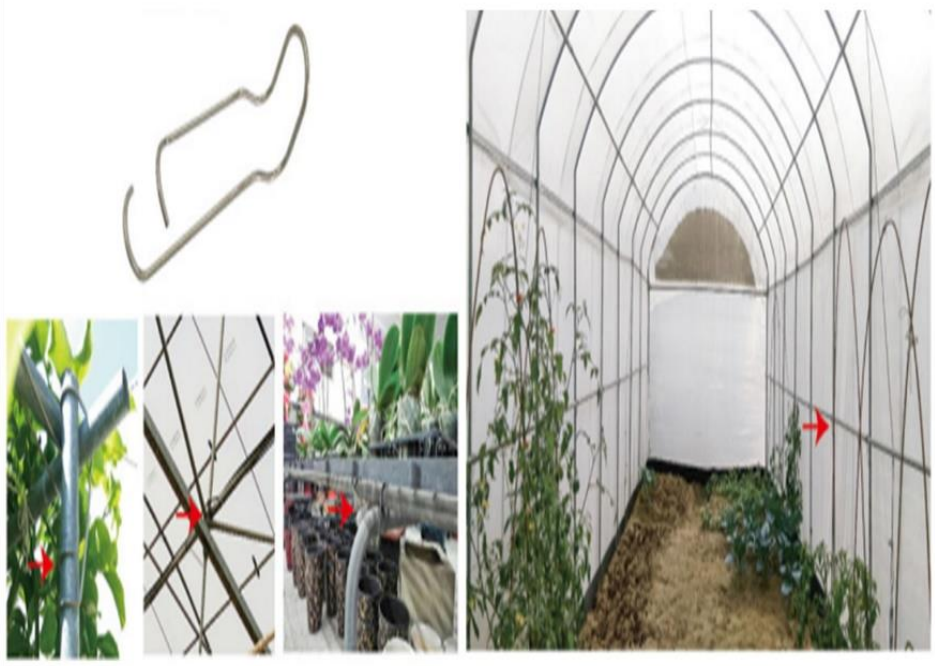


Fig 6:Spring Clip for Greenhouse Pipe Connection

TỜ KHAI
ĐĂNG KÝ SÁNG CHẾ

DẤU NHẬN ĐƠN
(Dành cho cán bộ nhận đơn) E

Kính gửi: Cục Sở hữu trí tuệ
386 Nguyễn Trãi, Hà Nội

CỤC SỞ HỮU TRÍ TUỆ
NATIONAL OFFICE OF INTELECTURE PROPERTY

Ngày DATE: 18/07/2022

Số đơn APL.NO: 1-2022-04520 SC

Chủ đơn dưới đây yêu cầu Cục Sở hữu trí tuệ xem xét đơn và cấp*:
☑ Bằng độc quyền sáng chế
☐ Bằng độc quyền giải pháp hữu ích

(21)[a] NGUỒN GỐC ĐƠN

☐ Đơn này được nộp trên cơ sở đơn PCT số: Ngày nộp đơn quốc tế:
Công bố quốc tế số: ngày: Ngày chọn Việt Nam (nếu có):
☐ Có sửa đổi, bổ sung tại thời điểm vào pha quốc gia (thuyết minh nội dung sửa đổi khai tại trang bổ sung)
☐ Đơn tách: Đơn này được tách ra từ đơn số: Ngày nộp đơn:
☐ Đơn chuyển đổi: Đơn này được chuyển đổi từ đơn số: Ngày nộp đơn:

(54) TÊN SÁNG CHẾ
Quy trình chế tạo móc ngàm thép kết nối dựng khung nhà màng chống gió bão và di dời được, phù hợp với khí hậu Việt Nam

PHÂN LOẠI SÁNG CHẾ QUỐC TẾ (IPC)**
(chỉ tiết đến chỉ số hạng thứ ba)

Fig 7: Registered patent

Conclusion

Appropriate materials and tempering methods help increase hardness, durability, and resilience thus provide flexibility to prevent steel bars from being broken or pushed in case of storms, but it also helps disassemble and remove the whole frame quickly.

H

Foods

Drinks

Restaurants

Hotels & Spa

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VBUNG® Technology

No Added Additives and Preservatives

Maceration, Fermentation, Malolactic Fermentation and Aging under Continuous Pressure in Custom Wooden Barrels

WWW.VBUNGVDOOR.COM

H

Standard Patent AU 2018203047 from 4th of May 2017 / Application EP 3564354A1

The speed of oxidation during maceration, fermentation, malolactic fermentation and aging is much faster than the process of winemaking itself which is a huge disadvantage and requires control using manly Additives and Preservatives.

The invention refers to a Totally New ***VBUNG ® Technology*** by applying:

Isobaric Winemaking Process inside Custom Wooden Barrels
Giving Control Over Oxidation, Contamination, and Evaporation.

1. Positive pressure can be created naturally by CO2 during fermentation or artificially using any food-grade gasses allowed
2. Negative pressure can be created using a vacuum system

No added Additives and Preservatives Winemaking
=
Grapes + Custom Wooden Barrel + VBUNG ® Equipment

Custom Wooden Barrel :

1. Food Grade Silicone Rod Between Staves / Barrelhead
2. Reinforced Hoops With Bolts
3. Acrylic Barrel Head for Sunlight / Visual / Sensors

VBUNG Patented Equipment :

1. Safety Relief Valve / Spunding Valve
2. Adjustable Racking Filter / Sparger / Liquid Inlet and Outlet Port
3. O2/N2/CO2/Ar…etc. Food Grade Gasses Inlet and Outlet Port
4. Temperature / Pressure / Dissolved Oxygen …etc. Sensors/ Wireless Sensors

Advantages

1. Sustainable Technology and Equipment without the use of Additives and Preservatives
2. Sustainable Mobile Winery in the vineyard with solar panels, sensors, and mobile data
3. Accelerated Winemaking and Aging technological process
4. Equipment Control over Oxidation, Contamination, and Evaporation
5. New or Old Wooden barrels can be used once custom modifications are done
6. Whole bunch, Juice, or Berries can be used
7. No Juice clarification is needed (No flotation, cold settling, or centrifugation)
8. No temperature or humidity control is required (Fermentation at high temperatures for white winemaking is not a problem)
9. Direct Sunlight for the whole technological process
10. No need for topping the barrels
11. Taking out wine samples for laboratory or tasting without oxidation, contamination, evaporation
12. Barrel regeneration with compressed O2 or Air before vintage
13. Extended lifetime for wooden barrels due to custom construction
14. Can be applied to making and aging Wine, Beer, Cider, Vinegar, and aging Spirits.
15. Reduced labor, time, and cost.
16. Global potential





Contact: *vitalie.popa@vbungvdoor.com https://www.vbungvdoor.com/*

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INSTITUTUL DE BIOLOGIE ŞI NUTRIŢIE ANIMALĂ

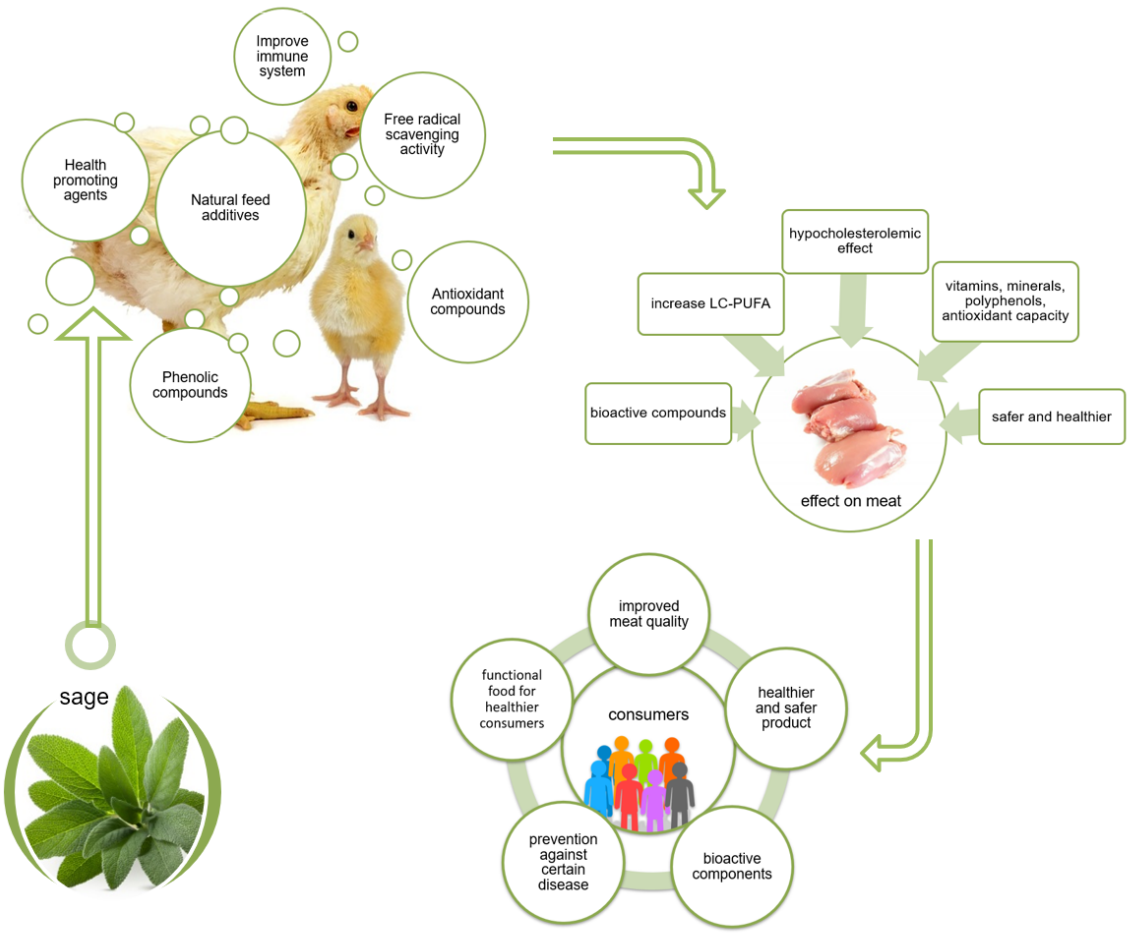
Compound feed for broilers containing sage as a natural feed additive

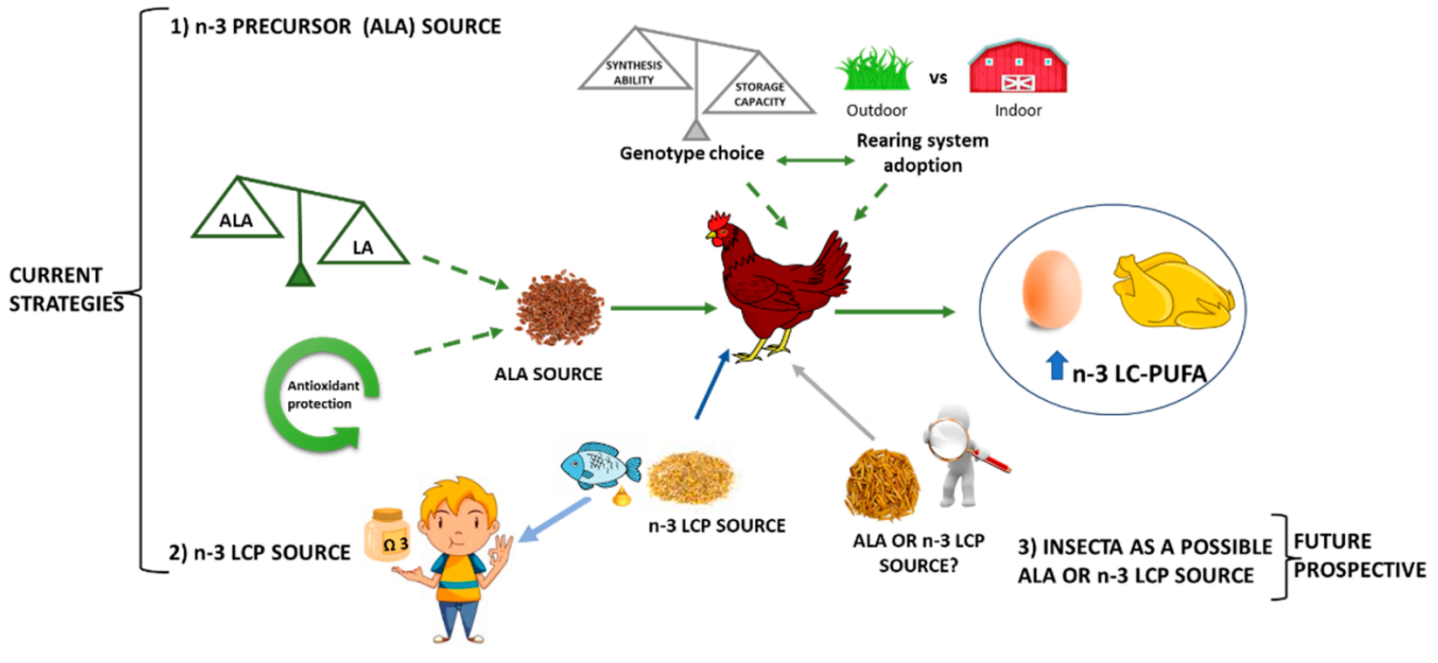
Patent A 00726/ 03/12/2021

VLAICU Petru Alexandru, UNTEA Arabela Elena,
PANAITE Tatiana Dumitra, OLTEANU Margareta,
TURCU Raluca Paula, SARACILA Mihaela,
CORNESCU Gabriela Maria

H

The invention refers to a new compound feed for broilers, in the growth and finishing phases, which contains sage as a natural feed additive. The numerous bioactive substances present in sage, which act as growth promoters in chicken and which can improve the nutritional and sensorial qualities of the meat, makes this invention an alternative to antibiotics. In addition, sage is rich in numerous substances with antioxidant potential, which protect the lipids in the meat against oxidation, increase the antioxidant capacity and lead to a decrease of cholesterol in the meat, which represents a very important aspect for chicken meat consumers.





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FALVURA

H

Innovation of Edible Film From Sea Lettuce (*Ulva lactuca*) and Tofu Waste

I Made Ananta Abie Diarta, I Putu Thio Mahapradana, I Made Bagus Wisnu Kertha, Liedya Tara Divya, Putu Lucia Amanda Mahadewi
Advisor: Ni Made Rai Rahayu, S.Pd., M.Si

Copyright no.: EC00202272363, 6 Oktober 2022



ABSTRACT

This research objectives are: (1) Investigate the Physical characteristics of "*Falvura*" were reviewed in terms of density test, water absorption, water vapor transmission rate test, and biodegradation test, (2) Investigate the results of the "*Falvura*" organoleptic test from the combination of tofu waste and *Ulva lactuca*, (3) Investigating the results of the "*Falvura*" proximate analysis of the combination of tofu waste and *Ulva lactuca* (4) Investigating the antioxidant test result of "*Falvura*" from the combination of tofu waste and *Ulva lactuca*. The research method used by researchers is an experiment, quantitative-qualitative descriptive, and literature study. The average density of T1 to T3 tends to decrease with successive values of 1.348; 0,935; and 0,769 g/cm^3. The average from the water absorption test of T1-T3 are 12,02%; 7,83%; and 7,14%. From the solubility test results, it is proven that the *edible film* can dissolve in water within 24 hours. From the parameters of the water vapor transmission rate, the edible film produced produces a value of 0.03-0.1 g/day/m2. And the edible film will decompose within 5.80-11.02 days, those are has been fulfil the standard. Based on the organoleptic test result, T1 has the highest value in color and texture parameters, T2 has the highest value in taste parameters, and T1 and T3 have the same value in scent parameters. The proximate analysis shows that *Falvura* positively contains water, ash, protein, fat, carbohydrate, and calories. With range of value in arrow are 1,15-1,37% bb; 0,36-0,68% bb; 14,24-18.23% bb; 1,46-1,91% bb; 78,11-82,54 %bb; and 400.26-402.61 kkal. A combination of tofu waste extract and sea lettuce extract can be produced as an edible film. Based on the antioxidant capacity test result, each T1-T3 in a row has 70.49 mg GAEAC/L; 78,37 mg GAEAC/L; and 83,90 mg GAEAC/L. There was an increase from T1 until T3 and can be seen that the antioxidant value was influenced by the composition of sea lettuce.

BACKGROUND



OBJECTIVES

1)Investigating Physical characteristics of *Falvura* were reviewed interms of density test, water absorption, water vapor transmission rate test, and biodegradation test. 2)Investigating the results of the *Falvura* organoleptic test from the combination of tofu waste and *Ulva lactuca*. 3)Investigating the results of the *Falvura* proximate analysis of the combination of tofu waste and *Ulva lactuca*. 4)Investigating the antioxidant test result of *Falvura* from a combination of tofu waste and *Ulva lactuca*

CONCLUSION & RECOMMENDATION

1)The average density of T1 to T3 tends to decrease with successive values of 1.348; 0,935; and 0,769 g/cm^3. The average from the water absorption test of T1- T3 are 12,02%; 7,83%; and 7,14%. From the solubility test results, it is proven that the edible film can dissolve in water within 24 hours. From the parameters of the water vapor transmission rate, the edible film produced produces a value of 0.03-0.1 g/day/m2. And the edible film will decompose within 5.80-11.02 days, those are has been fulfil the standard. 2)Based on the organoleptic test result, T1 has the highest value from color and texture parameters, T2 has the highest value from taste parameters, and T1 and T3 have samev value in aroma parameters. 3)The proximate analysis shown that Falvura positively contain water, ash, protein, fat, carbohydrate, and calories. With range of value in arrow are 1,15-1,37% bb; 0,36-0,68% bb; 14,24-18.23% bb; 1,46-1,91% bb; 78,11-82,54 %bb; and 400.26-402.61 kkal. 4)Combination of tofu waste extract and sea lettuce extract can be produced as an ediblefilm. Based on the antioxidant capacity test result, each T1-T3 in a row has 70.49 mg GAEAC/L; 78,37 mg GAEAC/L; and 83,90 mg GAEAC/L. There was an increase from T1 until T3 and can be seen that the antioxidant value was influenced by the composition of sea lettuce.

In the future research, we are going to: do further research about the effectiveness of Falvura and find other ingredients which can be added to increase the effectiveness and quality of Falvura.

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RESULT & DISCUSSION

Treatment	Solubility in water		
	6 Hours	12 Hours	24 Hours
C (-)	partially dissolved	Completely dissolved	Completely dissolved
T-1	Dissolving there are still solids	partially dissolved	Completely dissolved
T-2	Dissolving there are still solids	partially dissolved	Completely dissolved
T-3	Dissolving there are still solids	partially dissolved	Completely dissolved

Solubility Test Result

Treatment	Density Test Value (g/cm^3)			Average Density (g/cm^3)
	R-1	R-2	R-3	
C	0,054	0,072	0,045	0,057
T-1	1,192	0,909	1,944	1,348
T-2	1,222	0,937	0,645	0,935
T-3	0,833	0,641	0,833	0,769

Density Test Result

Description	P1		P2		P3		Ā	
	U1	U2	U1	U2	U1	U2	U1	U2
Initial mass (g)	0,08	0,09	0,05	0,08	0,08	0,07	0,06	0,07	0,04	0,05	0,0
Final mass (g)	0,84	0,77	1	0,6	0,5	0,66	0,64	0,54	0,44	1,11	1	0,78
Water absorption (%)	9,50%	7,55%	19%	11%	5,25%	7,25%	8,14%	8%	5,20%	26,75%	23,25%	17,58%
Average	12,02%		7,83%		7,14%		25,52%					

Water Absorption Test Result

Treatment	WVTR (g/day/m^2)				JIS Standart 2-1707
	R-1	R-2	R-3	Average	
C	0,2	0,1	0,1	0,13	Maximum 7 g/day/m^2
T1	0,1	0,1	0,1	0,1	
T2	0	0,1	0,1	0,06	
T3	0,1	0	0	0,03	

Water Vapor Test Result

Treatment	% Decomposed			% Weight Loss	Degradable Rate (%/day)	Perfect Degradation Time (day)	Standart ASTM D-6002
	R-1	R-2	R-3				
T-1	9,77%	11,44%	6,00%	9,07%	8,36%/day	11,02 day	60 day
T-2	13,20%	18,68%	19,90%	17,25%	7,83%/day	5,80 day	
T-3	11,50%	11,90%	10,14%	11,19%	6,86%/day	8,94 day	

Biodegradation Test Result

Treatment	Organoleptic Test Result			
	Colour	Taste	Aroma	Texture
T1	3.55	3.32	3.41	3.52
T2	3.45	3.48	3.38	3.48
T3	3.45	3.38	3.41	3.51
C	3.09	2.77	3.03	2.87

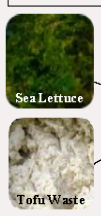
Oragnoleptic Test Result

Parameter	Treatment			
	T1	T2	T3	C
Water (%bb)	1,15	1,28	1,37	1.46
Ash (%bb)	0,58	0,68	0,38	0,23
Fat (%bb)	1,91	1,74	1,46	0.56
Protein (%bb)	18,23	16,77	14,24	0.68
Carbohydrate (%bb)	78,11	79,53	82,54	97.07
Calories (kcal)	402.61	400.87	400.26	396.63

Proximate Analysis Result

(Tofu Waste: *Ulva lactuca* Extract)	Antioxidant Capacity (mg/L GAEAC)
T1 (3:1)	70,4931
T2 (1:1)	78,3706
T3 (1:3)	83,9049

Antioxidant Capacity Test Result



The starch that occurs in the tofu dregs and the antioxidant that consist in the sea lettuce are able to be a new innovation of edible film that has a good nutrition



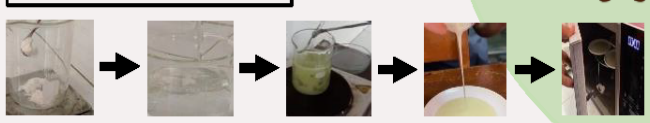
METHOD



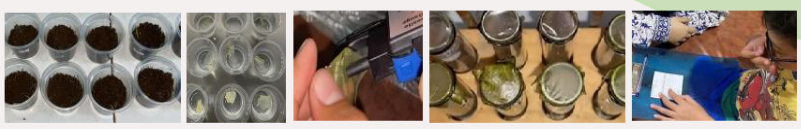
Processing *Ulva lactuca*



Processing Tofu Waste



Processing FALVURA



biodegradation test, water absorption test, density test, water vapor transmission test, organoleptic test

SWOT ANALYSIS

Strengths

1. Falvura has very good properties for the body because it is made from natural ingredients.
2. Falvura edible film can be used as a new innovation for the plastic wrap that more eco-friendly
3. Although it is often consumed, it will not cause harmful side effects

Weakness

1. Further effectiveness tests are needed to obtain more definitive test results
2. Has a low self life, because it does not contain any chemical preservatives

Opportunity

1. Have a good chance in business
2. The material is light and low-cost
3. Since the product are using affordable ingredients which are natural waste, so **easy to be develop and manufacture** *Falvura* on large scale

Threat

1. Need to compete with the usual edible film
2. Falvura needs to be advertised more

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HR EXCELLENCE IN RESEARCH

PROCESS REGENERATION OF ACTIVATED CARBON

PATENT APPLICATION: a 2022 0035/2022.07.18

AUTHORS: Vasile GUTSANU, Maria BOTNARU, Oleg PETUHOV, Gabriela LISA

APPLICATION FIELDS: Food industry - Health - Chemistry. **H**

AIM: Determination the optimal heat treatment conditions for the regeneration of activated carbon loaded with vitamin C.

SOLUTION: The regeneration conditions of activated carbon loaded with vitamin C were determined: temperature and duration of heat treatment.

Sample	S, m2/g	Vs, cm3/g	Vmi, cm3/g	Vme, cm3/g
Granucol GE	1384	1.085	0.364	0.721
Granucol GE + vitamin C	1133	0.923	0.288	0.635
Granucol GE regenerated	1296	1.042	0.332	0.710

Note: S is the specific surface area , Vs – the total pore volume, Vmi – the micropore volume, Vme – the mesopore volume.

ADVANTAGES: Carbon regeneration is done at a lower temperature. The regenerated coal keeps its specific surface of 94% and the sorption capacity of vitamin C of 88%.

IMPLEMENTATION STAGE: At the laboratory level.

ACKNOWLEDGMENTS: This research was supported by the *research project: #20.80009.7007.21*

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Stefan cel Mare University of Suceava

NUTRITIONALLY ENRICHED GINGERBREAD AND PROCEDURE FOR OBTAINING IT

TURTĂ DULCE ÎMBOGĂȚITĂ NUTRIȚIONAL ȘI PROCEDEU DE OBȚINERE A ACESTEIA

H

Authors: Adriana Dabija, Ancuța Chetrariu

***Patent application* A/00447/26.07.2022**

Turta dulce intră în categoria produselor făinoase, fiind cunoscută într-o mare varietate de sortimente, obținută din aluaturi tari amestecate cu afânători chimici, siropuri, grăsimi și alți amelioratori de gust și valoare alimentară, cu structură poroasă. Problema tehnică pe care o rezolvă invenția constă în obținerea unui produs cu caracteristici senzoriale și valoare nutritivă îmbunătățite, cu un conținut ridicat de proteine și fibre, fiind produse realizate din făină de grâu, făină de mei, făină de borhot de malț și sirop de păpădie, destinate persoanelor ce îşi doresc să aibă o alimentaţie sănătoasă. Produsul finit prezintă o serie de avantaje: obținerea unui sortiment de turtă dulce cu rol de aliment funcțional datorită ingredientelor din rețeta de fabricație, obținerea unui sortiment de turtă dulce cu indice glicemic scăzut și conţinut de proteine și fibre alimentare ridicat, uşor asimilabile de organism.



Wheat flour



Dandelion syrup



Hemp oil



Yeast flakes



Millet flour





Powdered turmeric



Spent grain flour



Powdered ginger



Powdered fenugreek

Gingerbread falls into the category of flour products, being known in a wide variety of assortments obtained from hard doughs mixed with chemical loosening agents, syrups, fats and other improvers of food taste and value, with porous structure. The technical problem that the invention solves consists in obtaining a product with sensory characteristics and improved nutritional value, with a high content of proteins and fiber, being produced from wheat flour, millet flour, spent grain flour and dandelion syrup, being intended for people who want to have a healthy diet. The finished product has a number of advantages: obtaining an assortment of gingerbread with the role of functional food due to the ingredients in the manufacturing recipe, obtaining an assortment of gingerbread with low glycemic index and high protein and dietary fiber content, easily assimilated by the body.

Contact: adriana.dabija@fia.usv.ro +40748845567

FUNCTIONAL YOGURT WITH LOW GLYCEMIC INDEX AND PROCESS FOR OBTAINIG IT

IAURT FUNCȚIONAL CU INDICE GLICEMIC REDUS ȘI PROCEDEU DE OBȚINERE A ACESTUIA

Authors: Adriana Dabija, Mihai Covașă, Andrei Lobiuc,
Camelia Oana Iațcu, Sebastian-Andrei Avătămăniței

***Patent* RO 134358/28.01.2022**

H

Invenţia se referă la un produs alimentar de tip produs lactat fermentat, cu rol de aliment funcţional, datorită beneficiilor multiple pentru sănătate. Iaurtul, conform invenţiei, este un produs lactat fermentat cu coagul spart, cu conținut redus de grăsime și indice glicemic redus, în compoziția căruia intră doar ingrediente naturale. Obținerea iaurtului cu 1,1% grăsime, conform invenţiei, presupune normalizarea laptelui la un conținut de 1,1% grăsime, fortifiere prin adaos de proteine din cânepă până la un conținut de 5,5% proteine, adaos de 1% fibre de ovăz, omogenizare, pasteurizare, inoculare cu culturi de bacterii lactice, termostatare până când pH-ul laptelui ajunge la valoarea de 4,5, adăugare de microcapsule cu bacterii probiotice, distribuție în ambalajele de desfacere și răcire în două trepte pentru maturare. Speciile bacteriene din genul Bifidobacterium contribuie la scăderea nivelului de zahăr din sânge, reduc rezistența la insulină și au proprietăți antiinflamatorii. Iaurtul – produs finit poate fi folosit în prevenirea și controlul diabetului zaharat de tip 2 și asociat cu afecțiuni





Lactic acid bacteria



Oat (*Avena sativa*)



Hemp (*Cannabis sativa*)



The invention refers to a food product of the fermented milk product type, with the role of functional food, due to its multiple health benefits. Yogurt, according to the invention, is a stirred fermented milk product, with low fat content and low glycemic index, in the composition of which only natural ingredients are included. Obtaining yogurt with 1.1% fat, according to the invention, involves: normalizing milk to a content of 1.1% fat, fortification by adding hemp proteins up to a content of 5.5% proteins, addition of 1% fiber oats, homogenization, pasteurization, inoculation with lactic acid bacteria cultures, thermostating until the pH of the milk reaches the value of 4.5, addition of microcapsules with probiotic bacteria, distribution in retail packaging and cooling in two stages for ripening. Bacterial species of the genus *Bifidobacterium* help lower blood sugar levels, reduce insulin resistance and have anti-inflammatory properties. The yogurt – finished product can be used in the prevention and control of type 2 diabetes and associated inflammatory conditions such as obesity.

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Drying plant for granular products in suspended layer

H

Patent: no. MD 1558 Y, of 31.08.2021;

Authors: *BERNIC Mircea, MD; ŢISLINSCAIA Natalia, MD; BALAN Mihail, MD; VIŞANU Vitali, MD; ŢURCANU Dinu, MD; MELENCIUC Mihail, MD; SANDU Andrei-Victor, RO;*

The invention relates to drying techniques, in particular to drying plants of granular products in suspended layer, and can be used in food industry enterprises, in laboratories and research centers.

The plant, according to the invention, comprises a body (1) and a pipe (6). On the body (1) is rigidly mounted a control panel (3) for actuating an inverter (2), a fan (4) for air suction by means of a filter (11), and a microwave generator (15) with a drying chamber (14), mounted on a support (8). On the fan (4) is mounted the pipe (6), to the upper part of which are attached a feed hopper (5) for loading the product, an outlet manifold (9) and a perforated receiver (10).

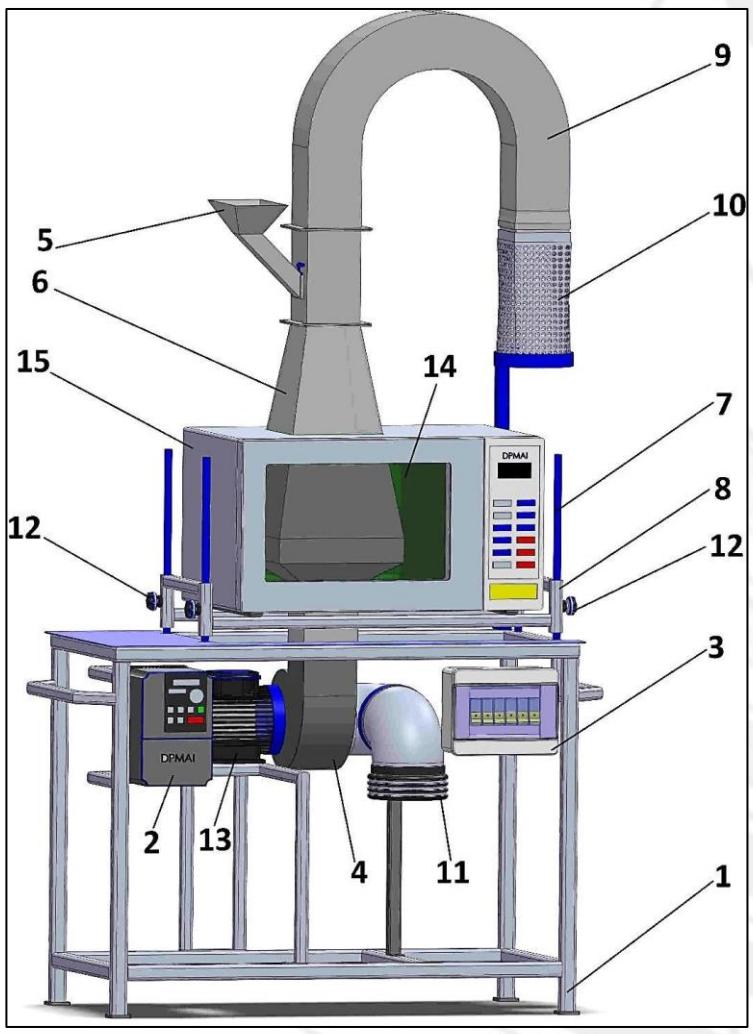

Figure 1. Suspended bed drying plant, 3D model.



Figure 2. Suspended bed drying plant, implemented model.

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COMPOSITIONS AND METHOD FOR PRODUCING COZONAC WITH SPONTANEOUS FLORA SOURDOUGH

Patent: no. MD 1563

Authors: *PhD, associate professor: Rodica SIMINIUC, PhD student: Dinu ȚURCANU*

Purpose: Development of pastry and bakery products based on spontaneous flora sourdough - field of research in accordance with the requirements of the European Union - in order to directly improve the nutritional benefits of cereals, reduce allergens, toxic compounds and increase food safety of products.

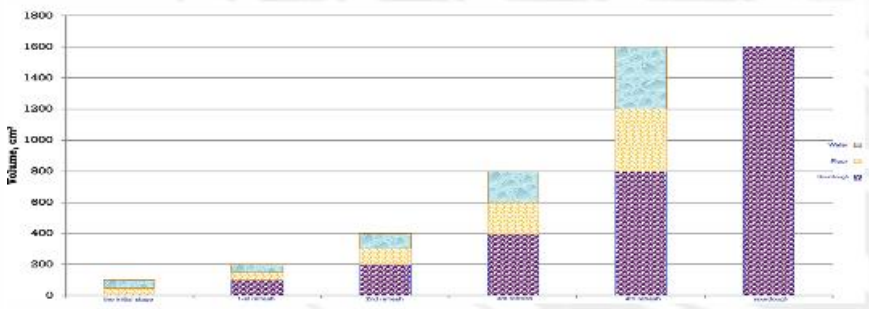
Solution: Elaborating spontaneous flora sourdough powder from wheat flour or sorghum flour *(Sorghum Oryzoidum),* with a stable texture of the finished product, higher nutritional and sensory characteristics (especially for cozonac obtained from sorghum flour), but also expanding the range of pastries with spontaneous flora sourdough from different flours, as well as developing products for people with disorders related to gluten consumption.

Advantages of the composition:

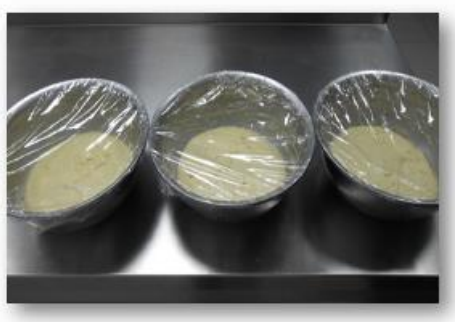
- The use of spontaneous flora sourdough powder from wheat flour or sorghum flour, does not involve refrigeration equipment for its storage;
- Easy dosing of spontaneous flora sourdough powder;
- The possibility to use the spontaneous flora sourdough from soriz flour in the elaboration of gluten-free products;
- Improving the taste and aroma of the finished product by using spontaneous flora sourdough from soriz flour;
- Reduced amount of sugar compared to the nearest solution;
- Without the use of preservatives.

Advantages of the process:

- Good rheological properties of the dough due to long fermentation and, respectively, the ability to bind water, swelling of starch and solubility of pentosans.
- Stable texture properties, with a well-preserved shape even after cooling the cozonac, which do not require suspension to keep the convex shape after baking (as in Italian panettone);
- Fine but rich aroma and taste, due to the long fermentation time (32 hours) compared to the nearest solution (19 hours), and as a result the formation of metabolites and amino acids takes place;
- Long shelf-life of the product (over 30 days without the use of preservatives or special storage conditions), which is due to the inhibitory effect of organic acids (formed during fermentation) on molds;
- Improving the nutritional value by increasing the bioavailability of minerals and reducing the glycemic index.















Researches have been carried out within the following projects:

- PERSONALIZED NUTRITION AND SMART TECHNOLOGIES FOR MY WELL-BEING (Project code - 2 0.80009.5107.10)
- CONTRIBUTIONS REGARDING NUTRITIONAL ERADICATION OF GLUTEN CONSUMPTION DISEASES, no. 21.00208.5107.06 / PD

Contact: Doctoral School of the Technical University of Moldova
e-mail: rodica.siminiuc@adm.utm.md
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CONTRIBUTIONS REGARDING NUTRITIONAL ERADICATION OF GLUTEN CONSUMPTION DISEASES (2021-2023)

Project: no. 21.00208.5107.06 / PD

Authors: *PhD, associate professor: Rodica SIMINIUC, PhD student: Dinu ȚURCANU*

Description (Purpose): Cereals and cereal products represent the basic element in ensuring food security of the population. Most cereal-based foods contain gluten, the consumption of which has increased considerably due to its properties for improving the organoleptic indices of the products. As a result, today we are facing a rising epidemic of gluten-related disorders: celiac disease, herpetiform dermatitis and gluten ataxia, gluten allergy and gluten sensitivity. Nutritional therapy is the only treatment for celiac disease unanimously accepted by the medical community and consists of a rigorous gluten-free diet followed for life. GFDs (Gluten Free Diet) are significantly lower in protein, magnesium, potassium, vitamin E, folic acid and sodium, with suggestive trends towards calcium and increased fat intake. Adherence to GFD is a hard path, associated with major changes in daily routine, activities and eating habits, often stressful and difficult to accept. The project tends to solve a major problem, especially for the Republic of Moldova, namely: *Ensuring the nutritional security of people with disorders related to gluten consumption* by:

• Identifying optimal formulas and designing gluten-free cereal-based products (bakery, pastry, and pasta products - the main challenge in a GFD); reasoned and scientific supplementation / fortification of products designed with equivalent sources of essential nutrients to supplement nutritional deficiencies, characteristic for gluten free diets.

• Nutritional education on the gluten-free diet, especially regarding the fashionistas' motivations to exclude gluten from the diet. The specific results for ensuring the nutritional safety of people with gluten-related disorders obtained during the project will be based on solid scientific knowledge and evidence in various fields such as: nutrition, medicine, statistics, food sciences, nutritional genomics, microbiology, computer science, social sciences, humanities etc. The project is part of the action plan for the prevention and control of non-communicable diseases in the European region of WHO 2016-2025. It is also reflected in the 2030 Agenda for Sustainable Development.

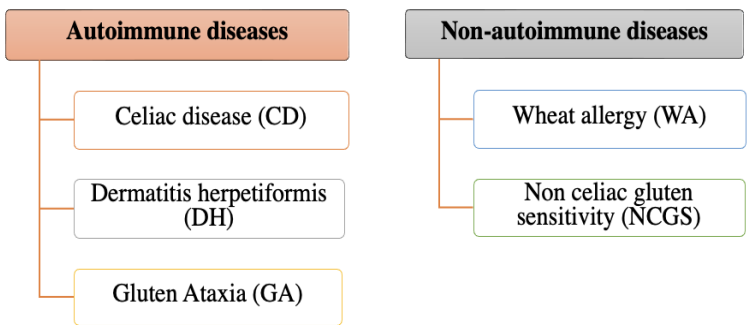

Figure 1. Disorders related to gluten consumption

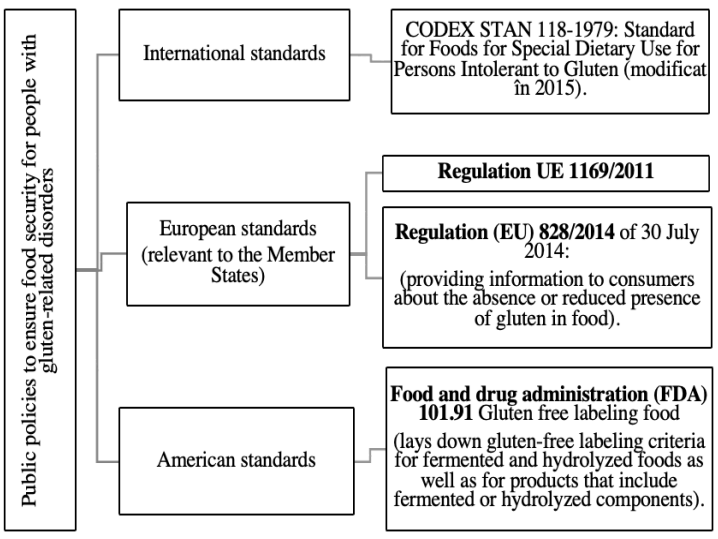

Figure 2. International standards governing gluten-free products

Table 1. The Public Policy Score for Celiac Disease (PPSCD) in the Republic of Moldova

	Items used to assess the level of care for people with celiac disease	Answer choices and the score awarded	
		Yes	No
1.	Does the Republic of Moldova have regulations regarding packaged industrial food products for people with CD?		0
1.	Does the country have regulations regarding unpackaged meals and food for people with CD?		0
1.	Is there a specialized healthcare service for celiac patients?	0,5	
1.	Is there a government food allowance and / or a financial incentive for patients with CD?	1,0	
1.	Is there a GF certification program for manufactured products for people with GD?		0
1.	Does the country have a national CD association?		0
	Total	1,5	

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PERSONALIZED NUTRITION AND INTELLIGENT TECHNOLOGIES FOR MY WELL-BEING

Project: no. PS nr.**20.80009.5107.10**

Authors: Rodica SIMINIUC, Dinu ȚURCANU, Vladislav REȘITCA, Aurica CHIRSANOVA, Daniela POJAR, Rodica CUJBA et al.

Description: As a result of triggering of the obesogenic food style, resulting from the global adoption of the Western diet and the sedentary way of life, mankind is experiencing a nutritional transition. Non-communicable diseases such as obesity, type 2 diabetes and metabolic syndrome are now collectively responsible for nearly 70% of all deaths worldwide.

Developing a personalized nutrition service to improve the quality of life! With this ambitious objective the project was born. The proposed project tends to contribute to solving two major problems of society in general and of the Republic of Moldova in particular:

• The insufficient degree of nutritional coverage of different segments of the population (people with celiac disease, allergies, gluten and lactose intolerance, people with diabetes, healthy people but overweight, obesity or other consequences of malnutrition etc.), deficiencies that respectively contribute to the increased risks of nutritional diseases;

• The absence of national nutritional software (mobile application) for consumers, especially for children and young people.

The project intends:

- to elaborate questionnaires and online surveys of public opinion in order to identify people's lifestyles and to develop personalized nutrition services;
- to design new local food products and to improve the nutritional coverage of different segments of population;
- to create national database on food and nutrition, for the development and implementation of the mobile application;
- to develop a national nutritional software (mobile application) for consumers.

The specific tools of personalized nutrition developed during the implementation of the project will be based on solid scientific knowledge and evidence from different fields such as: nutrition, medicine, food science, nutritional genomics, microbiology, computer science, social sciences and human sciences such as economics, marketing, psychology, marketing and social anthropology.

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University of Zagreb
Faculty of Mechanical Engineering and Naval Architecture
Department of Robotics and Production
System Automation

AUTOMATED BEVERAGE MIXING SYSTEM

H

Authors: BORNA HESKY and prof.dr.sc. ŽELJKO ŠITUM



An automated beverage mixing system is a small device that uses a control algorithm to obtain a combination of beverages in a defined ratio. By automating the fluid mixing process, it is possible to eliminate the possibility of human error while achieving high accuracy of the desired fluid ratio. The device has two containers from which liquids are taken. On the LCD screen, the user selects the standard volume of the glass and the ratio in which he wants the mixture. By starting the process, the mass of the glass in which the fluids are mixed is first subtracted and the pumps are started which deliver the required volume of fluid from the tank, in order to achieve the desired ratio of the beverage mixture. An Arduino microcontroller with an LCD screen is used as a control device.

The special feature of the device is its low manufacturing cost, it is easily portable and does not use capsules, as is the case with similar devices. The device also has an option for cleaning pumps and lines with a suitable solvent.

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Casa MORA

Author: Vasiu Dorina

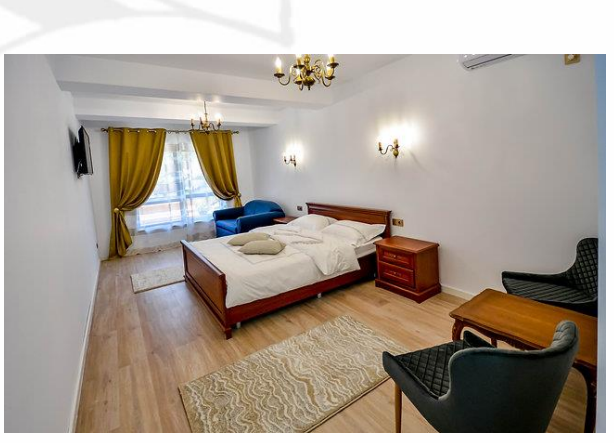
H

Casa Mora, the charming guesthouse in Deva, located right at the base of the Citadel. Here, once arrived, tourists return without fail. In addition, the reviews are among the most beautiful, hence the maximum score received, both on booking and on google, being one of the few locations that can boast of such appreciations.

Mrs. Dorina, the one who made this achievement possible, is the soul of the guesthouse. Having no experience at the beginning of the business, she ended up excelling in the field, proving, once more, that the man sanctifies the place. With the full support of the family, she built a guesthouse where everything was thought of as "home".







Quality, comfort and guest satisfaction are received at Casa Mora: "Words are too few to describe the perfection", "Our stay was superlative, the extraordinary host, the dreamy rooms, the view of the Deva Citadel, the cleanliness, all convinced us that we must come back". This is what most of the reviews look like, as proof that a job well done, dedication, involvement and a permanent desire for evolution are always rewarded.

Contact: https://www.casamora.ro/
casamora@yahoo.com
+40 742 252 223

Scan Casa Mora

Potential application of natural antioxidants in laying hens' diets and their effect on eggs' nutrients and oxidative stability (PHYTOFEED)

H

Project no. 631PED/2022

Authors: Predescu Corina, Untea Elena Arabela, Mihaela Saracila, Alexandru Vlaicu, Stefan Georgeta, Papuc Camelia

Description: Eggs are considered one of nature's perfect foods being a rich source of both nutritive and non-nutritive compounds important to human health. Many research studies have demonstrated that through dietary manipulation, bioactive feed compounds may be transferred from the hens' feed into the yolk.

Functional feeds satisfy the nutritional requirements of animals and support health, but they include feed additives that target a specific purpose. The increased antioxidant capacity of table eggs will have positive consequences in delaying the lipid peroxidation process and prolonging the shelf stability of lipophilic antioxidants. The improved oxidative stability of table eggs will be achieved through the action of bioactive compounds of functional feed ingredients (co-products of the food industry), without synthetic antioxidant supplements in rations or exceeding the physiological requirements of animals

The aim of this project is to develop feeding strategies based on functional feed ingredients (co-products of the food industry), which ensure enhanced oxidative status of animal origin products with the effect of delaying oxidation reactions and increasing the shelf stability of lipophilic antioxidants.

The project activities are planned for 23 months, and organized in three phases; the partners involved in project implementation are IBNA Balotesti, USAMVB and Avicola Lumina SA.

- ***Functional feed ingredients that improve the oxidative status of laying hens and thus enable the production of eggs with increased oxidative stability***

PHYTOFEED

Demonstration models

- ***Functional feed recipes by including new functional feed ingredients for laying hens, in order to obtain a more durable and stable table egg***

- ***Table egg with naturally improved oxidative stability delayed lipid peroxidation and increased shelf life***

Contact: Corina Predescu, email: corina.predescu@fmvb.usamv.ro

Validation in the industrial environment of technology for obtaining natural preservatives for ready meals products in order to achieve foods free of synthetic preservatives (CLEANMEALS)

H

Project no. 71PTE/2022

Authors: Predescu Corina, Papuc Camelia, Stefan Georgeta, Badea Emanuela, Gâjâilă Iuliana, Iordache Florin, Tasbac Bogdan, Temocico Georgeta

Description: The shelf life of ready meals is ensured by synthetic preservatives. An alternative to synthetic preservatives is represented by natural preservatives obtained from fermented juices of parsley and parsnip, PETROGUARD, and PASTIGUARD, respectively. Their production technologies were validated in USAMVB laboratories and contain biologically active compounds with functional properties (vitamins, minerals, peptides and polyphenols).

The aim of the project is the transfer of CDI knowledge from the research organization – USAMVB, to the economic operator – SC ANGST Bistro SRL, in order to validate in an industrial environment the technology for obtaining the two preservatives.

The project activities are planned for 24 months, and organized in three phases; the partners involved in project implementation are Angst Bistro SRL and USAMVB.

<u>The following properties of CLEANMEALS were identified:</u>

Antimicrobial activity

- Inhibits the growth of microorganisms

Emulsifying properties

- stabilizes the emulsion

CLEANMEALS

For ready meals

Antioxidant activity

- inhibits the oxidation of lipids and proteins

Maintain the health of consumers

- due to the high content of biologically active molecules

Contact: Corina Predescu, email: corina.predescu@fmvb.usamv.ro

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INVENTCOR

Power of Creative Mind

Star Doner & Pizza DEVA

Food Project

Author: Irimia Marius Ionut & Team

H

We created the STAR Taste World just for you. STAR Doner&Pizza, a new, original concept based on quality and diversity adapted to any situation, with a portfolio of over 60 products. The service is provided directly from our location or based on the order with home delivery.

★ Fii diferit, alege STAR! ★







Am creat Lumea Gustului STAR doar pentru Tine. STAR Doner&Pizza, un concept nou, original bazat pe calitate si diversitate adaptat pentru orice situație, cu un portofoliu peste 60 de produse. Servirea fiind asigurată direct din locatia noastra sau pe baza de comanda cu livrare la domiciliu.











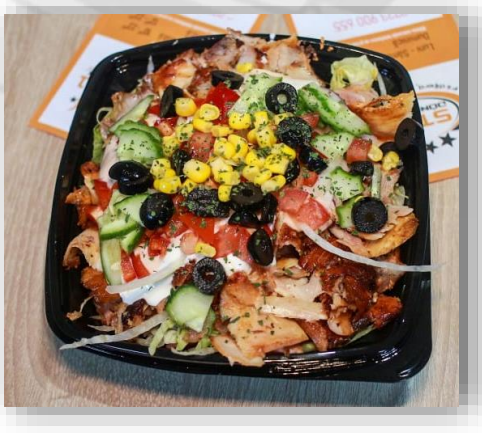



Contact: +40731 588 801

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Adriana’s Honey

Authors: Ignat-Matei Adriana
Ignat-Matei Adriana Daniela
Ignat-Matei Alexandra Roxana

H

Bee products intended for a healthy diet. In order to produce organic honey, bees are relocated to pollution-free areas as far away as possible from inhabited areas such as mountains, plains, and hills. Types of honey: polyflora, cherries, lime, chestnut, fir, sunflower, scallops.









In addition to honey, we also produce pollen, propolis, wax and a series of ENERGIN-like mixed products.

Capaceala is a beekeeping product that people don't really know, but it has great health benefits. As everyone understands, this is the cover of the honeycomb, with which the bees "seal" the honey deposited in each cell of the honeycombs.

In the mixture, honey with sea buckthorn fruits represents a complete cure with numerous healing properties for the body. In honey with sea buckthorn we find Vitamin A, the complex of B vitamins (B1, B2, B6, B9), Vitamins E, K, P and F, beta-carotene (more concentrated than in carrots) and other microelements such as calcium, magnesium, phosphorus, iron, potassium and volatile oils.

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THEREFRESH CONCEPT

PROJECT: HOSPITALITY CULTURE

Author: Florin Pirus & Team

H

Our company has been on the market for more than 12 years and we are continuously expanding.

Our activity is in the HoReCa field, we own 7 coffeeshops, a coffee roaster and a restaurant. In our cafes we offer our own brand of specialty coffee, hot chocolate, smoothie bar, catering and delivery services, in addition we are expanded with an online store where we offer our customers a varied range of products and accessories for serving and preparing tea and coffee.



Vision *TheRefresh is the place where you can really taste well-being!*

TheRefresh is more than a company or even a cafe. TheRefresh is a complex concept, which is based on the strong idea of refreshing, stimulating and educating the senses, to facilitate reaching the optimal level of energy and well-being.

TheRefresh is a concept aimed at offering customers a substitute for a healthy and balanced meal in the form of smoothies, teas and coffee.

TheRefresh is the place where the team is educated to serve all products in their finished form at the highest quality, honoring cultural factors and professional preparation methods. TheRefresh is more than a company or even a cafe. TheRefresh is a complex concept, which is based on the strong idea of refreshing, stimulating and educating the senses, to facilitate reaching the optimal level of energy and well-being.

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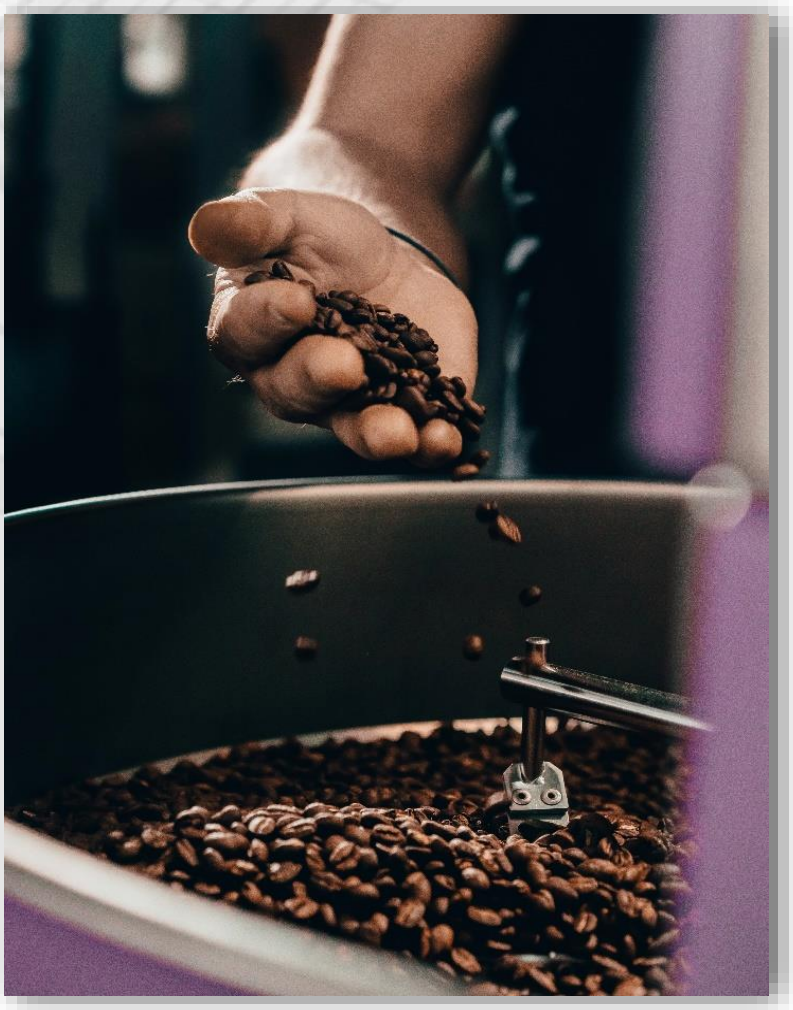

Scan

Contact: S.C. COFFEE&BEVERAGE S.R.L
E-mail: florin@therefresh.ro Tel.: +40 721 726 116 www.therefresh.ro

I

Textiles

Clothing

Fashion

Handmade

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"Gheorghe Asachi"
Technical University of Iasi, Romania
Faculty of Industrial Design and
Business Management

DIMA

COLLABORATIVE ONLINE INTERNATIONAL LEARNING IN DIGITAL FASHION - DIGITALFASHION

project number: 2021-1-RO01-KA220-HED-000031150

Ion Razvan Radulescu (INCDTP Bucuresti),
Irina Ionescu (TUIasi), **Manuela Avădanei** (TUIasi),
Carmen Loghin (TUIasi), **Andreea Talpă** (TUIasi),
Carmen Țiță (TUIasi)

The DigitalFashion project enables education providers to deliver new digital training methods, allowing students and professionals to quickly master key technologies for the design and production of customised products in a virtual environment and fully make use of the knowledge in the entire supply chain.

This knowledge mainly lies on digitization which is both a common and an important topic to all the partner countries. Develop three databases (library of knowledge) of textile materials, colors and garment styles as well as two fashion knowledge bases that will be built and integrated into the platform. Develop a supportive platform that will permit fashion students and fashion teachers to design together, in an interactive way, a garment for a specific customer.

The special requirements of the customer for the garment will also be communicated via the platform and taken into account in the final design.

TheInstitutul National de Cercetare-dezvoltare Pentru Textile si Pielari
Romania
www.certex.ro

Ecole Nationale Superieure Arts Industries Textiles
France
www.ensait.fr

Hogeschool Gent
Belgium
www.hogent.be

Univerza v Mariboru
Slovenia
www.um.si

Centro Tecnológico das Indústrias Têxtil e do Vestuario de Portugal
Portugal
www.citeve.pt

Universitatea Tehnica Gheorghe Asachi Din Iasi
Romania
www.tuiasi.ro





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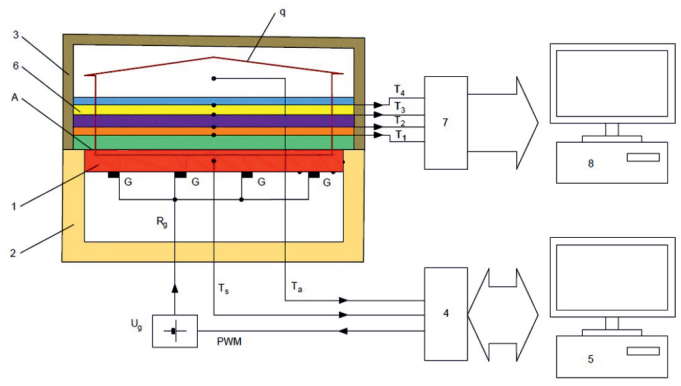
University of Zagreb
Faculty of Textile Technology

MEASUREMENT EQUIPMENT AND METHOD FOR THE SIMULTANEOUS DETERMINATION OF THERMAL RESISTANCE AND TEMPERATURE GRADIENTS OF LAYERS OF CLOTHING COMPOSITES

Authors: **prof.dr.sc. DUBRAVKO ROGALE, prof.dr.sc. SNJEŽANA FIRŠT ROGALE, doc.dr.sc. ŽELJKO KNEZIĆ**

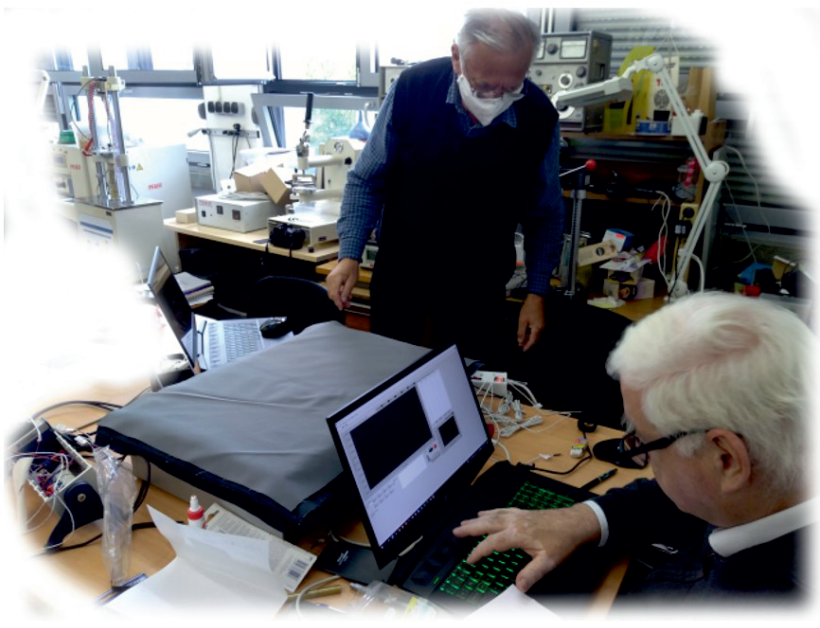
Patent no.: P20211208A

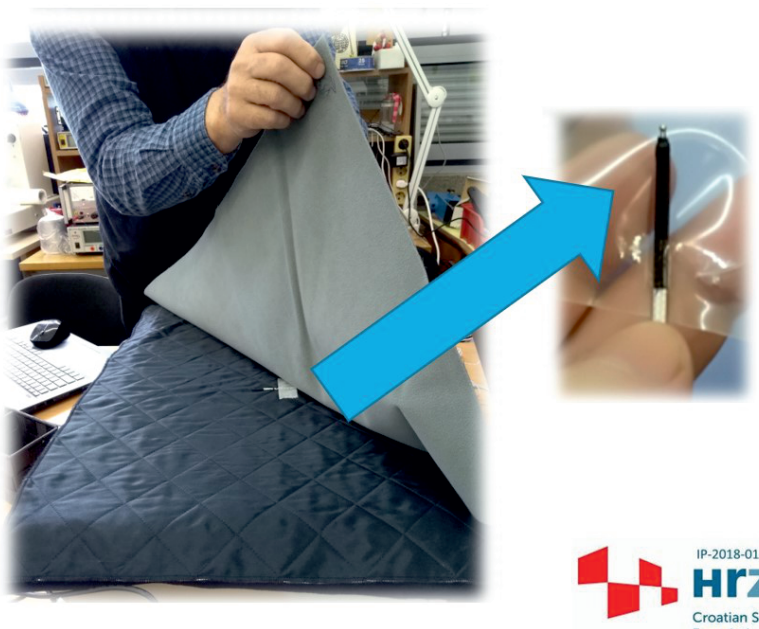
The thermal properties of clothing in most products are still not designed according to engineering science for most products due to the lack of simple and acceptable measuring equipment and methods, so the number of layers of clothing, the type of thermal insulation material and their thickness are chosen empirically.



A new measuring device and method for simultaneous measurements in determining the thermal resistance in one or more layers of clothing compo-sites and temperature gradients of composite layers are presented, as well as the theoretical principles of operation and practical results.

Clothing technology does not have a long tradition of measurement and metrology techniques needed to test the properties of materials required for the technical design of garments. Therefore, the introduction of a new measurement method for the simultaneous measurement of thermal resistance and temperature gradients is an important novelty for the field of clothing engineering. The novelty is that the measurements of two important parameters for the design of the thermal properties of clothing and of composite clothing (thermal resistance and values of temperature gradients) are carried out simultaneously with one measuring system.





IP-2018-01-6363
HrZZ
Croatian Science Foundation

Contact: CROATIAN INVENTORS NETWORK, e-mail:info@savez-inovatora-zagreba.hr
www.inova-croatia.com

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NO LIMITS

KisPetra-Antonia

Student project

Goth is making a comeback in a period when no aesthetic feels off limits. Nothing feels strange or unusual anymore, it's all about fashion choices and people who feel free to be themselves, even when they want to be perceived as a void or an otherworldly being. The artwork bring to the forefront the freedom of expression and the encouragement to show the innerself.



Stilul goth revine într-o perioadă în care niciun estetic nu are limite. Nimic nu mai pare ciudat sau neobișnuit, totul ține de alegeri vestimentare și oameni care se simt liberi să fie ei înșuși, chiar și atunci când vor sa fie percepuți ca un void sau o ființă de pe altă lume. Lucrarea aduce în prim plan libertatea de exprimare și încurajarea afișării sinelui interior.

Contact: kispetra04@gmail.com

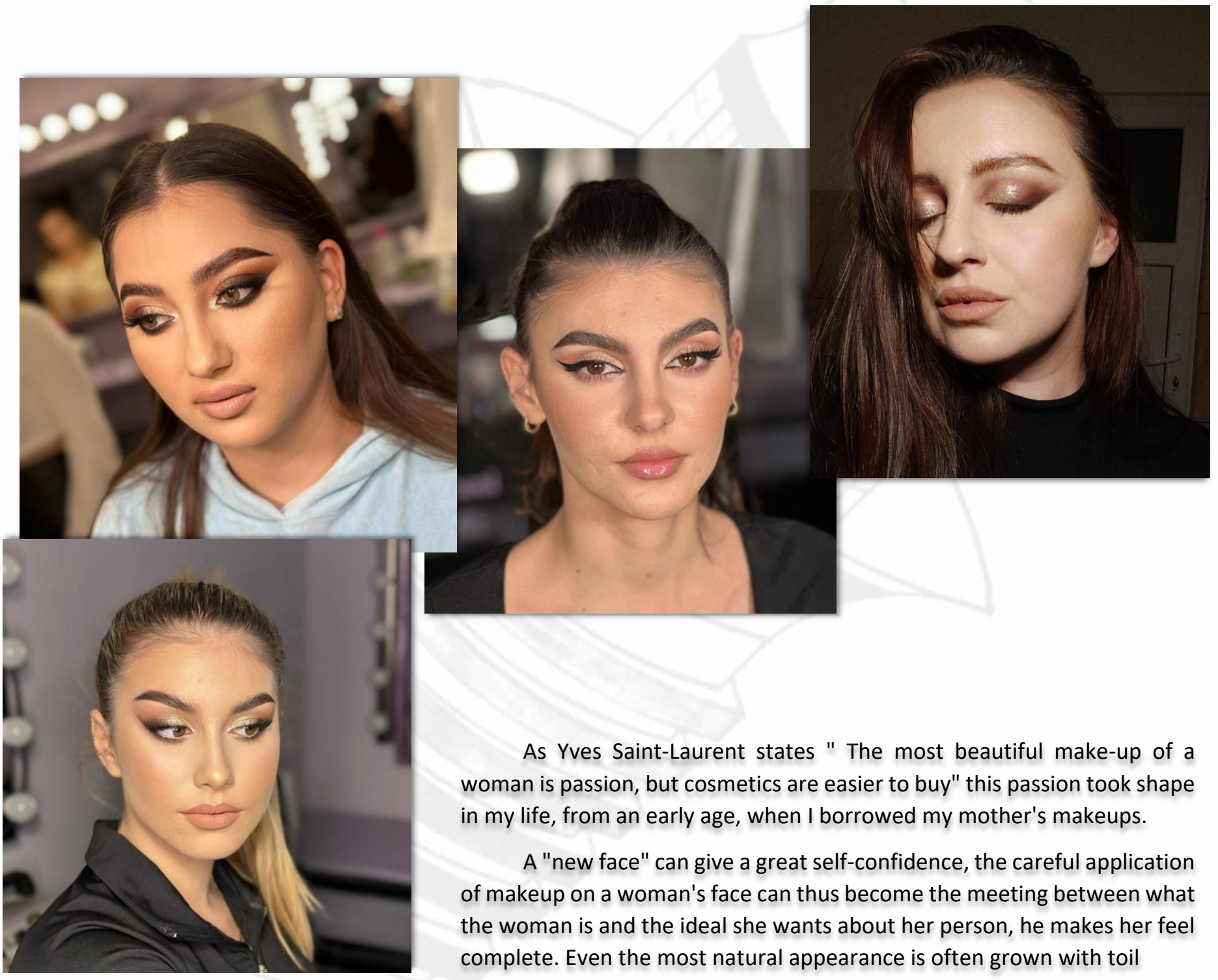
CREATE YOUR OWN HAPPINESS

Author/s: Marginean Giulia Ada

Dupa cum afirma si Yves Saint-Laurent ” Cel mai frumos make-up al unei femei este pasiunea, dar cosmeticele sunt mai usor de cumparat” aceasta pasiune a prins contur in viata mea, inca de la o varsta frageda, cand imprumutam machiajele mamei mele.

Un “chip nou” poate conferi o mare incredere in sine, aplicarea atenta a machiajului pe fata unei femei poate devein astfel intalnirea dintre ceea ce este femeia si idealul ce si-l doreste in legatura cu persoana sa, el face ca ea sa se simta completa. Chiar si infatisrea cea mai naturala este cultivata deseori cu osteneala

Nu exista machiaj standard! Pentru realizarea acestuia trebuie sa tinem cont de tipul fetei , de culoarea si forma ochilor, de personalitate, de evenimentul pentru care se realizeaza, de tinuta etc, astfel te poti juca cu nuantele, umbrele, texturile care te transforma in mod miraculos.



As Yves Saint-Laurent states " The most beautiful make-up of a woman is passion, but cosmetics are easier to buy" this passion took shape in my life, from an early age, when I borrowed my mother's makeups.

A "new face" can give a great self-confidence, the careful application of makeup on a woman's face can thus become the meeting between what the woman is and the ideal she wants about her person, he makes her feel complete. Even the most natural appearance is often grown with toil

There is no standard makeup! To achieve it we must take into account the type of face, the color and shape of the eyes, the personality, the event for which it is performed, the outfit, etc., so you can play with shades, shadows, textures that miraculously transform you

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Tel: +40735283802

FASHION SAYS ”ME TOO” STYLE SAYS ”ONLY ME”

I

Author/s: Albescu Corina

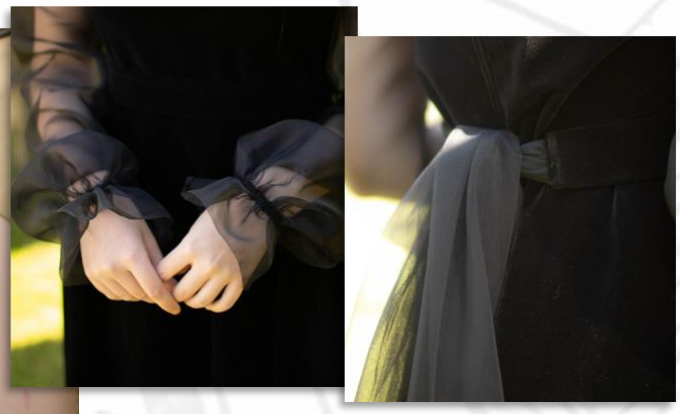
Fiindca “Stilul este un mod simplu de a spune lucruri complicate”, scopul meu este sa ii ajut pe oameni sa isi rafineze si sa isi gaseasca propriul stil, avand curajul de a si-l asuma, prin hainele create de mine.

Unicitatea hainelor este redata de micile diferente, amprentele personale ale designerului. Detalile de pe imbracaminte pun in evidenta creativitatea celui ce le realizeaza, iar uneori ideeile celui ce le poarta.

Diferenta dintre stil si moda este calitatea, alegerea hainelor trebuie sa fie in functie de stilul nostru de viata, tu singur trebuie sa hotarasti cine esti si ce vrei sa transmit prin modul in care te imbraci si iti traiesti viata. Dupa cum afirma si Katharine Hepburn “Port ce-mi place mie, ca sa nu mai fie nevoie sa-mi bat capul cu ce ar trebui sa port”







Because "Style is a simple way to say complicated things", my goal is to help people refine and find their own style, having the courage to assume it, through the clothes I create.

The uniqueness of the clothes is given by the small differences, the personal fingerprints of the designer. The details on the clothes highlight the creativity of the one who makes them, and sometimes the ideas of the one who wears them.

The difference between style and fashion is quality, the choice of clothes must be according to our lifestyle, you yourself have to decide who you are and what you want to convey through the way you dress and live your life. As Katharine Hepburn says, "I wear what I like, so that I don't have to bother with what I should wear"





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Instagram : _coco.a.clothes_

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THE WORLD OF NAILS

AUTHOR: ANA MARIA TIMPEAN

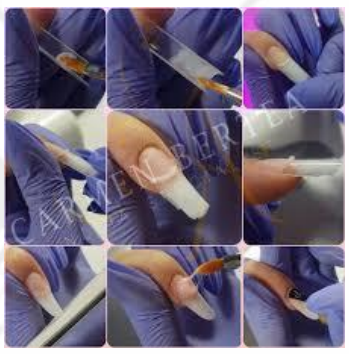
The nail is a thin plate that grows on the top of the last phalanx of the fingers and covers the top of the fingertips.



The most important methods to style a nail is **semi-permanent nail polish**, and to give it length you can use the **construction on the template** or the **construction from smart shapes tips.** There is also the old **tips** that are no longer used.







▶ The construction of the nail can be done with:

Gel



Acryl



Poly-gel



▶ The construction of gel nails is recommended for people who want a flawless manicure for a long time but it is very effective and for women whose natural nails are not very resistant, they break quickly or exfoliate immediately.

Contact: +40736358913

ana.timpean@student.upt.ro https://www.facebook.com/thebeautyroom.hunedoara

INTELLIGENT SYSTEM FOR MONITORING VITAL PARAMETERS IN CHILDREN WITH SPECIAL NEEDS

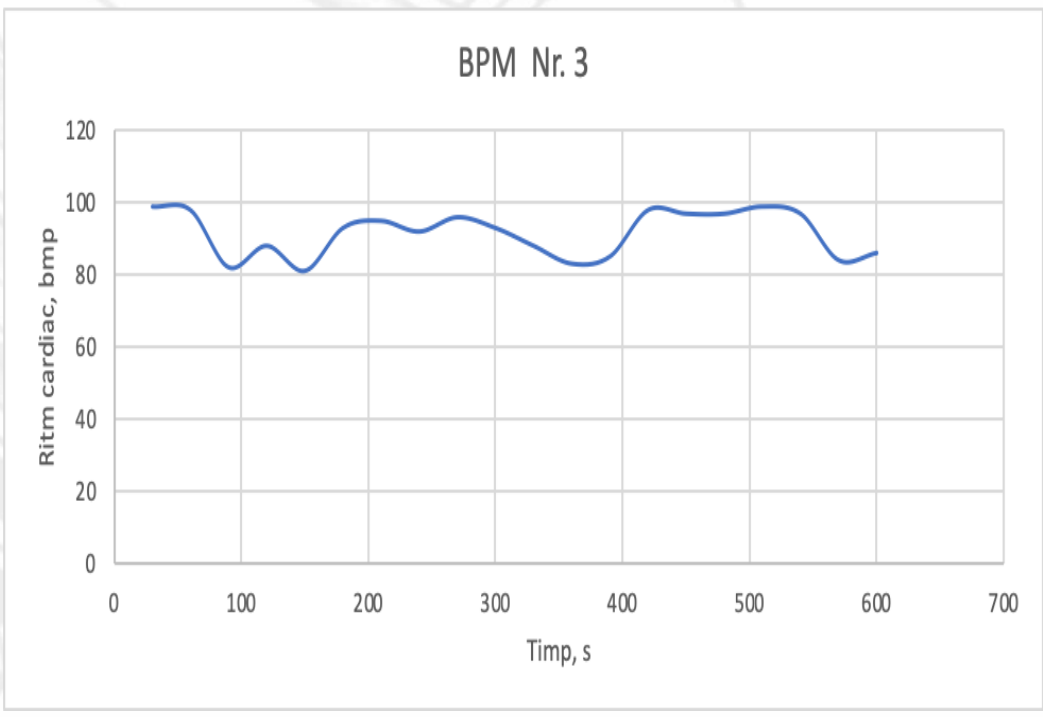
I

WIPO85961, DM/203338

Author/s: Victoria Danila, Stela Balan, Antonela Curteza

The benefits of the products are the intelligent system for obtaining information about the child's health, the shape of the product, it easily allows the integration of a system for monitoring the child's vital parameters. The design of smart products consists of flat elements with minimal seams, which are safe and comfortable and at the same time monitor the state of health. The product provides information to medical staff and parents about the child's condition in a short time.





Measurement of heart rate in children dressed in smart clothing, in conditions of physical exertion

Contact: victoriavasiledanila@gmail.com

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MOFT STUDIO SRL

Patricia's Handmade Accesories

Handmade creations

Author: Patricia Nelega

Patricia's Handmade is a concept based on creativity, sensitivity, passion for everything that art means. The products, unique, are designed for an avant-garde look. Diversity is the strong point of Patricia's Handmade creations from brooches, earrings, decorations to projects for special events: weddings, christenings, anniversaries etc.

All products are customized according to by the preferences of those for whom they are created.















https://www.facebook.com/moftstudio/

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ATELIERUL LUI BUTONEL

Handmade creations

Author: *SOLDAN ROXANA*

I

It is all about polymer clay, personalized and unique gifts decorated by hand with patience and love. From little pieces of clay to portraits, name tags, movie and cartoons characters, cute animals, appreciation and love messages and so much more. The limit is your imagination!

It takes time, a lot of clay, a good cutter blade, sometimes some pastel colours and a lot of creativity to create the perfect gift, and that makes worth it ☺.









You can see some of my creations in the attached photos and, also, you can see my activity on my Facebook Page : Atelierul lui Butonel and follow me on instagram @atelierulluibutonel.

Contact: *https://www.facebook.com/AtelierulluiButonel/*

J

Kids Corner

Games

Toys

Outdoor activities

Smart Portable Body Temperature MonitoringDevice Using Infrared Sensor

Adam Sufi Mohd Mustafa Al Bakri
Ezz Eilman Mohamad Ezral
Muhammad Qaiser Faheem Mohd Zul Fauzi

Advisor
Sharifah Noraziah Syed Ali
Azizah Hamzah

SEKOLAH KEBANGSAAN SENA, PERLIS

INTRODUCTION

1. Since our country has entered the endemic phase, the awareness of the people of charity has been emphasized.
2. This is to enable the government to continue the country's economic recovery. All citizens should have a high awareness of the current situation such as Covid-9i issues, influenza, flu and so on.
3. To ensure that this recovery phase runs smoothly, the people need to have self -awareness of the current situation to ensure that the infection does not spread.

PROBLEM STATEMENT

1. Infectious diseases such as COVID-19 that have symptoms such as fever are difficult to detect before a person enters the premises or social events that cause a high risk of infection.
2. How to record body temperature for a person with symptoms or fever using traditional methods is not suitable because the temperature reading can be obtained when the temperature measuring device measures the temperature in one place only.
3. Need a measuring device that is portable and can be carried anywhere and always record the temperature to allow people to be better prepared and able to avoid people who have a fever and symptoms.
4. Currently there is an increase in Covid-19 cases as well as influenza cases in children. Usually the initial effect is with high fever with temperatures above 37.5 degrees Celsius.
5. To solve this problem, **Smart Portable Body Temperature Monitoring Device Using Infrared Sensor** can help to detect and take appropriate action.

PRODUCT DESCRIPTION

1. This portable temperature gauge is designed to allow body temperature to be recorded periodically and automatically without the need to use a static gauge that provides temperature readings only at one time and place.
2. This device will allow everyone to always be able to see and know the body temperature of a person who has symptoms and fever through the wearing of a cap that is fitted together with a body temperature measuring device.
3. Therefore, the reading of a person's body temperature will always be visible through the screen/screen mounted on the front of the cap worn.
4. If a person's body temperature reading is high or feverish, the temperature and the reading on the screen of the device will show a change of red color and the body temperature reading above 37 degrees Celsius will be displayed and this reading will be visible to everyone.
5. Therefore, this high body temperature will warn everyone to stay away from people who have symptoms or fever and in turn reduce the risk of infection through contact.
6. This device is the first device created to allow the reading of a person's body temperature can be seen by others at all times and thus the risk of transmission of infectious diseases can be reduced by avoiding being close to people who have a fever and symptoms and can avoid any disease that easily transmitted through contact

MATERIALS

1. Cap 
2. Body Temperature Measuring Device Using Infrared Method 
3. Battery 3 Volt 

J

ADVANTAGES

- Mobile device and always record body temperature thoroughly
- Body temperature readings for people with symptoms and fever can always be seen by people who are in the same environment
- Easy to use and wear because you only need to wear a cap

PRODUCT FEATURES




POTENTIAL MARKET

The first device created and has a wide market either domestically or abroad because the problem of infectious diseases involving high body temperature is a global problem.



'Smart Portable Body Temperature MonitoringDevice Using Infrared Sensor'

www.PosterPresentations.com

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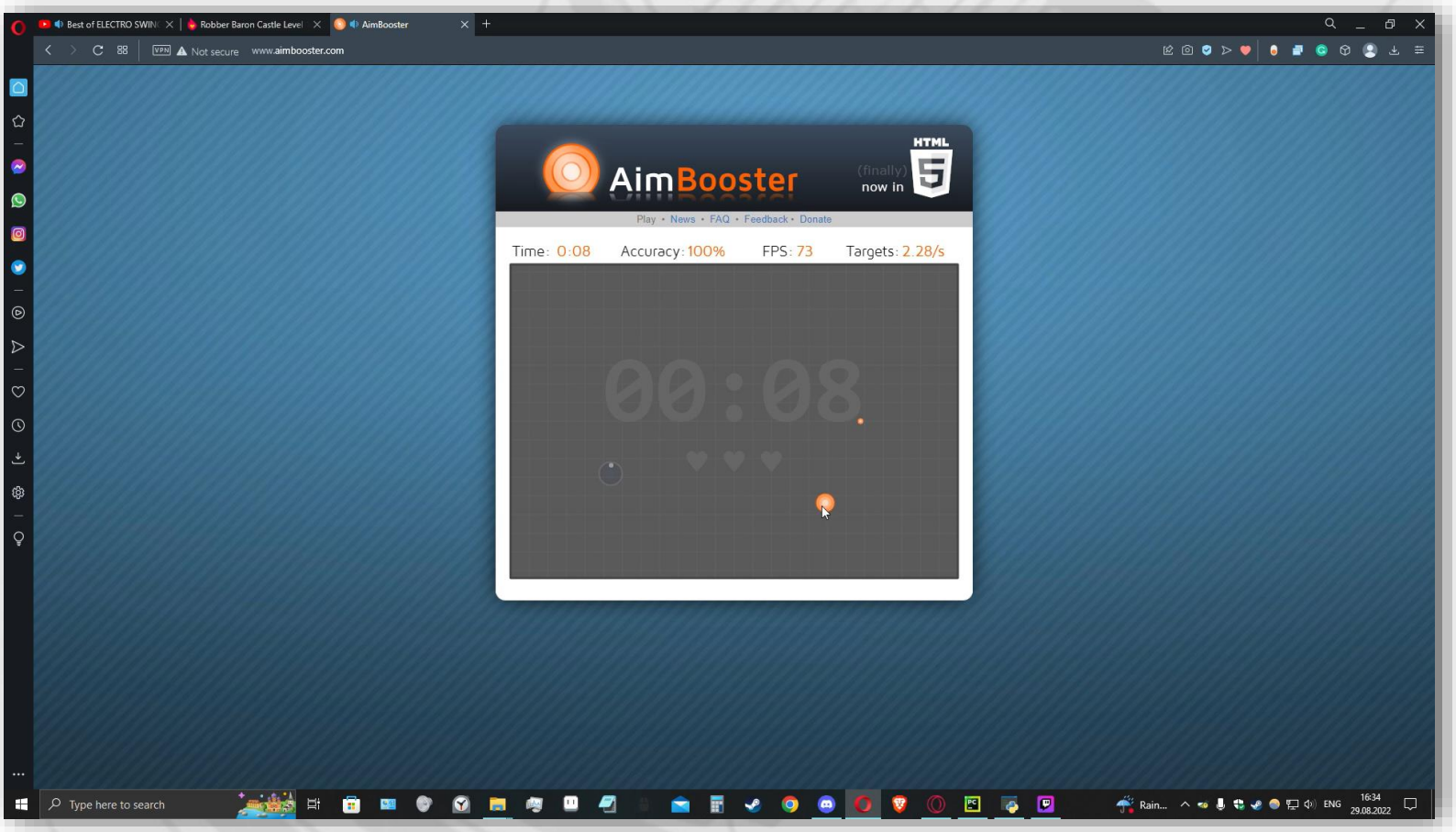
Power of Creative Mind

Imagine and color recognition with the help of AI created in Python

Author: Robert MUTU, Mihaela POPA

E

The following project presents what can be achieved with image recognition and color recognition. Image recognition, in the context of machine vision, is the ability of software to identify objects, places, people, written texts, and actions in images. Computers can use machine vision technologies in combination with a camera and artificial intelligence software to achieve image recognition. Image recognition is used to perform many machine-based visual tasks, such as labeling the content of images with meta-tags, performing image content searches, and guiding autonomous robots, self-driving cars, and accident-avoidance systems. While human and animal brains recognize objects with ease, computers have difficulty with the task.



Software for image recognition requires deep learning. Performance is best on convolutional neural net processors as the specific task otherwise requires massive amounts of power for its compute-intensive nature. Image recognition algorithms can function by use of comparative 3D models, appearances from different angles using edge detection, or by components. With guided computer learning, image recognition algorithms are often trained on millions of pre-labeled pictures. Current and future applications of image recognition include smart photo libraries, targeted advertising, the interactivity of media, accessibility for the visually impaired, and enhanced research capabilities.

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CORNELIUGROUP research-innovation association

INVENTCOR

Power of Creative Mind

FCA FACULTY OF CONTEMPORARY ARTS

Animation

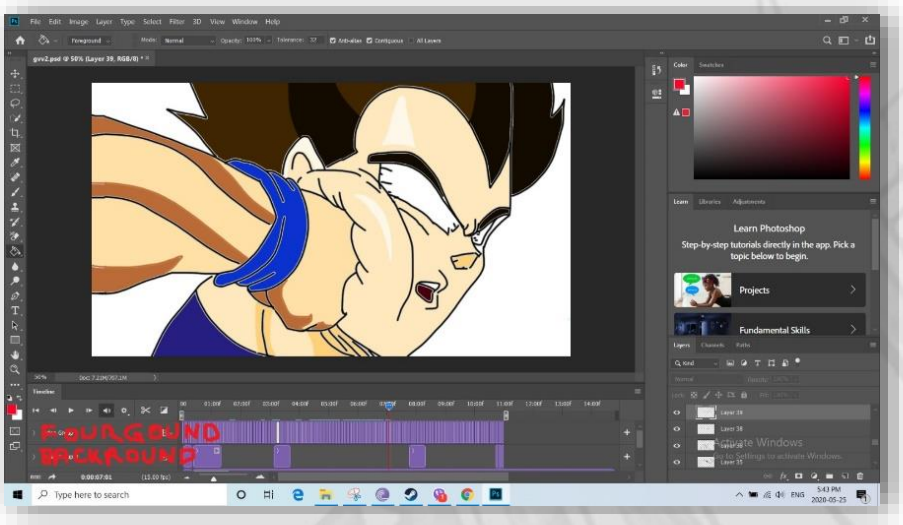
Student Project

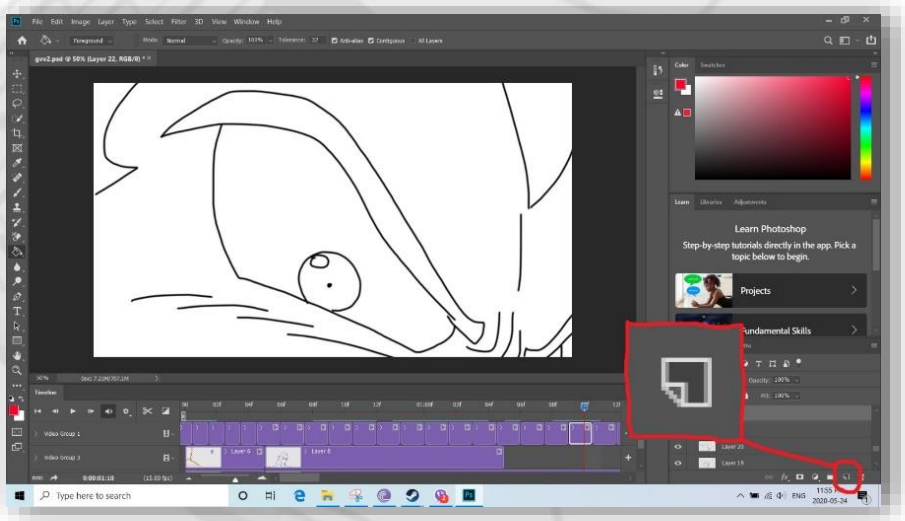
Author: Pavle Trišović

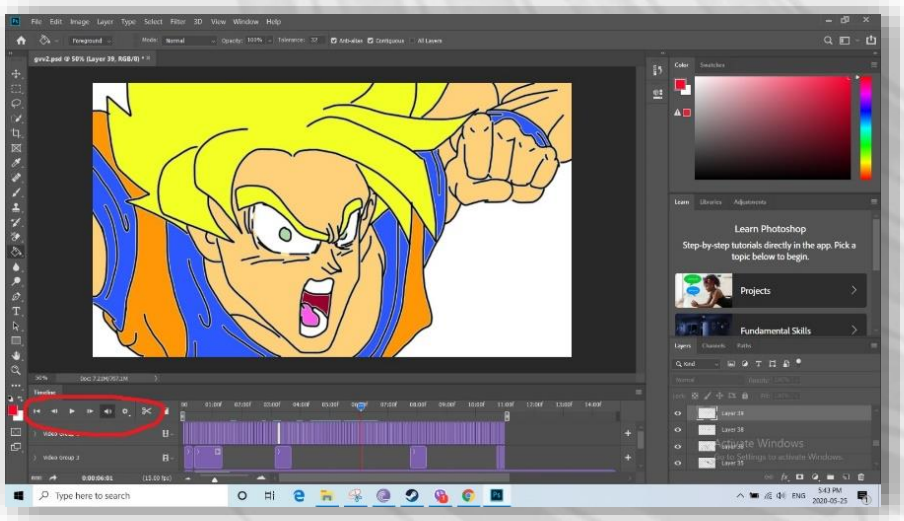
J

The Photoshop program was used and the result is an 11-second animation created from 122 digital drawings that the author also created in Photoshop.

This animation is originally in PDS format which was then converted to GIF with better manipulative properties (supportability and portability).









Contact:
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Tel: +381631033990
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SCAN GIF ANIMATION

A&O Game

Author/s: Albescu Oana, Albescu Corina

Jocurile de logica sunt un fel de gimnastica a creierului. Acesta antreneaza rapiditatea si flexibilitatea gandirii intr-un mod placut printr-o serie de procese cognitive care difera de la un tip de joc la altul. De aceea jocurile logice sunt printre cele mai interesante si mai variate si aduc o multime de beneficii pentru orice varsta.

Rezolvarea oricarui joc presupune implementarea unui mod de gandire diferit de cel native, parcurgerea unor etape sau crearea unor trasee noi sau strategii si adaptarea lor pentru a castiga sau a finaliza jocul. Parcurgerea uni joc presupune in acelasi timp pastrarea unei perspective de ansamblu, dar si urmarirea pasilor logici si a detaliilor pentru a ajunge la rezolvare.

Jocul este astfel: se completeaza careul din imagine. Pe fiecare rand si coloana se afla un numar egal de litere “A” si “O”. Nu pot fi mai mult de doua litere “A” sau “O” alaturate sau unele deasupra celorlalte.

O			O					O	O
			A						O
O				O		O			
	A		O			O	A		
		O	O				A		
				A		A			
	A								
		O		A				A	
A		O			O		O	A	
A			O	O					

Logic games are a kind of gymnastics of the brain. It trains the speed and flexibility of thinking in a pleasant way through a series of cognitive processes that differ from one type of game to another. That's why logic games are among the most interesting and varied and bring a lot of benefits for any age.

Solving any game involves implementing a different way of thinking than the native one, going through stages or creating new routes or strategies and adapting them to win or complete the game. Going through a game involves at the same time keeping an overall perspective, but also following the logical steps and details in order to reach the resolution.

The game is like this: it fills in the square in the image. On each row and column there is an equal number of letters "A" and "O". There can be no more than two letters "A" or "O" joined or one above the other.

Contact: albescu.oana@yahoo.com , albescu.corina@yahoo.com

Tel: 0754990236

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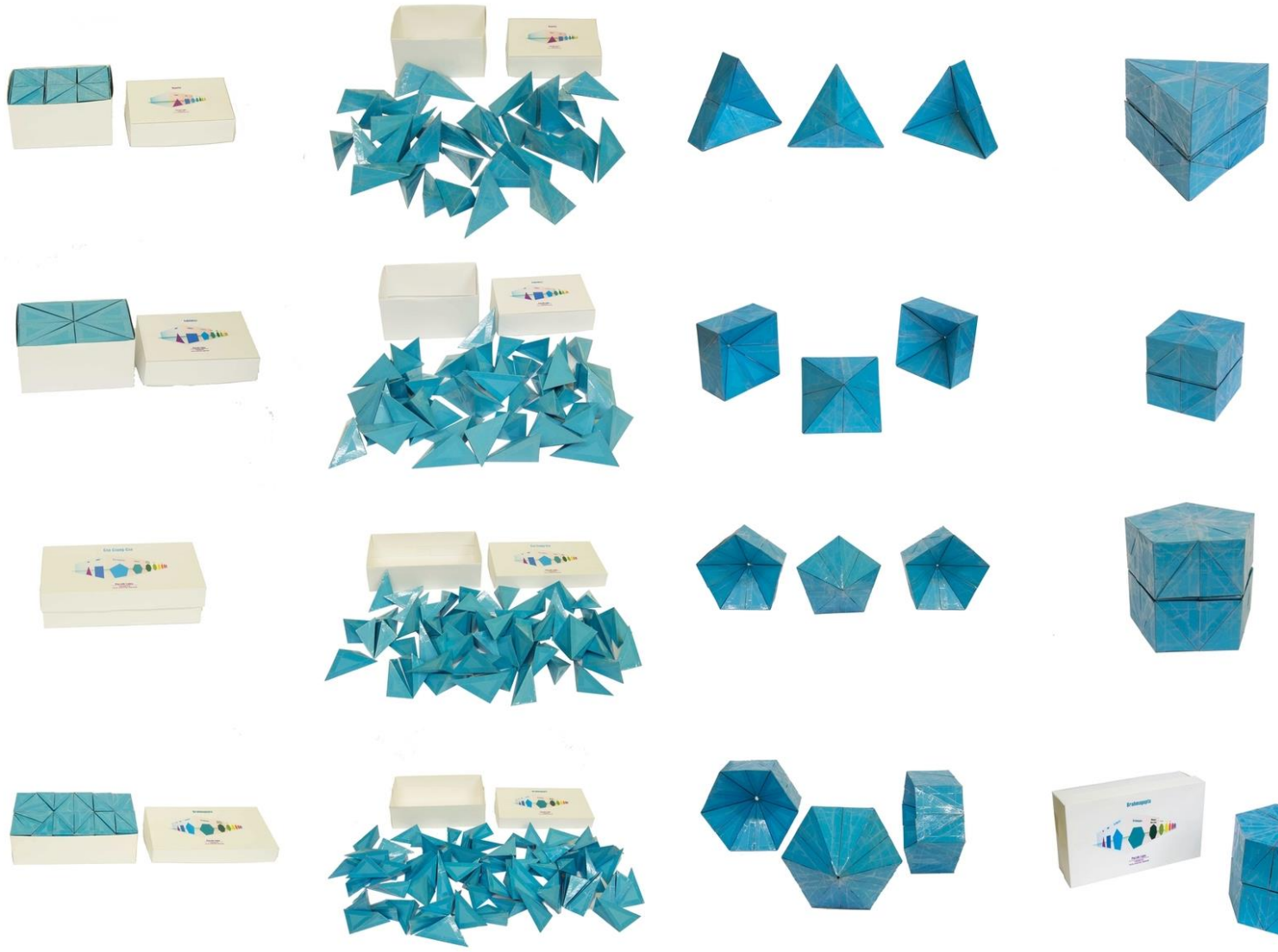
Mathematics - Spatial geometry - Solids, shapes, dimensions

J





PYTHAGOREAN SOLIDS

$A^2 + A^2 = A^2$

A, V A, V A, V

$12^2 = 144$ db
A=TEST 36 db
B=TEST 48 db
C= TEST 60 db

PROPORTIONALITY

A B A B

BINOMIAL THEOREM TRANSFORMATION AND NUMBER
Line Projection Machine (X IS NEVER 0)

SOLIDS WITH A UNIT MEASUREMENT OF 0

$cm^2 = cm^3$

A V

$156+\sqrt{24300} = cm^2$
$156+\sqrt{24300} = cm^3$

$234+\sqrt{54675} = cm^2$
$234+\sqrt{54675} = cm^3$

$312+\sqrt{97200} = cm^2$
$312+\sqrt{97200} = cm^3$

$390+\sqrt{151875} = cm^2$
$390+\sqrt{151875} = cm^3$

$468+\sqrt{218700} = cm^2$
$468+\sqrt{218700} = cm^3$

$546+\sqrt{297675} = cm^2$
$546+\sqrt{297675} = cm^3$

$624+\sqrt{388800} = cm^2$
$624+\sqrt{388800} = cm^3$

$702+\sqrt{492075} = cm^2$
$702+\sqrt{492075} = cm^3$

$780+\sqrt{607500} = cm^2$
$780+\sqrt{607500} = cm^3$

$858+\sqrt{735075} = cm^2$
$858+\sqrt{735075} = cm^3$

$936+\sqrt{874800} = cm^2$
$936+\sqrt{874800} = cm^3$



POCZÓK Lajos

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J

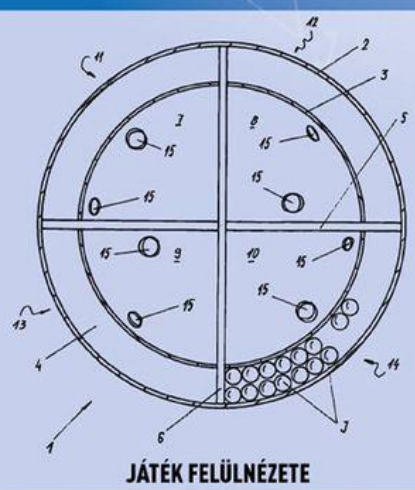
MAGYAR TALÁLMÁNY

3D-s MECHANIKUS LOGIKAI JÁTÉK

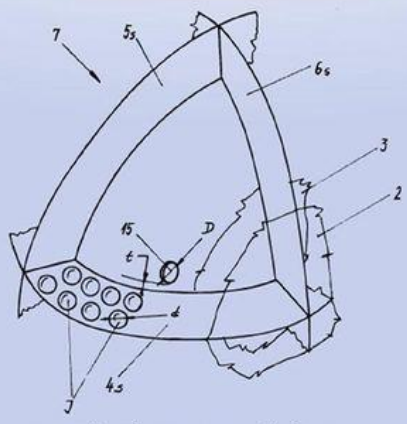


FÉNYKÉP SZINESBEN

ÖTLET CLUB 13 EGYESÜLET
IDEA
Hódmezővásárhely
IDEA CLUB 13
ASSOSIATION



JÁTÉK FELÜLNÉZETE



EGYIK ÖVHÉLYKAMRA KITÖRÉSSEL



EGYIK SZINVARIÁCIÓS TERV

TÉRBELI KIRAKÓS LOGIKAI GOLYÓSJÁTÉK
Magyar Találmány

RÖVID ISMERTETÉSE:
A kézilabda nagyságú 3D-s átlátszó, sima felületű gömbben érdekesen elhelyezkedő, száznál is több, sokféle színcsoportú kis golyók biztosítják a játék folyamán a választékban gazdag színkombinációk kirakását.

ANYAGA:
plexi, fa, műanyag, szilikongumi

AJÁNLÁSA:
A kisiskolástól az idősebb korosztályig.

ALKALMAZÁSI TERÜLETEI:
A játékiparban, családoknak, különböző szintű iskoláknak, azok közötti logikai vetélkedőin, versenyein stb.

CÉLJA:
Magyarországon és külföldön egyaránt népszerűsíteni és minél több játékszerető emberrel megismertetni ezt a különlegesen érdekes és szórakoztató logikai játékot, hogy sokak számára aktív kikapcsolódást és örömet okozzon.

EGYEDISÉGE:
Nem csak hagyományos, pl. kétféle funkciót oda és vissza történő színes golyók kirakására és rendezésére alkalmas, hanem azon túlmutatva, színte megszámlálhatatlan, egyre bonyolultabb színvariációk kirakása a játék célja. A gyerekek is imádni fogják, mivel lehet egyszerű és bonyolult feladatokat is elvégezni. Kiválóan fejleszti a kézügyességet, koncentrációt, kombinatív készséget, a kitartást stb.

JAVASOLTAN ALKALMAZHATÓ:
Oktatási segédeszközként a térlátás, kombinatív készség, türelem fejlesztésére stb.

GYÓGYÁSZATBAN:
Az éleslátás, koncentráció, kombinatív készség stb. javításában.

MŰKÖDÉSÉNEK RÖVID ISMERTETÉSE:
Egy zárt fényáteresztő gömbben külön külön elhelyezett, másféle színcsoportú kis golyók az alaphelyzetéből elindulva, különböző irányú forgatás, mozgatás és billegetés folyamán a golyókra ható gravitáció és azok holtpontjait kihasználva, lehetőleg egyenként való görgetésével és állandó cseréjével juthatunk el a különböző színnel és számmal megjelölt, az előre meghatározott megoldásokat kívánó kamrába, majd onnét lehet visszaállítani az alaphelyzetet. A felnőttek számára.ls kellő kihívást és fejtörést okozhat az egyre bonyolultabb megoldási folyamat, amely akár nagyon hosszú ideig is lekötheti a figyelmet.

TÖBBLETHATÁS:
A visszarendezés előtt akár tovább is léphetünk egy magasabb szintre, fokozatra, úgy, hogy egy újabb színkombináció megoldása lehet a játék további célja.

GYÁRTHATÓSÁGA:
Az egyszerű szerkezetének és anyagának köszönhetően, olcsón és könnyen előállítható, és kellően strapabíró.

TOVÁBBFEJLESZTHETŐSÉGE:
Fontos feladat Cél minél több színű golyó játékba vitele, és a kirakási lehetőségek további fokozása és nehezítése.

JAVÍTÁSI LEHETŐSÉG:
anyagminőségben, precizitás, pontosság, stb.

JÁTÉK SZABÁLYAI:
Egyéni: A három forduló megoldása közül a legjobb forduló ideje számít, szabályos kirakással.
Csapatverseny: Négy fős csapat, szintén a három fordulóval kell a végeredményt eldönteni. Ahol a legjobb forduló csapattagonkénti összideje számít, szabályos megoldással.

3D PUZZLE LOGICAL BALL GAME!
Hungarian invention

BRIEF DESCRIPTION:
More than 100 pieces of small balls of eight different colours specifically embedded in a handball-sized, 30, transparent, smooth-surfaced sphere create the possibility to display a wide range of colour combinations during the game.

MATERIAL:
Fibreglass, wood, plastic, silicone.

RECOMMENDATION:
From elementary school students to everyone of older age.

FIELDS OF APPLICATION:
Toy industry, homes, for families, students of different levels, logical quiz games, corn petitions.

TARGET:
To promote this particularly interesting and entertaining logical game in Hungary and abroad as well as to introduce it to as many game-loving people as possible to provide active recreation and joy for many.

UNIQUENESS:
Not only is it applicable to set or arrange coloured balls in the traditional 'to and fro' way, but beyond that, the goal of the game is to display almost countless and increasingly complex colour variations (number combinations) etc. Kids and adults alike will love it, since both simple and complex tasks can be performed. It improves dexterity, concentraticm, combinatorial skills, endurance, etc.

RECOMMENDED FIELDS OF APPLICATION:
-**Education:** as a teaching aid to develop stereoscopic vision, combinatorial skills and patience.
-**Healthcare:** to improve visual acuity, concentration, cognitive skills, etc.

BRIEF DESCRIPTION OF OPERATION:
8 separated game chambers in a closed, light-transmitting sphere, each having small balls of different colour groups of which the state of rest is the starting point of the game. The given task must be solved by rotating, moving and tilting the sphere in our hands by changing the order of small balls of different colours, if possible, one by one regarding the given colour combination. They must be scrolled, escorted to their places, taking advantage of gravity and dead points. After the task is correctly solved, the basic starting position must oe restored in a similar way or the next defined colour variation could be reached. The increasing complexity can be a real challenge even for adults and it requires attention for
a very long time.

ADDITIONAL OPTION(S):
Before rearranging, you can even move on to a higher level, so that solving another colour combination could be the further goal of the game. An important task can be to get as many multicoloured small balls into play as possible, to enhance the display variations further and make them more difficult.

MANUFACTURING:
Due to its simple structure and material, it is inexpensive and easy to manufacture and sufficiently durable.

POSSIBILITY OF REPAIR:
In material quality, accuracy, precision, etc.

GAME RULES:
Single player: the best time counts from 3 rounds keeping the rules
Team competition: with groups of 4 people the best total time counts summing up the individual player times, keeping the rules.

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Power of Creative Mind

Centrul Judetean de Excelenta Hunedoara

Energy Earth boardgame

Prototype

Authors: Dariana Alb, Sarah Ajtay, Anca Gostian, Adelina Kelemen, Bogdan Neamțu, Alexandra Sava, Delia Solomon, Ianis Vardea, Raluca Săpunaru,
Paul Țoța (coordinator)

Category:

J - Games

Proiectul propus este un joc de tip boardgame despre rețeaua de energie electrică globală și metodele de producere a energiei protejând mediul.
Strategia de joc ia în considerare elemente precum costul producerii energiei, taxe pentru energia poluantă și multe altele.
Fiecare poziție din joc are o semnificație precum: termocentrală, hidrocentrală, centrală eoliană, panouri fotovoltaice, centrală nucleară, linii de înaltă, medie și joasă tensiune, pene de curent, mină de uraniu, centru de prelucrare a lemnului, mină de cărbuni, rafinărie, companie de exploatare și distribuție gaz, centrală nucleară, fabrică de turbine eoliene sau fabrică de panouri fotovoltaice.



The proposed project is a board game about the global electricity grid and methods of producing energy while protecting the environment.
The game strategy takes into account elements such as the costs of energy production, taxes for from non green energy sources and many others.
Each game position has a meaning such as: thermal power plant, hydro power plant, wind power plant, photovoltaic panels, nuclear power plant, high, medium and low voltage lines, power cuts, uranium mine, wood processing center, coal mine, refinery , gas exploitation and distribution company, nuclear power plant, wind turbine factory or photovoltaic panel factory.

Contact: paultota79@yahoo.com

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Club Evoluţii cu Alexandra Marcu

Author: Alexandra Marcu

J

Club Evolutii is an organisation from Romania, providing personal development activities based on mountain and traveling education. We organize mountain hikes, expeditions, camps and educational courses for children who want to become explorers and enjoy many experiences and adventures.





Video Club Evolutii

Did you know that skiing offers a series of very important advantages?!

1. More calories burned

Skiing is an excellent cardiovascular exercise, which can help you burn serious calories and shed extra pounds. The number of calories you burn per hour is based on your weight and fitness level, but according to the Harvard Medical School, a person who weighs 85 kg will burn 266 calories in 30 minutes of downhill skiing. Beginners can get extra calories burned by going up the slope, instead of using the ski lift. As for advanced skiers, the steeper the slope, the more calories they will burn, because the body has to work harder to maintain its balance.

2. Strengthens the muscles of the lower body area

This winter, take the training from the gym directly to the game! Skiing naturally keeps the body in a squatting position, which strengthens the quadriceps, hamstrings, calves and glutes.

3. Improve flexibility

The very art of balancing and tensing the trunk and key muscle groups while skiing makes the body more flexible! As in any sport, it is recommended that you have a stretching routine before going on the track. It is also welcome to do some stretching afterwards to avoid injuries.

4. Improves mood

Movement in the open air promotes an increased production of endorphins, which leads to a feeling of liberation and happiness. In addition, winter sports offer families time together in nature, extremely important moments in winter, when the days are shorter and the time spent with the family is reduced.

Regardless of the duration and frequency with which you do this activity, skiing is extremely beneficial not only for your physical health, but also for your mental health.

Contact: https://www.facebook.com/clubevolutii

alexandraflaviamarcu@gmail.com Mobile: 004 0723 219 655

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Power of Creative Mind

EXPERT AVENTURA PARC

WWW.EXPERTAVENTURAPARC.RO

By CHINGI EXPERT

Outdoor playground equipments

Climbing Net, Friendship Net, Adventure Obstacle Course, Swing Hammock

Author/s: LARISA RERAT/ EXPERT AVENTURA PARC
TRADEMARK CHINGI EXPERT No 185544

J

The products are designed to solve the lack of diversity whitin the playgroud field.

CHINGI EXPERT manufactures high quality and safe webbing equipments **Our main goal is to make outdoor exercise more appealing and to disconnect, for a short time, children, from the digital world.**

CLIMBING NET

Children are born to climb!

The benefits of climbing can be divided into five categories: physical, mental, sensory awareness, and health.





FRIENDSHIP NET

Children adore sharing stories!

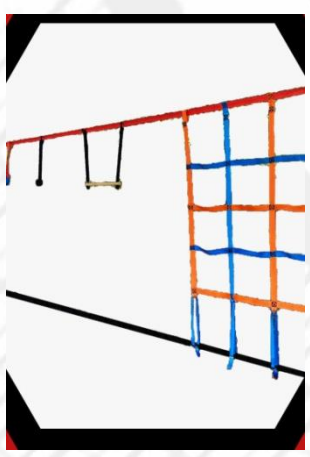
Nets are an excellent place for kids to interact with others. On this net you can sit back, relax and have a conversation with your friends.



Adventure Obstacle Course

Children are the best at overcoming!

This obstacle course will motivate children to improbe themselves with a fun yet difficult challenge





Swing Hammock

Children love to swing!

Our swing hammock offers both the fun of swinging and complet relaxation after a long day.





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+40749090725

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MOBILE MARKETING TOOL BASED ON GAME SPECIFIC TECHNIQUES / GAMIFICATION

INSTRUMENT DE MARKETING MOBIL BAZAT PE TEHNICILE SPECIFICE JOCURILOR/GAMIFICATION

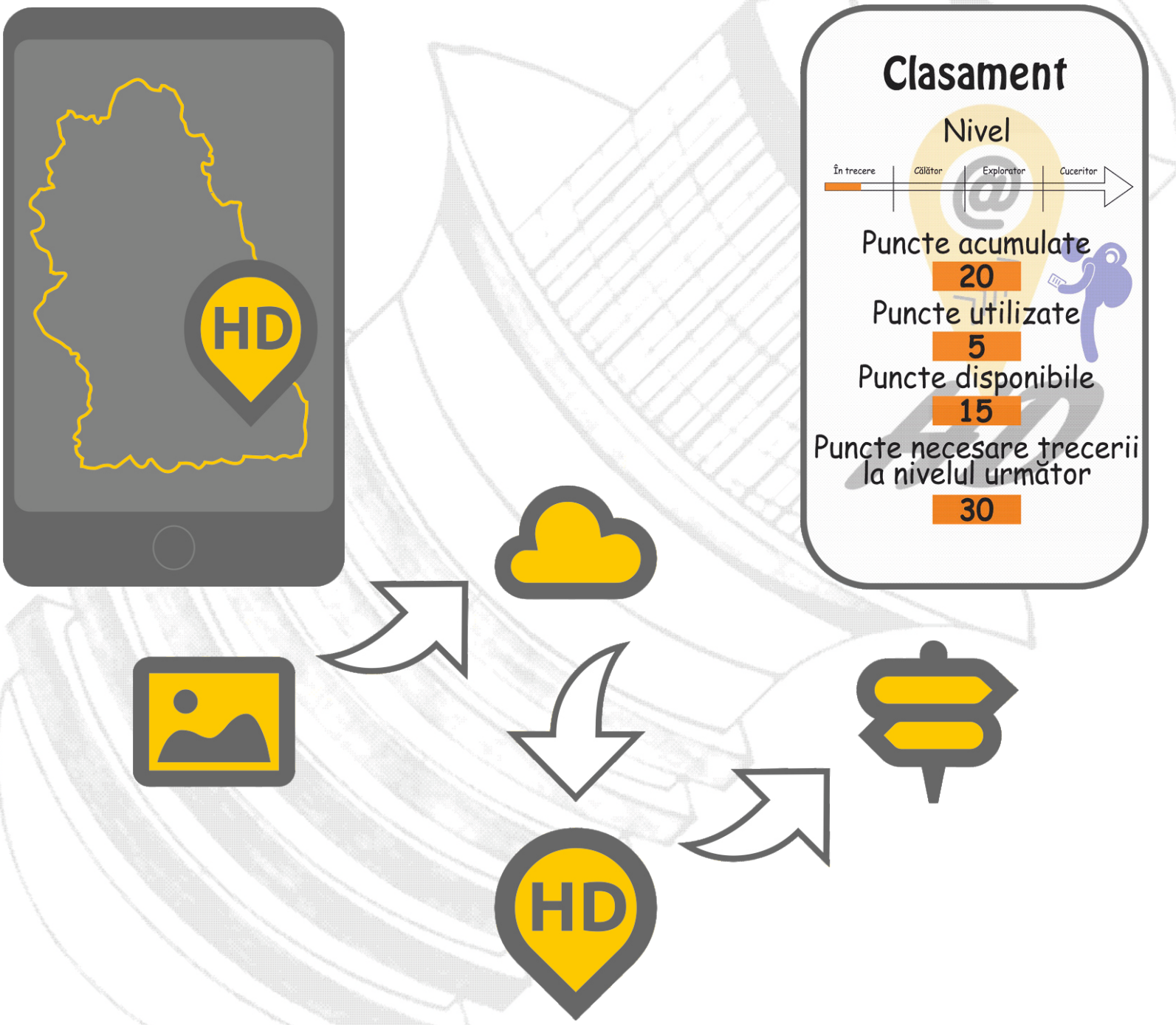
1948 UNIVERSITATEA DIN PETROȘANI

Patent number: OSIM A00088/14.02.2018, prototype

Andreea Cristina IONICĂ,
Monica LEBA, Mihaela ZICA, Simona Mirela RÎUREAN

Category
J

The invention aims to influence consumer behavior, using as a support a mobile application based on game-specific techniques, with the general objective of improving the means of promotion.



Invenția își propune să influențeze comportamentul consumatorului, folosind ca suport o aplicație mobilă bazată pe tehnici specifice jocului, având ca obiectiv general îmbunătățirea mijloacelor de promovare.

Asociația de Cercetare Doctorală Petroșani

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Power of Creative Mind

First Person Shooter

Student Project

Author/s: Golcea Julia Daiana, Obrenovici Lavinia Ioana,
Marinuț Gabriel Paul, Sapta Doru Ioan

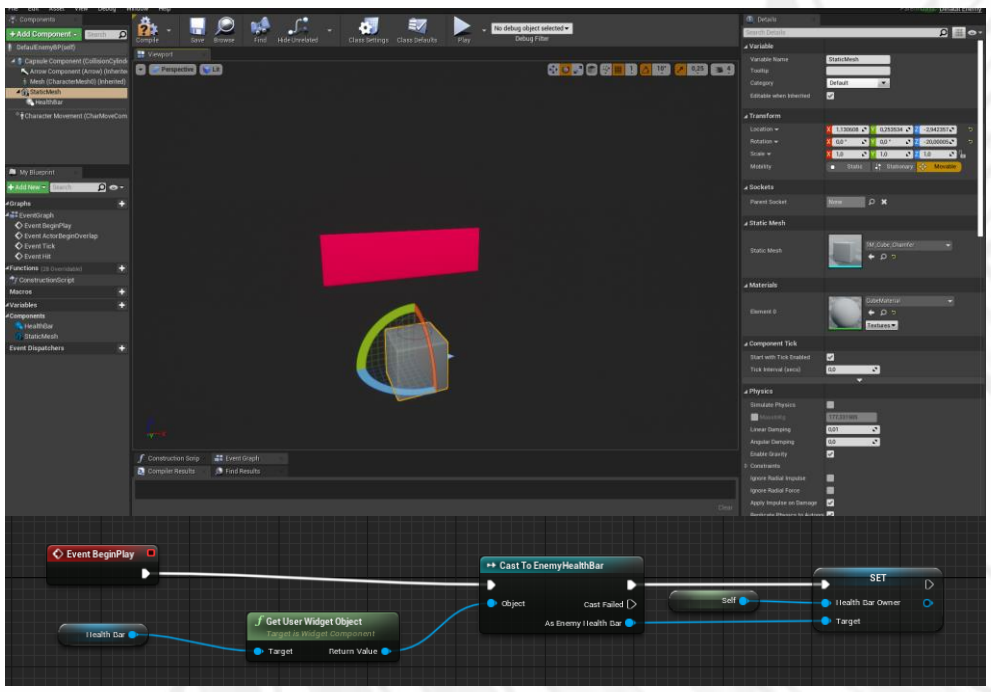
J

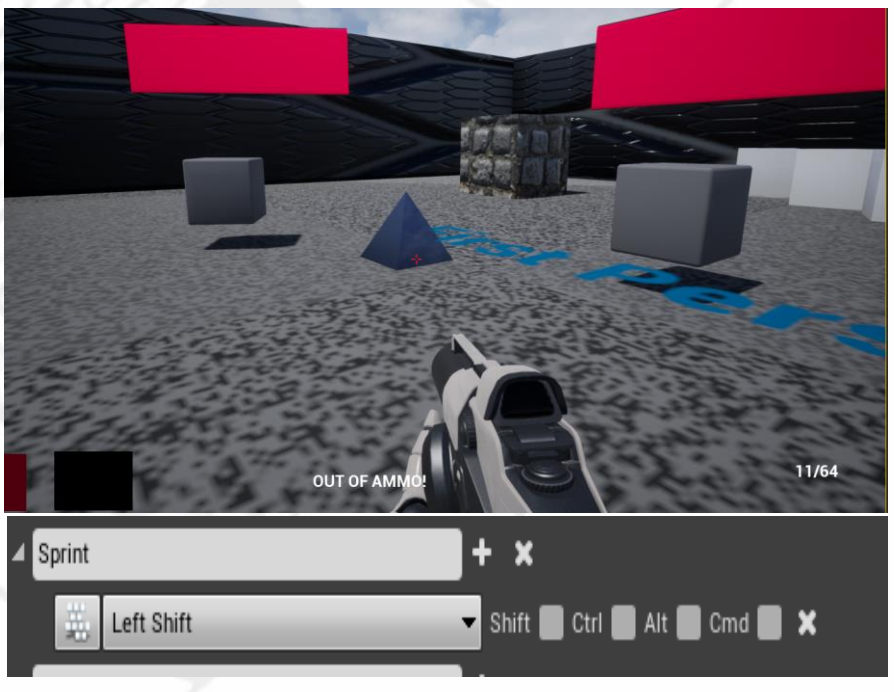
First Person Shooter genre it’s a type of game focused on the fighting with enemies with a variety of weapons and fighting styles, is one of the most popular genre of video games.

The concept of first person shooter was present before the video games in the carnival games and this was used in the creation of different type of first person shooter. Among the first FPS games we can mention Gun Fight, it was launched in 1969, the game consists in two players trying to shoot each other while being a cowboy character.

Unreal Engine it’s a software used for game development, was developed by Epic Games in 1988. This engine offers tools and characteristics helping the developers to create a game with less knowledge of coding .

For this First Person Shooter the game begins with the creation of the scene using Unreal Engine, the characters were added as cubes later being modified with blueprints from the library.





The character was placed in the scene, with a weapon that was previously created in blueprint afterwards adding the necessary code for the weapon to shoot and to inflict damage.

Obstacles were added for the purpose of being harder to kill the enemies, obstacles inflicting damage when touched. Enemies were made using AI, being able to search the scene for a character, after detecting it they are attacking the character.

The game was developed using just Unreal Engine making a scene, obstacles, enemies, character and the weapon. After creating all of them the C++ coding was used for actions: taking damage, health level, shooting, jump, running, special abilies(double jump, fast reload). To finish the level the player must exterminate all enemies without dying, and for competitive reasons the player can try to beat the level with the least amount of damage taken.

Contact: giulia_daiana18@yahoo.com

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Power of Creative Mind

Sebi Lego

Kid project

J

Author: Sebastian Rotea

Creative projects made by Sebi, innovative creations from Lego pieces, natural materials and recyclable materials. Lego constructions are the passion of mine.

I like to build Lego cars, ships, planes, but most of all we like to build my own creations / inventions.







After I come home from school I do my homework and then start crafting my favourite projects such as monster truck, car parking buildings, ambulance cars, racing cars, fire trucks.

Another passion of mine is the collection of miniature cars such as: HotWheels, MachBox, BBurago.

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Power of Creative Mind

Alex's creations

Kid project

J

Author: Alexandru Rotea

I'm Alex and I like to draw in coloring books but also to make my own drawings, especially with cars.

I am also good at constructions made of cubes such as buildings, castles, bridges, animal houses.

This year I also tried more complex Lego projects that I built with the help of my brother Sebi.





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Power of Creative Mind

Colegiul Economic „Emanuil Gojdu”
Hunedoara - Școala Gimnazială nr. 7

CHRISTMAS DECORATIONS

Kids Project

Author/s: Students of class I A
Coordinator: Prof. Coman Mirela Roxana

J

The Christmas fair organized within the Economic College "Emanuil Gojdu" Hunedoara aimed to develop the creative and innovative spirit by making decorations specific to the winter holidays. Students, parents and teachers made traditional decorations and products by hand.















SCAN

Contact: roxana.coman15@yahoo.com

K

Innovative ART

Music

Video

Photography

Publicity

CORNELIUGROUP research-innovation association

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Power of Creative Mind

UNIVERSITATEA LUCIAN BLAGA DIN SIBIU

Mobile application for storing receipt, inovoices and guarantees

Student Project

Author/s:
Dan Alexandru
Moca Sebastian
Antal Sebastian-Dionisie

K

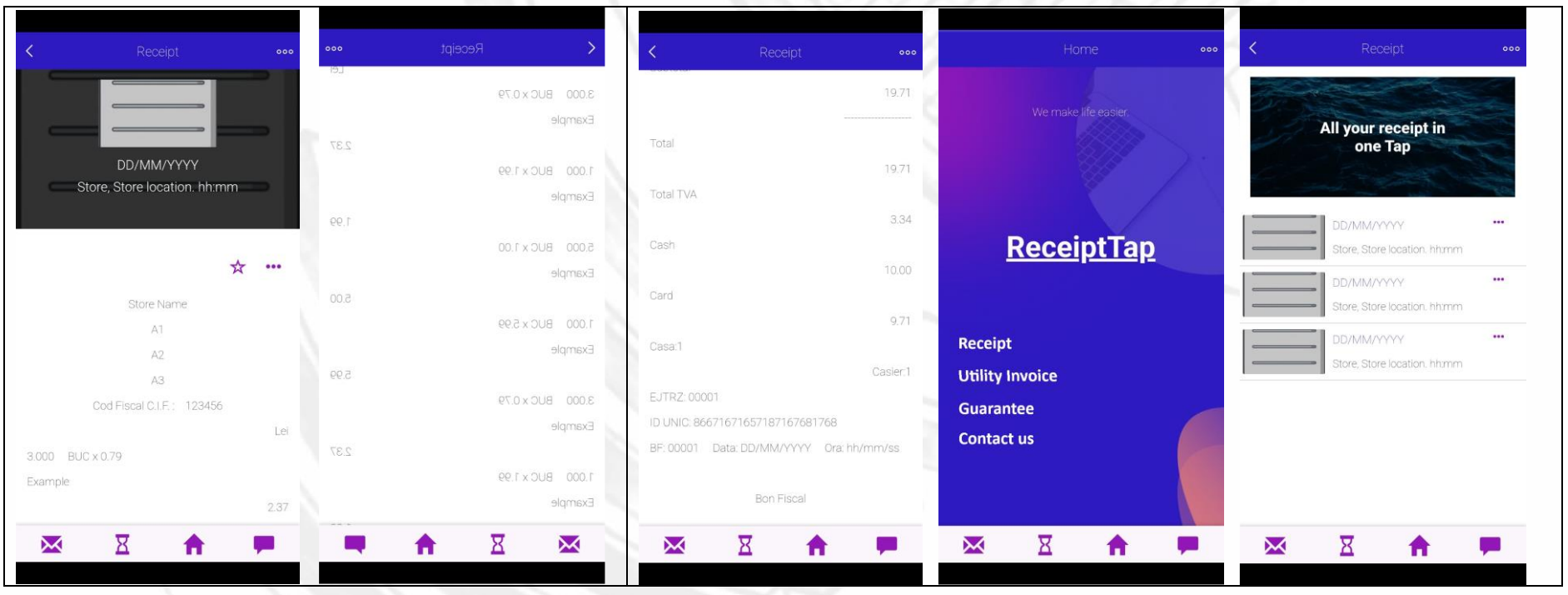
This project aims to create a mobile application allowing us to store receipts, invoices and warranties received following any type of purchase. The application is based on the Near Field Communication (NFC) system, through which the mobile phone receives information from the cash registers, which stores it in the application according to the parameters entered in the source code.

This process takes place only by using the application and bringing the mobile phone closer to the cash register.

The data is stored in the phone's memory, which is used for the application, eliminating the need for an external database, which increases security.

The interface of the application is user-friendly and has the options "Receipt", "UtilityInvoice", "Quarantee" and "Contact us".

In order to use the application, it is necessary to create an account.



Applications:

All areas in which, following purchases, we receive receipts, invoices and warranties.

Advantages:

It protects the environment by reducing the paper used for receipts, invoices and warranties.

It is a free, safe and easy-to-use application, which allows you to customize your interface and content.

It allows you to see the content, both during and after generation, eliminating the inconvenience caused by losing a warranty.

The application can be used on Android, iOS and harmony os.

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Power of Creative Mind

Design A Digital Store for Spare Parts In Saudi Arabia

Abdullah Khaled Al-Ghamizi, Supervised by Dr. Maged Farouk

K

The importance of designing digital stores In Saudi Arabia

No one can deny the impact of the Coronavirus on all countries of the world in all respects, most notably the increase in the number of digital stores. In the Kingdom of Saudi Arabia, the number of digital stores increased by 12.45% to reach 28,676 stores and electronic platforms in 2020, which makes designing digital stores of great importance.

Conditions for opening a Digital store in Saudi Arabia

Obtaining a Digital Store license (Commercial Registry):



You can do this through several steps or procedures approved by the Saudi government:

- Go to the website of the Saudi Ministry of Commerce and Investment to issue the electronic commercial registration
- Register on the site.
- Go to the service and choose your trade name.
- Register the commercial data to be registered.
- Confirm the data.
- Through the SADAD system, pay the commercial registration fees and the membership of the Chamber of Commerce in a unified invoice.

Register with Maroof

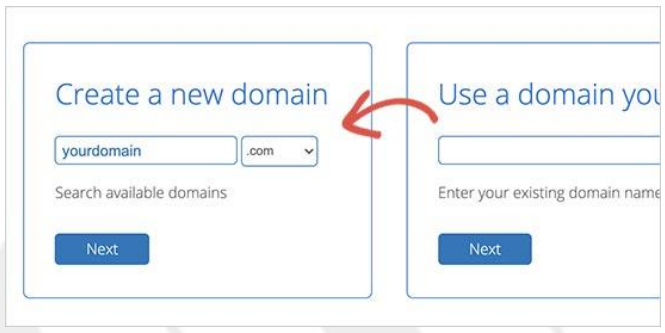
One of the necessary steps after obtaining the commercial register is to register with Maroof platform. This allows you to register your store in the database of the Ministry of Commerce.

- Enter the service link.
- Click on the “Create Account” icon, and then fill in the required fields.
- After logging in, click on the “My Business” icon and then the “Add work” option.
- Fill in the required fields and then click on the “Add work” icon.

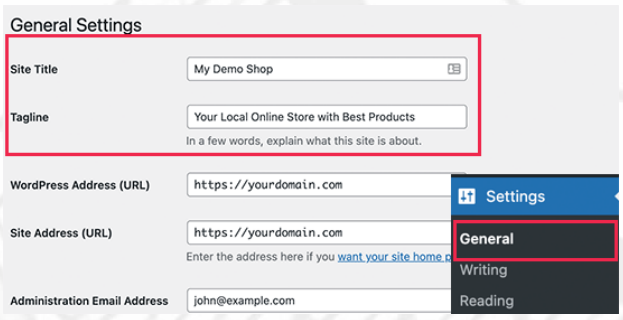
What Do You Need to Start an Online Store?

Step 1: Setting up Your Online Store Platform

There are two popular eCommerce platforms that we recommend: Shopify or WordPress + WooCommerce.
In this step, you have to enter the domain name for your website



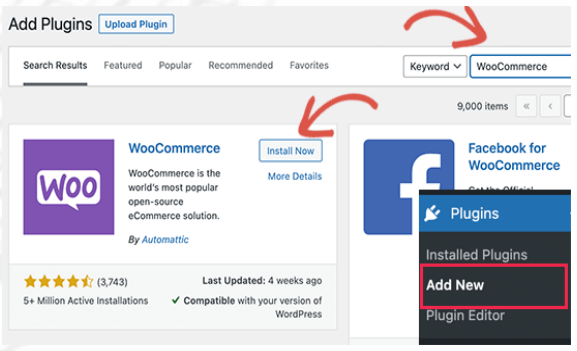
Step 2. Setting up WordPress



Set up your WordPress website

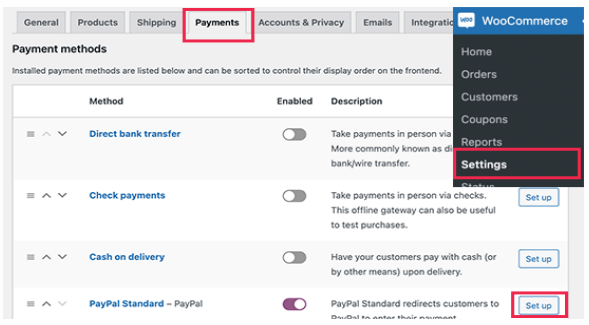
Step 3. Setting up Your WooCommerce Store

Install and activate the WooCommerce plugin

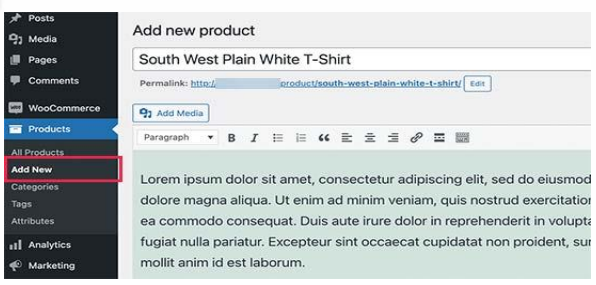


Step 4. Setting up Payments for Your Online Store

Set up payment methods to accept online payments on your store



Step 5. Adding Products to Your Online Store



Let’s start with adding the first product to your online store.

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The paint brush – a bridge between real and magic

Pensula – o punte între concret și oniric

Research project

Author: Edwina Kasler

K

Science and art are considered by most of us to be different or totally opposite fields. Even if according to this paradigm they have no common element, reality contradicts us. The two domains are like asymptotes of the graphs of some functions. It gets very close and generates an interface zone. The research project aims to analyze this possibly common surface and show how science influences art and art becomes a model for science.

Știința și arta sunt considerate de cei mai mulți dintre noi ca fiind domenii diferite sau total opuse. Chiar dacă potrivit acestei paradigme ele nu au nici un element comun, realitatea ne contrazice. Cele două domenii sunt asemenea unor asimptote ale graficelor unor funcții. Se apropie foarte mult și generează o zonă de interferență. Proiectul de cercetare își propune să analizeze această suprafață posibil comună și să arate felul în care știința influențează arta iar arta devine model pentru știință.



Edwina Kasler – Aqua (painting/pictură 30x40cm)



Edwina Kasler – Fleur du mal (painting/pictură 24x30cm)

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FACTORS RESPONSIBLE FOR CLIMATE CHANGE
&
MESSENGERS OF PEACE

Author: Katalin N. Sebestyén

K

I am not an inventor, but I make paintings with scientific and explanatory text on astronomical themes. It is typical for my creations to have a scientific explanatory text next to the displayed image, because every day I receive the latest telescopic images from NASA, such as those taken by Hubble and James Web. I am also a member of the Hungarian Astrophotography Association, from which I also draw my subjects.





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Power of Creative Mind

Art by Miruna

Art exhibition

Author: DIANA MIRUNA ARMIONI

K

„Art Corner by Miruna” includes a variety of faces, from friends and colleagues to artists or other personalities, illustrated in a realistic, detailed style.



The drawings were previously exhibited in several events, organized both by the Faculty of Engineering Hunedoara („Facultatea Altfel FIH” – European Researchers’ Night), and by the CorneliuGroup Association („Inventions, inventors, passions at the Deva Fortress”) or the Deva City Hall („Diamond Eyes”, „Art Corner by Miruna” - held on Deva Fortress).

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Ethereal

Photography project

Author: DIANA MIRUNA ARMIONI

K

„Ethereal”, as the world itself is defined, means „ in a way that seems not to be of this world”.







Ethereal



The images selected for this photo series convey the same otherworldly feeling of stillness yet inner turmoil, calmness yet chaos, light yet darkness.

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ROMANATUL

Project

Authors: Sapta Doru Ioan, Obrenovici Lavinia Ioana,
Chira Sorina Mihaiela, Strugaru Dragoș

K

ROMANATUL SRL is a Romanian based company, that activates in the field of medical supplies and delivers the best high-end equipment for all it's customers. We started our business in 2012 with a small range of products and just a handfull of customers. Now we deliver our products to more than 50 public hospitals, and 100+ private dental offices in the whole country.

We entered this industry because we didn't find the medical equipment that was used in 2012 to be at it's peak performance, and we wanted to change it for us, our customers, and all the patients that go to a public hospital in Romania. Our main products are syringes, scalpels, different types of clamps, surgical fields and much more.











ROMANATUL SRL este o companie cu sediul in Romania, care activează in domeniul consumabilelor medicale si livrează cele mai bune echipamente de vârf pentru toți clienții săi. Ne-am început afacerea în 2012 cu o gamă mică de produse și doar câțiva clienți. Acum livrăm produsele noastre la peste 50 de spitale publice și la peste 100 de cabinete stomatologice private din toată țara.

Am intrat în această industrie deoarece în anul 2012 nu am considerat că spitalele publice sunt dotate cu echipamente de performanță maximă și am vrut să schimbăm acest lucru atât pentru noi, dar și pentru toți pacienții care merg la un spital public din România. Produsele noastre principale sunt seringi, bisturie, diferite tipuri de cleme, câmpuri chirurgicale și multe altele.

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LICEUL TEHNOLOGIC ENERGETIC „DRAGOMIR HURMUZESCU"

The multimedia class - 2022 projects

Student Project

Authors: Multimedia Technicians High School
L.T.E. "Dragomir Hurmuzescu" Deva
Coordinator: Marius Dragomir

K

Within the profile of multimedia technician from the L.T.E. high school "Dragomir Hurmuzescu" Deva our students start a career in the media industry. During the four years of study, our students learn about photography, film technology, film equipment, animations, internet, sound and image processing, radio and television.

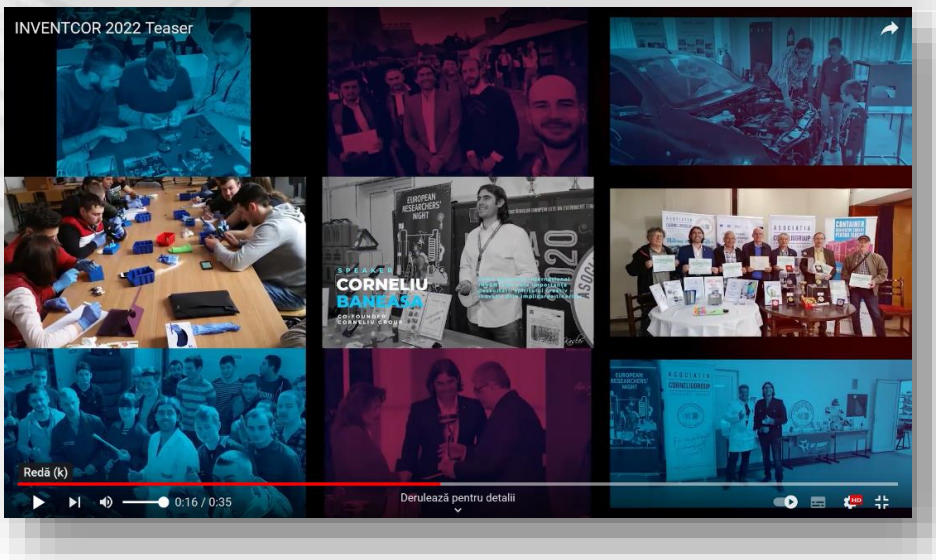
Multimedia technician performs activities that involve: processing and combining graphics, image, sound, animation, video sequences using digital technologies (multimedia system) through which interactive content is created and played, applying legislation and regulations regarding safety and health at work, preventing and extinguishing fires, using specialized technical language, assuming the responsibilities and roles that fall to him in the team, developing his ability to make decisions and solve specific problems at the workplace, strengthening his attitudes of fairness, respect, confidence in one's own strength, satisfaction for a job well done.

Be creative and say YES, start a media career!





The multimedia class was involved in many projects this year such as:



- High school without net - BIG FM radio show dedicated to multimedia class students;
- Outdoor photo sessions at Padurea Bejan in Deva. Xth grade students, multimedia profile, from Dragomir Hurmuzescu Energetic Technological High School participated, guided by teacher Marius Dragomir;
- The photography laboratory organized as part of the Night of European Researchers event with the aim of immortalizing the activities, exhibits, experiments and interactions on the spot;
- An interesting and at the same time challenging project was the creation of the presentation Teaser of the INVENTCOR International Exhibition 2022. For this purpose, we used photographers provided by the organizers but also photos taken by the students of the multimedia class and short videos.

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Adrian Stoica Photo Art

Metamorphosis

Author : Stoica Adrian

K

Metamorphosis is an artistic photographic project that refers to inner metamorphosis, which is not only a change of form, but one of behavior, following the reset of values, a long process of analysis, reflection. Inner metamorphosis begins with a journey, with an introspection.

The construction of the self is an extensive process, and trials place the human being in front of the stable and the ephemeral, in front of the known and the unknown.



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Transcendent

Adrian Stoica Photo Art

Author : Stoica Adrian

K

Transcendent is an artistic photographic analogy about change. Nothing really disappears, it just changes into something else. Something beautiful. The beautiful human strives for perfection. If he cannot speak against the ugly, he remains silent, but in his silence there is a Christian refusal of everything that is ugly.



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2023

Posters 3rd International Exhibition

InventCor

15-17.12.2022 – Deva, Romania

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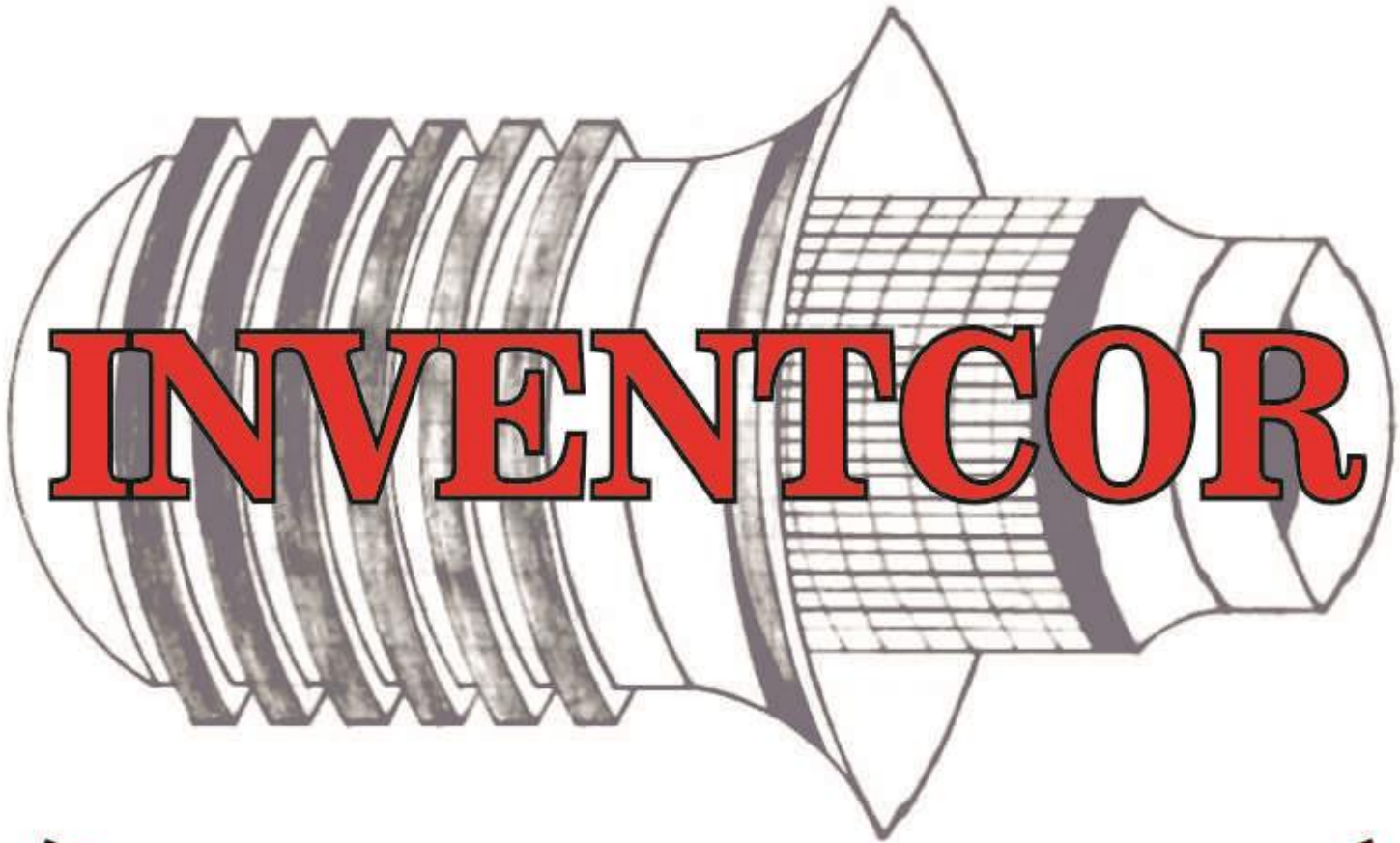

Power of Creative Mind

See you next year!

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