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TABLE OF CONTENTS

AGRICULTURE AND FOOD INDUSTRY (30)

AVIATION, CAR INDUSTRY AND TRANSPORTATION (15)

BUILDINGS AND MATERIALS (10)

CHEMICAL AND TEXTILE INDUSTRY (2)

ENERGY AND SUSTAINABLE DEVELOPMENT (13)

ENVIRONMENT – POLLUTION CONTROL (28)

INDUSTRIAL AND LABORATORY EQUIPMENT (8)

INFORMATION TECHNOLOGY AND COMMUNICATION (7)

INNOVATIVE RESEARCH (29)

MECHANICAL ENGINEERING – METALLURGY (20)

MEDICINE – HEALTH CARE – COSMETICS (56)

PRINTING AND ADVERTISING (1)

SAFETY, PROTECTION, AND RESCUE OF PEOPLE (6)

SPORTS, GAMES AND LEISURE (2)

OTHER (39)

AGRICULTURE AND FOOD INDUSTRY

30 Inventions

INVENTION #43

AGRICULTURE AND FOOD INDUSTRY

Premix functional pe baza de amestec de faina de orz si ovaz imbogatit in compusi bioactivi

Authors: Radulov I., Alexa E., Raba D., Poiana M., Cocan I., Negrea M., Misca C., Obistioiu D., Dragomir C. , Dossa S., Gaspar S

Organization: University of Life Sciences King Mihai I from Timisoara

The present invention concerns the development of biofunctional premixes based on barley (Hordeum vulgare)/oat (Avena sativa) flour in a mixture with 5....25% mass ratio added of fruits of sea-buckthorn (Hippophaë Rhamnoides L.), and/or red cranberries (Vaccinium vitis-idaea- L.) from the native wild flora and/or the by-product of wine making with applicability in the flour based food industry (pasta and biscuits). The following were considered: elaboration of manufacturing recipes, determination of optimal process parameters, composition in bioactive compounds, determination of nutritional value, suitability of premixes in obtaining flour based foods, as well as studies on glycemic index in evaluating the hypoglycemic effect of the obtained products. The results obtained on the nutritional value, phytonutrient intake and glycemic index value confirm the nutraceutical and biofunctional potential of premixes based on barley/oat flour with the addition of lingonberries/ sea-buckthorn /grape marc.

INVENTION #53

AGRICULTURE AND FOOD INDUSTRY

Innovative composition for biodegradable, antimicrobial packaging based on cellulose derivatives, zinc oxide nanoparticles and mesoporous silica loaded with essential oils

Authors: Ovidiu-Cristian OPREA, Ludmila MOTELICA, Anton FICAI, Denisa FICAI, Ecaterina ANDRONESCU

Organization: National University of Science and Technology POLITEHNICA Bucharest

Cellulose derivatives are gaining much attention in medical research due to their excellent properties such as biocompatibility, hydrophilicity, non-toxicity, sustainability, and low cost. Unfortunately, cellulose does not exhibit antimicrobial activity. However, derivatives like hydroxyethyl cellulose represent a proper matrix to incorporate antimicrobial agents with beneficial therapeutic effects. Combining more antimicrobial agents into a single composite material can induce stronger antibacterial activity by synergism. Therefore, we have obtained a hydroxyethyl-cellulose-based material loaded with zinc oxide nanoparticles and cinnamon essential oil as the antimicrobial agents. The cinnamon essential oil was loaded in mesoporous silica particles to control its release. The composite films demonstrated high antibacterial activity against Staphylococcus aureus and Escherichia coli strains, impairing the bacterial cells' viability and biofilm development. Such antimicrobial films can be used in various biomedical applications such as topical dressings or as packaging for the food industry.

INVENTION #74

AGRICULTURE AND FOOD INDUSTRY

New methods of cultivation of crop plants with the use of coordinative compounds

Authors: Coropceanu E., Ştefîrţă A., Bulhac I.

Organization: Ion Creanga State Pedagogical University from Chisinau

Various methods of cultivating crop plants have been developed using coordination compounds of cobalt(III) with dioximic ligands and thiourea, selenourea, nicotinamide and other molecules with biological activity. The combination of biometal and organic molecules with biological activity in a single compound can generate cumulative effects of stimulating physiological processes. Treating a series of crop plants (sugar beet, red beet, corn, garlic, etc.) with the solutions containing coordinative compounds or composite mixtures increased yield and resistance to water stress conditions.

INVENTION #75

AGRICULTURE AND FOOD INDUSTRY

NUTRIENT MEDIA FOR THE CULTIVATION OF FUNGAL STRAINS

Authors: COROPCEANU E., DESEATNIC A., CLAPCO S., TIURIN J., LABLIUC S., DVORNINA E., BULHAC I.

Organization: Ion Creanga State Pedagogical University from Chisinau

New coordination compounds of some 3d metals with organic ligands with various functional groups have been synthesized. The composition and molecular structure of the new complexes were determined with the help of modern research methods: IR spectroscopy, Uv-Vis, NMR , single crystal X-ray diffraction, etc. New nutrient media were elaborated with the use of cobalt(III) and zinc(II) coordinative compounds to stimulate enzymogenetic processes at a series of fungi from the genera Aspergillus, Rhizopus, Fusarium etc. The result of the cultivation of fungi on new nutrient media stimulated the processes of biomass accumulation, synthesis of enzymes, stabilization of physiological processes under stress conditions, shortening of the technological cycle, etc. – effects that increase the profitability of microbial technologies.

INVENTION #81

AGRICULTURE AND FOOD INDUSTRY

Cultura smochinului in banda fructifera, Brevet/CBI: A/ 00457/16.08.2023

Authors: Stanica Florin, Asanica Adrian Constantin, Butcaru Ana Cornelia, Mihai Cosmin Alexandru, Moisescu Emilia, Velcea Marian

Organization: Universitaea de Stiinte Agronomice si Medicina Veterinara Bucuresti

RO - Invenția se referă la o metodă originală și unitară de cultură intensiva a smochinului în sistem ecologic în zone cu climă temperată. Metoda presupune pregătirea solului conform tehnologiilor agricole consacrate, urmată de cultivarea unor plante medicinale și industriale pe toată suprafața care le încorporează la înflorire, pichetarea rândurilor în direcția Nord-Sud la distanțe de 2,5-3,5 m. între axele de simetrie (b1), realizarea de santuri de plantare (a) adânci de 40-60 cm și late de 20-30 cm la bază și 40-50 cm în vârf, umplerea acestor șanțuri cu gunoi de grajd (c) și nivelarea lor cu substrat la nivelul solului, așezarea tuburilor de picurare (e) pe direcția și poziția axelor de simetrie (b1) ale șanțurilor de plantare (a), udarea și realizarea gropilor de plantare (h) la 20-30 cm adâncime la intervale de 0,7- 1,0 m cu axul înclinat la 30-45° față de orizontală, plantarea smochinilor din ghivece cu vârful spre nord, acoperirea gropilor de plantare (a), realizarea de șanțuri de delimitare (l) a fâșiilor de cultură cu adancime de 15-20 cm și latime de 15-20 cm, care identifică crestele (m) dintre benzile late de 1,0-1,5 m. Întreținerea culturii în primul an se face prin irigații periodice, aplicare de îngrășăminte și plivitul după caz, recoltând fructele coapte o dată la două zile și păstrându-le în spații frigorifice la 1-2 grade Celsius până la livrare sau utilizare, acoperind plante pe o perioadă cuprinsă între căderea frunzelor și sosirea primăverii cu un strat termoizolant (l) de 40-50 cm grosime , format din amestec (k) de pământ cu iarbă uscată tocată, paie tocată, rumeguș, resturi textile de bumbac sau lână. La sosirea primăverii se deschide bilonul de protectie și se efectuează tăieturi mecanizate cu tocatorul reglat la o înălțime de 15-17 cm de la sol și/sau tăieturi manuale în ceapi la 2-3 muguri, concomitent cu rărirea ramurilor verticale la o distanta de 15-25 cm intre ele si mentinerea continuitatii vegetatiei pe rand, prin fixarea unor ramuri laterale la sol cu carlige (j), concomitent cu mentinerea la nivelul solului a tulpinilor din anul precedent cu ajutorul cârligelor; ciclul de recoltă se reia similar cu

anul precedent. EN - The present invention refers to an original and unitary method of fig culture (in an ecological system) in areas with a temperate climate. The method involves the preparation of the soil according to established agricultural technologies, followed by the cultivation of some medicinal and industrial plants on the entire surface that incorporate them at flowering, picketing the rows in the North-South direction at distances of 2.5-3.5 m between the axes of symmetry (b1), making planting trenches (a) 40-60 cm deep and 20-30 cm wide at the base and 40-50 cm at the top, filling these trenches with manure (c) and leveling them with soil at ground level, placing drip tubes (e) on the direction and position of the axes of symmetry (b1) of the planting trenches (a), watering and making planting pits (h) 20-30 cm deep at intervals of 0.7-1.0 m with the axis inclined at 30-45° from the horizontal, planting the figs (f) in pots with the tip towards the North, covering the planting pits (a), making the delimiting trenches (l) of the strips of culture 15-20 cm deep and 15-20 cm wide, which identify the ridges (m) between the fruit bands, 1.0-1.5 m wide;. The maintenance of the crop in the first year is done by periodic irrigation, application of fertilizers and weeding as appropriate, harvesting the ripe fruits once every two days and storing them in refrigerated spaces at 1-2 degrees Celsius until delivery or utilization, covering the plants for a period of between the fall of the leaves and the arrival of spring with a heat-insulating layer (l) 40-50 cm thick having the shape of a drum with a height of 40-50 cm from the ground, consisting of a mixture (k) of soil with chopped dry grass, chopped straw, sawdust, textile scraps of cotton or wool. At the arrival of spring, the bin is opened and mechanized cuttings are carried out with the chopper adjusted to a height of 15-17 cm from the ground and/or manual cuttings in onions at 2-3 buds, simultaneously with the thinning of the vertical branches at a distance of 15-25 cm between them and maintaining the continuity of the vegetation by fixing some lateral branches to the ground with hooks (j), simultaneously with keeping the stems from the previous year at ground level with the help of fixing hooks; the crop cycle resumes similar to the previous year.

INVENTION #82

AGRICULTURE AND FOOD INDUSTRY

ARTEMIS, Brevet de Soi de Asimina triloba / Banana Nordului: Nr.1024/2023 Eliberat de Ministertul Agriculturii si Dezvoltarii Rurale- ISTIS Institutul de Stat pentru Testarea si Inregistrarea Soiurilor

Authors: Stănică Florin, Jerry Lehman, Tabacu Andrei Florin, Mihălcioiu Ioana Mihaela, Butcaru Ana Cornelia, Mihai Cosmin Alexandru, Iliescu Lavinia Mihaela

Organization: Universitatea de Stiinte Agronomice si Medicina Veterinara Bucuresti

RO - ARTEMIS - Asimina triloba (L.) Dunal, or pawpaw, is the only temperate plant species that belongs to the Annonaceae family. It is a fruit species native to North America, from Florida to southern Canada. In Romania, the first asimina plants were brought to Transylvania from North America at the beginning of the 20th century, in 1926, by the Suciu family from Alba. They were cultivated locally and remained unknown in the rest of the country. Only after 2000, they began to be studied at the Faculty of Horticulture, in Bucharest. In terms of nutritional value, asimina can be compared to apple, banana, orange, peach and grape, as it is a nutritionally rich fruit with high levels of minerals, vitamins and antioxidant compounds. The color of the fruit changes from creamy white to bright yellow to shades of orange. The fruit aroma resembles a combination of banana, mango and pineapple. Asimina fruits are best eaten fresh when fully ripe, but the intense tropical flavor can be used to make food products such as: ice cream, smoothies, candies, juices, cakes and more. EN - ARTEMIS-Asimina triloba (L.) Dunal, or pawpaw, is the only temperate plant species that belongs to the Annonaceae family. Is a native North American fruit species from Florida to South Canada. In Romania, the first pawpaw plants were brought to Transylvania from North America at the beginning of the 20th Century, in 1926 by the Suciu family from Alba. They were locally cultivated and remained unknown in the rest of the country. Only after 2000, have started to be studied at the Faculty of Horticulture, in Bucharest. Regarding nutritional value, asimina is comparable to apple, banana, orange, peach and grape since it is highly nutritionally rich fruit with high levels of minerals, vitamins and antioxidant compounds. The color of the fruit changes from white-cream to bright yellow to shades of orange. The flavor of ripe pawpaw fruit resembles a combination of banana, mango

and pineapple. Pawpaw fruit are best eaten fresh when fully ripe but the intense tropical flavor may be useful for the preparation of food products such as: ice cream, smoothie, candy, juices, cakes and others. Asimina or paw-paw is a new fruit species for Romania, studied in the last 25 years at the Faculty of Horticulture in Bucharest with very good results regarding yield, fruit quality, and pest and disease tolerance/resistance. Asirius, Artemis, and Asteria are the best varieties from the whole collection, approved in April 2023. They are suitable for fresh consumption or processing in different forms (ice cream, liqueurs, vinegar, etc.). Nurseries worldwide have these three new paw-paw cultivars suitable for orchards or small gardens established in Romania.

INVENTION #83

AGRICULTURE AND FOOD INDUSTRY

NECTAR, Brevet de Soi de smochin nr.6413/2023, Eliberat de Ministerul Agriculturii si Dezvoltarii Rurale- ISTIS Institutul de Stat pentru Testarea si Inregistraea Soiurilor creat de Universitatea de Stiinte Agronomice si Medicina Veterinara din Bucuresti,

Authors: Vera Dobrescu, Stanica Florin, Butcaru Ana Cornelia, Iliescu Lavinia Mihaela, Ancuta (Moisescu) Emilia, Velcea Marian

Organization: Universitatea de Stiinte Agronomice si Medicina Veterinara Bucuresti

RO-Figs have been growing in Romania for hundreds of years, but only on small areas or in people's yards. Due to climate changes and the desertification process of many areas in southern Romania, the fig tree can become a new interesting fruit species for ecological culture. After years of research, the Nectar fig variety was approved at the Faculty of Horticulture in Bucharest. The plant forms erect bushes and its vigor is average. If the winter is mild and low temperatures do not affect the flower buds, the first harvest takes place in July (breba), with the one-year-old branches bearing fruit. The main crop begins in late July-early August, the fruits (proper figs) grow in the axils of the leaves on the annual shoots. If the plant is vigorous, it can bear fruit from the first year after planting it in the field. The yield increases steadily with the development of the bush. The leaves are strongly marked with five lobes. It generally features two small lobes near the petiole. The Nectar fig has a light green fruit skin and a pink/amber flesh. The skin of the fruit is of medium thickness. The fruit has a white ostiole with a high cracking resistance. After reaching its maximum width, the fruit is pyriform in shape and almost symmetrical about the vertical axis. The average weight of breba fruits is about 37 g, and for suitable figs, around 32 g. In the case of the Romanian climate, the Nectar fig is a medium variety. The fruits taste like honey and can be eaten fresh or dried (whole or sliced). They are also suitable for processing as sweets such as jam, preserves or distilled beverages. EN- In Romania fig tree is growing for hundreds of years but only on small areas or in people's yard. Due to global warming effect and desertification process of many areas of Southern Romania, fig tree can become a new

interesting fruit species for farmers. After years of research, Nectar fig cultivar was homologated at the Faculty of Horticulture in Bucharest. The plant forms erect bushes and its vigor is average. If the winter is mild and low temperatures do not affect the flower buds, the first crop occurs in July (breba), one-year-old branches bearing the fruits. Main crop starts at the end of July-beginning of August, the fruits (proper figs) grow at the leaf axil on the annual shoots. If the plant is vigorous it can bear fruit from the first year after planting it in the field. Yield increases steadily with bush development. The leaves are strongly marked with five lobes. Generally, they present two little lobes near the petiole. Nectar fig has a light green fruit skin and a pink/amber pulp. The fruit skin is of average thickness. The fruit has a white ostiole with a high resistance to cracking. Accoding to the location of the maximum width, the fruit has a pyriform shape and it is almost symmetrical according to the vertical axis. Average weight of breba fruit is around 37 g and for proper figs around 32 g. In case of Romanian climate Nectar fig is a middle cultivar. Fruits taste like honey and can be consumed fresh or dried (whole or sliced). They are also suitable for processing as sweets such as jam, jam or distilled beverages.

INVENTION #84

AGRICULTURE AND FOOD INDUSTRY

ZIPRIM Brevet de Soi omologat de Ziziphus jujuba-

Authors: Asănică Constantin Adrian; Stănică Florin; Mihai Cosmin Alexandru; Peticila Adrian George

Organization: Universitatea de Stiinte Agronomice si Medicina Veterinara Bucuresti

RO-Jujube (Ziziphus jujuba L.) is a new tree species for Romania with a high potential for the exploitation of areas exposed to desertification or salinization. At the same time, it is well known worldwide for its exceptional nutraceutical properties (it has been used as a medicinal plant for centuries). Ziprim is the newest variety approved by the Faculty of Horticulture in Bucharest, being one of the earliest to harvest. The plants can be grown in the plum areas of Romania, with excellent results in terms of yield and fruit quality. Romanian consumers have a new option regarding the diversity of fruits during the annual period. EN-Jujube (Ziziphus jujuba L.) is a new fruit species for Romania with a high potential for valorizing areas exposed to desertification or salinization. At the same time, it is well known globally for its exceptional nutraceutical properties (for centuries, it has been used as a medicinal plant). Ziprim is the newest cultivar homologated by the Faculty of Horticulture in Bucharest, being one of the earliest in harvesting. The plants can be cultivated in the plum areas in Romania, with excellent results regarding yield and fruit qualities. Romanian consumers have a new option regarding fruit diversity in the annual period.

INVENTION #94

AGRICULTURE AND FOOD INDUSTRY

Biopreservatives extracted from Black Sea macroalgae

Authors: Georgiana Horincar, Vicentiu Horincar, Gabriela Bahrim

Organization: Facultatea Stiinta și Ingineria Alimentelor, Universitatea Dunarea de jos din Galati

The scientific work entitled „Biopreservatives extracted from Black Sea macroalgae" targeted the extraction of bioactive compounds from algae biomass under conditions that do not affect the integrity and concentration of these metabolites; identification and physicochemical characterization of bioactive compounds extracted from seaweeds; identifying the bioactive potential (antioxidant activity and antimicrobial activity) of the seaweed extracts and testing their preservatives potential. This work confirms the macroalgae potential to be exploited as food resources, to obtain non-conventional energy and numerous additives and ingredients of economic value. The applications of these bioresources are a valuable alternative, because the macroalgae Cladophora vagabunda, Enteromorpha intestinalis and Ceramium rubrum grow abundantly in natural environmental conditions, and their applications also has an impact on the quality of the environment and the balance in natural ecosystems.

INVENTION #103

AGRICULTURE AND FOOD INDUSTRY

Resilient organic berry cropping systems through enhanced biodiversity and innovative management strategies

Authors: Oana-Crina Bujor-Nenita, Annette Reineke, Daniel Pleissner, Lene Sigsgaard, Rachid Lahlali, Abdelali Blenzar, Grzegorz Doruchowski, Bogdan Mihalcea, Roxana Ciceoi, Liliana Aurelia Badulescu

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

Within the framework of the EU project ResBerry research activities were carried out on conservation biological control which implies setting up an improved habitat management or altering existing practices to protect and enhance specific natural enemies or other organisms that occur naturally to increase resilience of berries against major pests and diseases. Experimental sites of the project, located in Denmark, Poland, Germany, Romania and Morocco, were established for the implementation of new biological control techniques on organic berry production. New espalier and cutting techniques in berry cultivation which can be used to achieve more narrow rows of bushes with better air and light penetration were evaluated. This reduces diseases and supports the development of flowers and fruit, leading to large, high-quality berries. Also, there were tested companion plants in the form of flower strips or trap plants in intercropping with berry crops to provide food (pollen, nectar and alternative prey), habitat and overwintering sites for beneficial arthropods as well as increased biodiversity. Furthermore, cover crops were used to assess its influence on the composition of the soil microbiome. Moreover, alternative strategies to control specific pests were evaluated. For management of SWD D. suzukii was assessed the efficacy of entomopathogenic nematodes, which are naturally present in the soil and could be isolated and used as a biocontrol agent. Finally, all new methods to be implemented in organic berry cultivation were thoroughly evaluated for quality parameters of fruits. The methods are ecologically sustainable, can also be used by conventional producers, and can be an important help in conversion to organic production.

INVENTION #104

AGRICULTURE AND FOOD INDUSTRY

Valorization of medicinal spontaneous and cultivated plants through the use of advanced micropropagation techniques as sources of bioactive compounds

Authors: Alina Ortan, Tatiana Calalb, Nina Ciorchina , Liliana Aurelia Bădulescu, Violeta Alexandra Ion, Oana Crina Bujor, Cosmina Oana Venat, Ioana Catalina Nicolae, Simona Spînu

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

The scope of the BioMedPlant project is to develop new research collaborations between groups of researchers from Romania and Moldova Republic through the valorization of medicinal spontaneous and cultivated plants as sources of bioactive compounds with high pharmaceutical potential by using advanced micropropagation techniques. The specific objectives that will ensure the achievement of the BioMedPlant project's goal are: 1) Providing innovative solutions for in vitro multiplication techniques that yield healthy planting materials; 2) Development of a technology of acclimatization of new species in in vitro and ex vitro culture with high content of targeted bioactive compounds; 3) Development of innovative extraction technology and characterization methods for targeted bioactive compounds; 4) Knowledge transfer to young researchers from the research institutions of the Moldova Republic. The activities outlined in the project aim to introduce and acclimatize new species in vitro and ex vitro culture, as well as to identify and analyze biochemically active compounds with high pharmaceutical potential from medicinal plants and fruit-bearing shrubs. BioMedPlant project will integrate the needs for the development of the young scientific researchers expertise from Moldova Republic in a new research infrastructure equipped at the European level from Romania, in order to consolidate their professional positions.

INVENTION #107

AGRICULTURE AND FOOD INDUSTRY

Sustainable utilization of MARIne resources to foster GREEN plant production in Europe

Authors: Violeta Alexandra Ion, Oana Cristina Pârvulescu, Anne-Kristin Løes, Joshua Cabell, Thanos Salifoglou, Carlos Octavio Letelier-Gordo, Max Nielsen, Sigbjørn Tveteras, Ailin Moloșag, Oana Bujor-Nenița, Liliana Bădulescu, Alexandra Mocanu, Cristina Orbeci, Tănase Dobre, Cristian Răducanu

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

The MARIGREEN project aims to valorize residual materials from the blue sector by treating them with appropriate technologies and applying them in green agriculture. Residual materials available from fish capture, the brown algae industry, the mussel industry, and organic aquaculture, provided by five Scandinavian industry partners, will be studied within the project. The materials will be chemically characterized, and compounds with potential biostimulant effects on crop plants will be investigated, while concurrently checking for possible biotoxicity. The effects of these materials (untreated or treated using appropriate treatments, e.g., extraction, composting) on plant growth will be assessed. The project also includes an innovative treatment of organic fish waste from aquaculture and a study on biochar impregnation technology. The most suitable materials (selected after chemical characterization) will be tested in real growing conditions in the greenhouse and field.

INVENTION #115

AGRICULTURE AND FOOD INDUSTRY

GreHSen - Ultrasensitive gas sensor array for greenhouse environment assessment

Authors: Stefan-Marian Iordache, Ana-Maria Iordache, Ileana Cristina Vasiliu, Mihail Elisa, Irinela Chilibon, Cristiana E.A. Grigorescu, Ana-Maria Florea, Stefan Caramizoiu, Bogdan Bita

Organization: National Institute for Optoelectronics - INOE 2000

Ultrasensitive gas sensor array for greenhouse environment assessment (GreHSEN) aims to develop an integrated gas sensor array for the real-time monitoring of the air environment in greenhouses. The project proposal is based on the preliminary results patented under patent no. RO130236-A2 - Multi-layer graphenes and process for obtaining the same. The sensitive layer used to develop the sensorial array is based on functionalized few-layer graphenes, previously synthesized using solvothermal process. The functionalization molecules are organic polymers, chemically bound at the edge of the graphenes, which act as “sensitive whiskers” for the detection of analytes. This configuration allows high sensibilities (down to ppb levels) and rapid responses (the electrical conductivity of the graphene is preserved due to the chemical bonding at the edge of the basal plane). The experimental model developed in the present project proposal is tested to various gaseous mixtures mimicking greenhouses air environment.

INVENTION #116

AGRICULTURE AND FOOD INDUSTRY

FoodESense – Senzor electrochimic pentru siguranta alimentara

Authors: Ana-Maria Iordache, Stefan-Marian Iordache, Ileana Cristina Vasiliu, Mihail Elisa, Irinela Chilibon, Valentin Barna, Cristiana E.A. Grigorescu

Organization: National Institute for Optoelectronics - INOE 2000

The proposal focuses on knowledge-based engineering for developing an e-tongue like sensor for histamine evaluation in food products (the emphasis is placed on meat products, since they seem to be subject to more improper hygiene during production, processing and transport). The general objective of the proposal is the development of an e-tongue like sensor based on modified screen printed electrode (SPE) structures with an receptor part made of porphyrins/metalloporphyrins chemically bound to graphene/carbon nanotubes (the sensitive assembly) to act as antennas and “capture” the histamine molecules. The role of the SPE is to convert the “sensing” signal of the receptor into a measurable electrical signal. Using a single, ultra-sensitive electrochemical sensor, we could measure the concentration of histamine, a compound which is strongly connected to the level of freshness (the caution level of histamine is 50 ppm, whereas the maximum accepted levels range from 200 ppm to 500 ppm). The e-tongue like sensor will provide on-site quality control of the food products, from producer to retailer and to consumer, giving information about the food safety status along the distribution chain. The applicability of the proposed device is mainly in the food industry, to evaluate the freshness level of a certain product after it has reached the market. The sensor will help both the food safety authorities and the producers to determine the level of freshness in a dynamic/active and on-site manner and will provide a real-time analysis, without the need of a well-equipped laboratory.

INVENTION #165

AGRICULTURE AND FOOD INDUSTRY

INNOVATIVE MATERIALS FOR ABSORPTION OF PETROLEUM HYDROCARBONS

Authors: Daniela Laura BURUIANĂ, Puiu Lucian GEORGESCU, Viorica GHISMAN, Nicoleta Lucica BOGATU, Georgiana GHISMAN , Elena Roxana AXENTE, Cătălin ARAMĂ

Organization: Dunărea de Jos University of Galați

The present invention relates to a mixture based on dolomite and steel mill slag for the absorption of petroleum hydrocarbons. The mixture is composed of CaMg(CO3)2 dolomite with pH=9.62 with a grain size between 40-63 mm and steel mill slag with a pH=12.1 with a grain size between 71-315 μm. The method according to the invention consists in the fact that the mixture of component elements (dolomite and steel mill slag) is spread evenly on the soil impregnated with petroleum hydrocarbons and a significant amount of polycyclic aromatic hydrocarbons is absorbed with the aim of greening the contaminated soil.

INVENTION #168

AGRICULTURE AND FOOD INDUSTRY

Tris(2,6-dimethyl pyridinecarboxylate-1kONO)-di-μ-(isothiocyanato-1,2kN)-(diisothiocyanato-2kN)barium(II)cobalt(II) with biostimulatory properties of the synthesis of bioactive principles on fungi

Authors: Ion BULHAC; Dumitru URECHE; Maria COCU; Pavlina BOUROSH; Alexandra CILOCI; Viorica CONDRUC; Elena DVORNINA

Organization: Institute of Chemistry of MSU

The technical result of the invention is to obtain a new well-crystallizable and non-corrosive monocrystalline heterodinuclear complex [BaCoL3(μ-NCS)2(NCS-κN)2] (L = 2,6-pyridinecarboxylic acid dimethyl ester), which is introduced into the nutrient composition of the producers increases the biosynthesis of amylases in the fungal strain Aspergillus niger CNMN FD 06 and the productivity of mycelial biomass in Lentinus edodes (Berk) Sing CNMN FB 01 with the reduction of the cultivation cycle by 24-48 hours. The complex has a stimulating influence on the biosynthesis of exocellular amylases in the Aspergillus niger micromycete, exceeding 35.6% and 51.0% of the control on the 5th day of cultivation (6th day of cultivation), facilitating the reduction of the technological cycle with 24 hours. The application of the heterometallic coordination compound in the cultivation process of the fungi Lentinus edodes (Berk) Sing CNMN FB 01 strain producer of mycelial biomass with curative and nutraceutical properties, ensures the increase of the amount of biomass already accumulated on the 6th day of cultivation until the 21,87-22,52 g/L compared to 16.37 g/L maximum of the control on the 8th day of cultivation, which exceeds the level of the maximum of the control by 33,6-37,6% depending on the applied concentration, while reducing the cultivation term by 48 hours.

INVENTION #172

AGRICULTURE AND FOOD INDUSTRY

From Yeast to Eco-Friendly Packaging: Developing Active, Edible Films Using Non-Thermal Processing

Authors: MIRELA Craciunescu Iulia Lidia Bleoanca Daniela Borda

Organization: Faculty of Food Science and Engineering, Dunarea de Jos University of Galati

Yeast biomass by-product resulting from bakery or brewing industries, hold the potential of added-value valorization in an innovative way, as an edible eco-friendly film for food packaging. Consequently, it contributes to a circular economy, reducing waste and the microbial biomass is converted into a valuable product from under-utilized resources. The yeast biomass was processed into a film using an optimized protocol that includes non-thermal treatments like ultrasonication (US). A (1:1) blend of lavender and cinnamon essential oils (EOs) was incorporated to boost the film's antimicrobial and antioxidant properties. The film was extensively characterized by assessing its water activity (aw), thickness, antioxidant activity, digestibility, protein content, and color differentiation using conventional methods described in detail elsewhere. The resulting films exhibited good flexibility, allowing them to be handled without damage, a uniform appearance with a silky tactile feel to the touch with no signs of cracks (Craciunescu, 2024). The developed film is brighter with neutral tones (values of the parameter a* close to 0) and brown shade (values of the parameter b* close to 30) demonstrated suitability for packaging darker-colored foods, such as aged cheeses, thus offering practical alignment with specific food applications. By incorporating essential oils like cinnamon and lavender, the film extends the shelf life of perishable foods, demonstrated protective qualities like antioxidant activity both during gastric and intestinal digestion (215-247 μM TROLOX/g s.u.) due to the presence of antioxidant compounds such as β- glucans, peptides from yeast and polyphenols from the essential oils, that meet both preservation and safety requirements. The digestibility process of the films showed values ranging between 1.5-2 mg of protein /mL sample. However, accelerated gastric digestibility occurred after one hour of treatment. The digestion process of the film continued in the intestinal phase, showing an increase through the entire process providing additional protein content (1.8 - 2.2 mg protein/mL sample),

thus enhancing its appeal to nutritionally conscious consumers. Also, the value of water activity (aw) below 0.8 limits microbial growth leading to the formation of stable materials, providing an additional reason for using this film. The current manufacturing process has been validated at a laboratory level (TRL4), demonstrating scalability potential due to its relatively simple protocol, which is adaptable to industrial requirements with minimal technological adjustments. This eco-friendly approach to film production utilizes fewer resources than conventional processes that requires thermal treatments and the non-thermal treatments are minimizing the environmental impact, thus aligning with the industry's transition towards sustainable packaging solutions. Its competitive production costs and functional benefits make it a viable alternative in the market. Preliminary analysis indicates that this yeast-based film is more cost-effective to produce compared to traditional edible and biodegradable alternatives, positioning it as a feasible option for both small-scale producers and large industries focused on reducing plastic reliance The inclusion of essential oils with antimicrobial and antioxidant properties provides a dual function—enhanced food preservation and bioactive packaging—which is increasingly valued in both the commercial and consumer sectors. Future studies may include sensory evaluations to assess consumer acceptance and optimize the film's organoleptic features. The current production method shows promise for refinement and scalability, with potential enhancements for film flexibility, transparency, and overall mechanical performance, aligning with industrial requirements for diverse and sustainable packaging. References. Craciunescu, M. 2024. Disertation Thesis- „Development and Characterization of a Yeast Biomass-Based Film Packaging'

INVENTION #185

AGRICULTURE AND FOOD INDUSTRY

Process for obtaining a functional drink with high bioavailability based on the fermentation of Kombucha culture

Authors: Alexiu Teodora-Otilia Vamanu Emanuel

Organization: University of Agronomic Sciences and Veterinary Medicine Bucharest

Probiotic beverage with high bioavailability, produced through a new fermentation method based on Kombucha culture and flavored apple juice substrate. In comparison to traditional ones exclusively using tea substrate, the resulting product has a more consumer friendly taste and aroma, along with antioxidant and probiotic properties.

INVENTION #194

AGRICULTURE AND FOOD INDUSTRY

New potato variety Amural

Authors: Hermeziu Radu

Organization: National Institute of Research and Development for Potato and Sugar Beet Brasov

Potato variety obtained by sexual hybridization between varieties Sarpo Mira x Charlotte, followed by individual clonal selection Maturity: medium early Tubers: form oval, red skin, light yellow flesh Plant: tall, very well developed Flower: medium pink white, medium corolla, mid-level flowering Resistance to pests and diseases: • medium resistant to leaf roll viruses (PLRV) and potato Y virus(PVY) • relatively resistant to late blight (Phytophthora infestans) on foliage and tubers • resistant to wart disease (Synchytrium endobioticum) Dry substance content: 25,6% Culinary quality: class B Skilled: for autumn - winter consumption, for salads and various dishes culinary, industrial processing (chips, French fries) Advantages: high yield capacity (50 t/ha), ecological plasticity, production stability

INVENTION #195

AGRICULTURE AND FOOD INDUSTRY

New potato variety Cezarina

Authors: Hermeziu Radu

Organization: National Institute of Research and Development for Potato and Sugar Beet Brasov

Potato variety obtained by sexual hybridization between varieties Angela x Dalida, followed by individual clonal selection Maturity: medium early Tubers: form oval, shallow eyes, yellow skin, light yellow flesh Plant: medium tall, with intermediate semi-upright vine Flower: dark red, medium corolla, mid-level flowering Resistance to pests and diseases: • high resistance to t leaf roll viruses (PLRV) and potato Y virus(PVY) • relatively resistant to late blight (Phytophthora infestans) on foliage and tubers • resistant to wart disease (Synchytrium endobioticum) Dry substance content: 21,00% Culinary quality: class A/B Skilled: for autumn - winter consumption, suitable for a whole range of culinary uses Advantages: high yield capacity (60 t/ha), ecological plasticity, production stability

INVENTION #208

AGRICULTURE AND FOOD INDUSTRY

Enhancing Green Tea Quality and Economic Opportunities for Mountain Ethnic Communities in Northern Thailand

Authors: Siraprapa Mahanil, Anthikan Klomchit, Darea Hayesalea, Krittidetch Anan, Dusit Athinuwat

Organization: Mae Fah Luang University

A green tea processing method involving post-fermentation with Eurotium cristatum has been developed to enhance tea quality, resulting in reduced bitterness and pronounced honey-like flavor notes. This technology was transferred to mountain ethnic communities in northern Thailand, leading to improved quality and market value of green tea. Additionally, it has provided these communities with greater opportunities to connect with both domestic and international tea industry entrepreneurs, thereby increasing revenue potential.

INVENTION #209

AGRICULTURE AND FOOD INDUSTRY

Biological pesticides for rose and economic crops production system

Authors: Dusit Athinuwat, Krittidetch Anan, Sasithon Srikram, Anthikan Klomchit and Wannaporn Thepbandit

Organization: Thammasat University

Biological pesticides made from agricultural waste to promote the BCG Model, a bio-circular-green economy, and reducing the usage of pesticides policy. The active microorganism passed toxicology included acute oral toxicity, acute percutaneous (dermal) toxicity, and skin irritation. This product can promote plant growth, strengthen plant immunity, and increase yield. The production process was done in standard factory.

INVENTION #213

AGRICULTURE AND FOOD INDUSTRY

"Composite food product and technology for manufacturing the composite food product consisting of microplants (sprouts/microgreens) and substrate for food use"

Authors: Livadariu Oana, Băbeanu Narcisa Elena, Barbu Lavinia-Diana-Nicoleta, Boiu-Sicuia Oana-Alina, Peticilă Adrian George, Constantin Carmen Gabriela, Dobrin Aurora, Ion Violeta-Alexandra, Venat Cosmina Oana Arabela, Nicolae Ioana Cătălina, Lagunovschi-Luchian Viorica, Badea Monica Luminița

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

The Project with title "Production technology of aromatic microplants in an innovative cultivation system (MICROLED)", was funded by the University of Agronomic Sciences and Veterinary Medicine of Bucharest through Project no. 1067/15.06.2022. The MICROLED project aims to test technology for the production of aromatic microplants of sorrel or basil in an innovative eco-system of cultivation which, by asepticization, has the potential to reduce/eliminate contamination with biotic factors in obtaining and marketing them. The novelty of the project stems from a concept that uses an ecosystem able to comply with food safety conditions for the production of sprouts established by ESSA (http://sproutedseeds.eu/list-of-members/). Thus, the proposed solution aims at the production and consumption model of the Circular Economy recommended by the EU for the quality of life. As a result, within this project, we filed a Patent Application, registered with OSIM in Bucharest, Romania: "Composite food product and technology for manufacturing the composite food product consisting of micro-plants (sprouts/microgreens) and substrate for food use". This Patent inaugurates a new class of products for human use, both for ordinary consumers and for those in need of a personalized diet. Such a diet should be able to support the physiological needs of the human body and keep it functioning even when it is the site of a battle with an extreme medical diagnosis (e.g. cancer). It should also facilitate the patients' desire to restore their vitality and return to their previous lifestyle. There is on going research on manufacturing products according to the patent.

INVENTION #215

AGRICULTURE AND FOOD INDUSTRY

HIGH CAPACITY AGRICULTURAL DRONE FOR PHYTOSANITARY TREATMENTS IN FIELD CROPS

Authors: Matache Mihai, Găgeanu Iuliana, Voicea Iulian, Gheorghe Gabriel, Persu Cătălin, Cujbescu Dan, Chirițescu Marian, Biriș Sorin-Ștefan

Organization: National Institute of Research - Development for Machines and Installations designed for Agriculture and Food Industry - INMA Bucharest

The invention refers to a high-capacity agricultural drone for carrying out phytosanitary treatments in field crops, in order to precisely apply them and reduce the amount of phytosanitary substances applied.

INVENTION #216

AGRICULTURE AND FOOD INDUSTRY

EcoExtract: Mobile Subcritical Solvent System for Sustainable Terpene and Essential Oil Production

Authors: Aluck Thipayarat, Jakrapop Wongwiwat, Pattarin Supanivatin, Tanabordee Meelarp, Darm Srithanasakulchai

Organization: King Mongkut's University of Technology Thonburi

The **Mobile Subcritical Solvent Extractor** is an innovative technology designed to efficiently extract high-value terpenes and essential oils from medicinal plants and fragrant flowers. Utilizing environmentally friendly subcritical solvents at low temperatures, this portable system preserves the integrity and potency of natural compounds. It reduces transportation needs by enabling on-site extraction, thus maintaining freshness and quality. This invention supports sustainable practices in the Thai traditional medicine and cosmeceutical industries, enhances local economies, and facilitates the development of high-quality, market-ready natural products.

INVENTION #221

AGRICULTURE AND FOOD INDUSTRY

VERTICAL FARM WITH INTEGRATED AQUAPONIC SYSTEM

Authors: Voicea Iulian, Vlăduț Valentin, Matache Mihai, Persu Cătălin, Cujbescu Dan, Olan Mihai

Organization: National Institute of Research - Development for Machines and Installations designed for Agriculture and Food Industry - INMA Bucharest

The invention refers to a vertical farm with integrated aquaponic system, which performs the automatic regulation and control of the working parameters - water flow and the duration of time during which the water supply and discharge takes place, the whole process being automated and controlled by a technological process computer.

INVENTION #226

AGRICULTURE AND FOOD INDUSTRY

SUSTAINABLE PROCESS FOR DELIVERING WATER AND BIOSTIMULANTS TO PLANTS GROWN IN PROTECTED SPACES

Authors: Miteluț Amalia Carmen, Dănăilă-Guidea Silvana Mihaela, Popa Mona Elena, Drăghici Mihaela Cristina, Popa Elisabeta Elena, Geicu-Cristea Mihaela, Popescu Paul Alexandru, Mănăilă Elena

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

A series of new superabsorbent polymeric materials (BSPs) were developed, obtained by irradiation with accelerated electrons, which were later tested for use in agriculture, to reduce water stress and to improve the nutritional status in plant culture . These materials have the property of absorbing and easily releasing very large amounts of water and/or fertilizers, thus allowing the optimization of plant access to these elements indispensable for growth and development, throughout the vegetation period. The results obtained from greenhouse and solar tests on two plant species (tomatoes and lettuce) demonstrated the effectiveness of using these superabsorbent polymeric materials (hydrogels) in compensating for water and nutrient deficits in the soil.

INVENTION #227

AGRICULTURE AND FOOD INDUSTRY

PROTEIN-VEGETABLE PRODUCT, NUTRITIONALLY BALANCED AND PROCEDURE FOR OBTAINING IT

Authors: Drăghici Mihaela - Cristina, Popa Elisabeta – Elena, Geicu – Cristea Mihaela, Popescu Paul – Alexandru, Popa Mona - Elena, Bujor Neniță Oana - Crina, Ion Violeta - Alexandra, Dobrin Aurora, Dragomir Nela, Constantin Carmen - Gabriela, Moț Andrei

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

The invention relates to a "waffle" type food product, salty, with a high vegetable protein content intended for the food industry. The novelty of the invention is that the product is obtained from a mixture of vegetable powder, namely peas, broccoli, asparagus, Agaricus bisporus mushrooms and eggplant skins, whole wheat flour, cold pressed olive oil, water, salt and cumin. The vegetable product can be consumed by consumers of all ages, being an alternative to fast food.

INVENTION #228

AGRICULTURE AND FOOD INDUSTRY

Technology for identifying biotypes of Lycium chinense resistant to the attack of the gall mite on goji plants (Cerere de brevet)

Authors: Roxana Ciceoi, Oana Venat, Cătălina Nicolae, Mihaela Iordăchescu, Minodora Gutue, Adrian Asanică, Florin Stănică, Ana Butcaru, Vasilica Luchian, Mala-Maria Stavrescu-Bedivan, Dan Popescu

Organization: Universitatea de Științe Agronomice și Medicină Veterinară din București

The invention refers to a preliminary selection process, assisted by molecular markers, on explants obtained in vitro, for identifying biotypes of goji resistant to the gall mite Aceria kuko. The process, according to the invention, consists of a sequence of steps involving: preparing seeds by harvesting goji berries from selected plants, extracting and decontaminating the seeds by immersion in 0.5% systemic fungicide for 20 minutes, followed by repeated rinsing to eliminate the fungicide, disinfecting with sodium hypochlorite at concentrations of 10...15%, preparing the culture medium based on Gamborg B5(-) without growth hormones, and inoculating the seeds on the medium. This is followed by monitoring the growth of callus/explants and plantlets, and analyzing them with two (2) ISSR-type molecular markers and one (1) SSR-type molecular marker to quickly identify biotypes resistant to the gall mite attack. Resistant biotypes can be differentiated from sensitive ones with the help of 10 bands, of which 6 bands positively indicate resistance, and 4 bands indicate the same characteristic by their presence only in sensitive biotypes. Claims: 3.

INVENTION #230

AGRICULTURE AND FOOD INDUSTRY

EnterGreenFood – Ecological approach for the prophylactic and curative treatment of enteric diseases in the poultry sector

Authors: Alina Ortan, Petronele Rosu, Simona Mrcu Spinu

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

Animal health has always been a concern for all European citizens, regardless of their area of activity. This concern is based on public health, food security and safety, aspects related to animal health, but also to the economic costs of epidemics caused by animal diseases. Enteric diseases in domestic poultry species are present both in the industrial rearing system and in the domestic one, producing significant damage to poultry flocks. Usually, the treatment of enteric diseases includes antibiotics administered in the feed or by injection, which increases the risk of antibiotic residues in meat and eggs and the risk of increasing the resistance of bacteria to them. In this context, the main objective of the project is the design of alternative solutions with prophylactic and curative action on enteric diseases in the poultry sector, through the development of an innovative technology by obtaining a phytogenic additive from indigenous flora with a multistage effect. The project will lead to obtaining bio products that can be easily mixed with other feed ingredients, without tissue residues, that improve feed intake, feed conversion rate, bird immunity, digestion, increase nutrient availability, as well as absorbability, have antimicrobial effects, do not affect carcass traits, reduce antibiotic use, act as antioxidants, compete for stressors, and provide healthy organic products for human consumption. Acknowledgement: This research was funded by the University of Agronomic Sciences and Veterinary Medicine of Bucharest—Romania, Research Project 846/30.06.2023, acronym EnterGreenFood in the Competition IPC 2023.

AVIATION, CAR INDUSTRY AND TRANSPORTATION

15 Inventions

INVENTION #8

AVIATION, CAR INDUSTRY AND TRANSPORTATION

Composite Sandwich Material Based on Polyetherimide and Carbon Fiber and Method for Its Production

Authors: Bogdan Rusu

Organization: INCAS "Elie Carafoli" Bucharest

With the increasing demand for lightweight, efficient, and high-performance aerospace products, new materials and manufacturing processes are being developed to reduce costs and address the challenges of modern transportation. This patent introduces an innovative design for a composite sandwich material based on polyetherimide and carbon fibers. The material features a 3D-printed polyetherimide core with mechanical strength up to 85 MPa, a mass density of 1270 kg/m³, and thermal resistance between 200–220°C. Additionally, a method for producing this composite material is detailed, involving the 3D printing of the polyetherimide core under established conditions. The material and its manufacturing process are patented by Romania's National Organization for Inventions (OSIM). While this solution may not address all challenges associated with materials and manufacturing processes for aerospace vehicles, it provides a promising foundation for future advancements that aim to produce more cost-effective and environmentally friendly products.

INVENTION #9

AVIATION, CAR INDUSTRY AND TRANSPORTATION

A Novel High-Temperature Composite Material System with Neuro-Fuzzy Temperature Control

Authors: Boțan Mihail, Piticescu Radu-Robert, Sobetkii Arcadie, Capatina Valentina, Sobetkii Arcadii, Cristea george-catalin, Dragomirescu Alina, Ion Guta Dragos Daniel

Organization: National Institute for Aerospace Research Elie Carafoli - INCAS - RO

This innovative technology introduces a novel composite material system for Molds production capable of achieving temperatures up to 100°C through Joule heating. The system incorporates a thin-film electrically conductive coating composed of a High-Entropy Alloy (HEA) and utilizes a sophisticated neuro-fuzzy control system for precise temperature management. By precisely regulating the electrical current, the neuro-fuzzy system enables accurate temperature profiling, leading to enhanced part quality, reduced cycle times, and significantly lower energy consumption. By eliminating the need for energy-intensive processes such as autoclave and oven curing, this technology significantly reduces carbon footprint and operational costs. The precise temperature control and rapid heating/cooling cycles enable the production of high-quality composite parts with superior mechanical properties, making it a valuable asset for industries like aerospace, automotive, and other demanding industries.

INVENTION #10

AVIATION, CAR INDUSTRY AND TRANSPORTATION

Composite based on polypropylene reinforced by functionalized aramid fibers

Authors: Maria Sonmez, Cristina-Elisabeta Pelin, George Pelin, George Catalin Cristea, Adriana Stefan, Mihaela Nituica, Laurentia Alexandrescu, Daniela Maria Stelescu, Mihai Georgescu

Organization: National Institute For Aerospace Research "Elie Carafoli" - I.N.C.A.S. Bucharest

The patent proposal refers to the development of an innovative polymeric composite based on polypropylene (PP), maleic anhydride grafted polyethylene (PE-g-AM), aramid fibers that were previously subjected to surface modification with titanium isopropoxide in the presence of microcellulose as template/stabilizing agent of the titanium dioxide (TiO2) particles dimensions, Genioplast®Pellet S additive for performance and pigment compound. The composite is designed for application as protection covers of electronic or other sensitive parts of small-size unmanned aerial vehicles (drones) destined for research or recreational purposes. The technical challenge that this patent proposal overcomes and solves consists of the melt compounding/thermal pressing development of composite foils having as composition polypropylene, maleic anhydride grafted polyethylene, TiO2 surface modified aramid fibers, Genioplast additive for performance and pigment that are processed into the final product (protection covers for drones) through vacuum thermoforming method. The developed polymeric composite exhibits, amongst other advantages, high impact strength that ensures facile energy dissipation in case of collision with different objects, which consequently allows the maintaining of structural and functional integrity of the drone.

INVENTION #16

AVIATION, CAR INDUSTRY AND TRANSPORTATION

‚Sistem de propulsie cu gaz rece pentru minisateliti de orbita joasa'

Authors: Constantin SANDU. Valentin SILIVESTRU, Dan BRASOVEANU

Organization: INCDT-COMOTI/INCDT-COMOTI/Orbital ATK

The invention refers to a new type of cold gas propulsion system that uses solar energy and has an increased operating time, which implicitly allows an increase in the operating time of low-orbit satellites (GPS) or other space equipment that use this propulsion. The cold gas propulsion system according to the present invention consists of a parabolic mirror assembly formed at the central part of one face of the satellite box and four other reflective segments applied to hinged structures formed of thin-walled bars. When the mirror is opened with the help of micromotors, it focuses the sun's rays on the gas reservoir in the focus of the mirror, thus increasing the pressure of the gas inside before each expansion in the Laval nozzle. In this way, the operating time of the propulsion system increases almost 3 times. The rest of the cold gas propulsion system components are the same as current cold gas propulsion systems.

INVENTION #40

AVIATION, CAR INDUSTRY AND TRANSPORTATION

MONITORING SYSTEM FOR CONTROL OF VEHICLE SPEED LIMITS ON PUBLIC ROADS

Authors: Pavel Ştefan, Ungureanu Daniel-Viorel

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

The invention refers to a fixed electrical system for preventing accidents caused by excessive speed on public road segments with vehicle speed restrictions. ADVANTAGES OF THE INVENTION: - Detects when a vehicle exceeds the allowed speed limit on a designated road segment and determines its actual speed. - It prevents the driver from exceeding the legal speed limit. - Verifies compliance with speed adjustment requests. - In case of noncompliance, it neutralises the vehicle's control system through an electromagnetic pulse, causing it to come to a stop. - It records, archives and transmits data via an internet connection to authorised authorities responsible for managing such situations. - The installation is energy self-sufficient. - The installation does not pollute the environment.

INVENTION #44

AVIATION, CAR INDUSTRY AND TRANSPORTATION

Aero-electric propeller with Coandă effect, with orientable propeller and air-taxi type aircraft using it

Authors: Arghirescu Marius

Organization: Asociaţia "Iustin Capră"

The invention refers to an aero-electric thruster with the Coandă effect, with an adjustable propeller, composed of a metallic casing-type body (4) consisting of an upper half-shell part (4.1) and a truncated lower half-shell part (4.2) in which an electric motor (3) is positioned on the axis of which a mixed suction propeller (2) is fixed, (axial-radial), having 3?5 radial blades (b) approximately rectangular and with the end edge solidified with one marginal blade each (c) with the length in the plane of rotation but oriented at an angle γ = 20?40° to the tangent to the circle of rotation and with the width inclined at an angle of 45°> β > 0 to the axis of the hub (a), the whole assembly: housing (4)-electric motor (3)-propeller (2) being supported by a rotating pipe (5) having a flat part (p) with a central screw fixing hole from the upper part of the electric motor housing (3), in the central space of an annular aerodynamic shape (1) with a circular arc section, fixed with some spacer screws (s) to a double wing (A) consisting of an attack wing (A1) and a downstream wing (A2) fixed at an angle of about 45° from the attack wing (A1) so as to form a triangle with the aerodynamic body (D) of an air-taxi type aircraft through which passes - on the upper part - and the rotating pipe (5), which comes out of it extended on the opposite side with an identical support part of an identical propeller (P1') fixed on the double wing (A'), its rotation preferably being carried out by a stepper motor type actuator and a gear with two toothed wheels, the air-taxi type aircraft also having a pair of tail wings (A3, A3') with a semicircular cutout in which an aero-electric propeller (P2, P2') with propellers is fixed adjustable, made similarly but without the aerodynamic shape (1).

INVENTION #113

AVIATION, CAR INDUSTRY AND TRANSPORTATION

A Small UAV With Fixed Wing Made of Polystyrene Reinforced With Glass Fiber Band

Authors: Daniel IORGA, Constantin GEORGESCU, Sorin CONSTANTINESCU, George Ghiocel OJOC, Alexandru Viorel VASILIU, Mihai CONSTANTINESCU, Constantin Cristian ANDREI, Lorena DELEANU

Organization: 1 “Dunarea de Jos” University, Galati, Romania, National Institute for Aerospace Research (INCAS) “Elie Carafoli”, Bucharest, Romania, Autonomous Flight Technologies, Clinceni, Romania, Orange Business Romania, Bucharest, Romania

The body of this small UAV is made of expanded polystyrene reinforced with adhesive tape with glass fibers. The design and technological solution were for a functional drone demonstrator of class C1, meaning a maximum take-off mass of 900 grams, and tests validated this small UAV under flight conditions. The wing profile was MH-49 with a maximum chord thickness of 10.5%, as it proved a much lower coefficient of pitching moment than the NACA 63215 profile, offering a superior governability. Use of expanded polystyrene in UAV industry can bring benefits, versatility and low-cost for tactical and logistic applications. The fabrication was easy and at low cost.

INVENTION #137

AVIATION, CAR INDUSTRY AND TRANSPORTATION

THERMAL MANAGEMENT DEVICE OF A CATALYTIC SYSTEM TO REDUCE POLLUTION CAUSED BY INTERNAL COMBUSTION ENGINES

Authors: Mariaşiu Florin Emil

Organization: Technical University of Cluj-Napoca

The invention refers to a thermal management device of a catalytic system to reduce pollution caused by internal combustion engines, which achieves, through construction and operation, bringing the catalytic system to the temperatures required by the operation of the internal combustion engine that equips a vehicle in a time very short, at stratified mixture operation, at cold start and operation. The problem that the invention solves is to reach an internal temperature of the catalytic pollution reduction system in a short time, which makes it possible to operate in the optimal pollution reduction parameters during the cold start of internal combustion engines.

INVENTION #138

AVIATION, CAR INDUSTRY AND TRANSPORTATION

ELECTRIC FUNICULAR WITH ENERGY RECOVERY

Authors: Breban Ștefan, Oprea Claudiu-Alexandru, Lateș Daniel

Organization: Technical University of Cluj-Napoca

Electric funicular, with energy recovery, in which the drive of the carrier drum is done by one or two electric machines, which operate in motor mode when lifting the transported material under the trolley, when returning the trolley to the pickup area and when transferring it from downstream to upstream (if applicable) and in generator mode when transporting the load from upstream to downstream. In this way, the potential energy of the descending transported load is converted into electrical energy and stored in the battery, being later consumed for the return, on the way up, of the anchoring elements related to the transported loads.

INVENTION #139

AVIATION, CAR INDUSTRY AND TRANSPORTATION

HYBRID FUNICULAR WITH ENERGY RECOVERY

Authors: Oprea Claudiu-Alexandru, Breban Ștefan, Lateș Daniel

Organization: Technical University of Cluj-Napoca

Hybrid funicular, with energy recovery, that has a hydraulic system (motor/pump) to drive the carrier drum, driven by two other hydraulic machines which are connected to the shafts of an electric machine or diesel engine. The hydraulic machine is mechanically linked to the electric one and reversible, to allow the recovery of the potential energy available during the upstream to downstream transport of the material, so that the electric machine will operate in motor mode when lifting the transported material under the trolley and at returning the trolley to the material pick-up area and in generator mode when the material is transported downhill.

INVENTION #201

AVIATION, CAR INDUSTRY AND TRANSPORTATION

CHARGE/DISCHARGE/CHECK CHARACTERISTICS OF NI-MH AND LI-ION BATTERIES

Authors: Gidali Adrian, Simon Florin; Mentor Corneliu BIRTOK BANEASA

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

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).

INVENTION #202

AVIATION, CAR INDUSTRY AND TRANSPORTATION

DUAL TANDEM TRANSMISSION

Authors: ROMEO CĂTĂLINOIU, SORIN AUREL RAȚIU, IMRE ZSOLT MIKLOS

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

The invention is an application of Patent RO134406 dated 30.03.2023 and refers to a gearbox intended to ensure the transmission of electrically powered automobiles with the aim of reducing energy consumption and increasing energy autonomy. The gearbox is characterized by the fact that it continuously varies the value of the transmission ratio, by varying the revolutions of the two electric motors, which can work individually or in tandem.

INVENTION #207

AVIATION, CAR INDUSTRY AND TRANSPORTATION

A-S-F SUPER-ASPIRATED AIR FILTER

Authors: Corneliu BIRTOK-BANEASA

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

This study presents a method for optimizing the intake system in the case of the internal combustion engine by implementing an axial super-aspirated air filter with special functions. The axial super-aspirated air filter has the following functions: capture, recovery, increasing the air speed and reducing the temperature. The advantages are the reduction of fuel consumption and polluting emissions.

INVENTION #231

AVIATION, CAR INDUSTRY AND TRANSPORTATION

FIXED-WING U.A.V. WITH VERTICAL TAKEOFF/LANDING SYSTEM WITH TRI-ROTOR PROPULSION SYSTEM AND METHOD OF INTERCEPTING THE SPECIFIC SOUND EMITTED BY THERMAL ENGINE-POWERED CHAINSAW

Authors: Tiberius-Florian FRIGIOESCU, Gabriel-Petre BADEA, Victoraș-Florentin ANGHEL, Grigore CICAN, Mihaela-Raluca CONDRUZ, Marius-Adrian DIMA

Organization: Autonomous Flight Technologies; COMOTI - Romanian Research & Development Institute for Gas Turbines,

The present invention refers to a fixed-wing drone that incorporates an innovative tri-rotor system with vectorization capabilities, enabling both vertical takeoff and landing as well as forward flight propulsion. It has been designed as a flying wing, involving the elimination of the tail, which result in the transformation of ailerons into elevons, control surfaces serving the functions of both elevators and ailerons. To enhance the drone's stability, winglets have been introduced with the purpose of eliminating vortex production at the wingtips. The mission of this aircraft is to identify illegal deforestation by equipping it with an artificial intelligence system capable of detecting the specific noise of a thermal powered chainsaw. To achieve this, the drone has been equipped with sensitive microphones to detect the sound and a high-performance camera capable of capturing and recording the identified areas and transmitting to authorities. All of the mentioned functions can be performed autonomously with the assistance of the onboard autopilot.

INVENTION #232

AVIATION, CAR INDUSTRY AND TRANSPORTATION

INTEGRATED TEST BENCH FOR MICRO – TURBOGENERATORS UNDER CONDITIONS SIMULATING THEIR APPLICATION ON UAVs WITH REMOTE CONTROL VIA WI-FI

Authors: Tiberius-Florian FRIGIOESCU, Gabriel-Petre BADEA, Mădălin-Constantin DOMBROVSCHI, Grigore CICAN, Maria CĂLDĂRAR

Organization: COMOTI - Romanian Research & Development Institute for Gas Turbines

The invention relates to a testing bench for microturbogenerators integrated on UAVs (Unmanned Aerial Vehicles), in which a micromotor generates mechanical energy that is then converted into electrical energy by coupling it to a generator. The energy produced is then consumed by an Electric Ducted Fan (EDF), a component which simulates the actual UAV. The control of the entire system is based on implementing a specific control law for the microturbogenerator, tailored to the requirements and particularities of a UAV, ensuring precise and efficient control of the device's performance. Additionally, this testing stand for microturbogenerators with automatic control enables remote testing through an intuitive graphical interface of an application controlled via WI-FI. This functionality allows users to monitor and adjust operating parameters in real-time, providing flexibility and efficiency in the testing process.

BUILDINGS AND MATERIALS

10 Inventions

INVENTION #42

BUILDINGS AND MATERIALS

The process of obtaining materials based on alkali-activated glass with intumescent properties

Authors: Adrian Ionut NICOARA, Alina Ioana BADANOIU

Organization: National University for Science and Technology Politehnica Bucharest

The invention refers to a process for obtaining alkali activated materials with intumescent properties which consists in mixing a solid component, represented by a glass powder and CaCO3, in percentages between 5...30% from the glass weight, with a liquid component represented by an alkaline activator solution consisting of a 70-30% mixture of NaOH and Ca(OH)2. According to this production process, the silico-calco-sodium glass waste are ground to a specific Blaine surface between 2000-3000 cm2/g. The powder obtained is mixed with CaCO3 and after homogenization for 10 min at 100 RPM, a mixture of NaOH and Ca(OH)2 is added (the mass ratio between the activator solution and the glass powder is between 0.15 and 0.21 depending of the degree of substitution of the glass with CaCO3 powder) under continuous stirring at the speed of 500 RPM for 10 min. After homogenization, the pasta is poured into molds and subjected to a maturation treatment at a temperature of 60°C for 48 hours, then it is removed from the mold and stored in the air (normal storage conditions). The obtained material is characterized by a mechanical strength at 28 days between 22.99...27.50 MPa, respectively by a swelling degree of up to 77% at a temperature of 900°C.

INVENTION #52

BUILDINGS AND MATERIALS

Thermo-insulating material for buildings, based on sheep's wool and method of obtaining it

Authors: Vasilievici Gabriel, Mîrț Andreea-Luiza, Ghimiș Simona-Bianca, Vlaicu Alexandru, Zaharia Emilian, Bomboş Mariana Mihaela, Bomboş Daniel

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM

The invention refers to a thermo-insulating material based on sheep's wool and a method of obtaining it with applicability in civil and industrial constructions. According to the process, a thermo-insulating material based on conditioned sheep's wool and additive with fire-retardant and bactericidal agents is obtained, intended for thermo-insulating panels for homes, having the advantage that all organic components are biodegradable. Through this process, the inorganic thermo-insulating materials that pose a danger to humans and the environment are replaced with an organic material with natural fire-retardant properties and a low thermal conductivity.

INVENTION #57

BUILDINGS AND MATERIALS

Process for regenerating end-of-life products for reuse in mortars/concrete

Authors: Adrian Ionut NICOARA, Ionela Andreea NEACSU, Bogdan Andrei ILIE, Bogdan Stefan VASILE, Otilia Ruxandra VASILE, Andrada-Elena NICOARA, Mirijam VRABEC, Saso STRUM, Sorour Semsari PARAPA

Organization: National University of Science and Technology POLITEHNICA Bucharest

The invention refers to an alternative process for obtaining aggregates/concrete, which consists in the use as an alternative raw material to ordinary Portland cement (OPC) of waste from historical dumps in Romania (thermal power plant deposits), in various proportions between 60 .. 80% CEM I cement and 40 ... 20% thermally activated ash.

INVENTION #58

BUILDINGS AND MATERIALS

PROCEDURE FOR TREATMENT OF VARIOUS NATURAL OR SYNTHETIC SUBSTRATES FOR THE INDUCTION OF ANTIMICROBIAL, ANTIBIOFILM, ANTIFUNGAL, ANTIALGICAL OR EVEN ANTIVIRAL ACTIVITIES BASED ON NANOTECHNOLOGIES

Authors: MARINESCU LILIANA; BOANŢĂ LAURA-FLORENTINA; FICAI ANTON; FICAI DENISA; ANDRONESCU ECATERINA

Organization: National University of Science and Technology POLITEHNICA Bucharest

The invention refers to a method of protecting the surfaces of natural stone, wood, leather, ceramics, composite materials based on cement or resins, designed for civil or special applications. The method, according to the invention, consists of the following steps: treating the surfaces by immersion or brushing techniques, at room temperature with a solution of siloxanes in a concentration of 25...100%, possibly in a mixture with an alcohol-based solvent, with the formation of a film on the surface of the treated material, drying for 6...24 h, followed by the application of a colloidal aqueous solution of Ag, Au or Cu with a concentration of 10...1000 ppm, in a single step or layer by layer, for increasing the content of particles on the surface, resulting in uniform surfaces treated against the formation of biofilms and microbial development.

INVENTION #108

BUILDINGS AND MATERIALS

Procedure for determining the thickness and evaluating the degree of degradation of layers by corroborating X-ray imaging analysis and X-ray fluorescence spectroscopy

Authors: A.I. Chelmus, R. Radvan, L. Ghervase

Organization: National Institute for Research and Development for Optoelectronics INOE 2000

The invention refers to a non-invasive procedure for obtaining quantitative information (thickness) of some archaeological or cultural heritage objects from radiographies. For example, this procedure can be successfully used in the case of an archaeological object, to approximate its third dimension (thickness), without the need to clean it, which reduces the risk of degradation of the investigated object. This procedure consists of several steps and is based on the use of two non-destructive techniques, namely X-ray imaging and X-ray fluorescence spectroscopy (XRF).

INVENTION #130

BUILDINGS AND MATERIALS

Ecologic geopolymer based on thermoelectric power plant ash and glass powder from recycled wastes for applications in the field of buildings materials and obtaining procedure

Authors: Dumitru Doru BURDUHOS NERGIȘ, Petrică VIZUREANU, Ofelia-Cornelia CORBU, Mohd Mustafa Al Bakri ABDULLAH, Andrei-Victor SANDU

Organization: Gheorghe Asachi Technical University of Iasi

The invention refers to an ecologic geopolymer based on thermoelectric power plant fly ash and glass powder from recycled wastes for applications in the field of constructions and procedure of obtaining it. The raw material, rich in aluminium and silicon oxides, is activated with an alkaline solution of sodium silicate and sodium hydroxide

INVENTION #136

BUILDINGS AND MATERIALS

PVA FIBER REINFORCED CEMENTITIOUS COMPOSITE WITH FLY ASH AS A REPLACEMENT FOR NATURAL AGGREGATE AND PROCESS OF OBTAINING

Authors: Negruţiu Camelia Maria, Şoşa Pavel Ioan, Câmpian Cristina Mihaela, Pop Maria Ileana

Organization: Technical University of Cluj-Napoca

This invention relates to the composition and process of obtaining a fiber reinforced cementitious composite with 2% Polyvinyl Alcohol (PVA) fibers and fly ash as a substitute for natural aggregates. The innovation involves the complete replacement of aggregates specific to conventional concrete with thermal power plants waste, such as fly ash, to obtain a new eco-friendly material with compressive and tensile strengths comparable to those of traditional concrete but with significant improvements in deformability properties.

INVENTION #148

BUILDINGS AND MATERIALS

INNOVATIVE USE OF SHEEP WOOL AND POLYURETHANE FOAM FOR OBTAINING MATERIALS WITH SOUND-ABSORBING PROPERTIES

Authors: Nemeş Ovidiu, Borlea (Mureşan) Simona Ioana, Tiuc Ancuţa-Elena, Deak Gyorgy

Organization: Technical University of Cluj-Napoca

The aim of this work was to obtain materials with sound-absorbing properties using sheep wool and rigid bicomponent polyurethane foam. Were obtained four materials composed of three layers, a layer of sheep wool previously processed by hot pressing at 80°C and 5 MPa, with final thicknesses of 2, 4, 6 and 12 mm; a layer of rigid bi-component polyurethane foam, with a thickness of 8....37 mm and a transition layer, 1...20 mm thick, resulting from the migration of polyurethane foam during the multilayer panel manufacturing process into the wool layer and/or the migration of wool into the polyurethane foam layer. Wool and polyurethane foam are the combination of sound insulation and sound absorption - wool absorbs sound and reduces it, and due to the rigid structure of polyurethane foam (closed pore structure), it does not allow sound to travel further, resulting in sound insulation. 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.

INVENTION #163

BUILDINGS AND MATERIALS

Process for obtaining poly-3-hydroxyoctanoic acid

Authors: Lupescu Irina, Stănescu Paul Octavian, Eremia Mihaela-Carmen, Săvoiu Gabriela, Petrescu Maria, Ştefaniu Amalia, Spiridon Maria

Organization: National Institute for Chemical Pharmaceutical Research and Development-ICCF

The invention relates to a process for obtaining poly 3-hydroxyoctanoic acid (PHO) in amounts and yields of biotechnological interest by using the Pseudomonas fluorescens ICCF 392 bacteria, as well as citric acid and sodium octanoate as carbon and energy sources. The polymer is isolated from native damp biomass by extraction with a 1:3 mixture of hypochlorite and chloroform, yielding a PHO content of 79.6%.

INVENTION #203

BUILDINGS AND MATERIALS

AUTONOMOUS HEATING SYSTEM FOR RESIDENTIAL SPACES

Authors: Pavel Ştefan, Ungureanu Daniel-Viorel, Stan Daniel-Voicu

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

The invention relates to an autonomous heating system for residential spaces consisting of a water heating system as a heat transfer agent and at least one induction heating recipient, an electric power generation system, and a management and distribution system for electric energy composed of a current generator for powering the induction coil of the heating system's recipient, an inverter with an accumulator, a group of photovoltaic panels, and an electric panel with a microprocessor.

CHEMICAL AND TEXTILE INDUSTRY

2 Inventions

INVENTION #17

CHEMICAL AND TEXTILE INDUSTRY

A new polymer additive for long-term stable oil-based nanofluids with carbon nanoparticles that enhances thermal conductivity and retains electrical resitivity

Authors: FABIO FARAGUNA, ROKO BLAZIC, LUCIJA SEKORANJA, MIHOVIL MEDIC, SINISA DESPOTOVIC, ANTE JUKIC

Organization: University of Zagreb Faculty of Chemical Engineering and Technology

A polymer additive prevents the agglomeration of nanoparticles and thus enables the preparation of stable nanofluids. Carbon-based nanoparticles such as carbon nanotubes and graphene are characterised by high thermal conductivity, which enables the preparation of nanofluids with increased thermal conductivity and improved heat transfer. However, the addition of carbon fillers reduces the electrical volume resistivity of nanofluids. Therefore, efforts are underway to prepare nanofluids with high (improved) thermal conductivity and maintained (or improved) electrical resistivity of the base fluid to enable the application of such nanofluids in transformers (or the electrical industry). With this innovation, a polymer additive that enables the preparation of stable nanofluids with carbon-based nanoparticles was synthesised, while the thermal conductivity is increased by up to 42% with addition of carbon-based nanoparticles. Moreover, when a polymer additive was added, the prepared nanofluids mentioned the electrical volume resistivity of the base fluid, regardless of the concentration of the added nanoparticles.

INVENTION #76

CHEMICAL AND TEXTILE INDUSTRY

Insulating fabric with thermoresistances based on copper filaments and method of obtaining

Authors: Aileni Raluca Maria, Doina Toma, Neagu Cristian, Jipa Cristian, Raducu Liliana

Organization: National Research and Development Institute for Textiles and Leather (INCDTP)

The invention refers to a grid-type woven structure that incorporates conductive yarns made from 100% cotton spun yarn and copper filaments. These conductive yarns are inserted in the weft direction, while 100% cotton spun yarns are used in the warp direction. This innovative fabric is designed for the production of smart garments that can adjust their temperature, providing heat on textile surfaces, particularly in challenging environments with very low temperatures. The copper and cotton yarns integrated within the fabric serve as thermoresistances, enabling surface heating when an electric voltage of 2-6 V is applied. The functionalized textile material (C) consists of two components: component A, which is the system of cotton yarns forming the warp, and component B, which is the system of twisted conductive yarns made from 100% cotton yarn and copper filament, forming the weft. To produce the textile material C, the weaving process is followed by immersing the ends of the conductive weft yarns in a 30-80% sulfuric acid solution for 30-40 minutes at a temperature of 20-25°C. After this, the yarns are rinsed in distilled water and dried at a temperature of 40-60°C for 60-120 minutes.

ENERGY AND SUSTAINABLE DEVELOPMENT

13 Inventions

INVENTION #14

ENERGY AND SUSTAINABLE DEVELOPMENT

POTASSIUM NITRATE MICROENCAPSULATION PROCESS IN A NANOSTRUCTURED INORGANIC ZINC OXIDE SHELL WITH APPLICATION IN THERMAL ENERGY STORAGE

Authors: Piticescu Radu Robert, Romero-Sanchez Maria Dolores, Motoc Adrian Mihail

Organization: INCDMNR-IMNR

The patent refers to an inorganic phase change materials based on potassium nitrate micro encapsulation process in a nanostructured inorganic zinc oxide shell with application in thermal energy storage in the temperature range 300-500 °C.

INVENTION #18

ENERGY AND SUSTAINABLE DEVELOPMENT

A SOURCE OF ELECTRICITY BASED ON THE MOVEMENT OF THE LIMBS

Authors: ZELJKO KNEZIC, DUBRAVKO ROGALE, ROBERT MATASIC

Organization: University of Zagreb, Faculty of Textile Technology

The source of electricity is placed on clothing near the limbs (arms or legs). It consists of a freely moving cylindrical permanent magnet and an induction coil made of thin varnish-insulated wire profiled into a suitable coil. The movement of the limb causes the movement of the permanent magnet inside the cylindrical cavity around which the coil is located, where a voltage appears that can be used to power devices on clothing or the body (wrist watches, different types of sensors, charging batteries, lamps, or mobile phones, etc.).

INVENTION #20

ENERGY AND SUSTAINABLE DEVELOPMENT

The 3D Printing Sustainable Resource For Teaching Materials In Braille Language

Authors: Vartolomei Nicoleta*, Tănasă Simina*, Pîrvu Andrei

Organization: Technological High School of Targu Ocna

The 3D Printing Sustainable Resource For Teaching Materials In Braille Language Vartolomei Nicoleta*, Tănasă Simina*, Pîrvu Andrei Technological High School of Targu Ocna, 1-3 Nicolae Arnabanas, Targu Ocna, Bacau, Romania Corresponding author: tanasa.simina@yahoo.com,vartolomeinicoleta28@yahoo.com Braille is an incredibly important accessibility aid, and yet it is left out of our home projects simply because of a lack of knowledge. With the help of 3D printers, we can create different shapes, puzzles, objects and much more. But we can also use them for much better purposes. This project supports and offers blind children the chance to learn to read the "Braille" alphabet much more easily, and not only that, geometric shapes and much more. At the base are some pieces printed with the sign of each letter of the alphabet, with which they can create words, learn the type of letter and punctuation marks. We can create small puzzles with which they can create phrases, words, geometric shapes. The piece is based on magnets that make the pieces stick to each other and form a string. These Braille plates are essential in providing information in tactile format to the visually impaired or low vision. They are made with a tactile Braille system on the front surface, allowing blind people to read and interpret information by touch. Embossed text and braille can be applied to almost any product allowing users to create a cohesive design that integrates braille. These 3D objects have raised text and symbols that can be easily felt with the fingertips, ensuring that people who are partially sighted or blind can read important messages. The overall aim of the project is to address knowledge gaps and add braille to as many things they create helping these people feel more confident. Keywords: 3 D, braille, Sustainable

INVENTION #21

ENERGY AND SUSTAINABLE DEVELOPMENT

Green Energy Production Device (GEPROD)

Authors: Bucă Elena-Andreea, Barac Ada-Rahela, Stanciu Florin Constantin, Olteanu Alexandru, Zerbeș Victor-Mihai, Popescu Liliana Georgeta

Organization: „Lucian Blaga" University of Sibiu

The purpose of the green energy production device (GEPROD) proposed by us is to help beneficiaries reduce their costs related to electricity consumption. It should be noted that a main objective of the realization and implementation of this type of device is to reduce the environmental impact generated by classic systems of electricity production. GEPROD is a device that transforms mechanical work generated by opening and closing a door into electrical energy. The movement of the door activates, via a cable, the starter which is connected to the coil rod. The coil produces electricity which is then stored in a storage unit. The storage unit can be connected to the building's mains via a fuse panel that switches automatically when the unit reaches a 100% charge level or when the local network is down. It is worth noting that this device fits into a concept that we are trying to promote among young people, namely waste as a resource. GEPROD can produce electricity 24h/24h with 0 operating costs. The efficiency of this device being directly proportional to the number of door openings in a period of time. That's why I say that the system is much more efficient in an administrative or public building, because the traffic of people on a certain door is much higher. At the same time, we encourage the development and own support of an alternative generator for the production of green energy with relatively low costs. GEPROD, in addition to being a solution for saving electricity, also replaces the classic systems that use the spring damper used to close the doors, generating green energy both when closing and opening the doors.

INVENTION #91

ENERGY AND SUSTAINABLE DEVELOPMENT

Method for obtaining nanostructured Cu2ZnSnS4 thin layers with a continuous concentration gradient for photovoltaic applications

Authors: Iulian BOERASU, Bogdan Stefan VASILE, Otilia Ruxandra VASILE, Roxana Doina TRUSCA, Adrian Vasile SURDU, Valentin CRACIUN

Organization: The National University of Science and Technology POLITEHNICA Bucharest

The present invention refers to a method of obtaining of thin nanostructured layers of photo-absorbing Cu2ZnSnS4 (CZTS) with a continuous compositional gradient, obtained by varying the Cu/(Zn+Sn) ratio from 0.80 to 0.90, thus varying the Zn/Sn ratio from 1.1 to 1.3, while kept the Cu/Sn ratio fixed at 1.6. The process, according to the invention, allows the growth in a single step of a thin layer of CZTS with a composition gradient, through the continuous variation of the Cu concentration, from a Cu poor composition at the substrate surface to a rich Cu composition at the layer surface.

INVENTION #93

ENERGY AND SUSTAINABLE DEVELOPMENT

WATER AERATION SYSTEM FOR HYDRAULIC TURBINES

Authors: Bunea F., Ciocan G.D., Nedelcu A, Bucur D.M., Dunca G., Codescu S.

Organization: INSTITUTUL NATIONAL DE CERCETARE-DEZVOLTARE INGINERIE ELECTRICA, Universitatea Nationala de Stiinta si Tehnologie POLITEHNNICA Bucuresti

The invention relates to a water aeration system for hydraulic turbines which is integrated in the cone of the hydraulic turbine suction apparatus, in order to increase the content of oxygen dissolved in the turbinated water of hydroelectric power plants. According to the invention, the system comprises a device for water aeration through hydraulic turbines integrated in the internal geometry of a turbine suction cone and perfectly adapted thereto, which consists of an air chamber (CA) having the internal wall made of some perforated plates (1) fixed on a supporting grid (2), so that they completely or partially cover the internal wall which is in contact with the turbinated water flow, the air chamber (CA) being provided with an upstream wall (3), a downstream wall (4) and an external jacket (5) on which some air intake pipes (6) are equally spaced for natural aeration of air at atmospheric pressure, which are provided with some electrically-operated valves (7) having the role of adjusting the air flow-rate, some air injection pipes (8) for forced aeration of air with the role of controlled injection of pressure and flow-rate of compressed air, a discharge nozzle (9) for the water entering from the hydraulic circuit of the turbine into the air chamber (CA), continued with an upstream section (18) provided with a pressure transducer, and a downstream section (19), where it is fixed to the suction cone of the turbine by means of an upstream flange (20) and a downstream flange (21) and the plates (1) which, along with the grid (2), make up the internal geometry of the original turbine cone, have some calibrated orifices with diameters in the range of 0.2...5 mm, equally spaced at a pitch of 3...7 diameters, in order to prevent bubble coalescence while flowing from the turbine, depending on the void ratio admitted upon flowing from the turbine, the air intake in the turbine being performed depending on the pressure level in the turbine and the dissolved oxygen deficiency in the water, by actuating an aeration control module.

INVENTION #128

ENERGY AND SUSTAINABLE DEVELOPMENT

Four-terminal solar cell with heterojunction structure based on non-toxic metal oxides

Authors: Chilibon Irinela, Vasiliu Ileana Cristina, Savastru Dan, Ørnulf Nordseth, Sean Erik Foss, Eduard Monakhov, Raj Kumar, Fara Laurenţiu, Mitroi Mihai Rãzvan, Ninulescu Valerica, Silvian Fara si Craciunescu Dan

Organization: INOE-2000

The invention relates to a four-terminal solar cell with a heterojunction structure based on non-toxic metal oxides and to a process for obtaining it, the cell being used for the production of advanced solar cells and photovoltaic panels. The solar cell according to the invention consists of two solar cells: a) a frontal subcell (SF) consisting of the layers (L2) as n-type emitter and the buffer layer (L3), over which is the quartz layer (L1), the p-type absorbent layer (L4) of Cu2O, the layer (L5) of the p 'type of Cu2O doped with N and the layer (L6) of optically transparent material, and b) the posterior subcell (SP) formed by the layers (L9) as n-type emitter of c - Si, the layer (L10) as p-type base (c - Si) of Cu2O absorbent material and the layer (L11) of c-Si material type p', the two subcell being separated by a layer (L7) of the encapsulation interface and a layer (L8) of SiNx, and the layer (I2) is a metallic contact layer of Al provided with four output terminals (T1 ... T4) which ensures the external contact connections. The process according to the invention has the following steps: making the cut plates type p, 1... 3 Ohm cm, 100 μm, 6 inches; printing (KOH) and texturing of the front surface; phosphorus emitter diffusion; elimination of phosphosolicate glass (PSG), SiNx deposition by plasma-based chemical vapor deposition (PECV); silkscreen of Ag front and Al rear; laser processing; heating contacts; welding of layers, making frontal contacts and laminating the subcell (SF) on the subcell (SP)

INVENTION #135

ENERGY AND SUSTAINABLE DEVELOPMENT

ENERGY MANAGEMENT METHOD IN SMART MICROGRIDS, BASED ON PREDICTION, OPTIMIZATION, AND CORRECTION ALGORITHMS

Authors: Petreuş Dorin, Pătărău Toma, Szilagyi Eniko, Paulescu Marius, Stroia Nicoleta

Organization: Technical University of Cluj-Napoca

The invention relates to a method of controlling an intelligent microgrid for supplying the loads using several types of renewable energy generators, by combining prediction algorithms with correction algorithms that use real-time data and optimization algorithms, to reduce the cost of electricity. The method involves going through the following steps: measuring the irradiance and temperature from a pyranometer mounted in the proximity of the photovoltaic panels and saving them in a first local file; estimating the next day's irradiance and temperature based on a prediction algorithm using data from the file above or using satellite data and writing the resulting data to a second file; determination of generator operation data (of the type: power, time) and cost optimization with an optimization algorithm; correcting generator operating data with a correction algorithm running on the external computing system or cloud.

INVENTION #183

ENERGY AND SUSTAINABLE DEVELOPMENT

Novel Inhibitor and Catalyst: Silver Nanoparticles on Natural Clay Targeting ISO SS Bacteria from Sewage Sludge and Malachite Green Dye Oxidation

Authors: Vartolomei Nicoleta1, Rosu Ana-Maria2, Panainte Mirela3, Georgescu Ana-Maria2, Aruș Vasilica-Alisa2, Mirila Diana-Carmen4, Nedeff Florin-Marian3 , Nistor Ileana-Denisa2*

Organization: Tehchnological High School of Targu Ocna, Targu Ocna, Bacau, Romania/ Faculty of Engineering, “Vasile Alecsandri” University of Bacau, Romania;

Novel Inhibitor and Catalyst: Silver Nanoparticles on Natural Clay Targeting ISO SS Bacteria from Sewage Sludge and Malachite Green Dye Oxidation Vartolomei Nicoleta1, Rosu Ana-Maria2, Panainte Mirela3, Georgescu Ana-Maria2, Aruș Vasilica-Alisa2, Mirila Diana-Carmen4, Nedeff Florin-Marian3 , Nistor Ileana-Denisa2* 1 Technological High School of Targu Ocna, 1-3 Nicolae Arnabanas, Targu Ocna, Bacau, Romania 2 Catalysis and Microporous Materials Laboratory, Department of Chemical and Food Engineering, Faculty of Engineering, “Vasile Alecsandri” University of Bacau, 157 Calea Marasesti Street, 600115 Bacau, Romania; 3Department of Environmental Engineering and Mechanical Engineering, Faculty of Engineering, “Vasile Alecsandri” University of Bacau, 157 Calea Marasesti Street, 600115 Bacau, Romania; 4 Department of Biology, Ecology and Environmental Protection, Faculty of Sciences, “Vasile Alecsandri” University of Bacau, 157 Calea Marasesti Street, 600115 Bacau, Romania; Corresponding author: dnistor@ub.ro An innovative, facile, eco-friendly, and cost-effective method was developed to prepare a newly microporous material based on naturally chemically modified bentonite with silver ions (BN-Ag0). This material exhibits excellent catalytic activity against Malachite Green (MG) dye and bacteriostatic activity against a newly isolated bacterium from sewage sludge, named hereafter “ISO SS,” and Escherichia coli (E. coli). BN-Ag0 was characterized using various advanced techniques, including energy-dispersive X-ray spectroscopy (EDX), scanning electron microscopy (SEM), Brunauer-Emmett-Teller (BET) analysis, Fourier-transform infrared (FTIR) spectroscopy, temperature programmed desorption (TPD), and X-ray diffraction (XRD). The new bacterium ISO SS was isolated using a technique for obtaining a pure culture from

anaerobically stabilized sludge. Comprehensive characterization of ISO SS isolated strains from anaerobic stabilized sludge was performed to identify bacterial species. The newly cationic clay-based nanomaterial demonstrated significant antibacterial activity against ISO SS, a Gram-negative bacterium, and showed good activity against E. coli. The bacteriostatic activity against harmful bacteria like Escherichia coli and the ISO SS bacterium can help in controlling the spread of waterborne diseases. This is particularly important in areas with inadequate sanitation infrastructure. As a catalyst in the catalytic ozonation of MG dye, BN-Ag0 significantly enhances the oxidation time of the dye due to its superior adsorption and catalytic properties. The material's excellent catalytic activity against MG dye and its antibacterial properties, make it highly effective for water purification. This can lead to cleaner water sources, benefiting public health and reducing the burden on water treatment facilities. The catalytic and antibacterial activities of natural bentonite (BN) and BN-Ag0 were examined using high-performance characterization techniques. The lifetime of BN-Ag0 catalyst was also evaluated. The results are expected to provide valuable insights for the preparation of a high-quality microporous material with multiple functionalities. The development of an eco-friendly and cost-effective method to prepare a microporous material contributes to sustainable practices. By using natural bentonite and silver ions, this study promotes the use of environmentally beneficial materials, reducing the reliance on harmful chemicals and processes. The material's dual functionality as both a catalyst and an antibacterial agent opens possibilities for its use in various industrial processes, including wastewater treatment, chemical manufacturing, and environmental remediation. Overall, this study not only advances scientific understanding but also offers practical solutions to pressing environmental and public health challenges, providing broad socioeconomic benefits. Keywords: antibacterial activity; bacteria; catalytic ozonation; clay; dye; silver catalyst; wastewater treatment

INVENTION #184

ENERGY AND SUSTAINABLE DEVELOPMENT

Innovative Retention of Phthalates in Wine Using Newly Developed Nanomaterials

Authors: Mirila Diana-Carmen, Rosu Ana-Maria, Georgescu Ana-Maria, Nedeff Florin-Marian, Arus Vasilica-Alisa, Platon Nicoleta, Muntianu Gabriela, Vartolomei Nicoleta, Panainte Mirela, Nistor Ileana-Denisa

Organization: Tehchnological High School of Targu Ocna, Targu Ocna, Bacau, Romania/ Faculty of Engineering, "Vasile Alecsandri" University of Bacau, Romania;

Innovative Retention of Phthalates in Wine Using Newly Developed Nanomaterials Mirila Diana-Carmen1, Rosu Ana-Maria2, Georgescu Ana-Maria2, Nedeff Florin-Marian3, Arus Vasilica-Alisa2, Platon Nicoleta2, Muntianu Gabriela2, Vartolomei Nicoleta4, Panainte Mirela3, Nistor Ileana-Denisa2* 1 Department of Biology, Ecology and Environmental Protection, Faculty of Sciences, "Vasile Alecsandri" University of Bacau, 157 Calea Marasesti Street, 600115 Bacau, Romania; 2 Catalysis and Microporous Materials Laboratory, Department of Chemical and Food Engineering, Faculty of Engineering, "Vasile Alecsandri" University of Bacau, 157 Calea Marasesti Street, 600115 Bacau, Romania; 3Department of Environmental Engineering and Mechanical Engineering, Faculty of Engineering, "Vasile Alecsandri" University of Bacau, 157 Calea Marasesti Street, 600115 Bacau, Romania; 4 Technological High School of Targu Ocna, 1-3 Nicolae Arnabanas, Targu Ocna, Bacau, Romania Corresponding author: dnistor@ub.ro The presence of phthalic acid esters (PAEs) in wines presents a significant health risk due to their toxic metabolic pathways. This study explores the use of aluminosilicate materials to retain various pollutants and undesirable compounds in wine. Specifically, dibutyl phthalate and diethylhexyl phthalate were targeted and detected using gas chromatography-mass spectrometry (GC-MS). Newly developed nanomaterials were synthesized from sodium bentonite and chemically modified with second, third, and fourth-generation Boltorn dendrimers (NBtH20, NBtH30, and NBtH40). These nanomaterials were characterized using Brunauer-Emmett-Teller (BET) analysis, Fourier-transform infrared spectroscopy (FTIR), and X-ray diffraction (XRD). Boltorn dendrimers are a type of dendritic polymer characterized by their highly branched, tree-like structure. These dendrimers are synthesized from a core molecule, typically

polyalcohol or hydroxy acids, and are built up through successive layers called generations. Each generation adds more branches, increasing the number of functional groups on the surface of the dendrimer. These dendrimers enhance the performance of the nanomaterials by increasing their ability to interact with and retain pollutants, thereby improving the efficiency of the adsorption process. Innovatively, this study also investigates the potential of these modified nanomaterials to enhance the sensory qualities of wine by reducing off-flavors associated with PAEs. Additionally, the impact of these materials on the antioxidant capacity of wine was assessed, providing insights into their potential to preserve or even enhance the health benefits of wine consumption. The scientific research focused on two main aspects: the retention of PAEs and the impact on protein and polyphenol levels in Aligoté white wine. Results demonstrated a significant reduction in PAEs, with retention rates reaching up to 85% following treatment with NBtH30 and NBtH40 (250-500 µL/10 mL wine). Furthermore, preliminary sensory evaluations indicated an improvement in wine aroma and taste profiles post-treatment. This research has the potential to have a positive impact public health, wine industry, environmental sustainability, technological innovation, and on economic growth. Keywords: bentonite, dendrimers, oenology, phthalates, white wine, sensory enhancement, antioxidant capacity.

INVENTION #192

ENERGY AND SUSTAINABLE DEVELOPMENT

Bicomponent photocatalytic nanohybrid sol-gel compositions and their obtaining process

Authors: Violeta Purcar, Valentin Raditoiu, Alina Raditoiu, Florentina Monica Raduly, Raluca Manea, Georgiana Cornelia Ispas, Luminita Eugenia Wagner

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest

The invention refers to a process for obtaining some bicomponent nanohybrid sol-gel compositions with photocatalytic properties. The process, according to the invention, consists of alkoxysilanes mixture preparation using alcohols, network modifiers of alkoxysilane type, network generators - tetraethoxysilane, tetramethoxysilane, an inorganic acid, in the presence of silver nitrate, the dispersion in this mixture of the complexation agent and tetraethyl orthotitanate crosslinking agent, followed by a reducing agent such as D-glucose and a UV photoinitiator of the benzaldehyde dimethylacetate type, and simultaneously the preparation of metal-doped TiO2 photocatalyst, resulting in two compositions, applied simultaneously/successively onto the surfaces, resulting in photocatalytic films.

INVENTION #196

ENERGY AND SUSTAINABLE DEVELOPMENT

Lambda Water Lift

Authors: Losonczi Lajos

Organization: Lambda Communications SRL

We propose a radically new liquid lifting technique, capable to provide nonstop water to impressive elevations. The main element of the invention is a brand new, revolutionary concept – Lambda Machine - that allows a non-conventional material handling, namely a high efficiency liquid transfer even at very-very low rotational speeds. This way has been created the opportunity to raise the slow flowing and flat rivers water to high altitudes, without any external energy, just by using the natural power of the flowing water. The environmentally friendly green technology and design dramatically reduces the weight, number of components, manufacturing cost and can deliver water at the point of use for farmers, small holding, off-grid community or water network. In addition, the innovative structure of the new mechanism not only deliver a precise amount of fluid into a system but also measure with high precision a wide variety of flow and fluid and can attain remote communication thus forming the core part of an intelligent automation system in many areas.

INVENTION #214

ENERGY AND SUSTAINABLE DEVELOPMENT

RESEARCH ON THE IMPLEMENTATION OF HYDROSTATIC TRANSMISSION IN CLASSICAL AND UNCONVENTIONAL LOW POWER WIND TURBINES

Authors: Ionela Mihaela Popescu, Mihai Avram, Victor Florin Constantin, Ionas Catalin Dumitrescu

Organization: National University of Science and Technology POLITEHNICA Bucharest

In the current context of climate change, depletion of fuel reserves and the transition to environmentally friendly energy sources. Finding technical solutions that allow obtaining energy without consuming other resources is increasingly urgent. This work aims to use a proven technical solution, the hydrostatic transmission, to transform the energy received by the wind rotor into hydraulic energy, and later either transformed into electrical energy or used as such. The new element brought is the method of command and control of the transmission. In order to carry out this research, it was necessary to create an experimental stand, which would simulate a rotor of a wind turbine coupled to a hydrostatic transmission, on which several tests were carried out. Before the actual realization of the stand, several models of transmissions were proposed, which could be used, after the theoretical analysis, the best model was chosen to satisfy the operational requirements. The chosen model is able to make the transition between closed circuit operation and open circuit operation, which allows a wide range of tests and checks to be performed. The implementation of the theoretical model involved the construction of the test stand, which consists of the driven element, the hydraulic pump, the system protection component, the safety valve, the flow regulation and directing elements, the hydraulic distributors and the throttle and an auxiliary system, which is serviced with energy by the transmission.

ENVIRONMENT – POLLUTION CONTROL

28 Inventions

INVENTION #22

ENVIRONMENT – POLLUTION CONTROL

OBTAINING NANOMATERIALS AND DESIGNING SENSORS FOR THE REAL-TIME DETERMINATION OF PM10 AND CO2 POLLUTANTS

Authors: DEÁK György, GHEORGHE Florina-Diana, DUMITRESCU Cristina, GHEORGHE Petrache-Ionuț, DIACONU Teodor-Cătălin

Organization: National Institute for Research and Development in Environmental Protection Bucharest

The project aims to develop innovative solutions that contribute to the EU directives to minimize pollution to zero, determining an improvement in air and water quality, and as a result the quality of life. Therefore, initially the types of nanomaterials that can be used for the development of filters for air pollutant retention were analyzed, taking into account the main atmospheric pollutants that affect the outdoor and indoor air, but also the nanomaterials that can be used for the remediation of the quality of water bodies, considering the source (natural, sewage or industrial wastewater), the adopted techniques, the number of treatment stages, the materials used, and the type and amount of pollutants.

INVENTION #23

ENVIRONMENT – POLLUTION CONTROL

THE POSSIBLE TRANSBOUNDARY WATER POLLUTION IMPACT OF THE ARMED CONFLICT

Authors: Eng. DEÁK György Ph.D, Habil.; Eng. HARABAGIU Alexandra; Dr. Eng. GHEORGHE Diana-Florina; Eng. Biol. SADÎCA Isabela; Eng. GHEORGHE Ionut

Organization: INCDPM Bucuresti

The pollution related to armed conflicts impacts not only the affected region, but also the territories surrounding it, due to the movement of pollutants across regional and national borders. Water, a precious natural resource, is frequently polluted by human activities, including armed conflicts. Their effects can be direct or indirect. Direct effects include destruction of water supply infrastructure, exposure to pollutants from military facilities, and oil spills in waterways. Indirect effects include displacement of people, lack of infrastructure, data, and funding for environmental protection. Upholding water service provision is crucial in conflict-affected communities, as it is one of the biggest and most essential difficulties.

INVENTION #24

ENVIRONMENT – POLLUTION CONTROL

ENHANCING THE UNDERSTANDING OF WILD STURGEON POPULATION` SEX RATIO IN THE LOWER DANUBE

Authors: Eng. DEÁK György Ph.D, Habil.; Eng. Biol. SADÎCA Isabela; Eng. TUDOR Georgeta; Dr. Ecol. HOLBAN Elena; Ecol. CUCU George; Ecol. ZANFIR Alexandru; Geogr. STEGĂRESCU Sorin

Organization: INCDPM Bucuresti

The evaluation of population sex ratios enables scientist to predict recruitment trends and the decline of genetic diversity in natural communities, particularly when the target population is scarce and vulnerable to demographic stochasticity. Differential degrees of natural or artificial selection for males and females, along with varying mortality rates, can lead to diminished population recruitment, reduced genetic diversity, and increased genetic drift. The adult sex ratio (ASR) displays significant variability in nature. Theory argues that the ASR could impact sex roles and breeding systems, as the rarer sex in an environment has a greater number of prospective mating partners compared to the more prevalent sex. Recent investigations have demonstrated that the reproductive period for the female sturgeons varied from 1 to 23 days, impacted by arrival date, temperature, discharge, and the number of males, with the latter exerting the most significant impact.

INVENTION #25

ENVIRONMENT – POLLUTION CONTROL

DEVELOPING CONSERVATION MEASURES FOR WILD STURGEONS, BASED ON THE EU TAXONOMY PRINCIPLES

Authors: Eng. DEÁK György Ph.D, Habil.; Eng. MATEI Stelian; Dr. Eng. MATEI Monica; Dr. Eng. BOBOC Mădălina; Dr. Ecol. HOLBAN Elena; Eng Biol. SADÎCA Isabela

Organization: INCDPM Bucuresti

The three wild anadromous sturgeon species in the Black Sea and Lower Danube are Critically endangered, with a constant trend of population decline, and this is due to a cumulus of multiple factors of anthropogenic and natural causes. The EU Green Taxonomy comes as an indispensable framework that offers all the right premises to help the researchers, the communities and the Government to work closely together in order ensure the natural ecosystems protection and biodiversity conservation with great regard to a sustainable and balanced socioeconomic environment.

INVENTION #26

ENVIRONMENT – POLLUTION CONTROL

Assessment of greenhouse gases fluxes and carbon pools from ecosystems and their relation with environmental parameters

Authors: Laslo Lucian; Deak Gyorgy; Enache Natalia; Matei Monica; Boboc Madalina

Organization: National Institute for Research and Development in Environmental Protection

The feedback between climate and ecosystems can be assessed directly by quantification of specific indicators and/or by modelling of involved phenomena. The greenhouse gases (GHG) are the triggers in the climate-ecosystems feedback loops, their changes affecting the systems in positive or negative way. This study focuses on assessing the fluxes of greenhouse gases (GHG), especially CO2, from different types of land use, with a focus on understanding how the application of NBS measures and certain meteorological and environmental parameters, such as increasing temperature and changing precipitation regime or soil moisture, influence the dynamics of CO2 fluxes. By calibrating and validating the DNDC model and performing emission simulations for different climate scenarios, according to the RCP, the impact of climate change on CO_2 emissions in the land cover types in the case studies was estimated. By conducting controlled experiments under laboratory conditions using agricultural land microcosms, the project highlights how alginate influences CO_2 emissions under controlled conditions. The results establish a basis for assessing the effectiveness of sustainable land use strategies in mitigating the impact of climate change.

INVENTION #28

ENVIRONMENT – POLLUTION CONTROL

TECHNOLOGICAL SYSTEM FOR REAL-TIME MONITORING OF PHYSICAL PARAMETERS ON WATER/WASTEWATER SAMPLES

Authors: Eng. DEÁK György Ph.D, Habil.; Biol. PRANGATE Raluca; Prof. Habil. Dr. Eng. COVALIU-MIERLĂ Cristina Ileana;

Organization: INCDPM

The present DKLP-MB system has been proposed as a solution for the implementation of an efficient monitoring program by two separate entities. The invention relates to a system for real-time monitoring of physical parameters for water/wastewater samples. The system, according to the invention, comprises a multi-parameter sensor (I) attached to a sampling container, a software application (II) installed on a mobile device, and a server (III), wherein the sampling container is labeled with a QR code generated by the software application. Data from the multi-parameter sensor obtained in real time is stored on the server and interpreted by the software application.

INVENTION #45

ENVIRONMENT – POLLUTION CONTROL

MANUFACTURING PROCESS AND ROOTING PRODUCT BASED ON WILLOW (GENUS SALIX) EXTRACT

Authors: POŞTA Daniela Sabina, HĂDĂRUGĂ Nicoleta Gabriela, PEŢ Elena, POŞTA Gheorghe Marinel, PEŢ Ioan, CAMEN Dorin Dumitru, HĂDĂRUGĂ Daniel Ioan

Organization: University of Life Sciences King Mihai I from Timisoara

The invention relates to a rooting product used in biostimulation of plant root system development and to a process for preparing the same. According to the invention, the product is an aqueous extract from genus Salix, obtained by extraction in combination with entrainment-separation of residual volatile compounds. The process, as claimed by the invention, consists in harvesting willow sprouts at the beginning of vegetation, peeling and chopping the same, followed by mixing them with water in a ratio of 20...60%, in a vessel connected to a condensation-cooling coil in which separation takes place at a temperature of 50...100 degrees C, a pressure of 0.14...1 atm, the resulting mixture being subjected to extraction while being entrained with water vapour for 12...24 h, after which the distillate is collected into a separating vessel permitting separation and removal of volatile oil. The aqueous extract within the vessel, after filtration and analysis, is optimized from the viewpoint of the concentration of bioactive compounds - salicylates and auxins, by dilution/concentration.

INVENTION #95

ENVIRONMENT – POLLUTION CONTROL

Module for determination of the synchronisation factor of the emission-reception channels in lidar systems

Authors: Belegante Livio; Vasilescu Georgeta-Jeni; Nicolae Doina Nicoleta; Nemuc Anca Viorica; Dandocsi Alexandru Marius

Organization: National Institute of R&D for Optoelectronics INOE

The invention relates to an optical configuration designed for telescopes used in lidar systems that perform near-field atmospheric measurements in the lower and middle troposphere. This optical configuration is optimized for lidar systems operating within altitudes of 0.15–13 km at night and 0.15–6 km during the day, featuring a small 75 mm telescope and a field of view between 1.5 mrad and 3 mrad. Lidar systems (Light Detection and Ranging) emit laser pulses toward the atmosphere, where the light is scattered by air particles (such as dust, molecules, and aerosols) and partially absorbed. The backscattered radiation is collected by a telescope and directed toward photosensitive elements that convert the optical signal into an electrical signal. By measuring the time interval between the laser pulse emission and the reception of the backscattered signal, the distance of the scattering event can be determined. Based on signal intensity, specific atmospheric parameters can be calculated. A fast counter enables the measurement of signals from various distances, creating profiles of parameters of interest. Depending on the lidar configuration, these systems can generate profiles of aerosol optical properties, cloud height, wind speed, and other atmospheric characteristics. The optical configuration proposed by this invention is specialized for near-field detection of turbulent phenomena in the atmosphere, as well as aerosol optical parameters, cloud height, and other atmospheric properties, making it valuable for meteorology and climate research.

INVENTION #96

ENVIRONMENT – POLLUTION CONTROL

Laser emission stabilization technique for detection by high spectral resolution lidar

Authors: Belegante Livio; Vasilescu Georgeta-Jeni; Nicolae Doina Nicoleta; Nemuc Anca Viorica; Dandocsi Alexandru Marius; Țilea Alexandru; Radu Cristian Marian

Organization: National Institute of R&D for Optoelectronics INOE

The invention presents an innovative technique for stabilizing laser emission, intended for high spectral resolution lidar systems that use a specialized optical filter to differentiate signals from molecular scattering and aerosol scattering. Laser emission stabilization is achieved through continuous monitoring and automatic frequency adjustment using an acousto-optic modulator (AOM) and a Raspberry Pi 5 module, along with two Raspberry Pi HD cameras for detecting the generated radiation. This method is distinguished by its simplicity of implementation and low cost, providing an efficient solution for ensuring spectral stability of laser emissions in lidar applications.

INVENTION #97

ENVIRONMENT – POLLUTION CONTROL

Near field telescope for optimisation of sounding distance of lidar systems

Authors: Belegante Livio; Vasilescu Georgeta-Jeni; Nicolae Doina Nicoleta; Nemuc Anca Viorica; Dandocsi Alexandru Marius

Organization: National Institute of R&D for Optoelectronics INOE

This invention describes a compact module designed to determine the synchronization factor between emission and reception channels in lidar systems used for atmospheric monitoring. Precise timing of laser pulse emission and signal reception is essential to accurately determine distances, but synchronization issues can significantly impact data accuracy. The proposed module addresses this by integrating a fiber optic of known length, enabling easy mounting on the lidar system's emission-reception block without disrupting optical alignment. Made of lightweight, rigid black matte cardboard, the module minimizes stray light interference and allows for enhanced signal collection with an optional lens. This design simplifies installation and use, providing a practical solution to reduce data uncertainties in lidar measurements.

INVENTION #117

ENVIRONMENT – POLLUTION CONTROL

Monitoring the Variation of Bioclimatic Indices in Secondary and Tertiary Urban Environments

Authors: Sorin Frasina, Mirela Voiculescu, Gabriel Murariu

Organization: Universitatea "Dunarea de Jos" , Facultatea de ingerie, Galati

The atmospheric environment continuously affects the human body in a highly evident way. Over 75% of Europe's population lives or mainly works in urban environments. Economic reports identify secondary cities as the main drivers of economic growth in the European Union. The combined effect of urban heat islands (UHI) with recurring heat waves (HW) represents a current threat to achieving sustainable development goals in these urban areas. Typically, the indicator describing the UHI effect is the temperature difference between densely built urban areas and nearby rural or less dense urban zones. The urban heat island phenomenon also causes changes in other meteorological parameters (such as air relative humidity, soil moisture, and precipitation volume), impacting the human body. In this study, an analysis was conducted on the effects of the urban heat island effect on the population, using two additional bioclimatic indices: the temperature-humidity index and the Missenard index (temperature-humidity-wind speed). Using recorded parameter values in Galati during heat waves over the astronomical summer of 2023 (June 21 - September 23), assessments were made on the effects felt by the population in the municipality of Galati (Romania), considered as a secondary city, compared with the rural areas and neighboring tertiary cities (Tecuci, Cahul).

INVENTION #132

ENVIRONMENT – POLLUTION CONTROL

The beluga sturgeon agent-based model

Authors: Anna Marie DAVISON, Ştefan HONŢ, Alexandru DOROŞENCU

Organization: Danube Delta National Institute for Research & Development (DDNI)

The beluga sturgeon (Huso huso) is a critically endangered species which inhabits the Black Sea and undergoes a spawning migration each year up the Danube river. Despite its large size, monitoring this species is highly challenging since invasive or expensive techniques are required which has lead to a deficit of information to be used for their conservation. In order to leverage the information which is available on the species and direct research to gain a deeper understanding of their migration and population dynamics, we developed a beluga sturgeon agent-based model. This model spatially explicitly simulates the migration of beluga sturgeon up the Danube river until the Iron Gates II dam and the theoretical population dynamics given known life history traits. The model runs on daily time steps based on real recorded daily water temperature and level measurements made from 2015-2023 which inform environmental triggers for migration, spawning and hatching. Using a virtual ecologist approach, we assessed the informativeness of catching the young spawned that year (the most reliable long-term measurement available in this region) as a proxy for adult population health and found that there was no significant relationship between the trends observed in the two. We also found that the most important variables for predicting the timing of sturgeon migration and spawning were water temperature and the location of the environmental dataset used which will inform future research into making this model a predictive tool for sturgeon migration.

INVENTION #144

ENVIRONMENT – POLLUTION CONTROL

EX-SITU BIOREMEDIATION SYSTEM AND PROCESS OF HYDROCARBON POLLUTED SOILS USING PSEUDOMONAS AND BACILLUS MICROORGANISMS

Authors: Micle Valer, Sur Ioana Monica, Mitrea Mihai

Organization: Technical University of Cluj-Napoca

The ex-situ bioremediation system of hydrocarbon-polluted soils using Pseudomonas and Bacillus microorganisms is composed of the concrete platform, the plastic foil on which a draining layer of gravel and the polluted soil is deposited, an aeration system consisting of a blower and a network of air distribution provided with five perforated PVC pipes, three being placed horizontally in the gravel layer at the base of the pile and two in the middle of the pile and a system for introducing water and the solution with nutrients and microorganisms consisting of a tank, hydraulic pump and corrugated suction and discharge hoses. By using the soil treatment system at a temperature of 24–26^{o}C, pH 7.5–8, humidity of 28–30%, and an increase in the total number of microorganisms from 151x105 to 213x107 CFU/gram of soil, after 12 weeks of treatment the achieved depollution yield is 83%.

INVENTION #147

ENVIRONMENT – POLLUTION CONTROL

Centaurea jankae monitoring using drones

Authors: Marian MIERLĂ, Silviu COVALIOV, Mihai DOROFTEI, Cristian TRIFANOV, Ion GRIGORAȘ

Organization: Danube Delta National Institute for Research & Development (DDNI)

The significance of this study stems from the rarity of the plant species Centaurea jankae, which is found exclusively on Cape Dolosman within the Danube Delta Biosphere Reserve. Monitoring such a rare species is crucial for its protection and conservation in an evolving and dynamic environment. Preserving both common and rare species is fundamental to maintaining biodiversity. This work introduces an efficient and contemporary method for monitoring and evaluating the species. The methodology involves utilizing images obtained from drone flights to create a comprehensive picture of the area where the species is found within the Danube Delta Biosphere Reserve. After assembling the complete image, supervised classification was performed to identify and extract the pixels representing the inflorescences of Centaurea jankae. Through this process, over 750 inflorescences were identified and organized into two subpopulations within the study area. An accurate estimation of the species' population was achieved by determining the average number of flowers per individual plant. These procedures could potentially be converted into a programming script in the future, making the entire process accessible to botanists without specialized knowledge in remote sensing techniques.

INVENTION #167

ENVIRONMENT – POLLUTION CONTROL

IMPROVEMENT OF ASPHALT MIXTURES WITH GRIT SAMBLASTING WASTE AND MICROPLASTICS BASED POLYPROPYLENE

Authors: Daniela Laura BURUIANĂ, Puiu Lucian GEORGESCU, Gabriel Bogdan CARP, Viorica GHISMAN, Cristian Cătălin STĂNCIC

Organization: Dunărea de Jos University of Galați

The invention relates to the technological eco-innovation of introducing polypropylene microplastics in the recipe of the asphalt mixture and of partially replacing the natural resources with the waste grit from the blasting process of the ship's hulls. The invention relates to an improved asphalt mixture with waste grit from the process of sanding ship hulls and with polypropylene microplastics, the so-obtained asphalt mixture having improved mechanical resistance and resistance to wear, to the action of water or other exogenous agents, as compared to the standard asphalt mixture.

INVENTION #169

ENVIRONMENT – POLLUTION CONTROL

Coordination polymer 2,6-diacetylpyridine bis(izonicotinoylhydrazonato)(2-)cobalt(II)–aqua(1/5.75) which manifest adsorptive properties

Authors: Danilescu Olga, Bourosh Pavlina, Petuhov Oleg, Bulhac Ion, Shova Sergiu

Organization: Institute of Chemistry of Moldova State University

The essence of the invention consists in the synthesis of new cobalt(II) three-dimensional porous coordination polymer on the base of aromatic hydrazone, with composition {[Co(L)]·5.75H2O}n, where H2L = 2,6-diacetylpyridine bis(izonicotinoylhydrazone). The doubly-deprotonated (L2-) ligand shows a new coordination mode and the obtained novel coordination compound exhibits adsorptive properties. The adsorption isotherm of N2 shows a type-I adsorption behavior, which is the characteristic of microporous (7.1 Å) and mesoporous (35 Å) materials. The BET and Langmuir surface areas for {[Co(L)]·5.75H2O}n are 841 m2/g and 878 m2/g, respectively.

INVENTION #170

ENVIRONMENT – POLLUTION CONTROL

Preliminary results on microplastics distribution in Lower Danube and their contribution to the marine environment

Authors: DESPINA Cristina, BURADA Adrian, CIOCEANU Nicoleta, GHEORGHE Petre-Bogdan, SECELEANU-ODOR Daniela, ȚIGĂNUȘ Mihaela, SULIMAN Iasemin, IBRAM Orhan, TUDOR Iuliana-Mihaela

Organization: Danube Delta National Institute for Research & Development (DDNI)

Over the last decades, the number of studies indicating the presence of microplastics in aquatic environment has considerably increased and those that refer to the pollution and damage that plastics can cause to the environment have reported ever-increasing amounts. In this context, this study fills the information gap and has as main objective the identification of microplastics and the quantification of quantities transported by the Danube River in the discharge area into the Black Sea. An overview of the main categories of plastics particles in freshwater ecosystems was achieved. The obtained results highlighted significant variations in the amounts of microplastics detected, which presented major differences both in terms of sampling location and the Danube rate at the time of sampling. The collected results are intended to be a starting point in addressing the issue of microplastics in the aquatic ecosystems of the Danube Delta Biosphere Reserve. In addition to evaluating the types of microplastics transported by the surface waters of the Danube, the present study also focused on the variability of the number of microplastics depending on the elevation and flow rate of the Danube waters at the time of sampling campaigns.

INVENTION #176

ENVIRONMENT – POLLUTION CONTROL

Development and implementation of some reproductive technologies suitable for endangered or declining fish species in the Danube Delta Biosphere Reserve

Authors: Adrian BURADA, Cristina DESPINA, Nicoleta CIOCEANU, Petre-Bogdan GHEORGHE, Daniela SECELEANU, Mihaela ȚIGĂNUȘ, Iasemin SULIMAN, Orhan IBRAM, Iuliana-Mihaela TUDOR, Aurel NĂSTASE, Marian TUDOR

Organization: Danube Delta National Institute for Research & Development (DDNI)

Ecosystem changes caused by human intervention, such as land use changes, large-scale hydrotechnical works and pollution with various contaminants, have caused an alarming decline in biodiversity. Added to all this are the effects of climate change which have significantly altered the frequency of rainfall, thus causing prolonged droughts or delayed floods. All this accumulation of factors generated as a first effect major disturbances in the reproduction of sensitive fish species that were limited to a low number of habitats suitable for reproduction as a result of the disappearance of many of the temporary aquatic ecosystems, or the phase shift of the flood period compared to the optimal period of reproduction. In this context, starting from the examples of good practices used in the reproduction of endangered/declining fish species, from which 2 artificial reproduction methods were adjusted and adapted to the specific conditions of the Danube Delta Biosphere Reserve. During all this time, directed natural reproduction was tested and adjusted for 2 fish species. Following the results obtained, it can be stated that the "Danube Delta" National Research and Development Institute has the first reproduction line of endangered species in the Danube Delta Biosphere Reserve which can be scaled up for use in support and revitalization of endangered species with conservative value.

INVENTION #177

ENVIRONMENT – POLLUTION CONTROL

Harvesting common reed (Phragmites australis) in the Danube Delta Biosphere Reserve: Sustainable Practices and Innovative Technologies for Economic and Ecological Benefits

Authors: Matei SIMIONOV, Marian MIERLĂ, Mihai DOROFTEI, Cristian TRIFANOV, Silviu COVALIOV, Marian TUDOR

Organization: Danube Delta National Institute for Research & Development (DDNI)

Nestled within Romania's Danube Delta Biosphere Reserve, a thriving hub of biodiversity, is the Phragmites australis (Cav.) Steud., known as the common reed. This versatile species serves various roles - from shaping habitats to powering energy production, aiding construction, and even addressing water pollutants. The reserve designates areas for common reed harvesting, with traditional methods favored due to economic reasons and easy access. However, to ensure the lasting use of the common reed in the Danube Delta Biosphere Reserve, a shift to innovative harvesting techniques is needed. We seek pioneering technology that balances two goals: minimizing disruption to the wetland ecosystems while maximizing harvest efficiency. Whether dealing with floods or extracting from water bodies, the specialized boats and automated harvesters driven by AI expand the possibilities without human intervention. These innovations also impact local communities economically. Higher productivity, reduced labor costs, and new job opportunities promise change. And importantly, these technologies contribute to climate change mitigation. The common reed's role in energy production aligns with reducing greenhouse gas emissions. Our focus centers on innovative strategies for Phragmites australis harvesting in the Danube Delta Biosphere Reserve. This synergy of sustainability and economic prosperity is poised to address climate change challenges. This confluence underscores the transformative role of innovation, heralding a future where resource utilization preserves ecological integrity while empowering communities, all within the framework of sustainability.

INVENTION #178

ENVIRONMENT – POLLUTION CONTROL

Development of the Monitoring Station for Migratory Fish: Sturgeon and Pontic shad - Isaccea

Authors: Iuliana-Mihaela TUDOR, Gabriela CREȚU, Marilena MAEREANU, Marian TUDOR, Radu MUSCALU, Mioara COSTACHE, Vasile PIPIRIGEANU, Bogdan-Ioachim BULETE, Iasemin SULIMAN, Adrian BURADA, Orhan IBRAM, Marian IANI, Marian PARASCHIV, Ștefan HONȚ, Aurel NĂSTASE, Cristian TRIFANOV, Marian MIERLĂ, Paula PINDIC, Alexandru BĂNESCU

Organization: Danube Delta National Institute for Research & Development (DDNI)

The "Development of the Monitoring Station for Migratory Fish: Sturgeons and Pontic shad - Isaccea" will contribute to the recovery of sturgeon and Pontic shad populations and to the protection of biodiversity in the Danube Delta Biosphere Reserve through monitoring, research and reproduction of sturgeon and Pontic shad species. Supportive stocking of critically endangered species of sturgeon with artificially propagated offspring is an active conservation measure. The team of specialists of the “Danube Delta” National Institute for Research and Development (I.N.C.D.D.D.) Tulcea carried out artificial reproduction activities in order to obtain the F1 generation of Acipenser gueldenstaedtii, obtained from wild breedstock.

INVENTION #187

ENVIRONMENT – POLLUTION CONTROL

Antimicrobial multilayer nanoassembled films and process for manufacturing the same

Authors: Tanţa Verona Iordache, Ana-Mihaela Gavrilă, Andrei Sârbu, Anita-Laura Chiriac, Ana Lorena Ciurlică, Anamaria Zaharia, Elena Bianca Stoica, Andreea Olaru, Dan Cosasu, Teodor Sandu

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest/ EDAS EXIM S.R.L.

The invention relates to a process for manufacturing nanoassembled multilayer antimicrobial films with applications in the treatment of wastewater infested with gram-negative bacteria and to a process for obtaining them. According to the invention, the process consists in coating a glass support with a first layer of organosilane compound, using the sol-gel method, over which a second layer is added, said layer being a polymer molecularly imprinted with the O antigen of lipopolysaccharide, resulting in a surface as films, having the capacity of selectively retaining the O antigen, with a decrease of the E-Coli indicator from 2 CFU/50 ml to 0 and the coliform indicator from 41 CFU/50 ml to 1.

INVENTION #189

ENVIRONMENT – POLLUTION CONTROL

Procedure for organic pollutants removal using materials based on food waste

Authors: Roxana Ioana Brazdis (Matei), Irina Fierascu, Toma Fistos, Anda Maria Baroi, Ioana Silvia Hosu, Radu Claudiu Fierascu, Valentin Raditoiu, Monica Florentina Raduly, Maria Grapin

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest

The present invention refers to a material and procedure for the removal of organic pollutants. The procedure is based on the use of a phosphatic material (obtained from the valorization of food wastes-shells of Mya arenaria Linnaeus, 1758 (the most encountered edible clam on the Black Sea shore), decorated with metallic oxides (Cu or Ni) obtained using a rapid approach, further formulated as an active coating. The material proved to be effective at low concentrations against the model organic pollutant (dye) Methylene Blue. Acknowledgements. This work is supported by the Ministry of Research, Innovation and Digitization through PN 23.06.01.01/2022 (AquaMat), within PN 23.06 Core Program-ChemNewDeal..

INVENTION #193

ENVIRONMENT – POLLUTION CONTROL

Catalytic system with the structure of metal oxides and humic acids for the treatment of contaminants traces in wastewaters and method of obtaining

Authors: Cristina-Emanuela Enăşcuţă, Elena-Emilia Sîrbu, Radu Claudiu Fierăscu, Grigore Pşenovschi

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest

The invention refers to a process for obtaining a catalytic system with the structure of metal oxides, under an ultrasound field, used in the advanced treatment of contaminants traces from wastewater resulting from the pharmaceutical industry and those from agriculture. The invention belongs to the technical field of treating contaminated water by photocatalytic oxidation. The catalytic system with magnetic properties, which contains Fe3O4 oxide components and humic acids (HA) synthesized by the utilization of vegetable waste, is obtained by the co-precipitation-drying method. Iron oxide (Fe3O4) is used as an intermediate coating, over which a layer of synthesized humic acids is deposited. The magnetic photocatalyst can be activated in the presence of sunlight being used to treat water impure with contaminants from the pharmaceutical industry or agricultural waters. The invention presents the following advantages: - presents a relatively cheap catalytic system with photocatalytic activity used to treat contaminated waters; - presents an optimal preparation method of the Fe3O4/HA system; - represents an optimal method of preparing the raw material - carrying out the production process in the ultrasound field favors the homogenous dispersion of the iron oxide - presents a photocatalyst that allows the treatment of waste water in a relatively short time; - the photocatalyst can be quickly recovered and reused repeatedly.

INVENTION #197

ENVIRONMENT – POLLUTION CONTROL

AUTOMATIC SURVEY OF MAGNETIC FIELD WITH DETECTION AND CHARACTERIZATION OF TRANSIENT FIELDS

Authors: Valeriu David, Costel-Eduard Lunca, Ionel Pavel

Organization: "Gheorghe Asachi" Technical University of Iasi, Faculty of Electrical Engineering

The invention relates to a method of automatic long-term survey of background magnetic fields, which performs simultaneously the detection and characterization of transient fields or electromagentic pulses in order to evaluate the persons' exposure to magnetic fields and also to characterize complex electromagnetic environments. The claimed method consists in continuously determining the three components of the magnetic induction and its derivative relative to time by means of a wideband three-axis sensor (ST), continuously sampling waveforms by a high-speed data acquisition system (1.7), followed by transmitting them to a computing system (SC) on which several software applications run performing the following operations: determining (2.2) the representation of magnetic induction components and their derivatives in time and frequency domains, while storing (2.7) the significant representations, determining (2.8) the effective and peak-to-peak values of magnetic induction components and characterizing the resulting field, detecting (2.4), analyzing (2.6) and storing (2.9) the transients or randomly occurring electromagnetic pulses and extracting, displaying and statistically processing (2.10) data in order to characterize complex electromagnetic environments and sources of field.

INVENTION #205

ENVIRONMENT – POLLUTION CONTROL

System for functionalized membranes testing for water treatment

Authors: Lavinia Lupa, Petru Negrea, Laura Cocheci, Anca Filimon

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

he 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 of the aqueous solution. to be treated by membrane filtration, a peristaltic pump by means of which the solution is passed into the membrane support device, which is attached to a pressure-resistant vessel. The aqueous solution is filtered through the membrane due to the vacuum created by the vacuum pump, the pressure being adjusted and kept constant by means of the manometer.

INVENTION #212

ENVIRONMENT – POLLUTION CONTROL

Blue Swimming Crab Bank for Environmental Restoration

Authors: Wikit Phinrub

Organization: Rajamangala University of Technology Srivijaya

The Blue Swimming Crab Bank for Environmental Restoration is a community-style crab hatchery-type hatchery for environmental restoration

INVENTION #219

ENVIRONMENT – POLLUTION CONTROL

PepBrew™: Sustainable Peptide-Based Plant Hormone and Fertilizer

Authors: Sanong Ekgasit, Nittaya Keawprak, Petcharin Charoenrat and Panita Thaveethavorn

Organization: Chulalongkorn Universtiy

PepBrew™ is an innovative peptide-based plant hormone and fertilizer that harnesses the power of brewers' spent yeast, pineapple peels, and seashells. Bromelain from pineapple peels hydrolyzes yeast protein into peptides that chelate with calcium. This eco-friendly calcium-chelated peptides improves nutrient uptake in plants, promoting stronger cell walls and healthier root and shoot growth. PepBrew™ accelerates the harvesting period of Romaine lettuce by 30%, while boosting its crispiness, water content, shelf-life, and taste. PepBrew™ repurposes waste from the beverage, food, and seafood industries for sustainable agriculture by enhance productivity, efficient resource utilization, improve product quality, and promote organic farming.

INVENTION #222

ENVIRONMENT – POLLUTION CONTROL

de-adBUG: a biopesticide from waste green mussel shells

Authors: Sanong Ekgasit, Nittaya Keawprak, Duangthip Kantha, Panita Thaveethavorn

Organization: Chulalongkorn Universtiy

de-adBUG is a groundbreaking biopesticide that transform waste green mussel shells (GMS) into efficient agricultural pest control products. Using an energy-efficient, chemical-free process, GMS are transformed into plate-shaped aragonite calcium carbonate with unique surface properties. de-adBUG combats pests by adhering to and dehydrating the protective wax layers of mealybugs and aphids. It prevents whiteflies from hatching by dehydrating their eggs. It also eliminates coffee bean weevils by irritating their exoskeletons. This eco-friendly, bee-safe biopesticide is 100% biodegradable, becoming a soil amendment after use. de-adBUG repurposes seafood waste for sustainable agriculture, reducing chemical usage in crop prtection and supporting organic farming.

INDUSTRIAL AND LABORATORY EQUIPMENT

8 Inventions

INVENTION #2

INDUSTRIAL AND LABORATORY EQUIPMENT

Coring bit with drill and guide bushings for the rotary hammer machine

Authors: Mara Chifor, Mihai Ciupan

Organization: Technical University of CLUJ - Napoca

The product refers to a coring bit that can be used on a conventional rotary hammer machine. The core is provided with a guide drill and two plastic bushings with the same purpose. The bushings are mobile and are pushed towards the back of the core as it advances through the soil. The developed system has the role of being able to be used with a rotary hammer drill of medium power and impact energy and can be used in drilling through soil or rock for fence posts, anchors, etc.

INVENTION #3

INDUSTRIAL AND LABORATORY EQUIPMENT

Stand for making samples for the thermoplastic composites characterization

Authors: Claudiu Muresan, Sebastian Bude, Claudiu Rusan

Organization: Technical University of CLUJ - Napoca

The project refers to a stand for thermoforming plates made of thermoplastic composite material. The stand consists of an oven with a thermometer (fig. 1) and a mold (fig. 2, 3). Heating the material above the polypropylene melting temperature is done in the mold. Productivity is reduced, but it offers advantages regarding the simplicity and cost of the equipment. Parts made of fibrous layer (Fig. 4) or composite mixture (fig. 5) can be thermally consolidated. Samples are cut from the thermoformed plates for material characterization (Fig. 6).

INVENTION #6

INDUSTRIAL AND LABORATORY EQUIPMENT

Mobile Target for Shutting Training

Authors: Lazar Marian, Dobrescu Gabriel, Ighigeanu Adelina Maria, Sasu Gheorghita, Ivan Ioan Alexandru, Kuncser Victor-Eugen

Organization: National Institute of Materials Physics

The invention aim is to provide a physical support for training of special forces of the Ministry of Internal Affairs. Real intervention conditions related to the sudden appearance of targets are reproduced. It helps to improve combat skills and enhance reactions (optimizing intervention times and methods) of special forces personnel. In this regard, the purpose of a mobile target is to mimic the dynamics of human movements. It simulates linear movements, sudden stops, changes of direction, as well as rotation or balancing movements as faithfully as possible. Accordingly, the Mobile target consists of a housing containing the linear displacement system, the target rotation system, the balance system, the command and control system, and the remote control. The essential characteristics are: (i) maneuverability, (ii) flexibility in setting target motion parameters, (iii) manual and automatic target control mode, (iv) convenient size and weight, (v) stability during movements, (vi) operational reliability, (vii) easy replacement of various types of humanoid target panels.

INVENTION #87

INDUSTRIAL AND LABORATORY EQUIPMENT

pH Analyzer with Automatic Calibration Function

Authors: Ph.D. JUHYEONG KIL

Organization: LOTUS PROSUMING MANAGEMENT

The present invention is a pH measuring system with an automatic calibration function, which is a pH measuring system that can be automatically calibrated “without a buffer” and this technology is developed for the first time in the world. Up until now, using a buffer for calibration has been the technology used around the world. However, this system features this unique automatic calibration function in which there is no buffer required proves to be the next level of pH analyzing technology making it much more convenient while using the system in the field. This system solves many previous demerits such as expensive maintenance and labor costs and reduces much of technical workloads like unnecessary system check-ups, providing a time-saving effect at the same time. The conventional electrochemical pH electrode is 2-Electrode Type Composite Electrode. However, the Electrode used in this system is 4-Electrode Type. While 2-Electrode Type consists of a reference electrode and measurement electrode, the 4-Electrode Type has two reference electrodes and two measurement electrodes respectively. G1 and R1 are electrodes for measuring pH, while G2 and R2 measure the electromotive force of R1. Therefore, G2 and R2 measure that the zero potential of the reference electrode R1 has changed due to aging or various causes. When the measured potential value is transferred to pH meter, it is corrected by comparing with the already programmed built-in equation. In other words, in the past, if such a calibration is used as a buffer, the system is a difference that R1 measures and measures the changed electromotive force separately. Therefore, it is not necessary to manually calibrate while using the buffer during the usage process because the system will automatically and repeatedly calibrate when time is set. If an abnormality is detected in the electrode or the meter, "Replace" or "Check" is displayed to inform the user. Up until now, the use of Buffer to calibrate has been used around the world. But there is a cost problem. Skilled technicians are also needed. And the calibration is not simple. I have been studying how to fix these problems automatically. However, there was no way to calibrate without using a buffer. Therefore, we first completed the pH

Electrode research by making automatic calibration. After that, the artificial intelligence system was completed and the automatic correction without buffer was made possible. This is a remarkable technology in the world. Buffers used as consumables are expensive. We have therefore developed a passive method for automatically detecting and correcting periodically the system. This enables us to solve most of the on-site needs such as a lot of maintenance cost reduction, accurate and quick detection, labor cost reduction, and system simplification. This system can be applied to all fields related to water quality, so it is expected in the world market.

INVENTION #109

INDUSTRIAL AND LABORATORY EQUIPMENT

Planar surface plasmon resonance structure with relief diffraction grating.

Authors: Popescu Aurelian, Savastru Dan.

Organization: National Institute of R&D for Optoelectronics INOE 2000

The invention was concerned with surface plasmon resonance structures for optical sensors. The invention consists in the use of the relief diffraction grating that works in transmission. The diffraction grating coupling allows the structure to be planar. The SPR structure consists of a thin metal film deposited on one side of the substrate and on the other side a relief diffraction grating realised in a film which have properties of photoresist. This one is illuminated throu metallic mask and subsequently etched, a process known and used in nano-photolotography. The flatness of the structure is an important achievement as it reduces manufacturing costs, reduces the size of sensors and allows the creation of portable devices. A/00490 / 27.08.2024

INVENTION #110

INDUSTRIAL AND LABORATORY EQUIPMENT

Planar surface plasmon resonance structure with volume diffraction grating.

Authors: Popescu Aurelian, Savastru Dan.

Organization: National Institute of R&D for Optoelectronics INOE 2000

The invention was concerned with optical sensors using surface plasmon resonance phenomenon. The invention consists of generating surface waves using diffraction gratings. To simplify the technology, the diffraction grating is made in the volume of a film deposited on the rear side of the structure. The grating made of amorphous chalcogenide compounds that exhibit photoinduced changes of the refractive index. The diffraction grating operates under Bragg conditions, the advantage of which is that it has only one diffraction maximum. The proposed structure ensures the functionality as in the case of prism coupling, but preserves the flatness of the structure. This reduces manufacturing costs, plasmonic sensor dimensions and allows the creation of multiple sensors integrated on a single substrate. A/00401 / 09.07.2024

INVENTION #204

INDUSTRIAL AND LABORATORY EQUIPMENT

METHOD FOR OBTAINING A REINFORCED ALVEOLAR STRUCTURE

Authors: Emilia Dobrin, Sorin Mușuroi, G.-V. Mnerie, C.M. Matei

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

The process for producing reinforced alveolar structures according to the invention solves the technical problem presented and eliminates the disadvantages mentioned in that the structure obtained, with components produced by 3D printing, can be configured from the design phase according to the material used for printing, the intensity and orientation of the anticipated mechanical stresses and the mechanical strength imposed on the final product. The structure is composed of a 3D-printed semi-finished product and metal fabric reinforcement, the joining of the structure components is done by ultrasonic welding equipment after the printing material, polymer or polymer with reinforcing agent (composite) is deposited layer by layer in a cellular volume structure with a configuration (cell size and orientation) determined by the mechanical strength requirements of the final product.

INVENTION #206

INDUSTRIAL AND LABORATORY EQUIPMENT

EQUIPMENT FOR REDUCING OF HYDRAULIC INSTABILITIES GENERATED BY THE SWIRLING FLOW FROM THE CONICAL DIFFUSER OF HYDRAULIC TURBINES

Authors: Susan-Resiga Romeo Florin, Bosioc Ilie Alin, Tanasa Constantin, Stuparu Adrian Ciprian, Szakal Raul Alexandru

Organization: Politehnica University of Timisoara, CITT Politehnica 2020

The invention refers to a new equipment for eliminating/reducing the pressure fluctuations associated with the vortex rope, which appear at partial discharge in the conical diffuser of hydraulic turbines, especially those with fixed blades (ex: Francis turbines). The new equipment can be applied both in new hydropower plant constructions and in the case of existing ones. The main element of the invention is the so-called free runner, which connected to a shaft passing through the turbine rotor, eliminates the rope vortex and the pressure fluctuations associated with it, which are very harmful to the hydraulic turbines. The major advantages of the invention are: simple construction and implementation as well as low maintenance costs. Furthermore, it does not produce any other negative effects on the flow in the conical diffuser or on the turbine.

INFORMATION TECHNOLOGY AND COMMUNICATION

7 Inventions

INVENTION #5

INFORMATION TECHNOLOGY AND COMMUNICATION

Antenna for 5G N79 frequency band with triangular dielectric resonator fabricated by spark plasma sintering

Authors: Liviu Nedelcu, Marian Gabriel Banciu, Cezar Dragoș Geambașu, Mihai Alexandru Grigoroşcuţă, Mihail Burduşel, Petre Bădică

Organization: National Institute of Materials Physics

We present a microwave antenna device using a dielectric resonator in the shape of an equilateral triangle with rounded corners. The dielectric resonator is manufactured of zirconium tin titanate (ZST) ceramic material by using spark plasma sintering (SPS). The conventional processing methods currently used show the problem of limitations in obtaining high mass densities of the ZST bulk body due to the reduced sinterability of the ZrO2 - SnO2 - TiO2 ternary system. However, by using the spark-plasma sintering, high densification over 99% was achieved without secondary phases. Moreover, the ceramic material obtained by SPS method shows improved thermal stability. The ceramics exhibit a dielectric constant of 38 and a product Q x f about 50 000 GHz. The proposed antenna addresses the issue of reducing the volume of dielectric material, exhibits low profile, improved gain, and a larger operating bandwidth of the antenna, better than 16%. The bandwidth increase is achieved by coupling two resonance modes of the new shape dielectric resonator. The antenna is excited through a microstrip line of 50 Ohms characteristic impedance, allowing an easy integration with many microwave systems. The antenna's characteristics make it suitable for the use in 5G communication systems for the N79 frequency band (4400 – 5000 MHz). The antenna represents an efficient solution for wireless 5G communications.

INVENTION #111

INFORMATION TECHNOLOGY AND COMMUNICATION

Synchronization system for multiplexed signals transmitted unidirectionally between two units via a single-wire shielded cable.

Authors: Valeriu SAVU, Mădălin Ion RUSU, Dan SAVASTRU, Dragoș MANEA

Organization: National Institute of R&D for Optoelectronics INOE 2000

The invention refers to a system for synchronizing multiplexed signals transmitted unidirectionally between two units through a shielded cable with a single wire that synchronizes the signals between the two units, through repeated initializations of the transmission and reception blocks of the communication signals between the units and through separation. data signals by signaling repeated initializations, by transmitting data signals between two successive initializations. Synchronous TDM multiplexing systems use time slots that are tightly fixed and assigned to each signal in a predetermined manner. The system eliminates crosstalk between the data channels and the sync channel. A/00647/31.10.2023

INVENTION #112

INFORMATION TECHNOLOGY AND COMMUNICATION

Amplifier controlled by the input signal level for a Cherenkov detector in saline environment.

Authors: Mădălin Ion RUSU, Valeriu SAVU, Dan SAVASTRU

Organization: National Institute of R&D for Optoelectronics INOE 2000

The invention refers to an amplifier used for a Cherenkov detector in order to obtain the most accurate information about the phenomena in the Universe. The amplifier according to the invention comprises three stages of amplification, mounted in cascade, each having a delay circuit, a comparator, an amplifier and a semi-adjustable resistor. The input signal coming from an electromagnetic sensor and formed following the interaction of a cosmic radiation neutrino with a saline environment, commands the amplifier to obtain an optimal amplification in order to determine the Cherenkov cone. A/00273/19.05.2022

INVENTION #140

INFORMATION TECHNOLOGY AND COMMUNICATION

DEVICE AND METHOD FOR PRECISE REMOTE SYNCHRONIZATION OF SYSTEMS FOR ASTRONOMICAL OBSERVATION

Authors: Dănescu Radu Gabriel

Organization: Technical University of Cluj-Napoca

The invention describes a system and method for remote synchronization of optical systems for sky observation, used for detecting objects in low, medium, or high Earth orbits. According to the invention, the system comprises a triggering device, which consists of a GPS receiver with two channels, one for reading global time and a very high-precision Pulse Per Second (1PPS) synchronization signal, a microcontroller board, a matrix keyboard for user input, and an LCD screen for display. A telescope equipped with a camera is connected to this device, which will be triggered by the device according to a preloaded exposure program.

INVENTION #145

INFORMATION TECHNOLOGY AND COMMUNICATION

METHOD FOR AUTOMATICALLY CALCULATING NORMALS FROM SURFACES ON THREE-DIMENSIONAL (3D) SCANS, INVOLVES USING CONVOLUTIONAL NEURAL NETWORKS

Authors: Molnar Szilard, Tamas Levente

Organization: Technical University of Cluj-Napoca

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.

INVENTION #146

INFORMATION TECHNOLOGY AND COMMUNICATION

METHOD FOR CORRECTING PLANE SURFACES IN IMAGES FROM CAMERAS EQUIPPED WITH TIME-OF-FLIGHT (TOF) SENSORS, USING CONVOLUTIONAL NEURAL NETWORKS

Authors: Pop Marian-Leontin, Tamas Levente

Organization: Technical University of Cluj-Napoca

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.

INVENTION #211

INFORMATION TECHNOLOGY AND COMMUNICATION

Hub of Knowledge on Prevention and Solution of Drug Problems

Authors: Patchara Sinloyma, Thiti Mahacharoen, Saroj Pullteap and Wichit Yaemyim

Organization: Royal Police Cadet Academy

Hub of Knowledge on Prevention and Solution of Drug Problems (PSDP-Hub) aims to transfer knowledge by utilizing digital platforms as tools for providing various information related to drug problems. Additionally, it aims to coordinate cooperation in establishing a center of knowledge on law and justice, public health, and the community process for prevention, rehabilitation, and solution of drug problems in Thailand. Therefore, the PSDP-Hub results in seamless cooperation among all sectors, the thorough integration of legal and social measures, and serves as a vital mechanism in addressing the country's drug problems in a concrete and sustainable manner.

INNOVATIVE RESEARCH

29 Inventions

INVENTION #13

INNOVATIVE RESEARCH

Planar mold for out-of-autoclave processes for composite polymerization using thin conductive films from high entropy alloys as heating elements and process for obtaining it

Authors: Botan Mihail, Piticescu Radu Robert, Sobetkii Arcadie, Capatina Valentina, Sobetkii Arcadii, Cristea George Catalin, Dragomirescu Alina, Ion Guta Dragos Daniel

Organization: INCDMNR-IMNR

The invention refers to the creation of a planar mold used for the polymerization of composites based on heat-resistant resins reinforced with glass or carbon fibers using as a heating element conductive metal films based on high-entropy alloys deposited by the process of physical vapor deposition in a vacuum with electron flow.

INVENTION #15

INNOVATIVE RESEARCH

THREE-DIMENSIONAL STRUCTURES BASED ON HYDROXYAPATITE AND POLYURETHANE DIOL OBTAINED THROUGH 3D PRINTING TECHNOLOGY

Authors: Popescu (Cursaru) Laura Madalina, Piticescu Roxana Mioara, Motoc Adrian Mihail, Voinea Liliana Mary, Gradinaru (Istrate) Sinziana Luminita, Ulieru Dumitru, Topor Alexandru

Organization: INCDMNR-IMNR

The present invention relates to the production of three-dimensional structures based on hydroxyapatite and polyurethane-diol by 3D extrusion bioprinting technique, which can be used for the fabrication of ocular implants with interconnected porosity.

INVENTION #30

INNOVATIVE RESEARCH

COP G, SMIS: 105631 Research project European Funding THE IMPLEMENTATION OF BIOMEDICAL RESEARCH EXPERTISE THROUGH THE TRANSFER OF KNOWLEDGE TO THE PRIVATE SECTOR FOR THE VALIDATION OF PRODUCTS AND SERVICES IN THE FIELDS OF MEDICAL BIOTECHNOLOGY AND HEALTH

Authors: Cristiana TĂNASE, Gina MANDA, Monica NEAGU, Elena CODRICI, Ionela Daniela POPESCU, Simona MIHAI, Ana Maria ENCIU, Carolina CONSTANTIN, Sevinci POP, Emilia MANOLE, Eleonora CODOREAN, Laura CEAFALAN, Aura ARGHIR, Mircea LEABU, Mihaela GHERGHICEANU, Laura NECULA, Radu ALBULESCU, Lucian ALBULESCU

Organization: Victor Babes National Institute of Pathology

The general objective of the project was the transfer of knowledge and technology from INCD ”Victor Babeş” to private enterprises in the production and development sector of bioproducts for health care, in order to increase their economic and scientific competitiveness on a national and international level. The beneficiaries of the project represented commercial companies with activities in the field of bioproducts, interested in developing the products and services using new medical and pharmaceutical research and innovation technologies (-omics technologies). New opportunities were created to establish structures dedicated to knowledge transfer, Center for Technology Transfer, in partnership with partner companies.

INVENTION #34

INNOVATIVE RESEARCH

Additive manufacturing process for a titanium metal product with millimeter dimensions, intended for fixing medical implants

Authors: Diana CHIOIBASU, Sabin MIHAI, Liviu DUTA, Andrei POPESCU

Organization: National Institute for Laser, Plasma and Radiation Physics

The invention pertains to an innovative additive manufacturing process for producing metal components using titanium (Ti) alloys, specifically designed to enhance the fixation of metal implants through the Laser Melting Deposition (LMD) technique. Orthopedic implants, particularly plates, typically require fixation devices provided by the manufacturer. However, advancements in additive manufacturing hold the promise of creating bespoke implants that are precisely tailored to the unique shapes and sizes required for individual treatments. These implants, which are produced according to the specific dimensions of the wound, will also require specially designed fixation devices, achievable through 3D printing technology. This invention addresses a critical technical challenge by establishing phase parameters that ensure optimal resolution during the additive manufacturing process. This is essential for the accurate laser deposition of titanium alloy components with millimeter-scale dimensions, thereby guaranteeing the necessary level of fixation to maintain the immobility of the metal implants.

INVENTION #59

INNOVATIVE RESEARCH

Glass functionalization and decoration with nanoparticles: a challenging way to induce new applications

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

Organization: National University of Science and Technology POLITEHNICA Bucharest

The invention refers to a process for modifying the glass surface according to a self-assembly methodology induced by the layer-by-layer deposition of appropriately chosen components. The first stage is represented by the silanization of the glass surface or the deposition by any other specific methods of a layer that allows the (self)assembly of successive layers and the modification of the surface properties. The first deposited layer can be the result of a silanization with agents or even the deposition of oxide or polyethylene glycol (PEG) layers, followed by successive treatments to form homogeneous or heterogeneous supramolecular structures according to Figure 1. The surface modification can be done in stages, using PEG , of different molecular masses or direct silanization and later, by layer-by-layer deposition, superstructures can be deposited with properties strongly dependent on the chemical nature and the characteristics of the deposition.

INVENTION #66

INNOVATIVE RESEARCH

Comparative analysis for two-dimensional cellular structures composed of two materials fabricated by 3D printing

Authors: Cristian Tilea, Cătălin Fetecău

Organization: Dunărea de Jos University of Galați

This study pursues a comparative analysis between two-dimensional, hexagonal honeycomb structures and two algorithmic structures. The structures are made in the form of composite sandwich panels with solid faces and a core of cellular structures. Two types of materials are chosen for making composite panels. The solid surfaces are made of ABS and the cellular core of TPU. Their manufacturing technology is dual-material FDM printing using a dual-extruder printer. The comparative analysis follows the results obtained from the flexural testing of the structures. The advantages pursued in this study are the high strength and flexibility of very light structures.

INVENTION #67

INNOVATIVE RESEARCH

The demultiplier with fuse

Authors: Student Belei Gabriel Student Bolintineanu Gheorghe Professor Mihail Titu

Organization: Lucian Blaga Univeristy of Sibiu

The role of this mechanic fuse is to replace the sliding gearbox mechanism. The fuse consists of a spring, which, by storing heat, achieves the ratio change. The spring expands causing the axial displacement of the sliding gear. The components of the demultiplier are mainly made of Fe-Mn alloy, and the spring is made of aluminium. During the operation, when the first gear reaches a certain temperature, the transmission ratio is automatically changed.

INVENTION #68

INNOVATIVE RESEARCH

Power plant sand

Authors: Student Cloțan Antonio Professor Țîțu Aurel Mihail

Organization: Lucian Blaga University of Sibiu

This type of Power plant sand is intended for use in dry areas of the Earth. The water in a hydropower plant is replaced with sand, the operating principle remaining the same. From an ecological point of view, it is very sustainable, the same amount of sand can be reintroduced into the circuit a large number of time, almost infinitely, because sand does not evaporate like water.

INVENTION #69

INNOVATIVE RESEARCH

Electric car with solar energy

Authors: Student Dan Teodora

Organization: Lucian Blaga University of Sibiu

We want to make a little car that uses solar energy and in case of anything the car will be incorporated with a battery. The car will be able to move front-back and sideways because of the special wheels. It will be driven by a special remote control,which will actually be every phone that has download de car app and has the chassis number of the car.So that means you can control the car from not only one but multiple remotes.

INVENTION #70

INNOVATIVE RESEARCH

Vital Flow Tracker

Authors: Student Flisc Adelina-Maria, Student Dumitru Alexandru-Nicolae, Student Florea Ionut-Alexandru, Student Popa Ioan Alin

Organization: Lucian Blaga University of Sibiu

The Vital Flow Tracker monitors real-time health by measuring hormones and chemicals from the body. Precise data, accessible through a simple interface, provides users with an immediate understanding of their physiological balance. A perfect combination of advanced technology and practical utility for personal health care.

INVENTION #71

INNOVATIVE RESEARCH

Rack and pinion jack system to help lower the coffin into the grave

Authors: Student Bunescu Bianca Student Pănăzan Andreea

Organization: Lucian Blaga University of Sibiu

The rack and pinion coffin lowering system is a technical and human innovation that redefines the solemn moment of coffin lowering during funeral ceremonies. Designed to ensure safety, precision and elegance in every movement, this system provides essential support for mourners. With its elegant and discreet design, it blends harmoniously into any funeral environment, completing the moment of mourning with subtlety and refinement. Each smooth and controlled descent of the crematorium is an expression of human respect and compassion, offering a fitting last tribute to those departed in peace and tranquillity.

INVENTION #72

INNOVATIVE RESEARCH

Mechatronic system for withdrawal and arrangement of microphone cables in the context of audio system optimization

Authors: Professor Aurel Mihail TITU Ph.D Student Daniel BALC Ph.D Student Emanuel BALC

Organization: Lucian Blaga University of Sibiu

In the context of ongoing technological progress, efficient microphone cable management is essential for improving audio system performance. The proposed mechatronic system not only retracts cables but also organizes them strategically to enhance system efficiency. Its main role is to simplify the installation and maintenance of audio equipment, prevent cable clutter, and reduce electromagnetic interference. The system also offers greater flexibility and mobility, allowing for easier adjustment of equipment to meet user needs. By optimizing cable management, it reduces failure risks, saves time on installation and maintenance, and improves overall equipment management. This innovative solution plays a key role in advancing audio system technology and performance.

INVENTION #73

INNOVATIVE RESEARCH

Autonomous mobile platform equipped with a manipulator arm for sample retrieval in rough terrain

Authors: Professor Aurel Mihail TITU Ph.D Student Daniel BALC Ph.D Student Emanuel BALC

Organization: Lucian Blaga University of Sibiu

This study focuses on optimizing an autonomous mobile platform designed to navigate rough and challenging terrains. Equipped with a manipulator arm, the platform efficiently retrieves samples from remote, inaccessible environments. Its robust design allows it to overcome obstacles and reach areas where traditional exploration tools fail. A key feature is its advanced communication system, enabling real-time data transmission, including sensor data and live video feeds, which enhances decision-making and situational awareness for operators. The manipulator arm, with its precise range of motion, further boosts the platform's efficiency, allowing for accurate sample collection in even the most difficult conditions.

INVENTION #77

INNOVATIVE RESEARCH

Favorable effects of EMCOPAD Doctor Tech (QiPolino) electromagnetic patches on the human being – Case studies

Authors: Lucian MÂNDREA, Eugen CARACAS, Corneliu Ion MOLDOVAN, Ioan CURTA, Marian VELCEA, Ciprian ENE, Mihai CHETAN, Ana Maria RADU, Beatrice GHERMAN

Organization: Asociatia de INventatori Justin CAPRA

RO - The authors used genuine devices to improve the health and general condition of people, devices described in patent WO/2018/037379 A1. These original electronic devices are made under technical conditions specific to military technology and are marketed by SC Doctor Tech SRL (www.DoctorTech.ro). The paper presents several concrete uses and the results of measurements made with the Bio Well device on human subjects. The principle of operation of this revolutionary device is also described. The favorable effects produced by our EMCOPAD Doctor Tech electromagnetic patches (QiPolino) on the human being are justified by the increase of energy or the improvement of the general balance of the analyzed subject in each case. An improvement in the general condition of the subject can also be observed. Easy to place on various objects that will come into direct contact with the body or directly on certain parts of the body, our EMCOPAD Doctor Tech (QiPolino) electromagnetic patches can be of real personal help on various occasions: reducing stress or improving vision (quantum earrings), reducing local pain (e.g. lumbar), improving balance (effect on the inner ear), improving physical performance or long-term exertion (eg with insoles). EN - The authors used genuine devices to improve the health and general condition of people, devices described in patent WO/2018/037379 A1. These original electronic devices are made under technical conditions specific to military technology and are marketed by SC Doctor Tech SRL (www.DoctorTech.ro). The paper presents several concrete uses and the results of measurements made with the Bio Well device on human subjects. The principle of operation of this revolutionary device is also described. The favorable effects produced by our EMCOPAD Doctor Tech (QiPolino) electromagnetic patches on the human being are justified by the increase of energy or the improvement of the general balance of the analyzed subject in each case. An

improvement in the general condition of the subject can also be observed. Easy to place on various objects that will come into direct contact with the body or directly on certain parts of the body, our EMCOPAD Doctor Tech Electromagnetic Patches (QiPolino) can be of real personal help on various occasions: reducing stress or improving vision (quantum earrings), reducing local pain (e.g. lumbar), improving balance (effect on the inner ear), improving physical performance or long-term exertion (e.g. with insoles).

INVENTION #78

INNOVATIVE RESEARCH

SIMS - Sistem Integrat Mobil de Supraveghere

Authors: Emil POPESCU Mihai JURBA Danut STROE

Organization: Asociatia de Inventatori Justin Capra / Electro Optic Systems SRL

System design to integrate a various range of sensors in order to collect, process, store and transmit data regarding surveillance of hostile actions to the environment, influence of traffic over the environment, management of prevention and mitigation the environmental risks, weather, climatic change, fauna surveillance. 1. Environment – ecology, ecological management, environmental protection and monitoring 2. Security, protection, safety – antiterrorism, disasters and accidents

INVENTION #98

INNOVATIVE RESEARCH

Method for obtaining nanoparticles using a multifunctional microfluidic platform

Authors: Cristina Chircov (Uncu), Alexandra Catalina Bîrcă, Bogdan Stefan Vasile, Alexandru Mihai Grumezescu

Organization: National University of Science and Technology Politehnica Bucharest

The present invention relates to a multifunctional microfluidic apparatus specially designed for the controlled synthesis of nanoparticles. This innovative system comprises five interlocking, screw-fastened plates, each made from a range of compatible materials to support precise chemical processes. Each plate serves a distinct purpose in the synthesis pathway, creating an efficient stepwise configuration to optimize nanoparticle formation, collection, and purification. Starting with the first plate, four openings are strategically designed for the insertion of Teflon tubes, which may vary in diameter from 0.5 to 3.5 mm. These adjustable orifices accommodate different tubing sizes to ensure proper flow and material compatibility. The second plate features intermediate openings with smaller diameters, ranging between 0.25 and 2.5 mm, which are engineered to reduce pressure upon the introduction of reagent solutions. This design feature enables a smooth and controlled flow, preventing fluctuations that could affect particle size and uniformity. The third plate, central to the synthesis process, incorporates a series of flow channels tailored for the movement of the reagent solutions involved in nanoparticle production. Additionally, this plate includes mixing chambers and a specialized junction channel where the actual synthesis reaction occurs, allowing reagents to combine under controlled conditions to promote uniform particle formation. The design of these channels and chambers is critical, as it allows for rapid and consistent mixing, minimizing variations and supporting reproducibility in nanoparticle size and quality. Once formed, the nanoparticles are directed into collection chambers embedded within plates two, three, and four. These chambers facilitate the first phase of particle collection and enable a subsequent rinsing step, during which reagent solutions are replaced with water to wash away residual chemicals. This built-in washing stage ensures that the final nanoparticle product is free from impurities, enhancing its stability and applicability in

various scientific and industrial contexts. In the final stage, the purified nanoparticles are transported through an exit channel on the fourth plate and ultimately pass through an outlet on the fifth plate, where they can be collected for further use or analysis. This design provides a seamless and efficient route for the synthesis, purification, and collection of nanoparticles, making it a versatile tool for a wide range of applications in fields requiring precise nanoparticle production.

INVENTION #99

INNOVATIVE RESEARCH

Synthesis Method of Composite Powder Materials with a (CoCrNiVCu) High-Entropy Alloy (HEA) Matrix Reinforced with Carbide Ceramic Particles for Plasma Spraying and the Resulting Powders.

Authors: ZOIȚA Nicolae Cătălin, GRIGORESCU Cristiana- Eugenia- Ana, DINU Mihaela, IORDACHE Ana Maria, PÂRÂU Anca Constantina, KISS Adrian Emil, CONSTANTIN Lidia Ruxandra

Organization: National Institute of Research and Development for Optoelectronics - INOE 2000;

The invention relates to a synthesis method for composite powder materials with a (CoCrNiVCu) high-entropy alloy (HEA) matrix of a single FCC crystallographic phase, reinforced with carbide ceramic particles such as TiC, WC, etc., for coating friction components (clutch discs, brake discs) by plasma spray technique. Patent application number: A00052/15.02.2024 (RO).

INVENTION #100

INNOVATIVE RESEARCH

Multilayer Structures Based on Thin Layers ff Copper and Silicon Carbides, Nitrides, and Carbonitrides, With High Transparency and Heat-Reflecting Properties.

Authors: VITELARU Catalin, PANA Iulian, PARAU Anca Constantina, DINU Mihaela, DRAGOMIR Alina, KISS Emil Adrian, CONSTANTIN Lidia Ruxandra

Organization: National Institute of Research and Development for Optoelectronics - INOE 2000;

The invention relates to a multilayer structure, consisting of alternative SiCxNy and Cu layers, that is transparent to radiation in the visible spectral range, and exhibits high reflection in the infrared spectral range, as well as the technology for obtaining the individual layers and this structure. Patent application number: A00477/14.08.2024 (RO).

INVENTION #101

INNOVATIVE RESEARCH

Multilayered coatings for protecting of cutting tools which work in server wear regimes used in woodworking tools- Patent no.A/00093/28.02.2023

Authors: Alina Vlădescu (Dragomir), Anca C. Pârâu, Diana M. Vrânceanu, Mihaela Dinu, Lidia R. Constantin, Cătălin Vițelaru

Organization: National Institute of Research and Development for Optoelectronics - INOE 2000; Drugon International SRL

The patent application relates to a solution to obtain multilayered coatings consisting of alternate layers of metal, nitrides and binary or ternary carbonitrides of some transition metals (Ti, Cr, W, Fe), to be used as protective layers of cutting tools subjected to a severe regime abrasion, erosion and corrosion wear used in the woodworking industry. The multilayer coatings, according to the invention, are made of alternating thin individual layers, with total thicknesses between 1 and 4 μm, having high adhesion to the substrate, the critical normal forces in the "scratch test" being in the range of 24 ... 42 N, with hardness between 18 ... 55 GPa, a corrosion rate < 4 x10-4 mm/year, having friction coefficients in dry mode of 0.1...0.4 and in solution saline 3.5% NaCl of 0.10...0.22, and the wear rate in the dry ball-on-disc test of 0.6...2.6 × 10-6 mm3N-1m-1.

INVENTION #126

INNOVATIVE RESEARCH

An Eco-friendly Approach for the Synthesis of Silver Nanoparticles Using Green Microalga Desmodesmus protuberans

Authors: Claudia-Veronica Ungureanu, Rodica Pețu, Alina Săracu

Organization: Dunarea de Jos University of Galati

The traditional physical and chemical methods used in the production of silver nanoparticles (AgNP) consist of complex, expensive, and environmentally harmful processes. To overcome these problems, researchers have turned to the AgNP production method called green synthesis or biosynthesis. The strong ability of algae to absorb metals and decrease metal ions makes algal synthesis of Ag-NPs particularly intriguing. The aim of this study was the evaluation of the ability of selected microalgae to biosynthesize silver nanoparticles. The green synthesis of AgNPs was confirmed by the color change from colorless to yellowish brown. The morphological characteristics were analyzed by scanning electron microscopy (SEM) and energy dispersive X-ray analysis (EDX). Furthermore, silver nanoparticles demonstrated a significant antimicrobial activity against the pathogenic microorganisms.

INVENTION #149

INNOVATIVE RESEARCH

Modular aquaculture platform for a sustainable development of the blue economy in the Lower Danube region, acronym FISH&FAN

Authors: Costel Ungureanu, Adrian Presură, Radu Bosoancă, Andreea Mândru, Silviu Perijoc, George Cotoc

Organization: "Dunarea de Jos" University of Galati, Faculty of Naval Architecture

The results of the research and developing of a modular floating aquaculture platform based on inland river cargo barge design to be exploited under biosecurity and sustainability conditions in the Lower Danube region, aligned with the current sustainable development strategies of the blue economy outlined by the European Union is presented. The new design combines the capabilities of growing fish in modular tanks with the growing vegetables in recirculating systems in the greenhouse superstructure of the floating platform. The first step of this interdisciplinary and multidisciplinary research is a full naval architecture study, meaning both aerodynamically and strength calculation, as a starting point for the design and evaluation of the growing fish and cultivating vegetables systems.

INVENTION #150

INNOVATIVE RESEARCH

The influence of cyclic loading on the indentation mechanical properties of G-aenial restorative composite

Authors: Adriana-Madalina Turcanu (Constantinescu), Felicia Stan, Catalin Fetecau

Organization: Center of Excellence Polymer Processing, Dunarea de Jos University of Galati

In dentistry, resin composites have become the most common materials for direct restorations because of significant improvements in their physical, bonding, and aesthetic properties. During the mastication process the restorative materials are exposed to dynamic loading since tooth cusps and hard foods cyclically indent these materials. Therefore, understanding the behavior of restorative materials under dynamic conditions is essential for the adoption of new dental materials. Although no restorative dental material can exactly match the structure and physical properties of the natural tooth, G-aenial is an ideal choice among the available restorative materials, providing natural-looking and high-gloss restorations. In this study, the mechanical behavior of G-ænial is investigated under various multi-cycling nanoindentation conditions and the mechanical properties, including elasticity, hardness, and visco-elasticity, are determined and analyzed with respect to cycling load.

INVENTION #151

INNOVATIVE RESEARCH

Research on evaluating the capacity to use cellulose fiber foams in acoustic protection applications

Authors: Silviu Marian Nastac, Petronela Nechita, Maria Violeta Guiman, Mirela Iana Roman, Mihai Seciureanu

Organization: Dunarea de Jos University of Galati

This study presents an innovative highly porous materials based on cellulose fibres, using foam forming technique, and intended to soundproofing applications. Being from renewable resources, biodegradable and recyclable in the paper waste value chain, this type of materials provides a competitive alternative to actual petroleum-based foam materials/composites, currently and widely used in sound insulation. The results indicate that bio-composite materials based on foam and cellulose fibres provide acoustics insulation performances at comparative or higher level to the commercial products large scale used nowadays.

INVENTION #152

INNOVATIVE RESEARCH

Innovative technology demonstrator implemented in military educational activities

Authors: VESA DUMITRU-CLAUDIU ȚOPA IONUȚ-CRISTIAN

Organization: "Nicolae Balcescu" Land Forces Academy from Sibiu

The innovation refers to a technological demonstrator with augmented reality (abbreviated DTRA), wich revolutionize the learning in an innovative system that easily integrates cutting-edge technologies as augmented reality (AR) and virtual reality (VR) with advanced kinetic sensors and real-time connections to Google Satellite and Bing Maps. This innovative approach creates an immersive and interactive learning environment wich motivates the users to explore complex concepts in a dynamic and captivating way. The project infrastructure is innovative, supported by an ultra-fast Wi-fi network wich is essential for the optimum functionality of the virtual and augmented reality applications and through VR and DTRA technology an immersive learning environment is created, where cadets can experiecnce complex scenarios and develop critical skills needed in the operational environment. VR and DTRA can also transform the learning space in an interactive lab where cadets can explore 3D models, animations and simulations thereby improving their understanding of theroy and practice in the operational environment. By using kinetic sensors, the DTRA Demonstrator provides a more personalized learning opportunity, adapting to each cadet's understanding style and progress through application-instructional exercises. Real-time feedback allows quick identification of strenghs and weaknesses, facilitating continuous improvement of military training. Integration using Google Satellite and Bing Maps platforms allows users to explore and analyze geographic data in an interactive way, thereby facilitating the understanding of the operational context. By incorporating an innovative and interactive learning model, the DTRA demonstrator increses motivation and information literacy, preparing cadets for a successful career in the military. The platfrom also provides an ideal collaboration and knowledge-sharing environment between cadets and teachers.

INVENTION #153

INNOVATIVE RESEARCH

Homogeneous mixtures based on hemicelluloses for treating food packaging papers

Authors: Petronela NECHITA, Mirela ROMAN (IANA ROMAN), Silviu-Marian NĂSTAC

Organization: Dunarea de Jos University of Galati, Romania

The objective of the research activity is to identify innovative solutions based on biopolymer mixtures for the surface treatment of paper in order to improve the properties required for food packaging. For this purpose, composite mixtures based on hemicelluloses such as xylan, chitosan and nanocellulose were obtained and applied in a thin film (approx. 4.5g/m2) on both sides of the paper. The results obtained highlighted the fact that these materials have properties comparable to those based on synthetic polymers or fluorochemical compounds and can be used for packaging food products.

INVENTION #217

INNOVATIVE RESEARCH

TECHNICAL SOLUTIONS REGARDING UNDERWATER INSPECTION METHODS, IN ACCORDANCE WITH THE AQUACULTURE 4.0 CONCEPT

Authors: Cujbescu Dan, Persu Cătălin, Voicea Iulian, Matache Mihai, Constantinescu Mihai

Organization: National Institute of Research - Development for Machines and Installations designed for Agriculture and Food Industry - INMA Bucharest

Underwater inspection is the main factor in compensating labor shortage and improving production efficiency, with the development of technology based on artificial intelligence, intelligent fish-mollusk-crab feeding, real-time monitoring of water quality.

INVENTION #224

INNOVATIVE RESEARCH

FEED INGREDIENT FROM DRIED GRAPE MARC

Authors: BARBULESCU IULIANA DIANA, TEODORESCU RAZVAN IONUT, DRAGOTOIU DUMITRU, CÎMPEANU SORIN MIHAI, MARINESCU SIMONA IOANA, FRINCU MIHAI, TUDOR VALERICA, MATEI FLORENTINA, MATEI PETRUTA MIHAELA, MARIN MARIAN-SORIN, DUMITRACHE CORINA, BANITA CORNEL-DANIEL

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

The invention relates to a process for obtaining a feed ingredient from dried grape marc resulting from the vinification process of the Feteasca Neagra and Tamaioasa Romaneasca varieties within the Didactic and Research - Development Station for Viticulture and Pomiculture Pietroasa - Istrita. Grape marc, in addition to the intake of some basic nutrients, is also an important source of polyphenols, its antioxidant capacity being thus closely correlated with the level of concentration of total polyphenols. This product has been tested / used for the formulation of new recipes of combined feeds intended for feeding broilers (period II and III of growth). The proposed technical solution is suitable to be used as raw material and for the formulation / manufacture of compound feeds used in food for other species and categories of animals.

INVENTION #225

INNOVATIVE RESEARCH

Obtaining active wine yeast biomass of Saccharomyces cerevisiae

Authors: TEODORESCU RAZVAN IONUT, BARBULESCU IULIANA DIANA,BEGEA MIHAELA, FRINCU MIHAI,DIGUȚĂ FILOFTEIA CAMELIA, MARCULESCU SIMONA IOANA,DUMITRACHE CORINA,CÎRÎC ALEXANDRU IONUŢ

Organization: University of Agronomic Sciences and Veterinary Medicine of Bucharest

The invention refers to obtaining an active yeast biomass of S. cerevisiae NCAIM (P) Y 001534 in order to be used in the winemaking of white wines and especially for Feteasca regala. The biomass of active yeast can be used for inoculating the Feteasca regala must for wine obtainment. Yeast biomass can be used at a ratio of 25g wet biomass / 25L wort vessel, as well as in co-inoculation with other yeasts, such as Lachea thermotholerans (20g wet biomass S. cerevisiae with 20g wet biomass of L. thermotolerans).

INVENTION #233

INNOVATIVE RESEARCH

Procedure for obtaining deposition of AlCrFeNi multi-element alloy by fusion with electric arc and inert shielding gas

Authors: SCUTELNICU Elena, SIMION George, MIRCEA Octavian, RUSU Carmen-Cătălina, MISTODIE Luigi-Renato, GHEONEA Marius-Corneliu, GEANTĂ Victor , VOICULESCU Ionelia

Organization: "Dunarea de Jos" University of Galati, Politehnica Bucuresti National University for Science and Technology

The invention describes the technology for obtaining multi-element alloys from the AlCrFeNi system, by melting a bundle of rods/wires, using Tungsten Inert Gas (TIG) deposition welding process, on a low carbon steel substrate. The rods can have identical or different chemical compositions and diameters, depending on the multi-element alloy and mechanical properties requested (resistance to corrosion, resistance to wear, ductility). To increase the chemical composition homogeneity of the deposited material and to eliminate the potential defects, the material solidified can be remelted on longitudinal, transverse or combined directions, by the same fusion welding technique, without filler material.

MECHANICAL ENGINEERING – METALLURGY

20 Inventions

INVENTION #1

MECHANICAL ENGINEERING – METALLURGY

Mineral casting for machine tools

Authors: Raul-Silviu Rozsos, Claudiu Rusan, Mihai Ciupan

Organization: Technical University of CLUJ - Napoca

Polymeric concretes, also called mineral casting, are formed from a mixture of aggregates and a thermosetting resin. The used aggregates include granite, basalt, quartz and other materials. The ratio of aggregate to resin volume is approximately 9:1. The mineral composite offers several advantages compared to cast iron: the reduction of the energy balance starting from obtaining the raw material to the realization of the machine tool components, the reduction of the costs of the raw material and the labor required for the construction of machine tools, the simplification of the manufacturing equipment, the increase of the productivity of the machine by using higher speeds and feeds, and last but not least, increasing the precision and quality of the resulting surfaces. The mechanical properties of the mineral composite were tested by measuring the flexural strength according to standard EN1015-11:1999.

INVENTION #35

MECHANICAL ENGINEERING – METALLURGY

PROCEDURE FOR PRODUCING A PROTECTIVE METALLIC COATING OF A GRAY CAST IRON BRAKE DISC

Authors: Diana CHIOIBASU, Sabin MIHAI, Raluca IVAN, Andrei POPESCU

Organization: National Institute for Laser, Plasma and Radiation Physics

This invention introduces an advanced coating process utilizing metal layers to enhance the properties of brake discs employed in the automotive industry. The proposed technique involves applying a substrate comprised of metallic or ceramic material in powder form, which is subsequently melted by a laser beam. Upon cooling, this material solidifies into a smooth, adherent, and uniform layer on the surface of the disc. This process is known in technical literature as laser cladding. Distinct from other methods of applying metal layers, laser plating is capable of depositing considerable amounts of material onto a metal object. A noteworthy application of this innovative technique is the restoration of carbon steel cutting tools that have undergone deformation due to wear or exposure to elevated temperatures. The invention addresses the technical problem of enhancing the mechanical and corrosion resistance of brake discs used in vehicles.

INVENTION #54

MECHANICAL ENGINEERING – METALLURGY

Tehnologie hibrida pentru obtinerea structurilor compozite in camp ultrasonor

Authors: Florea Bogdan, Semenescu Augustin, Chivu Oana, Nițoi Dan, Marcu Dragoș-Florin, Pasăre Vili

Organization: National University of Science and Technology POLITEHNICA Bucharest

The proposed project aims to develop a new technology for producing composite structures by applying reinforcement materials in an ultrasonic field. This approach significantly enhances adhesion and mechanical properties, aiming to eliminate composite defects such as delamination and premature wear caused by the detachment of reinforcement particles. The project includes analytical calculations, optimization using the Finite Element Method (FEM), and the practical implementation of an ultrasonic deposition stand.

INVENTION #55

MECHANICAL ENGINEERING – METALLURGY

Procedure for obtaining a composite coating with increased durability on a metal surface

Authors: Vili Pasare, Dan Florin Nitoi, Augustin Semenescu, Mihnea Cosmin Costoiu, Oana Roxana Chivu, Dragos-Florin Marcu, Radu Claudiu Fierascu, Irina Fierascu, Raluca Somoghi

Organization: National University of Science and Technology POLITEHNICA Bucharest

The invention refers to a procedure for obtaining a composite coating with increased durability on a metal surface, especially on a brake roller, by successively depositing of layers of liquid epoxy resin mixed with sand granules on a metal surface, supported and rotated by using some bearings assembled in a casing which in turn is mounted on a support plate.

INVENTION #56

MECHANICAL ENGINEERING – METALLURGY

Composite coating material with anticorrosive and anti-scratching properties

Authors: Radu Claudiu Fierascu, Vili Pasare, Augustin Semenescu, Mihnea Cosmin Costoiu, Dan Florin Nitoi, Oana Roxana Chivu, Dragos-Florin Marcu, Irina Fierascu, Raluca Somoghi

Organization: National University of Science and Technology POLITEHNICA Bucharest

The present invention refers to a composite coating material, which simultaneously presents high cohesion and a high degree of scratch resistance, dedicated to the steel-carbon type support materials, offering at the same time anti-corrosion protection.

INVENTION #114

MECHANICAL ENGINEERING – METALLURGY

A Polymeric Blend with Good Mechanical Characteristics in Traction and Charpy Impact

Authors: Andreea Elena Musteață, George Ghiocel Ojoc, Doina Constantinescu, Horia Petrescu, Alina Ceoromila Cantaragiu, Lorena Deleanu

Organization: Dunarea de Jos University, DMT Marine Equipment Galati, Autonomous Flight Technologies, Clinceni, Romania, Monofil SA, Săvinești, Romania, National University of Sciences and Technology ”Politehnica”, Bucharest, Romania

The polymeric blend has as components PA6 (60% wt) and EPDM (40% wt) and was injection mold in samples for traction and Charpy tests. Tensile tests were done for several test rates in the range of 10 mm/min and 1000 mm/min The modulus of elasticity has close values (1548-1663 MPa) for the test rates ranging v=250-1000 mm/min, values higher than that obtained at the lowest test speed v=10 mm/min (1429 MPa). The ultimate tensile strength over the range of test rates has a very low sensibility to test rate, this characteristic being between 36.5 MPa to 38.2 MPa (average values for five tests under the same test rate), the difference between them being only 4.48% with respect to the latter. The other two studied characteristics (the strain rate at break and energy at break) have a clear decreasing trend with increasing test rate. The fracture morphology in traction was studied with the help of a electron scanning microscope, for different test velocities and no significant differences in the shape and size of the fractured fibrils are observed, these proving a ductile in character. Charpy tests were carried out ten times, with a test machine CEAST 9340, with a hemispherical impactor with a velocity of 0.96 m/s and an impactor mass of 3.219 kg. Specimens have 10 mm x 4 mm x 80 mm, with notch type C (SR EN ISO 179-1:2010). The results after Charpy tests, pointed out a better behavior of the polymeric blend at this impact type as compared to neat PA6: energy at break has an average of 0.334 J for the blend and only 0.256 J for PA6, impact rezistance was 11.47 for the blend and 8.52 for PA6. SEM images for PA6m revealed a zone parallel to the fracture surface of the crack, where the polymeric blend has a pronounced plastic flow at an angle of approximately 45° to the fracture surface. The thickness of this layer is about 200 microns. The addition of EPDM

in PA6 resulted in the propagation of a fibrillation-free, but strong local flowing fracture in a band near the fracture surface.

INVENTION #118

MECHANICAL ENGINEERING – METALLURGY

Glass fiber composite for shipbuilding industry

Authors: Ioana Gabriela Chiracu, George Ghiocel Ojoc, George Cătălin Cristea, Mihail Boțan, Alexandru Viorel Vasiliu, Lorena Deleanu

Organization: Dunarea de Jos University, INCAS Bucharest, Autonomous Flight Technologies, Clinceni, Romania

The composite was fabricate at laboratory scale, using a quadriaxial fabric of glass fibers and an epoxy resin, with heat treatment and natural aging. The composite was tested in three-point bending (under three test rates) and impact with hemispherical striker (diameter of 16 mm), for 50 J to 200 J and the results are promising. The composite behaves has a good repeatability in bending and under impact, for all the tested parameters. Macro photographs reveals a good behavior especially at impact, with only local damage and without total penetration. Thus, based on laboratory tests, the composite could be recommended for shipbuilding industry and for impact protection.

INVENTION #122

MECHANICAL ENGINEERING – METALLURGY

Luminescent fan structure

Authors: YANG CHEN, SHIH

Organization: Taiwan Invention Products Promotion Association

"This creation presents a structure for an illuminated fan. It incorporates LED lighting devices on the rear cover of the fan and LED color-changing lights on the PCB inside the fan base. Additionally, a solar panel is installed on the top cover of the base to directly provide power to the fan. By using a switch, the illumination of the LEDs can be controlled, with the solar panel serving as a power source for the LEDs.

INVENTION #127

MECHANICAL ENGINEERING – METALLURGY

Nozzle system used for thermal spraying in electric arc

Authors: TOMA Ștefan Lucian, SAVIN Gabi, TOMA Bogdan Florin, BEJINARIU Costica, IONIȚĂ Iulian, VIZUREANU Petrică, BĂDĂRĂU Gheorghe, SANDU Andrei Victor, CAZAC Alin, BURDUHOS – NERGIȘ Diana – Petronela

Organization: Gheorghe Asachi Technical University of Iasi

The invention belongs to the field of Thermal spraying in electric arc of wire drawn metallic materials. The technical problem that is solved by the invention is the directed constrain of the electric arc without modifying the velocity and the flow of the compressed air that divides the droplets of molten metal into fine particles in order to increase the temperature and the velocity of the sprayed particles. The technical solution to solve this problem consists in the creating a compressed air circuit through a concentric nozzle system composed of a body, a cap, a conical nozzle, a conical nozzle and a constraint frontal nozzle.

INVENTION #131

MECHANICAL ENGINEERING – METALLURGY

CONTINUOUS THERMOFORMING LINE FOR PROFILED BOARDS

Authors: Ciupan Cornel, Ciupan Mihai, Filip Ioan, Ciupan Emilia

Organization: Technical University of Cluj-Napoca

The invention refers to an automatic thermoforming line for parts made of thermoplastic composite materials consisting of a reinforcing element (hemp fibers, flax, willow, poplar etc.) and a thermoplastic matrix (polypropylene). The line consists of a material feeding system in the form of two strips of fibrous layer, a heating furnace with two successions of rollers that lead the strips of material in separate zig-zag paths, and finally, at the terminal part of the furnace, the strips come together in a single strip with the help of two pairs of rollers and pass into the forming system with rollers in order to obtain a profiled board.

INVENTION #133

MECHANICAL ENGINEERING – METALLURGY

AUTOMATIC LINE AND THERMOFORMING PROCESS OF THE PARTS FROM THERMOPLASTIC COMPOSITE MATERIAL

Authors: Ciupan Cornel, Ciupan Mihai, Filip Ioan, Ciupan Emilia

Organization: Technical University of Cluj-Napoca

The invention refers to an automatic thermoforming line for parts made of thermoplastic composite materials reinforced with plant fibers. The line consists of a heating system formed by a conduction heating zone where two strips of composite material are heated in parallel by pressing between the plates of a hot press and a roller heating zone. The material is kept in the hot press for a time t1, after which it passes through the hot rollers in the second zone forming a single strip which is further heated by conduction and convection for a time t2, until the thermoplastic matrix melts. The strip of plasticized material passes from the heating zone to the forming zone with cold rollers, resulting in a profiled board.

INVENTION #134

MECHANICAL ENGINEERING – METALLURGY

COMPOSITE MAGNETIC CORES BASED ON FERROMAGNETIC FIBERS AND PROCESS FOR PREPARING THE SAME

Authors: Neamţu Bogdan Viorel, Marinca Traian Florin, Chicinaş Ionel

Organization: Technical University of Cluj-Napoca

The invention relates to composite magnetic cores based on ferromagnetic fibers and to the method of obtaining these cores. The proposed process can be applied to obtain magnetic composite cores from a varied range of ferromagnetic fibers. The proposed process is a process with increased productivity compared to the classic processes of pressing fibers in a mold. It facilitates the obtaining of composites compact with superior magnetic characteristics because it allows a better preservation of the integrity of the dielectric layer and does not induce mechanical stresses and crystallographic defects in ferromagnetic fibers. Also, the innovative cold sintering method proposed in the patent brings a significant improvement in terms of the productivity of the conventional cold sintering operation.

INVENTION #141

MECHANICAL ENGINEERING – METALLURGY

RECONFIGURABLE GEARBOX

Authors: Ciupan Cornel, Steopan Mihai, Pop Emanuela

Organization: Technical University of Cluj-Napoca

The invention presents a reconfigurable gearbox designed for the skills development of students in the field of mechanical engineering. The solution offers students the opportunity to build over 20 different types of gearboxes, depending on the structure and the speeds selected by the workload of the machine tool. Reconfigurability of the box is provided by a modularized concept, by using interchangeable shafts and gears and by creating an optimized set of gears. The invention will help the students to understand important aspects related to the design, construction and operation of the gearbox and, in addition, contributes to the development of their creative abilities.

INVENTION #142

MECHANICAL ENGINEERING – METALLURGY

METHOD FOR MAKING SUPPORTS TO BE USED IN SELECTIVE LASER MELTING BY DIFFERENTIAL SCANNING

Authors: Cosma Sorin Cosmin, Bâlc Nicolae Octavian, Popan Alina Ioana, Hendea Radu Emil

Organization: Technical University of Cluj-Napoca

The invention relates to a method for making supports to be used in selective laser melting (SLM) by differential scanning, more exactly to anchor the parts during the SLM process. The purpose is to improve the quality of support structures by having better adhesion with SLM platform and fabricated parts. According to the invention, the method comprises the stages of initialization of process parameters corresponding to the scanning of the lower zone of the supports, material deposition layer-by-layer and laser scanning of 2D sections of the support for consolidation purposes, the support being divided into a lower zone which is the contact zone with a working platform, an upper zone on which the piece is fixed and a medial zone, where the scanning of the support is differentiated on the three zones.

INVENTION #180

MECHANICAL ENGINEERING – METALLURGY

ADVANCED VIBRATING PYROLYSIS REACTOR: A Versatile Platform for Next-Generation Biofuels

Authors: Adisak Pattiya

Organization: Mahasarakham University

This invention presents a novel vibrating pyrolysis reactor designed for efficient and versatile biofuel production. The reactor's simple yet effective design minimizes energy consumption while enabling scalability to meet diverse production needs. By adjusting operational parameters, the reactor can produce a wide range of valuable biofuels, including bio-oil, biogasoline, sustainable aviation fuel (SAF), biocoal, and biochar. The reactor's flexibility extends to its feedstock options, accommodating various biomass materials and waste products like agricultural residues, forestry waste, and even waste plastics or rubber. This innovative technology offers a sustainable solution for energy production and waste management, contributing to a greener future.

INVENTION #181

MECHANICAL ENGINEERING – METALLURGY

Efficient Macadamia Processing: A Semi-Automatic Cracking Machine

Authors: Suphan Yangyuen, Cherdpong Chiawchanwattana, Juckamas Laohavanich

Organization: Mahasarakham University

This research aimed to develop a semi-automatic macadamia nut cracking machine to improve efficiency and quality. By modifying a manual nut cracker with electrical motors, the machine could crack nuts faster and more accurately. The study focused on optimizing blade speed, nut size, and feeding method to achieve the best cracking performance. Results showed that a blade speed of 19 rpm and a nut size of 25-27 mm yielded the highest quality (87.71%) and quantity (10.58 kg/hr) of whole kernels

INVENTION #182

MECHANICAL ENGINEERING – METALLURGY

Innovative Equipment for Accelerated and Efficient Germinated Brown Rice Production in Thailand

Authors: Cherdpong Chiawchanwattana, Suphan Yangyuen, Juckamas Laohavanich

Organization: Mahasarakham University

This research developed an innovative equipment set to modernize the traditional germinated brown rice (Hang rice) production in the northeastern region of Thailand. This time-consuming process, involving multiple steps, has been significantly streamlined. The new system includes a paddy washer, a soaking and germination accelerator, a 3-in-1 soaking, germination, and steaming unit, and an infrared rotary drum dryer. The system reduces production time by over 50%, improves quality, and decreases labor, energy, and water consumption. This innovation has been adopted by farmers in 14 regions and has been patented.

INVENTION #218

MECHANICAL ENGINEERING – METALLURGY

ACTIVE ORGAN OF CHISEL TYPE, FOR SOIL WORKS

Authors: Marin Eugen, Manea Dragoș

Organization: National Institute of Research - Development for Machines and Installations designed for Agriculture and Food Industry - INMA Bucharest

The invention refers to a chisel-type active organ for soil tilling, intended for various equipment provided with supports for active organs used for tilling the soil without turning the layers, such as scarifiers, chisels, tillers etc.

INVENTION #220

MECHANICAL ENGINEERING – METALLURGY

System for generation and testing of gears with toothed wheels through additive technologies

Authors: Prof. Drd. Ing. Mihai Avram Conf. Dr. Ing. Victor Florin Constantin As. Drd. Ing. Alexandra-Gabriela Vasilescu

Organization: Universitatea Națională de Știință și Tehnologie POLITEHNICA București

Additive manufacturing technologies have made a leap forward in the past decades with practical applications being more and more visible in today's engineering world. This is possible due to the introduction of new materials, the advances in computer science as well as processing power and low cost of consumer grade electronics. Since these technologies allow for rapid prototyping of small batches of non-standard parts, it is now possible to improve on the performance of mechanism by allowing for certain dimensions to be customized to the specific needs of a system. Such an example would be using additive technology to customize the sizes, shapes, and tooth profiles of gears to allow for specific gear ratios to be obtained. This paper studies some of the techniques and technologies that may be employed to manufacture such geared wheels, geared transmissions, alongside their respective advantages and disadvantages.

INVENTION #223

MECHANICAL ENGINEERING – METALLURGY

MOBILE STATION FOR PRODUCING BIOFERTILIZERS THROUGH PYROLYSIS

Authors: Ștefan Vasilica, Popa Lucreția, Ciupercă Radu, Zaica Ana, Constantinescu Mihai

Organization: National Institute of Research - Development for Machines and Installations designed for Agriculture and Food Industry - INMA Bucharest

The invention refers to a mobile station for obtaining biofertilizers by pyrolysis intended for the processing of poultry droppings by pyrolysis (burning in the absence of oxygen) in order to obtain biofertilizers with a high phosphorus content.

MEDICINE – HEALTH CARE – COSMETICS

56 Inventions

INVENTION #4

MEDICINE – HEALTH CARE – COSMETICS

Manufacturing method of a dual analytical platform for electrochemical and colorimetric detection

Authors: Teodor Adrian Enache, Costas Liliana Andreea, Daciana Botta, Elena Matei, Victor Diculescu

Organization: National Institute of Materials Physics

The present work describes a dual analytical platform for electrochemical and colorimetric detection designed for applications such as analytical determination of molecular compounds of biological interest using simultaneously two methods,. This platform is made on a nitrocellulose support with the areas of interest (ie. sample introduction and detection) interconnected and delimited with wax printed on the support. Electrodes for electrochemical detection are manufactured by photolithography, cathode sputtering with magnetron in radio frequency and thermal evaporation in vacuum. The platform contains four detection systems: two electrochemical (test and control) and two colorimetric (test and control).

INVENTION #11

MEDICINE – HEALTH CARE – COSMETICS

COBALT, CHROMIUM AND NOBLE METAL CONTAINING ALLOY USED FOR MANUFACTURING METAL-CERAMIC DENTAL PROSTHESES, COMPRISES COBALT, CHROMIUM, SILICON, RUTHENIUM, ZIRCONIUM AND SILVER (patent no: RO134132 A0)

Authors: ANTONIAC Vasilea Iulian, RAU Dzulietta, SEMENESCU Augustin, DAWOD Nazem, GEANTA Victoras, VOICULESCU Ionelia, MATES Ileana Mariana, SOLEA Marina Roxana

Organization: NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY POLITEHNICA BUCHAREST

Cobalt, chromium and noble metal containing alloy comprising 58-61 %mass cobalt, 28-30 %mass chromium, 3.4-4.4 %mass silicon, 2-4 %mass ruthenium, 0.7-1.4 %mass zirconium and 0.8-1.2 %mass silver and obtained by elaboration in an electric arc furnace in a neutral atmosphere, with or without magnetic levitation. The alloy has high biocompatibility. DETAILED DESCRIPTION - Cobalt, chromium and noble metal containing alloy of formula: CoCrMn comprises 58-61 %mass cobalt, 28-30 %mass chromium, 3.4-4.4 %mass silicon, 2-4 %mass ruthenium, 0.7-1.4 %mass zirconium and 0.8-1.2 %mass silver and obtained by elaboration in an electric arc furnace in a neutral atmosphere, with or without magnetic levitation. Cobalt, chromium and noble metal containing alloy of formula: CoCrMn comprises 58-61 %mass cobalt, 28-30 %mass chromium, 3.4-4.4 %mass silicon, 2-4 %mass ruthenium, 0.7-1.4 %mass zirconium and 0.8-1.2 %mass silver and obtained by elaboration in an electric arc furnace in a neutral atmosphere, with or without magnetic levitation The alloy is useful for manufacturing metal-ceramic dental prostheses.

INVENTION #12

MEDICINE – HEALTH CARE – COSMETICS

DENTAL ALLOY OF COBALT-CHROMIUM-MOLYBDENUM TYPE USED FOR MAKING METAL-CERAMIC DENTAL PROSTHESES, COMPRISES COBALT, CHROMIUM, MOLYBDENUM, SILICON, NIOBIUM, RUTHENIUM, ZIRCONIUM AND SILVER (patent no: RO134131)

Authors: DENTAL ALLOY OF COBALT-CHROMIUM-MOLYBDENUM TYPE USED FOR MAKING METAL-CERAMIC DENTAL PROSTHESES, COMPRISES COBALT, CHROMIUM, MOLYBDENUM, SILICON, NIOBIUM, RUTHENIUM, ZIRCONIUM AND SILVER (patent no: RO134131)

Organization: NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY POLITEHNICA BUCHAREST

Dental alloy of cobalt-chromium-molybdenum type comprises 47-53 wt.% cobalt, 22-26 wt.% chromium, 4-7 wt.% molybdenum, 0.9-1.2 wt.% silicon, 3-5 wt.% niobium, 0.8-1.1 wt.% ruthenium, 10-14 wt.% zirconium and 2-4 wt.% silver, where the alloy has biocompatible metals comprising molybdenum, zirconium, niobium, silver and ruthenium, and is prepared by elaboration in electric arc furnace in neutral atmosphere. The alloy exhibits excellent biocompatibility and corrosion resistance. The alloy is used for making metal-ceramic dental prostheses.

INVENTION #27

MEDICINE – HEALTH CARE – COSMETICS

Bio-borate glass doped with cerium oxide in the form of a thin film for improving surfaces of medical interest and obtaining method

Authors: Gabriela- Irina UNGUREANU (NEGUȚ), Bogdan SAVA, Grațiela GRĂDIȘTEANU, Bogdan BIȚĂ

Organization: National Institute for Laser, Plasma and Radiation Physics, Magurele, Romania

This invention pertains to bio-borate glasses doped with cerium oxide (BBGi) designed as thin films for enhancing Titanium (Ti) surfaces utilized in medical applications, as well as a method for their production. The doped BBGi composition includes: glass network formers comprising 40–65% B2O3 and 2.5–10% P2O5, glass network modifiers consisting of 15–30% Na2O and 20–30% CaO, and dopants with specialized properties such as 1–3% CeO2 and 0–1% SrO2, expressed in molar percentages. The manufacturing process involves several steps: volumetric and gravimetric measurement of raw materials, homogenization, drying of the material mixture, melting, annealing the resulting glass, pulverizing the glass, blending it with dimethyl sulfoxide (DMSO), freezing the mixture in liquid nitrogen, and depositing it onto Ti substrates using the matrix-assisted pulsed laser evaporation (MAPLE) technique. This process employs a KrF* excimer laser, with the substrates positioned in a plane-parallel arrangement within the deposition chamber.

INVENTION #29

MEDICINE – HEALTH CARE – COSMETICS

RO133249A2/2019 Novel process of preparation and characterization of sapropelic mud extract "PELL AMAR".

Authors: Zainea Elena, Harasim Iuliana, Zainea Cătălin, Dragomir Simona, Ponta Corneliu Cătălin, Virgolici Marian, Pintilie Cosmin Adrian, Zorila Florina, Cutrubinis Mihalis, Albulescu Radu Nicolae Aurel, Grigore Alice Elena, Neagu Georgeta, Niţă Sultana, Albulescu Adrian, Panteli Irina Minerva, Raşit Iuksel, Bâzdoacă Cristina Mirela, Rusu Nicoleta, Codrici Elena, Tanase Cristiana, Popescu Ionela Daniela, Mihai Simona, Enciu Ana-Maria.

Organization: Victor Babes National Institute of Pathology

The invention relates to a process for preparing an active product from sapropelic mud to be used in the treatment of rheumatoid arthritis and other chronic inflammatory diseases. According to the invention, the process consists in preparing aqueous sapropelic mud extract, filtering the extract and bringing the filtered extract into solid state by lyophilization in two stages, a main lyophilization stage, under prefreezing conditions at -20°C, a pressure of 0.04 mbar, a temperature of -50°C, and a final lyophilization stage at a pressure of 2.6 mbar and temperature of -10°C, followed by extract sterilization by irradiation with γ radiation, between 10 and 25 kGy, to result in a product having microbiological and pharmacological characteristics suitable for it to be used as an anti-inflammatory product.

INVENTION #31

MEDICINE – HEALTH CARE – COSMETICS

RO130589B1/2022 Method for setting a protein biomarkers set for diagnosing glioblastoma

Authors: Popescu Ionela Daniela, Albulescu Radu Nicolae Aurel, Tanase Cristiana, Codrici Elena, Albulescu Lucian, Mihai Simona, Enciu Ana-Maria, Neagu Teodora Monica, Constantinescu Ştefan

Organization: Victor Babes National Institute of Pathology

The invention relates to an assay for identifying biomarkers by analyzing the protein profile in serum samples from patients with glioblastoma. The method according to the invention consists in the preparation and acquisition of the chips, after which the measurement protocol is applied to the protein samples, and analyzes from which a group of relevant serial clusters is identified, selecting a set of 4 biomarkers S100A8, S100A9, CXCL4, CXCL7 showing statistically significant differences between brain tumor patients and healthy subjects.

INVENTION #32

MEDICINE – HEALTH CARE – COSMETICS

RO130591B1/2022 Method of establishing a set of biomarkers for diagnosis or prognosis in cervical cancer patients.

Authors: Codrici Elena, Tanase Cristiana, Albulescu Radu Nicolae Aurel, Stănculescu Ruxandra, Popescu Ionela Daniela, Mihai Simona, Neagu Ana-Iulia, Necula Laura Georgiana, Mambet Cristina

Organization: Victor Babes National Institute of Pathology

The invention relates to a method of identifying a set of biomarkers useful in the diagnosis and prognosis of cervical cancer. According to the invention, the method comprises the analysis of the proteomic profile in a tumoral-pathological tissue in relation with a peritumoral-normal tissue from which a set of protein biomarkers was identified, where the molecular weight varies in the range of 15...50 kDa, with pI 5.5...7.5, namely: CDK4 with a molecular weight of 33 kDa and pI 6.66, cycline B1 with a molecular weight of 48 kDa and pI 7.1, p16 with a molecular weight of 16 kDa and pI 5.5 intended to be used as an instrument of prognosis and diagnosis for cervical cancer at the molecular level.

INVENTION #33

MEDICINE – HEALTH CARE – COSMETICS

RO130590B1/2018 Method of identification of a soluble set of biomarkers for diagnosis, prognosis and monitoring of glioblastoma, and method for diagnosis, prognosis or monitoring of glioblastoma based on the use of said set.

Authors: Tanase Cristiana, Albulescu Radu Nicolae Aurel, Codrici Elena, Mihai Simona, Albulescu Lucian, Popescu Ionela Daniela, Constantinescu Ştefan

Organization: Victor Babes National Institute of Pathology

The invention relates to a method of identification of a set of biomarkers to be used in prognosis and diagnosis of brain tumours. According to the invention, the method comprises the simultaneous determination of serum and plasma concentration in samples taken from patients suffering from glioblastoma versus the control of a complex of cytokines and angiogenic factors IL-1β, IL-6, TNF alpha and VEGF, the values of which are 1.5...10 times higher than the average normal values, and the simultaneous use thereof as a set of biomarkers for monitoring brain tumours.

INVENTION #36

MEDICINE – HEALTH CARE – COSMETICS

MODULAR-ADAPTIVE STEM FOR TOTAL HIP PROSTHESIS, USING SMART MATERIALS

Authors: Prof.dr. Tarnita Danut Nicolae Prof.dr.ing. Tarnita Daniela

Organization: University of Craiova & University of Medicine and Pharmacy

The patent's subject refers to the fabrication of modular orthopaedics implants for the ostheosynthesis of the long bone fractures which comprise a predefined number of modules which, by mechanical coupling, and forms various dimension plates adaptable to the fractured bones and to the tensions developed in the bone by muscular forces. The coupling system of the adjacent modules with regard to the fracture place is made of Nitinol clips which act by the property of shape memory, enabling a continues compression over the fracture fragments, fact which represents an essential factor of the healing process. Advantages 1) by combining a certain number of modules we can obtain implants with various lengths depending of type, position or dimension of the fracture; 2) the use of the Nitinol staple enables the stabilization of the implants and the good union of the bone fractures, a key element in the healing process; 3) the small sizes of the modules enable the surgeon to use minimally invasive surgical techniques, with following advantages: ▪ reduction of soft tissues destruction; ▪ eliminating intra-operator infections; ▪ reduction of blood losses; ▪ reduction of infection risk; ▪ reduction of the healing time for the plagues; ▪ reduction of the scar (the aesthetic aspect).

INVENTION #37

MEDICINE – HEALTH CARE – COSMETICS

ELBOW PROSTHESIS TYPE BALL JOINT

Authors: Prof. dr. ing. Danut-Nicolae Tarniță, Prof. dr. ing. Daniela Tarniță, dr. Boborelu Cristian, Conf. dr. ing. Popa Dragoş Laurenţiu

Organization: University of Craiova

The invention relates to a new model of elbow prosthesis which has the operating principle hinge model, with a spherical shape. The invention relates to an elbow prosthesis which is implanted by cementation in the humerus and cubitus, respectively. According to the invention, the prosthesis consists of three metallic components (A, B and C), the component (A) consisting of a metal sphere, of which a square profile rod is fixed to a pole and the component (B) being formed by a hemispherical cup so designed that the sphere of the first component (A) is contained in the cup with a minimum tolerance which ensures the movement of the hemispherical cup being fixed to a square profile rod. The elbow prosthesis according to the invention has the following advantages: • It has a simple construction, easy to perform; • It consists of two components that are implanted separately easily; • The destruction of bone for implantation is small; • Intracapsular implantation is performed, which provides greater stability elbow prosthesis after implantation; • The two components are coupled without using other devices.

INVENTION #38

MEDICINE – HEALTH CARE – COSMETICS

Nanostructured bone graft

Authors: Jian Mariana, Ficai Anton, Ficai Denisa, Nacu Viorel, Cobzac Vitalie, Motelica Ludmila, Mostovei Andrei, Oprea Ovidiu Cristian, Solomon Oleg

Organization: Nicolae Testemitanu State University of Medicine and Pharmacy

The invention relates to regenerative medicine, tissue engineering, dentistry, implantology, traumatology and oral-maxillo-facial surgery and can be used to supplement, augment and restore bone defects with the prevention of microbial infections. The problem that the invention solves consists in obtaining a nanostructured graft, for the repair of bone defects, consisting of collagen extracted from the umbilical-placental complex, hydroxyapatite and zinc oxide nanoparticles. The graft is allogeneic, porous, biocompatible and biodegradable, possesses antimicrobial properties, has potential for bone regeneration, excludes the transmission of zoonotic infections and post-transplant graft rejection. The advantages of the claimed graft are that it is allogeneic, with rapid integration capacity in the host tissue and minimal risk of rejection due to the collagen extracted from the umbilical-placental complex with the use of surfactants to ensure non-immunogenicity, but also prevents the risk of postoperative infection. It can be used both with and without osteoprogenitor cells.

INVENTION #39

MEDICINE – HEALTH CARE – COSMETICS

MODULAR-ADAPTIVE CENTROMDEULAR ROD USED FOR THE OSTHEOSYNTHESIS OF THE LONG BONES

Authors: Prof.dr.ing. Daniela Tarnita Prof.dr. Danut-Nicolae Tarnita s.l.dr.ing. Berceanu Cosmin ing. Cismaru Florin

Organization: University of Craiova

The patent's subject refers to a modular-adaptive centromedular rod (orthopaedic implant) used for the ostheosynthesis of the long bone fractures which incorporates in the structure intelligent materials like Nitinol, material with the property of shape memory. The orthopaedic rod is an assembly made from 9 components divided in three zones: a epiphiseal zone (components 1, 2, 3 and 9), a diaphiseal zone (components 4 and 5) and a metaphiseal zone (components 6, 7, 8 and 9). Advantages: 1) smart materials like Nitinol ensure a permanent pressure and a good cohesion between the orthopaedic rod and medular channel of the bone; 2) the rod is modular and adaptable to various long bones; 3) the components used are simple in shape thus the rod is easy to manufacture; 4) the rod is easy to extract by the surgeon by cooling the Nitinol component

INVENTION #46

MEDICINE – HEALTH CARE – COSMETICS

Composition of Phytotherapeutic Preparation Based on Essential Oils Used as Adjuvant in Urinary Disorders and Procedure for Obtaining It

Authors: Mircea Negruta, Oana Negruta

Organization: Asociatia de Inventatori Iustin Capra

The invention refers to a composition of phyto-therapeutic preparation based on essential oils used as an adjuvant in urinary disorders such as urinary tract and bladder infections, inflammation caused by infections, etc. The technical problem that the invention solves is to create a composition based on plant oils, in an association that makes it suitable for use as an adjuvant in kidney diseases caused by infections, in urinary bladder diseases, in inflammations of the urinary tract and of the urinary bladder, preventing local microbial development, multiplication and dispersion. The advantages of using the obtained composition consist in obtaining a quick and lasting effect, which can also be used as an adjuvant in recurrent urinary infections without the risk of acquiring microbial resistance. The composition does not require preservatives or other undesirable stabilization and preservation agents, vitamin E and essential oils having at the same time the role of antioxidants.

INVENTION #47

MEDICINE – HEALTH CARE – COSMETICS

PLANT-BASED FOOD SUPPLEMENT USED FOR PREVENTING AND CONTROLLING NOSEMOSIS IN BEES

Authors: MEDERLE N, MORARIU S, DARABUS G, BOGDAN A, CRACIUN C

Organization: University of Life Sciences King Mihai I from Timisoara

The invention relates to a plant-based food supplement used for preventing and controlling nosemosis in bees. According to the invention, the supplement consists of 50% sugar syrup and 50 % infusion of 33.33% common nettle and camomile, respectively, 8.33% milfoil and thyme, St. John's wort and mint, respectively.

INVENTION #48

MEDICINE – HEALTH CARE – COSMETICS

Development and introduction on the market of a range of innovative food supplements with superior bioavailability based on bee products and essential oils

Authors: Raba Diana Nicoleta, Dumbrava Delia Gabriela, Alexa Ersilia Calina, Poiana Mariana Atena, Cocan Ileana, Obistioiu Diana Monica, Iancu Tiberiu, Ciucur Radu Ioan, Stoia Sorin, Popa Viorica-Mirela, Moldovan Camelia

Organization: University of Life Sciences King Mihai I from Timisoara

The project aims to develop and introduce on the market a range of innovative food supplements with superior bioavailability based on bee products and essential oils. Through collaboration with the USVT Technology Transfer Centre, a new range of honey-based foods will be developed and the technical skills for their production will be created. A technology will also be developed with optimized operating conditions and preparation mode of the basic matrix, ensuring functionality and bioavailability of the active principles in the ingredients used and long shelf life of the product without requiring chemical or physical preservation processes.

INVENTION #49

MEDICINE – HEALTH CARE – COSMETICS

Biofunctional premixes (PMXBF) based on spelt wheat with application in the flour food industry

Authors: Alexa Ersilia, Radulov Isidora, Popescu Cosmin Alin, Raba Diana Nicoleta, Poiana Mariana-Atena, Cocan Ileana, Negrea Monica, Misca Corina, Obiștioiu Diana, Dragomir Christine, Dossa Sylvestre, Suster Gabriel

Organization: University of Life Sciences King Mihai I from Timisoara

The present invention concerns to the development of premixes based on Triticum spelta wheat flour (PMXBF) with applications in the flour based food industry (bread, pasta, biscuits, pastry), with 5....25% meal ratio added flour from fruits of sea buckthorn (Hippophaë Rhamnoides L.), and/or lingonberries (Vaccinium vitis-idaea L.) and/or pomace resulting as a by-product of winemaking. The results obtained on the nutritional properties, phytonutrient content of premixes, as well as the rheological suitability of the dough, highlighted the possibility of implementing the technologies to obtain PMXBF-based products in the farinaceous food industry.

INVENTION #50

MEDICINE – HEALTH CARE – COSMETICS

ENANTIOSELECTIVE DOT SENSOR AND PROCEDURE FOR ITS CONSTRUCTION

Authors: Raluca-Ioana van Staden, Jacobus Frederick van Staden

Organization: National Institute for Research-Development in Electrochemistry and Condensed Matter

Cancer is in most cases a silent disease, which does not give specific symptoms except in phases 3 and 4, when the chance of cure is very low. Therefore, mass screening tests are needed, which are as close as possible (as a result) to the diagnostic ones. The biomarkers used so far do not provide a very high accuracy to the screening test, given that most of them are also responsible for other diseases or inflammations in the body. Therefore, identifying biomarkers such as amino acids that are not specifically present in biological samples (saliva, urine, tissue, blood) in healthy people, but only in patients who have been diagnosed with cancer can help make a faster diagnosis, in the early phase of cancer – the phase in which the cancer is curable, In order to be able to perform enantioanalysis at the level of pg/mL or even lower than it, reliable instruments are needed with very high sensitivity, enantioselectivity and limit of determination in the pg/mL-fg/mL range. Therefore, the invention proposes endo-enantioselective sensors for the rapid and early diagnosis of cancer. With the help of these sensors, it will be possible to identify the enantiomers of various amino acids (e.g., glutamines, arginine, histamine, etc.) using stochastic mode. The screening method that uses these sensors is very close to diagnosis for different types of cancer, the method being based on the use of an electrochemical, enantioselective, innovative platform for screening saliva, urine, blood and tissue samples.

INVENTION #51

MEDICINE – HEALTH CARE – COSMETICS

MINERAL PREMIX USED FOR LAYING HENS REARED IN ECOLOGICAL SYSTEM

Authors: ŞTEF LAVINIA, JULEAN CĂLIN, SIMIZ ELIZA, PEŢ IOAN

Organization: University of Life Sciences King Mihai I from Timisoara

The invention refers to development and verification of a mineral premix structure intended for laying hens maintained in ecological systems. The formulation of specific mineral premix is based on establishing through laboratory analysis the microelement intake of the main feeds used in the diet. The micro-mineral intake values of the basic feed have been determined to be 60 ppm Fe, 20 ppm Mn, 28 ppm Zn, 7 ppm Cu, 0.12 ppm Co, 0.06 ppm I, and 0.26 ppm Se, indicating a fulfillment of mineral requirements in the proportion of 70-100% and the necessity of supplementation through premixes. -through direct experiments, a mathematical equation was established for each of the 7 studied microelements, resulting in the following values: 10 ppm Fe, 20 ppm Mn, 20 ppm Zn, 1.5 ppm Cu, 0.125 ppm Co, 0.2 ppm I, and 0.10 ppm Se. The specific mineral premix structure was developed, consisting of: 19.122% heptahydrate iron sulfate, 65.502% tetrahydrate manganese sulfate, 12.670% heptahydrate zinc sulfate, 2.419% pentahydrate copper sulfate, 0.211% heptahydrate cobalt sulfate, 0.038% sodium iodide, and 0.038% sodium selenite, which are incorporated into a calcium carbonate carrier. The premix is introduced in a proportion of 0.5% in the concentrates mixture.

INVENTION #60

MEDICINE – HEALTH CARE – COSMETICS

Forearm model for practicing arterial catheter mounting and arterial puncture

Authors: Ovidiu Alexandru MEDERLE, Dumitru ȘUTOI, Daian Ionel POPA, Alexandru Bogdan PUȘCAȘ, Cosmin Iosif TREBUIAN, Cosmin LIBRIMIR, Octavian Marius CREȚU, Augustin SEMENESCU

Organization: University of Medicine and Pharmacy „Victor Babeș”

The invention consists of a mold that imitates the anatomy of the ventral region of the right forearm, made for the purpose of learning and practicing the mounting of the arterial catheter through the Seldinger maneuver by medical students and resident doctors, especially from the branch of anesthesia and intensive care and emergency medicine. The cast consists of a solid base surrounded by material such as loose connective tissue and adipose tissue. Inside, from right to left, it shows: a solid structure similar to the radius bone, followed by another structure imitating the radial groove, above which is the radial artery (simulated by means of a Folley bladder probe due to its structure, which exhibits the property of elasticity), attached proximally to a closed circuit that connects to a 50 ml syringe; by means of the syringe piston, manually, a rhythmic, pulsating positive pressure is created, which simulates the physiological pulsating wave of the radial artery). To the left of the radial groove, two other solid structures are found: the flexor carpi radialis tendon and the median nerve. The leftmost solid structure simulates the ulna. The advantages of the invention are represented by: improving the rules of asepsis and antisepsis, practicing and practicing arterial puncture and mounting the arterial catheter through the Seldinger maneuver until the practitioner considers that he has acquired sufficient experience, reduces the risk of complications during and post-intervention, represents an extrinsic motivational source, the use of surgical instruments and practice of surgical nodes, the low cost, the short time of realization and the possibility of easy acquisition by those who wish.

INVENTION #61

MEDICINE – HEALTH CARE – COSMETICS

Lumbar region model for practicing lumbar puncture and locoregional anesthesia type rachianesthesia

Authors: Ovidiu Alexandru MEDERLE, Dumitru ȘUTOI, Romeo Theodor STOIANOV, Cosmin Iosif TREBUIAN, Cosmin LIBRIMIR, Octavian Marius CREȚU, Augustin SEMENESCU

Organization: University of Medicine and Pharmacy „Victor Babeș”

The invention relates to a method of learning and practicing two practical maneuvers common in the intra-hospital environment, especially in the field of anesthesia and intensive care. By means of this invention, lumbar puncture and spinal anesthesia can be practiced. The mold consists of a skeleton of 5 lumbar vertebrae made of polylactic acid that imitates the anatomy of the lumbar region, and other elements that simulate the anatomical layers of this region. This structure offers the practitioner the possibility of recognizing the intervertebral spaces, choosing the puncture site and performing the maneuver both by the classic method with needles specially designed for performing spinal anesthesia. The main advantages of this invention are the decrease in the rate of complications caused by the way of execution, the possibility for inexperienced doctors to effectively practice both quantitatively and qualitatively the lumbar puncture and spinal anesthesia, the short time of making the mold and the low cost. The technical problem that the invention solves consists in reducing the training time of resident doctors from the above-mentioned branches of specialization in the case of invasive procedures performed at the lumbar level, as well as increasing the degree of difficulty of the procedure by simulating the type of "difficult back" to gain experience in performing lumbar puncture on a patient with vertebral pathology. The advantages of the invention are as follows: • the possibility of simulating the procedure with different degrees of difficulty; • the possibility of using all types of needles intended for lumbar puncture or spinal anesthesia (Quincke, Spinocan, Pencil-Point); • the molding time is short; • low realization cost; • wear is low. A mold can be used for hundreds of punctures, only some elements of the structure need to be replaced.

INVENTION #62

MEDICINE – HEALTH CARE – COSMETICS

Device and method for cryoinclusion of tissue material for microscopic examination

Authors: Vaduva Adrian Ovidiu

Organization: "Victor Babes" University of Medicine and Pharmacy Timisoara

The invention describes a portable device and method for cryoinclusion of biological tissues, for microscopic evaluation purposes, used especially in hospitals and research laboratories. The advantages of the device are : extended autonomy, low weight – easy to transport, training for use is done in short time, passive device – does not require additional cooling agents (liquid nitrogen, dry ice or a compressor), equipped with an element for monitoring its functionality.

INVENTION #63

MEDICINE – HEALTH CARE – COSMETICS

Crenelated dental veneers

Authors: Maroiu Alexandra-Cristina, Sinescu Cosmin, Rominu Mihaita, Negrutiu Meda-Lavinia, Rusu Laura-Cristina, Levai Codrina-Mihaela

Organization: "Victor Babes" University of Medicine and Pharmacy Timisoara

The invention relates to a new marginal contour of dental veneers, that consists of several sinusoidal lines which form peripheric junctions, thus increasing the surface contact with the enamel. As a result, they augment both the adhesion and retention forces of the restoration to the dental support. In order to create the crenelated veneer, it is necessary to perform a specific dental preparation, namely: reduction of the vestibular face by 0.5-0.8 mm, reduction of incisal margin by 1 mm and contouring 3 marginal sinusoidal lines with the following characteristics: 2.5-3 mm height and variable depth: 0.6-0.8 mm (cervical), 0.4-0.6 (middle) and 0.3-0.4 mm (incisal). Accordingly to one of our recent experimental studies, crenelated veneers increase the adhesive forces by more than 60%, thus decreasing the probability of veneer detachment. Moreover, they provide higher retention forces due to the peripheral micro-retentions that form an intricated joint between the veneer and the substrate. Last, but not least, the new design assures a more accurate positioning of the veneers in situ during the luting procedure. The crenelated veneers seem to represent a successful long-term treatment option in esthetic dentistry.

INVENTION #64

MEDICINE – HEALTH CARE – COSMETICS

Medicated composition with propranolol hydrochloride and eucalyptol for topical treatment of infantile hemangiomas

Authors: Vlaia Lavinia-Lia, Olariu Ioana-Viorica, Coneac Georgeta-Hermina, Lupuliasa Dumitru, Vlaia Vicentiu, Mut Ana-Maria

Organization: "Victor Babes" University of Medicine and Pharmacy Timisoara

This patent refers to a novel composition of medicated hydrogel for human use, containing propranolol hydrochloride and eucalyptol, intended for topical treatment of infantile hemangiomas. The medicated composition overcomes the disadvantage of low percutaneous permeation of propranolol hydrochloride, due its combination with eucalyptol, monoterpene used as penetration enhancer. According to the patent, the composition is: 1...3% propranolol hydrochloride, 2...5% eucalyptol, 2.5% hydroxypropylmethylcellulose, 10...20% propyleneglycol, 30...50% ethanol and distilled water to 100% (w/w). Compared to few topical propranolol hydrochloride compositions described in literature, the present invention can be considered a safer and more effective drug for topical treatment of infantile hemangiomas.

INVENTION #79

MEDICINE – HEALTH CARE – COSMETICS

”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” (www.DoctorTech.ro)

Authors: VELCEA Marian, MOLDOVAN Ion-Corneliu, PLOTOG Ioan, MIHĂILESCU Bogdan, HIDEG Cătălin, CARACAS Eugen

Organization: Asociatia de Inventatori Justin Capra / Doctor Tech SRL

RO132423A2 / WO2018037379 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)

INVENTION #80

MEDICINE – HEALTH CARE – COSMETICS

Composite food product and technology for manufacturing the composite food product consisting of microplants (sprouts/microgreens) and substrate for food use

Authors: Livadariu Oana, Băbeanu Narcisa Elena, Barbu Lavinia-Diana-Nicoleta, Boiu-Sicuia Oana-Alina, Peticilă Adrian George, Constantin Carmen Gabriela, Dobrin Aurora, Ion Violeta-Alexandra, Venat Cosmina Oana Arabela, Nicolae Ioana Cătălina, Lagunovschi-Luchian Viorica, Badea Monica Luminița

Organization: Universitatea de Stiinte Agronomice si Medicina Veterinara Bucuresti

RO - Patent application no. A/000392023 entitled "Composite food product and manufacturing technology of the composite food product consisting of microplants (germs/microgreens) and food substrate", inaugurates a new class of products for human use, both for ordinary consumers and for those who need a personalized diet. Such a diet should be able to support the physiological needs of the human body and keep it functioning even when it is the site of a battle with an extreme medical diagnosis (eg cancer). It should also facilitate the desire of patients to restore their vitality and return to their previous lifestyle. There is ongoing research into the manufacture of products according to the patent. EN - The Patent Application no. A / 00039 on 30.01.2023 registered at OSIM in Bucharest - Romania, with title "Composite food product and technology for manufacturing the composite food product consisting of micro-plants (sprouts/microgreens) and substrate for food use", is a result of the Project with title "Production technology of aromatic microplants in an innovative cultivation system (MICROLED)" was funded by the University of Agronomic Sciences and Veterinary Medicine of Bucharest through Project no. 1067/15.06.2022. This Patent inaugurates a new class of products for human use, both for ordinary consumers and for those in need of a personalized diet. Such a diet should be able to support the physiological needs of the human body and keep it functioning even when it is the site of a battle with an extreme medical diagnosis (e.g. cancer). It should also facilitate the patients' desire to restore their vitality and return to their previous lifestyle. There is ongoing research on manufacturing products according to the patent.

INVENTION #85

MEDICINE – HEALTH CARE – COSMETICS

SAM VR-Social autobiographical memory stimulation virtual reality app

Authors: Claudiu Papasteri Alexandru I. BerceanuTeofila Rădeanu, Ciprian Făcăeru, Cătălina Poalelungi, Alexandra Sofonea, Romina Blodașu, Ioana Carcea, Dragos Cirneci

Organization: UNATC IL Caragiale

Virtual reality (VR) increasingly permeates medical practice, facilitating new health interventions and diagnostic tools. We have desiged and produced SAM VR a memory training tasks that could help delay or alleviate cognitive aging providing social interaction vith a virtual character. Currently it is not clear if VR-based memory tasks or mixed reality (MR and virtual) tasks are as efficient as those administered by human providers and not a full understanding of VR effects on human physiology and procedures might also conceal undesired effects along with the benefits. To address these questions, we tested the SAM VR application against several odor-triggered autobiographical task in MR environments. We created different MR environments with increasing contributions of VR elements, from no contribution (MR0) to predominant contribution (MR3). In our runt test we found that subjects recalled comparable numbers of autobiographical memories in all MR environments and that the MR3 environment, including a virtual social interaction, our proposed SAM VR experience triggered the longest recalls. The MR0 environment triggered the lowest valence memories. In our test we find that SAM VR is useful in memory training and out study also highlights the effects of increasing VR elements on endogenous oxytocin levels, a physiological correlate of the impact of social interactions. SAM VR was also tested with persons with cognitive decline with good results suggesting its future use in clinical setting for persons with mild cognitive decline as experienced in early Alzheimer's disease stages. Currently there are no cures for Alzheimer's disease, therefore efforts in improving living conditions and memory decline through palliative care is of great importance.

INVENTION #88

MEDICINE – HEALTH CARE – COSMETICS

VERSACRYL: HEAT-SENSITIVE MOLDABLE MULTI-PURPOSE DENTURE ACRYLIC “BITEM” (Biocompatible Intraoral Thermo-Elastic Acrylic Material)

Authors: BOB HUYBRECHTS, RDT

Organization: Innovation Initiative Co-operative Inc. “The Inventors Circle"

Acrylic adjustable by heat from warm water – a thermo-elastic acrylic has received regulatory approval from Health Canada and Health Australia, the FDA Approval, and CE Mark in Europe. BITEM can be used for any part of a dental appliance and it is adjustable simply by using warm water. It can be used by patients to adjust their own fit and control comfort level of their dentures. It is acrylic, consistency controllable, “thermo-elastic”, and it has a memory. Cross-linked chemical bond to itself and all other acrylics. Heat and Self Cure, or a combination of both and also allows tracking back. This innovative thermo-elastic acrylic can create any part of a dental appliance to become adjustable, simply by using warm water. It can be extended, for example, into any undercut to mechanically retain a denture; it can be used to produce repeatable thermo-relines; it can replace metal clasps on partials; it can create sublingual wings to stabilize lower dentures and much more. In addition, the consistency of VERSACRYL is pre-determined to furnish a complete range of rigidities; from traditional hard to very soft when heated. The material also possesses an internal memory, which maintains a stable reference point, since it can always be returned to its original shape.

INVENTION #90

MEDICINE – HEALTH CARE – COSMETICS

Adjuvant food in the prevention/treatment of non-alcoholic hepatic steatosis

Authors: Irina Matran, Claudia Banescu, Rodica Talmaci

Organization: George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures

More than half of the total number of diabetics have significant fat deposits in the liver. Additionally, hepatic steatosis increases the risk of hypertension, cardiovascular and excretory system pathologies. This pathology is frequently associated with obesity, impaired glucose tolerance, diabetes mellitus and dyslipidemia, which is why it has been described as a hepatic manifestation of the metabolic syndrome. An adjuvant food in the prevention and/or treatment of non-alcoholic fatty liver disease, prebiotic, with high protein content and low glycemic index has been developed. It is 1005 natural and does not contain dyes, preservatives, gluten or lactose. Prevents/treats non-alcoholic hepatic steatosis by lowering liver enzymes: aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), total cholesterol (CT) and blood sugar. The new food can be consumed in the car, office, subway, or traditionally, in the family. The efficacy of this food has been preclinically verified in male and female Sprague-Dawley rats, the newly developed food, related notices. Both the ingredients and the packaging of this food contribute to the achievement of the Sustainable Development Goals (SDGs), respectively the transition of innovations/ intellectual property to sustainability.

INVENTION #92

MEDICINE – HEALTH CARE – COSMETICS

Advanced sensor technology for pelvic floor muscles assessment

Authors: Alina-Roxana Miron

Organization: Univ Ghe. Asachi Iasi

Evaluating muscle strength is pivotal in physical therapy, yet it poses particular difficulties when it comes to the pelvic floor muscles (PFM) owing to their positioning and restricted mobility. The assessment of these muscles yields valuable information about the patient's capacity to engage and uphold the pelvic organs (bladder, bowel, uterus) and abdominal structures, thereby sustaining sphincter function, stability during locomotion, and blood flow. Furthermore, it aids in monitoring alterations in PFM functionality and robustness throughout the rehabilitation journey. Different assessment methods like palpation, visual inspection, electromyography (EMG), ultrasound, or magnetic resonance imaging (MRI) can capture distinct facets of PFM activity. Nevertheless, these approaches demand specialized facilities, equipment, skilled personnel, and may cause discomfort for the patient. The unique feature of the innovative sensory system will be to alleviate these limitations. The proposed sensory device will consist of a Foley urinary catheter integrated with a fluid-activated sensor. This sensory system will be linked to the balloon port lumen of the Foley catheter. This design enables easy attachment and detachment of the sensory device from the urinary probe, rendering it suitable only for patients who require it. The advantages of this innovative sensory device are manifold: the Foley catheter is suitable for both genders, cost-effective, and widely employed. It can serve as a point of reference for locating and engaging the pelvic floor muscles, managed by medical professionals, comfortable for extended wear and home use, reduces the need for additional equipment and assessment space, and can assist patients in performing exercises while documenting potential treatment progress.)

INVENTION #106

MEDICINE – HEALTH CARE – COSMETICS

Suport spinal adaptiv cu rigiditate variabila realizat din metamateriale programabile

Authors: Florin Bogdan Marin, Laura Daniela Buruiana, Mihaela Marin

Organization: "Dunarea de Jos" University of Galati

The present invention relates to an adaptive spinal support system with variable stiffness to meet individual anatomical and therapeutic needs and also making it suitable for medical applications where during the rehabilitation there is need to adapt the support stiffness in time. The support system utilizes programmable metamaterials composed of structures with tunable mechanical properties enabling dynamic adjustments in stiffness and flexibility in response to the treatment evolution. The metamaterials in the support structure are configured to allow precise adjustments at specific regions along the spine using a robot that modify structures composing the metamaterial. This invention integrates sensor technology to monitor real-time spinal alignment, pressure points, adjusting the stiffness accordingly to medical treatment. The adaptive response can be controlled manually by the user or automatically by a programmable robot. The innovation also allows for customization to meet individual anatomical and therapeutic needs, making it suitable for medical applications, rehabilitation, and daily use. This adaptive spinal support provides a lightweight, ergonomic, and efficient solution for dynamic spinal support, revolutionizing traditional approaches to spinal braces and support devices.

INVENTION #119

MEDICINE – HEALTH CARE – COSMETICS

Nanocomposite material based on poly(methyl methacrylate) and titanium dioxide nanoparticles for 3D printed dental prostheses and the method of obtaining it

Authors: Cristache Corina Marilena, Eftimie Totu Eugenia, Nechifor Gheorghe, Didilescu Andreea Cristina, Nechifor Aurelia Cristina

Organization: "Carol Davila" University of Medicine and Pharmacy, Bucharest

The invention relates to a 3D printable composite material made from poly(methyl methacrylate) with titanium dioxide nanoparticles and a method for obtaining thereof. According to the invention, the process for obtaining nanocomposite material was based on critical steps namely: (i) the use of a controlled solvo-hydro-thermal synthesis to obtain titanium dioxide nanoparticles, (ii) introduction of titanium dioxide nanoparticles into a polymeric matrix solution of polymethyl methacrylate to which polyethylene methacrylate, methyl methacrylate monomer, and dibenzoyl peroxide promoter are added, where UV radiation sustains the cross-linking, and (iii) formation of the polymethyl methacrylate-based polymer matrix. The obtained nanocomposite material was characterized by having a weight percentage content of 0.4% titanium dioxide nanoparticles, a homogeneous structure, a uniform distribution of TiO2 nanoparticles in the polymer matrix, capable of withstanding a compression of 8023.31 N for a compression deformation of 1.09%, a shear strength of 239x106 Pa for a deformation of 0.91%, a glass transition temperature (Tg) of 118°C, a melting temperature of 335°C, and antimicrobial activity against Candida scotti species, as appropriate in creating 3D printed dental prostheses.

INVENTION #120

MEDICINE – HEALTH CARE – COSMETICS

Microemulsions with miconazole for buccal application and method for obtaining thereof

Authors: Popa Lăcrămioara, Dinu-Pîrvu Cristina-Elena, Ghica Mihaela Violeta, Anuța Valentina, Prisada Răzvan Mihai, Talianu Marina-Theodora

Organization: "Carol Davila" University of Medicine and Pharmacy, Bucharest

The invention refers to a miconazole-based microemulsion, intended for oromucosal application to treat oral candidiasis and a method for obtaining thereof. According to the invention, the microemulsion was prepared using an accessible low-energy method. The composition is advantageous due to an improvement in miconazole solubility with the aid of oleic acid and a stabilizer mixture composed of Tween 20 and polyethylene glycol 400, mixed in particular proportions with an aqueous phase containing xylitol. Thus, the technical issue solved by the invention consists of (i) designing a topical oromucosal system as oil in water microemulsion, (ii) selection of two phases, an aqueous and an oil phase, a stabilizer mixture formed by a surfactant and a cosurfactant, (iii) selection of a sweetener agent, combined in various ratios to obtain a stable system characterized by adequate rheological behavior described by Newtonian flow, nanometric-scale droplets, high hydrophilicity, and enhanced miconazole diffusion as favourable parameters for local displaying and antifungal activity at the oromucosal site.

INVENTION #121

MEDICINE – HEALTH CARE – COSMETICS

Gels with naproxen for skin application and method for obtaining them

Authors: Ghica Mihaela Violeta, Dinu-Pîrvu Cristina-Elena, Popa Lăcrămioara, Anuța Valentina, Prisada Răzvan Mihai, Velescu Bruno Ștefan, Tudoroiu Elena-Emilia

Organization: "Carol Davila" University of Medicine and Pharmacy, Bucharest

The invention relates to a gel based on hydroxyethyl cellulose and various penetration promoters to ensure the release of a non-steroidal anti-inflammatory drug, intended for skin application in the treatment of acute soft tissue injuries, and to a method of obtaining it. The technical problem that the invention solves consists in: (i) designing a gel for skin application based on a semi-synthetic biopolymer (hydroxyethylcellulose) and a mixture of penetration promoters (Transcutol, polyethylene glycol 200, ethyl alcohol and isopropyl alcohol) combined in different proportions, (ii) selecting naproxen as non-steroidal anti-inflammatory, and loading it in different concentrations in the gel base, to obtain an appropriate drug delivery system. The resulting semisolid gel-based system with skin application is characterized by adequate rheological profiles that allow proper conditioning and spreading on the skin surface, improving the patient compliance to the treatment. The obtained gel exhibits a sustained release of naproxen over several hours, providing pain relief associated with soft tissue injury, followed by a gradual release to relieve inflammation.

INVENTION #129

MEDICINE – HEALTH CARE – COSMETICS

Jacuzzi system for thermalism with hydro-/air-massage and halochamber treatments with solions

Authors: I.G. SANDU, A.V. SANDU, I. SANDU, K. EARAR, V. VASILACHE, C.M. ŞTIRBU, R.A. CRIȘAN DABIJA, M. CHIRAZI, A. VLADESCU, M.C. COTRUT, M.D. VRANCEANU

Organization: Gheorghe Asachi Technical University of Iasi

The invention relates to a jacuzzi system for thermalism with hydro-/air-massage and halochamber treatments with solions, to be used for the prevention and treatment of cardio-respiratory, osteo-muscular and neuro-motor diseases as well as for improving performance in children, elderly and sportsmen or persons performing intense physical activity. The system consists of a parallelepipedal or circular tight chamber, with ionized windows, with UV filters, having, in central position, a round-, oval- or lagune-shaped basin made of glass fibers and photo-thermal resistive polymer, an aerosol-generating bubbling device with concentrated solution of NaCl, KCl, CaCl, MgCland KI in a mass ratio equal to 7.95 : 1,0 : 0.5 : 0.5 : 0.05, where, through the frits from the bottom side, overheated water vapours are purged to reach the preset levels of solions, the bubbling device being placed in a niche next to the entrance door, where for the control, in real time, of the working parameters, there are used devices with specific sensors coupled to a microcomputer, which also enables modification of the water vapour flow-rate for bubbling, the basin volume is correlated with the halochamber volume and it ranges between 1000 and 10000 liters, with a depth of 0.5...1.5 m, and the working temperature ranges between 35...40°C, on the walls, the system having a network of uniformly zig-zag distributed purging nozzles for hydro- and air-massage, the jets from the two sets of nozzles being obtained by pressurized recycling of the concentrated salt solution from the basin and the solion-charged air from the halochamber, the volume of saturated solution from the bubbling device needs to be higher than 1/20000 of the halochamber volume, and the bubbling device, which has above a limewood grate for retaining drops, is only half filled with the salt solutions which are at the saturation limit, with a temperature within the range of 75...80°C.

INVENTION #143

MEDICINE – HEALTH CARE – COSMETICS

DEVICE FOR PERFORMING ARTERY PUNCTURE WITH VIEW TO SAMPLING BLOOD FROM RADIAL ARTERY

Authors: Mocan Bogdan, Universitatea Tehnică din Cluj-Napoca Mocan Mihaela, UNIVERSITATEA DE MEDICINĂ ȘI FARMACIE „IULIU HAȚIEGANU” CLUJ-NAPOCA

Organization: Technical University of Cluj-Napoca

The invention relates to a device for effectively performing arterial puncture to collect a blood sample from the radial artery. The device for performing the arterial puncture in order to collect a blood sample from the radial artery allows proper immobilisation of the patient's forearm, facilitates precise identification of the radial artery position even in the case of a reduced peripheral pulse, allows visualization of the subcutaneous area of the vein plane from the area under consideration to avoid their puncture, and maintain the needle orientation at a precise angle to the central horizontal plane of the patient's forearm.

INVENTION #154

MEDICINE – HEALTH CARE – COSMETICS

Antimicrobial agents with quinolone structure, RO 137326 A2 / 30.03.2023

Authors: Lucia Pintilie

Organization: National Institute for Chemical Pharmaceutical R&D

The invention refers to derivatives with a quinolone structure with antimicrobial activity against gram-positive and glass-negative microorganisms, which are defined by the general formula I, in which R6 is fluorine, chlorine, hydrogen, methyl, and R7 is 3,5-dimethyl-piperazinyl, homopiperazinyl, piperazinyl, 4-methyl-piperazinyl. Derivatives with quinolone structure are used in the treatment of infections caused by gram-positive and gram-negative microorganisms. Among the synthesized compounds, FPQ55 (II) shows the best antibacterial activity : CMI against E. coli ATCC 8739: < 0.25 µg/ml and against St. aureus ATCC 6538 :0.5 µg/ml .

INVENTION #155

MEDICINE – HEALTH CARE – COSMETICS

Procedure for obtaining molecularly imprinted polymers through green synthesis

Authors: Bogdan-Cezar Iacob, Andreea-Elena Bodoki, Ede Bodoki

Organization: University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

Molecular imprinting enables the fast, versatile, robust and cost-effective synthesis of biomimetic polymeric receptors with tailored selectivity for a wide variety of target molecules. Solvents are a critical component in the synthesis of molecularly imprinted polymers (MIPs), both as a porogen and a reaction media, however their use comes with additional challenges: environmental concerns, target molecule binding to the polymer matrix interference, the use of specific solvents or solvent mixtures. To address some of the above-mentioned issues, but also to explore potential opportunities or further constraints, we report the first solvent-free mechanochemical synthesis of MIPs via liquid-assisted griding (LAG). Molecularly imprinted polymers (MIPs), are established artificial molecular recognition platforms with tailored selectivity towards a target molecule, whose synthesis and functionality are highly influenced by the nature of solvent employed in its synthesis step. Steps towards the “greenification” of the molecular imprinting technology (MIT) has already been initiated by the elaboration of green MIT principles, however developing MIPs in a solvent-free environment may not only offer an eco-friendly alternative, but could also significantly influence the affinity and expected selectivity of the resulting binding sites. In the current study among the first solvent-free mechanochemical synthesis of molecularly imprinted polymers (MIPs) via liquid-assisted griding (LAG) is reported. The successful synthesis of the imprinted polymer has been functionally demonstrated measuring its template rebinding capacity, as well as the selectivity of the molecular recognition process in comparison with the ones obtained by the conventional, non-covalent molecular imprinting process in liquid media. Results demonstrated similar binding capacities towards the template molecule and superior chemoselectivity compared to the solution-based MIP synthesis. The adoption of green chemistry principles with all its inherent advantages in the synthesis of MIPs, may not only be able to alleviate potential environmental and health concerns associated with their analytical (e.g. selective adsorbents) and biomedical (e.g. drug

carriers or reservoirs) applications, but might also offer a conceptual change in the molecular imprinting technology.

INVENTION #156

MEDICINE – HEALTH CARE – COSMETICS

8-chloro-quinoline-carboxylic acids with antimicrobial activity and their preparation process

Authors: Lucia Pintilie

Organization: National Institute for Chemical Pharmaceutical R&D

The invention relates to quinolones (I) with antimicrobial activity and to a preparation process, in which: R6 = fluorine or chlorine, R = hydrogen, acetyl, methyl, R1 = hydrogen, methyl, and R8 = hydrogen or chlorine. The steps of the process: protecting the piperazine nitrogen of quinolone in which R6 = fluorine or chlorine; R = R1 = R8 = hydrogen, the chlorination of the compound wherein which R6 = fluorine or chlorine; R = acetyl, R1 = R8 = hydrogen, quinolone hydrolysis wherein R6 = fluorine or chlorine; R = acetyl, R1=hydrogen and R8 = chlorine. From the synthesized compounds, the compound FPQ 50 shows a better antibacterial activity against E. Coli (MIC 2 µg/mL) and St. Aur. (MIC 4 µg/mL). Docking studies have been performed to achieve accurate predictions on the optimized conformations for both ligand and protein targets E. Coli (PDB ID:1S14) (II) and St. Aur (PDB ID:5CDQ) (III) to form a stable complex. I: General Formula of New quinolones compounds II. Hydrogen bonds between FPQ50 (score: -56.00; RMSD 0.16) and SER 1043, ASP 1069 and THR 1163 amino acids from 1S14 III. Hydrogen bonds between FPQ50 (score: -36.59; RMSD 0.02) and SER 84, DG 2009:F, DC 2012:E, and DA 2013:E amino acids from 5CDQ

INVENTION #157

MEDICINE – HEALTH CARE – COSMETICS

Device for fixation and stabilization of the lesser trochanter in case of trochanteric fractures associated with lesser trochanter fracture

Authors: Tomoaia Gheorghe, Benea Horea-Rares-Ciprian, Oltean-Dan Daniel, Tomoaia-Cotisel Maria, Oltean-Dan Gligor, Bodea Eugen

Organization: University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

The invention refers to a medical device for fixation and stabilization of the lesser trochanter in the case of trochanteric fractures associated with the fracture of the lesser trochanter, consisting of a plate provided with holes, for fixation on the femur with screws and with an inclined tubular part, for fixation of the trochanter to the femoral head with the help of a trans-trochantero-cervical-cephalic screw, known in itself and from a fin, arranged laterally facing the plate, the fin being fixed or foldable.

INVENTION #158

MEDICINE – HEALTH CARE – COSMETICS

Functionalized magnetic nanostructures as platforms for drug transport/release

Authors: Ioana Baldea, Anca Petran, cristian Iacovita

Organization: University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

The invention refers to a process for obtaining a core-shell magnetic nanostructure consisting of a magnetite core (Fe3O4) functionalized with a new biocompatible polymer Poly-3,4-dihydroxybenzylamine as a platform for the intracellular transport of drugs and mediator through magnetic hyperthermia of the oncological therapeutic procedure and the process of adsorption of doxorubicin. The process for obtaining Poly-3,4-dihydroxybenzylamine@Fe3O4 according to the invention consists in the steps of obtaining the magnetite core from Fe3O4-EDTA, followed by functionalization with 3,4-dihydroxybenzylamine (1:1). The doxorubicin adsorption process consists of the steps of dispersing Poly-3,4-dihydroxybenzylamine@Fe3O4, followed by functionalization with doxorubicin (20:1) then magnetic separation and successive washings. Poly-3,4-dihydroxybenzylamine@Fe3O4 is a biocompatible magnetic nanostructure internalized by normal fibroblastic, endothelial and breast tumor cells and selectively decreases tumor viability by magnetic hyperthermia. Doxo@Poly-3,4-dihydroxybenzylamine@Fe3O4 is internalized and produces, through magnetic hyperthermia, decreased cell viability, apoptosis and selective cell cycle arrest of breast tumor cells.

INVENTION #159

MEDICINE – HEALTH CARE – COSMETICS

Procedure for obtaining functionalized nanostructures with applicability in colon cancer treatment

Authors: Mocan Teodora, Matea Cristian, Iancu Cornel, Agoston Vas Coldea Lucica, Tăbăran Flaviu, Mocan Lucian

Organization: University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

The invention relates to a process for preparing a product to be applied in targeting neoplastic cells in colon cancer and to make the photo-thermal effect selective. According to the invention, the process consists in the preparation, in the first step, of gold nanoparticles stabilized with citrate, which is then replaced by thioctic acid, after which they are functionalized by covalent binding with anti-MUC-1 antibody, after which - the functionalized nanoparticles are subjected to successive steps of centrifugation and redispersion by ultrasound treatment in double distilled water for removal of secondary reaction products.

INVENTION #160

MEDICINE – HEALTH CARE – COSMETICS

Procedure for obtaining functionalized nanostructures with applicability in targeted antibacterial treatment

Authors: Mocan Lucian, Matea Cristian, Pop Teodora, Mosteanu Ofelia, Mocan Teodora

Organization: University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

The invention refers to a method of preparing a product to be applied in antibacterial photo-thermal laser treatment. According to the invention, the process consists in the preparation, in the first stage, of gold nanoparticles stabilized with citrate, which are then replaced with mercaptosuccinic acid, after which they are functionalized by covalent binding with the anti-PBP2a antibody, then the nanoparticles thus functionalized are subjected to successive steps of centrifugation and redispersion by ultrasound treatment in double distilled water, to remove secondary reaction products.

INVENTION #161

MEDICINE – HEALTH CARE – COSMETICS

Teeth whitening gel composition based on natural agents

Authors: Moldovan Marioara, Prejmerean Cristina, Prodan Doina, Silaghi-Dumitrescu Laura, Saroși Codruța , Cuc Stanca, Dudea Diana

Organization: University of Medicine and Pharmacy "Iuliu Hatieganu" Cluj-Napoca

The patent concerns two gel formulas intended to improve tooth color, in the case of extrinsically caused dental dischromia (caused by dyes in food, colored drinks, oral rinse solutions) or internalized in the dental structure, dischromia caused by age. The two gels contain: Gel 1: plant extracts + nanohydoxyapatite; Gel 2-plant extracts and HA-ZnO, HA-TiO2, HA-SiO2, HA-F. The gels can be applied by brushing or kept in individualized thermoformed trays. Whitening systems based on natural agents have the following advantages: efficiency, through a detectable whitening effect, highlighted on extracted teeth and samples of composite materials, biocompatibility, they do not alter the surface roughness.

INVENTION #162

MEDICINE – HEALTH CARE – COSMETICS

BIOCOMPATIBLE MEDICAL DEVICE AND METHOD OF MAKING SAME

Authors: Ruxandra Vidu, Augustin Semenescu, Ileana Mariana Mates, Cristian Dragos Vidu,

Organization: University of California, Davis, USA

The present invention relates generally to biocompatible medical devices, such as cranial implants, and a method and means of attaching to bone. More specifically, the present invention relates to multilayered porous material with controlled porosity and drug load designed to control the release of drugs from a medical device. Additionally the present invention provides methods for controlling release of drugs by integrating the multilayer structure in medical devices with successive layers of polymer coatings of different porosities and drug contents. The multilayer material is inserted in between two plates such as meshes that provide strength to the implant. The present invention relates to biocompatible medical devices that has osseointegration and antibacterial properties. The present invention also relates to a method and means of attaching the medical device to defect in a bone structure and comprises of tree mounting parts configured to secure the medical in place.

INVENTION #164

MEDICINE – HEALTH CARE – COSMETICS

Microorganism and process for obtaining a microbial polysaccharide by biological synthesis

Authors: Roxana-Mădălina Stoica, Mişu Moscovici, Mihaela-Claudia Sevcenco, Georgeta Neagu

Organization: National Institute for Chemical-Pharmaceutical Research & Development, Bucharest, Romania

The invention relates to a process for obtaining a microbial polysaccharide by biological synthesis using the microorganism Rhizobium radiobacter ICCF 410, isolated from nature. The present invention describes the biosynthesis process of a polysaccharide called rhizoban, using a newly isolated bacterial strain of Rhizobium radiobacter and obtaining an original polysaccharide, with a different structure from other microbial polysaccharides known until now, consisting mostly of glucuronic acid (40-45%), glucose (30-35%), and rhamnose. Applications: - medicine and pharmaceutical industry, as a vehicle with selective target release of antitumor substances in cancer therapy; -cosmetic industry, for the development of cosmetic formulations with high moisturizing potential.

INVENTION #171

MEDICINE – HEALTH CARE – COSMETICS

NATURAL THERAPEUTIC COMPOSITIONS FROM MACROMYCETES AND OBTAINING PROCESS

Authors: Bubueanu Elena Corina, Popa Gabriela, Cornea Petruta, Zagrean Valentin, Munteanu Laurentiu, Grigore Alice, Pirvu Lucia, Iuksel Rasit, Panteli Minerva

Organization: National Institute for Chemical and Pharmaceutical R&D, ICCF Bucharest

Natural therapeutic composition, made entirely from mushroom extracts obtained from the species Agaricus campestris (field mushroom), Pleurotus ostreatus (oyster mushroom) and Laetiporus sulphureus (chicken-of-the-woods) OBTAINED from mushroom species (macromycetes), in different proportions, by 2 processes: (1) by combining individual, selective extracts; (2) by obtaining a selective extract from a mixture of raw materials The hypolipidemic effect was demonstrated by the method of hypolipidemic activity assay, in rats. Upon oral administration of the sample, at a dose of 5 ml/kg body weight, over a period of 15 days to rats with associated hyperlipidic diet, the results showed consistently lower values of blood cholesterol at 8 days (167 mg/dl) and at 15 days (164 mg/dl) compared to the control group with hyperlipidic diet, at 8 days (172 mg/dl) and at 15 days (170 mg/dl). Additionally, lower levels of triglycerides were observed at 8 days (100 mg/dl) and at 15 days (119 mg/dl) compared to the control group with hyperlipidic diet, at 8 days (114 mg/dl) and at 15 days (147 mg/dl). MADE for human use, for oral administration. Pharmacological experiments in vivo have shown, lack of toxicity, significant hyperlipidic effect. CHARACTERISTICS: ➢appearance – brown solution; ➢aromatic odor; ➢bitter taste; ➢solubility in alcoholic solutions; ➢content - 2.96...3.92% total polyphenols expressed in gallic acid. ➢content - Fe 1.3081 (mg/100g), Cu 0.0751 (mg/100g), Zn 1.1628 (mg/100g), Mn 0.0485 (mg/100g) INNOVATIVE Natural product, obtained from native macromycete species with a definite hypolipidemic effect, usable as an adjuvant in specific diseases FIELD OF APPLICATION Hypolipidemic therapies.

INVENTION #173

MEDICINE – HEALTH CARE – COSMETICS

HYDRO-ACTIVE DRESSING BASED ON BACTERIAL CELLULOSE FOR DERMAL WET MANAGEMENT

Authors: Angela CĂŞĂRICĂ, Paul Octavian STANESCU, Mişu MOSCOVICI, Catalin ZAHARIA

Organization: National Institute For Chemical - Pharmaceutical Research and Development – ICCF Bucharest

The present invention refers to an atraumatic hydro-active/bioactive dressing, based on fibrillar nanocellulose film and a bioactive mixture rich in natural compounds with high bioavailability (organic red vine extract, propolis extract, natural tocopherol, natural levomenol, natural vitamins and oily plant extracts). According to the invention, this is a dermatocosmetic dressing, hydro-active/bioactive and totally biocompatible, with local atraumatic and anatomical adhesion, with increased malleability and stability, with antibacterial, antifungal action; it confers to the application area a calming, nourishing, regenerating, fast and optimal effect, preventing infection and restoring skin integrity, with optimal local disinfection and hydration, with synergic effect.

INVENTION #174

MEDICINE – HEALTH CARE – COSMETICS

Device for determining the occlusal plane

Authors: RUSU Vasile, MD; SOLOMON Oleg, MD; RUSU Andrei MD. Erar Kamel RO.

Organization: Universitatea de Stat de Medicină și Farmacie „Nicolae testemițanu

The invention relates to medicine, in particular to dentistry, and can be used for determining the occlusal plane for the manufacture of dental prosthesis. Summary of the invention consists in that the device comprises three components of the same shape, made of stainless steel, placed one above the other and interconnected with an adessive, forming a U-shaped frame, at an angle of 45°.

INVENTION #175

MEDICINE – HEALTH CARE – COSMETICS

SILICONE KEY FOR INDIVIDUALIZED HEALING ABUTMENT CREATION

Authors: Oleg Solomon

Organization: Universitatea de Stat de Medicină și Farmacie „Nicolae testemițanu

The present invention relates to an innovative silicon key used for manufacturing individualized healing abutments in implant dentistry. This silicon key allows for the precise reproduction of the emergence profile of existing natural teeth, thereby ensuring an individualized approach in the treatment of prosthetic restorations on implants.

INVENTION #179

MEDICINE – HEALTH CARE – COSMETICS

A Sitting and Standing Balance Assessment Device

Authors: Kiattisin Kanjanawanishkul and Noppachai Khongcharern

Organization: Mahasarakham University

A sitting and standing balance assessment device has been developed to monitor the patient's weight bearing during sitting and standing exercises. This helps the patients know whether or not they have performed the procedure correctly. The sitting balance training equipment uses 2 load cells to measure weight on both sides. The weight difference is displayed on the screen. The standing balance training equipment uses 4 load cells, divided into 2 sets for each foot, to measure weight bearing on both the toes and heels. The difference between the four load cells indicates the weight bearing of the feet and then is visualized on the screen. In addition, training results can be summarized in the form of graphs to be used for analysis and comparison before and after training.

INVENTION #186

MEDICINE – HEALTH CARE – COSMETICS

ANTI-SEDENTARY ERGONOMIC ASSEMBLY FOR THE HOME OFFICE

Authors: ȚÎȚU Aurel Mihail, MĂRGINEAN Ion, ȚÎȚU Ștefan, BOGORIN PREDESCU Oana, BOGORIN PREDESCU Adrian, MOLDOVAN Alexandru Marcel, OPREAN Constantin

Organization: Lucian Blaga University of Sibiu

The invention relates to a piece of furniture which replaces persons' long motionless sitting while watching TV and working at the computer, with a sitting providing a continuous mobility of the human body skeletal structure. According to the invention, the piece consists of a chair having an ergonomic seat placed above a base plate fixed to a telescopic leg which rolls on some swinging rollers, between the seat and the base plate, there being an electro-mechanical oscillating assembly provided with a linear electric actuator, which imparts two simultaneous continuous oscillating movements to the seat, one of left-right inclination by 4° related to the horizontal and the other of rotation in the horizontal plane by an angle of 10° related to a median position, the repeated linear movement of the actuator being converted into two angular movements of the seat by means of a central hub.

INVENTION #188

MEDICINE – HEALTH CARE – COSMETICS

Composite material for dental restoration with increased compression strength and antimicrobial properties and method of producing it

Authors: Radu Claudiu Fierascu, Roxana Ioana Brazdis (Matei), Anda Maria Baroi, Toma Fistos, Irina Fierascu, Irina Elena Chican, Lia Mara Ditu

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest

The present invention refers to a composite material with improved mechanical properties and antimicrobial effect, intended for use in dental applications, consisting of aluminofluorosilicate glass with a particle size below 45 μm, the liquid component of the glass ionomer cement and an antimicrobial component with a role in improving the properties mechanical, consisting of apatite material (of the hydroxyapatite type - Ca10(PO4)6(OH)2 in which the calcium:magnesium ratio is 10:0..1:1) decorated with silver nanoparticles having a crystallite size below 15 nm, phytosynthesized using extracts of plants from the Lamiaceae family, such as hyssop (Hyssopus officinalis L.), white horehound (Marrubium vulgare L.), oregano (Origanum vulgare L.) or white dead nettle (Lamium album L.) and eugenol in concentration 7..14% (alcoholic solution), the procedure for obtaining the composite material consisting of five stages, obtaining the apatite material (in which calcium may or may not be partially substituted with magnesium) by the sol-gel method, the phytosynthesis of silver nanoparticles, the decoration the apatite material with metallic nanoparticles and the phenolic compound (eugenol) followed by mixing with the aluminofluorosilicate glass until complete homogenization, and in the fifth stage the liquid component of the glass ionomer cement is added. Acknowledgements. This work was supported by a grant of the Ministry of Research, Innovation, and Digitization, CNCS-UEFISCDI, project number PN-III-P4-PCE-2021-0292, within PNCDI III.

INVENTION #190

MEDICINE – HEALTH CARE – COSMETICS

Nanocarriers with natural endoperoxide

Authors: Denis Panaitescu, Adriana Frone, Gabor Raluca, Catalina Usurelu, Madalina Oprica, Cristian Nicolae, Dorian Radu

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM Bucharest

The invention refers to several processes for obtaining more efficient artemisinin-carrier systems with multiple therapeutic effects, including anti-inflammatory, antibacterial, antiviral, antidiabetic, and anti-cancer. Based on its special properties, artemisinin, known firstly as an antimalarian drug, is expected to be a valuable medicine for many other diseases. However, its low water solubility and high sensitivity to the enzymes in human body reduce its efficiency and prevent the desired effects from being achieved. Additionally, the extensive chemical modification of artemisinin is restricted by the presence of the endoperoxide bridge, whose decomposition is the basis of the efficient action mechanism of artemisinin against bacteria, viruses or for apoptosis in human cancer cells. Therefore, this invention proposes several processes for encapsulating artemisinin by using biomaterials such as nanocellulose or surface-modified nanocellulose, cellulose derivatives, polyhydroxyalkanoates with different molecular weight or other polyesters. The role of these substrates or coatings is to protect artemisinin from the action of different agents (acids, enzymes and others) during oral administration and to better control its action after entering the systemic circulation, where ferrous heme induces the scission of the peroxide bridge in artemisinin and releases the active species with multiple therapeutic effects. Acknowledgement. This work was financially supported by the Ministry of Research, Innovation and Digitization, CNCS/CCCDI–UEFISCDI, through the projects PN-III-P4-PCE2021-0435, contract 77PCE/2022 (CELGAS) within PNCDI III.

INVENTION #191

MEDICINE – HEALTH CARE – COSMETICS

Procedure for realization of a miniaturized electrochemical multisensing platform based on nanocomposites and enzymatic bioreceptors for the monitoring of clinically relevant biomarkers

Authors: Ana-Maria Gurban, Lucian-Gabriel Zamfir, Mihaela Doni, Iuliana Răut, Mariana Constantin, Cristina Firincă, Maria Luiza Jecu

Organization: National Institute for Research & Development in Chemistry and Petrochemistry – ICECHIM, Bucharest

The invention describes the process for obtaining a miniaturized electrochemical multisensing platform based on an innovative electrocatalytic nanomaterial Fullerenol-Hydrogel for the selective determination of clinically relevant markers, such as glucose, lactate, cortisol and H2O2. The electrosensitive layer consists in the simple deposition onto the active surface of a multisensing carbon paste screen-printed electrode (SPE) of an innovative nanocomposite material based on a 3D elastic crosslinked hydrogel network (Hy), doped with conductive polyhydroxylated derivatives of fullerene (fullerenol, FL) containing specific bioreceptors (e.g. enzymes, aptamers). The analytical method according to the invention consists in placing the miniaturized multisensing platform in the buffer containing artificial solution of biological fluid (e.g. sweat, saliva) solution and quantifying simultaneously the clinical markers by amperometry. The present electrosensitive multisensing platform of the invention and the analytical method can be used for the determination of glucose, lactate, cortisol and H2O2 content from different biological fluids with a sensitivity as high as 177.86 mA·M−1·cm−2 for H2O2, 185.6 mA·M−1·cm−2 for glucose and 110.8 mA·M−1·cm−2 for lactate, respectively, being operated at low values of applied potentials, such as 0.04 V vs Ag/AgCl, decreasing in this way the influence of the potential interfering compounds.
This work is supported by the Ministry of Research, Innovation and Digitization, CNCS/CCCDI – UEFISCDI, project COFUND-M-ERANET-3-FULSENS-GEL within PNCDI III, project no. 318/2022.

INVENTION #200

MEDICINE – HEALTH CARE – COSMETICS

Revolutionizing Medical Implants with High Entropy Titanium Alloy

Authors: Anak Khantachawana, Supakit Amornthitipong, Pawanan Rittarwet, Wichan Kanchanatawan, Tarathip Sangaroon, Trissnana Pleekam, Teetuch Ongsulapha

Organization: King Mongkut's University of Technology Thonburi

We are introducing an exciting innovation in medical materials—high entropy titanium alloy, crafted from five biocompatible metals through a cutting-edge technique called spark plasma sintering (SPS). This breakthrough alloy offers extraordinary strength and an ultra-low modulus, closely mimicking natural bone, making it ideal for use in implants like bone plates and clavicle fixation plates. Its excellent biocompatibility ensures that it integrates seamlessly with the body, promoting better healing and patient comfort. SmartMed Group which is our startup company has taken the lead in transforming this research into real-world solutions, developing prototypes that meet international standards, including ISO 13485. With this technology, we aim to raise the bar for medical devices in Southeast Asia, addressing the growing need for safer, more effective, and high-quality medical implants.

INVENTION #229

MEDICINE – HEALTH CARE – COSMETICS

Sistem de placi modulare pentru osteosinteza oaselor lungi si metoda de utilizare a acestora

Authors: Daniela Tarnita, Danut-Nicolae Tarnita, Nicu-George Bizdoaca

Organization: University of Craiova

The patent's subject refers to the fabrication of modular orthopaedics implants for the ostheosynthesis of the long bone fractures which comprise a predefined number of modules which, by mechanical coupling, and forms various dimension plates adaptable to the fractured bones and to the tensions developed in the bone by muscular forces. The coupling system of the adjacent modules with regard to the fracture place is made of Nitinol clips which act by the property of shape memory, enabling a continues compression over the fracture fragments, fact which represents an essential factor of the healing process. The modular plates for the osteosynthesis of long bones fractures, according to the invention, includes several identical linear modules corresponding to the area of the diaphyseal bone and more modules of non-linear form corresponding to epiphyseal bone areas. The shape and size of the plates can be adjusted depending on the broken bone, on the type and location of the fracture. Diaphyseal linear modules are made of biocompatible materials with mechanical properties suitable to trauma applications (titanium or titanium alloys, cobalt, stainless steel, ceramics, etc.), being provided with designed extremities allowing the translational coupling of modules. The modules are provided with two holes adapted to receive the screws in order to mount the plates on the diaphyseal segments of fractured bone. The modules can be built with dimensions compatible with bone surgical area. On the upper face, close to the extremities, the module has two tunnels. The legs of Nitinol staple will be introduced in these tunnels; they will perform the fracture compaction by memorizing the initial shape. The modules are placed on both sides of the fracture and will engage with "dovetail" system. Between the two modules a gap of a few millimeters will be kept, that will allow slipping a module to the other under the action of nitinol staple being achieved thus compacting the fracture. The modules are combined each other through a system „dovetail ". The plate may be made from two or more modules, depending on the length. In all cases the middle modules should be placed on both sides of the

fracture. Their combination leaves the space of a few millimeters that allow slipping a module to another under the action of nitinol clip thus achieving compaction of the fracture. The advantages of invention are: 1) by combining a certain number of modules we can obtain implants with various lengths depending of type, position or dimension of the fracture; 2) the use of the Nitinol staple enables the stabilization of the implants and the good union of the bone fractures, a key element in the healing process; 3) the small sizes of the modules enable the surgeon to use minimally invasive surgical techniques, with following advantages: ▪ reduction of soft tissues destruction; ▪ eliminating intra-operator infections; ▪ reduction of blood losses; ▪ reduction of infection risk; ▪ reduction of the healing time for the plagues; ▪ reduction of the scar (the aesthetic aspect)

PRINTING AND ADVERTISING

1 Inventions

INVENTION #19

PRINTING AND ADVERTISING

Application of printed computer-generated holograms as security elements

Authors: VLADIMIR CVILJUSAC

Organization: University of Zagreb Faculty of Graphic Arts

Computer-generated hologram (CGH) has a wide use in many different fields but it often comes at a high cost due to complex proprietary equipment. This innovation presents a new robust computational method, applied and tested common printing technology CtF (Computer to Film) to create affordable and high-resolution print of CGH that can be used primarily in security printing. Development of the computer algorithm is based on a previously known method of elementary hologram generation (point hologram) which in turn is based on Huygens principle and the mathematical model of interference. This approach allows us to construct a unique 2D binary matrix that will reproduce the image of the chosen 3D model when light passes through it. There is no commercial or open-source software for calculating CGH and generating a print prepress, since they require a complex mathematical model and are restricted to a specific fabrication technique. However, using the CtF process for their manufacture enables every produced hologram to be different in size, shape, rasterization, and information that it holds. Calculation result (binary martix) is converted into prepress in correlation with the capabilities of the selected graphic printing technique. Innovation presents a new and unique process for generating prepress and printing of CGHs related to the technical requirements of the standard graphic CtF process.

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

6 Inventions

INVENTION #7

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

Smart ESG Auto-refill U-traps in the Drainage System

Authors: Siu Tung LUI and Corina Man Ngo CHENG

Organization: Simply Mask Ltd

It is ISO13485:2016 certified medical device which applies IoT control for real-time water drainage management. It features a U-shaped pipe with an anti-bacterial coating and a water injection hole at the pipe's bottom. The system includes a water storage tank with a water inlet, outlet, electromagnetic valve switch, and float switch. The electromagnetic valve opens when the float switch detects a low water level, refilling the tank. It ensures the U-trap maintains water levels, preventing failures & reducing pathogen transmission. It digitalizes drainage systems with key ESG benefits, such as conserve water, reduce bleach usage & carbon emissions, preventing pathogens transmission & ensure regulatory compliance. Our research is published on globalpublishers.org. Founder Corina's dedication for pandemic solutions has earned her recognition, including an Honorable Fellowship from the Global Academy of Innovative Enterprises, endorsed by Nobel Laureate Professor Shuji Nakamura. It presents strong commercialization and future potential in residential & commercial sectors. Its automated maintenance reduces operational costs and enhances hygiene, making them attractive to building managers. IoT integration allows for real-time monitoring and predictive maintenance & ESG benefits position "Smart ESG U-traps" for widespread adoption, ensuring long-term market success & contributing to a sustainable future.

INVENTION #86

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

VIGORION

Authors: Iman Hadi Vincheh and Ma. Chat Donna V. Ofilas

Organization: Farin Technologies

An energ-efficient solution is provided to infiltrate the air through an innovative cyclone sweeper to infiltrate air and destroy airborne viruses and bacteria through an innovative, responsive negative ion dispenser that adjusts to the air stream dynamically to ensure the maximum and uniform ion delivery including an activated carbon filter which is replaceable by user and an Ultra Violet C light is used to kill the viruses and bacteria trapped in the activated carbon filter constantly. The system has a sound proof design and is consistent to all settings of the household usage to the hospital and classrooms through a scalable product design. The system has a power usage of maximum 5 watts which provides the filtration in an energy-efficient platform.

INVENTION #89

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

Smart-hygiene Toilet Robot

Authors: Siu Tung LUI and Corina Man Ngo CHENG

Organization: Simply Mask Ltd

The Smart-hygiene Toilet Robot eliminates 99.9% of aerosols generated during toilet flushing within seconds, compared to traditional exhaust fans that require over 30 minutes with low efficiency. It is cost-effective, comparable to traditional ventilation fans. It features UVC sterilization to sanitize the interior toilet bowl area and sensors for real-time air-quality monitoring, ensuring all pollutants remain below breathing zone, bringing bathroom hygiene into the new era. It is a already patented, design IP and ISO13485:2016 medical-grade device, backed by collaboration with scientist from the BeiHang University for Computational Fluid Dynamics (CFD) testing, also demonstrates 99% aerosol elimination. Founder Corina's dedication for pandemic solutions has earned her recognition, including an Honorable Fellowship from the Global Academy of Innovative Enterprises, endorsed by Nobel Laureate Professor Shuji Nakamura. It is now in the initial commercialization stage. Corina's creative design features a charming pink cartoon cat, "Air Flush Miao Miao," making this essential pandemic solution accessible for everyday home. She also developed various models such as the “Long-range Puppy”, "IAQ Duck" and “Quiet Shark" for specific application. Positive patent valuations: Invention Patent UK (GB2612430) and Hong Kong Design IP Patent (2422794.6).

INVENTION #102

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

Impact-resistant protection for the inner area of a car fender made from auxetic material

Authors: Florin Bogdan Marin, Mihaela Marin, Daniela Laura Buruiana, Gheorghe Gurau

Organization: "Dunarea de Jos" University of Galati

This invention provides an impact-resistant protective mean for the inner area of a car fender, made from auxetic material. The resistance to impact in the case of semi-frontal collisions or partial overlap collisions is essential for passenger safety in automobiles. These types of collisions, where only a part of the front area of the vehicle is involved translates into significant structural deformation and serious injuries to occupants. Also the imposed legal standards are strict in order to ensure a high level of occupant protection. Auxetic materials exhibit unique mechanical properties, such as negative Poisson's ratio, which allows them to expand laterally under tension and contract under compression. This characteristic enhances the material's resistance to impacts making it ideal for automotive applications where impact superior characteristics are needed. The auxetic material-based protection structure placed in the car fender provides an increased capacity to absorb and dissipate impact energy. This innovative approach is it a practical solution for modern automotive design and an improvement over traditional impact-resistant materials.

INVENTION #199

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

Tracked robot for humanitarian demining operations

Authors: Petrișor Silviu-Mihai, Bârsan Ghiță, Simion Mihaela, Virca Ioan, Moșteanu Dănuț Eugeniu

Organization: Nicolae Bălcescu Land Forces Academy from Sibiu

The tracked robot designed for humanitarian operations represents, according to the invention, a technological product belonging to the category of tracked mobile robots, capable of replacing the human element in high-risk areas for its health and life, either by avoiding accidental detonation, or by detecting and demining anti-personnel and armor-piercing minefields in countries where there were military conflicts. The robot is able to move autonomously using electric motors which take their energy by means of electric engines that take energy from solar photovoltaic cells encased in solar panels, which is provided with a storage compartment for the explosive necessary for humanitarian demining; it has a completely modularized structure, compact, easy to mount and maintain. It is made of two main organological structures: the tracked basis and the serial-modular robot of type TRTTR to which the translation system of detecting unexploded mines is being added, the functional product having applicability both in the military-applicable field by enriching actional flexibility within humanitarian detecting and demining operations and in the educational field, by forming high educated and specialized resources in the field of advanced military technologies.

INVENTION #210

SAFETY, PROTECTION, AND RESCUE OF PEOPLE

Smart Safety Zones 5G for Traffic Accident Investigation Project

Authors: Patchara Sinloyma, Pongthorn Pongratchatanan, Thitiporn Ruangrod, Saroj Pullteap and Wichit Yaemyim"

Organization: Royal Thai Police

The development of an intelligent surveillance system for traffic accident investigation has been proposed. However, the developed system comprises 56 security cameras for surveillance. Consequently, all components are then connected through a network to a main control center at the nearby police station for real-time monitoring. Besides, there are three police stations, including Huai Khwang, Lumpini, and Phasi Charoen stations have been considered as the target areas. After installing the intelligence system in the target areas, the survey results indicated that the population was very satisfied and reliable with the developed system at an average level of 3.16 from 4.

SPORTS, GAMES AND LEISURE

2 Inventions

INVENTION #123

SPORTS, GAMES AND LEISURE

Interactive New Toy

Authors: Chung Yi Chen

Organization: Taiwan Invention Products Promotion Association

"The creation offers an interactive new toy consisting of a main body and a base unit. Multiple toy units can be arranged and combined to form a structure through which a rope can be threaded. Adjacent toy units are connected by interlocking protrusions on one end of the main body fitting into corresponding indentations on the other end. When users wish to rotate or change the position of adjacent toy units, they can do so quickly and with slight elasticity."

INVENTION #124

SPORTS, GAMES AND LEISURE

Horizontal bar construction

Authors: Horizontal bar construction

Organization: Taiwan Invention Products Promotion Association

This creation introduces a single-bar structure composed of two pillars, a crossbeam, two telescopic rods, and a pull bar. Adjacent to each pillar, there is at least one support frame to stabilize the pillar. Inside the pillars, the telescopic rods are inserted, allowing the height of the single bar to be adjusted according to the child's height. The pull bar is threaded through the two telescopic rods. This single-bar structure is designed for easy portability and assembly."

OTHER

39 Inventions

INVENTION #41

OTHER

HORIZONTAL GAS COMPRESSOR WITH FREE LIFTING PISTON FOR OIL AND GAS INDUSTRY

Authors: PRODAN MARIAN

Organization: COMPRESSOR PUMP INDUSTRIAL SRL

PCT PATENT US 11,454,231 B2 HORIZONTAL GAS COMPRESSOR WITH FREE LIFTING PISTON A RECIPROCATING COMPRESSOR WITH FREE LIFTING PISTON WHICH INCLUDES A STRAIT PISTON WITH INCLINED COMPRESSION CHAMBERS WHICH USES THE VERTICAL COMPONENT OF THE RESULTANT FORCE OF THE GAS PRESSURE UPON THE INCLINED PISTON GROOVE AS AN OPPOSITE FORCE TO THE WEIGHT FORCE OF THE PISTON AND HALF OF THE PISTON ROD DECREASING THE VALUE FRICTION FORCE AND WEAR EFFECT BY THE FRICTION BEETWIN GUIDING RINGS OF THE PISTON AND CYLINDER'S LINER INCREASING THE RELIABILITY FOR ANY MATERIAL OF GUIDING RINGS, MORE THAN 4 TIMES THAN CLASSIC ARRANGEMENT OF THE STRAIT PISTON HEADS GAS COMPRESSOR

INVENTION #65

OTHER

Lighting technology through the transparency of wooden structures

Authors: Cristian Tilea, Codruț Trăsnea, Lucian Tilea

Organization: Tilia Art Light SRL

The works carried out in the Creative Workshop of the company "Tilia Art Light" use a lighting technology through a surface that emits light with the help of luminophores from the PMMA material used, through the transparency of a wooden structure processed at a thickness of 0.5 mm. On the wooden surface thus prepared, mechanical engraving is done by milling with cylindrical cutters with a diameter of 0.2-0.6 mm. The engraving is loaded with ink (tattoo on wood) to create the difference in brightness between the background of the material and the design applied through the engraving.

INVENTION #105

OTHER

Complex method for identification, characterization and mapping of polychrome multilayer objects, from macroscopic to microscopic level

Authors: M. Dinu, R. Radvan, L.C. Ratoiu

Organization: National Institute for Research and Development for Optoelectronics INOE 2000

The present invention proposes an innovative method that combines complementary techniques in order to obtain a complex package of spectral and imaging data: Hyperspectral analysis, RAMAN and LIBS. The analysis package creates in real time a “profile” of the investigated heritage object, starting from 2D macroscopic hyperspectral imaging, pixel by pixel hyperspectral analysis, micrometric RAMAN, and reaching 3D micro level through LIBS that offers the package the stratigraphic component. LIBS provides stratigraphic spectral data, advancing pulse by pulse in the depth of the layers, but the chained triggering of the complementary systems introduced by the current method gives us the possibility to acquire stratigraphy Raman spectra, as well.

INVENTION #125

OTHER

Electric welding gun with adjustable electric welding power

Authors: YANG LUNG SHIH, YANG CEHN, SHIH

Organization: Taiwan Invention Products Promotion Association

"This creation provides a type of welding gun with adjustable welding power. The welding gun is composed of a gun body, heater, solder tube, solder controller, handle, PCB, and voltage regulator controller. Its main feature lies in the installation of a PCB and a voltage regulator controller inside the gun body. The PCB is electrically connected to the voltage regulator controller, and the voltage regulator controller is electrically connected to the heater. By rotating the knob at one end of the voltage regulator controller, the user can infinitely adjust the welding power of the welding gun, thereby enhancing the efficiency of the welding gun."

INVENTION #166

OTHER

Dragonfang Flight Controller and Quadcopter

Authors: Cosmin Dumitru Emanuel Pantelimon Alexandru Guzu

Organization: Politehnica Bucuresti

This project focuses on designing and developing an autonomous quadcopter, aiming to address significant challenges in unmanned aerial vehicle (UAV) systems. With a strong emphasis on agility and reliability, the quadcopter is designed to perform complex tasks such as precise navigation, object recognition, and landing in unstructured environments. The integration of single-board computers, cameras, and long-range communication (e.g., LoRa) enables efficient real-time control and enhanced communication capabilities. Key components include a custom-built frame, advanced flight control algorithms using sensor fusion, and printed circuit boards (PCBs) designed to fit within compact dimensions. The system incorporates a PID control loop, Madgwick Filter for orientation estimation, and a telemetry protocol to facilitate safe and stable operation. Potential applications include law enforcement, agriculture, and search-and-rescue, demonstrating the quadcopter's adaptability across various sectors requiring autonomous mobility and precise environmental interaction.

INVENTION #198

OTHER

Method for extracting quasi-periodic signals from noise

Authors: Valeriu David, Cristian Foşalău, Marius Brânzilă

Organization: Technical University "Gheorghe Asachi" of Iasi

The invention relates to a method for extraction of quasi-periodic signals from noise, intended to be used in processing biomedical signals, such as electrocardiographic signal (ECG), magnetocardiographic signal (MCG) or other quasi-periodic signals of reduced level, recorded in the presence of high-level noise. According to the invention, the method consists in that the waveform of a quasi-periodic signal of very low amplitude recorded in the presence of noise of high amplitude is obtained based on the prior determination (2.2) of duration of all sequences of the quasi-periodic signal, which allows the selection (2.3) of some groups of sequences randomly located in the record, but with the approximately the same value of durations, where, for each so-formed group, a replica of the signal of interest is obtained (2.4) which, together with a replica of the signal for the entire record, obtained by the signal sampling (2.5) and processing (2.6) corresponding to the duration of each sequence, are compared and analyzed (2.7) to permit identification and characterization of specific waves or of changes or evolutions of the signal of interest, even in the conditions in which the records exhibit a very low signal-to-noise ratio.

INVENTION #234

OTHER

Mobile Test Bench of Testing Fans for Turbofan Engines

Authors: Răzvan Marius Catană, Gabriel Dediu, Horațiu Mihai Șerbescu

Organization: COMOTI – Romanian Research&Development Institute for Gas Turbines

The invention is referring to a mobile test bench, designed at a reduced scale, dedicated to experimental research of a fan stage, with fix and variable pitch blades, for turbofan engines, through which the fan stage performances are determined, as air mass flow, overall pressure ratio, actual rotor work, adiabatic efficiency and fan thrust, in order to optimize the fan and to reduce the fuel consumption of turbofan

INVENTION #235

OTHER

Fan Rotor For Turbofan Engine

Authors: Costin Panaitescu, Răzvan Marius Catană

Organization: COMOTI – Romanian Research&Development Institute for Gas Turbines

The invention is referring to a new fan rotor configuration and constructive solution, for turbofan engines, a fan rotor that is split in two different sections rotors, a section with fix pitch blades dedicated for engine primary flow, and a section with variable pitch blades dedicated for engine secondary flow. This new fan rotor is designed for a secondary flow optimization at different engine working regimes, in order to decrease the specific fuel consumption and to reduce the gas emissions of turbofan engine.

INVENTION #236

OTHER

The cultivar 'MARIA' of jerusalem artichoke, Helianthus tuberosus L.

Authors: Dr. Victor ŢÎŢEI

Organization: "Alexandru Ciubotaru" National Botanical Garden (Institute) of Moldova State University, Chisinau, Republic of Moldova

The new cultivar „MARIA" of jerusalem artichoke or topinambur, Helianthus tuberosus L., family Asteraceae has been created by mobilization and individual breeding activities. The plants reach a height of 280 cm. The aerial parts can be used as forage for farm animals (fresh mass, silage, vitaminized flour) and as feedstock for renewable energy production (briquettes, pelettes, biomethane, celulozic ethanol) and biorafinary (phytochemicals, paper production etc.). The tubers may be used as feed, fodder and inulin extraction. The cultivar „MARIA" also can be served as ornamental and honey plants. The fresh mass yield 65-80 t/ha, with 38-43 % foliage. The biochemical composition and nutritive value of fresh mass dry matter: 9.8-12.5 % CP, 29.6-36.7% CF, 34.3-36.9% ADF, 49.6-56.2 % NDF, 5.0-6.5 % ADL, 29.3-30.4l, 15.3-19.3%HC, 23.5-26.2% TSS, 8.3-13.1% ash, with 543-613g/kg DDM, 524-597g/kg DOM, 11.90-12.25 MJ/kg DE, 9.77-10.06 MJ/kg ME, 5.79-6.08 MJ/kg NEl, RFV=100-117. The enseled mass was characterized by agreeable colour with specific smell, pH 3.85 - 4.37, 13.2 % CP, 30.7 % CF, 32.8% ADF, 52.6% NDF, 3.3% ADL, 29.5 % Cel, 19.8% HC, 9.0% TSS, 10.9% ash, with 60.3% DDM, 52.2% DOM, 12.47 MJ/kg DE, 10.23 MJ/kg ME, 6.26 MJ/kg NEl, RFV=112. The fresh and ensiled mass substrates for anaerobic digestion, have optimal C/N ratio, amount of lignin and hemicellulose, biomethane potential varied from 290 to 329 l/kg ODM. The dry stalks mass contain 83.3% volatil matter, 47.16% C, 5.51%H, 0.31% N, 45.94%O, 0.05% S, 0.04%Cl, 1.03 ash, 17.8 MJ/kg NCV. The tubers contain 237-242g/kg dry matter with 9.63-10.24 % CP, 0.62-0.71% EE, 4.88-8.12% CF, 5.67-8.02 % ash, 0.080.16% Ca, 0.27-0.29% P, 72.90-79.19%NFE, 52.40-58.29% inulin, 5.05-5.10% starch and other carbohydrates, eligible for feed and raw material for the pharmaceutical and food industry. Tubers forage value is 0.28-0.30 nutritive unit/kg, 15.63-16.26 g/kg digestible protein and 2.85-30.9 MJ/kg ME. Financially supported Subprograme

no.010102„Identification of valuable forms of plant resources with multiple uses for the circular economy".

INVENTION #237

OTHER

The innovative technology for founding melliferous-energy plantations

Authors: "Alexandru Ciubotaru" National Botanical Garden (Institute) of Moldova State University Chisinau, Republic of Moldova

Organization: "Alexandru Ciubotaru" National Botanical Garden (Institute)of Moldova State University Chisinau, Republic of Moldova

New cultivars of non-traditional crops created at the National Botanical Garden (Institute) "Alexandru Ciubotaru" MSU, Chisinau, registered in the Catalog of Plant Varieties, patented and in patenting processes at the State Agency for Intellectual Property (AGEPI) in the Republic of Moldova are destined for founding melliferous and energy plantations and restoration on degraded, eroded, polluted lands that cannot be profitably cultivated with traditional crops. For the foundation of plantations with cv. 'Vital' of cup plant, Silphium perfoliatum Asteraceae family (MD 204) are necessary 5-10 kg/ha seeds or 28-40 thousand seedlings/ha; the plant spacing should be 70 cm x 50 cm or 70 cm x 35 cm, 45 cm x 45 cm. It is a medium-tardive source of pollen and nectar for bees (July-September) that makes it possible to obtain 150-220 kg/ha of honey, the dry biomass potential 15-20 t/ha with 17.8-18.3 MJ/kg GCV, may be used for briquettes, pelettes and celulozic ethanol production. For the foundation of plantations with cv. 'Energo' of Virginia mallow Sida hermaphrodita Malvaceae (MD 207) are necessary 3-5 kg/ha seeds or 28-40 thousand seedlings /ha; the plant spacing should be 70 cm x 50 cm or 70 cm x 35 cm. It is a medium-tardive source of pollen and nectar for bees (July-September) that makes it possible to obtain 80-120 kg/ha of honey, the dry biomass potential 20 t / ha with 18.6-18.7 MJ/kg GCV, may be used for briquettes, pelettes and celulozic ethanol production. For the foundation of plantations with cv. 'Melifera' (MD 208) Lacy phacelia Phacelia tanacetifolia Hydrophylloideae family (MD 208) are necessary 6-10 kg/ha seeds incorporated at a depth of 2–3 cm, ensures an early-medium source of pollen and nectar for bees (May-June) with 400–600 kg/ha potential honey, the dry biomass potential 7-9 t / ha with calorific value 18.1–18.4 MJ/kg GCV, may be used for briquettes and pelettes production. Financially supported Subprogram

no.010102„Identification of valuable forms of plant resources with multiple uses for the circular economy".

INVENTION #238

OTHER

The cultivar „ILEANA” of Elecampane Inula helenium L.

Authors: “Alexandru Ciubotaru” National Botanical Garden (Institute) of Moldova State University Chisinau, Republic of Moldova

Organization: “Alexandru Ciubotaru” National Botanical Garden (Institute) of Moldova State University Chisinau, Republic of Moldova

The cultivar "ILEANA" of Elecampane Inula helenium is perennial crop Asteraceae family, which can be used for several purposes: as medicinal, melliferous, fodder, ornamental and technical plant. It grows 200-220 cm tall and is a highly frost-tolerant plant. The rhizomes (Radix Inulae) contain 42% inulin and 9% other carbohydrates, as well as essential oils, which are necessary for the preparation of inulin and various drugs, the aromatization of soft drinks, some wines and pastries. The yield of aerial fresh mass (2 cuts per season) reaches 50 t/ha. It can be added to vitamins flour and can be used to prepare silage for animals. The biochemical composition of the dry matter in forage: 103 g/kg CP, 337 g/kg CF, 68 g/kg ash, 350 g/kg ADF, 523 g/kg NDF, 57 g/kg ADL, 293 g/kg Cel, 173 g/kg HC, with nutritional value: 61.6% DDM, RFV=110, 12.16 MJ/kg DE, 9.98 MJ/kg ME and 6.00 MJ/kg NEl. The silage was characterized by optimal pH values, high content of lactic acid and low content of acetic acid, the dry matter contained 115 g/kg CP, 360 g/kg CF, 89 g/kg ash, 382 g/kg ADF, 576 g/kg NDF, 61 g/kg ADL, 321 g/kg Cel, 194 g/kg HC, with nutritional value: 59.1% DMD, 11.71 MJ/kg DE, 9.62-MJ/kg ME and 5.64 MJ/kg NEl. 115 g/kg crude protein, 360 g/kg crude fiber, 89 g/kg ash, 382 g/kg ADF, 576 g/kg NDF, 61 g/kg ADL, 321 g/kg cellulose, 194 g/kg hemicellulose with a nutritional value of 59.1% digestible dry matter, 11.71 MJ/kg energy digestible, 9.62 MJ/kg metabolizable energy and 5.64 MJ/kg net lactation energy. Substrate for biogas plants with methane potential 274-280l/kg MO. It can be used as substrate for anaerobic digesters, with a methane potential of 274-280 l/kg VS. This variety is a source of pollen and nectar for bees, available for 30-42 days (July-August), and makes it possible to obtain 70-130 kg/ha of honey. The specific density of the briquettes made from stems reaches 800 kg/m3, the gross calorific value 18.5 MJ/kg and the amount of ash 2.6%. It is suitable to be cultivated on marginal and wet lands.

Financially supported Subprogram no.010102 "Identification of valuable forms of plant resources with multiple uses for the circular economy".

INVENTION #239

OTHER

The cultivar „VIGOR” of milkvetch, Astragalus galegiformis L.

Authors: Dr. Victor ŢÎŢEI

Organization: Alexandru Ciubotaru” National Botanical Garden (Institute) of Moldova State University Chisinau, Republic of Moldova

The cultivar „VIGOR” of milkvetch, Astragalus galegiformis is perennial leguminous plant, which can be used for several purposes: as fodder, melliferous, ornamental, medicinal and technical crop. In the flowering stage, it grows about 165-175 cm tall. The yield of aerial fresh mass (2-3 cuts per season) is 55-70 t/ha with 49-57% leaves. The chemical composition of the dry matter of the harvested mass: 16.8-20.6% protein, 3.2-3.7% fat, 28-35% ADF, 42-50% NDF, 4-5% ADL, 6.1-11.0% ash, 127-142 g digestible protein per nutritive unit. The fermented fodders, silage and haylage from Astragalus galegiformis ‘Vigor’, were characterized by optimal pH values, high content of lactic acid and low content of acetic acid, the dry matter contained 227-194 g/kg CP, 320-335 g/kg CF, 127-143 g/kg ash, 334-343 g/kg ADF, 518-524 g/kg NDF, 39-43 g/kg ADL, 34-92 g/kg TSS, 295-300 g/kg Cel, 175-190 g/kg HC, with nutritive value: 70.6-74.0% DMD, 63.0-66.0% OMD,12.26-12.39 MJ/kg DE, 10.07-10.17 MJ/kg ME and 6.09-6.40 MJ/kg NEl. Energy biomass: the fresh and fermented mass can be used as co-substrates for anaerobic digesters and methane potential achieved 370 l/kg; the stems, after harvesting the seeds, can used for the production of solid biofuel with gross calorific value 18.1-18.8 MJ/kg and 1.5-2.3% ash. It is a source of pollen and nectar for bees that makes it possible to obtain 90-100 kg/ha of honey. For the pharmaceutical industry, it may be a source of flavonoids and glycosides. This crop is suitable for the phyto-amelioration and the use of marginal, eroded and polluted lands.

INVENTION #240

OTHER

iSentinel® - Earthquake Intelligent Protection and Warning Solutions

Authors: Mircea MANOLESCU

Organization: A BETTER LIFE SOLUTIONS SRL

iSentinel® is an innovative seismic protection and early warning system, designed to safeguard lives, property, and the environment during major earthquakes. It operates by detecting the primary seismic waves (P-waves) before the more destructive secondary waves (S-waves) arrive. This early detection triggers automatic protective actions, such as shutting off gas and electrical systems, activating emergency protocols, and avoiding non-structural risks such as fire, explosion, or flooding. The system also initiates life-saving protocols like unlocking exit doors, driving elevators to the ground floor, and activating public address systems. iSentinel® is an open, fully customizable solution, integrating AI and IoT technologies for building safety, life-saving measures, and asset protection. Its intelligent design enables seamless integration with any existing or future protection equipment, driven by a three-level structure of detection, decision, and execution. This structure supports collaborative AI inputs and outputs, allowing iSentinel® to evolve with increasing user needs. The system's modular conception means additional protection measures can be added over time, ensuring adaptability to future risks. iSentinel®'s autonomy allows it to function for up to 15 days without external power, providing protection even in extreme post-earthquake conditions. Additionally, user training programs prepare individuals to respond rationally in emergency situations, transforming them from potential victims into life-savers. By combining cutting-edge AI, IoT, and seismic technology, iSentinel® offers a comprehensive solution that not only minimizes damage but also ensures the safety and continuity of operations in high-risk seismic zones.

INVENTION #241

OTHER

Pecingină Irina, Grofu Florin, Călinoiu Ion, Cosmin Zah, Gîlcă Gheorge

Authors: Pecingină Irina, Grofu Florin, Călinoiu Ion, Cosmin Zah, Gîlcă Gheorge

Organization: University „Constantin Brâncuși„ of Târgu-Jiu

Accommodation with modern technologies in the horticultural sector to ensure the monitoring and optimization of the plant growth and development process by: - getting real-time data on climate change and how it directly affects the horticultural sector - early warning about the conditions that favor the occurrence of diseases in plants - real-time measurement of the degree of development of trees, leaves and fruits and alerting if the parameters expected at various development thresholds are not compliant. the use of the measurement and analysis capabilities of the practical laboratory in the field of intelligent agriculture in fruit growing - the implementation of didactic activities, research activities, internships in the field, specialty and for the development of students' diploma projects, within the undergraduate study program Engineering and Management in Public Food and Agritourism

INVENTION #242

OTHER

Self-Adaptive Transtibial Prosthesis for Pediatric Leg Length Compensation (Patent application no. a 00747 / 18.11.2022)

Authors: Dimitrie-Cristian FODOR, Neculai-Eugen SEGHEDIN

Organization: Gheorghe Asachi Technical University of Iaşi

Worldwide, a significant number of young individuals are affected by amputations, and this population continues to grow. Among them, patients with transtibial amputations frequently encounter a major issue related to prosthetic alignment, caused by the natural growth of the contralateral biological limb. Typically, these young patients need to visit their prosthetist regularly to adjust the length of the prosthesis, ensuring it remains properly adapted to their growth. To address this need, our invention proposes a self-adjusting transtibial prosthesis that automatically adjusts its length without the need for a medical specialist after the initial calibration. This innovative prosthesis gathers information from the amputee's body through dedicated devices, ensuring precise compensation for limb length discrepancies as the patient grows. Doing so eliminates the risk of degenerative conditions in the spine and healthy joints, prevents their deterioration, and ensures the harmonious development of the young patient. Thus, the self-adjusting prosthesis represents a significant advancement in prosthetic technology, offering an efficient and accessible solution for children facing transtibial amputations.

INVENTION #243

OTHER

Neutralization Device with Liquid Jet of Improvised Explosive Device (DNJLDEI)

Authors: Emilian Ghicioi Artur George Găman Daniel Pupăzan Robert Laszlo Sorin Burian Adrian Jurca Dan Gabor Angelica Nicoleta Găman Alexandru Simion Alin Irimia Doru Cioclea Maria Prodan Emeric Chiuzan Irina Vasilica Nalboc Andrei Szollosi Sonia Șuvar Edward Jan Gheorghiosu Gabriel Dragoș Vasilescu Attila Kovacs Daniela Carmen Rus Cristian Rădeanu Ilie- Ciprian Jitea Vlad Păsculescu Marius Șuvar Nicolae Vlasin Bușoi Bogdan Garaliu Daniel Florea Adrian Șimon Bogdan Ligia Tuhuț

Organization: INCD INSEMEX

The invention relates to a prototype for a neutralization device of improvised explosive bombs, by propelling a quantity of liquid at high speeds, over 500 m/s, in the direction of the target, The invention has the potential to be a valuable tool for urban interventions against the terrorist attack. The device can be configured on site, depending on the way the target is presented (briefcase, backpack, package, etc.), being able to use reduced explosive charges. The device is connected to a detonator operated by an operator from a safe distance.

INVENTION #244

OTHER

Mobile training ground for the practical training of intervention and rescue personnel in toxic / explosive / flammable environments

Authors: Nicolescu Cristian Găman George Artur Ghicioi Emilian Pupăzan Daniel Găman Angelica Nicoleta Ilie Cosmin Irimia Alin Gireadă Andrei Toth Lorand Kovacs Marius

Organization: INCD INSEMEX

The practical training of intervention and rescue personnel in toxic / explosive / flammable environments is the essential factor in the success of an intervention in case of major incidents. The mobile training ground is a modern equipment for the practical training of rescuers that can be made available to any economic agent, regardless of the place and nature of the activity it carries out. Within the polygon, different training scenarios can be carried out, on different degrees of difficulty, with high temperature, low visibility, high humidity, as well as with the monitoring of the physiological parameters of the rescuers.

INVENTION #245

OTHER

Field method for assessing the impact of volatile organic compounds on human health

Authors: Găman Angelica Găman George Artur Ghicioi Emilian Pupazan Daniel Toth Lorand Prodan Maria Kovacs Marius Simion Sorin Simion Alexandru Șuvar Niculina Sonia

Organization: INCD INSEMEX

The mobile real-time measurement system of volatile organic compounds (BTEX) consists determination of concentration of benzene and organic compounds (BTEX) in the surrounding environment using HP gas chromatography with FID detector in air from populated areas, traffic locations, and industrial platforms, through a mobile unit that allows continuous measurements during movement. Understanding the concentrations of VOC in a triaxial system of coordinates (concentrations / space / time) makes it possible to quantify the impact generated by BTEX pollutants on human health by measuring the pollution level, processing data, and integrating them into an active mapping system using GIS computational environment.

INVENTION #246

OTHER

Dynamics determining of explosive atmospheres formation method

Authors: Cioclea Doru George Artur Găman Ghicioi Emilian Gherghe Ion Ianc Nicolae Rădoi Florin Boantă Corneliu Chiuzan Emeric Tomescu Cristian Matei Adrian Drăgoescu Răzvan Cămărășescu Alexandru Vlasin Nicolae-Ioan Șimon Marinică Adrian

Organization: INCD INSEMEX

The method is based on the analysis of the dispersion dynamics in the accumulation phase, as well as the reaction capacity of the ventilation system in the dilution and evacuation phase, by choosing the closed enclosure, determining the volume of the closed enclosure, placing the methane introduction and control system, connects the system for continuous determination of gas concentrations, the gradient of dispersion and progressive dilution of the gas at the level of the closed enclosure is determined, which determines the dynamics of the formation of the explosive atmosphere.

INVENTION #247

OTHER

Scalable applicable system to optimize blasting parameters specific to safe exploitation technologies in surface mining operations

Authors: Laszlo Robert Găman George Artur Ghicioi Emilian Pupăzan Gheorghe Daniel Vasilescu Gabriel Dragoș Gheorghiosu Edward Jan Kovacs Attila Rus Daniela Carmen Rădeanu Cristian Jitea Ilie- Ciprian Ilici Ștefan Manea Florin Garaliu Bușoi Bogdan

Organization: INCD INSEMEX

The invention relates to the creation of an applicable system that enables the establishment in real time of the ideal blasting work parameters in close connection with the uniqueness of each ore deposit, the types of explosives, and the seismic limitations due to the blasting works. Setting the blasting work parameters in a way that ensures rock detachment from the ore body, reduced ore body back cracking, proper granulometry, reduced ore mass scattering, a seismic effect, and a low carbon footprint is a requirement for achieving the best results in mining operations.

INVENTION #248

OTHER

Continuous monitoring and recording system of gas explosion parameters

Authors: Vlasin Nicolae Găman George Artur Ghicioi Emilian Pupăzan Gheorghe Daniel Călămar Angelica-Nicoleta Păsculescu Vlad Mihai Nicolescu Cristian Laszlo Robert Burian Constantin Sorin Manea Florin Florea Gheorghe-Daniel Nălboc Vasilica Irina Szollosi-Moța Andrei Șuvar Marius Cornel Vass Zoltan Tuhuț Ligia - Ioana Simion Alexandru Florin Morar Marius Simion

Organization: INCD INSEMEX

The invention relates to a system for monitoring and continuously recording the parameters of gas explosions. The system is capable of analyzing the explosion phenomena of air-combustible gas mixtures at higher recording speeds of the parameters. The invention provides the material basis for understanding the mechanisms of ignition and propagation of gas explosions in controlled environments (at various gas concentrations, in a quiet or turbulent state of the explosive mixture), as well as for calibrating computational simulations of flammable gas explosions.

INVENTION #249

OTHER

Experimental set-up for the determination of the explosion limits of flammable liquids vapours

Authors: Maria Prodan Găman George Artur Ghicioi Emilian Lupu Constantin Cioclea Doru Păsculescu Vlad Gabor Dan Vlasin Nicolae Jurca Adrian Szollosi Mota Andrei Nălboc Irina Șuvar Marius

Organization: INCD INSEMEX

The invention relates to an experimental set-up for the determination of the explosion limits of flammable liquids vapors, namely the lower explosion limit (LEL) and the upper limit of explosion (LSE). The equipments from the experimental set-up allow the recording of several processes: the explosion pressure, the vaporization of the liquid, the homogeneous air-vapor mixture and the combustion, that take place in a controlled temperature vessel at the boiling point of the liquid.

INVENTION #250

OTHER

Test bench for imagery research of gas explosions

Authors: Vlasin Nicolae Găman George Artur Ghicioi Emilian Lupu Constantin Păsculescu Vlad Pupăzan Gheorghe Daniel Prodan Maria Călămar Angelica Nicoleta Cioclea Doru Nălboc Irina Șuvar Marius Florea Gheorghe-Daniel

Organization: INCD INSEMEX

The invention is a stand for imaging explosions of flammable air-gas mixtures, allowing high-speed camera recordings (over 30,000 frames/second) of ignition and flame front evolution. It features a transparent parallelepiped explosion chamber, with planar mirrors mechanically deformed in controlled horizontal and vertical planes to achieve the necessary focal distances for Schlieren imaging. A cylindrical incandescent light source illuminates the setup, and internal pressures are monitored. The explosion is initiated by an electrical spark (inductive or capacitive), enabling precise analysis of combustion phenomena in the chamber.

INVENTION #251

OTHER

Integrated system for simultaneous measurement of flame front propagation and pressure wave velocities in case of explosions

Authors: Emilian Ghicioi George Artur Găman Lupu Constantin Sorin Burian Mihaela Părăian Maria Prodan Dan Sorin Gabor Vlad Păsculescu Nicolae Vlasin Andrei Szollosi - Mota Marius Şuvar Irina Vasilica Nălboc

Organization: INCD INSEMEX

The invention relates to an integrated system for simultaneous measurement of flame front propagation and pressure wave velocities in case of air-flammable gas explosions triggered in the cylindrical shock tube, equipped with optical and pressure transducers, in order to study their behavior depending on the concentration, on the ignition sources and on the propagation distance, respectively for establishing the deflagration or detonation characteristics

INVENTION #252

OTHER

Fast sealing system for underground mining works

Authors: Ghicioi Emilian Constantin Lupu Doru Cioclea Ion Toth Sorin Constantin Burian Artur George Găman Mihaela Părăian Maria Prodan Jeana Ionescu

Organization: INCD INSEMEX

The invention relates to the development of a system for fast sealing underground mining works in order to guide air into those underground mining works located in the proximity of areas in which occurred explosion or fire type events and which have to be insulated with priority and celerity in order to minimize the risk for the initiation of a new explosion or of new coal self-ignition processes (in the insulated area) or against the input of toxic/flammable gases released within the insulated perimeter/mining work into mining works which have to dispose of uncontaminated fresh air.

INVENTION #253

OTHER

Industrial-scale plasma-based equipment for thin film deposition with sub-nanometric uniformity and roughness over large areas

Authors: Surdu-Bob Cristina, Badulescu Marius

Organization: National Institute for Lasers, Plasma and Radiation Physics

The invention consists on a computer-controlled large-scale equipment based on plasma, capable of coating large areas with film uniformity and roughness at sub-nanometer level. Typical deposition rates are in the range of 0.5 to 1.5 nm/min. The equipment is able to produce coatings from gas precursors, including diamond-like carbon (DLC). The high-tech equipment is able to produce high quality films from gas precursors at room temperature and could therefore be used to coat flexible substrates and also in microfabrication processes. Due to the high thickness uniformity and roughness of the films produced, the system could be involved in coating of large optical components of Space telescopes or high-power laser facilities.

INVENTION #254

OTHER

INO-SEN-Innovative technology for the greenhouse gases sensors achievement

Authors: Balcu Ionel, Macarie Corina, Sfirloaga Paula

Organization: National Institute for Research and Development in Electrochemistry and Condensed Matter Timisoara

The general objective of the project refers to the creation of an innovative spin-off aimed at commercializing the scientific results achieved in the basis of a obtained patent within a public research institute, namely a sensor for the purpose of detecting greenhouse gases. The project aims to create a sensitive platform based on surface acoustic wave sensors (SUAS) that uses perovskite materials of the ABO3 type (where A is a rare earth - La, and B is a transition metal - Mn) for the detection of gases with greenhouse (eg: CO, CO2) from the Western Region of Romania.

INVENTION #255

OTHER

METHOD FOR ACTUATING SPRINGS MADE OF SHAPE MEMORY MATERIALS

Authors: Bejenar Ciprian, Bejenar Marian, Popa Valentin, Dimian Mihai, Milici Laurențiu Dan, Rață Mihai, Afanasov Ciprian, Ungureanu Constantin

Organization: Stefan cel Mare University of Suceava

The method for actuating shape memory material springs according to the invention features a distinctive three-phase, implementable and parameterizable power supply sequence that can be modeled, integrated, adjusted and generated by programmable electronic systems as needed, so as to cause a reaction of additional speed and force, both by thermal and electromagnetic effect, simultaneously developed on the actuation spring coils within an actuator.

INVENTION #256

OTHER

SYSTEM FOR INCREASING THE QUALITY OF SLEEP

Authors: Popa Valentin, Bejenar Ciprian, Milici Laurențiu-Dan, Dimian Mihai, Ungureanu Constantin, Pavăl Mihaela

Organization: Stefan cel Mare University of Suceava

System for sleep quality enhancement, according to the invention, it assumes a unitary body composed of an elastic rectangular structure of thermo-sensitive elements that react to the local temperature variation, depending on which it adapts the shape of the rest mattresses between the layers of which it is embedded, that it modifies according to the shape of each user's body and returns to its original shape after each use, so that it represents an appropriate solution for the role it fulfills.

INVENTION #257

OTHER

HYBRID SYSTEM FOR IMPROVING THE ENERGY EFFICIENCY OF PHOTOVOLTAIC PANELS

Authors: Milici Laurențiu-Dan, Pavăl Mihaela, Atănăsoae Pavel, Nițan Ilie, Ungureanu Constantin, Iavorschi Eugen, Alisavetei Irina, Tuduriu Constantin Cornel

Organization: Stefan cel Mare University of Suceava

The solution involves a panel placed on the back of the photovoltaic panel and which has a system of channels, of variable section through which the cooling fluid circulates, which can be water for the preparation of hot water or air for heating a room.

INVENTION #258

OTHER

METHOD AND SYSTEM FOR LIMITING THE LOAD CURVE

Authors: Bejenar Ciprian, Bejenar Marian, Milici Laurențiu-Dan, Pentiuc Radu-Dumitru, Atănăsoae Pavel, Popa Cezar-Dumitru, Pop Teodor, Ifrim Visarion

Organization: Stefan cel Mare University of Suceava

The invention involves a specific communication and adjustment system in relation to controllable electrical sources (e.g. charging and/or power supply systems) with which adjustable electrical consumers are equipped and/or flexibly supplied (e.g. electric propulsion vehicles or hybrid), simultaneously connected to an electrical network with limited energy capacity, so that it limits and/or regulates one or more electrical parameters (e.g. electrical voltage, electrical current, etc.).

INVENTION #259

OTHER

Field method for assessing the impact of volatile organic compounds on human health.

Authors: Găman Angelica Nicoleta Găman George Artur Ghicioi Emilian Pupazan Daniel Toth Lorand Prodan Maria Kovacs Marius Simion Sorin Simion Alexandru Șuvar Niculina Sonia

Organization: INCD INSEMEX

The mobile real-time measurement system of volatile organic compounds (BTEX) consists of applying a method to determine the concentration of benzene and organic compounds (BTEX) in the surrounding environment (emissions) using high-performance gas chromatography with FID detector in ambient air from areas classified as rural and urban zones, traffic locations, and locations influenced by industrial sources, through a mobile unit that allows continuous measurements during movement. Understanding the concentrations of volatile organic compounds in a triaxial system of coordinates (concentrations / space / time) makes it possible to characterize / quantify the impact generated by BTEX pollutants on human health

INVENTION #260

OTHER

PROCESS FOR OBTAINING HEAT-INSULATING CONCRETE BASED ON HEAVY ASH OF POWER PLANT

Authors: Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Popescu Cristinel, Diaconu Bogdan Marian, Ciofu Florin Cristian, Cazalbașu Ramona, Anghelescu Lucica

Organization: University „Constantin Brâncuși„ of Târgu-Jiu

The invention refers to a process for the manufacture of heat-insulating concrete, with the use of hearth ash resulting from the burning of coal in thermoelectric power plants as a light granular aggregate. It is known that for the manufacture of heat-insulating concrete with maximum usage temperatures of up to (1000-1100)°C, light aggregates are currently used, such as calcined diatomite and granulated blast furnace slag, raw materials that are currently in short supply in Romania. The technical problem that the invention solves consists in obtaining concrete with thermal power plant ash, through a cheap, economical and easy to apply process.

INVENTION #261

OTHER

PROCESS FOR OBTAINING COMPACTION MASSES WITH REINFORCEMENT BASED ON HYDRAULIC BINDER

Authors: Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Popescu Cristinel, Diaconu Bogdan Marian, Ciofu Florin Cristian, Cazalbașu Ramona, Anghelescu Lucica

Organization: University „Constantin Brâncuși„ of Târgu-Jiu

The invention refers to a process for obtaining quick-hardening masses, based on hydraulic binder, used in the execution of reinforced form, leveling or filling layers, in construction works. The process according to the invention capitalizes on the specificity of the oxidic and mineralogical chemical composition of the secondary steel treatment slag, in that, after grinding to an appropriate fineness for a rest of a maximum of 10% on the sieve with the meshes of 0.09mm , is used as a hydraulic binder in the composition of the compacting masses.

INVENTION #262

OTHER

INO-SEN-Innovative technology for the greenhouse gases sensors achievement.

Authors: Balcu Ionel, Macarie Corina, Sfirloaga Paula

Organization: National Institute for Research and Development in Electrochemistry and Condensed Matter Timisoara

The purpose of the project refers to the creation of an innovative spin-off aimed at commercializing the scientific results achieved in the basis of a patent obtained within a public research institute, namely a sensor for the purpose of detecting greenhouse gases. The project aims to create a sensitive platform based on surface acoustic wave sensors (SUAS) that uses perovskite materials of the ABO3 type (where A is a rare earth - La, and B is a transition metal - Mn) for the detection of gases with greenhouse effect (eg CO, CO2) from the Western Region of Romania.

INVENTION #263

OTHER

CONSTRUCTION BRICK MANUFACTURING PROCESS USING INDUSTRIAL WASTE

Authors: Popescu Georgeta Luminița, Marica Mădălina Mirabela, Abagiu Traian Alexandru, Predeanu Georgeta, Racoceanu Cristinel, Cruceru Mihai, Diaconu Bogdan Marian, Dițescu Corneliu Laviniu, Dondoe Valentin, Anghelescu Lucica

Organization: University „Constantin Brâncuși„ of Târgu-Jiu

The invention refers to a process for the manufacture of heat-insulating concrete, using as light granular The invention refers to a process for manufacturing construction bricks using industrial waste, in which raw materials are exclusively used materials considered waste in the energy and extractive industries: heavy ash from thermal power plants, clay from lignite mining quarries in the area Carboniferous Gorj, drilling mud. The advantages of this process are represented by the fact that power plant ash successfully replaces the sand used as an additive to correct the plasticity of the Rovinari clay.

INVENTION #264

OTHER

Identifying native amyloid precursor protein used in Alzheimer's disease pathology, involves separating cell membranes, extracting and separating protein complexes by gel electrophoresis, and identifying protein with specific antibodies

Authors: ENCIU ANA-MARIA; CODRICI ELENA; MIHAI SIMONA, BUCURE$TI; POPESCU ION ELA DANIELA; DUDAU MARIA; ANGHELACHE LAURENTIU; TANASE CRISTIANA

Organization: Victor Babes National Institute of Pathology

Process for identifying native amyloid precursor protein in high molecular weight protein complexes isolated from cellular membranes, involves (i) separating the cell membranes from the other cell components and extracting protein complexes with 0.5-1% detergent Triton-X 100 (RTM: Octylphenol ethoxylate) in 50-75 mM imidazole buffer, and (ii) separating protein complexes by polyacrylamide gel electrophoresis for 2-4 hours at a constant amperage of 10 mA/gel on ice in electrophoresis buffer with pH of 8-10, transferring complexes on transfer membrane for 20-22 hours at a constant amperage of 100 mA on ice and performing protein identification with specific antibodies.

INVENTION #265

OTHER

Autonomous mobile platform with differential locomotion and ROS operating system

Authors: Vasile Alexandru Maga

Organization: Lucian Blaga University of Sibiu

The research "Mobile Platform with Differential Traction and ROS Operating System" presents the design and implementation process of an autonomous mobile platform named CANOE (Computerized Autonomous Navigation Oriented Equipment), capable of navigating efficiently and accurately in an industrial environment. It highlights the importance of mechatronic systems and Automated Guided Vehicles (AGVs) in optimizing logistics and material flows within the context of Industry 4.0 automation. The paper describes the selection of the locomotion type, the dimensioning of the traction system, the choice of encoders to ensure movement precision, and the structural design of the platform, utilizing 3D printing.

INVENTION #266

OTHER

AUTOMATED STAND FOR TESTING RESISTANCE TO OXIDATION AND THERMAL SHOCK OF LAYERS DEPOSITED AS A THERMAL BARRIER

Authors: BADEA Teodor-Adrian, BATALU Nicolae Dan

Organization: INCDT COMOTI

An automated stand for oxidation and thermal shock testing of thermal barrier coatings is constructed using six graphite blocks comprising a heating channel with an electric heating element, cooling channels for both the sample and substrate, hot/cold exhaust channels, contact thermocouple holes for monitoring sample and substrate temperatures, a sample positioning slot, energy recovery channels, and three ventilation systems ensuring adequate hot and cold air flow.

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CELEBRATING INNOVATION & RESEARCH

266

Inventions

1021

Researchers & Inventors

128

Research Institutions

16

Research Categories