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TRANSFERU TECHNOLOGII MORSKICH

Inventions on sale

MARITIME UNIVERSITY OF SZCZECIN
IX 2014

Maritime University of Szczecin

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educates highly qualified maritime staff i.e. navigators and mechanics answering the needs of contemporary transport and fishing fleet as well as onshore staff prepared to implement computer software and systems for supporting transfer of information in the transport-forwarding-logistics industry.

It also implements research projects in international consortia. The research fields for potential project partners to be found at <http://www.am.szczecin.pl/en/research> and EU projects at <http://portalcttm.am.szczecin.pl/>

University factsheet:

- educates 4 000 students a year in three faculties offering 9 specializations (Faculty of Navigation, Faculty of Maritime Engineering, Faculty of Economics and Transport Engineering),
- educates specialists for the Liquid Natural Gas terminal built in winouj cie, Poland to diversify the gas supply for Poland,
- has well-equipped laboratories, modern research-training vessel the m/s Navigator XXI and 16 technically most advanced simulators,
- is a member of many international organisations and associations

Centre for Maritime Technology Transfer

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CENTRE
FOR MARITIME TECHNOLOGY TRANSFER

was founded as an answer to a need of making the inventions of the Maritime University of Szczecin researchers commercially successful. CMTT aim is to take the most promising ideas forward through intellectual property rights (IPR) licensing, new venture creation and consultancy.

Maritime University of Szczecin Innovation Centre

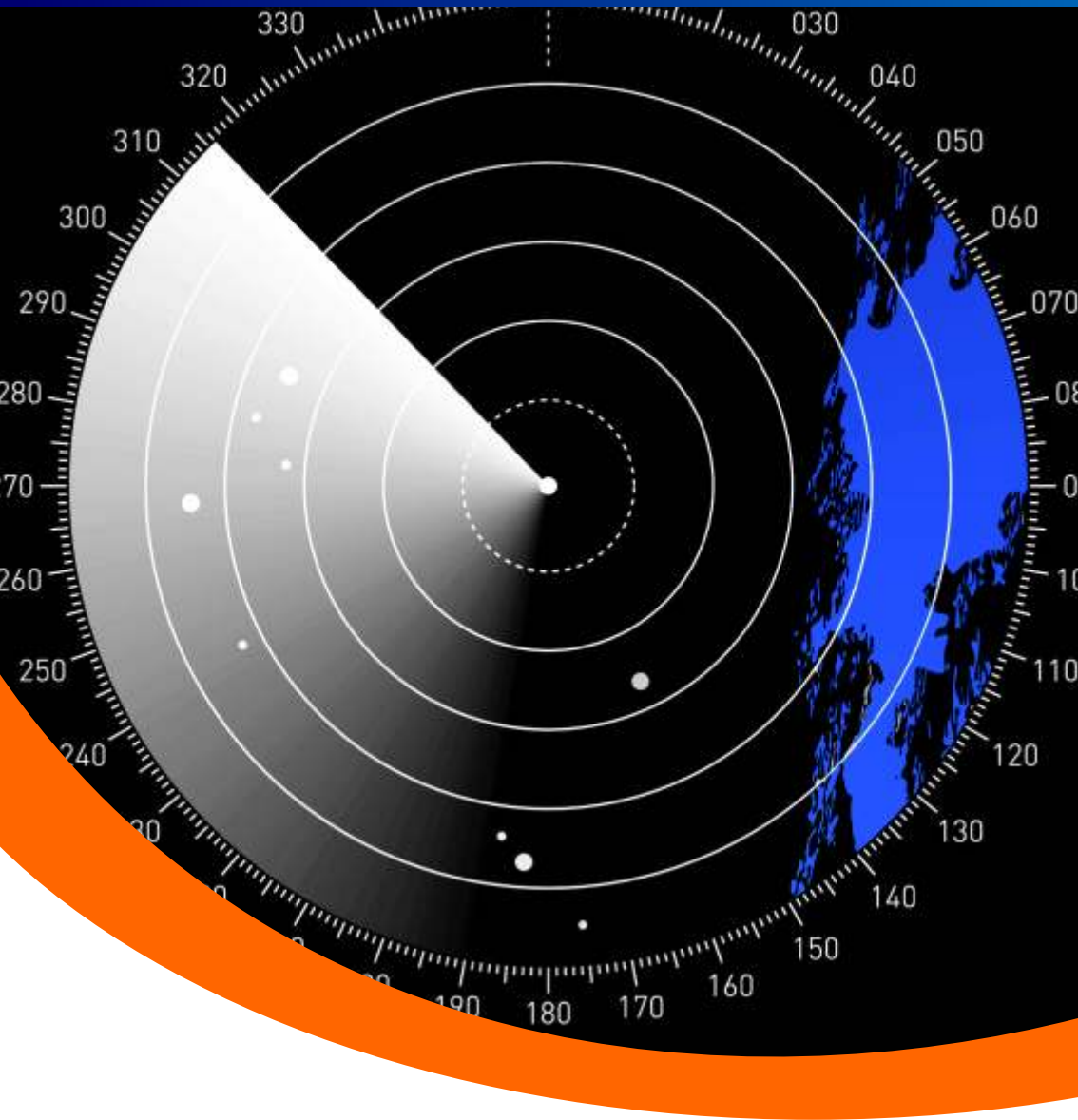
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is a company established to sell results of scientific research and inventions owned by the Maritime University of Szczecin. Possible forms of cooperation with industry: licence, establishing a new company with or without VC/seed involved (spin off / out), other kinds of IPR sale, joining consortia with other public and private bodies, projects implementation.

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Neural tracking filter

Field: navigation

For: manufacturers of marine radars and navigational systems of ECDIS and INS type

The neural filter estimates the course and speed of a target tracked by a navigational radar from bearing and range measurements. Input values are processed by a neural network that adapts to target characteristics. Research has shown that the method allows to obtain smaller errors and delays of target tracking, especially manoeuvring vessels.

Innovative aspect of the invention:

- new tracking filter,
- smaller errors of tracking radar targets during their manoeuvres,
- shorter delay of tracking after a manoeuvre (approx. 50%).

Form of intellectual property: patent

Full name of the invention: Method and system of determining the movement vector of tracked targets

Inventors: Witold Kazimierski, Andrzej Stateczny

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

Contact person: Konrad Frontczak k.frontczak@innoam.pl,
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Shore protection against sea waves

Field: environment protection, safety, offshore engineering, harbour structures.

For: maritime administrations, local authorities in coastal towns, national parks, seaports, shipyards.

The idea of the invention is to place a device damping sea waves at a sufficient distance from the shore. The device is composed of two co-operating, specifically positioned wave damping units interacting in a manner allowing to suppress sea waves by initiating the phenomena of dispersion and interference of waves.

Innovative aspect of the invention:

The proposed solution compared to existing ferroconcrete breakwaters, mainly in the form of star-shaped blocks is:

- much cheaper,
- more attractive look (important for seaside resorts),
- easier to install (wide range of system parameters modification).

Form of intellectual property: patent

Full name of the invention: Method of shore protection against sea waves and a unit damping the energy of sea waves

Inventors: Bolesław Kuzniewski

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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Energy from sea waves

Field: renewable power generation, environmental protection, offshore engineering, hydro-engineering.

For: electric energy producers, local authorities in coastal towns, seaports, shipyards.

The main idea of this invention consists in using a new design of a mechanical motor propelled by the energy of sea waves via an innovative system of power transmission system. The motor drives a generator or another power generating machine continuously, ensuring rotation in one direction, regardless of the direction of flowing sea waves.

Innovative aspect of the invention:

The proposed solution compared to currently operated power stations generating electric energy from sea waves:

- has much simpler construction and is cheaper,
- offers a variety of installation methods (vertical or horizontal system, direct or indirect propulsion, etc.),
- looks more attractive than floating systems in use.

Form of intellectual property: patent pending

Full name of the invention: Underwater generating unit and method of underwater installation of a generating unit under the sea surface

Inventors: Bolesław Kuzniewski

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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Assessment of technical condition properties of fuel injector atomizers

Field: machines.

For: shipyards, ship operators, engine makers.

The method consists in gradual increase of terrestrial gravity force applied to a V-block mounted pin of the needle placed in the atomizer, at a 45° angle, until the pin moves out of the atomizer body. Gradual increase of friction force component is executed by a jet of water fed into a suspended container. Once the needle completely moves out, water jet should be immediately cut off and the additional elements and the needle should be weighed. The needle mass and additional mass allow to determine the terrestrial gravity force and maximum friction force. It is recommended to make measurements in four planes.

Innovative aspect of the invention:

- simple quantitative assessment of friction force

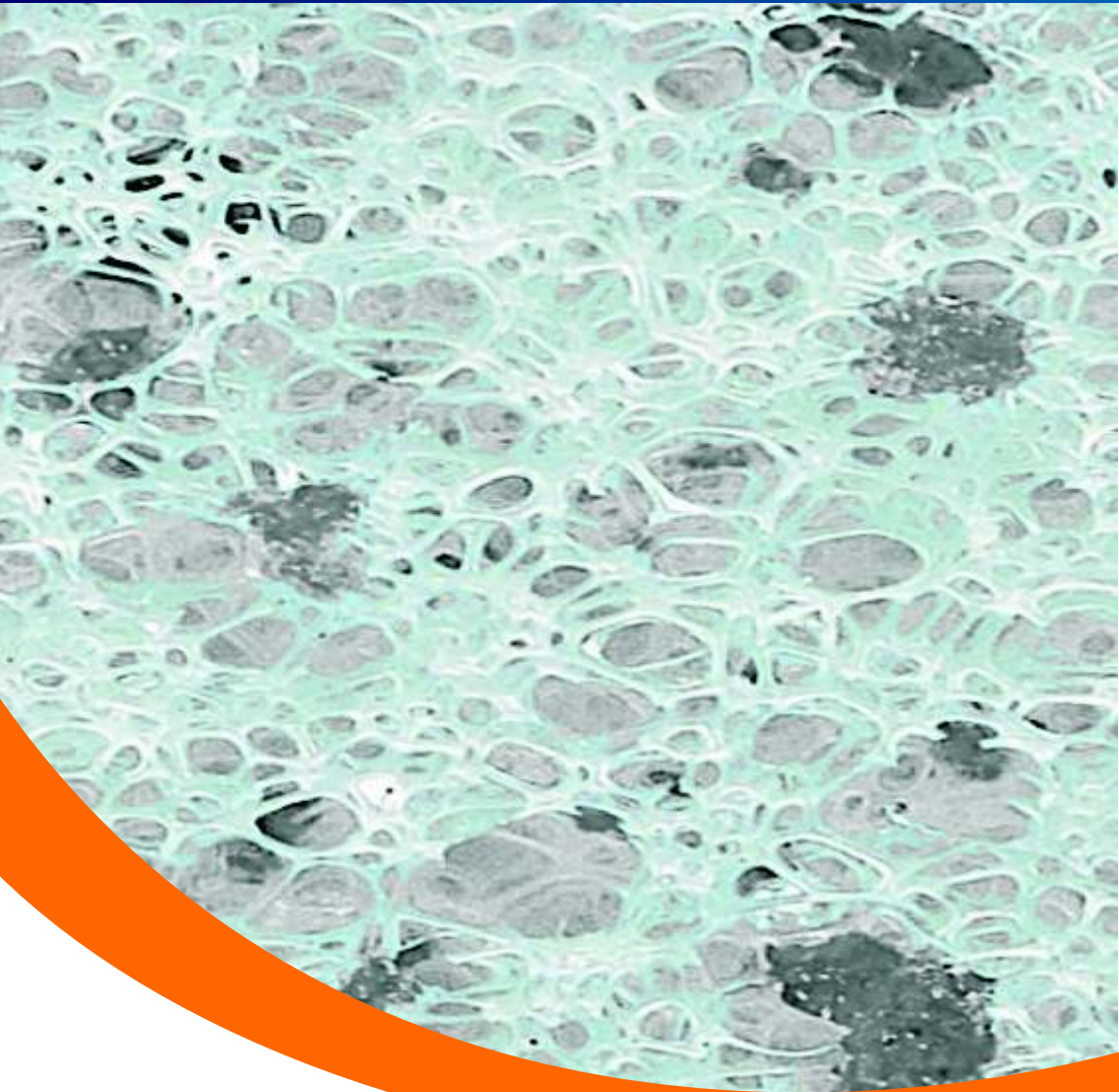
Form of intellectual property: patent pending

Full name of the invention: Hydrostatic method and device for measurement of friction force between atomizer body and needle of engine fuel injectors

Inventors: Jan Monieta

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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Composite metal-ceramic foams

Field: armaments industry, automobile industry, transport, fire protection, aviation and space industry, shipbuilding, civil engineering.

For: manufacturers of road vehicles, aircraft, ships, machinery, fire resistant shields, soundproof and vibration absorbing shields, weapons, military vehicles and elements, designers, ship operators, shipyards.

The device for foaming metallic composites, capable of continuous foaming of a liquid metal-ceramic composite, has the following features:

- processing of a charge of liquid composite, maintenance of a constant level of liquid composite in the foaming chamber and automatic level control,
- monitoring of parameters, e.g. composite charge temperature, control of the parameters,
- foaming by blowing gas into the liquid composite,
- gas blowing horizontal-axis rotor,
- continuous production of foam,
- possible monitoring and control of blown gas parameters,
- continuous reception of foam, its portioning and cooling.

Innovative aspect of the invention:

- use of metal-ceramic composites with wide ranges of selected components,
- production of foams with specific properties: low density, ability to absorb impact energy and sound waves, suppression of mechanical vibration, low thermal conductivity, attenuation of electromagnetic waves, fire resistance meeting standards of the International Maritime Organisation,
- cheap and simple casting method allowing to obtain a desired rigidity and enhanced strength of composite foams compared to monolithic materials.

Form of intellectual property: patent

Full name of the invention: Method of manufacturing structural elements from foamed metals

Inventors: Katarzyna Gawdzinska, Janusz Grabian, Michal Szweycer

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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*System for large marine engine crankshaft
measurements*

Field: shipbuilding, machine operation.

For: shipyards, ship operators, engine manufacturers.

This measurement system with measured object flexible support control eliminates elastic deflections of a crankshaft, guaranteeing correct estimation of actual shaft geometry. No matter if the crankshaft is set in centre points or V-blocks, elastic supports positioned in the shaft's central part compensate possible shaft deflections. Measurements done by the proposed system are computer-based, and the results are processed by dedicated computing programmes.

Innovative aspect of the invention:

- elimination of elastic strains of a shaft caused by its own weight,
- comprehensive assessment of the geometry of marine engine crankshafts.

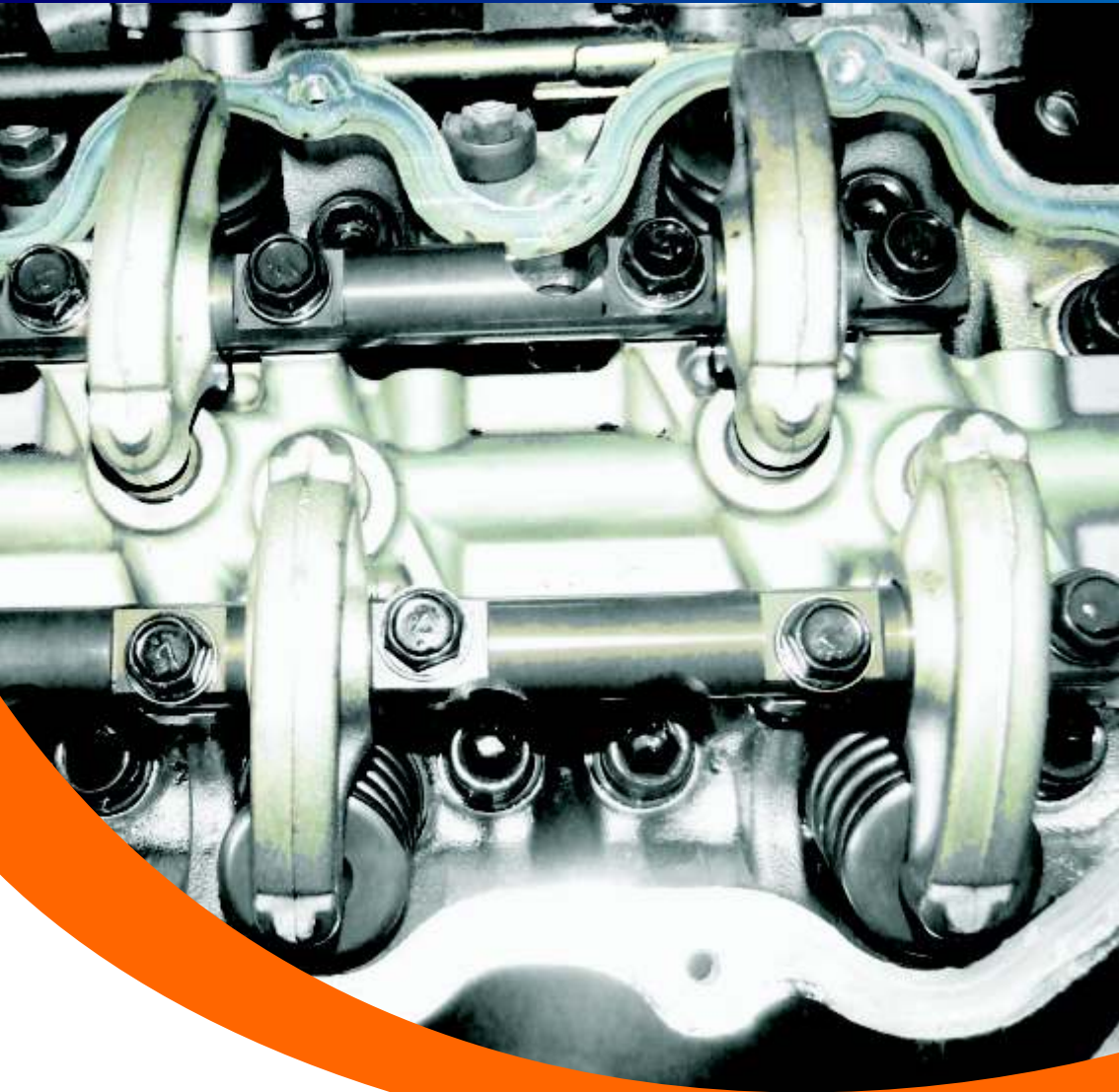
Form of intellectual property: patent

Full name of the invention: Method and device for measurements of shape and axis position deviations of crankshaft journals

Inventors: Krzysztof Nozdrzykowski

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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*Safe and reliable startup and economical operation
of diesel engines*

Field: power industry, transport, sea mining, shipbuilding.

For: diesel engine makers, ship operators, producers of machine supervision and diagnostic systems, shipyards.

The invention has application for diesel engines with starting air valves mounted on cylinder heads. The device for diagnosing the technical condition of these valves uses temperature sensors installed in appropriate places of the starting air installation. Based on collected measurements, a data processing unit analyzes input data and if necessary, activates a starting air valve failure alarm.

Innovative aspect of the invention:

An active system for the diagnostics of technical condition of starting air valves on diesel engine cylinder heads, allowing to detect early wearing of valve-nest tightness during normal operation of the engine (when starting air valves do not work). It permits to:

- prevent explosions in the starting air manifold (improvement of engine's operational safety),
- minimize time of ineffective work of the engine connected with lowering the combustion pressure in the cylinder,
- increase the operational reliability of the engine starting air system.

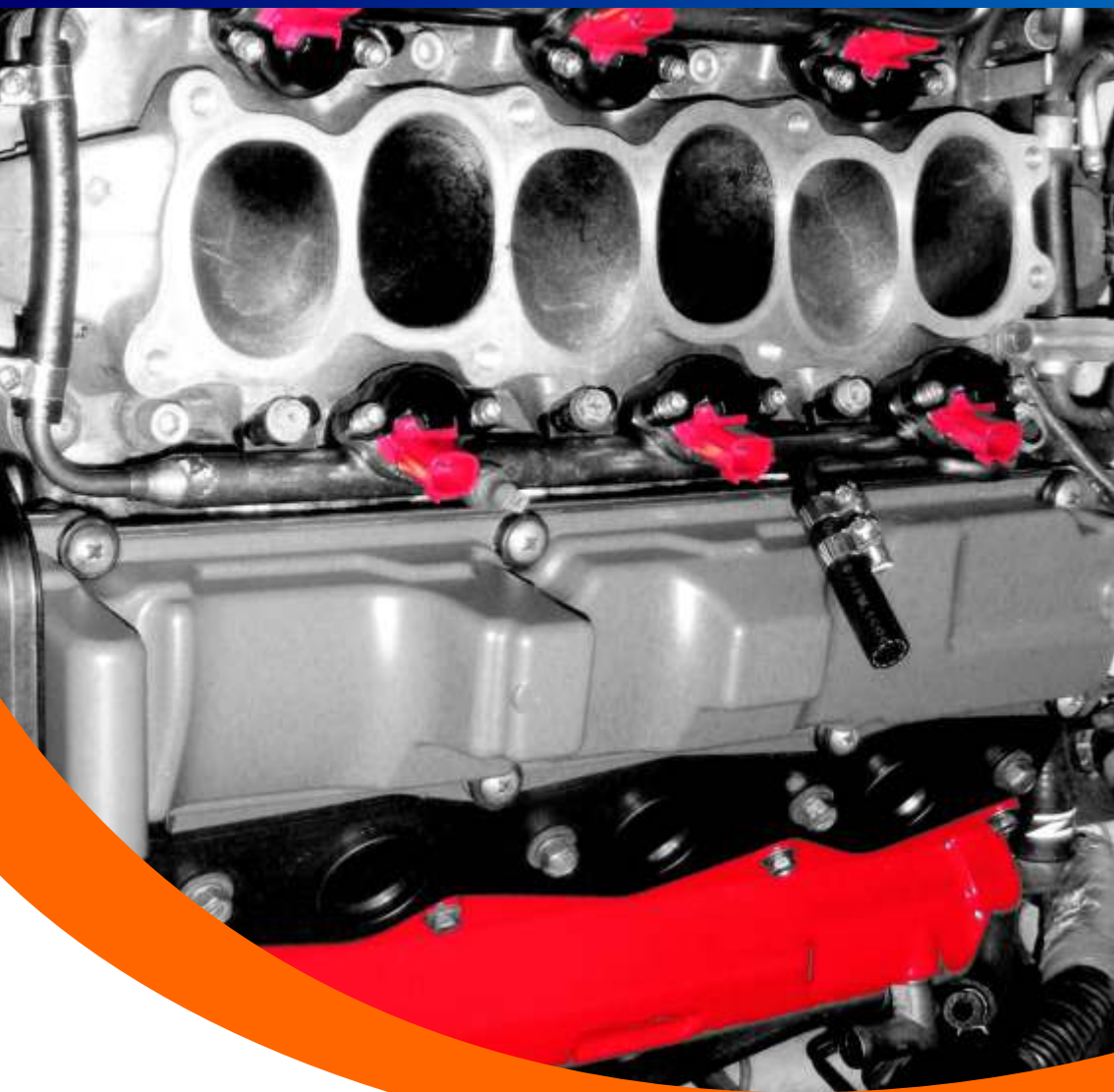
Form of intellectual property: patent pending

Full name of the invention: Method and system for diagnosis of diesel engine starting valves, especially the marine version

Inventors: Leszek Chybowski, Robert Grzebieniak

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

Contact person: Konrad Frontczak k.frontczak@innoam.pl,
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Fuel injector

Field: shipbuilding, power engineering, transport.

For: shipyards, ship operators, engine manufacturers, transport companies operating diesel engine vehicles.

A thin-walled cylinder with a deposited layer of a catalyst is inserted in the injector body. When fuel flows through, the catalyst causes fuel dehydrogenation, which shortens the delay of self-ignition. As a result, combustion is improved at lower maximum temperatures of the cycle, thus reducing unit consumption of fuel and emissions of nitrogen oxides.

Innovative aspect of the invention:

- additional element, a thin-walled sleeve does not require any changes in the technological process of making injectors,
- a thin-walled sleeve can be inserted in injectors of already operated engines.

Form of intellectual property: patent pending

Full name of the invention: Fuel injector

Inventors: Oleh Klyus

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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Static homogenizer

Field: shipbuilding, fuel systems, oil systems, water-fuel and fuel-water emulsions, onshore power engineering.

For: shipyards, ship operators, working fluid manufacturers, land-based power engineering companies.

The principle of operation of the device consists in directing a two- or multi-component liquid onto homogenizer sections. The flow of multi-component liquid through nozzles allows to split the jets, which then cross and collide with one another and with stationary parts of the homogenizer. An additional effect of flow turbulization improves the quality of homogenization.

Innovative aspect of the invention:

- simple design, cheaper construction, no moving parts,
- modular construction, possibility of selecting elements' configurations to suit user's needs,
- improved combustion of standard fuels and fuel-water emulsions,
- changed morphology of petroleum wastes and utilization of their chemical energy in the combustion process,
- wide range of homogenized fuels,
- possibility to produce fuel-water emulsions.

Form of intellectual property: patent pending

Full name of the invention: Static homogenizer

Inventors: Cezary Behrendt, Robert Jasiewicz, Oleh Klyus

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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Non-invasive diagnostic method for diesel engine atomizers

Field: transport, shipbuilding, diesel engine manufacturing

For: shipyards, ship operators, manufacturers of diesel engines

A generated pulse of acoustic emission (AE) signal releases internal energy of elastic waves passing through an examined tribological node: needle taper and atomizer seat. The energy is then registered at the node output and processed by a special program. The value of recorded AE signal reflects the technical condition of the needle taper and the fuel atomizer seat. Comparison of the recorded AE signal with a reference signal shows whether the examined atomizer is in good condition or worn out.

Innovative aspect of the invention:

- unique, non-invasive and quick method of atomizer examination.

Form of intellectual property: patent pending

Full name of the invention: Method and device for the assessment of technical condition of diesel engine fuel atomizers.

Inventors: Mirosław Meissner, Zbigniew Ranachowski, Zygmunt Raunmiagi

Type of intended co-operation: licence or research and industrial co-operation on agreed terms and conditions

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