MODELLING OF ENTERING OF FREE GAS FLAME INTO POROUS MEDIUM

N.A.Kakutkina, A.A.Korzhavin, E.B.Manzhos, A.D.Rychkov, P.K.Senachin

Experimental and theoretical analysis of entering free gas flame into porous medium were carried out. It is shown that the value of porous medium surface temperature at which flame entering into one is a function of the system parameters. It is established occurrence of lower and upper limits of ignition on filtration velocity. The dependencies of ignition time on porous medium parameters are obtained and interpretation of these is presented.

Keywords: filtration combustion, gas combustion, ignition.

PROCESSES OF HEAT TRANSFER IN CROSS CAVERNS WITN TWO VERSIONS OF EXTERNAL TURBULENCE

A. Yu. Dyachenko, V.I. Terekhov, N.I. Yarygina

Discusses two ways the impact of increased turbulence the main flow on the quick release for the flat lateral trench with different inclinations of the front and back walls. The first is the traditional method of external turbulence generated by bars at the entrance to the port. The second less commonly used method is based on the use of minipregrad-vortex generators installed before-cavity vessels. There are given comparative results of experimental investigation of heat transfer coefficients of models of external turbulence.

Keywords: cavern, detachable turbulent flow.

USE THE FINE-DISPERSED LIGNOCELLULOSE RAW MATERIALS AS SOLID FUEL

A.P. Burdukov, M.J. Chernetskiy, A.A. Dekterev, N.S., O.I., Lomovsky, A.L. Bychkov

In this paper the mechanochemical receive fuel from lignocellulosic particulate suitable raw material source and using a suitable semi equipment, testing of the samples in the firing stands to determine their suitability for use as an environmentally friendly fuel, as well as the mathematical model of torch combustion biofuels.

Keywords: biofuel, burner, mechanical activation, microgrinding, modeling.

NUMERICAL SIMULATION OF THE IGNITION OF COAL PARTICLES FROM MOISTURE EVAPORATION AND ENDOTHERMIC DECOMPOSITION OF SOLID COMBUSTIBLE COMPONENTS

S.V. Syrodoj, V.V. Salomatov, G.V. Kuznecov

Defined by the developed mathematical model of coal particle ignition settings with heat together by cart and convection, and rejection by evaporation of moisture on the front edge of the phase transition and èndotermičeskoj decomposition of solid fuel. Numerical results obtained are correlated with data from experimental studies.

Keywords: water-coal fuel, ignition, ignition and combustion particles.

CALCULATION OF THE MUTUAL INFLUENCE OF THERMAL AND DESIGN PARAMETERS OF WATER WARM FLOOR

M.I. Nizovtsev, I.A. Sakharov

In the article the results of computer simulation of the heating system water warm floor "at different step of laying heating pipes and varying the temperature of the coolant. As a result of the calculations is the mutual influence of con-struktivnyh and thermal parameters of water warm floor. Recommendations for VA-ru styling step heating tubes and coolant temperature, as well as the optimum thickness of thermal insulation to reduce heat loss.

Keywords: Panel-radiant heating, water warm floor, temperature distribution, finite element method.

TRANSLATION OF BOILERS OF LOW POWER VODOUGOL'NUÛ TECHNOLOGY

V.V. Salomatov, U.V. Dorokhova, S.V. Syrodoj

Held for technical and technological solutions for reconstruction of steam boilers of low power output with their transfer to combustion of coal-water fuel patent according to the IT SB RAS 2009113840/06 dated 2005.04.13. A selection of races-accounts and the design of the combustion chamber cooling Chambers and other boiler heating surfaces. A heat balance of reconstructed boilers to water-coal fuel from Brown coal Šivè-Ovooskogo deposit in Mongolia. A techno-economic evaluation of the reconstruction and environmental characteristics of the boiler to water coal.

Keywords: water-coal fuel burning, environment, reconstruction.

PREPARATION AND GASIFICATION OF SOLID WASTE IN TWOAREA GAS GENERATORS DIRECT PROCESS SERVING OF MINI-CHP AND COMPLEXES FOR PRODUCING SYNTHETIC LIQUID FUELS

R.Sh. Zagrutdinov, V.N. Negutorov, D.G. Malykhin, P.K. Senačin, M.S. Nikishanin, S.A. Filipchenko

The problems of the energy use of solid household wastes, including their training and dvuhzonnyh gas generators direct gasification process with dual combustion zone for the mini-CHP. Describes the concept of energy flows and balance mini-CHP. Provides a description and schematic diagram of the complex on production of synthetic liquid fuel from the gas generator and its composition and quality.

Keywords: domestic waste, briquetting, gasification, dvuhzonnye gazoge-gasifiers can be selected, the mini-CHP, synthetic liquid fuels.

ROTARY MACHINES

E.M. Puzyrev, V.A. Puzyrev, M.E. Golubev

Addressed the development of steam engines, including the thermodynamic characteristics of the pair as a working body. Noted the need for wider use of steam engines in power system. Considered the odnorotornyh of compressors and the possibility to use them as the Rankine cycles for expansion and others.

Keywords: steam, steam engine, turbine, compressor.

THE USE OF COHERENT SMALL ANGLE LIGHT SCATTERING TO DETERMINE THE RANGE OF SIZES OF DROPLETS SPRAYED DIESEL FUEL

V.V. Chertishev, P.K. Senachin, S.A. Ulrich, P.S. Zhigulin

The technique of laser diagnostics of dispersed diesel engine fuel, developed by authors, which allows to find the parameters of the particle-size distribution of fuel drops, is described. The cross-interference influence on a pattern of coherent light scattering on the drops of fuel by the use of numerical modeling of the Fraunhofer diffraction on spherical droplets with random location has been considered.

Keywords: laser diagnostics, coherence, diesel engine, fuel injector, fuel drop, small-angle light scattering method.

EXPERIMENTAL STUDIED OF THE BIOFUELS DISPERSION UNDER DIFFERENT PRESSURE INJECTION USING THE OPTICAL CONTROL OF FUEL DISPERSION QUALITY

A.V. Eskov, A.V. Maetsky

Annotation: The results of experimental research on fuel dispersion of rapeseed oil, ester from rapeseed oil and diesel fuel at different pressure injection. Experiments were carried out in atmospheric conditions with the use of Common Rail and native fuel injection systems.

Key words: quality of fuel dispersion, optical heterogeneity, image processing, biofuel.

MATHEMATICAL MODEL OF BURNING OF METHANE WITH FORMATION OF HARMFUL SUBSTANCES IN HCCI ENGINE

A.P. Senachin, A.A. Korzhavin

The mathematical model of the gas piston HCCI engine (a homogeneous charge with ignition from compression), working at methane or natural gas, with the detailed kinetic mechanism from 273 reactions from 35 particles is given. The model allows to optimize on the basis of numerical modeling working process and formation of harmful substances in the HCCI engine.

Keywords: numerical modeling, the piston engine, the HCCI engine, a homogeneous charge, ignition from compression, the detailed kinetic mechanism, formation of harmful substances.

THE DEFINITION SECTION OF THE GAS OF A DIESEL ENGINE BUSHING D-144, EQUIPPED WITH ADDITIONAL ZOLOTNIKOVYM GAS DISTRIBUTION MECHANISM

A.A. Balashov, D.V. Syrotenko, V.S. Yarov

Is one of the pictures 3D model performed to visualize air flow on the gas dynamics engine, System tracts dual-exhaust (OG). The Kazan Dynamics theoretical and effective walk-through sections of main and additional exhaust, distributing, using the static purge. The results can be used in the calculation of gas-exchange engine with dual-launch of OG.

Keywords: diesel, gas distribution, gas-air routes, the exhaust gases, the system of dual release.

EXPERIMENTAL AND ANALYTICAL STUDY ON THE DEGREE OF BLACKNESS OF THE WORKING PARTS SURFACES OF CYLINDER-PISTON DIESEL ENGINES

A.A. Zuev

The article is devoted to one of the topical issues of modern engine research local radiation heat transfer in combustion chamber of a diesel engine. On the basis of experimental research and theoretical analysis of the radiation characteristics of the heat exchange surfaces obtained details of the cylinder-piston group of the engine.

Keywords: engine, diesel, radiative heat transfer.

QUICK TEST OF FUEL LINES TEMPERATURE OF DIESEL MULTIPLE PUMP FUEL SYSTEM

E.M. Tausenev, K.V. Koh, A.E. Svistula, E.A. German

Are investigated air temperature and high pressure line in the engine compartment of agricultural tractor. Air temperature influence in the engine compartment on temperature of high pressure lines is proved.

Keywords: diesel, diesel fuel system, engine compartment, diesel fuel temperature, air temperature in an engine compartment.

THERMAL STRESSES OF CATALYTIC MATERIALS BASED ON ILMENITE IN DIESEL EXHAUST CONVERTERS

A.A. Novoselov, A.L. Novoselov, N.P. Tubalov, A.A. Melbert

The use of ilmenite as a basis for the preparation of porous permeable SHS catalytic materials is a very promising way of expanding the resource base receipt of catalytic materials based on natural resources. The paper presents the results of determination of the

thermal conductivity of porous permeable SVS-based materials ilmenite ore, the mathematical relationship linking the thermal resistance of the material to the thickness of the porous permeable wall and its temperature. Knowledge of thermal and need in terms of additional heating of the catalytic converter exhaust components in order to ensure technological regimes cleaning them from harmful substances.

Keywords: catalytic materials, purification, cleaning of exhaust gases, the catalyst

SETTLEMENT PILOT STUDIES OF A TWO-STROKE ENGINE OF INTERNAL COMBUSTION WITH DIRECT INJECTION FUEL AND A SPARK IGNITION

S.A. Eroshchenkov, V.A. Korogodsky, E.P. Voropaev, O.V. Vasilenko

Settlement pilot studies of the engine of the direct injection of fuel equipped with system are carried out. The chosen mathematical model with high precision describes the processes weeping in the engine at use of direct injection with stratification of an initial working body in the cylinder of the engine.

Keywords: internal combustion engine, direct injection of fuel, stratification of an initial working body, two-stroke engine.

DEVELOPMENT OF MECHANOTRONIC MODELS OF MECHANICAL SYSTEMS USING CAMEL-VIEW APPLICATION

V.I. Poddubnyi, A.S. Pavlyuk, M.L. Poddubnaja

The ideology of development of mechanotronic systems using CAMeL - View application, the description mechanotronic test rig models «a steering - a forward conventional suspension of the car» and results of mathematical modelling of control by turn of a steering wheel of the test rig are presented.

Keywords: a control system of movement of mechanical system, mechanotronic model, applied software package CAMeL-View, visual object-oriented programming

HEAT RECOVERY STEAM GENERATORS DESIGNED AS A PART OF COMBINED CYCLE

S. Khutornenko, I. Fursov, G. Pron

The article addresses the state of power industry in Russia and possible ways to improve power-generation stability by introduction of new combined cycle units and includes the review of flow diagram of CCP plants with HRSG.

Keywords: energy, combined cycle, combined cycle gas turbine, a heat recovery steam genarator, modernization, gas turbine

THERMAL STRESSES OF CATALYTIC MATERIALS BASED ON THE MODELING CLAY IN THE DIESEL EXHAUST CONVERTERS

N.N. Gorlova, A.A. Melbert, G.V. Medvedev, D.S. Pechennikova

The paper identifies the key characteristics and properties of materials on the basis of modeling clay. For this type of porous permeable SHS catalyst materials received and describes important thermal characteristics to allow for the necessary analytical calculations for the design of materials. As a result, the experimental data was obtained by the expression linking the material with heat and its temperature in the batch containing the moldable clay. As a result of the study, the connection between the intensity of the heat and the resulting porosity of the material.

Keywords: Cleaning emissions, composite materials, catalyst, corrosion resistance

DEVELOPMENT OF AN ALGORITHM TO DETERMINE THE FLUXES OF SATURATION ON THE REGULATED CROSSING OF THE CITY OF BARNAUL

S.A. Ulrih, V.I. Vedyashkin, D.Yu. Kashirskiy

The paper presents the study of high-speed mode of traffic flows through the main streets of cities in different time periods, location "problem" intersections in the city, the saturation flux analysis techniques and value calculation algorithm saturation flux by the proposed procedure.

Keywords: Road traffic, flow saturation, traffic delays vehicles, correction flow saturation.

THE TECHNOLOGY OF BURNING OF AGRICULTURAL WASTES WITH THE USE OF MULTIPLE CIRCULATION FUEL

I.S. Yakimova, E.V. Krasutsky, E.B. Zhukov, A. Alimov, D.P. Denisik

The article considers the conditions of use of agricultural waste as fuel, disposal of utilization of such waste. The results of experiments of the fuel combustion, the development of boilers with a vortex combustion furnace and the results of numerical simulation are shown in the article. We determined the coefficients for further calculations.

Keywords: alternative fuels, wastes, multiple circulates the fuel, numerical simulation, the combustion of fuel.

THEORETICAL FOUNDATIONS FOR THE DIAGNOSIS OF THE DIESELS ON THE PARAMETERS OF THE WORKING ENGINE OIL

S.V. Vikulov

On the basis of the analysis of the experimental material developed theoretical framework and guidelines for the assessment of the state of marine diesel engines.

Keywords: marine diesel engine, diagnostics, prognostication, residual life, the engine oil.

DIAGNOSTICS OF THE CRANKSHAFT MARINE DIESEL ENGINES FOR THE PARAMETERS OF TORSIONAL VIBRATION

S.V. Vikulov

On the basis of the analysis experimental material developed standards for the assessment of the status of damper and mathematical model forecasting a residual resource of the crankshaft of exploited marine diesel engines.

Keywords: marine diesel engines, damper, crankshaft, torsional vibration, spectrogram, diagnostic, prediction, residual life.

ANALYSIS OF THE RESONANCE PROCESS DURING TORSIONAL VIBRATIONS IN THE INTERNAL COMBUSTION ENGINE

V.S. Popovich, A.A. Zherdev

The work of machine-tractor unit in the operating conditions of instability excitations of significant volatility of the angular velocities of all sections situation. Special trouble is, this instability near resonance mode of operation. Strain measurement and Dinamometrirovanie shaft lines of tractors T-4, T-4A and DT-75M shows that the resonance curves shot in field conditions, have less acute stretched resonant peaks.

In this paper we propose a method of calculating a single passage through the resonance, and the «hollowing out» of resonance peaks in the unstable excitation is considered as repeated passage through resonance.

Keywords: machine-tractor unit, situation, strain measurement, dinamometrirovanie, «hollowing out», resonance mode, resonance curves, resonant peaks.

TORSIONAL VIBRATIONS OF MACHINES, TAKING INTO ACCOUNT THE GAPS

V.S. Popovich, P.E. Pestretzov

The real torsional system of power drive machines have clearances at the compound transmissions. The presence of clearances leads to a significant change in the nature of the dynamic phenomena in the elements, System with the clearances is non-linear, and the theoretical analysis of its fluctuations with the much more complicated compared to the anti-backlash system. Non-resonant and resonant forced oscillations lead to changes in laws and possibilities assess the effect of clearances in the systems. In the article considers the theoretical issues of free and forced torsional oscillations in the presence clearances in the systems of machines.

Keywords: torsional oscillations, resonance oscillations, clearances.

STREAMLINED DESIGN OF THE ROTARY ENGINE TURBO COMPRESSOR TYPE

A.N. Tokarev, M.Yu. Tokarev

Describe the design of the rotary internal combustion engine turbo-compressor type developed in the AltSTU with a modified design of the compressor.

Keywords: rotary motor, compressor, turbine, combustor, seals, the working chamber.

RESEARCH OF THE CONTENT OF HARMFUL SUBSTANCES IN AIR AT THE INTERSECTION OF THE ROAD NETWORK OF THE CITY AND IN BUS SALON

J.A. Shaposhnikov, N.A. Chernetskaya

In article results of research of the content of harmful substances are given in air at the intersection of a road network of the city and in bus salon. On the basis of results of pilot studies and generalizing calculations the analysis of influence of the characteristic of transport streams, delays of cars at the intersection, and also a technical condition of the bus on contents of harmful substances in air is made.

Results of research showed that reduction of delays on a road network of the city will allow to reduce volumes of automobile emissions and respectively the content of harmful substances in air. Concentration of harmful substances isn't evenly distributed on the volume of salon and depends on a technical condition of the bus and its load operating modes.

Keywords: researches, harmful substances, concentration, road network, transport stream, intersection, delays, bus salon, engine, fuel, ecology.

THERMAL STRESSES OF CATALYTIC MATERIALS BASED ON CORDIERITE DIESEL EXHAUST CONVERTERS

L.S. Aleksandrova, A.A. Novoselov, N.P. Tubalov, A.L. Novoselov

In this paper the authors have identified the main characteristics and properties of materials based on cordierite ore produced high-temperature synthesis. Were carried out to determine the thermal conductivity of porous permeable catalytic materials obtained on the basis of high-temperature synthesis of ore cordierite.

Keywords: composites, emission control, cleaning efficiency, catalytic properties, charge.

IMPACT OF DESIGN PARAMETERS OF THE STEERING GEAR ON THE WHEELS TURN OF THE MOBILE MACHINES

A.S. Pavlyuk, S.V. Safronov

The possibility of impact assessment of design parameters of the steering gear connection of steering wheel with dependent leaf suspension on unsteered wheel turn due to the deformation of the elastic elements have been considered. Analytical dependences allowing to choose rational design parameters of the steering gear to reduce uncontrolled rotation angles have been obtained. The

characteristics of the steering gear of two auto-trucks were determined. The results are directed on improving road holding.

Keywords: wheel vehicle, moving, bumps, steering wheels, front suspension, steering gear, design parameters, wheel turn.

DEVELOPING EFFECTIVE TRANSPORT NETWORK MAILING MATRIX BARNAUL

A.V. Borovikov, D.Yu. Kashirskiy, S.A. Ulrih, V.I. Vedyashkin

The paper presented study by division city Barnaul transport areas, develop a matrix of correspondence, presented the matrix calculation of correspondence and distribution of transport load city of Barnaul.

Keywords: Transport network, the matrix of correspondence, the gravity model, transport areas.

MATHEMATICAL MODELING OF THE HEAT RECOVERY STEAM GENERATOD, DESIGNED FOR OPERATION IN THE CCPP-230

S. Khutornenko, I. Fursov, G. Pron

The article covers the experience of developing a computational model of HRSG designed for operation as a part of CCPP-230 and presents main results of heat recovery boiler calculations.

Keywords: energy, combined cycle, combined cycle gas turbine, a heat recovery steam genarator, modernization, gas turbine.

THERMAL STRESSES OF CATALYTIC MATERIALS BASED ON ALLOY STEEL IN CONVERTERS OF EXHAUST GASES OF DIESEL ENGINES

G.V. Medvedev, L.S. Aleksandrova, A.A.. Novoselov, D.S. Pechennikova, N.N. Gorlova

The paper presents the results on the effect of heat intensity of catalytic materials based on alloy steel converters in the exhaust gases of diesel engines. New knowledge about the influence of porosity permeable catalytic materials on the basis of scale alloy steel for their thermal tensions.

Keywords: yield strength, thermal conductivity, permeable porous materials, heat, exhaust, catalytic converters.

MATHEMATICAL MODEL OF PIVOTALLY CONNECTED MACHINERY WITH TOWING COUPLER IN THE FORM OF FOUR-BAR LINKAGE

A.S. Pavlyuk, Y.I. Shenkneht

The article is concerned with the mathematical model of pivotally connected machinery. The analytical model and the equations of motion are given. The results can be used to simulate the movement of machine-tractor aggregates when choosing rational design and operational parameters. The proposed model is of scientific and practical interest when considering the possibilities to improve the stability and maneuverability of the machine-tractor aggregates.

Keywords: mathematical model, simulation of the motion, pivotally connected machinery, machine-tractor aggregates, four-bar linkage, maneuverability, road stability

FACTORS CONSERVATION COOKING MODE NUTRIENT MIXTURE IN THE APPARATUS OF THE PADDLE

N.A. Chernetskaya, J.A. Shaposhnikov

The process of mixing the fat fertilizer with water in a horizontal machine with radial paddle. A solution of the equations of relative motion of the fat with the resistance of the medium, which allows to determine the particle's trajectory, descending from the blade, with different kinematic conditions. Identified factors conservation making process nutrient mixture.

Keywords: mixing blade, mixer, tuks, mix mode, the movement trajectory.

INTEGRATION DEVELOPMENT OF DAIRY AND MEAT SUBCOMPLEX
(on materials of the Altai territory)

I.A. Svistula

The author specifies concept of «agroindustrial integration», added metrics to assess the effectiveness of the integration of formation. The analysis of the provisions of the livestock development. The recommendations for integrated development of agriculture of the Altai Territory.

Keywords: agriculture, integration, integration development, cluster, area, meat subcomplex, dairy subcomplex, industrial location, innovation, the innovative approach.

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Контактная информация:
тел. 8-3852-29-07-44
e-mail: gen195@mail.ru
Суханкин Геннадий Владимирович