SUMMARIES

RESEARCH OF KINEMATIC AND DYNAMIC ERRORS OF CRANK-PISTON MECHANISMS. **N. Davitashvili, V. Bakhshaliev, S. Bliadze. "**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 7-15, (Engl.).

Is stated a study of influence of kinematic and dynamic errors of crank-piston mechanisms. For purpose of determination of technological errors of position, velocity and acceleration of output links of mechanism is applied the differential method. For real crank-piston with clearances in kinematic pairs with taking into account additional and basic motions of mechanism are determined the errors of position, velocity and acceleration of coupler and piston. All necessary requirements that are characterized for definition of dynamical precision of crank-piston mechanisms are shown. Due the comparative analysis of reaction forces in the kinematic pairs of ideal and real mechanism are determined their errors. The obtained results gives the possibility with taking into account of error of mechanism to define real law of motion of piston that promotes to reliable and durable operation of piston as well as whole mechanisms. 1 ill. Bibl. 15. Engl.; sum. in Russian.

METHOD OF PHYSICAL MODELING OF TRACTOR UNITS OPERATION ON SLOPE. **R. Makharoblidze, B. Basilashvili, Z. Makharoblidze. "**Problems of Mechanics". Tbilisi, 2014, №3(56), pp. 16-20, (Engl.).

For accelerated development as well as reasonable purchasing of foreign engineering for mechanization of mountainous agriculture is offered their preliminary testing on test bench by physical and mathematical modeling instead of routine methods of research in the field conditions when the accumulation of experimental data is carried out rather slow and are delayed the terms of implementation. 2 ill. Bibl. 3. Engl.; sum. in Russian.

GENERATION OF USABLE ENERGY IN THE DIFFUSER AT FLOW OF GAS WITH HIGH THERMAL CONDUCTIVITY. **A. Aptsiauri. "**Problems of Mechanics". Tbilisi, 2014, №3(56), pp. 21-28, (Engl.).

In this paper on a concrete example is shows the correctness of Ge-theorem on possibility of useful energy generation from the heat of environment, in conditions of thermal equilibrium. In particular, is proposed modeling of one-dimensional flow of an ideal gas that has a high thermal conductivity and is demonstrated the origination of a strong sucking effect in an expanding channel (diffuser) that gives the possibility to provide independent, stable flow of gas from the low pressure to high pressure area with energy consumption only at the initial stage of such flow origination. 2 ill. Bibl. 3. Engl.; sum. in Russian.

IMPACT OF THE MAIN ENGINE TYPE ON THE ENERGY EFFICIENCY OPERATIONAL INDICATOR OF THE SELECTED TYPES OF POLISH FISHING CUTTERS. **Cezary Behrendt. "**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 29-34, (Engl.).

In view of the hazards to the environment and an energy efficiency of fishing cutters, this paper presents and comprises an analysis of the Energy Efficiency Operational Indicators' (EEOI) calculation results as an indicator relating fuel consumption and the emission of the harmful exhaust gases. In order to determine EEOI the field test results have been applied. The research was carried out on three Polish fishing cutters of the same type on which different types of medium-speed self-ignition internal combustion engines, used as main engines, were installed. The conducted analysis allowed for an assessment how an engine type affects the EEOI value. 1 ill. Bibl. 11. Engl.; sum. in Russian.

ANALYSES OF EMITTED AND TRANSFERRED AT CUTTING PROCESS INTO THE CUTTING TOOL PLATE HEAT BY FINITE ELEMENTS METHOD. **G. Gratiashvili, M. Sanikidze. "**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 35-38, (Engl.).

In the article is considered and developed the geometric model of tool plate cutters and presented in the form of finite element, as well based on the laws is obtained new original method of heat transfer and distribution that is obtained grounded on application of method of finite element. 5 ill. Bibl. 5. Engl.; sum. in Russian.

ASSESSMENT CRITERIA FOR IGNITION PROPERTIES OF DIESEL ENGINE FUELS. **Pawel Krause. "**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 39-46, (Engl.).

In case of biodiesels (and also some marine residual petroleum fuels) their cetane number, proper according to fuel standards, is not sufficient indicator ensuring good quality of combustion process and engine performance, comparable with use of typical distillate petroleum diesel fuels. In article, factors affecting on atomization quality, typical chemical composition of rapeseed oil methyl ester (RME) and changes occur during atomization of fuel, having influence on combustion process, have been investigated. Also, proposal of the use an additional quality ignition criterion taking into account viscosity and surface tension of major chemical component fraction, instead of viscosity and surface tension of RME or its blend diesel fuel, should be taken under consideration. 7 ill. Bibl. 17. Engl.; sum. in Russian.

METHODS OF STRUCTURE FRACTURE RESEARCH AND ANALYSIS OF REASONS. **A. Katsadze. "**Problems of Mechanics". Tbilisi, 2014, № 3 (56), pp. 47-53, (Engl.).

In article are presented the issues of revealing of reasons and analysis of the structure fracture. Are considered influenced on the object operational integrity main and secondary factors. Are stated the structural control methods and devices. 4 Ill., Bibl. 8. Engl.; sum. in Russian.

NUMERICAL STUDY OF MODE OF DEFORMATION OF SINGLE-MESH SHELL'S MODELS. **M. Sanikidze, G. Gratiashvili. "**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 54-64, (Engl.).

In the article are considered the results of a numerical investigation of the mode of deformation of models of composed mesh aluminum shells of variable curvature. From the carried out on models studies under the action of a uniformly distributed static load is clear that the shell behaviors as a compressed structure with a high load capacity and confirmed the position that the load, uniformly distributed over the covering, is determinative by the shell's deformations. The numerical calculation of mesh shells models mesh in elastic stage showed good agreement between calculated and experimental results. The study showed that the characteristic form of failure is the loss of load-carrying capacity related with changes in the geometry of membranes at very high loads. 8 ill. Bibl. 5. Engl.; sum. in Russian.

OPERATIONAL METHODS FOR THE ENERGY EFFICIENCY MANAGEMENT OF THE POLISH FISHING FLEET. **Marcin Szczepanek**. **"**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 65-70, (Engl.).

The paper presents potential selected solutions that may affect positively an increase of an energy efficiency of fishing cutters belonging to the Polish fishing fleet. The presented solutions, in most part, may be applied by shipowners without any large financial investments and they are mainly based on the results of energy audits of the Polish fishing cutters. Bibl. 9. Engl.; sum. in Russian.

APPLICATION OF CALS-TECHNOLOGY METHODS AT CREATION OF CONSTRUCTION TECHNICAL EXPERTISE INFORMATION SYSTEMS (IS). **A. Katsadze. "**Problems of Mechanics". Tbilisi, 2014, № 3(56), pp. 71-76, (Engl.).

In this article has been developed idea of application at creation of information systems (IS) CALS-technologies methodology for carrying out of construction - technical expertise, based on the application of documents and information technologies, computers and means of communication equipment due that the information system is realized. The reference data of information system dataware that are represented by classifiers are considered. The one of the main tasks of building expertise process - to reveal their true state and prediction of their further operation possibility is considered. Also are represented stages of carrying out of construction - technical expertise and their reflection in the information systems. Bibl. 5. Engl.; sum. in Russian.