
ABSTRACTS

TECHNICAL SCIENCES

Gribkov E. P., Rizak P. I., Malyhin S. O. Finite element simulation of a stressed-deformed state when drawing a tube-shaped blank with a powder core // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

A finite element model of the wire drawing process is considered. The stress-strain state of both the powder core and the metal shell are taken into account in the model. On the basis of the model, the automated design of processing methods was considered. As criteria, conditions were used to ensure the required core density, the required wire diameter, and maintain the integrity of the shell. The results with reference to drawing wire from a copper powder in a copper shell were obtained. The equivalent deformation of the shell did not exceed 40%, the relative density of the core was 0.75, and the drawing force reached 3.6 kN. The proposed algorithm for the computer-aided design of processing methods of drawing allows to determine the minimum number of passes while ensuring the integrity of the shell and the required density of the powder core simultaneously.

Tkachuk N. A., Ishchenko O. A., Tkachuk N. N., Atroshenko A. A. Experiment-calculated study of the die tooling elements // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The general approach to the experiment-calculated study of the die tooling elements is described. On the example of the dies for shearing operation of sheet-metal forming the stress-strain state and contact pressure distribution obtained experimentally and in the course of computer simulation were compared. Numerical studies using the finite element method were carried out. Modern software systems were used for this purpose. Contact marks and strain measurement methods were used for experimental studies. The movements were measured with the help of displacement sensors of the watch type. The satisfactory agreement of the results of numerical and experimental studies was confirmed by the comparative analysis.

Kassov V. D., Kabatskii A. V. Automated line for applying a moisture-resistant composition to the surface of electrodes // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The results of the research on the construction of an automated line for applying a moisture-resistant composition to the surface of electrodes are presented. The automated line is designed for applying a moisture-resistant composition to the surface of finished electrodes of any types and brands by immersion method. The technology provides for holding the electrodes in a liquid solution for five minutes, followed by heat treatment of the applied solution. The line allows simultaneous processing of 400 electrodes (200 electrodes are coated, the rest 200 are heat - treated) and is designed for automatic operation with manual loading of electrodes into the suspension cage. The introduction of the line allows solving the problem of setting up the production of electrodes with guaranteed welding-technological properties in long-term storage conditions, which do not require long-term heat treatment before applying

Kovalevsky S. V., Kovalevskaya E. S., Koshevoy A. O., Evsyukov E. Y. Research of the method of strengthening technological tool by acting on the working surfaces of high-voltage discharges of electric current // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

A new technological way of acting on working surfaces of cutting tools with the aim of improving their durability is proposed and studied on the basis of the analysis of physical effects of high voltage electric current on various materials. The technical result of the method research lies in increasing the lifespan of working surfaces of cutting tools in a short period of time with the usage

of simple equipment, improving productivity and reducing energy costs. Recommended values of the modes of high-voltage discharge treatment are proposed, a new method of data processing that allows the evaluation of wear degree according to the graphic editor on the number of pixels is represented, as well as a way of data processing, allowing to estimate the quality of a technological tool on the basis of ranking according to the predicted wear degree is considered.

Kovalevsky S. V., Truskin Y. Yu. About the flexibility of the machine-assembly complex on the basis of mechanisms with kinematics of a parallel structure // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The main ways of solving the problem of low productivity and flexibility of traditional production systems are presented. The advantages of using mobile robot machines on the basis of mechanisms with kinematics of a parallel structure in the conditions of multi-nomenclature reconfigurable production are shown. It is shown that the algorithm of simulation modeling under the conditions of reconfigurable production allows to solve the problem of providing an optimal structure, the number of equipment and its layout, and also the composition of technological equipment for providing high flexibility and productivity. The continuity of the multi-nomenclature material flows should be ensured in the process of designing the layout and processing.

Tulupov V. I., Onishchuk S. G. Mathematical model of thermal fields in friction-electric modification of surface details // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The paper presents the developed mathematical models of thermal fields that arise during friction-electric modification of parts depending on the parameters of the pulsed current and the modes of smoothing. The mathematical dependences for determining the pulse current frequency, the length of the strengthened fragments, and the magnitude of the longitudinal feed of the indenter are obtained for obtaining a regular discrete structure using molybdenum disulfide as a modifier. The mathematical model of the heat flow is determined and the relationship between modes and temperature is investigated. The depth of the hardened layer after the friction-electric modification of the surfaces of the parts is determined.

Podlesny S. V., Stadnyk O. M. The use of computer algebra in the presentation of the section "plane motion" in the course of theoretical mechanics // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

This article deals with the use of the activity approach in studying the topic "plane motion of a rigid body" on the example of a multi-link hinged mechanism for using the Mathcad package. The problem of the synthesis of the four-link hinged mechanism of crank-rocker type is considered depending on the coefficient of variation of the average rocker speed, the beam swing angle, the minimum angle of the rocker inclination at the beginning of the working stroke and the allowable angle of the rod pressure on the beam. Two methods for calculating the laws of motion, linear and angular velocities, and accelerations of links and characteristic points of the mechanism are developed. The methods are implemented in the Mathcad system, the results of calculations are compared with the help of the both methods.

Bondariev S. V., Donchenko E. I. Research and development of capacitive sensors for sowing of row crops, providing noise immunity in their group use // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

In this article, the analysis of the factors that reduce the noise immunity of capacitive seed cropping sensors for group use was made. By modeling in the Multisim software environment, an analysis of the negative effect of one seed sensor on a neighboring sensor was made, the presence of induced interference and its parameters was detected. Based on previous research prototype, a method for increasing the noise immunity of a sensor consisting in a change in the circuitry

parameters of input amplifiers, which allows fine tuning of the operating points of the sensor excitation generators, is proposed and implemented. The ratio of frequencies that are inadmissible for tuning excitation generators in the case of group use of sensors is determined.

Subotin O. V., Yakovleva A. I. Investigation of the methods of torque and speed control in asynchronous electric drives of belt conveyors // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

In this article, studies are given of an asynchronous electric drive of a belt conveyor with frequency scalar control without a speed sensor and vector control. The modeling and analysis of the control methods under consideration are carried out, their advantages and disadvantages are shown. It is shown that the electric drive with frequency vector control allows to manage the speed of the conveyor at low frequencies well, which increases the accuracy of regulation and allows improving the dynamic characteristics of the electric drive, broadening the speed control range and limiting the torque at a given level.

Aksonov V. P. Program mutual synchronization of speed of shaft of mechanically untied electric motors // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The method of program mutual synchronization of shaft of two servomotors with cutoff on speed is presented at achievement maximum drawdowns. As the stand for researches the stand of firm Siemens with drives Sinamics S120 has been used. Management of two servomotors was conducted in sensorless mode. Program realization of the given method of synchronization with use of programming language CFC is resulted. It is shown, that the offered method of synchronization of speed of two shaft of electric motors provides the necessary accuracy of regulation and gives the chance to save on expensive gauges of speed and drive peripheral units for their connection.

Kvashnin V. O., Lazutkina Yu. A., Fedchenko M. D. Investigation on influence for the inductive resistance the rotor circuit on the induction motor static characteristics // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

In the presented work, the effect of changing the inductive resistance rotor circuit on the induction motor static characteristics in the process acceleration has been studied. To carry out the research, an analysis were made. The existing replacement schemes for the induction motor and the corresponding design relationships for determining its static characteristics. Analytical dependences motor static characteristics were taken into account the change in the inductive resistance of the rotor chain are determined and obtained. On their basis, the static characteristics of an induction motor with and without the effect of a change in the inductive resistance of its rotor chain have been obtained and compared with each other. The results has been obtained in the field of characteristic points and analyzed.

Sheremet A. I., Klimchenkova N. V., Klimchenkov A. G. Mathematical description of the stepper motor drive and implementation of its control system on the basis of Arduino microcontroller // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

Stepper actuators are widely used in positioning and contour motion systems. This raises the question and the need for correct mathematical and computer models to study the dynamic behavior of stepper motor drives. Features in mathematical modeling of the stepper motor drives are considered, the equations allowing conducting researches of electromechanical processes in this electric drive are received. An equivalent circuit for the replacement the stepper motor was obtained, after the equations of electromechanical energy conversion (the basic equation of motion of the drive) for a given drive type were compiled. This provided the basis for the implementation

of the stepper motor drive control system based on the Arduino Uno intelligent controller and the research of the stepper motor parameters, and also to organize remote control. The control system is implemented in the training and research stand.

Sheremet O. I., Tkachenko O. O. The synthesis theoretical aspects by relay regulators for DC electric drives // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The synthesis theoretical aspects by relay regulators for direct current electric drives are considered in the article. Relay regulators operating in the sliding mode are equivalent to a linear amplifier with an infinitely large gain. Sliding mode of the relay system is that under the influence of feedbacks, covering the linear links of the control object in conjunction with the relay controller, the latter switches from one stable position to another with a high frequency. It is shown that the relay system in the slip regime has the property of invariance with respect to certain parametric and coordinate perturbations. The synthesis of relay regulators for direct current electric drives is considered when representing the dynamics of the power part by a system of differential equations. An algorithm for the optimal control of the DC motor speed is proposed and it is shown that the optimal control law, synthesized analytically, can be realized by various structures.

Sheremet O. I., Shevchenko G. S. The parameters determination of the T- shaped circuit for replacing the induction motor based on the no-load test // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The article deals with the method of determining the T-shaped circuit for the replacement in induction motor based on the idling experience. It is established that when studying the effect on the electromechanical characteristics of an asynchronous motor of the network voltage, it is advisable to use the T-shaped replacement circuit, which will allow taking into account the peculiarities in the investigation of the electromechanical characteristics of an asynchronous motor with a voltage change. The parameters of the T-type substitution circuit can be obtained either by calculation or by experiment, or by a combination of these. The most widely used experimental methods research. It is established that the no-load current has a significant effect on the current in the stator winding in an asynchronous motor with a less saturated magnetic system (at lower idle current values), there is more intensive growth of the stator current with decreasing input voltage; The current of the rotor varies insignificantly when the no-load current varies.

ECONOMIC SCIENCES

Isikova N. P., Ovsyannikov R. R. Optimization mathematical model of the formation of a schedule for the process of training personnel of the enterprise // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

Are analyzed the approaches to modeling of the formation of the timetable for the process of training the personnel of the enterprise. Is substantiated the expediency of developing of optimization mathematical model of scheduling for the training process of the enterprise personnel. Is done the optimization mathematical model and the algorithm for creating a timetable for the process of training (advanced training), built on its basis, with a separation from the production activities of the company's personnel. The model optimizes not only the scheduling, but also the selection of the most effective programs for each type of personnel. In this paper, a mathematical optimization model and the corresponding algorithmic support for the task of scheduling and selecting alternative educational programs in the tasks of corporate training of personnel is described, and it is possible to formalize in a mathematical language a number of aspects embedded in the listed models.

Kalinichenko E. V., Telnova A. V. Decentralization at the present stage of development of Ukraine // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

Defining the role of decentralization in development of local self-government on the modern stage of development of Ukraine is the purpose of the study. The purpose of decentralization in Ukraine proclaimed the strengthening of the role of local government, the empowerment of representative bodies of territorial communities with a large amount of power. The article examines the status of decentralization in Ukraine. The analysis of the dynamics of creation of united territorial communities for the period 2014-2017 is done. The analysis of the absolute growth of local taxes and fees in the consolidated territorial communities during January-September 2017 to January-September of 2016 is presented. Is analyzed the dynamics of government subsidies for community development for 2015-2017. Is studied the dynamics of growth of local budgets of Ukraine for 2014-2017. The evaluation of decentralization in Ukraine as well as prospects of its development is done.

Mishura V. B., Spicin V. E. Economic essence, analysis and estimation of the financial state of the enterprise // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The article highlights the essence of the financial condition of the company and presents the main indicators for assessing the financial condition. The basic techniques of financial analysis are presented, identified ways to improve it. It is proved that the financial status must be systematically and comprehensively assessed using a variety of methods, techniques and methodologies. These indicators are an important characteristic of the results of operations of each company, and determine the interaction of all the components of its financial relationships, as well as a set of production and economic factors.

Oleshko T. I., Paziura Y. V. Formation of the system of economic security at the enterprise // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The most important tasks for the company are to ensure the stability of the operation and to achieve the main objectives of its activities. To achieve this, there is a need for constant compliance with the economic security of the enterprise. The system of economic security of the enterprise is characterized, the method of forming the system of economic security at the enterprise is proposed. Having investigated the essence of the economic security system at the enterprise, it was revealed that economic security depends on how effectively the system will be formed, how the system will be adjusted to the specifics of the enterprise and how effectively management and specialists will be able to avoid possible threats and eliminate harmful consequences of certain negative components of external and internal environment.

Reshetnyak T. V., Ivchenkova H. Y., Krikunenko K. N. Diagnostics and prediction of the financial state of machine-building enterprise // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The diagnostics of the financial state of enterprise includes the exposure of rejections in financial activity of the enterprise and the determination of their reasons. The eventual stage of diagnostics is decision making, directed to the removal of reasons of deviations from the normative values of indexes of the financial state. Different methodical approaches are considered in relation to the evaluation of the financial state of the enterprises. Advantages and disadvantages of the approaches are underlined. The level of financial liquidity of machine-building plant is analyzed. The model for the analysis of the financial state on the basis of prognostication of general liquidity ratio is offered. By means of statistical analysis prognosis models are built. Their quality is appraised. The best is chosen. The prognosis of level of liquidity ratio for a machine-building enterprise for the next year is done.

Serdiuk E. N., Gurova A. V. Features of the analysis of incomes and expenditures of budget institutions on the example of the Territorial Center for the Provision of Social Services of the Kramatorsk Local Council // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The analysis of incomes of a budgetary institution is carried out on the example of the Territorial Center for Provision of Social Services of Kramatorsk Local Council. The analysis, conducted on the example of a specific budgetary institution, allowed to substantiate expediency of its separate stages. It is substantiated that incomes of recipients of budget funds can be analyzed in terms of the sources of receiving (general and special fund, special fund - service fee, other sources of own income, other incomes). In the framework of the cost analysis, the analysis of the dynamics and structure of cash and actual costs of general and special funds and the analysis of the execution of cost estimates for the general and special fund can be carried out. Particular attention should be paid to the analysis of wage costs as the main component of the expenditure of the general fund of budget institutions.

Simakov K. I., Boychuk I. P. Problems of forming the system of internal audit of the commercial bank // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The article deals with the theoretical and organizational aspects of internal audit of the banks. The functions, tasks and problems of the internal audit service, which arise in many Ukrainian banks, are considered. The ways to help to avoid and to solve the problems in the industry are found. The principles of internal audit, the need to increase the efficiency of internal audit of banks in Ukraine, which is caused by the growing number of problem banks and is not only related to general macroeconomic instability, are also considered. Measures related to improvement, increasing the quality, effective functioning of the Internal Audit Service are proposed. In accordance with this, the measures for increasing the competitiveness and improving the internal audit processes of Ukrainian banks are substantiated.

Shubnaya E. V., Lozgunova A. S. The current state, problems and prospects for the development of the machine building complex in Ukraine // Scientific bulletin of DSEA. – 2017. – № 3 (24E).

The article is devoted to monitoring the activities of domestic machine-building enterprises, determining their state, problems and development prospects, which is a prerequisite for ensuring the effective functioning of the Ukrainian economy. The state and tendencies of development of the machine-building complex of Ukraine in 2012-2015 are studied. The place and the role of machine building among other branches of the national economy have been determined. The main factors of the negative impact on the development of machine-building enterprises are characterized. The analysis of the basic problems of functioning of the Ukrainian machine-building enterprises is carried out. Prospective directions of development of the machine-building complex of Ukraine are determined. The analysis of the state and problems of the machine-building industry in Ukraine made it possible to conclude that in modern terms the way out of the crisis for the machine-building industry needs support for the innovative development of machine-building enterprises and the reorientation of their export opportunities to other countries and regions.