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The collection includes abstracts of the Second international scientific and practice conference «Ukraine – EU. Modern Technology, Business and Law». (Part 1. Modern Priorities of Economics. Engineering and Technologies).

The actual issues and aspects of collaboration between Ukraine and European Union in the direction of economics, engineering and technological developments are highlighted. The prospective directions, innovative approaches and modern views on the prospects of the development of economics, engineering and technologies are considered.

The publication is oriented on scientists, academicians, postgraduates, students and people who are interested in the prospective collaboration between Ukraine and European Union.

Збірник містить тези доповідей Другої міжнародної науко-практичної конференції «Ukraine – EU. Modern Technology, Business and Law» (Частина перша. Сучасні пріоритети економіки. Інженерія та технології).

Висвітлено актуальні питання та аспекти співпраці між Україною та Європейським Союзом у напрямку економіки, інженерії та технологічних розробок. Розглянуто пріоритетні напрями, інноваційні підходи та сучасні погляди щодо перспектив розвитку економіки, інженерії та технологій.

Видання орієнтоване на теоретиків та практиків, науковців, викладачів, аспірантів та студентів, а також зацікавлених перспективами співпраці між Україною та Європейським Союзом у пріоритетних напрямах.

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ENGINEERING AND TECHNOLOGIES

electrolyte and the floated material is the consistency of the foam and the liquid flocculants with signs. Sedimentation curve shows the parameters useful clarification for technical solutions. Moreover, filtration of the liquid dočíri paper filter so that it meets the required specifications, including the chemical oxygen demand and the measuring sample of 25 300 mg/l $CHSK_{Cr}$ of the input to the 98 mg/l output. Practical use of electrolytic methods of disposal of waste water color can be applied according to experiments of the author also in the cotton and textile industry.

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SYSTEMIC APPROACH TO RESEARCH ENERGY EFFICIENCY OF MACHINE TOOLS

With an ever rising of energy prices and tough competition in the commodity of products market the improving of energy efficiency, performance of modern engineering production, reducing of final cost of production are the topical and the urgent problems of today. In addition, the issue of energy efficiency improving is directly related to the conservation of the environment, reduction of harmful emissions and reduce consumption of fossil resources [1, 2], especially coal, which is mainly used for electricity production in the Ukraine.

According to the source [3] a significant impact on power consumption during machining spindle has the main drive (within 30%) and auxiliary machine units (60% of total electricity consumption). The report states that electricity consumption of spindle nodes together with the energy consumption for lubrication and cooling mechanisms working fluids varies in the range of 50 to 70% depending on the conditions of processing on CNC machines.

For example, the work of spindle unit identified a number of typical energy costs stages: 1 - switching and related processes; 2 - output steady lubrication support; 4 - establishing of the workpiece; 5 - main machining process, which depends on the certain method of surfaces forming; 6 - lubrication conditions change and reducing of rotation speed to a complete stop of spindle unit; 7 - removing of the workpiece; 8 - full off of spindle [4]. Study of individual stages allows to determine the critical processes that lead to significant energy costs.

In [5] noted that there is a contradiction between performance simultaneous provision of accuracy, productivity and efficiency tools. Overcome these contradictions in future allows to produce machines tools with new level of quality.

Scientific approaches to energy research tools are characterized by the wide variety and different approaches. Obviously the most rational is a systematic approach to designing energy efficient constructions of machines that can analyze components and subsystems machines and their relationships within a given hierarchical structure. When designing machines based on a systematic approach can be allocated two interrelated hierarchical levels:

- level of the machine (general requirements for technical level, input and output parameters of processing, operational environment, etc.);
- the subsystems of different levels (drive main movement, drives innings supply system lubricating fluids, etc.).

Defining energy costs can be based on the relevant passport data into separate mechanisms, subsystems or machine known theoretical or empirical relationships. Best available option in terms of adequacy of the obtained values of energy loss is conducting and analysis of experimental research. However, this approach is associated with considerable investments and can be characterized by long duration and is not always possible, especially in a production environment.

The most promising in terms of the previous prediction of energy consumption is to use special software to analyze the energy flow in machine tools [6], but it requires a priori information on an array of energy options, expanding of libraries of standard elements to take into account wide range of power equipment.

At study of the energy efficiency of machining tools, including tools with slip resistance it is necessary to identify the some typical group, which would be presented most widespread energy sources, engines, gears, control systems and energy converters with the executive mechanisms. This will extend the main directions for solving problems related with energy efficiency of machine tools. To one of the machine tools, which has various types of used energy, the large number of AC and DC motors, as well as many independent systems of control can be attributed lathe with hydrostatic bearings UT16A (in original УТ16А).

For further analysis of the energy efficiency machine tool was conducted the analysis of its basic elements, subsystems of lower level to identify useful connections between the processes and the sources of energy used within the hierarchical structure. General functional-energy structure of the machine tool can be presented in several levels, the main of which are the main useful features of its key elements, and lower levels are the main useful features, which are realized through higher levels of the structure. Generalized structure of the lathe UT16A is shown in fig. 1.

Fig. 2 shows that the basic structures of higher levels include creating of the movement of lubricating material that provides continuous power supplies of sliding supports of spindle lathe; creating rotational movement of the workpiece through the spindle, which is connected to the flexible connection with DC motor; spread through the main motion kinematics elements connected to each other; additional features that can expand functionality of the machine tool.

Research has shown that the considered machine tool is characterized by a wide variety of used motors of different capacities in particular AC induction motors.

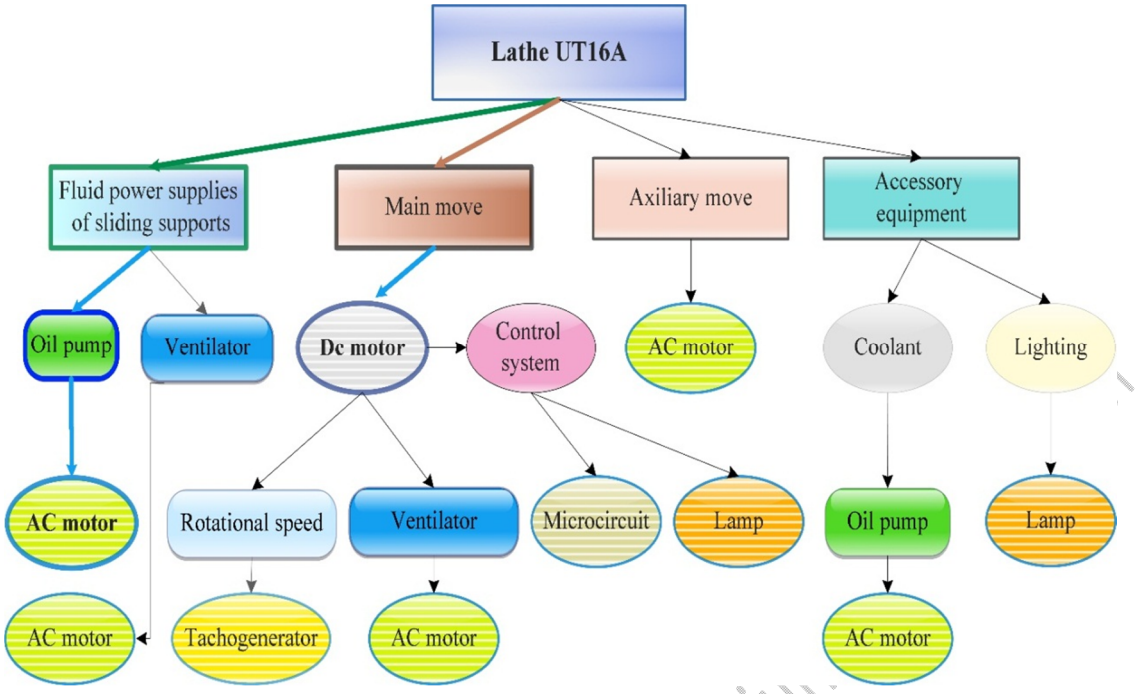

Fig. 1. Functional-energy structure the lathe UT16A

To improving the energy efficiency of fluid power supply systems of spindle bearings the application of hydroaccumulators, fluid flow control systems to the bearing pockets depending on the spindle speed and machining conditions are perspective.

Construction of block diagrams and energy balance of the machine can detect "narrow" place systems that are characterized by significant power consumption. To overcome these technical contradictions in the system is directed next phase synthesis, which begins with the development of mathematical models usually numerical modeling and experimental studies of mechanisms and machine systems with significant power. Elements of the structure of the machine that have shown the greatest power consumption was displayed thickened line.

According to the results of many studies as compared with the traditional processing the use of high-speed processing can significantly reduce specific energy consumption for processing a workpiece in several times.

Considering the complexity of the problem of energy efficiency of industrial equipment in order to assess obtained project solutions it is advisable to use of groups criteria that cover a variety of disciplines (technology, economics, ecology, sociology). Subject to technical criteria: energy and electrical efficiency, specific power consumption, efficiency, equipment utilization electric energy and capacity, and so on. As the economic criteria can be applied given the cost, the payback period of investment, energy efficiency, and more. Environmental effect of the introduction of energy efficient equipment and technologies can be evaluated for predicted intensity indicators of harmful emissions from electricity generation.

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RESEARCH OF TECHNOLOGICAL FACTORS IMPACT ON OBTEINING PROCESS OF DAIRY-PROTEIN CO-PRECIPITATES WITH VIBURNUM

One of the most important problems today is the dietary protein deficiency, which is constantly growing. World production of animal food protein is 4 times less than needed. The general protein deficiency in the planet is estimated at 10-25 mln. tons per year [1,2].

One of the promising directions of this problem solution is the production of protein concentrates and co-precipitates made of dairy recyclables, particularly buttermilk, whose use in food technology will not only permit to get products with high nutritional and biological value, but, considering the substantive volumes and the low cost of raw materials, also significantly economize on their production.

The basis for obtaining protein-carbohydrate co-precipitate of buttermilk is the concentration of the protein phase, often by thermo-acidic or thermo-calcium coagulation [3]. However, the products obtained by these methods have a number of imperfections, including tight and sufficiently elastic texture, calcium flavor, etc., which complicates their subsequent use in food technology. To improve the quality of the obtained concentrate it is advisable to improve existing co-precipitate methods that will aim to reduce the number of manufacturing operations and to improve the chemical composition of the final product.

One of the ways to achieve this aim is the precipitation of dairy recyclables protein due to the impact of local plant products own acids, including viburnum. Viburnum berries are characterized by a high content of free amino acids and pectin (10...18%) that regulates cholesterol quantity, positively influences on the intracellular respiration reactions and metabolism, increases resistance to allergic factors, rides the body of radionuclides and heavy metals [4]. Viburnum contains sugars, mainly glucose and fructose, vitamin C, bioflavonoids. Viburnum berries contain significant amounts of antioxidants (beta-carotene, vitamin P, E and ascorbic acid), which are effective protection against free radicals and which the human body is not capable to synthesize. Moreover, the composition of viburnum includes 1,9% organic acids (malic, valeric, formic, acetic, caprylic et al.), suitable for use as coagulants [5].

The technological process of buttermilk co-precipitate obtaining under the influence of viburnum organic acids is reduced to the following operations: buttermilk pasteurization (t = 90 ... 95 ° C) during 10-15 minutes, its cooling to 60 °C, add of mashed viburnum, coagulation, cooling and bunch filtering. During the technological process casein forms the bunch in IEP (pH 4,6 ... 4,7) and whey proteins under impact of high temperatures denature and aggregate subject to the availability of additional coagulation centers (cellulose, pectin) and denatured casein flakes. The degree of proteins excretion of buttermilk depends on a number of parameters, among which there are the amount of casein and whey proteins, ionic strength, length of heating and so on.