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dissertation work on competition of the PhD academic degree on the specialty 6D071200 – "Mechanical engineering"

SUMMARY

THE JUSTIFICATION OF THE DYNAMIC PARAMETERS OF THE SHAKING CONVEYOR

The improvement of dynamic parameters of the shaking conveyor which is widely used in heavy and light industry is considered in the dissertation work.

The purpose of the research: By necessity of automation in the field of equipment at research optimum engineering of machine and mechanism according to criteria of force transfer are appeared new approaches of solution the task. The new approach for drawing up algorithm and program at the optimum complex solution of the task according to criteria of force transfer of four and multilink mechanism is required for the solution of these tasks. The way of the solution of the task at engineering of the initial kinematic chain (IKC) is presented and kinematic synthesis of its modifications of the four-link flat lever mechanism, and also regularity of the movement of multilink mechanism of the high class carrying out incoming and outgoing link on optimum criterion of force transfer. After that the technique of the solution of the kinematic and dynamic analysis of the mechanism with application of the latest way of synthesis of the six-link flat lever mechanism for justification of dynamic parameters was presented. The research and engineering of regularity of the movement of the multilink mechanism carrying out incoming and outgoing link, and also the high-class mechanism is actual and demands comprehensive scientific and creative approach.

Scientific novelty:

1. The method of the problem solution of the initial kinematic chain (IKC) of four-link its modification of kinematic synthesis of the high-class multilink mechanism appearing at engineering is presented.

2. Applying programming technique of modern mathematical algorithm to the solution of synthesis of initial kinematic chain (IKC) of four-link and on the basis of this method determination parameters of mechanism measurement of the six-link shaking conveyor.

3. The solution of kinematic and dynamic problems of the shaking mechanism of the III class of the done synthesis.

4. Obtaining the analysis of dynamic parameters, having investigated on modern programming of MSC ADAMS in engineering process.

5. Optimum engineering of the shaking conveyor was investigated having compared results which were taken on the intense deformed condition of the shaking conveyor mechanism on the APM structure 3D, Solidworks or Autodesk Inventor program.

Object of research: The studied object is kinematic synthesis and analysis, and also dynamic analysis and solution on safety flat lever mechanism of the III class of the shaking conveyor.

Method of the research: the problem solutions of synthesis of the initial kinematic chain (IKC) of four-link, applying the offered new method of synthesis (programming of mathematical algorithm). Using this method we receive results of synthesis of the mechanism of the III class of the shaking conveyor and dynamic parameters. Firstly having investigated according to the program APM structure 3D, Solidworks and Autodesk Inventor, and then comparing the received results it is necessary to project the shaking conveyor.

The following new results of the research are submitted to protection:

-new methods for the solution of kinematic synthesis of flat and dimensional initial kinematic chain (IKTs) of the four-link mechanism, on programming of mathematical algorithm.

-on the same basis justifications of parameters on kinematic synthesis and dynamic research of the multi link lever mechanism are taken out.

-investigating kinematic, kinestatistic and dynamic, applying new engineering programs and comparing the received results we project mechanism of the III class shaking conveyor.

Practical importance of the research: Results of the studied work are applied in higher educational institutions, at research institutes, production engineering. Such shaking conveyors are practical significant object of the research as they are widely applied in food industry, in chemical industry, in casting production, in agricultural industries, in the industry of transportation materials, cargo-transportation industries, on working platform of the space branch.

The basis of work and reliability of the scientific achievement: It was based on the theory of machines and mechanisms, on dynamics of mechanisms of machines, on theoretical and applied mechanics, on the mathematical analysis, on linear algebra, on optimization, on the approximation method with application of the main equation of the greatest deviation of kinematics of the geometrical place of the solid body.

The application of mathematical algorithm to the solution of the problem of the kinematic synthesis of lever mechanism of the III class shaking conveyor and on the basis of the taken results of analyses of synthesis ensuring operability of the received mechanism model.

Introduction of work results in practice: For application of results of the studied work is provided to choose students on the subject "Theory of the machines and mechanism" for specialty 050901 – "The organization of transportations, movements and transport exploitation, « 050713 – "Transport, transport equipment and technology" of poly technical college of the city Talgar. And also the statement of application in production at engineering at LLP «Massaget Plus» research institute is drawn up.

The approbation of the work: Basic scientific results of dissertation work were reported and discussed on: conferences "Actual Problems of Mechanics and Mechanical Engineering", "Preparation of Engineering skilled workers in the

context of global challenges of the XXI Century", " Innovation technologies ,equipment and materials in mechanical engineering", "The place and role of young scientists in delivering new economic policy of Kazakhstan", "The perfection ways of innovational education on the basis of teaching informational technologies", "Science, education, innovations: priority directions of development" (Kyrgystan, 2014), "XXIVth International conference on theory of machines and mechatronic systems", IFToMM (Poland, 2014), "International Conference on Technological Convergence for Information, Health, Food and Energy Security" (Chennai, India, 2015), "19th International conference vibroengineering 2015" (Nanjing, China 2015), "20th International conference vibroengineering 2015" (Katowice, Poland 2015) international scientific and practical conferences.

Publication: 32 scientific works, including 11 articles offered by the Committee edition, 8 articles on international scientific and practical conferences, 4 articles in foreign international scientific and practical conferences the 5 articles in the foreign research edition on which there isn't impact-factor, 3 articles on the Scopus edition, 1 article on the edition «Thomson Reuters» entering to the data base are published on the basis of contents of the thesis.