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Influence of Mechanism Structure of Shaking Conveyer on its Friction Position

Mechanisms of the second class are widely used in different fields of modern technique. Mechanisms of higher classes are met not very often. Technological level of current machine increases demands of application of principally new mechanisms with complicated law of working organ movement. Mechanisms of the first class which are higher than the second ones meet these requirements. Eveluation of mechanism kinematic possibilities can be carried out according to function of its location. The problem of influencing mechanism structure on this function is of great interest.

Study is carried out by vector algebra. Vector approach is the most logical as all kinematic parameters are vector values.

Shaking conveyer is the object of the study. It can be of the second or the third classes. Crank is input element. Its angular coordinate is independent value. Angular coordinate of one of the yokes is taken as an output parameter. Under synthesis of possible variants of the third class of mechanisms in three cases of motion transmission was carried out to outside kinematic pair with changing the length of piston-rod.

Task solution of determining function of position on the example of plain link mechanism is considered. Function of position in this case is determined as dependence of output parameter φ_5 on changing input one φ_1. due to geometrical analysis of mechanism.

Angles characterizing position of each mechanism link are determined with the help of operational unit “Given-Find”. Mechanism position corresponding to end left point of yoke is accepted as initial one. Crank and piston rod are located on the same line.

We receive data to build dependence of output parameter φ_5 on input one φ_1. Angle coordinate of input link was changed every 45º.Therefore 8 pairs of values φ_1 and φ_5 were received. Function of position is built along these coordinates.

Functional dependence of parameter φ_5 on changing φ_1 can be visualized in the program MathCAD with the help of spline-approximation. Such operations were made with each of the following mechanisms.

Analyzing given functions of position of studied mechanisms we can come to conclusion that kinematic parameters (rate and speed-up) of links will be the same.

Therefore, in case of using shaken conveyor structure complication doesn’t lead to extensional changing kinematic mechanism parameters.