THE ROLE AND SIGNIFICANCE OF THE BEARING BODY IN INCREASING THE LIFETIME OF TECHNOLOGICAL MACHINERY MECHANISMS

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Today, in the development stage of mechanical engineering, it is important to accelerate the production of machinery and technologies in all directions, including the improvement of machines and mechanisms, resource-saving, long-term working, and high productivity, and to further increase the quality and competitiveness of products. is doing. At the same time, it is necessary to improve the technical and economic indicators of production, to ensure the quality of transportation devices in the fields. 60-70% of transport devices are conveyors, and new generations of them need to be created and introduced into production.

Screw conveyors are considered as an important equipment in the mining and metallurgical industry and in the field of agriculture, and serve to continuously transport the product from one place to another. Therefore, the development of resource-efficient constructions of the components of this equipment and its practical application are considered as a task.

To increase the efficiency of this equipment, it is possible to prevent the failure of spare parts by reducing the vibration of the mechanism by installing bushings made of rubber with strap elements on the bearings mounted on the screw shaft. For this, it is necessary to rationalize the geometric parameters of transport and the mathematical description of the material flow process, taking into account the effect of the characteristics of the transported products and the parameters of the working bodies of the conveyor on the specific energy consumption [1, 2].

In the calculation and design of screw conveyors, the method of determining the optimal parameters of all elements of this conveyor machine for the development of a resource-saving design is important.

In the design of screw conveyors, the cross-sectional area of the material flow, the speed of movement of the material on the conveyor, the maximum permissible rotation speed of the screw, the diameter of the screw, and the power of the motor are taken into account. Initial selection values should be theoretically justified, taking into account analytical data and current factors.

Due to the fact that conveyor mechanisms work at high loads, breakdowns or repair processes are common. In order to ensure long-term operation of screw conveyor

mechanisms and product quality, the bearing housing mounted on the screw shaft is improved and a rubber bushing is installed on it. As a result, it dampens the loads falling on the bearing and partially avoids the torque vibration amplitude of the mechanisms, noise and vibration, which contributes to the long-term operation of the mechanism [3].

As a result of the experimental studies, the angular velocities and torques of the screw conveyor and the drive pulley shaft of the screw conveyor were determined in different working conditions.
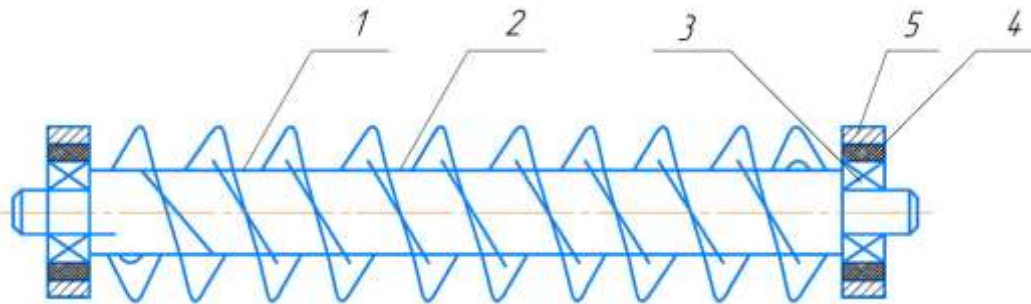
1-shaft, 2-wavy surface, 3-bearing, 4-belt bushing; 5-bearing shell

Fig. 1. Scheme of a screw shaft with a belt bushing

Disadvantages of existing supports in any machines and mechanisms are the direct transmission of vibrations of rotating shafts in the bodies of machines and mechanisms to the direct objects, which leads to failure of machines and mechanisms as a result of a certain vibration. Rotating shafts used in mechanical engineering have a certain rotation speed, vibration amplitude, torque, frequency of rotations and work with noise.

The rotating shaft is affected by driving torque, gravity, inertia of unbalanced masses, frictional forces and other forces.

As a result, the components of the force are directed radially and axially. These forces affect the housing through the bearing support. As a result of such effects, the failure and fatigue of the mechanisms leads to the need for repair. In order to reduce these forces by a certain amount, in order to increase the reliability of the operation of the bearing supports with rotating shafts, rubber bushings of different thicknesses and different brands are made to dampen the vibrations of the rotating shafts, and an elastic rubber bushing is placed between the outer ring of the bearing and the support (Fig. 1.).

Prepared elastic, deformable bushings are made of 7IRP-1352, 7IRP-1068 and GX-2566 rubber. The difference between these bushings is that they differ from rubbers of other brands in terms of usage, service temperature range and hardness. Different sizes of recommended belt bushings and different brands of rubber material were used.

The presence of belt bushings significantly reduces the effect of certain vibrations and forces on the body during the operation of the mechanism. As a result, the periodicity of the mechanisms will be increased by 1.2÷1.5 times. During operation, the belt bushing is deformed and ensures uniformity of the loads in the vibration of the shaft. The degree of this adjustment depends mainly on the coefficient of elasticity of the belt bushing.

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