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SYNTHESIS OF BLOCK FUNCTIONAL MECHATRONIC MODULES

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Abstract: The application of simulation software and computational resources in solving complex technical problems - creates an opportunity to integrate advanced technologies into new technical solutions. The review of pneumatic drives of vibration-inertial trays for transportation, separation into streams, reorientation of piece products has shown - that at present pneumatic muscles are used as actuators in tracking pneumatic systems with small displacements quite effectively. They have several advantages over pneumatic cylinders: absence of friction force and high forces at the same dimensions. Existing systems with the drive on pneumomuscles allow realizing motion frequencies up to 20 Hz. This fact allows at the first stage of design to calculate the designed platform by static parameters and to choose pneumatic cylinders with bellows housing (bellows pneumatic cylinders) as a replacement for muscles.

Key words: pneumatic actuator, bellows cylinder, vibration, inertial platform, hysteresis, tracking control system.

In accordance with the task of creating a new drive of the vibration-inertial tray

for separation of piece products into streams, a rocking platform with three degrees of freedom is required. The drive of this platform is realized on pneumatic cylinders with a bellows body (bellows pneumatic cylinders) of 5 corrugations, with the possibility of control by means of alternating pressure. This is a significant distinctive feature of this drive from existing designs, including pneumatic cylinders. The actuator based on bellows pneumocylinders (Fig. 1) is able to operate at frequencies up to 20 Hz [1, p. 72]. It was assumed that for the required frequency range from 0.2 to 5 Hz, the dynamic properties of the bellows pneumatic cylinder (BC) itself can be neglected. Calculation of the actuator by static muscle characteristics was given in [2, p. 108]. One after manufacturing of the drive of a vibration-inertial tray for separation of piece products, on a rocking platform with three degrees of freedom and its tests with inertial load, at such frequencies it was revealed a significant deviation of the obtained amplitudes of displacements from the calculated values. In this connection, experimental studies of the dynamics of the BC with an inertial load under harmonic pressure changes were carried out. Pneumatic muscles (PM) are unidirectional devices, therefore they are used in pairs or in antagonistic pair with pre-stretched springs.

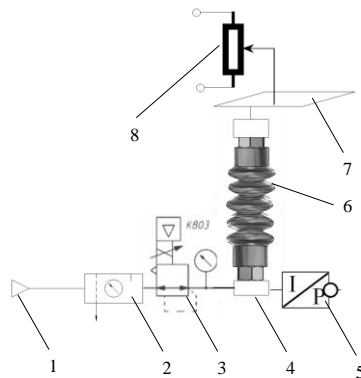


Figure 1. Schematic representation of the measuring setup for the study of muscle dynamics with inertial load: 1 - pressure source, 2 - air preparation unit, 3 - pressure reducing valve with MX PRO proportional control, 4 - pressure supply fitting, 5 - pressure sensor, 6 - bellows pneumatic cylinder; 7 - inertial load (tray), 8 - potentiometric position sensor

The design under consideration has an outer diameter of 25 mm and a length of $L_0 = 40$ mm at static position, the platform vibration frequency is tuned by means of a

relay contact circuit using $f = 0.2 \dots 10$ Hz. A maximum frequency of 10 Hz was the threshold frequency for the control valve used. The BC preload pressure was determined based on the requirement to achieve the maximum displacement amplitude at a pressure change amplitude of $p_A = -0.5$ bar to $P_{\text{preload}} = 1.5$ bar according to the specified tray operation characteristic. The value of inertial load of BC is $m = 200; 300; 500$ g. During the review and analysis of literature on this topic, no experimental studies or mathematical models describing the dynamics of BC with inertial load in the considered frequency range were found. Pneumatic muscles (PM) are unidirectional devices, therefore they are used in pairs or in antagonistic pair with pre-stretched springs. This model studies the behavior of PM of McKibben design in the frequency range from 0.05 to 0.95 Hz; the proposed model describes the experimental results with an accuracy of 10%. The amplitude-frequency characteristics of the BC [3, p.113] in the frequency range up to 0.5 Hz at the amplitude of pressure change $p_A = 0.5$ bar were experimentally constructed. Logarithmic amplitude and phase-frequency characteristics of displacement for a dynamic system with a transfer function of the form:

$$W_{PX}(s) = \frac{x(s)}{p(s)}, \quad (1)$$

where x - displacement of the movable end of PM, p - sinusoidally varying pressure in BC.

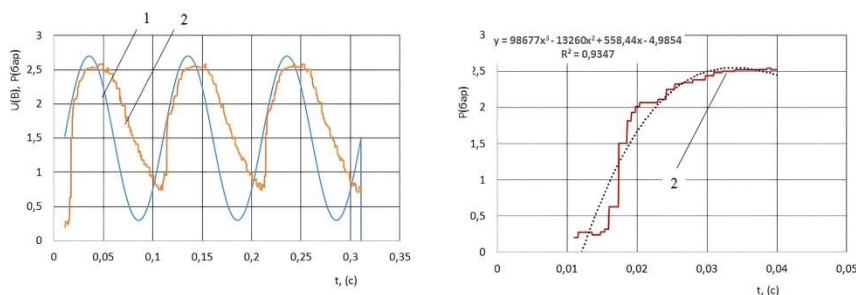


Figure 2. Amplitude and phase frequency characteristics of the bellows cylinder pneumatic cylinder: a - for low-frequency tray oscillation up to 0.5 Hz; b - for tray oscillation up to 10 Hz; 1 - amplitude characteristic is set with MX PRO (U, V), 2 - inverse signal in the form of controlled pressure at the output of MX PRO (P, bar)

According to the results of the work done, it is possible to draw conclusions about the possibility of using pneumatic bellows cylinders in the drive of the vibration-inertial tray. Experimental analysis of the BC dynamics features shows an acceptable hysteresis and stable operation in the investigated range. The frequency characteristic of the force exposes the use of BC in technical systems where small displacements at frequencies up to 10 Hz are realized. An example of such systems can be drives of guides, tenons, knives of package cutting, set to a certain fixed size of the workpiece.

REFERENCES:

1. Kryvoplias-Volodina L., Gavva O., Volodin S. (2023) Architecture of hybrid mechatronic dosing and packing module of packaging machine based on qualitative analysis, Eastern-European Journal of Enterprise Technologies ISSN 1729-3774 4/2 (124) p. 70–79. <https://doi.org/10.15587/1729-4061.2023.286615>.

2. Mironchuk V.G., Gera V.M., Volodin S. O. (2023) Innovative locking and regulating devices in technological flows of sugar production Print Scientific works of NUFT. Vol. 29, No. 4. - K. : NUHT.-107-117. doi: <https://doi.org/10.24263/2225-2924-2023-29-4-10>.

3. Kryvoplias-Volodina, Liudmyla; Gavva, Oleksandr; Hnativ, Taras; Rivna, Kateryna (2019) Investigation of ejection process in mechatronic functional modules of packaging machines. Published in Ukrainian Food Journal. <https://doi.org/10.24263/2304-974X-2019-8-3-16>.