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STAND FOR EXPERIMENTAL STUDIES OF INDIVIDUAL WORKERS DISTRIBUTOR-DISPENSER ANIMAL FEED

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Developed automated stand for experimental studies of individual workers distributor dosing feed, which allows you to justify and optimize structural and technological regime parameters and distributor-dispenser.

Automatic Booth, performance, feed, labor body individual distributor dispenser.

Formulation of the problem. The main requirements that relate to the distributor dosing feed, is to ensure proper performance, precision and uniformity of dosage with minimal energy [1, 2]. The choice of optimal structural and technological parameters and modes of study to be performed on the automated stands.

Analysis of recent research. Department of Automation livestock quality and standardization of Lviv National Agricultural University developed an automated stand to study dosing work of individual distributor dosing of fodder protected declarative patents of Ukraine for invention [3, 4, 5] (Fig. 1, Fig. 2), which provides availability of tools for measuring, recording and transmission of electrical signals traveling the values of the mass flow in dynamic mode, display and store information and test instruments and devices to measure the process of dispensing and uneven issuance feed, mass feed bunker individual distributor-dispenser changes the direction of the flow of feed, a set of tools for power distributor-dispenser.

The purpose of research is to develop automated test bench for the study of individual workers distributor dosing feed.

Results. Fig. 1 shows a block diagram, and Fig. 2 general view of the stand for the study of individual workers distributor dosing feed.

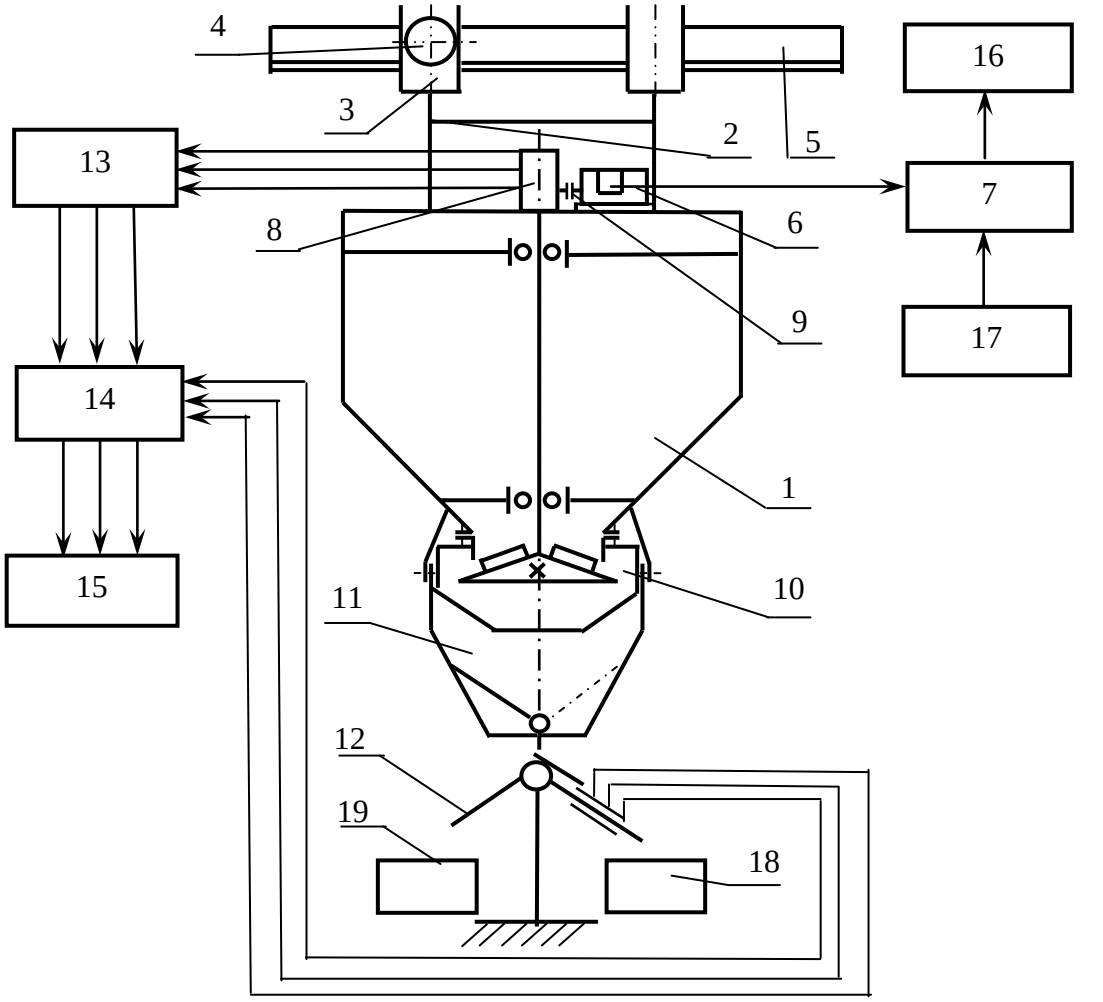


Fig. 1. Block diagram stand for the study of individual workers distributor of animal feed dosing: 1 - bunker; 2 - suspended frame; 3 - carriage; 4 - drive to move the distributor-dispenser; 5 - fixed beam; 6 - the electric motor to drive the dispenser; 7 - meter dosing frequency of rotation of the working body; 8 - gear; 9 - coupling; 10 - guard; 11 - device changes the direction of the flow; 12 - meter the flow of bulk materials;
13 - meter torque; 14 - tenzopidsylyuvach 8ANCH-7M; 15 - PC; 16 - electronic frequency CHZ-54; 17 - power supply VIP-0.09 and ICA-10A; 18 19 - National capacity for collection of necessary and unnecessary portions of feed.

Distributor of animal feed dispenser consists of a hopper 1 which is attached to the suspension frame 2, which secured carriage 3 of 4 Actuators movement engaged rectilinear reciprocating motion on a fixed beam 5. The top of the individual distributor-dispenser mounted on the frame 2 DC motor 6 to drive the cone-blade working body that hosts the rotation frequency meter 7 at the operational amplifier type K140UD701 and gear 8. working bodies of individual distributor-dispenser made cone and cone-blade. At the bottom of the hopper distributor dosing device 1

set changes the direction of the flow of feed flow meter 11 and bulk materials 12 [6]. To measure power dispensing process in the case of gear 8 mounted torque meter 13 [7]. To collect the mass of necessary and unnecessary portions of feed used capacity of 18 and 19.

Fig. 2. General view of the stand for the study of individual workers distributor dosing feed.

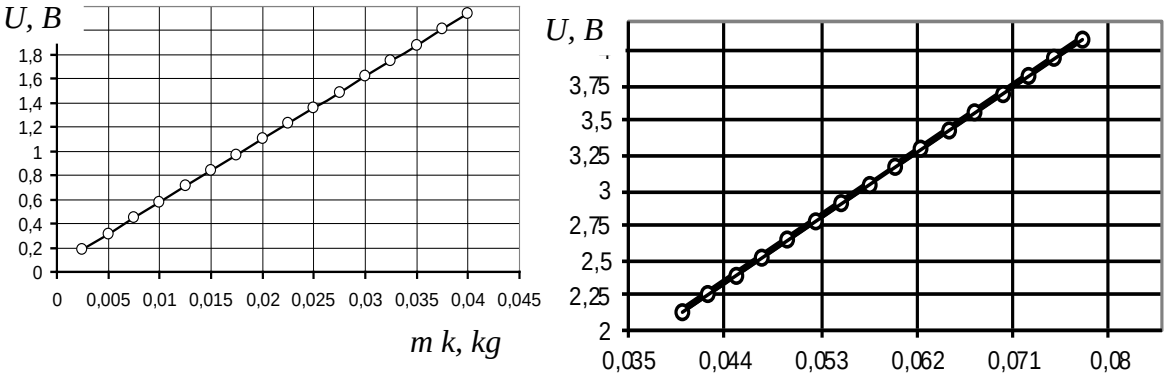
The aim was to establish calibration depending output voltage U tenzodavachiv measuring flow of bulk materials from passing mass flow m tenzovymiryuvalniy feed on the plane. Graphs of the results shown in Fig. 3 [6, 8, 9].

As a result of the calibration flow meters for bulk materials obtained regression equation:

$$U = 52{,}051 \cdot m_к + 0{,}0588\,, \quad (1)$$

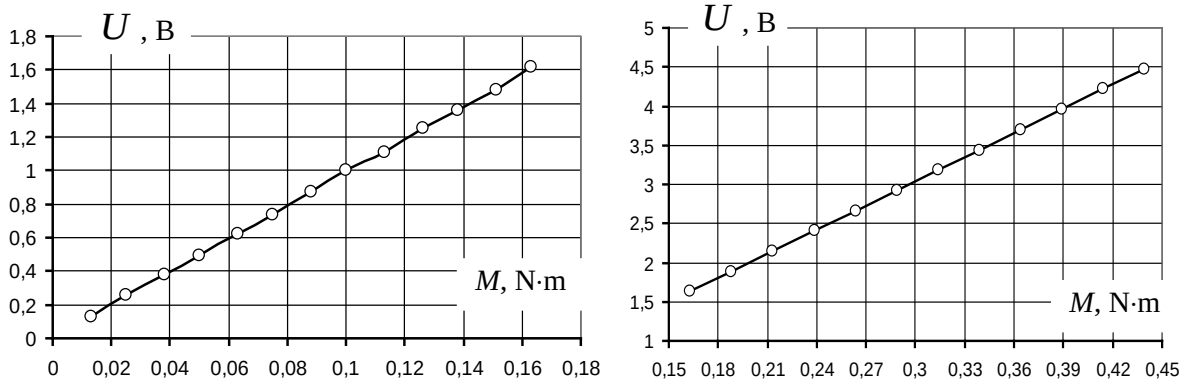
$$U = 51{,}958 \cdot m_{кл} + 0{,}0616\,. \quad (2)$$

where: U - Output voltage tenzodavachiv flow meters for bulk materials, V; MC, mkl - mass flow of feed that meets the performance and cone-tapered blade dosing of workers, kg / s.



and) b)

Fig. 3. Gauge graphics output voltage U tenzodavachiv flow meters for bulk materials of mass m passing onto tenzovymiryuvalniy $m\ k,\ kg$ (a) from 2.0 to 75.5 g / s and (b) from 75.0 to 545.5 g / s .



and) b)

Fig. 4. Gauge graphics output voltage U tenzodavachiv measuring the torque on change efforts torque M costs for power (a) from 10 to 1.0 × 10-3 W and (b) 1.0 to 7.0 watts.

The purpose of the calibration of measuring torque is to establish changes depending on output voltage U tenzodavachiv measuring the torque on change efforts torque M. calibration results are shown in Fig. 4 [7, 10].

As a result of meter calibration torque obtained regression equation:

$$U = 9{,}8464 \cdot M + 0{,}0043, \quad (3)$$

$$U = 10{,}297 \cdot M - 0{,}0502 \quad (4)$$

where: U - output voltage tenzodavachiv meter torque, B; M - change of torque, H·m.

Conclusions

Implementation of the system of measuring quantitative parameters

for individual dosing distributor of animal feed using tenzodavachiv and analog-to-digital converter provide a linear change of the measured parameter, enabling highly accurate mass calibration and measurement of flow and torque on the shaft of the dispenser.

Interval changes tenzodavachiv voltage measuring flow of bulk materials is in the range of 0.2 to 4.5 V at a mass flow of bulk materials from 2.0 to 545.5 g / s.

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Automated stand is designed for эksperymentalnыh bodies of research workers individually razdatchyka dosing kombykormov, kotoryya obosnovat and allows us to optimize design-rezhymnыe and Technological Options razdatchyka dosing.

Automated stand proyzvodytelnost, kombykorm, Rabochy body razdatchyk Individual dispenser.

The automated stand for experimental studies of individual workers distributor dosing feed, which allows you to justify and optimize constructive and technological parameters and regime distributor-dispenser.

Automated stand, productivity, feed, labor body individual distributor dispenser.

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THE RESULTS OF EXPERIMENTAL DOSLIDZHENPRODUKTYVNOSTI DISPENSER-MIXER COMPONENTS OF ANIMAL FEED

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Schematics dispenser-mixer is designed for preparation of loose feed mixes. Powered and design features of the dispenser-mixer, the results of experimental studies of productivity at atmospheric pressure and vykuummetrychnomu in the workspace dispenser-mixer.

Capacity, uniformity of feed, vacuum pressure disc dispenser-mixer regression equation.

Formulation of the problem. Feeding animals in modern livestock industry based on compound feed. Preparation of animal feed should be done to ensure balanced animal feed both nutrients and their total number. To provide a better homogeneity of mixing the main component of additions necessary to ensure fluidization main component of feed.

Analysis of recent research. One of the main requirements of the production technology of feed mixtures are homogeneous bulk distribution of animal feed components in volume, that will enable a uniform distribution of particles ingredients. Ongoing research on the process of mixing loose materials at atmospheric pressure [1, 2].

Due to the design of the dispenser-mixer, the presence of the cone and the inclined surface theory worthy of a particle on the surface, particularly in the works analyzed in detail PM Vasilenko [3, 4] and other researchers [5, 6]. When using the dosing mechanism is shock interaction spherical particles of the working surfaces of machines considered in Morozov IV [7] and Rohatynskoho RM [8]. In particular, researchers Adamchuk V. Adamchuk and O. [9-11] developed analytical