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RESULTS OF THE TEST OF STEADY MOVEMENT OF THE SOFT-KICKER SOFTENER OVER THE PROCESSING DEPTH

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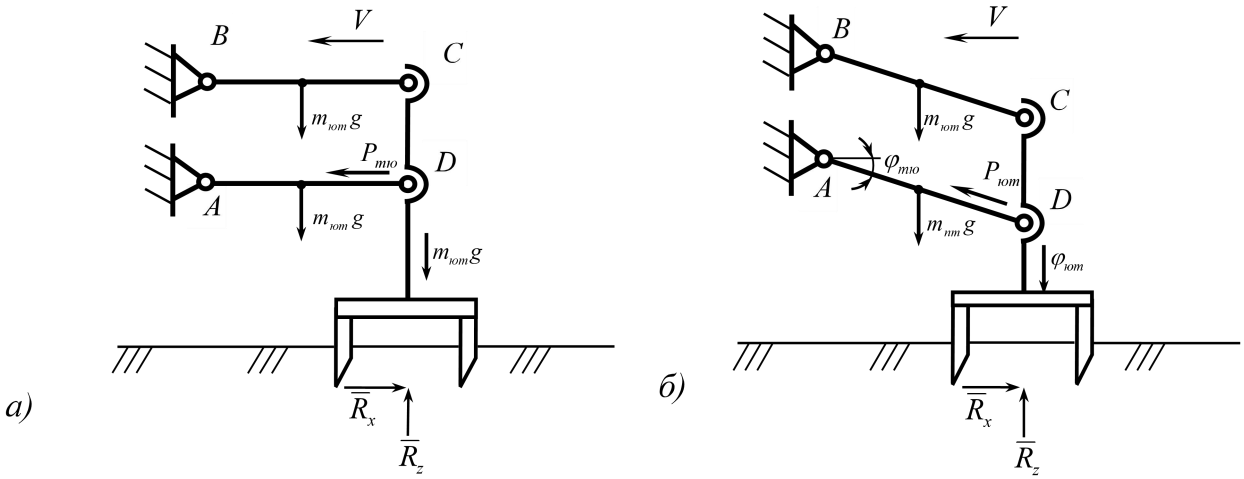
Annotation: It is ensured that the tensions of the parallelogram mechanism of the gear softener of the device for processing feathers occupy a horizontal position, so that the tensions are processed by the softener to the top of the feather in a uniform depth.

Keyword: universal device, gear softener, frame, compressive force, tensile force, tensile force.

The threaded inserts of the push-pull are connected to its frame by means of a parallelogram mechanism without a base device and a pressure spring, which are processed on top of the pushes.

In the process of work, the gravitational forces of the gear softener are $G_{tyu}=m_{tyu}g$ (in which m_{tyu} is the mass of the gear softener, g is the acceleration of free fall), the gravitational forces of the parallelogram mechanism pulls are $G_{yut}=m_{yut}g$ and $G_{pt}=m_{pt}g$ (in which $m_{yu}t$, m_{pt} – the mass of the upper and lower torques of the parallelogram mechanism, respectively, is affected by the horizontal and vertical reaction forces of the soil R_x and the R_z gravitational force exerted by the pulls of the parallelogram mechanism (Fig. 1.1).



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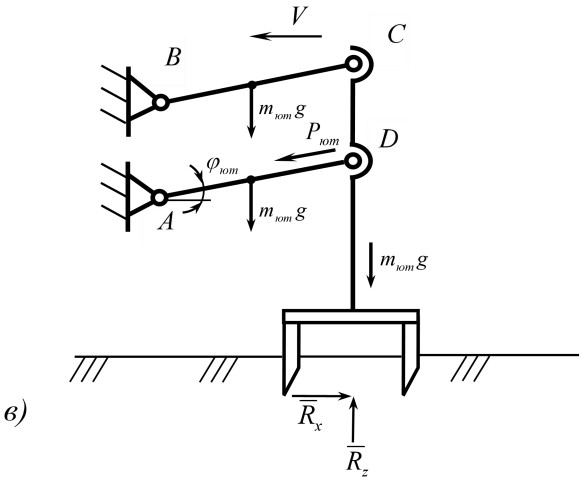

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Figure 1.1. Gear Softener Frame Coupling Schemes and Forces Acting on It

According to the schemes in Figure 1.1,

$$Q_{тю} = R_z = m_{тю}g + 0{,}5(m_{ют} + m_{пт})g \mp P_{тю}\sin\varphi_{тю}, \qquad (1.1)$$

In this Q_{tyu} – the force that dimmers the teeth of a gear softener into the ground, N;

φ_{tyu} – Parallelogram from the horizontal position of the mechanism drawers angle of deviation, deg.

(1.1) The gesture "–" in front of ni in the expression $P_{тю}\sin\varphi_{тю}$ is put when the drawers of the parallelogram mechanism are tilted downwards relative to the horizontal position, and the "+" gesture is used when the drawers of the mechanism are tilted upwards.

By projecting the forces acting on the gear softener onto the horizontal plane, we get the following

$$P_{тю} = R_x / \cos\varphi_{тю}. \qquad (1.2)$$

Taking into account this and that $0.5(m_{tyu} + m_{pt}) << m_{tyu}$, we make the expression (1.3) as follows

$$Q_{тю} = m_{тю}g \mp R_x tg\varphi_{тю}. \qquad (1.4)$$

As can be seen from this expression, when the pulls of the gear softener parallelogram mechanism occupy a downward or upward position from the horizontal position, the force Q_{tyu} R_x becomes variable depending on the force. When the pullers are tilted downwards from the horizontal position, the R_x force decreases the Q_{tyu}, resulting in a decrease in the depth of the teeth' immersion in the ground and therefore the depth of processing, while when they deviate upwards, the force Q_{tyu} and the corresponding depth of processing increase. Taking into account the variability of the physical and mechanical properties of the soil, as well as the fluctuation of the force due to

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irregularities in the field surface and depending on the speed of movement of the aggregate R_x , the downward or upward deviation of the tensions of the gear softener parallelogram mechanism relative to the horizontal position leads to uneven tillage of the soil by the gear softener.

When the pulls of the gear softener parallelogram mechanism occupy a horizontal position, i.e., when $\varphi_{tyu}=0$ (1.4), as can be seen from the expression, the R_x force does not affect Q_{tyu}, and as a result, the gear softener is processed by the gear softener to the top of the pole at a uniform depth relative to other states.

Based on the above, experimentally the positions of alignment of the drawers of the gear softener parallelogram mechanism of the device for processing pushes with respect to the horizontal were studied, the depth of softening (machining) of the pushing top and its effect on its uniformity.

The experiments were carried out during the processing of pushers obtained with the GX-4 pusher in field 2-a of the institute's experimental site. At the same time, the average moisture and hardness of the feathers in layers 0-5, 5-10 cm were 13.4 and 15.8 percent, respectively, and the hardness was 0.52 and 0.86 MPa.

Experiments were carried out using an experimental copy of a push-pushing device, wherein the gear softener was provided by changing the Cronstein length connecting the parallelogram mechanism.

The results of the experiments are presented in Table 1.1. The data presented therein show that the downward deviation of the longitudinal drawers of the gear softener parallelogram mechanism with respect to the horizontal position leads to a decrease in the depth of the machining and its quadratic deviation, and the upward deviation leads to an increase in both indicators. When longitudinal drawers occupy a horizontal position, it is ensured that the working depth is uniform, that is, its mid-square deviation has a minimum value.

Table 1

Its parallelogram mechanism is the change of the depth of processing by the gear softener on the top of the feather depending on the position of the longitudinal tensions in relation to the horizontal

№	Gear softener parallelogram mechanism Longitudinal drawers working condition	Processing Depth	
		Mo‘r	±s
1.	Worked Horizontally	5,7	0,47
2.	Worked a 20° downward deviation from the horizontal position	3,7	0,61
3.	Worked with a deviation of 10° down relative to the horizontal position	4,8	0,57

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4.	Worked with a deviation of 10° upwards relative to the horizontal position	6,1	0,54
5.	It worked with a deviation of 20° upwards relative to the horizontal position	6,6	0,68

Therefore, the results of the experiments fully comply with the above, that is, in order to ensure the stability of the depth of tillage to the soil by the gear softener, in the process of work it is necessary to ensure that its parallelogram mechanism works so that the longitudinal tensions occupy a horizontal or close position.

CONCLUSION

Therefore, our research shows that in order to ensure the same depth of processing of the top of the feathers by the gear softeners of the device for pushing, it is necessary to ensure that the longitudinal tensions of the parallelogram mechanisms installed by them occupy a horizontal position in the process of work.

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