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Basing the operation of a combined frontal plug with an active working body

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One of the most important and energy-intensive production processes in Uzbekistan is mechanical tillage. The most common method of mechanical tillage is ploughing.

The performance of the driving units increases due to the increase in the coverage width and the speed of operation. The coverage width of modern series-produced plugs has reached 3.15 m, and its further increase is associated with overcoming great difficulties [1, 2].

The growth of working speeds in plowing has now stopped at 10...12 km/h, because the speed exceeding this value causes the soil to "fountain" and seriously increase the resistance to pulling the plow. It should be noted that in plowing it is often not possible to fully use the power of modern powerful driving tractors. This is because the traction of the tractor undercarriage with the soil may not be sufficient to overcome the pulling resistance of the tipper plow.

Thus, it can be concluded that the currently used tilting plowing method and the constructions of tilting plows based on its implementation do not meet the requirements of modern agricultural production [3, 4].

Therefore, it is necessary to find new low-energy plowing methods, to develop tillage machines with work efficiency that satisfy agrotechnical requirements.

Currently, one of the ways to increase the productivity of the driving machine-tractor units together with the improvement of tractor traction-gearing characteristics is the use of combined traction-motion transmission units using active and passive working bodies [5, 6].

In recent years, modern powerful driving tractors are widely used in the agricultural production of our Republic. But there is a problem with using these tractors. This problem consists in the fact that during technological operations and transmission of the power of the engine through the "tractor engine - soil" link, it is not possible to fully realize the energy potential of the tractor due to the insufficient characteristics of connecting the engines with the soil. This is a particularly important problem when driving tractors and plows with flat plows are combined.

In recent years, increasing requirements for the quality of tillage have led to the creation of new technologies and technical means of plowing. Among them are frontal plows that turn plows up to 1,800 at the limit of their edge based on new technology. However, the problem of efficient use of the power of powerful drive tractors has arisen when aggregating flat plows with a passive working body. The reason for this is that due to their relatively small weight, their running part does not

have enough contact with the soil, and because of this, it is not possible to fully use the engine power (Fig. 1) [7, 8].

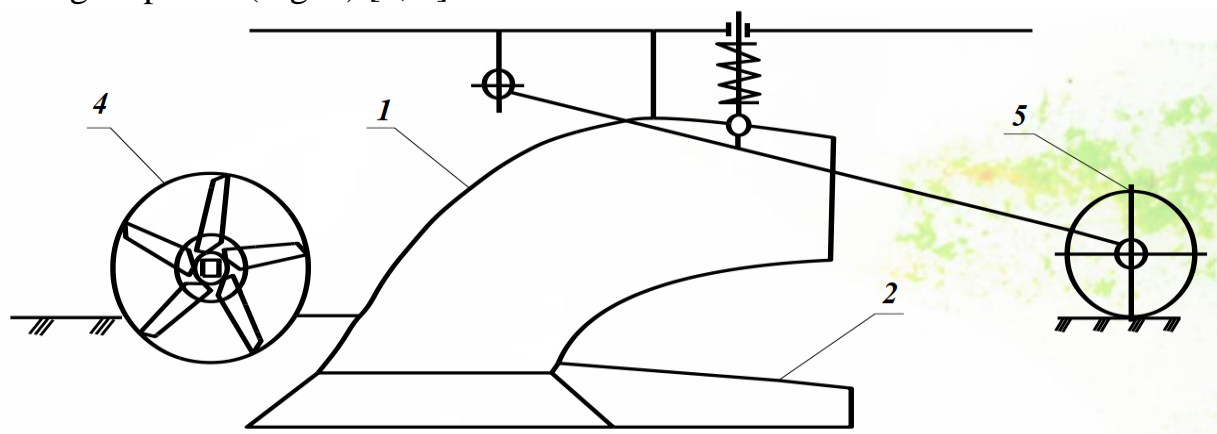


Figure 1. A combined plow scheme with an active and passive working body of a flat tiller without a soil edge

In order to effectively use the power of powerful driving tractors, to prepare the soil for sowing and to increase the labor productivity of the unit, a combined action plow with active working bodies for flat plowing without an edge was developed.

The combined plow, which softens the surface of the soil and prepares it for planting in one pass without moving the blades to the side, consists of passive and active elements: a working body with a rotor (in the form of a milling machine), the main one that flips to the right and left housings, additional housings (zaplujniks) and softening-leveling coil. The connection of active and passive working bodies increases soil compaction and reduces energy consumption due to overlapping of the field of stresses in different directions generated by the body plow and active working body. Since the soil resistance to the active working body is directed in the direction of movement of the aggregate, it also acts as a mover in addition to the technological process. This makes it possible to use the power of the tractor effectively to operate the unit at high speeds [9, 10].

The working process of the combined plow is as follows: the active working part is driven by the power take-off shaft (PTO) of the tractor to grind plant residues and grind the surface part of the soil, and the main body interacts with the plows. turns the palakhsa and lays it in its place on the border of the egati. Then the smoothing-leveling roller grinds the pieces and flattens the surface of the plow. Shredding of plant residues with an active working organ prevents plant residues from getting stuck between the hulls when working in fields with a lot of plant residues.

Thus, the use of a combined plow with an active working body makes it possible to effectively use the power of powerful driving tractors, a frontal plow with an active working body with the recommended parameters reduces the total labor consumption by 24.11%, fuel-lubrication, in comparison with existing plows materials will decrease by 28.8% and labor productivity will increase by 8.89%.

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