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IDENTIFICATION DEVELOPMENT PROCESS ADAPTED ROOT CROP MACHINES

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Shows stages of improvement, structure and working principle of operation adapted vykopuvalnyh treatment and transport and technological systems root crop machinery that is designed for the simultaneous collection of sugar beet and potatoes, fodder beet and carrot. Based on the identification of objects of study (existing types of archeologists and cleaners heap of roots) the basic principles and ways of development or construction algorithm structurally adapted Layouts root crop machinery.

Woroch, root, impurity transport and technological system, combined working body, digger, cleaner, root crop adapted car*.*

Problem. The problem of raising the technical level of root crop machines (CM), the main evaluation criterion which is the ratio of losses, contamination and damage roots, is particularly relevant in terms of the further development of national root crop technology, development of which in Ukraine in recent years virtually ceased.

A characteristic feature of modern general trend of the gathering of large roots, especially sugar and fodder beet, is a large-scale use of energy intensive single-propelled bunker harvesters (SCB), which combine harvesting phase (collecting tops, cleaning residues tops, digging roots, clean dug heap of roots of impurities Root load in large piles on the field or in vehicles) into one coherent technological operation, ie implementing the principle of single-phase harvesting root crops.

In the EU the following year SCB going to 70%, and in some countries, such as Germany, France, and much more acreage of root crops of sugar and fodder beet.

Functional scheme of SCB is not always and not fully meet modern requirements of quality indicators harvesting root crops at the expense of existing shortcomings [1].

However, despite the rather complex many nodal transport-

technological system (TTS) of working for digging and cleaning heap root vykopuvalni working bodies (BPO) served with root vegetables dug into the following treatment system root crop machines (CM) unacceptable number of significant mass of soil contaminants (an average of 10 ... 15 t 1 ha). As a result - after cleaning energy-intensive multi-stage cleaning systems dug heap of impurities from the fields exported amount of fertile soil, which is equivalent to 10 ... 15 cm of topsoil over an area of 100 hectares collection [2], even though in this case, the total length (length technology) treatment Surface is 8 ... 10 (m) or more [3].

Modern trends of KM provide design and implementation of agricultural production in high-performance, energy-efficient and technologically reliable harvesting systems and facilities that are adapted to the simultaneous harvesting sugar beet and potatoes, fodder beet and carrot root crop adapted one machine (ACN). Criteria for eligibility requirements of modern process of AKM, first of all, are indicators of the quality of excavation and separation of impurities Root [4].

The analysis of known vykopuvalnyh and cleaning work of CM showed that they are much damage and lose efficiently large shallow roots and do not meet the parameters of quality heap of roots clean of impurities in conditions of excessive soil moisture.

In addition, these types of archeologists and cleaners heap Root structurally and technologically impossible to combine at harvest simultaneously two manufacturing operations - digging roots and non-free separation of impurities from root crops with simultaneous removal of residues tops of their heads [5, 6]. Therefore, combining operations to remove residual tops heads of roots simultaneously with the process of excavation and separation free of impurities, is a further step in the development, research and implementation in production TTS combined work of ACN.

Analysis of recent research. The results presented in papers [7-10 et al.] Holistically describing only basic principles of BPO and treatment of workers (URO) no criteria to the analysis of trends and ways to improve the process of cleaning intensyfikatsiy Root of impurities or quality of AKM.

These studies are a further development of methodologies and techniques technological aspects of development processes functioning TTC workers of AKM that appointment harvesting root crops.

The purpose of research.The aim is to improve the technical and economic parameters of the process harvesting root crops AKM with satisfactory quality of the collection through the development and application of TTS combined work of ACN.

Research results.In Ukraine, especially in terms of managing diversified farming farms that grow roots sugar, fodder beet and carrot,

relevant technical and economic problem is the return on implementing technically complex and too expensive (from 150 to 350 thousand. UAH per unit) SBC due to limited climatic terms of use (about one calendar month) in a small area (especially feed and table beets and carrots), with 90% of the total area of roots is going to separate two- or three-phase energy-consuming, cost-loss methods [11].

Significant increase economic efficiency multi farmers can be achieved not only economic analysis of profit, but primarily by indicators such as the definition of flexibility using a relatively AKM collection of roots of different cultures in different soil backgrounds, different agrophysical characteristics of roots, etc; cyclical necessary timing relative to weather and climatic conditions, arrangements etc. compatibility with previous technological operations and production systems of culture, for example, as a means of cultivation, planting, care, row spacing, productivity and more.

Using AKM, design-layout schemes which are based on the use of adapted and BPO URO considerably extend the terms of AKM during the year by harvesting sugar beet and potatoes, fodder beet and carrot one AKM with stable agronomic terms of quality of work that will increase the technical and economic efficiency of roots. The basis of the solution of scientific problems of increasing technical and operational parameters and agrotechnological quality of AKM laid hypothesis about the possibility of a significant expansion of the range and timing of the use of machines for harvesting root crops through the development and study of design parameters and technological principles and aspects of the use of AKM, based on the development and PTS adapted its research combined working bodies.

Development or construction of algorithm design-layout scheme AKM should be based on the use of its basic functional circuit adapted PTS - vykopuvalnoho adapted transport and cleaning combined working organ (AVTOKRO) and adapted transport and cleaning combined working organ (ATOKRO), which are monobloc vykopuvalni and combined treatment PTS BPO and Oro principles of operation are based on general properties of the process of multi adapters (to some extent universal) types, their purpose and methods of use in gathering roots.

A variety of design patterns and BPO URO directly related to KM closely related, as a process of collection, and with structural and technological requirements for quality indicators picking different crops and varieties of root crops, the main ones are quality indicators digging roots and their treatment of impurities.

A large number of new designs working bodies, units and Layouts vykopuvalnyh and cleaning devices require a differentiated approach in selecting, calculating, designing, researching and implementing new

developments into production. Therefore classified approach considering the peculiarities of working, schemes of arrangement and methods of operation, would allow the analysis and synthesis of the required structural and technological scheme adapted BPO and Oro, or the whole design-layout scheme AKM for specific conditions.

The criteria for justification adaptive BPO and URO should be based on common basic principles of optimizing the properties of similarity agrophysical Root characteristics and functioning of the process of excavation and cleaning of roots of impurities, and basic technological aspects of approximation of farm machinery [12].

The general principle of the shortcomings of existing and technically implemented types of BPO (blade, fork, two-disc, vibration) and Oro (conveyor, screw, blade, turbine), which basically equip mounted, trailed and self-propelled KM,SBK following:

- BPO for a relatively large supply of free seconds and adhering to the surface of the body of roots soil (7 ... 10 kg / s) residues tops in heads potatoes (0.5 to 1.5 kg / s) with one line per meter at operating speed KM 1.6 m / s, up to 70% of the total weight is free and adhering soil to 10 % - balances heads on tops of root crops, leading to an increase in the length and complexity of the constructive treatment PTS [3, 13];

- URO for a relatively large, as a percentage (3% relative to the mass of roots) and massive amount of soil adhering to the surface of the body of roots and percentage (from 0.5 to 1.5% relative to the mass of roots) and mass of residues heads on tops of root crops that reduces depending on the culture, or in one case, the quality of raw sugar and sugar yield, or otherwise - the shelf life of products. In addition, with root vegetables picked from the fields exported an average of 1.5 ... 3.0% depending on the fertile soil productivity culture [3, 14]. Analysis of structural and technological processes of KM showed that objective reason technological imperfections of existing BPO and URO is that they structurally and technologically impossible to simultaneously combine quality in the collection are two manufacturing operations into one - excavation and cleaning of root crops heap of simultaneous removing residues tops of their heads, and that the root-crops cleaning of impurities occurs in a process flow when roots and move impurities on the surface treatment of workers in one longitudinal or transverse directions, which greatly complicates the process of separating impurities from various kinds of roots.

Search more radical ways to improve the reliability of technological fork blade and archeologists of roots by increasing the activity of working surfaces was achieved by providing blade Kopacz oscillating movements or forklift Kopacz - rotational motion that significantly increased fullness

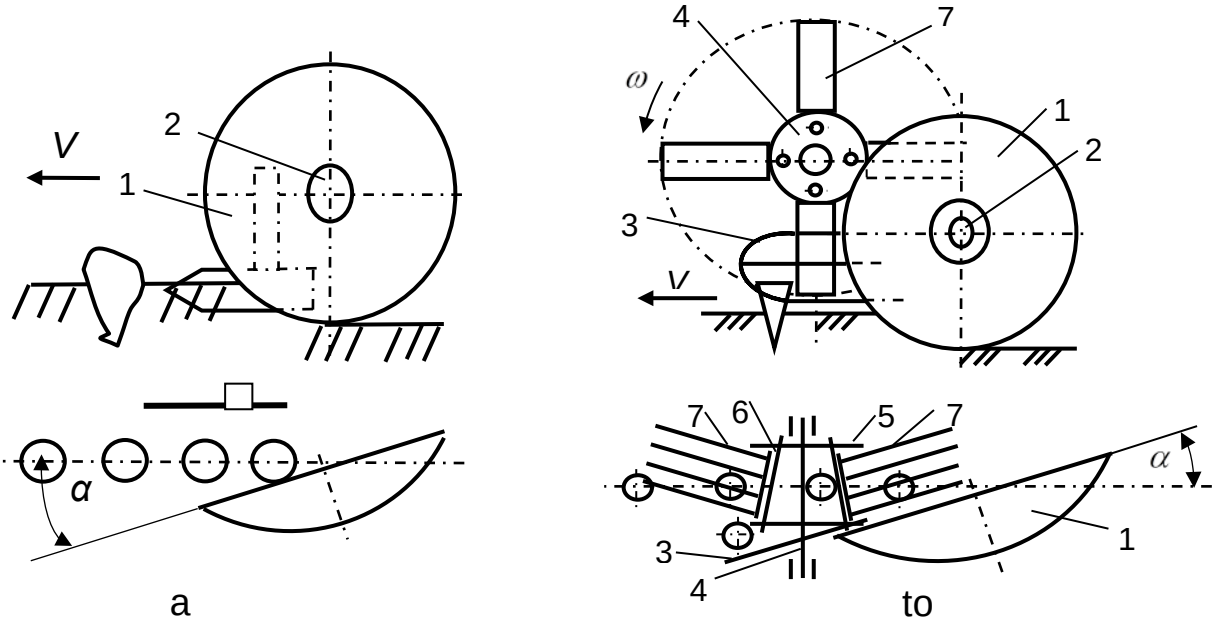
and intensity excavation crushing lumps.

Considered the most versatile double disc diggers characteristic feature of which is the vertical position of the two spherical discs, while the vertical axis forming an angle discs collapse and horizontal - angle of attack.

Double disc digging out bodies working satisfactorily gather broad roots in soil and climatic conditions, compared to the blade or forklift Kopacz, have a higher capacity hruntopodribnyuyuchu; do not lose efficiency when working in areas with high humidity field soil and crop weediness have a much larger stock of developments.

Double disc diggers have one major drawback - zaschemlyayut indestructible breast and feed them to the following system of the machine, the much lower set agrotechnical requirements, quality work. In addition, similar to the blade and fork archeologists, the existing two-disc Kopachi structurally and technologically impossible to efficiently combine at harvest simultaneously two manufacturing operations - digging root crops with simultaneous removal of residues tops of their heads, despite all the other design flaws:

Of all varieties archeologists, one-disk, ball, or so-called "Euro disco" (Fig. 1a), with a simple design, is the least energy-intensive metal and compared with other types of archeologists, have a wide range of applications for digging root crops in satisfactory quality of their work. The axis of rotation 2 spherical disc 1 digger forms an angle of attack α a horizontal axis line Root [15].



a to

Fig. 1. Plans BPO: A --disk digger; b - basic Avtokro.

Significant shortcomings of which are in poor working edge recess drive into the soil at the lowered soil moisture, absence of simultaneous excavation Root remove residual tops of their heads, are predictably eliminated further structural and technological improvements of this type of digger.

Increasing technological indicators and indicators of quality of existing archeologists roots, but in general - all ACN is solved using the basic version AVTOKRO (Fig. 1b), or additional installation in the front area of the spherical disc 1 korenenapryamlyacha 3 and 4 horizontal shaft breakage, which radially fixed flanges 5. Between flanges on their stake in series parallel to the axis 6, which returned to the axis of the shaft breakage at an acute angle. In parallel axes pivotally mounted flat elastic blade section 7. When moving AVTOKRO, korenenapramlyach 3 shifts previously knocked out during the working bodies cut tops hychkozbyralnoyi machine roots with its line center, and spherical disc 2 digs roots. Along with the excavation of root crops spherical disk by rotating shaft breakage, flat elastic blade contact with the heads of root crops, clearing their heads from the remnants tops them through their contact interaction with the remains tops. Turn parallel axes acute angle relative to the axis of the shaft allows clearing firm flat shovel to strike root crops heads side of the line, which improves cleaning Uneven root crops, with high root not covered lowest root of oblique impact. In addition, flat elastic blade also interact more with clumps of soil, and the soil is the destruction of lumps and pushing heap of roots dug into the following adapted PTS, increasing technological capabilities AKM [16].

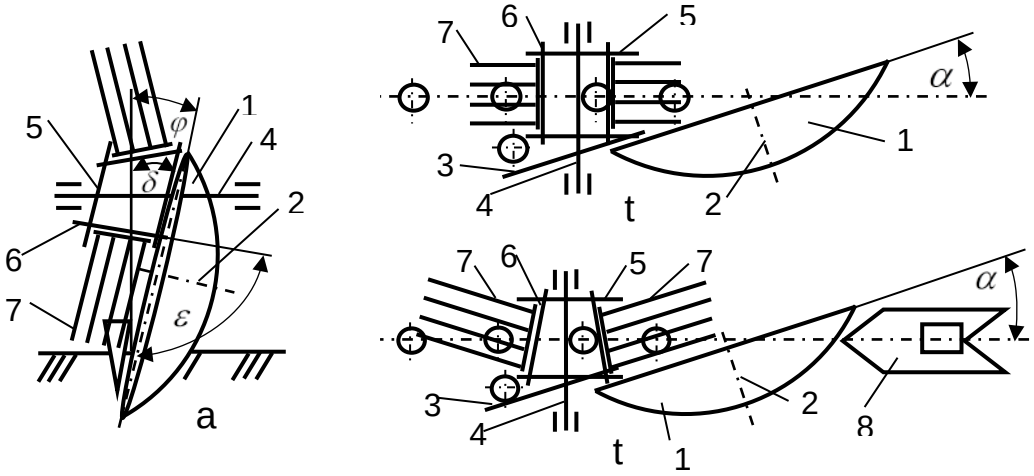


Fig. 2. Scheme Avtokro.

During the excavation of root crops in terms of dry solid ground is injured tail root crops due to their lack of cracking due to vertical forces

pushing roots, which leads to significant losses. To eliminate cracking tail of roots or losses spherical disc 1 (Fig. 2a) set at an acute angle φ And flanges 5 - angle δ to the vertical plane with axis 6, which takes on flanges lowest position forms a plane that passes through the spherical disc blade angle ε Equal or close to 900. sided spherical disc 1 digs root by lifting them up by emerging with additional lateral force pushing projection, which is aimed at the vertical plane. At the moment of impact flat elastic blades 7 to the head of root is their turn around its axis in the plane 6 and effort by installing flange 5 at an angle φ and return to the vertical axis at an angle relative to the axis of the shaft 4. Because the axis in the lower position perpendicular to the plane that passes through the spherical disc blade, or inclined to it at an angle close to the line, then flat elastic blade in the down position parallel to this plane and not in contact with the surface of a spherical disc, which reduces wear them [17]. To increase the degree of separation of residues tops of heads of root crops, particularly sugar beets and carrots and degree of destruction of lumps of soil by increasing the force of contact interaction (direct central impact strength) elastic blades flat on the head of roots and soil clods, parallel to the axis 6 (Fig. 2b), which is placed on the horizontal flanges 5 cleaning shaft 4 and which is fixed flat elastic blade 7, set parallel to the axis of rotation of the shaft breakage. Along with digging roots, by rotating the shaft cleaning, flat elastic blade heads interact with clumps of roots and soil, thus there is a direct blow elastic flat blades with subsequent removal of residues tops of heads of root crops and destruction of lumps of soil [18].

For digging roots, which lie relatively deep soil surface (sugar beets, some varieties of carrots) used tillage 8 installed behind the move spherical disc 1 (Fig. 2c), which can be made as cultivators or paws bit. While working ripper 8, moving forward previously undermines the roots, with ties broken root crops with soil that is crushing the previous layer of soil. Root, whose relationship with the soil is disturbed, then easily dug out soil rozkryshenoho spherical disc 1 and shift it towards the plane that passes through the edge of a spherical disc. Thus we have the opportunity to drive vhlyblyuvaty spherical rational depth so as not to lose roots and suppress adapted for cleaning TTS AKM minimum soil and vegetable impurities [19].

Search more radical ways to increase technological efficiency of wastewater treatment systems heap of roots by increasing the activity of working surfaces was achieved by differentiation in the cleaning process heap traffic flows basic roots and impurities in two mutually perpendicular directions, which is implemented through the use of cleaner combined heap [20], which consists of supplying a horizontal rod conveyor 1 (Fig. 3) and set with a gap of 2 rods and perpendicular to the direction of the

velocity of the working Vtr branches horizontal screw conveyor outlet 3. The outlet auger is designed as a pipe 4, the surface on which spiral spiral coils installed 5. outlet screw rotates opposite direction of the feeding conveyor rod with angular velocity ω.

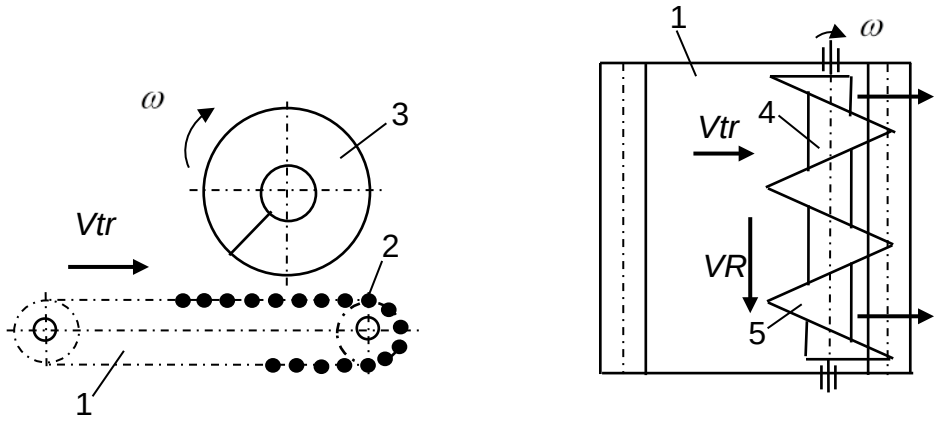


Fig. 3. Scheme of the combined cleaner.

To 10% - on balances tops heads roots.

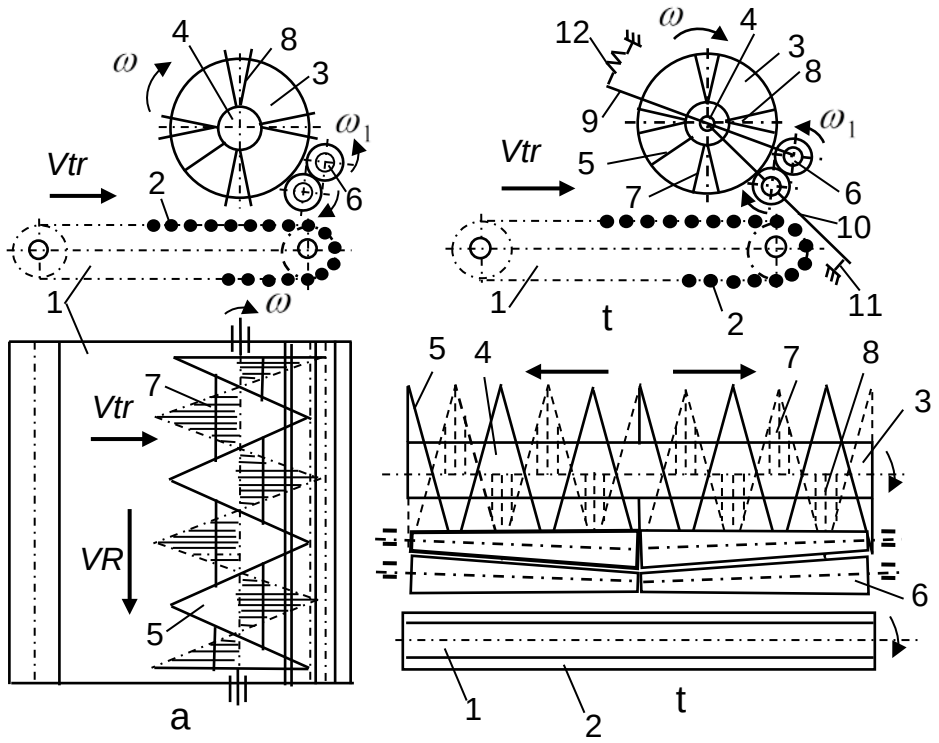


Fig. 4. Scheme Atokro base.

Improving the quality of performance combined cleaners heap

roots, but in general - all ACN is solved using the basic version Atokro (Fig. 4a), or by installing additional screw 3, toward the discharge end of the horizontal feeding conveyor drive 1 pair of cylindrical rollers 6 vidmynalnyh that mounted one above the other and on the feeding conveyor at a distance of 2 bars working branches. Vidmynalni rollers rotating in opposite directions with angular velocity ω_1. In addition to the pipe 4 screw mounted on the helix treatment elastic elements 7, which scored a pile beams 8. The direction of coiling spiral spiral coils 5 and cleaning elastic elements mounted on a pipe 4 screw, counter [21].

Root residue tops of their heads and residues and soil adhering to the surface of the body of roots, and wholemeal impurities turns the screw moves along the axis of rotation of spiral turns, treatment vidmynalnyh elastic elements and rollers. Experiencing pidpyrannya on the part of a new filing heap coming on working hiltsi feeding conveyor and for the extent of movement to vidmynalnyh roller is tightening residues heads on tops of root crops and vegetable impurities between the surfaces vidmynalnyh rolls because of their opposite directions of rotation. Passed between rollers vegetable impurities entering the output end of the feeding conveyor. The remains tops in roots, experiencing double-action efforts retracting roller vidmynalnyh work surfaces and moving Root turns screw along its axis of rotation, separated from the head of roots by vidmynannya and likewise all impurities handed feeding conveyor beyond. In addition, treatment elastic elements interact to drive the body of roots, while clearing them from adhering soil surface and because of their counter-rotation relative motion of spiral turns of the screw is moved vegetable impurities in the opposite direction paged area cleaner, ie in the direction opposite to the movement of roots, increasing the time of impurities on the working hiltsi feeding conveyor.

Thus, improving the process of root-crops cleaning impurities, especially the separation of soil adhering to the surface of the body of roots and tops remnants of their heads, in the first case is achieved by treatment of dynamic performance elastic elements that are mounted on the pipe to screw components impurities heap of roots, and the second case - the delay between residues tops worktops vidmynalnyh rollers.

To improve the reliability of ATOKRO and the degree of separation of residues tops of heads of roots by eliminating process stops when hitting a foreign body in the gap between the lower vidmynalnym Waltz and working branch rod conveyor in the first case and increase the force of contact interaction (pressing) working surfaces of rollers vidmynalnyh the second case, vidmynalni rollers 6 (Fig. 4b) pivotally mounted on fixed top and bottom 10 9 levers, hinges are attached to the ends of the screw shaft and coaxial with it. Rotate the lower lever limited set stops 11 and

the upper vidmynalnyy vilets by spring 12 is made relatively lower spring-loaded roller vidmynalnoho [22].

After contact with stones or other hard objects between the conveyor and lower vidmynalnym Waltz is a simultaneous turn up vidmynalnyh rollers articulated arm, overcoming the resistance of the spring. The gap between the lower vidmynalnym Waltz and working branch conveyor height is equal to a foreign bodies that pass freely through this gap and submitted beyond the conveyor cleaner and rolls back into the original position, and the lower arm rests on the palm.

Also increase technological efficiency of separation plant is due to impurities performance screw 3 (Fig. 4c) Two-piece, with the direction of coiling spiral coils 5 one section opposite direction of coiling spiral turns and other sections towards the side corresponding output ends of the screw. For each section of the two-piece screw in the direction of the output end of the supplying conveyor 1, rozmishena pair of drive rollers vidmynalnyh 6 installed console of each other and of the feeding conveyor rod. Each drive roller vidmynalnyy corresponding pair in the shape of a truncated cone, cones and one above the other, respectively, large and small bases [23].

To intensify the process of separation of adhering soil from the surface of the body of roots Atokro proposed improved construction, construction diagram is shown in Fig. 5 [24].

Unlike basic Atokro (Fig. 4a, b) drive screw 3 is designed as a hollow cylinder screw mounted on support bracket 4 screw. 5 screw turns is wound in a spiral pipe 6 circular cross section, which is fixed to the side supports screw flanges 7. Screw using driven sprocket 8 9 about the auger rotates towards supplying conveyor motion with angular velocity ω. In the cavity of the hollow cylinder screw screw placed drive shaft 10 to the sewage pipe 11 which is fixed in a spiral cleaning elastic elements 12 and sewage shaft cantilever mounted on supports 13 cleaning shaft located on the opposite side of console supports screw. Cleansing shaft via the driven sprocket 14 about 15 cleaning shaft rotates towards the movement screw with angular velocity ω_2. For screw, similar to the previous ATOKRO installed steam rollers 16. vidmynalnyh by running separate occasions, respectively, and the screw shaft breakage can independently adjust the numeric value of the angular velocity of rotation of the screw ω and cleaning shaft ω_2 That is set regardless of the angular velocity screw more angular speed of rotation of the shaft breakage, which greatly enhances the cleansing effect separation of soil adhering to the surface of the body of roots.

Thus, the intensification of the process of root-crops cleaning impurities, especially the separation of soil adhering to the surface of the body of roots, dynamic performance is achieved by treatment of elastic

elements that are mounted on the tube drive shaft components cleaning impurities heap of roots due to the possibility of installing the required angular velocity of the drive cleaning shaft ω_2 the rational sense angular velocity screw ω.

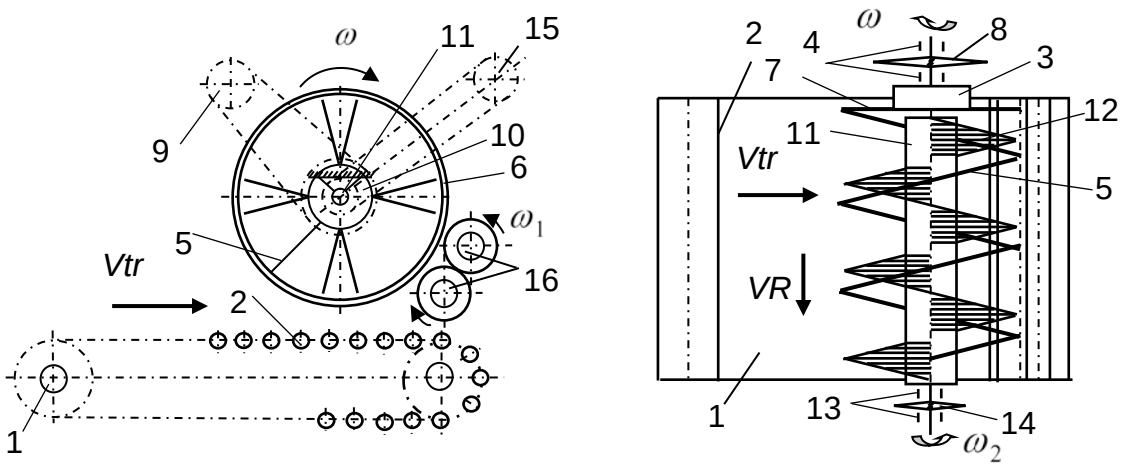


Fig. 5. The scheme improved basic Atokro

On the basis of identification (analysis and synthesis) and analogues previous Avtokro Atokro, we proposed improved design and Avtokro Atokro that may be taken by the main base case, respectively, double row Avtokro and Atokro designed AKM. They combine both in itself all the positive aspects and benefits relative to existing single-disk digger spherical (Fig. 1) and the combined cleaner (Fig. 3) and used in conditions of excessive soil moisture and large weed-infested fields.

Design concept of double row Atokro shown in Fig. 6, top view.

Atokro consists of two rows set at an angle α corresponding to the axis line of roots of two spherical discs 1 freely planted on its axis of rotation 2. The front area of the working edge of each disc 1 is set korenenapramlyach 3. On the Disk 1 perpendicular to transferring the working speed of the digger V_k set horizontal drive shaft 4. The horizontal drive shaft includes 5 drum, drum bearing flanges 6. horizontal shaft made three-section. Between the flanges of the drum circle on its axis installed in series 7, 8, 9 are running flat elastic blade 10, 11. Axes 7, 8 two end sections 12, 13 form a truncated cone drum, and sections 12, 13 are directed to each other smaller bases . Axis 9 intermediate section 14 form a cylinder. The planes that pass through the axis 7, 9 or 8, 9 adjacent sections 12, 14 or 13, 14, set at an obtuse angle [25].

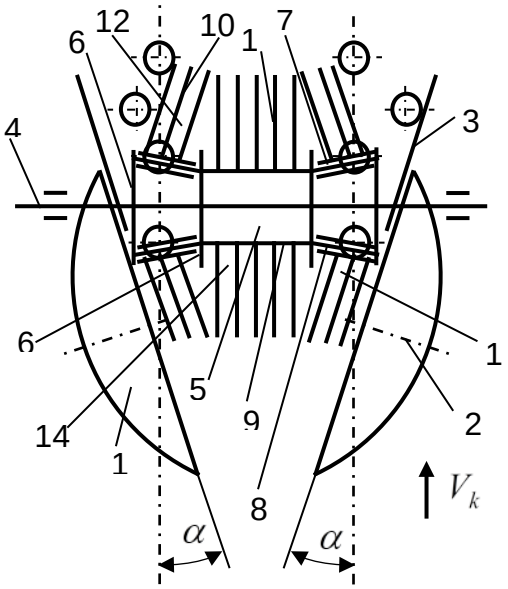


Fig. 6. The design concept of double row Avtokro AKM.

Combined two-row AVTOKRO ACN operates as follows. When moving AVTOKRO AKM, korenenapramlyach 3 shifts broken line of roots to its center, and spherical disc 1 digs roots. Along with digging roots, by rotating the drive shaft 4 horizontal, flat elastic blade 10 two end sections 12, 13 interact with the heads of roots, while at the same time is cleaning the heads of roots from the remnants tops of two adjacent rows of roots and soil clods destruction. In addition, flat elastic elements 11 intermediate section 14 simultaneously interact with root vegetables and lumps of soil, thus there is cleaning the surface of the body of roots and adhering soil clods destruction while pushing heap, which is located in the space of spherical disc 1, accelerating its supply the following process systems AKM.

Thus we can say that the installation of the drive shaft mounted on it with flat blades allows simultaneous excavation of the remains of roots separate tops with the head of root crops and reduce the supply of second impurity by contact interaction of flat blades with components heap, thus increasing the reliability of technological process of excavation Root and as a result - performance digger and AKM.

To reduce the feeding ground of impurities during the double row AVTOKRO in dry conditions and firm ground on the outside of each flat elastic blade 11 (Fig. 7a) intermediate section 14 spring-loaded rod set 15 which is designed as a two-piece spring 16 is rigidly fixed on each axis 9 of intermediate section 14 [26].

Along with digging roots, by rotating the drive shaft 4 horizontal, flat elastic blade 10 two end sections 12, 13 interact with the heads of roots and flat elastic blade 11 intermediate section - dug with spherical lumps of soil Disk 1, while at the same time is cleaning heads Root of residues

tops of two adjacent rows of roots and soil clods intense destruction by the shock of contact inside of the flat elastic blades 11 lumps of soil. In addition, flat elastic blade middle section simultaneously with the destruction of lumps of soil dug pushing spherical disks Woroch, which is located in the space between them, thereby accelerating its move to the next process systems AKM.

To adjust the contact force plane elastic blades 10 (Fig. 7b) two end sections 12, 13 head of root crops during their excavation, or ensure maximum purity residues tops of heads roots and simultaneous compromise agreement relative to the amount of damage roots, which should not exceed limit in accordance with the requirements of cultural practices is proposed to install on the outside of each flat elastic blade two end sections 12, 13 three-section 5 of the drum loaded rod 17 which is designed as a two-piece two-piece spring 18. The spring is rigidly fixed on each axis 7, 8 three-section of the drum. The strength of the contact plane blades two extreme sections regulated by rotating each axis sections, resulting in variation of twisting two-piece springs and spring-loaded rod healing power [27].

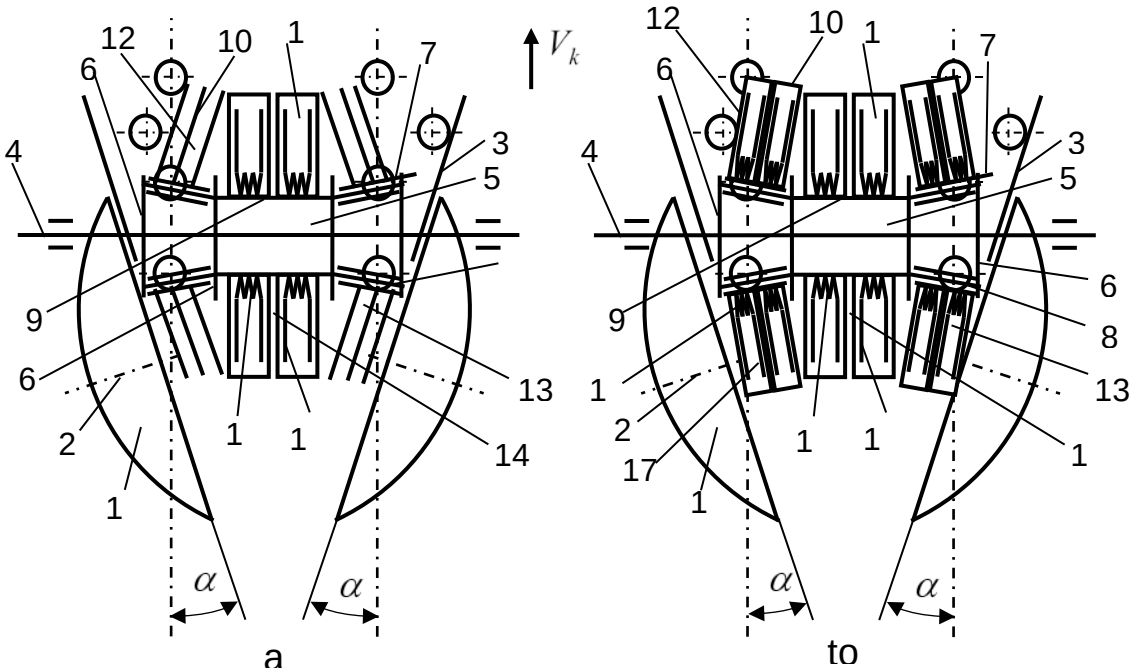


Fig. 7. Improved double row AVTOKRO.

Thus, the reduced supply of groundwater contaminants due to their dynamic destruction blades intermediate section and increased technological process reliability digging roots, which improves performance digger and AKM in general.

The design scheme improved ATOKRO shown in Fig. 8, top view.

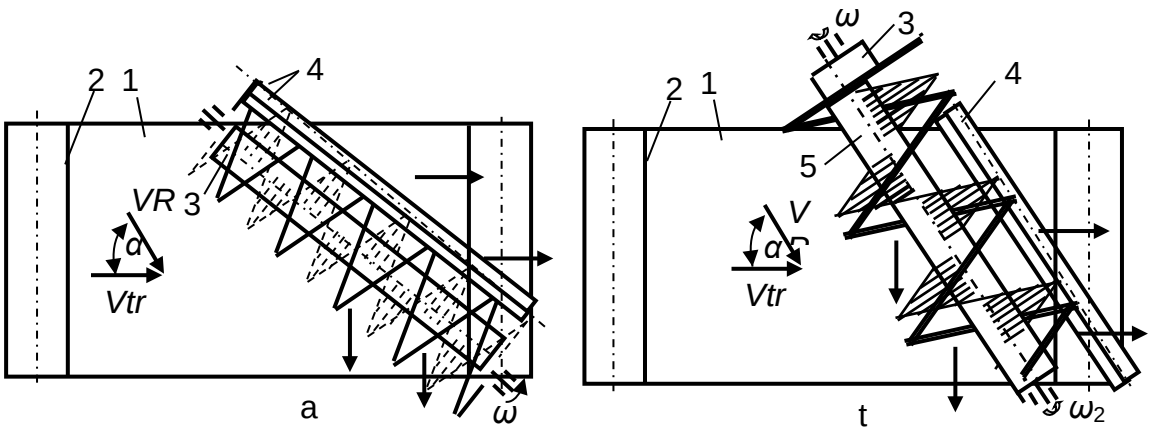


Fig. 8. Scheme Atokro improved.

The difference between constructive schemes improved Atokro (Fig. 8) with respect circuits (Fig. 4a, b, Fig. 5) is that the screw 3 and 4 vidmynalni rollers (Fig. 8a) and screw 3, 4 vidmynalni rollers and drive shaft breakage 5 (Fig. 8b), located on the rods 2 horizontal feeding conveyor 1 set at an angle α to the direction of the velocity of the working Vtr thread rod feeding conveyor [28, 29].

Thus, by installing the screw at an acute angle α to the direction of movement of branches feeding conveyor, an increase technological efficiency of the device due to the intensification of the process of separation of impurities from root crops by increasing the movement of contaminants in the way of working branch feeding conveyor, or the time spent working on impurities branch supplying conveyor.

Thus, the use of advanced designs and AVTOKRO ATOKRO can increase performance quality of AKM by a significant decrease in feed additives, especially lumps of soil and residue heads on tops of root crops, soil adhering to the lateral surface of the body of roots dug by further intensifying effect on Woroch basic structural elements digger and cleaner.

Conclusion. Based on the analysis of processes vykopuvalnyh and cleaning workers of KM can be stated that the identification process of developing AKM should be based on the use of advanced AVTOKRO and ATOKRO that will greatly improve your quality of AKM.

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Pryvedeny эtapы Improvement, Device and principle funktsyonyrovanyya adaptyrovannыh workers and organs vыkapyvayuschyh ochystnыh transport and technological systems korneuborochnыh machines kotoraja prednaznachena for simultaneous collection korneplodov saharnoy, kormovoy, beet and carrot Table.

Based on Authentication objects of the study (typically suschestvuyuschyh kopateley and cleaner heap korneplodov) opredelenы Basic Principles path and development, Or building a constructive algorithm-komponovochnoy scheme adaptyrovannoy korneuborochnые machine.

Woroch, korneplodы, impurities, transport and technological system Combined laboring body kopatel, cleaner, adaptyrovana korneuborochnaya machine.

The stages of improvement, structure and principle of functioning of adapted workings organs of diggings up and cleansing transport technological systems, are resulted root of harvester which is intended for simultaneous collection of root crops of sugar, feed, table beet and carrot. On basis of authentication of research (existent types of dig and purifiers to lots of root crops) objects certainly basic ways and principles of development, or algorithm of construction, structurally layout chart adapted root of harvester.

Lots, root crops, admixtures, transport-technological system, combined working organ, dig, purifier, adapted root harvester.

UDC 620.92: 631.11

FEASIBILITY OF BIOFUEL In agriculture UKRAINE

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Analyzed the feasibility of renewable energy in agriculture in terms of Ukraine's energy dependence on fossil energy sources and perspectives of the energy strategy States until 2030.

Biomass, biofuels, energy efficiency, alternative energy, renewable energy.

Problem. Incessant technological progress requires people more resources to meet the rapidly growing problem. We live in a time when energy, such as their source is probably the most problematic issue for developed countries because their budget should be calculated according to the prices of oil and gas. This in turn leads to international