Energy-saving potato picker stacking elevator with screw guide

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Abstract: This article potato farming in the field of peasants work lightening, energy-saving potato picking his car improvement ideas before pushed. Active elevator mechanism through one of time in itself dialing potatoes to sift and pile up possible seen.

Keywords: elevator, active elevator, screw router, stacking

Potato is considered a root-fruit plant grown in many countries of the world. Potatoes are used as food and fodder, as well as raw materials for obtaining starch, alcohol, glucose, dextrin and other products. Potato tubers contain 75-80% water, 23.7% dry matter, including 17.5% starch, 1-2% protein, 0.5% sugar, 1% mineral salts, as well as vitamins B, B_2, B_6 , C, RR, D vitamins and provitamin A (carotene), and the skin contains a poisonous substance - solonin.

Potatoes occupy an important place in the human diet. According to physiological recommendations, the annual consumption of potatoes per person is 45 kg.

According to the information service of the Ministry of Agriculture, in 2022, 4.1 million tons of potatoes were grown in the fields of the republic. Potatoes in Uzbekistan today arab, elegant, nutritious, hope, Arizona, Zarifa, Rosagold, Rudolph, Faluka, Fontane, Evolution, Desire, Lucinda, Panamera, Silvana, Sifra, Feruza, Koksaroy and more than 130 varieties are grown. Potato products grown in our country are exported to countries such as the Republic of Belarus, Kazakhstan, Kyrgyzstan, Russia, and Turkmenistan.

Potatoes are moisture-loving (especially during flowering and budding), light-loving, somewhat cold-resistant plant potatoes. Buds on the bud begin to bloom in the soil at 5-8°. Propagate from shoots and seeds.

Vegetation period is 60-150 days. Potatoes are divided into quick ripening (60-65 days from ripening to harvest), medium quick ripening (70-80 days), medium late ripening (90-120 days), late ripening (130-150) varieties depending on the ripening period.

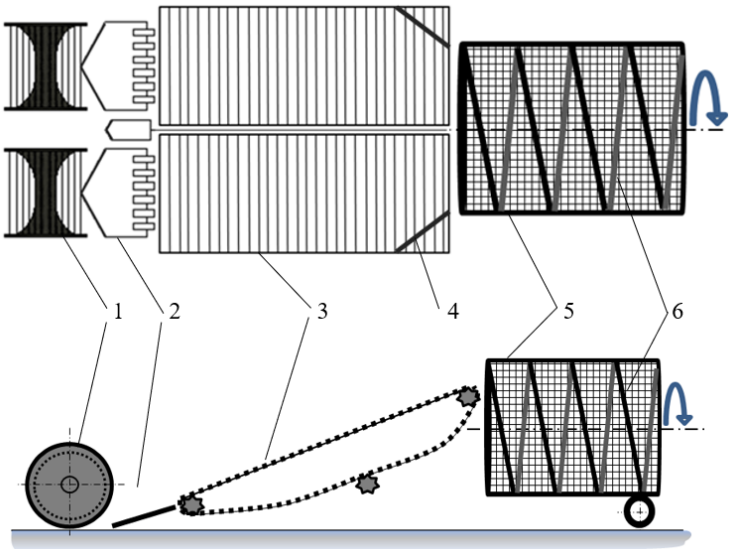
It is necessary to collect the cultivated potato tubers without killing them, protecting them from mechanical shocks and preserving the quality of the crop. 30-40 days before the period of natural formation of the potato layer, a large amount of starch

and dry matter accumulates in the tubers.

Evening potato harvesting depends on the weather conditions and is dug on sunny days. Rainfall interferes with harvesting, reduces the quality of tubers, and increases the amount of potatoes that are shriveled and rotten. If the potato grows in good climatic conditions and the pods are well developed, the rate of harvesting will be high, and at the same time, the potential value of storing good-quality harvested potato tubers as seed will increase.

Today, in many countries of the world, scientific and research work is being conducted aimed at the development of resource-saving and effective techniques and technologies that ensure the complete digging of seed and table potatoes without damaging them with low energy consumption. However, in these studies , the development of an energy-resource-saving potato digger by improving the potato digger elevator and stacker in conditions of high soil moisture by using active working bodies, and substantiating its working process and parameters have not been sufficiently studied. Because in the conditions of Uzbekistan, taking into account that potato picking processes are carried out in two seasons, it is urgent to develop a potato digger that collects seed and table potatoes with high productivity.

Every year, potatoes are grown on an area of about 100,000 hectares in our republic, and 500-600 potato diggers are required to harvest this potato crop. Therefore, by improving the potato digger elevator and stacker in these areas, in order to reduce the number of elevators and reduce the number of elevators, to collect the potato harvest with high productivity and quality, to eliminate manual labor during harvesting, and to reduce its cost by using an energy-resource efficient potato digger, we have installed an elevator and stacker. It is proposed to develop a potato digger equipped with active working bodies.



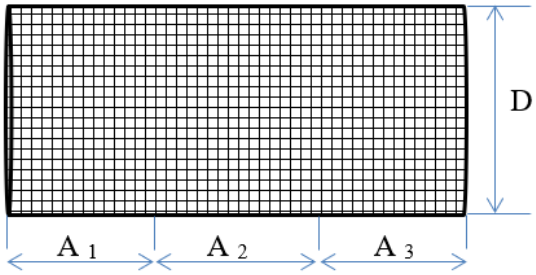
1-picture. Proposal for improving the sifting and stacking function of an energy-saving potato digger b the proposed constructive scheme

1. Wire drum for grinding soil q. 2. A plow that directs the layer of soil and potato nodules to the elevator. 3rd elevator. 4th router. 5- stacking elevator with screw guide. 6-screw guide

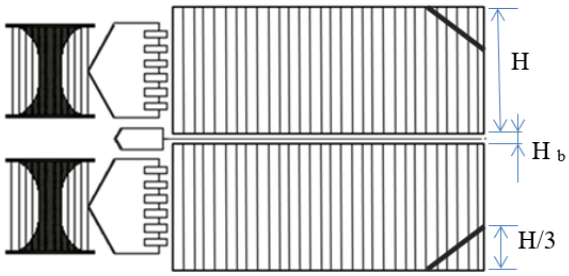
The results of our scientific and experimental studies show that the separation of potato tubers harvested in the late season from the soil mass remains complicated and relevant. This proposed elevator and stacker mechanism can ensure the energy efficiency and productivity of the potato picker. It is important to note that by changing the direction of sieving potatoes a lot, we can increase the coefficient of separation from the soil.

We call our mechanism on this potato digger a stacking elevator with a screw guide.

We determine the geometrical parameters of the stacking elevator with a screw guide based on agrotechnical requirements.



When determining the diameter of the stacking elevator with a screw guide, the cross-section length of two elevators placed at an angle to the horizon, lying parallel on the same axis, relative to the direction of movement of the potato digger is important.



$$D=2H+H_b-2H/3 \quad (1)$$

To store potatoes in warehouses, they are divided into three different fractions:

a) large (for food) - 80 gr larger than the mass of the bud;

b) medium (for seeds) - up to 50 gr bud mass 80 gr;

c) small (for fodder) - 50 gr smaller than the mass of the tubers.

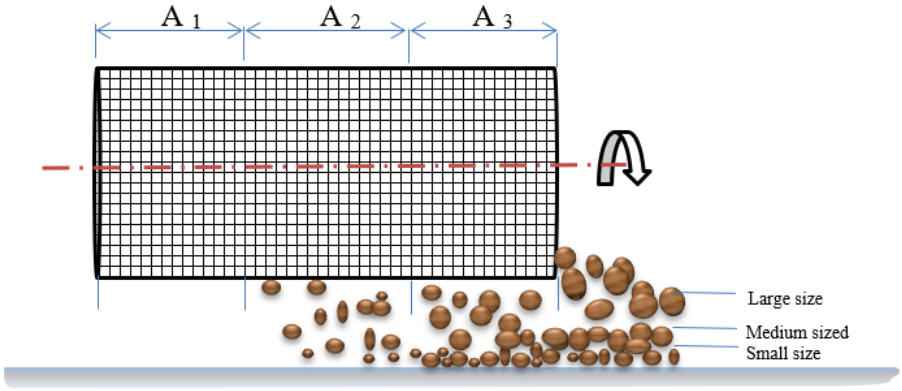
is divided into 3 different sections (A_1 , A_2 , A_3). These sections help in quality sifting and sorting of potatoes.

A_1 section - changes the direction of sifting, performs the task of separating potato tubers from the soil.

A_2 is responsible for changing the sifting direction, separating potato tubers from the soil, sorting small-sized potatoes, separating them from the elevator, and forming the first layer of sifted potatoes.

A_3 is responsible for changing the sifting direction, separating the potato tubers from the soil, sorting medium-sized potatoes, separating them from the elevator, and forming the second layer of sifted potatoes.

Large-sized potatoes produce a third layer of sifted potatoes thanks to the screw movement of the stacking elevator with the screw guide.



The section slits are sized to match the sizes of the potatoes that have been sieved.

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