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Dielectric sorting device of new innovative rice seeds

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ABSTRACT: The article presents the results of research on the selection process of agricultural rice seeds in the electric field on such important properties as physical and mechanical and electrical properties, mass, geometric dimensions, dielectric constant.

KEYWORDS: Rice seed, electrode, dielectric constant, electric field, rice weight, centrifugal force, dielectric sorting.

I.INTRODUCTION

Today, in the world and in the Republic, the demand for rice and rice products is growing day by day. In order to meet this need, at least to some extent, and to ensure food security of the population of the Republic, the introduction of new innovative techniques and technologies in the agricultural sector. First of all, in order to meet the agro-technical requirements for sown rice seeds, it is necessary to carry out a sorting process.

At present, with the help of pneumatic, mechanical devices and equipment available at the newly established enterprises "Cluster" in the country, rice seeds are sorted and delivered to farmers for the sowing season. However, these devices unilaterally sort rice seeds by pneumatic, mechanical methods, and there are some drawbacks.

To solve the existing shortcomings in the agricultural sector, through the creation and application of new machines and sorting devices, high productivity, low power and seed consumption, high sorting accuracy, alternating current, the operation of the device is not affected by changes in ambient temperature, The demand for scientists to create a cheap sorting device that consumes less metal and is easier to manufacture is put before scientists.

In order to meet the demand for rice and rice products in the world and in the Republic, including the domestic and foreign markets, scientists of the Republic are also contributing.

Scientists of the Uzbek Scientific Research Institute of Agricultural Mechanization (KHMITI) Ph.D. Prof. A. Yusubaliev, Ph.D. y.i.x. AT Rasaboev and Bukhara Institute of Engineering and Technology (Bux MTI) in collaboration with independent researcher SP Shoyimova are conducting research on the preparation of rice seeds for sowing.

As a result of scientific research, a laboratory model of a new innovative device based on electrotechnology "Electron-ion" was created.

This sorting device is designed to separate rice seeds into technical (waste) fractions from various organic minerals, mixtures, raw, unripe, mechanically damaged, small geometrically small and lightly immature rice, taking into account the chemical, physico-mechanical, biological, electrical properties. The newly created innovative sorting device has a high efficiency, low metal consumption, easy to build, energy-saving, compact, inexpensive device, KXMIT and Bux MTI scientists t.f.d. prof. A.Yusubaliev, t.f.n. y.i.x. A.T. The “New Innovative Rice Seed Sorting Device” created by Rasaboev and independent researcher SP Shoyimova is shown in pic. 1.

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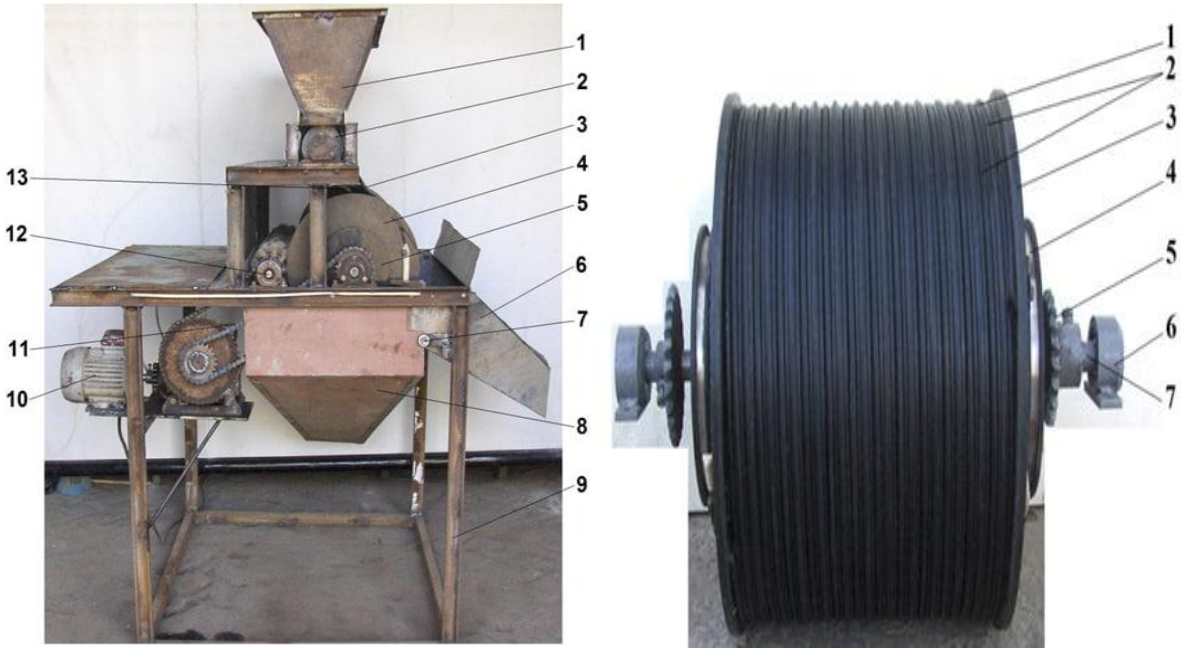

Pic. 1 The schematic diagram of the new innovative rice seed dielectric sorting device and the working body drum are shown.

Currently, scientists are conducting research on the basics of the basic parameters of the sorting device in theory and practice. With this in mind, the device can be selected by dielectric sorting of rice seeds by geometric dimensions, thickness, width, mass, physical-mechanical, biological and electrical properties. have conducted experiments and continue scientific work in this direction.The structure, operation, and working body of the energy- and resource-efficient, dielectric sorting device for rice seeds proposed by scientists are described.

The sorting device is made in the form of a cylindrical working drum, on the surface of which at a depth angle (ɣ) are directed two-lane screw grooves with width (t) and spacing (d) and wrapped electrodes with opposite signals.

The working body of the proposed device for dielectric sorting of rice seeds is located on the surface of the drum, the resulting electric field under two different conditions, ie as a result of friction between two dielectric materials, and the formation of electric field between opposite electrodes. in the theoretical study of the technological process of sorting, this process is studied taking into account the specific aspects.

Therefore, in the study of the technological process of sorting rice seeds in a dielectric sorting device, it is studied the effective use of previous research in this area, enriching the analytical links and filling in the gaps.

The proposed energy and resource-saving dielectric sorting device for sorting new innovative rice seeds is described as an experimental device and a working body drum.

For the device to work, we connect it to the mains and the electrodes are supplied with high voltage from the transformer TG-1020. In the feeder, a uniform amount of rice seeds is delivered to the surface of the working body, the seeds falling on the surface of the drum are polarized under the influence of the electric field generated between the electrodes with opposite signals.As a result, the seeds are affected by the sum of the electric field generated under two different conditions, namely the friction and the electric field strength generated between the electrodes with opposite signals.

Heavy, fully ripe seeds fall to the sowing fraction, which is previously separated from the surface of the working body under the influence of centrifugal force.

Mass lightly fully immature seeds and various mixtures, raw, cooked, mechanically damaged waste. Under the influence of electric force, a large force is applied to the surface of the working body, falls into the waste fraction and separated from the surface of the drum by a brush, depending on the physical-mechanical, electrical properties of the impact forces, cut at different angles.Rice, raw, light mass unsuitable rice seeds are cleaned on the surface of the drum using a brush.

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This means that by changing the value of the high voltage applied to the opposite signal electrodes, controlling the sorting process in the electric sorters and changing the rational parameters of the working body, it is possible to sort the seeds of other crops in the electric sorting device while maintaining the same value of electric field strength.

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