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Development Of Effective Technology Of Cotton Cleaning

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ABSTRACT

The article provides an analysis of scientific work done to improve the cleaning efficiency of ginners. The result is based on the effect of the cross-sectional shape of the columns on the cleaning efficiency when cleaning cotton from large contaminants.

The analysis of the grate grate concludes that additional shaking of the raw material in the cleaning zone is necessary to increase the cleaning efficiency.

KEYWORDS

Oven, grille, cleaners, mechanical damage, scratching, versatile, conical.

INTRODUCTION

One of the main indicators of the performance of technology today is determined by the quality of cotton fiber. Many years of experience in the field of ginning show that improving the quality of fiber obtained from production prevents losses in the production of ginning raw cotton rather than ginning fiber.

Excessive humidity during the cleaning process will negatively affect the cleaning efficiency. For grades I-III of cotton, the initial moisture content should not

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exceed 13% for low-grade varieties up to 11%. Exceeding the established norm leads to deterioration or burning of fiber and seed quality indicators during storage. Several types of ginning machines are used in ginning enterprises in the country, including 1XK, UXK, PT-10, ChX-ZM2 and others. These devices differ from each other in their processing process.

The more times the cotton is cleaned in the machine, the lower the staple length of the fiber, for example, 3 times it is reduced by 0.25 mm, the amount of short fibers increases from 7.1% to 9.8%, the amount of long fibers from 60.4% to 52.2%. decreased. If the moisture content of cotton increases by 3.4%, then the degree of purification of seed cotton is reduced by half.

MATERIALS AND METHODS

In recent years, the UXK cotton ginning unit has been widely used in production. The UHK unit includes a series of sections for cleaning raw cotton from large and small contaminants. Figure 1 shows the schematic diagram of the UXK cotton ginning unit, which includes 3 sections for cleaning raw cotton from large contaminants.

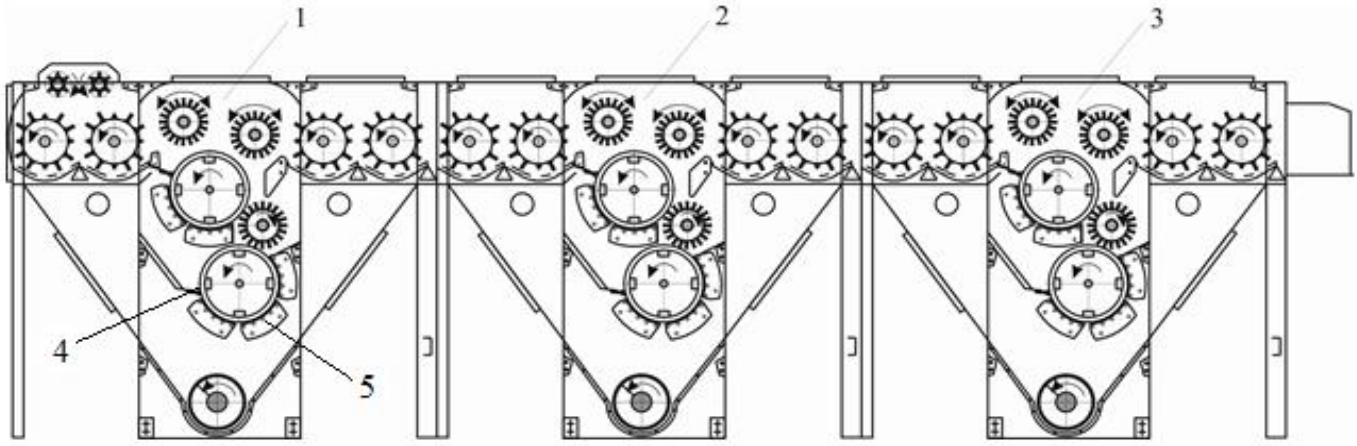

Figure 1. Scheme of UXK cotton ginning unit:

Sections 1, 2, 3 - a 4-saw drum, designed for cleaning large contaminants in the raw cotton, a grate with a cross-section of 5 circles.

All three sections are equipped with two saw drums 4 and under them grate columns 5. The columns have a circular cross section with an outer diameter of 20 mm. It should be noted that as the cleaning efficiency increases, the number of sections from each section can be reduced, as well as the frequency of cotton cleaning.

In the scientific works of Budin E.F., Borodin P.N., Lugachev A.E.

In order to improve the flow of the UXK-type cleaner, a comb-type column was introduced in the research. However, due to the low efficiency, this technology has not been used in practice.

A grate with a multi-sided grate

Presented in Figure 2. In the presented technological construction, the process of cleaning the fibrous material is carried out as follows. During the work, the raw cotton (fibrous material) comes to the saw drum 2. His teeth grind raw cotton and pass it through a grating grate. Under the influence of the saw drum 2, the cotton raw material is beaten into multilayer colossuses 1. In this case, due to the fact that the number of edges of the columns1 is different, the direction of impact force of the impact of cotton on the columns with different angles of rotation of the saw drum 2 is different. In addition, as

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the number of colostrums increases from 1 edge, the pulse of impact force applied to the cotton decreases, and as the number of collars from 1 edge decreases, the pulse of the impact force increases. This interaction of the raw cotton with the multi-faceted (different number) columns 1 creates favorable conditions for the separation of the dirty mixtures of different sizes that have penetrated between the fibers of the raw cotton. However, the diversity of the edges of the column leads to an increase in the mechanical damage of the seed in the cotton, the breakage of the fiber from the change of impulses of impact force. An increase in the number of edges of the column, the approach of the cross section of the column to the circle, leads to its failure to perform the specified function.

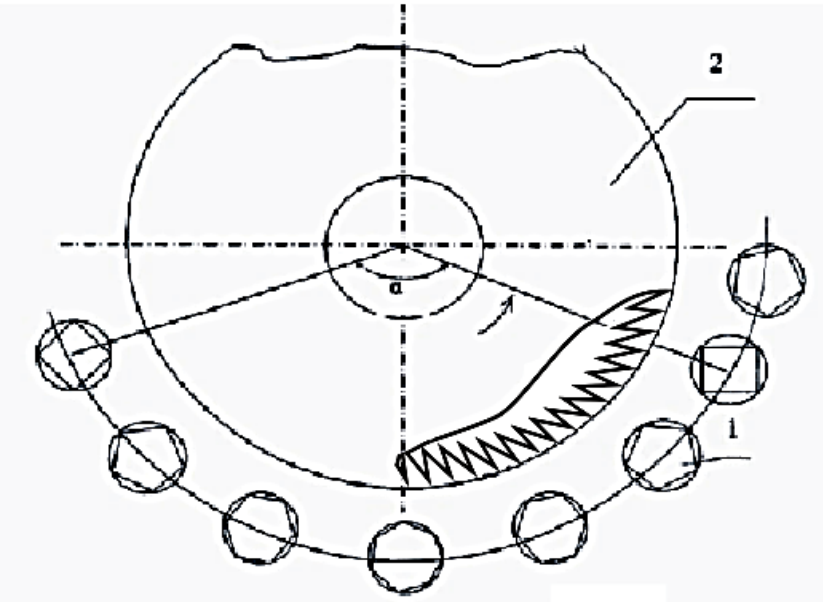

Figure 2. Grill grate with multi-sided rafters: 1 rafter, 2 saw drum.

DISCUSSION

In the construction of the grid of the ginner, designed to clean the raw cotton from large contaminants, under the saw drum 1 are mounted conical girders 2 in flexible bushings 3, the central groove of which is eccentric (variable thickness) (Fig. 3). In this case, the cyclic vibration of the cotton, which allows intensive separation of contaminants, is manifested both in the drag line and in the vertical plane. The design of the cleaning grate grate for rotary and oscillating movement of the grate is provided by the processed material. This technological design differs from the previously developed column by the fact that the conical columns are mounted on 2 bearings 3. Bearings 3 are mounted on eccentricly made flexible bushings 4 in turn. The bushings are placed in 4 arched side slits (Fig. 4).

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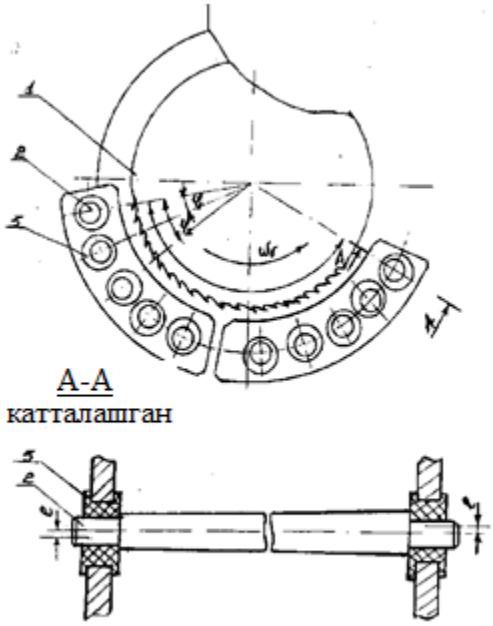
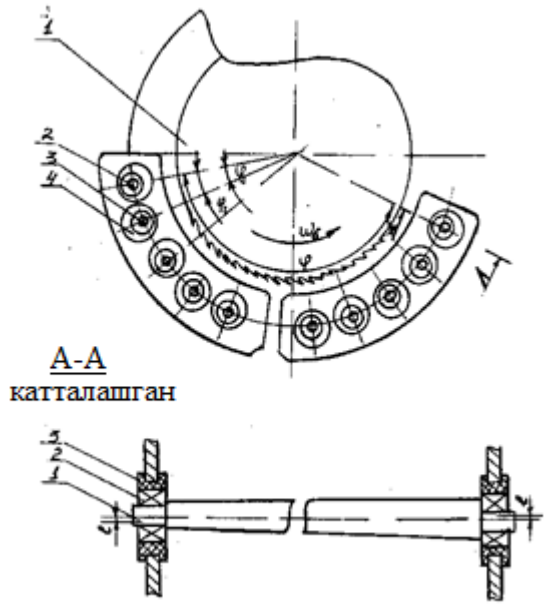


3-picture. Lever grating mounted on the fiber material rack: 1-working Drum, 2-lever, 3 - slider



4-picture. Kolosnikli grid, which is made of fiber material: 1-working Drum, 2-kolosnik, 3-bearings, 4-belt

It should be noted that the current situation in ginneries, the cost of equipment, electricity and spare parts is constantly rising. In recent years, the high cost of linear-current lines has become a practical problem for consumers, which has led to an increase in the cost of cotton fiber and other by-products.

CONCLUSION

With this in mind, it is necessary to create effective modules of such cleaning, which will allow to form a module of short economic technological lines in cotton processing. Such resource-saving technology should be highly efficient and, depending on the initial description of the raw cotton, process indicators should consist of mobile elements.

The analysis of the grid grate installed in the ginner designed to clean the cottonseed from contaminants showed that in order to increase the ginning efficiency, additional ginning of cotton is required in the ginning zone. application will increase the cleaning efficiency of the cleaners.

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