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IMPROVING THE EFFICIENCY OF THE STONE CATCHER

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Abstract: *The scientific article describes the device, the principle of operation, the efficiency and disadvantages of devices for separating heavy compounds at transferring raw cotton into the production process at ginning factories, and a new design of the device for their elimination is proposed. The proposed device for masonry was introduced into production, and its effectiveness was determined as a result of experiments.*

Key words: *cotton, seed, fiber, stone, metal, working chamber, pipe, pocket, drum, grade, .*

THE MAIN PART

The main raw material of the world's textile products is cotton fiber. According to the information of the "International Consultative Committee on Cotton" (ICAC), 23.07 million tons of cotton fibers were produced worldwide in recent years, and its consumption is 24.55 million tons. It is expected that the consumption of cotton fiber and the demand for it will increase in the future due to the intensively growing population . The increase in demand for cotton fiber, in turn, requires continuous improvement of its quality and production efficiency. In this regard, great attention is being paid to increasing the competitiveness of cotton fiber in the world market, new technology that produces modern and technologically reliable and high-quality products, and their modernization.

There are various types of impurities in cotton, which are divided into active and passive according to the degree of adhesion with cotton, large and small in size, organic and mineral types according to origin. These include mineral (stone, sand, slag, metal fragments and other objects) mixtures that affect the continuity, efficiency and high productivity of the process. These mixtures are observed in large quantities during the process of picking cotton, transporting it from one place to another and transferring it to

production. Therefore, raw cotton supplied to cotton ginning and ginning enterprises often contains heavy impurities and foreign inclusions (stones, sand, slag, metal fragments and other objects). These foreign and heavy impurities cause many negative problems in the storage and processing of cotton [1]. As a result of the transfer of heavy impurities in cotton to the next technological process, there is a risk of fire or damage to the cotton gin and linter saws due to getting into the working parts of the cleaning machines. As a result, the service life of cotton gin and linter saws is reduced.

In the process of picking and storing cotton, various foreign substances may be added to it. Foreign impurities make up 0.2-0.3 percent of the cotton mass [1]. Such a situation requires the use of devices that separate heavy impurities during the processing of cotton. Otherwise, stones and metal fragments will enter the working chambers of the gin, linter and cleaning machines and have a negative effect on their smooth operation and their working bodies (Fig. 1). As a result, the production efficiency of the equipment decreases, which causes a decrease in the efficiency of continuous operation of the technological process.

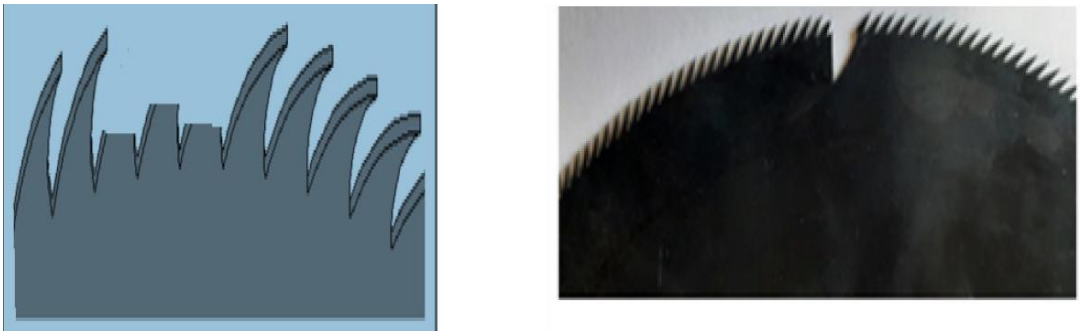

Figure 1. Cases of damage to gin and linter saws caused by heavy impurities and metal objects.

In this case, the specified 72-hour and 48-hour working periods of linter saws are reduced, requiring additional costs for the purchase of saws for the enterprise.

One of the urgent problems identified as a result of the analysis of the shortcomings identified in the device is the timely and continuous removal from the working chamber of heavy impurities separated from the cotton raw material. Today, existing gins use two stone traps to remove the heavy impurities separated from the cotton from the working chamber of the gin [2].

To remove heavy impurities, ginneries workers open the first plate and lower it into the second plate, then close the first plate again, and then open the second plate to release heavy impurities and close it again. This process is carried out on the basis of constant manual labor. In some cases, due to the inattention of workers, as a result of untimely cleaning, the pockets are mixed with raw cotton under the influence of air sucked in the working chamber.

Figure 2. Newly designed handheld device, continuous removal of heavy impurities from the working chamber of the stone trap.

At the same time, heavy impurities separated from cotton in the working chamber of the stone trap, fill the empty spaces between the rubberized blades of the vacuum valve, and the vacuum valve begins to pour out the accumulated heavy impurities into the inclined base of the pocket. Since the bottom of the stone catcher pocket is tilted, heavy impurities quickly hit through the door (Fig. 2).

In terms of operation and design, the pocket part of the new device is very simple, its manufacture does not require complex technological and machine-building processes. Many of the parts are designed to be easily replaceable to make it easier to replace working tools. Does not require excessive installation costs in current production conditions. Both sides of the rotating vacuum valve of the device have the ability to automatically eject heavy impurities by hardening the walls of the pocket part of the stone with light rotating bearings. In addition, it is possible to rotate the vacuum valve under the influence of an external factor using a lever from the outside.

In this way, the cleaning of the pocket part of the stone trap is facilitated by the workers working in the factory, and clogging due to various stresses occurring in an emergency situation is also prevented.

CONCLUSIONS

To eliminate the problem of removing heavy impurities separated from raw cotton, from the pocket part of the dryer in existing dryers, a vacuum was installed in the pocket part of the new dryer valve. The decision was made to make the bottom of the pocket slanted in order to ensure rapid ejection of heavy mixtures when they fall to the bottom incinerator pocket.

LIST OF USED LITERATURE:

1. Rakhimov F., Kasimov H., Muradov R. Ways of continuous pressure of heavy impurities from the working chamber of the stone trap // All-Russian scientific and practical conference NamMTI on the topic "Innovative approaches to the design and improvement of textile and light industry machines". 2021.

2. Rakhimov F., Kasimov Kh., Muradov R. Improvement of the working chamber of the stone trap // NamMQI. International scientific and practical conference

"Innovations in mechanical engineering, energy-saving technologies and increasing the efficiency of resource use." 2021. Pages 491-493.

3. Rakhimov F., Kasimov H., Abdukarimov T., Muradov R. New technology and technology of cotton transportation by pneumatic transport // NamMQI. International scientific and practical conference "Innovations in mechanical engineering, energy-saving technologies and increasing the efficiency of resource use." 2021.

4. Rakhimov F., Kasimov Kh., Abdumannopov A. Improvement of the device for continuous removal of heavy impurities from the stone trap // NamMTI International Scientific and Practical Conference "Modern concepts for ensuring the quality of cotton ginning, textile and light industrial products." 2021