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IMPROVEMENT OF A STONE CATCH DEVICE FOR REMOVING HEAVY IMPURITIES FROM COTTON

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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, stone, working chamber, pipe, pocket, drum, fan, grade, grade.*

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.

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 of heavy impurities from the working chamber, 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].

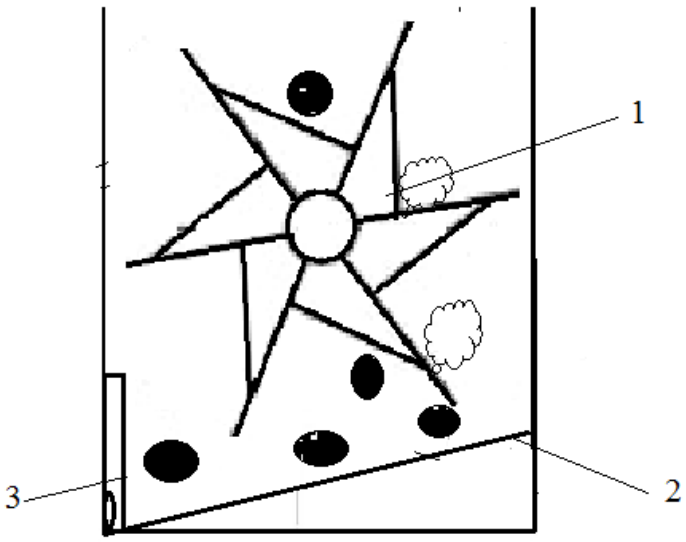

Figure 1. Newly designed handheld device, continuous removal of heavy impuritie from the working chamber of the stone trap.
1-vacuum valve; 2-inclined base; 3-palace for impurities

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.

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 (picture 1).

Figure 2. Heavy impurities trapped in the proposed stone trap

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