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INCREASING THE EFFICIENCY OF RETAINING DEVICE FOR FINE AND LARGE HEAVY MIXTURES IN COTTON RAW MATERIALS

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Abstract: The new device for catching heavy impurities doubles the efficiency of catching heavy small and large objects in seed cotton raw materials and eliminates the risk of damage to its cotton impact parts. The proposed device has two pockets, a double "S"-shaped working surface, and a spring plate is installed on the working vertical surface, which is fixed on the second vertical surface. The plates for dropping heavy mixtures in the working part of the pockets are equipped with a device that can be opened by artificial intelligence, which ensures effective dumping of heavy mixtures. Automatic opening and closing of the device's pocket plates that expel heavy impurities from the working part prevents air ingress, sensors are installed, robotic technology is used, and the control is in our own hands by automatically transmitting messages from the sensor to smartphones and computers through the program through artificial intelligence. This ensures that heavy impurities are efficiently removed from the device. A spring-loaded plate installed on the working surface prevents cotton from being damaged by impact. This device ensures the good operation of the equipment for cleaning impurities, separating the seeds from the fiber in the cotton ginning plants, and protects against fire in the drying equipment. Protects cotton and fiber from damage to seeds.

Keywords: Tray, pocket, heavy mixtures, plate, sensor, artificial intelligence, spring, vertical surface, horizontal surface, seeded cotton, camera, floor.

Introduction. We all know that we love to wear and shop for clothes made from quality fabrics. For this, we need high-quality yarn to make high-quality yarn, and high-quality fiber is needed to get high-quality yarn. In order to obtain such products, we get the necessary products based on the textile industry and fiber spinning machines, and then on the machines of cotton ginning plants, and we wear quality clothes from the products that have passed this process, and various gauzes used in the industry are produced. In order for us to obtain this quality fiber, we must first improve the processes of ginning, ginning, and drying of seed cotton. It is necessary to increase the efficiency of our pneumatic mechanical machines. And in order to improve its fiber production processes and not to damage the saws of gin machines, it is necessary to improve the

processes of cleaning cotton from heavy impurities in order to prevent damage to saw cylinders and pile drums of cleaning processes.

If we pay attention, our such a device is called a stone catcher that captures small and large heavy mixtures of seed cotton. We have most of the devices available and in production processes, many types have been invented and many of them are still unproven, but these devices are called stoners.

By increasing the effective retention effect, the stone trap that captures heavy impurities in seed cotton improves the conditions of all cotton processes, prevents damage, prevents damage to the drying equipment, punctures and, most importantly, burning. It prevents the breaking of the piles of pile drums in each section during cleaning processes. Also fiber breakage prevents seed crushing. In the process of grinding, it prevents the saw cylinders from breaking and stressing the shaft. In this process, fiber improves the effect of tolanin release from the seed. Then the saws of the linting machines eliminate the stress on the shafts. It improves all processes and increases the quality efficiency of fiber production. To this day, this device has proven its inextricable dependence on our high-quality fiber and gas extraction process. We will talk a little bit about how the heavy duty clarifier currently in development works, and explain in detail how it is considered one of the important processes for the cotton industry and what factors reduce its performance.

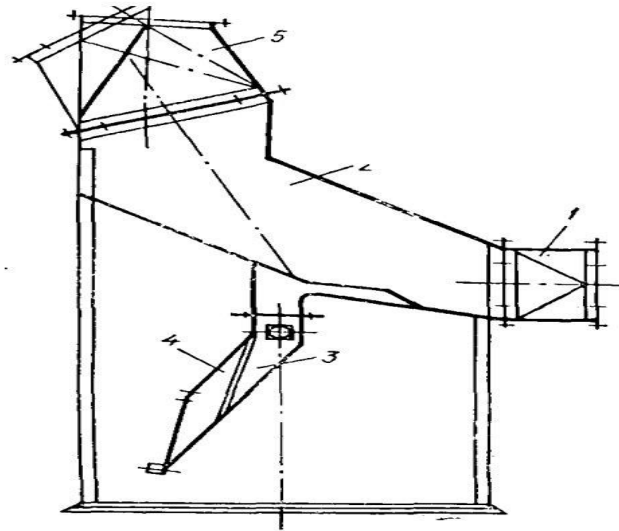
Methods. The role of cotton gins is very important for the transportation of raw cotton materials and the production of fiber from them. Because this device is one of the main devices, catching heavy impurities in raw cotton prevents fire in the passage of cotton in another process, i.e. separator, in the device for separating air from cotton, drying drum, when the temperature of wet cotton rises, heavy impurities in cotton stones, pieces of iron, scraps, etc., can cause dangerous fire due to friction on the surface of the drying drum, the small and large impurities in the cleaning equipment will cause some aggregates of cleaning equipment to break, eat, and stop. , and stalling will cause the motors to burn out. It causes damage to the fiber and seed of raw cotton. It leads to serious damage to sawing devices, breaking of saws and stopping of sawing, this is a conclusion that comes from experienced practice. All in all, it will cause great damage to the cotton ginning plant. It causes a lot of money to be wasted.

Currently, cotton ginning enterprises use the 2CHTL type sieving device that captures heavy impurities in raw cotton. Its operation makes a great contribution to the rapid operation of all technological processes. Every cotton ginning enterprise uses a filter device that captures heavy impurities of various types. In the age of modern technologies, this device, i.e. the stone crusher, is used in other processes. We are currently talking about a clarifier that captures heavy impurities, as an example at the Chust cotton ginning enterprise. This device has been overhauled and used every year

since the cotton ginning plant was built. The structure of the clarifier, which traps heavy impurities, is simple and simple in appearance.

Cotton is pulled at a certain speed through a pneumatic transport, that is, a mechanism that helps to pull cotton raw materials with the help of pipes. Into these pipes the seeded cotton in bundles is thrown by the workers with the help of tools and it is pulled out at high speed by this device. together with is pulled by pneumatic transport in horizontally placed pipes, in the process of pulling, seeded cotton raw material encounters a device that captures heavy mixtures, one part of which is horizontal and the other part of which is vertical. The seed cotton raw material from the horizontal part of this device is hit on the vertical surface, and another main part of this device is the bottom-mounted pocket, which is located on the horizontal surface, where the heavy impurities are caught, and this equipment is made of two layers will consist of The first and second floors are closed, and the bottom part of the second floor consists of plates covered with gypsum. In order to prevent the release of air and the addition of seeded cotton raw material together with heavy mixtures, two plastic irons are installed on two stages. Then, when the seeded cotton raw material hit the vertical surface rises up, the heavy impurities inside it fall into the pocket below. In this process, only when the pneumotransport was on a horizontal surface and there was no gap, the heavy mixtures would have been taken to other processes together with the cotton. Therefore, a two-part pocket is installed on the lower part of this vertical surface, in which the cotton raw material rises up according to its lightness. Heavy objects fall down with their own weight. This is called a cooling device. It is written in the next words that the refrigerator is dry. 15 tons of seeded cotton raw material passes through the dryer device per hour. In this process, we have already mentioned that the pocket of the stone crusher is double-layered so that it does not fill up. Assuming that this plate is full of heavy mixtures on the first floor, the first plate is pulled and falls on the second floor, while the bottom of the second floor is covered with gypsum with an iron sheet with the same plate, and heavy mixtures fall on the surface. The first floor plate is quickly plastered closed, and when it is sure that it is closed, the second plate is opened, at which time the heavy impurities are expelled through the pocket. The human factor is used to weigh these two plates. Workers tighten the plate by hand and put it back in place, which has a very negative effect on human life and health. A large amount of dust comes out of it, which causes damage to the respiratory tract and lungs. These dusts cause lung cancer and cancer. And when you pull it by hand, it hurts your hands. To prevent these situations, the automatic pocket opening system can be used. In cotton ginning enterprises, we can see the 2TChL brand clarifier (picture 1) and the UTP-1.5 brand clarifier (picture 2) the clarifier device that captures heavy impurities. The working process of this device has been explained verbatim, its scheme and sketch can be clearly seen in this picture. And the operation process of the dehumidifier device increases the good performance and

efficiency of many devices. It ensures effective and high-quality fiber production of seeded cotton raw materials.



Picture 1. 2TChL brand stoner.

The 2TChL brand duster (picture 1) has a simple structure, and it is convenient to connect it to the cotton suction tube of the pneumatic transport in the workshop. The heavy objects in seeded cotton coming with the air flow through pipe 1 are separated from the cotton as a result of hitting a fixed surface and losing speed, as well as the air speed in the extended part of pipe 2 being significantly reduced. Heavy objects separated from the cotton fall into the separation pockets 3 and 4 and leave the tube. When passing 15 tons of cotton in one hour, the stone crusher catches 70-80% of the stones mixed with this cotton. When the speed of air in the refrigerator is 22 m/s, its pressure decreases to 295 Pa. Due to the fact that the separators in the line cannot separate all the heavy objects in the cotton, the UTP-1.5 brand device is also installed after the separator.

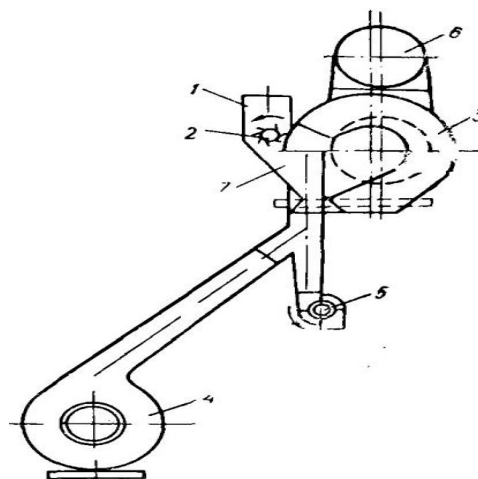


Figure 2. UTP-1.5 connector.

The UTP-1.5 stone crusher (Fig. 2) consists of a shaft 1, a feed drum 2, a chamber 3, a fan 4, a vacuum valve 5 and a suction pipe 6. Seeded cotton rises along the inclined plane 7 with air flow and enters the chamber 3. In this case, as a result of a significant decrease in air speed, the cotton is separated from the air and falls down. Heavy objects are removed from the device through the vacuum valve 5. Air is expelled through the suction pipe. Productivity of seed cotton is 12 t/s; stone holding capacity is 100% for stones weighing more than 10 g; 94% for stones lighter than 10 g. When the air pressure is 1370 Pa, the consumption is equal to 3.3 m³/s. The amount of heavy objects is on average 0.2% in II-grade cotton, and 0.3% in low grades.

One of the main disadvantages of this brand of stone crusher equipment is its low efficiency and the effect of trapping heavy mixtures. As an example, in the experimental sentence above, which is said to be 70-80%, we have made a plan for a new construction without the participation of the human factor and without affecting the safety of life, and we want to put it into practice.

Results. The new device we offer doubles the efficiency of catching heavy small and large objects in seed cotton raw materials and eliminates the risk of damage to its cotton impact parts. Various types of sensors installed in the internal organs of this device provide us with the process of its operation through our mobile devices, and through this, we can see how and what processes the cotton in it goes through. When the cotton raw material is pulled through the pneumatic device, due to the high speed of the air, the cotton raw material hits the vertical surface of the dryer with a blow, and damages the cotton seed and fiber. Underneath, an iron plate covered with a soft non-combustible material is attached to the entrance of the seeded cotton and fastened to the vertical surface at the top of the pocket, and the upper side of the vertical surface is fastened with an overhang, and the lower part is made at a 30-degree angle, and a spring is placed between the vertical surface and the plate. . This device mainly ensures that the seeded cotton is not damaged and in many cases, the accumulated cotton is crushed and the heavy impurities between it fall into the pocket. We would like to offer a new device in the form of "S". This shape of the stone crusher will have two pockets and two vertical surfaces, on these surfaces this plate will be installed, and sensors will be installed on the top side of the pockets that monitor these processes.

As for the pockets, in order to ensure their automatic opening and closing, magnets are used that automatically open the plates of the two pockets. In this case, a small amount of electricity is used to ensure strong closing and sticking of the magnet, since these plates are mainly made of iron, rubber is placed around them to prevent electric shock. In order for the magnet to open when the pressure drops to 7 kg, a sensor is installed that notifies when a load is placed on it. If a load of 7 kg falls on the first plate, the sensor notifies and the automatic plate opens downwards, drops heavy mixtures on

the second plate and closes. The second plate is placed so that it opens at a certain time, and a sensor is installed there, and it is set to open only after the first plate is closed.

Discussions. In this way, our proposed device can single-handedly replace both pre-separator and post-separator devices installed in cotton ginning plants, and the effect of trapping heavy impurities is twice as much and more efficient. It reduces damage to all equipment in cotton gins. Stones, pieces of iron and hard objects are trapped and do not transfer to other equipment. By increasing the efficiency of the proposed new construction, we distinguish it from other similar devices by the fact that it has more working surface and one more pocket. As a result, the process of trapping heavy impurities in seeded cotton is performed effectively and qualitatively.

Conclusion. The proposed device is mainly to ensure that the seeded cotton raw material in cotton gins does not harm the seeded cotton when all kinds of heavy impurities get mixed with the cotton due to machine and hand picking and negligence by the workers. The purpose of obtaining high-quality fiber and seed is put forward that it effectively carries out the process of trapping heavy impurities in its content. It consists in protecting the seed cotton from damage by passing it through less equipment. The device we offer consists of two-pocket and two-chamber surfaces, and the plates inside the pockets, which expel heavy impurities, are automatically opened and closed to prevent air ingress. Keeping control in our own hands by streaming to smartphones and computers ensures that this device efficiently removes heavy impurities. At the same time, in order to prevent the accumulation of raw cotton in many cases, especially when touching its vertical surface, there is a spring in the bottom part of the iron plate installed at a 30-degree slope, which helps to facilitate the damage and spread of the accumulated cotton, and then transfer it to the next parts. In conclusion, it can be said that this device consists in increasing the efficiency of the processes of trapping small and large heavy impurities in raw cotton and using artificial intelligence without the automatic human factor.

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