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SCIENTIFIC RESEARCH ON THE SS-15A SEPARATOR

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Introduction

Cotton ginning sector of great importance to the current stage of development, as well as technical and technological activities, from the harvesting of cotton to prevent raw material losses, while preserving the natural features of the high level of work the first time, and the resulting product to ensure uninterrupted supply to consumers must go. It should be noted needs, the use of technology on the basis of available technical equipment, it is important to timely adjustment and control.

Cotton processing enterprises, and equipment to increase productivity, improve the quality of the product in many ways similar devices tuned for the selection of technical requirements technical regulations and pneumo-transport aerodynamic principles of the system will depend on Foot. Technological and aerodynamic analysis, alternative options and choose production. Production capacity is to determine the factors that affect the natural properties of cotton and to find ways to eliminate it. Disappearance of cotton fiber aerodynamic system aimed at preventing the production of proposals and implementation this scientific work is evolving. This analysis of the subject and the ensuing find a solution to the problem today, cotton ginning factories are used in separators fully-depth analysis of the technique. Because, today used in a large-scale festival in separators being transported cotton and the main products as well as causing damage to the cotton fiber [2].

Materials and Methods

Separating the working chamber from the cotton ginning hits on the mesh surface. This process can be thought as the cotton ginning mesh longitudinal stroke (figure 1).

You know, the SS-15A separating the best technological process is absorbed in the upper part of the working chamber being. This separator into the working

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chamber of cotton gang distribution equal to the entire length of the camera. The implementation of the process of equal distribution of the length of the vacuum valve leads to the spread of cotton against the gang. This is the basis for effective functioning of the facility is a vacuum valve. However, stick to the crowd, consequently of absorption of cotton mesh, mesh surface due to the action of the pressure. This is due to the pressure, friction between the mesh surface and cotton. Therefore, the seeds injury cases SS-15A into the separator chamber is also working on the side of the principal amount of cotton sticks to the surface using the direction of suction force to suck the air and the result are erased using a grater. The same situation occurs in the text of a continuation of the process is uneven.

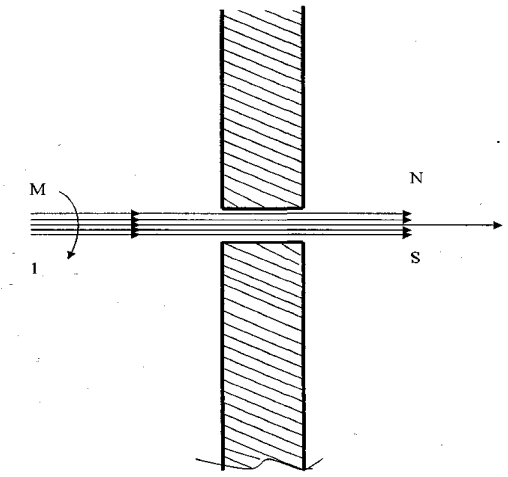
In this case, the vacuum valve is working to prevent the distribution equal to the length of the cotton that safety separators associated with the cotton mesh surfaces and four taken erased from the surface of cotton in the above-mentioned process.

The deformation of the fiber will be move less. (1) The side an impact moveable and periodic parameters zone.

If φ - fiber inclination angle (the angle between the fiber surface is S), T - tension, X.Y to highlight the speed of the fiber particles, and the force of friction along the surface of the fiber, F - round-the-clock, P - affecting the fiber mesh surface pressure, then in the N area we have the following (Figure 2):

$$X_2 = -V \cdot \varepsilon_2 \quad (1)$$

$$T_2 = K_x \cdot \varepsilon_2 \qquad \text{here } K_x = \rho_0 \cdot V^2 \quad (2)$$



Pic.1. To connect cotton seeds with net stroke scheme

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In the M are we have the following:

$$X_3 - X_1 = V \cdot (\varepsilon_3 - \varepsilon_1)\cos\varphi \quad (3)$$

$$Y_3 - Y_1 = V \cdot (\varepsilon_3 - \varepsilon_1)\sin\varphi \quad (4)$$

$$T_3 = K_x \cdot \varepsilon \quad (5)$$

ε – Deformation;
K_x – coefficient of elasticity.
The above mentioned data, it has become clear, cotton working camera on the side of the device after the mesh surface is formed under the influence of two different zones. This will change in the direction of the influence of the zone of cotton gang.

For example, (1 - 2) equations show that the concurrent use of layers of cotton, their linear speed of the relative movement of the body, in this case, change the direction of the movement against the gang of cotton fiber. As a result, cotton base layers of the relative risks, which may lead to the severing of fiber. In addition, the severing of fiber tensile strength greater than the value of the T building. Since this is a large herd of cotton mesh fibers occurs as a result of excessive speed will depend on the value of V formed [3].

A piece of cotton mesh surface contact point B tunglama coding. This is the point where the pressure P and the Fisher effect (Figure 2). Pressure and friction force one Guknik is estimated to be associated with a linear law. According to avoid the laws of the movement in the X and arrows proeksiyalari follows.

$$\rho_3 \cdot dS_3(X_3 - X_1) = (-T \cdot \cos\varphi \pm P \cdot \sin\Theta - fP \cdot \cos\Theta)dt \quad (6)$$

Here: dS3- taken to fiber element "3" in length; O-OU with a coordinate axis R angle between the direction of the vector of pressure. (2.6.), If the line pressure P X = O, Y = O passes the plains of high character, if the line pressure P X = 0, Y = 0 passes down the plains.
According to the law to avoid mass element section 3 of Section 2 of the fiber is difficult to write equation (Pic 2.):

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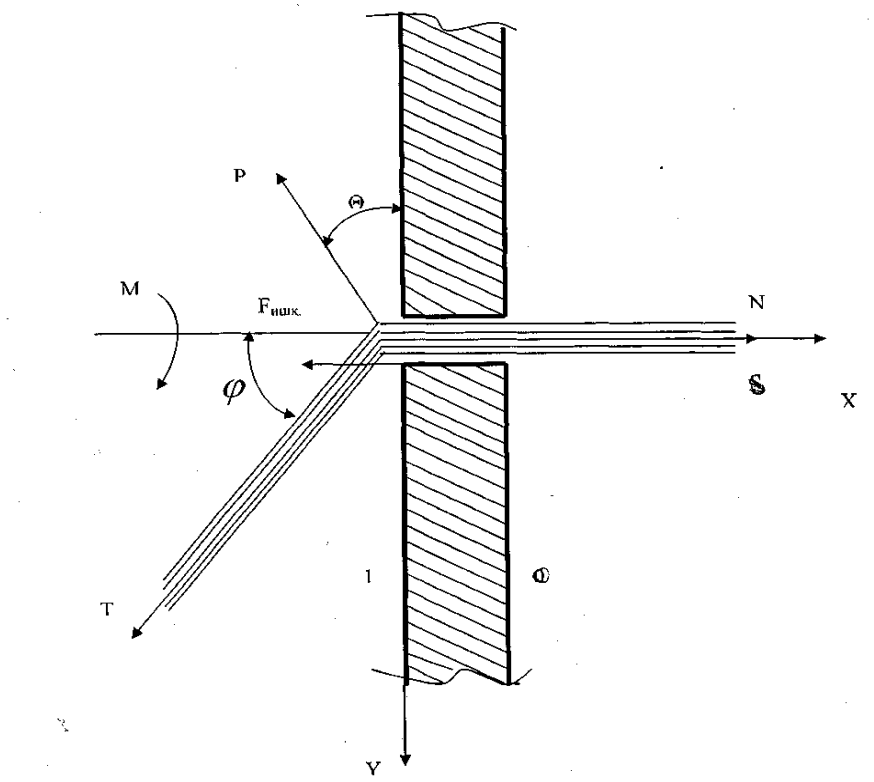
$$\frac{dS_3}{1+\varepsilon_3} = \frac{dS_2}{1+\varepsilon_2} \qquad (7)$$

According to B point with the terms of the continuous progress, as follows:

$$dS_2 = |X_2|dt \qquad (8)$$

$$dS_3 = |X_3|\cos\varphi dt \qquad (9)$$



Pic.2. The scheme of forces that forms during the bonding of cotton with cotton seeds

Overall wired strength P can be found following equation:

$$P = \frac{\rho_3\varepsilon_2(1+\varepsilon_3)(\varepsilon_3-\varepsilon_1)V^2\cos\varphi + K_x\varepsilon(1+\varepsilon_2)\cos\varphi}{(1+\varepsilon_2)(\pm\sin\Theta - f\cos\Theta)} \qquad (10)$$

(1) - (10) the equation is used finding unknowns. (10) According to formula, we can notice that if φ angle dicreases to become a decrease of P wired strength. For falling φ ankle hole of different surface should be deviate horizontally [4].

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Results

The main object of the analysis as part of the waste is added to the amount of fiber chosen from the following method is used to determine the amount.

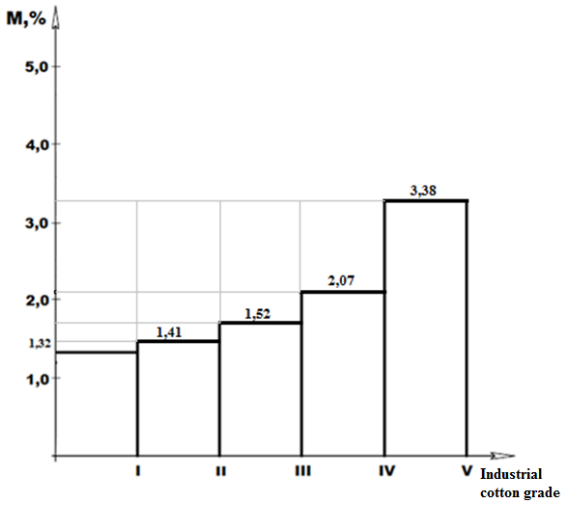
Remove the dust from the slot to collect waste 10 minutes of processing time, paper bags, a resolution of 0.01 g weight. Then sift this waste 3x3 mm mesh size, are separated from the content of all impurities. The remaining part of the fiber, then it is difficult.

Eating seeds mechanical damage rate is determined on the basis of the current style. I, III, IV and V in the experiment, industrial-grade cotton was used. Separators test one g'aramdagi cotton used in the experiment.

Sulton selection of cotton varieties used in the experiment. I industrial-grade cotton pollution 2.05%, the moisture level of 8.6%. III industrial-grade cotton pollution humidity level of 3.98%, 10.92%, and 6.8% in the fourth industrial-grade cotton pollution, humidity rate of 13.5%, industrial-grade cotton V pollution 11.4%, while the level of humidity and 16.5%, respectively.

The same amount to use both air separators, labor productivity is 10-15 t/h.

This can be seen in Table 1, I-grade cotton separating waste transfer really improved separator, that the fiber structure of the mass of 0.46 kg / h, the third-grade cotton was 1,05 kg / h. This is a simple separator that I grade cotton to 0.23 kg / hour, the third-grade cotton is less than 0,72 kg / hour.



Pic.3. SS-15A extent of damage to the mechanical separator varieties of cotton

As it is known, the basic indicators of cotton seeds extent of damage to the mechanical isolation of the air. The experiments in this simple SS-15A separator and improved version. Based on the results of the form chart in Pic.3. and 4.

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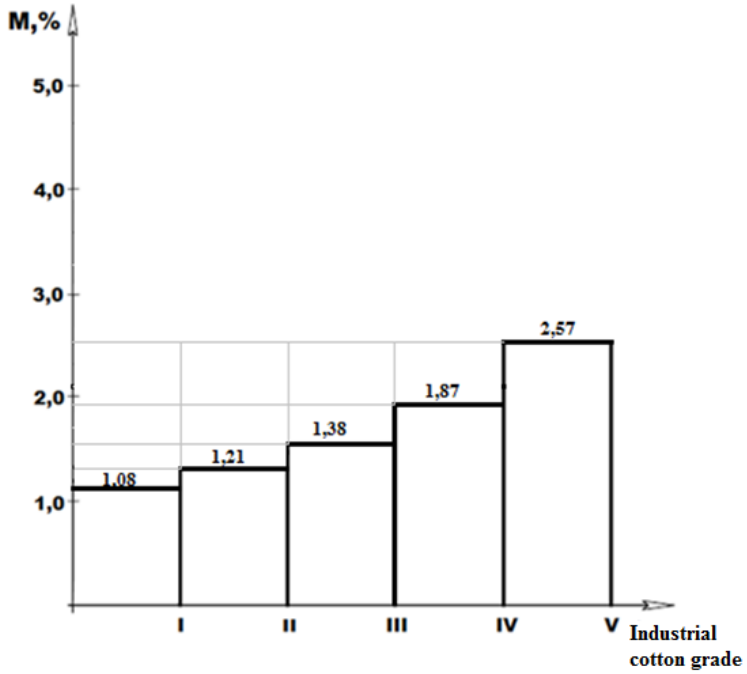

Pic.4. Improved extent of damage to the mechanical separator varieties of cotton seeds.

Pic.3. SS-15A separating the results of simple options. This chart shows that the extent of damage to the mechanical varieties of cotton seeds in a garden, I sort passed Separation of industrial-grade cotton seeds mechanical damage of an average of 1.32%, the explanations II sort – 1,41%, the III sort explanations, - 1,52%, IV explanations – 2,07% and V sort explanation is 3,38%. The same party cotton advanced SS-15A extent of damage to the mechanical separator of non-seeds, about 15 - 18%. The results in Figure 3.10 - tenacity. Advanced SS-15A and keeping the level of friction in the mechanical cotton varieties was equal to the following amounts:

I grade cotton 1.08%, the II-grade cotton - by 1,21%, the III-grade cotton 1,38%, the IV-grade cotton 1,87%, a V-grade cotton is equal to 2,57%. Now, the next main index of industrial varieties of cotton short fiber content, this figure is also important, and this figure is directly related to the length of the fiber and the fiber output.

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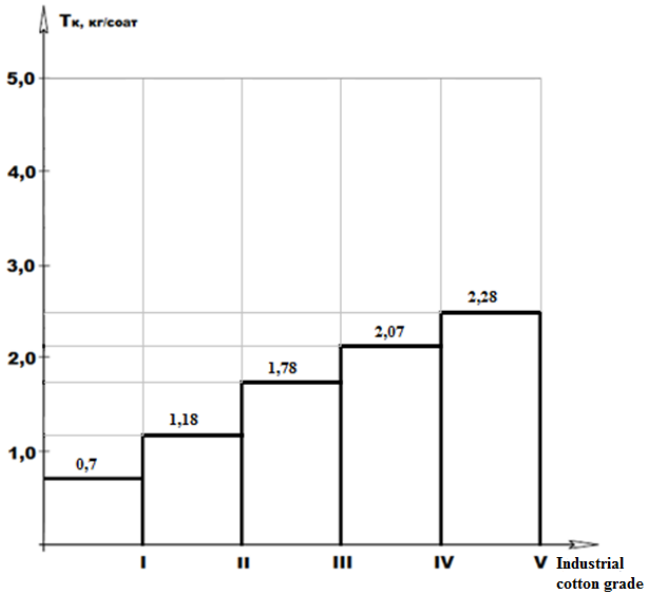
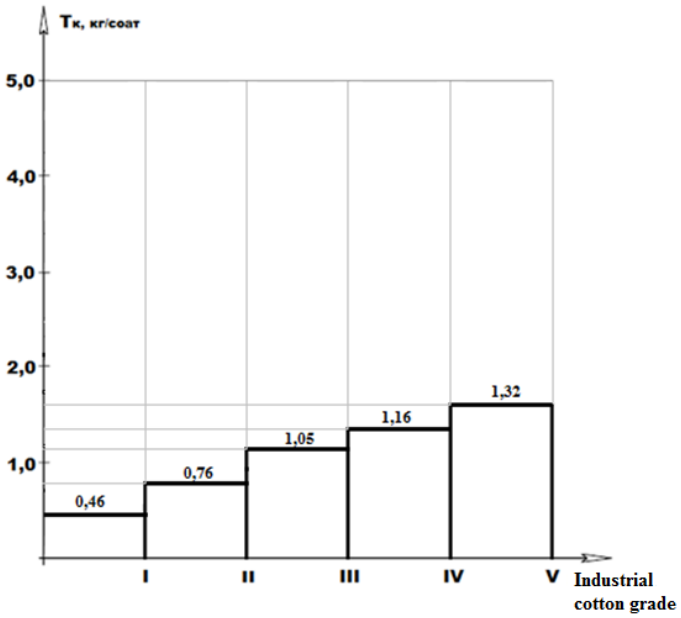


Pic.5. SS-15A separator for industrial change in the number of varieties of short fiber cotton

Pic.5. shows a simple result of separating cotton from the change in the amount of short fiber. This chart shows, I sort of cotton held in a short amount of fiber, 0.7 kg / hour, and the II-grade cotton 1,18 kg / hour, the III-grade cotton 1.78 kg / hour, the IV-grade cotton 2,07 kg /hour, V-grade cotton and 2.28 kg / hour.



Pic.6. Improved separator in a change in the amount of industrial varieties of short fiber cotton.

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These parameters change are given in Pic.6. - perfect for keeping cotton varieties. This Graph varieties of short fibers, the amount will be equal to the following:

I grade cotton and 0.46 kg / hour; II grade cotton 0,76 kg / hour; III grade cotton 1,05 kg / hour; IV grade cotton 1,16 kg / h and V-grade cotton was 41,32 kg /h. 3.11 - compared with the chart in Figure 3.12 shows Graph advanced SS-15A separating the amount of short fiber was determined to be about 23-30% less [1]. This is caused by the flow of air using a cotton mesh surface pressure due to the presence of the insulating power of the camera is equal to zero, it is the result of interruption to the mesh erased erased from the surface of cotton fibers, resulting in a reduction in the amount of short fiber not be determined. The absence of mechanical air pressure also leads to a reduction in wear.

Discussion and Conclusions

In conclusion we can say that the cotton used in the process of separating from the air separator structure and operation of the main surface on the basis of the conflict is distinct from the air, with cotton happen. This technology is not only local but also foreign countries, the US, India, China and other technologies are also available. So we can conclude that the four surface pressure under the influence of air pressure in the cotton harvest, and this power in accordance with the laws of physics to increase the strength of the friction that occurs between the surfaces of the cotton mesh

1. Separator working chamber out of a swarm of cotton mesh construction as a result of the formula to determine the speed of the fiber. Determine the direction of the separation process zonalararo forces in each zone, and real method to determine the relative speed of a gang of cotton.

2. Edit the device by using laboratory mesh surface with cotton fiber in technological processes have been analyzed, with the result that the circumstances that caused the disconnection. As a result, the fiber mesh to reduce the gap in the surface of the outlet is equal to the optimal angle = 45 ° to be invited to the event.

3. The angle of the mesh surface with a cotton-gravity method of communication between R discs. As a result, the power of gravity to make the maximum value of the technology have been identified. As a result, the mesh surface zo'nasida insulating camera based on the installation.

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4. advanced separator SS-15A with a separator in order to try and compare the test works. The average experience level of the results obtained from seeds of mechanical damage of 1.5%, short fiber allows a reduction in the amount of 1,14%.

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