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THE EFFECT OF THE ANGLE OF HEAT AGENT SUPPLY TO THE DRYING - CLEANING EQUIPMENT ON COTTON QUALITY AND CLEANING EFFICIENCY OF THE EQUIPMENT

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Abstract: In order to effectively dry cotton and clean it from small impurities at the same time, the temperature of the air supplied from the upper side of the cleaner at a deviation angle of 300, 450, 600 degrees to the horizontal axis along the length of the cleaner is from 75 0C to 100 0C, the air consumption is from 8 thousand m3/hour to 10 when it is increased to thousand m3/h, the effect on the change of dirt in cotton and cleaning efficiency was studied.

Keywords: seed cotton, spiked cylinder, small and large trash, moisture, cleaning efficiency.

Introduction. For drying cotton with a moisture content of 9% and impurity of 5.4%, the temperature of the air supplied through the pipe slot at an angle of deviation of 300, 450, 600 degrees relative to the horizontal axis is 75 0C, and when the air consumption is 8 thousand m3/hour, the impurity of cleaned cotton is 4.12 %, decreased to 4.31 % and 4.62 % In this case, when the drying agent is supplied to the cleaning chamber at a deviation angle of 300 degrees, compared to the drying agent supplied at 450, 600 degrees relative to the horizontal axis, the quality of cleaned cotton improved from 0.19 (abs)% to 0.5 (abs)%. As the temperature and consumption of the air supplied to the drying-cleaning chamber increased, the separation of small impurities from the cotton content accelerated. In this case, when the air flow to the cleaning chamber exceeds 100S and the air consumption exceeds 10,000 m3/hour at an angle of deviation of 300, 50, 60 degrees instead of the horizontal pipe, the amount of cleaned cotton is 3.23%, and 4% includes ,

it was observed that the quality of cleaned cotton increased from 0.53 (abs)% to 0.77 (abs)% when the drying agent was given at 450, 600 degrees.

The efficiency of the equipment in simultaneously drying and cleaning cotton from small dirt was also studied. The cleaning efficiency of the equipment is equal to 23.7%, 20.2% and 14.4% when the air temperature is 75 0C and the air consumption is 8 thousand m3/hour at the angle of deviation of the pipe slot from the horizontal axis of 300, 450, 600 degrees. it happened. In this case, when the drying agent is supplied to the cleaning chamber at a deviation angle of 300 degrees, the cleaning efficiency of the equipment is shown to increase from 3.5 (abs)% to 9.3 (abs)% compared to the drying agent This indicator shows that when the temperature of the air supplied to the cleaning chamber is increased to 100 0C, and the air consumption is increased to 10 thousand m3/hour, the cleaning efficiency of the equipment is equal to 40.2%, 30.4% and 25.9%, and the drying agent is placed at a deviation angle of 300 degrees. showed that the cleaning efficiency of the equipment was 9.8 (abs)% to 14.3 (abs)% higher than when the drying agent was supplied at 450 and 600 degree deviation angles. supplied at a deviation angle of 450 and 600 degrees. The results of the conducted test-research work showed that the simultaneous drying and cleaning process for cleaning cotton from small impurities has a positive effect on the quality of cotton and the efficiency of cleaning equipment. In this case, it was found that when the drying agent is supplied to the cleaning chamber, installing the pipe on the upper side of the chamber along the length of the chamber and placing the slot for supplying the drying agent at an angle of 300 degrees relative to the horizontal axis along the length of the chamber leads to an increase in the quality of cleaned cotton and the efficiency of the cleaning equipment.

Materials and method. The productivity of equipment in the technological system during primary cotton processing, cleaning efficiency, and improved fiber quality through the effective separation of impurities from cotton and fiber are inextricably linked to the degree of influence of air temperature and air consumption on cotton, which is one of the main factors [1, 2]. A pipe perpendicular to the cleaning chamber from above for simultaneous efficient cotton drying and cleaning from small impurities. To study the degree of separation of fine impurities from cotton, along with the receipt of the necessary heat by the cotton fiber, theoretical and practical studies were conducted on the degree of heat reception of the cotton fiber and the influence of the degree of separation of impurities on the quality of the fiber by changing the pipe gap passing the drying agent from the upper side of the chamber at different angles of inclination relative to the horizontal axis [4, 5]. Based on the conducted research, the 6A-12M1 device for cleaning cotton from small impurities was improved by installing pipes along the length of the chamber on the upper side of each cleaning chamber in the upper tier. Based on theoretical research, the drying agent is fed into the upper cleaning chambers at an angle of inclination of 300, 450, 600 degrees relative to the horizontal axis of the pipe opening, which passes through the upper side of the chamber along the length of the drying chamber, and cotton must be dried and cleaned of impurities. It is known that drying cotton is one of the factors influencing the cleaning process, which is the temperature of

the drying agent, and an increase in temperature above 160°C negatively affects the fiber quality indicators, while a decrease in temperature below 100°C reduces the release of small impurities from the cotton composition [7, 8].

Results. The research was conducted on cotton of the Namangan-77 breed of grade I, class 2, with a moisture content of 9% and a contamination of 5.4% [9 ÷ 11]. At the same time, drying agent was used to dry cotton from 75 °C to 100 °C through a pipe opening, and air was used from 8 thousand m3/hour to 10 thousand m3/hour. The results are shown in Figures 1 and 4. Figure 1 shows that with an air temperature of 75°C and an air flow rate of 8 thousand m3/hour, provided at an angle of inclination of 300, 450, 600 degrees relative to the horizontal axis, the contamination of cleaned cotton decreases by 4.12%, 4.31%, and 4.62%, and the drying agent is fed into the cleaning chamber at an angle of inclination of 300 degrees, while the drying agent is fed into the cleaning chamber at an angle of inclination of 300 degrees. compared to the horizontal axis at 450, 600 degrees, it can be seen that the quality of refined cotton has improved.

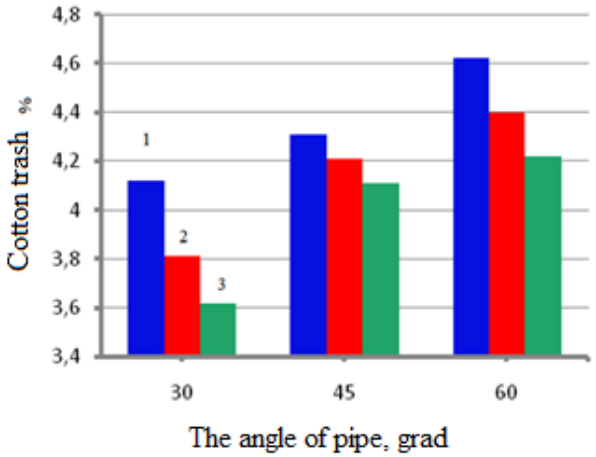


Figure 1. Graph of the dependence of the change in impurities in the composition of raw cotton on the angle of inclination of the pipe opening (drying agent 100°C) from 0.19 (abs) % to 0.5 (abs) %.

Increasing air consumption by 9,000 m3/hour without changing air temperature reduces the contamination of cleaned cotton, in turn, to 3.81%, 4.21%, and 4.4%. In this case, when the drying agent is fed into the drying and cleaning chamber at an angle of inclination of 300 degrees, the quality of cotton after the installation is 450, 600 With an increase in air consumption by 10,000 m3/hour without changing air temperature however, the contamination of cleaned cotton decreased by 3.62%, 4.11%, and 4.22%, and the quality of cleaned cotton improved from 0.49 (abs) % to 0.6 (abs) %, respectively, when the drying agent was applied at an angle of inclination of 300 degrees relative to the horizontal axis and when the drying agent was applied at 450, 600 degrees relative to the horizontal axis [12].

Increasing the temperature of air supplied to the improved 6A-12M1 drying and cleaning unit for cleaning cotton from small impurities by 100°C increases air

consumption by 8 thousand m3/hour by applying the drying agent to the cleaning chamber at a temperature of 450, 600 degrees relative to the horizontal axis, the quality of cleaned cotton, in turn, improved from 0.28 (abs) % to 0.52 (abs) % (fig. 2). With a constant air temperature of 9 thousand m3/hour, the contamination of cotton decreases to 3.56%, 3.98%, and 4.2%, and when the drying agent is fed into the cleaning chamber at an angle of inclination of 300 degrees, the quality of cotton is higher than when the drying agent is fed at other angles of inclination the cleaning efficiency of the equipment at an angle of inclination was higher, respectively, from 3.5 (abs) % to 9.3 (abs) % compared to drying agents at an angle of inclination of 450 and 600 degrees.

With an increase in air flow rate by 9,000 m3/hour without a change in air temperature, the cleaning efficiency of the installation, in turn, is 29.4%, 22% and 18.5%, while the cleaning efficiency of the installation with the application of the drying agent at an angle of inclination of 300 degrees is achieved at an angle of inclination of 450 and 600 degrees it can be seen from the histogram that the cleaning efficiency of the equipment increased from 7.8 (abs) % to 11.9 (abs) %, respectively, when the drying agent was applied at an angle of inclination of 450 and 600 degrees. With an increase in air consumption by 10,000 m3/hour without a change in air temperature, the cleaning efficiency of the equipment, in turn, is 40.2%, 30.4%, and 25.9%, while with the application of the drying agent at an angle of inclination of 300 degrees, the cleaning efficiency of the equipment is 450 and 25%. as a result, the introduction of the drying agent into the cleaning equipment at an angle of inclination of the pipe gap at 300, 450, 600 degrees relative to the horizontal axis accelerates the separation of small impurities from the cotton composition during the cleaning of cotton, which leads to an improvement in the quality of cotton and an increase in the cleaning efficiency of the equipment due to a decrease in the contamination of the cleaned cotton.

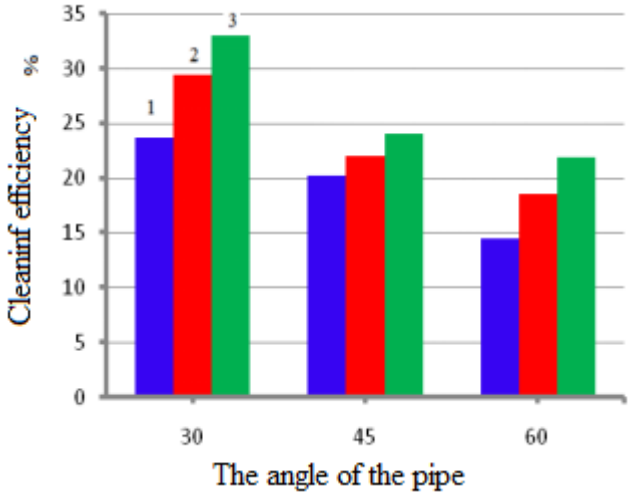
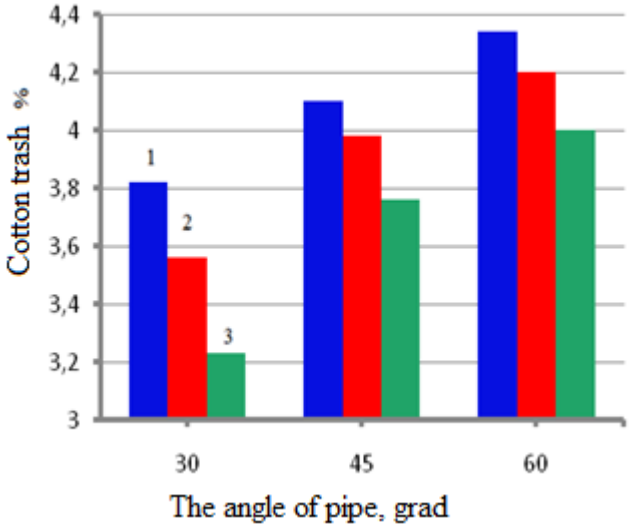


Figure 2. The graph of the dependence of the change in cleaning efficiency of the installation on the angle of inclination of the pipe section.
(drying agent 75 °C)

In this case, the pipe opening is installed at an angle of inclination of 300 degrees relative to the horizontal axis along the length of the installation and drying is carried out through this opening Summary. It has been shown that the application of the drying agent from the upper side of the improved 6A-12M1 device at an angle of inclination of 300, 450, 600 degrees relative to the horizontal axis, from 75°C to 100°C, and air consumption from 8 thousand m3/hour to 10 thousand m3/hour, leads to an improvement in the quality of cotton and an increase in the equipment's cleaning efficiency.



1, 2, 3 in turn 8, 9, 10 thousand m3/hour

Figure 3. The graph of the dependence of the change in cleaning efficiency of the installation on the angle of inclination of the pipe cut. (drying agent 100°C)

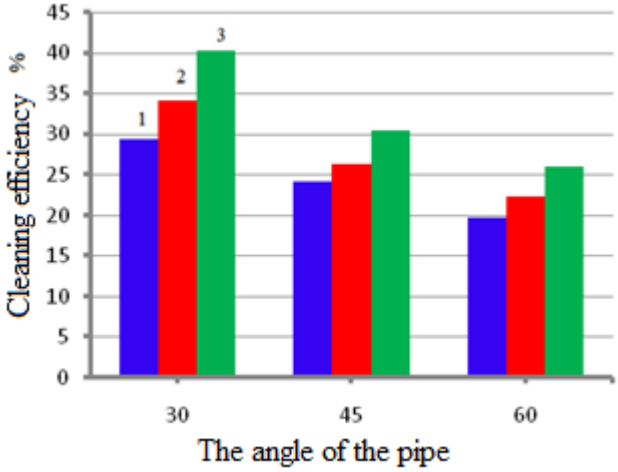


Figure 4. The graph of the dependence of the change in cleaning efficiency of the installation on the angle of inclination of the pipe cut. (drying agent 100°C)

The temperature of the air supplied to the cleaning chamber at 300, 450 and 600 degrees relative to the horizontal axis of the pipe gap is 75 When cleaning cotton from small impurities at an angle of inclination of the pipe gap to the horizontal axis of 300, 450, and 600 degrees, the air temperature is 75°C, and the air flow rate is 8 thousand m3/hour, the cleaning efficiency of the equipment is 23.7%, 20.2%, and 14.4%. In this case, when the drying agent is applied to the cleaning chamber at an angle of inclination of 300 degrees, the cleaning efficiency of the equipment is higher than when the drying agent is applied at an angle of inclination of 450 and 600 degrees, respectively, from 3.5 (abs) % to 9.3 (abs) % .

Conclusions. Experimental studies have shown that drying and cleaning cotton from small impurities positively affects the quality of cotton and the cleaning efficiency of the equipment. It has been established that when the drying agent is fed into the cleaning chamber, the installation of the pipe on the upper side of the chamber along the length of the chamber and the placement of the clearance provided with the drying agent at an angle of 300 degrees relative to the horizontal axis along the length of the chamber lead to an increase in the quality of cleaned cotton and the efficiency of equipment cleaning.

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