# INCREASING THE EFFICIENCY OF COTTON SEPARATION DEVICE FROM WASTE

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## Abstract

In this article, studies on the improvement of the RX regenerator used in the cleaning processes of cotton ginning enterprises have been carried out. The influence of the new working body proposed in the study - the number of drum plates with rubber plates - on the efficiency of cotton separation was studied, and the maximum level of separation efficiency was determined.

**Keywords.** Regenerator, cotton, impurities, rubber-plate drum, cotton piece, brush drum, separation effect, enterprise, plate axis, parameter, working body, colosnik grid.

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The increase in the amount of cotton pieces in the waste separated from the technological equipment for cleaning cotton from large impurities in cotton ginning enterprises causes them to be burned with waste. That's why 1RX cotton regenerator is installed for each cleaning system in enterprises. It was observed that one of the main disadvantages of the used regenerators is their efficiency, the low efficiency of cleaning separated cotton pieces, and the passing of waste and cotton pieces through the colognes as a result of the air hitting the colostrums from the middle pipe of the waste cotton supply. Due to the extreme dirtiness of the cotton coming out of the regenerator, if it is re-added to the cotton coming to the cleaning system, the negative effect on the overall quality indicators of the received fiber will increase [1-5]. It is necessary to strengthen the cleaning of separated cottons in the regenerator, taking into account the need to bring the level of contamination to the same state in order to add the piece of cotton separated from the regenerator to the cotton in the flow. In this regard, in this study, a regenerator device with a new working body was proposed and its main parameters were studied [6-8].

Some changes were made to the construction of the unit to increase the cleaning and separation efficiency of 1RX type cotton regenerators used in cotton ginning enterprises. Fig. 1.

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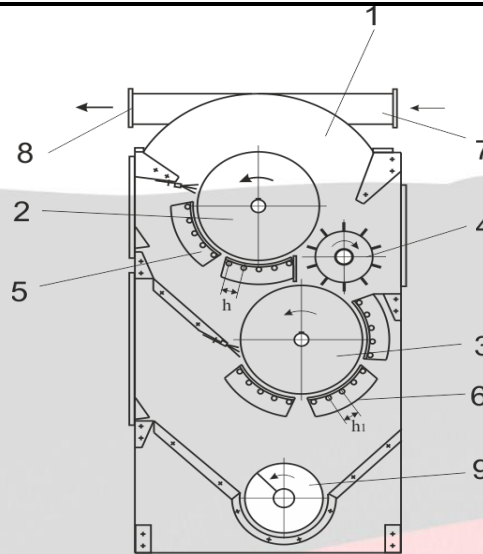
Figure 1. Construction of an improved cotton regenerator 1-Pneumofeeder, 2-main cleaning saw drum,  3-regeneration saw drum, 4-separating plate drum, 5-6-   colossal grid, 7-waste cotton inlet pipe, 8-cleaned cotton discharge pipe, 9-waste auger.

It was observed that the 1RX regenerator was fed from both ends of the waste cotton sawdust drum, and air was drawn from the middle, resulting in a reduction of cotton pieces in the waste. In this case, when the waste cotton is divided into two parts during its movement in the air duct, it is easier to clean it by dividing it into small pieces towards the saw drum. Our next change is that the slats of the drum with the separator plate are installed at an oblique angle along the axis to the center of the drum, so that the cotton is removed from the saw tooth and directed towards the center. In order to reduce the amount of cotton pieces from the regeneration drum to the waste, the distance between the columns of the lower column grid is reduced [9-10].

A theoretical study. The brushes of the separating brush drum of the 1RX regenerator were removed, holes were drilled for installing rubber plates on the drum discs, and the plates were installed (Fig. 2).



Figure 2. A rubber-plate separating drum prepared for the experiment

In order to maintain the outer diameter of the brush-separating drum at 300 mm, the height of the rubber plates was ensured not to exceed 45 mm.

We can place the number of planks installed on the drum up to 8, 10, 12 pieces, and the experiments are planned to be carried out in these quantities. After determining the number of plates to be installed on the separation drum, we can determine the angle of inclination of the plates towards the center of the drum.

During the experiments, the cotton pieces in the waste separated from the processing of Nam-77 selection grade, III-industrial grade, the initial dirtiness of which was 9.6%, and the moisture content was 10.2% in the UXK system, were analyzed and the amount of cotton pieces was 22, It was found to be 8%. In order to determine the effectiveness of separation during the experiments, the number of separated cotton and the amount of cotton remaining in the saw were determined by changing the number of planks every 30 minutes, while the amount of cotton pieces passed to waste was also determined. The separation efficiency was calculated using formula 3.1.

Result. In the experiments, the influence of the number of planks in the drum on the separation efficiency is studied, the experimental results are presented in Table 1 below.

Table 1

The effect of the number of planks on the drum on the separation efficiency

| № | Number of plates, pcs | Amount of separated cotton, kg | The amount of cotton left in the saw, kg | Separation efficiency, % |
|---|---|---|---|---|
| 1 | 8 | 19,6 | 1,15 | 94,5 |
| 2 | 10 | 20,6 | 0,9 | 95,8 |
| 3 | 12 | 23,6 | 0,96 | 96,1 |

**Summary.** Table 1 above shows that the amount of cotton separated in 30 minutes from 8 pieces of planks in the drum is 19.6 kg, when the cotton left on the surface of the saw is separated by hand, it is 1.15 kg, and the separation efficiency is calculated to be 94.5%. The number of such planks, the amount of cotton separated in 10, 12 pieces, is increasing in the specified period of time and is 20.6, 23.6 kg. In this case, the separation efficiency is 95.8, 96.1%, and we can see that the number of plates in the separation drum is high at 10 and 12 pieces. However, due to dense placement of 12 planks in the drum, it was observed that the voltage drops on the electric motor with the difficulty of air passing through them, so the number of planks in the drum was left at 10.

## References

1. R.K. Djamolov, U.M. Ismailov. Improving the efficiency of cotton regeneration technological equipment. Proceedings of the international scientific-practical conference "Modern innovative technologies in light industry: problems and solutions", Bukhara Institute of Engineering and Technology, Bukhara-November 19-20, 2021, p. 391-396.

2. A.A. Obidov M.M. Sultanov. To research the method of separating fibers suitable for spinning on a needle drum. International scientific and practical conference CUTTING EDGE-SCIENCE. June 29-30, 2020 Shawnee, USA, 128-131 P.

3. 3. Patent FAP 00335 RUz "Drum for removing raw cotton from saw cylinders and transporting it in cleaners".

4. Avazbek Azamatovich Obidov and Mirzaolim Mirzarakhmatovich Sultanov. Study of Technological Parameters of Fiber Separation Device. International Journal of Psychosocial Rehabilitation. 2020, Volume 24 - Issue 5, 6400-6407 P.

5. Borodin, P.N. report, on topic 9807, JSC SPC "Paxtasanoatilm", Tashkent, 1999.

6. Avazbek Obidov, Arif Mamatkulov, Mirzaolim Sultanov. Theoretical Analysis of the Movement of Cotton Piece on the Slope Surface, International Conference "Science and practice: a new level of integration in the modern world". Conference Proceedings. Berlin-Warsaw, 2018, 82, 151-156 P.

7. Vzenkonsky A.B., Boldinsky G.I. etc. "Method of calculating the number of slats on the removable drums of raw cotton cleaners". Cotton industry, 1966 No. 1.

8. Obidov A.A. Improvement of the technology of cleaning and sorting of ginned seeds. Dissertation of Candidate of Technical Sciences. - Tashkent: TITLI, 2007. - 200 p.

9. Loginov B.V. Investigation of the process of removing raw cotton from saw drums in heap cleaners and raw cleaners. Dissertation Ph.D. Tashkent-1961

10. Obidov Avazbek, Sultanov Mirzaolim, Muhksinov Ibrahim, Abdullaev Shakir. The Theoretical Studies of the Cultivation of Three Cotton Seeds along the Plain. Engineering Vol.10 No.08(2018), 514-520 P.