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RESEARCH TO REDUCE SEED DAMAGE IN SEPARATORS

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Pneumatic transport is widely used in ginneries to transfer cotton to the production process and transport separated cotton fiber, fluff and fibrous waste.

The separator is one of the main elements of the pneumatic conveying device. It is known that separators can be installed in portable or stationary conditions.

An urgent task is to increase the efficiency of the technological process, productivity, maintain the quality of raw cotton by improving the design of separators, which are currently used in cotton ginning plants [1].

The author has developed a new improved design of the separator of the small cleaning chamber (Fig. 1) in order to overcome the drawbacks of the separators.

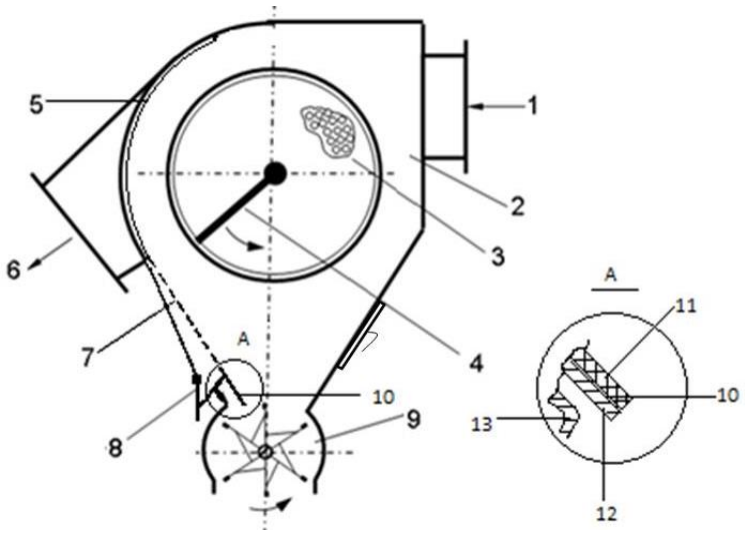

Fig. 1. The proposed new separator:
1 – inlet pipe, 2 – working chambers, 3 – mesh surfaces, 4 – scrapper,
5 – rubber-based mesh surfaces, 6 – air outlet pipe, 7 – oblique mesh surface,
8 – cover, 9 – vacuum valve, 10 – fixed hose, 11 – rubber cover,
12 – metal plate, 13 – cover of vacuum valve

In addition to eliminating defects, it is also possible to clean the dirt. The improved design of the proposed separator ensures that the cotton enters the rubber coating and, after separation from the air, enters directly into the slots between the wings of the vacuum valve. As a result, cotton is prevented from getting stuck between the wings of the vacuum valve and the walls, and the seeds are protected from damage. This, in turn, leads to a reduction in various defects in the fiber content obtained by refining the cotton and to an increase in the quality of the fiber.

After a mesh surface was installed opposite the inlet pipe, its cleaning efficiency was determined by sampling the cotton entering and leaving the separator.

The results of studies to determine the efficiency of separator cleaning after installing an improved working chamber are presented in Table 1.

Table 1 – Influence of moisture content of cotton on the change in its pollution

Number of passes	Moisture content of cotton, %			
	8,6	**11,4**	**14,7**	**19,6**
1	4,980	5,060	5,100	5,210
2	4,650	4,670	4,710	4,890
3	4,310	4,340	4,410	4,600
4	4,023	4,080	4,130	4,280

During the separation of cotton from air in pipes, cotton was determined by repeatedly passing it through a separator when the contamination was 4.9%, Bukhara sort-1.

Based on the results obtained, a diagram of the change in cotton contamination was obtained when the mesh surface was installed in front of the inlet pipe of the separator and its dependence on the number of passes and the moisture content of the cotton (Fig. 2).

The results show that as the moisture content of the cotton increases, the amount of contaminants retained in the cotton also increases, and as the number of transitions increases, the contamination decreases. This means that cotton moisture has a negative impact on the performance of the cotton ginning process.

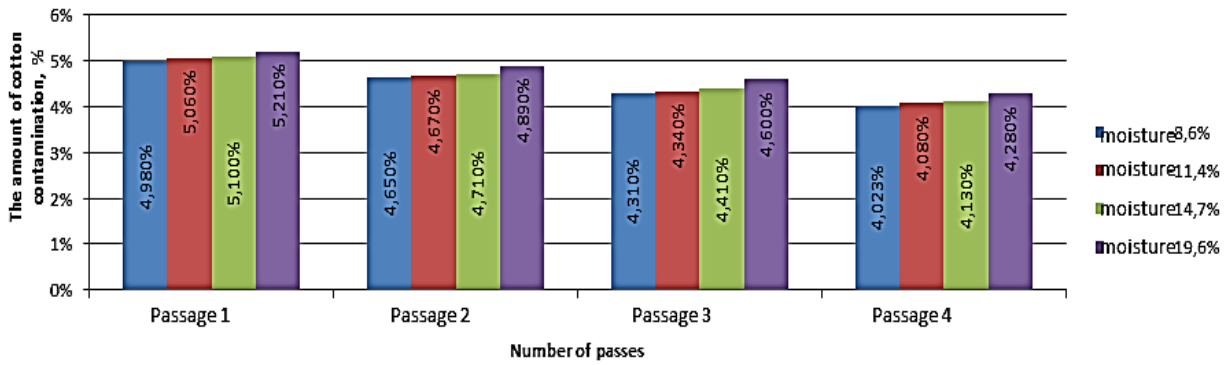

Fig. 2. Dependence of cotton moisture on the amount of contamination by the number of passes

Therefore, the cleaning efficiency of the separator is low when transporting high-moisture cotton in cotton separators and, conversely, the cleaning efficiency of the separator is high in low-moisture cotton. Therefore, the presence of the recommended cleaning section in the cotton separator installed after the drying equipment provides a significant increase in the cleaning efficiency of the cotton.

References

1. R. Muradov. Fundamentals of increasing the efficiency of air transport of cotton. Fan. Toshkent, 2014y. pp. 63-64.