

IJORCES

**INTERNATIONAL JOURNAL
OF CONFERENCE SERIES ON EDUCATION
AND SOCIAL SCIENCES.**

**PUBLISHER: ÇORUM: OGERINT -INTERNATIONAL
ORGANIZATION CENTER OF ACADEMIC RESEARCH**

IJORCES

**International journal of conference series on education
and social sciences. (Online)**

January 2025

Science Editor: **Cetin Avcı**
(*Kadir Has University*)

Copyright © 2024

By Çorum: Ocerint -International Organization Center of Academic Research

All rights reserved.

Available at ijorces.org

Published:

Çorum: Ocerint -International Organization Center of Academic Research

ISSN 2717-7076

Bursa

Bursa, Turkey

Editorial Board Members

Prof. **Hakan Mete Dogan**, Tokat Gaziosmanpasha University, Turkey

Prof. **Afsun Sujayev**, Institute of Additive Chemistry of the ANAS, Azerbaijan

Prof. **Nadir Mammadli**, Azerbaijan Architecture and Construction University, Azerbaijan

Prof. **Munevver Sokmen**, Konya Food and Agriculture University, Turkey

ELSEVIER



SSRN
Electronic Journals

Universal
Impact Factor



CONSTRUCTION ANALYSIS OF THE SEPARATOR WHILE PRESERVING THE NATURAL CHARACTERISTICS OF COTTON

Abbazov Ilkhom Zapirovi

Dean of faculty of "Industrial technologies" of Jizzakh polytechnical institute

Khodjaev Kudrat Sherzadovich

Independent researcher of Jizzakh polytechnical institute

Sharopov Bobir Nabijon ugli

Assistant of department of "Natural fibers and fabric processing technology"
of Jizzakh polytechnical institute

Abstract: This article presents the construction analysis of the separator equipment currently used in the cotton ginning industry. Also, the advantages and disadvantages of separators are shown, and an improved Intensive separator construction is proposed to eliminate these disadvantages.

Keywords. Cotton, fiber, seed, separator, construction, air, aerodynamics, pneumatic transport.

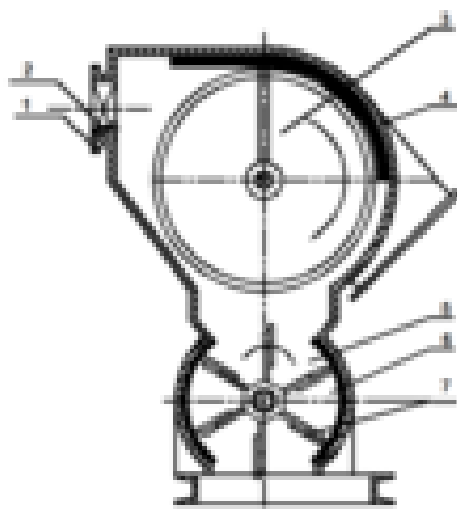
Currently, pneumatic transportation is the main method of transportation in cotton ginning enterprises for the production process of cotton from warehouses and between departments.

The pneumatic transportation system is easy to operate and maintain, reliable, and there is no loss of raw material during transportation. In the operation of this system, separators for separating cotton from the air flow are of great importance. Separators are the only device that affects the normal operation of the pneumatic system, its efficiency and aerodynamic resistance mode.

Taking this into account, many studies have been conducted on separators and design changes have been made. The main disadvantage of the separator is that even if the effective surface of the mesh is not large, the efficiency of separating small impurities in the cotton is low, and the mesh surface absorbs air, which leads to fiber loss due to the inclusion of fibers [1,2].

The SS-15A paddle separator is designed to separate cotton from air in a flow conveyor system.

Figure 1 shows a cross-sectional view of the improved device to prevent back wall erosion of the SS-15A separator [3].



1-inlet pipe; 2-springboard; 3- working chamber; 4,6,7 - rubber coating; 5-vacuum-valve

Figure 1. An improved cross-shear diagram of the SS-15A separator is presented.

Cotton entering the separator at a speed of 15 m/s hits the separator wall, causing breakage, perforation, and damage. As a result of the wall being flattened from the outside, the inner surface remains uneven, which damages the seeds and fibers. To prevent wall damage, it is proposed to install a rubber coating on the surface where the cotton with seeds is hit. This also prevents damage to the cotton. In such cases, heavy stones and metal fragments, along with the cotton entering the separator at high speed, are hit by the air flow against the inner wall of the separator, resulting in a fire hazard when heavy impurities hit the metal wall [4-6].

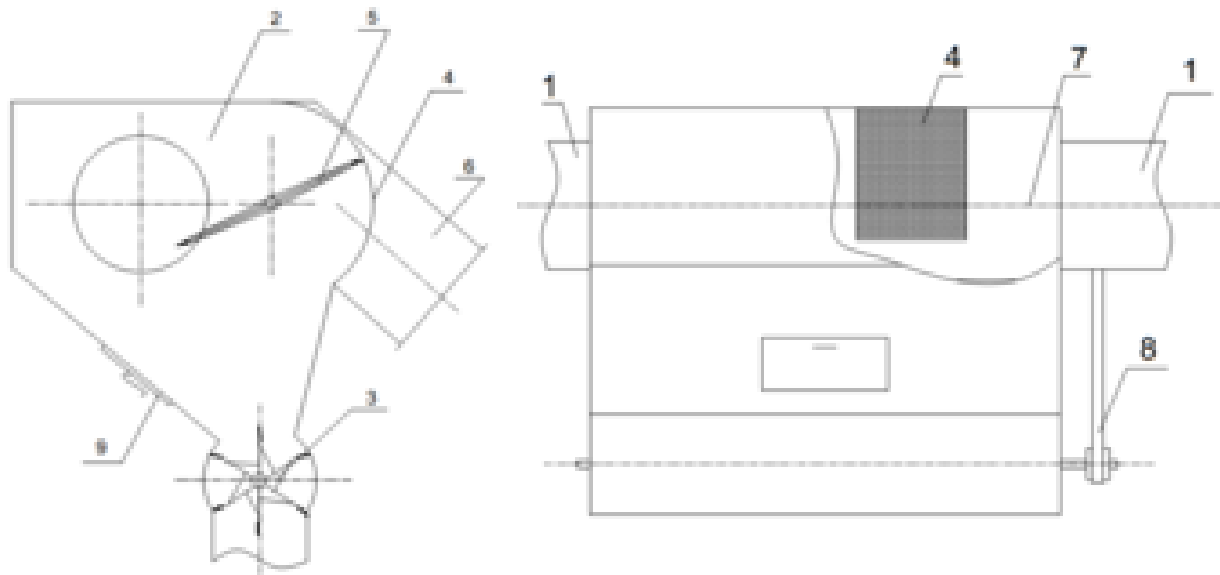
Despite the scientific research conducted, the separator device still has a number of shortcomings. Table 1 presents an analysis of the advantages and disadvantages of the CC-15A separator.

Table 1

№	Advantages	Disadvantages
1	High productivity (15 t/h)	Air leakage from the vacuum valve
2	Aerodynamic resistance 1610 Pa	Cases of patching as a result of damage to the back wall
3	It works equally well on seeded cotton of different varieties.	Rapid damage of vacuum valve rubbers
4	Separation of cotton from air at high speed 6.1 m ³ /s	Cotton coming from the pipe hits the scraper shaft directly.

It was found that it is necessary to conduct a literature analysis and introduce new designs to prevent these shortcomings, improve production efficiency, prevent cotton damage, reduce air flow consumption, prevent work efficiency and improve aerodynamic resistance. Taking into account the advantages and disadvantages of the above separator, the design of the separator was modified and improved. An invention patent was filed for the creation of a new intensive separator, and the Intellectual Property Agency accepted the application No. IAP 2022 0024 for examination (Fig. 2).

The intensive separator has two inlet pipes, which are used to gently separate the cotton from the air by colliding the cotton seeds with each other. In this case, the cotton seeds collide with each other rather than with the metal walls of the separator, which prevents various types of damage to the cotton seeds, and secondly, there is no damage to the walls and mesh surfaces of the separator. This leads to an increase in the service life of the separator.



1-inlet pipes; 2 - working chamber; 3 - vacuum valve; 4 - mesh surface; 5 - scraper; 6 - outlet pipe; 7 - scraper shaft; 8 - transmission mechanism; 9 - surveillance camera.

Figure 2. Improved Intensive Separator.

In conclusion, it can be said that the separator equipment is an important construction in the cotton processing process and meets the requirements of modern production. However, it has a number of shortcomings. This indicates the need to introduce a number of design changes and conduct research to prevent them and reduce cotton damage.

References:

1. Г.Ж.Жабборов, Т.У.Отаметов, А.Х.Хамидов. Чигитди пахтани ишлаш технологияси.-Тошкент: Ё?итувчи, 1987й.
2. Khojiev M. T., Abbasov I. Z., Mardonov V. M. Theoretical study of the motion of dust particles in the chamber of the collector //Journal of Textile Problems.-Tashkent: TITLI.-2015. - 2015. - Т. 2. - С. 75-79.
3. Р.Мурадов. Пахтани ?аво ёрдамида ташувчи ?урилма самарадорлигини ошириш асослари. Монография. 2015й.
4. Abbazov I., Usmankulov A., Sharopov B. Investigation of local resistance and air velocity in narrowing pipes for the transport of fibrous materials //IOP Conference Series: Earth and Environmental Science. - IOP Publishing, 2023. - Т. 1142. - №. 1. - С. 012093.
5. Muksin K., Javlon K., Ilkhom A. A new technology for dust removal from cotton processing //International Journal of Recent Technology and Engineering. - 2019. - Т. 8. - №. 3. - С. 583-586.
6. Турсунов З. Р. У. и др. АНАЛИЗ СУЩЕСТВУЮЩИХ ОЧИСТИТЕЛЕЙ ХЛОПКОВЫХ СЕМЯН НА ХЛОПКООЧИСТИТЕЛЬНЫХ ПРЕДПРИЯТИЯХ //Universum: технические науки. - 2023. - №. 10-4 (115). - С. 11-17.