

**PROFITS AND CAUTIONS OF SEPARATOR IN AMERICAN COTTON GINNING**

Komoliddin Mirgulshanov

Namangan institute of textile industry

mka.phd2022@gmail.com

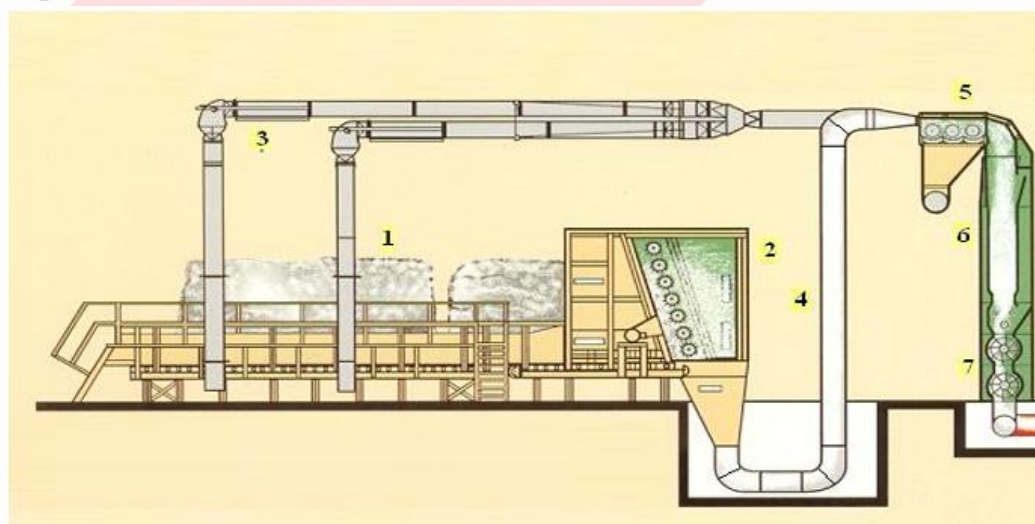
**Abstract**

The article examined the ways in which exposure of cotton raw materials to the working parts of pneumatic transport equipment at the cotton ginning enterprise affected quality indicators, the impact of equipment parameters, and the factors influencing the efficiency of cotton transportation in pneumatic transport and their optimization. The pros and cons of cotton separators that are available in the USA and Uzbekistan were discussed.

**Keywords:** Separator, pneumatic systems, vacuum valve, screen, revolving rubber flapper.

Increased competition in world markets, cost reduction due to the production of mixed types of products by foreign manufacturers require additional measures for the development of this cotton industry.

Great importance is attached to the development of the process, technique and technology of air transportation of cotton. A device for conveying cotton by air currents is presented in cotton gins of the USA (Fig. 1). Proper organization of all technological processes is required in order to preserve the natural parameters of fiber and seed, the main product produced in this technological process [1].



**Figure 1. Pneumatic systems (USA)**

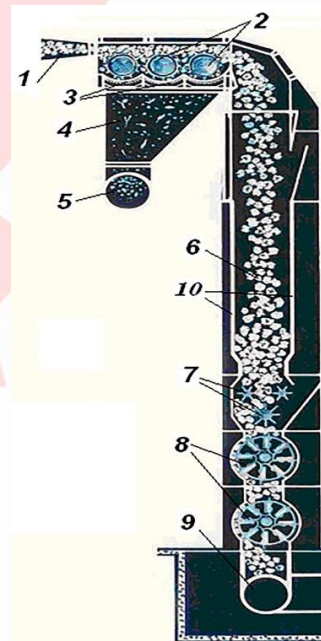
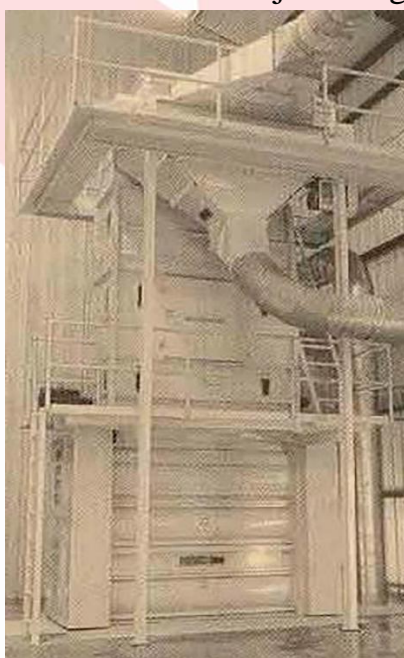
1. Module Feeding System, 2. Suction Telescopes, 3. . Stick Machine. 4. Pneumatic pipes.  
5.Separator, 6. Conveyor Distributor, 7. Vacuum wheel.

Cotton can be transported up to 125 m in an aerial cotton pneumatic systems. (Figure 2). Improving the quality of cotton fiber and seed and reducing fine trash mixed with seed cotton directly depends on the good use of gins and the quality of getting fiber and seed [2].



**Figure 2. Types of Pneumatic systems (USA).**

Big "J" separator (Fig. 3) with automatic control of cotton supply, this separator consists of 3 spiked cylinders, and partially cleans the cotton and transfers it to the collecting hopper. A controlled and controlled flow of cotton ensures efficient operation of drying and cleaning equipment and reduces cotton jamming in the system [3].



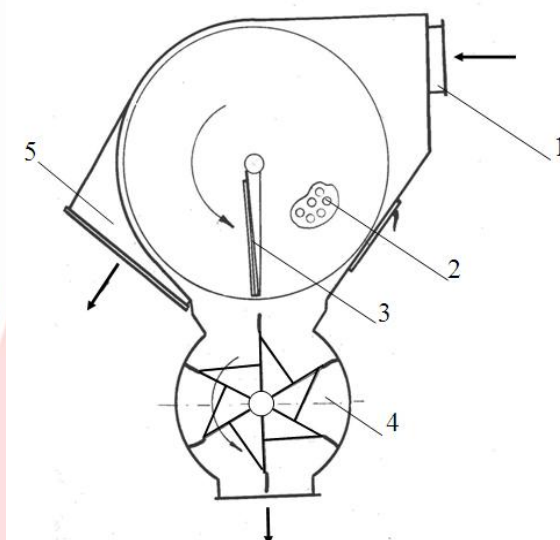
**Figure 3. Technological scheme and cross section of the Big "J" separator**

1. Inlet. 2. Spiked cylinders; 3. Screen; 4. Trash outlet;

5. Trash conveyor; 6. Control bunker; 7. Stripper roller; 8. Vacuum valve wheel; 9. Cotton conveying systems; 10. Air outlet.

CC-15A separator is widely used in the technological process of cotton cleaning enterprises in Uzbekistan. The separator separates cotton from dusty air and partially cleans it from small impurities. The separator is the main device of this pneumatic systems (Fig. 4). The efficiency

of the pneumatic transport is inextricably linked with the efficiency of the separator. The main requirements for separator devices are to separate the cotton raw materials transported by the air flow without damaging it, keeping its natural parameters, and to ensure the smooth operation of pneumatic transport devices without pressure loss. [4].



**Figure 4. Cross section of “CC-15”**

1-inlet pipe; 2- screen surface; 3-revolving rubber flapper ; 4-vacuum valve;  
5-outlet.

As a result of a part of seed cotton entering the separation chamber of the separator through the pipe and sticking to the screen surfaces on both sides, the air current speed inside the separator is greatly reduced, and the main part of the incoming cotton falls directly into the vacuum valve wheeler. The seed cotton stuck to the screen surface is soaked with revolving rubber flapper, and they are also dropped to the vacuum valve [5].

The main disadvantage of the cotton separator is that a large amount of cotton sticks to the screen surfaces of the side and the cleaning efficiency of the elastic separators is low during the transfer of seed cotton at low or high humidity during operation. In this case, the rotation of the drive shaft increases and the transmission belts slip. As a result, the revolving rubber flapper and the separator becomes clogged. In the short outlet pipe of the separator, the raw cotton falls between the drum blades of the vacuum valve and the steel shell. Drum blades hit the cotton on the surface of the husk, as a result of which the seed breaks and causes damage to the fiber.

Based on the reference analysis, the advantages and disadvantages of cotton separators available in the USA and Uzbekistan were presented. As a result of exposure of seed cotton to the working parts of pneumatic transport equipment at the cotton ginning enterprise, changes in quality indicators, the influence of equipment parameters on it, factors affecting the



efficiency of cotton transportation in pneumatic conveying systems and their optimization were studied.

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