

## Development of a Cotton Cleaner Machine Collected

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### ABSTRACT

*The article describes the analyzes of the technological process of the work of cotton cleaners of machine collection and indicates their identified shortcomings. To prevent the identified shortcomings, a change in the design of the cleaner is proposed, in which the gaps between the cleaning grates are set at 50 mm on the first and second cleaning cylinders, and the raw cotton supply to the second cleaning cylinder is fed through the gap formed between the first cleaning cylinder and the casing of the loosening bar drum.*

**KEYWORDS:** *PT-10, cleaner, ripper, drum, grates, removable drum, bar, slatted*

JSC "Paxtasanoat ilmiy markazi" carries out research work on the creation of machine-picked raw cotton cleaners. Based on the results of these studies, the purifier PT- 10 was developed and introduced into production (Fig. 1) [1, 2].

Studies carried out on raw cotton of the first grades with a moisture content of 9% and weediness of up to 16% showed that with the gaps between the cleaning grates of the first and second cleaning saw cylinders, respectively, 70 and 50 mm and between the grates of the regeneration saw cylinders 40 mm, after cleaning by the grate of the first cleaning saw cylinder along the raw cotton flow, about 20% of the raw cotton from the total amount supplied to the cleaner gets to the second cleaning saw cylinder together with trash, and 80% remains on the first saw cylinder and the upper slatted drum is removed from the cleaner.

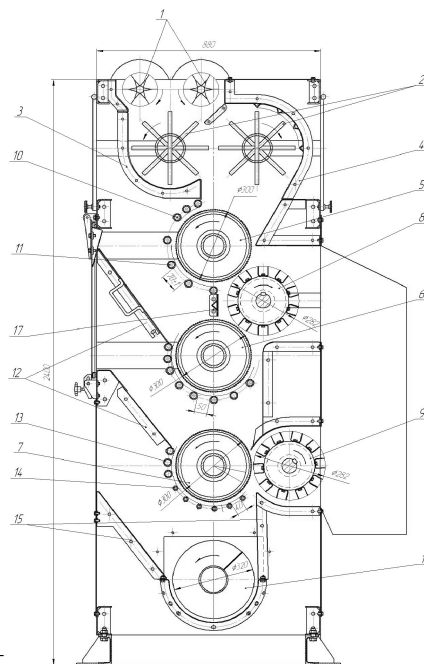


Fig. 1. Diagram of a general view a purifier of raw cotton machine collection

1-feed roller, 2-loosening bar drum, 3- casing, 4-guide, 5, 6, 7- saw cylinder, 8, 9-slatted removing drum, 10.13- securing grate, 11.14- cleaning grate, 12-guide trays, 15-bottom inclined tray, 16-auger, 17-deflectors.

After cleaning on the grate of the second cleaning saw cylinder, 20% of raw cotton on the first regeneration saw cylinder, together with trash impurities, gets about 5% of raw cotton, and the 15% of raw cotton remaining on the second cleaning saw cylinder is also removed from purifier.

Studies have also shown that with the above-described technology for cleaning and regenerating raw cotton of the first grades and with the indicated gaps between the grates, the overall cleaning effect is up to 70%, for large litter up to 80%, and when cleaning low-grade raw cotton with weed and moisture content on the level of 20-22%, the general cleaning effect is reduced to 40-50%, for large litter to 60-70% [3].

Analysis of the technological process of the developed purifier revealed the following shortcomings. First, the bulk (80%) of raw cotton is cleaned on the first cleaning cylinder, which has a reduced number of cleaning grates. Secondly, on the second cleaning cylinder, on which the cleaning grates are installed in a normal amount, only 15% of the cotton from the total mass of the cotton supplied to the cleaner is cleaned.

To prevent the identified shortcomings, a change in the design of the cleaner is proposed, in which the gaps between the cleaning grates are set at 50 mm on the first and second cleaning cylinders, and the raw cotton supply to the second cleaning cylinder is fed through the gap formed between the first cleaning cylinder and the casing of the loosening bar drum.

A diagram of the proposed purifier circuit is shown in Fig. 2.

The raw cotton cleaner of machine collection includes a feed section containing two feed rollers 1 and a loosening bar drum 2, with a casing 3, a guide 6, a cleaning and regeneration section, saw cylinders 5, 11 and 14 with fixing grates 6, 12 and 15 cleaning grates 7, 13 and 16 and the removing slatted drum 8, 17. Obliquely to the saw cylinders 5 and 11, 14, guide trays 10 and 18 are located. The discharge opening of the cleaner 9 is formed between the upper and lower ends of the slatted drums 8 and 17.

The purifier will work as follows. Raw cotton from the mine (not shown in the figure) by feeding rollers 1 is directed to the loosening bar drum 2, which rotates counterclockwise and transports it along the enveloping casing 3 and then reflects the raw cotton to the guide 4, and then transports it to the first grasping saw cylinder 5 of the cleaning section.

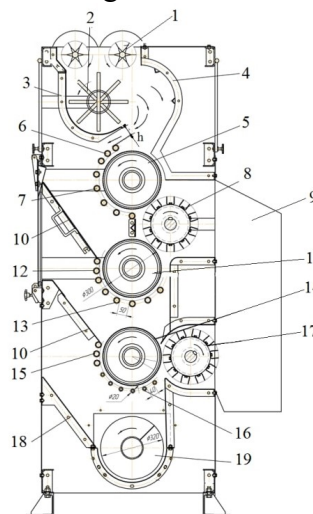


Fig. 2. Scheme of the proposed purifier of raw cotton machine collection

Raw cotton in an amount of, for example, 55-60% is captured by the saw teeth of the cylinder 5, fixed on them by the fixing grates 6 and is cleaned of impurities when it collides with the cleaning grates 7, and then it is removed from the saw teeth by the removing slatted drum 8 and unloaded from the cleaner through the outlet 9 located in the front wall of the cleaner opposite the pickup drum 8.

Raw cotton in an amount of, for example, 40-45%, passing between a gap of height, for example  $h$ , formed by the casing 3 and the fixing grates 6 together with the weeds separated through the gaps between the cleaning grates 7 fall on the tray 10, is captured by the saw teeth of the second cleaning cylinder 11, are fixed on them by fixing grates 12 and are cleaned of weed impurities upon collisions with the cleaning grates 13, and free weed impurities are separated from the saw cylinder 11 under the action of centrifugal forces and through the gaps between the cleaning grates 13 are lowered onto the regeneration saw cylinder 14.

The raw cotton strips cleaned on the saw cylinder 11 are removed from the saw teeth by a stripping slatted drum 8, transported along the back side of the saw teeth of the saw cylinder 5 and, together with the raw cotton removed from it, are unloaded from the cleaner.

The trash impurities that have fallen onto the regeneration saw cylinder 14 are captured by the saw teeth, fixed on them by the fixing grates 15 and are cleaned of impurities when they collide with the cleaning grates 16, and then are removed from the saw teeth by the removing slatted drum 17 are unloaded from the cleaner, and the trash impurities along the tray 18 falls onto the auger 19 and is removed from the cleaner.

Currently, working drawings of the modified units have been developed and are being manufactured for their assembly at the PT-10 purifier installed at the Baghdad cotton ginning plant.

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