# EFFECTIVE CLEANER OF RAW COTTON FROM SMALL WEEDS

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## ABSTRACT

The article under discussion investigates the questions of rational and economic expediency in cleaning and storage of highly clogged and wet raw cotton of manual and machine picking. The purpose of the article is to consider proposals for design changes in new machines proposed by the authors, aimed at increasing their productivity and improving the quality of cotton fiber during cotton ginning. The authors of the article determined the reasons of raw cotton selfheating in bunches and covered storages, besides the process of raw cotton overheating with the help of centrifugal fan during transportation by suction pipeline has been studied as well.

**Keywords:** Sealant, plunger, press, hydraulic pump, oil seal, cuff, genuine leather, chrome plating, tanning, substitute (leather), varnish, polychloromy.

The quality indicators of cotton harvested by cotton harvesters do not yet satisfy the industry, especially due to the high contamination of raw cotton.

The process of debris removal from raw cotton, the development of improvedThe process of debris removal from raw cotton, the development of improved designs, the search for new methods for cleaning raw cotton from impurities and the selection of purifier modes that favor high quality indicators of cotton fiber remain a very pressing problem for the cotton ginning industry. designs, finding new ways to clean raw cotton from impurities and choosing purifier modes that favor high quality cotton fiber remain a very pressing problem for the cotton ginning industry.

The purpose of this work is to study the principles of operation of existing purifiers and to achieve intensification of the construction removal process with a minimum number of pegging drums and to carry out: finding ways to find the optimal option for cleaning cotton from impurities, choosing the type and design of a raw cotton purifier from small impurities, as well as the influence designs of working bodies on the quality indicators of cotton fiber.

The principle of interaction between the peg-slat drum and the debris removal mesh is considered; A theoretical dependence was obtained on the influence of the peg height, radius, and drum rotation speed on the speed of movement of the raw cotton fly along the surface of the drum peg and in the area from the top of the peg to the guide visor. The shape of the guide and debris removal surface was justified and selected, the type of peg drum with a new form of peg bar, working in combination with a debris removal mesh, was determined.

The results of machine processing showed that the relative speed of the fly of raw cotton ranged from 2.15 to 10.83 m/s, the portable speed of the fly was from 5.0 to 16.23 m/s To optimize the parameters of the drum radius and peg height, we conducted a number of experiments. Tests on a bench installation of peg-slat drums with peripheral speeds from 5.0 to 16.23 m/s for medium and fine-fiber varieties showed that the best cleaning effect is achieved in the zone of 7.95÷9.46 m/s. At a speed of less than 7.95 m/s, the cleaning effect drops sharply, and at a speed of more than 9.46 m/s, increased crushing of seeds also occurs. Since the proposed cleaner is also intended for cleaning fine-fiber varieties, and the greatest increase in seed fragmentation in this case is observed at a speed of more than 9 m/s, therefore we recommend taking the peripheral speed of the drums within 8-9 m/s, [1] .

To optimize the shape of the reflective visor, necessary for the normal transfer of raw cotton to the drum for further shaking, it is obviously necessary to study the nature of the movement of the cotton fly in the area from the top of the peg to the moment it hits the reflective visor.

In order to theoretically determine the shape of the guide visor, a differential equation was compiled, after solving which the values of the coordinates of the points, time, speed and acceleration when the cotton hits the reflective visor were revealed. Thus, the contour of the debris removal mesh, the type and speed of the drum, the geometric parameters of the peg were justified and selected, and projections of the response surface were constructed to optimize the experiments. Since the main working parts of raw cotton cleaners from small debris are peg-slat drums operating in combination with meshes, the task was set to identify their optimal parameters and select the most effective operating mode [2]. For this purpose, the process of cleaning raw cotton from small debris was studied depending on the type and speed of rotation of the drums, the contour of the debris removal nets, and the shape of the drum pegs.

The types of drums, the contours of debris removal nets and pegs were selected taking into account theoretical considerations and operating conditions of cotton ginning enterprises [3].

In all experiments, the fundamental indicators were the cleaning effect and seed damage. All experiments to optimize the parameters of the peg-slat drum and debris

removal mesh were carried out using methods of mathematical experimental planning, the results of which are shown in the summary table of variance analysis [4]. Analysis of the experimental results and comparison of calculated and tabulated values of Fisher's criteria confirmed that the factors "drums", "garbage removal screens" and "speeds" have an exceptional influence on the process of cleaning raw cotton [4].

The purpose of the study is not only to obtain specific information about the process of cleaning raw cotton with the selected combination of treatments, but also to obtain some generalization about the contour of the debris removal nets. In this interpretation, the configurations of the debris removal grid selected in the study will be the nodal points of the series. This may apply to all types of drums, where a quantitative relationship characterizes the types of drums being studied.

1. Based on this, a graph of response surface projections was constructed and a conditional distribution of the experimental results according to their groups was given [5].

2. The study showed that increasing the number of peg drums from 1 to 12 increased the cleaning effect from 20 to 98%. With an increase in the number of peg drums to 8, with this design of the cleaner, the damage to the seeds is insignificant (i.e. from 0.06 to 0.80%), but then with their increase from 8 to 12 it increased sharply (1.12-1. 89%). In this regard, the optimal number can be recommended as 8 reels. Then, as experiments have shown, the cleaning effect will be 35-40% higher than that of the serial cleaner OKB-10M.

3. 3. The use of an elongated mesh makes it possible to obtain effective cleaning with a smaller number of pegging drums and is 2.5 times better than with the OKB-10 M cleaner; the cleaner allows you to achieve a high cleaning effect with little damage to the seeds.

4. Conclusions:

5. 1. The use of an elongated mesh surface makes it possible to obtain effective cleaning with a smaller number of pegging drums and 2 times better than with the OKB-10M cleaner.

6. 2. The cleaner we offer allows us to achieve a high cleaning effect with little damage to the seeds.

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