

Исследование рабочих органов машины для очистки хлопка

**Анвар Джураев¹, Сардор Сайиткулов^{2,*}, Бекзод Бозоров²
Ситора Фатуллаева²**

¹Ташкентский текстильный институт и легкой промышленности, Ташкент, Узбекистан

²Бухарский инженерно-технологический институт, Бухара, Узбекистан

*E-mail: abrorov1975@mail.ru

Аннотация. В статье представлена информация о том, как усовершенствовать рабочие органы машины для очистки хлопка-сырца, в том числе на полигонах захоронения крупных смесей отходов. На основе анализа конструкции хлопкоочистительных машин и рабочих органов разработана новая эффективная расчетная схема хлопкоочистительной машины от крупных загрязнителей. Рекомендуемые многогранные колонки характеризуются хорошей очисткой хлопковых отходов и сохранением качества волокна.

Ключевые слова: хлопок-сырец, очиститель хлопка, мусор, колышки, цилиндр

Investigation of working bodies of cotton cleaning machine

Anvar Dzuraev¹, Sardor Sayitkulov^{2,*}, Bekzod Bozorov², Sitora Fatullaeva²

¹Tashkent Institute of Textile and Light Industry, Tashkent, Uzbekistan

²Bukhara Engineering Technological Institute, Bukhara, Uzbekistan

*E-mail: abrorov1975@mail.ru

Abstract. The article included information on how to improve the working bodies of the machine for cleaning raw cotton, including large waste mixtures waste disposal sites. Based on the analysis of the design of cotton ginning machines and working bodies, a new effective design scheme of cotton gin from large contaminants was developed. The recommended multi-faceted columns are characterized by good cleaning of cotton waste and maintenance of fiber quality.

Keywords: raw cotton, cotton cleaner, trash, pegs, cylinder

1. Introduction

Today, the Republic of Uzbekistan is one of the world's leading cotton producers and exporters. It is therefore set up to buy cotton in the country. The production of high-quality fiber in line with world standards poses great challenges to specialists and scientists in the field of cotton processing in improving the existing technology. Its ever-increasing level of sophistication in spinning and weaving equipment necessitates greater safety concerns for the quality of cotton fiber.

Based on world experience, research is being conducted to improve the techniques and technology of weed control of raw cotton. In this regard, the development of effective technologies and equipment for ginning, achieving high efficiency of ginning, substantiation of operating modes and parameters are important tasks. Over the past five years, the country has taken comprehensive measures to improve the consumer properties of cotton products, the introduction of highly effective control systems for primary processing of raw cotton and technological processes of production. In this regard, significant results have been achieved due to the initial characteristics of production, especially in the production of high-quality fibrous products from raw materials processed in the initial processing of cotton, improvement of techniques and technology of cotton ginning. President of Uzbekistan Sh. M. Mirziyoyev signed Resolution No. PF-3408 of 17 October 2017 “On measures to radically improve the management system of cotton” and “On cultivation and processing of raw cotton”.

It can be said that it was important to radically modernize the activities of clusters for the production and processing of raw cotton, ginning and processing enterprises. To perform these tasks, you need the following.

One of the most important problems of cotton growing is the creation of new technologies of primary processing of raw cotton, improvement of cotton ginning technology and technology. In

order to ensure the implementation of the above resolutions and regulations, the quality of cotton is higher than that of cotton weeds in indoor cleaning devices, so that its contaminants do not degrade the fiber during the separation process.

2. Materials and methods

The structure of cleaning cotton from large weeds consists of two main parts. In order for the working part (organ) to rotate the saw drum and the threshing device to knock down large weeds. Prior to the creation of the first cotton drums, the B4-1N was used to polish large wheels, but the sampling efficiency was low. In 1952, (figure 1), invented 54-1M, shows the basic elements.

When cleaning large weeds, the sawdust radius was 610 mm in diameter, and the radius of the sawdust was 215, with fixed blades (columns) on the corner of the bean.

Harvesters used in pollinators ensure a good separation of large weeds. The disadvantages of this category are following.

In 1956, the CNIHProm (comb) -based combustion device (figure 2) was used to remove the combs at the same height as the barbed wire on the saw drum and to remove the removable brushes. During the operation of the cleaner, many flyovers (dusts) were removed from the dustbins, which were very low and low, and such structures did not play a role in the cleaning of cotton wool [1].

Harvesters have a high level of weed control in three-pronged combat vehicles. The warships are 19, 25 and 12 mm in size (figure 3). The radius of the drum with a radius of 1570 in the destruction of these columns was increased by a certain extent, with a clearance of 44 mm hectares.

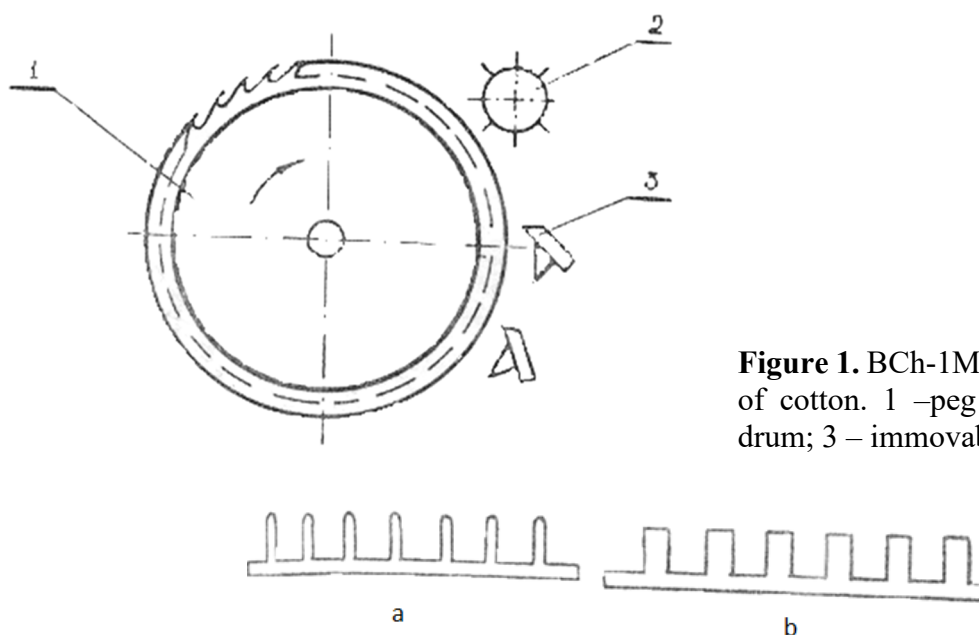


Figure 1. BCh-1M mode cleaning device of cotton. 1 –peg drum; 2 –smoothing drum; 3 – immovable knives.

Figure 2. Griben comb beating device: a – arched; b – flat.

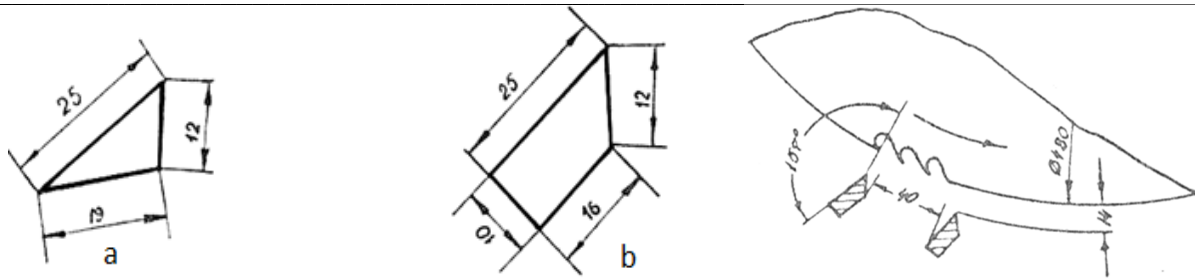


Figure 3. ChX – 3M1 section of trapezoidal columns in the cleaner: a – three-sided beating machine; b – trapezoidal.

Subsequent cleaners use 25X, 3, and 4X-3M trapezoidal spikes to measure edges of 25, 16, 12, and 10 mm.

The working edges of the columns are the same size and the three edges are 25 mm. The main criteria are the supply of high-value pulses, high-strength pulses, and cotton-cleaning process. The disadvantages of these colostrums are that they increase the number of free flies, some of the flies and seeds. The colostrum was used in an analogous form with a 250 mm diameter OHP-3 sprayer section (figure 4) [2].

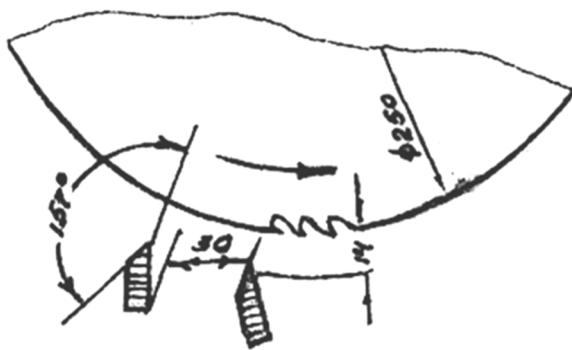


Figure 4. OXP – Cotton ginning section with 3 types of trapezoidal columns.

Compared to the 4X-3M cleaner, the working edge has a 12 mm diameter edge-to-edge collar. According to experts, the construction of such columns should increase the efficiency of the cleaning. Such an arrangement of the OHP-3 dusting collars would be ineffective.

In this way, the designers prefer the trapezoidal shape of the columns (working edge 25 mm). In the CHX-3M1 cleaner, the columns are arranged in the form of a trapezoid in the island drum, with a working edge of 25 mm and an intermediate groove of 40 mm.

In order to improve the pollinators, scientists have recommended rotating columns.

The force of the circular columns, the thin-walled columns, are well behind the force of the beating, but in large weeds, they are well-cleaned and free-flowing.

In this way, RX-2 and CHX-3M2 / RH-2M2 generators were used in the RF rotary generators. Figure 6 shows the cleaning sections. In the course of operation, the wheelchair softens the rubber with a coating, slightly reducing the damage to the seeds. The entrance to the worktop with a colossal

window is shown in figure 5. The detrimental effect of the cleaner on the wear and tear of the collarbones in the workplace can be attributed to the large weeds. In the process of garbage disposal, the opposite slopes allow the side rods to be tapered.

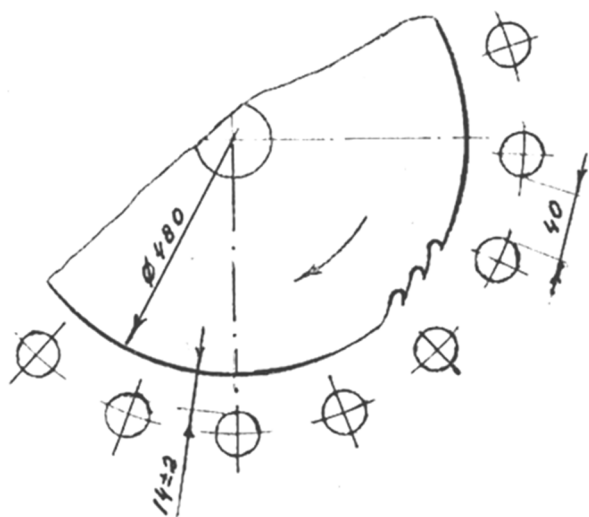


Figure 5. CHX-3M2 «Labor» type circular grate section cleaner.

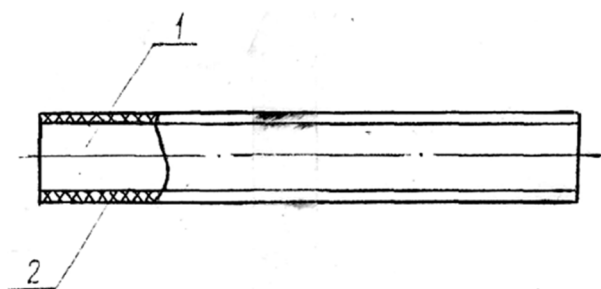


Figure 6. Mounted grille with rubber nozzle: 1-2-rubber nozzle.

The disadvantages of this design are due to its complexity, such a disadvantage occurs in the fence (figure 6).

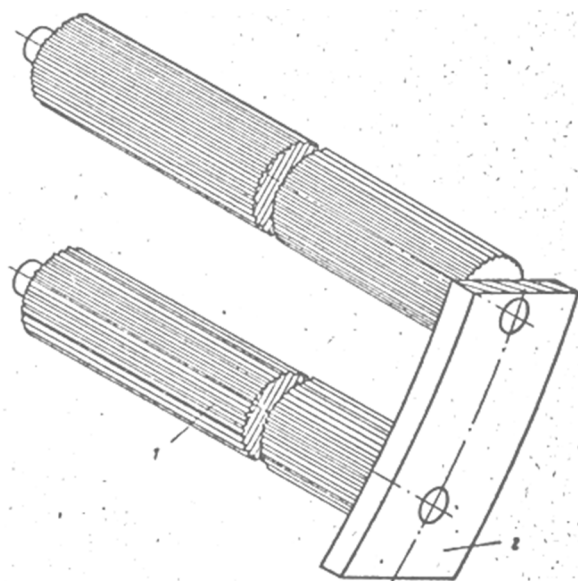


Figure 7. Cylindrical fence construction.

Two rows of corrugated material cleaning columns are placed, one of which is fixed to the fixed arch side, the second row of columns is placed on the arch bars between the first row of columns. Effective with vibrating, rotating and others). The columns on the fence are shown in figure 7. It is depicted in the form of a steel strip in the width (width) of the fabric of the manufacturer, one side of which is fastened to the plate the other side is fitted with a pair of screws for weighing.

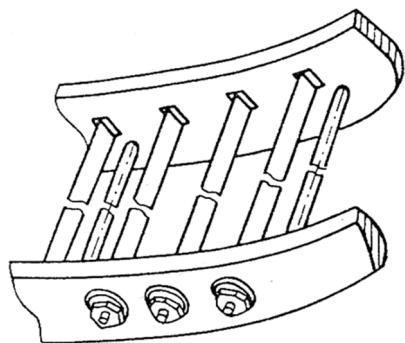


Figure 8. Colossal fence for cleaning corrugated materials.

The grille with a simple construction, as well as the grilles are mounted on a double-sided flexible base (figure 8).

This design of the coil means that the cotton fiber reacts back to the coil and vibrates, helping the cotton stalks to float more. The disadvantages of this design are the limited amplitude (vibration width) and the frequency oscillation of the speakers (figure 9).

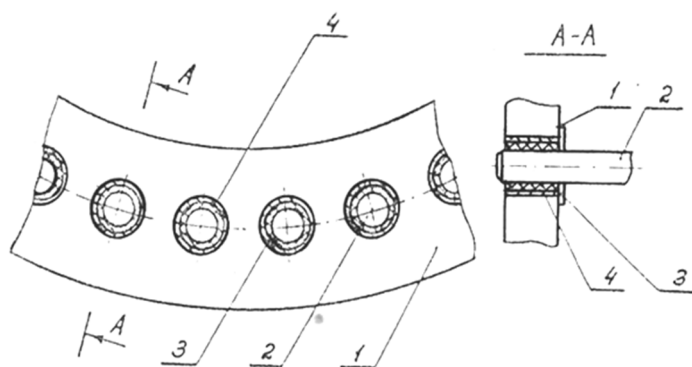


Figure 9. Cleaning fence of cotton: 1 – double-sided flexible base; 2 – grates; 3 – sleeve; 4 – flexible base.

Another type of grate fence (cleaner of large weeds) was proposed by our scientists. It consists of two columns (figure 10), operated by means of a lateral device 3, a flexible support 4 and a pair of screws 5. The vibrational movement of the cranes is controlled by 4 rigid bending supports. The main disadvantages of the grate are the low cleaning efficiency and the complexity of the design, multiple cleaning and lack of technological parameters.

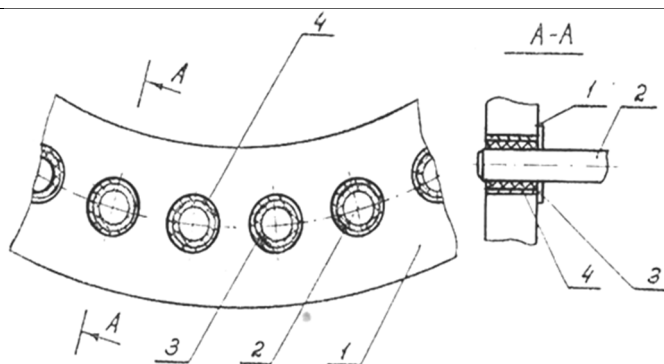


Figure.10. Grates cleaning fence of cotton: 1 – grates; 2 –making balance; 3 – flexibility; 4 –two planks crossed against each other; 5 – roller.

Taking into account the shortcomings of the above-mentioned cotton ginning working bodies, a new design of the working bodies of the UHC machine, which is widely used in pre-ginning enterprises, has been developed. At the same time, we offer multi-faceted ginner, which provide good separation of large weeds in cotton and good results in maintaining the quality of cotton. The drum with this saw blade is mounted in front of the six-sided, seven-sided and five-sided [3-5].

Figure 11 depicts a grate with multi-sided columns. The structure consists of 1 column mounted on 2 rotating saw cylinders. In the proposed design, the process of cleaning raw cotton is carried out as follows. In the process, a cotton saw is brought to the drum 2, the teeth of which pull the cotton and pass it over the grate. During the 2 movements of the saw drum, the cotton is hit by 1 on the multi-sided strings. In this case, the direction of the impact force during the movement of the intermediate drum 2 varies depending on the number of edges of the columns 1. As the edges of the columns increase, the impact force on the edge of the column decreases, while the impact force increases. The interaction of cotton with multi-sided ginner 1 allows you to remove various contaminants from cotton [6, 7].

The control of the process of ginning of raw cotton is carried out in accordance with the law of sinusoidal 1 drum on the sawmill, this eliminates the fact that the process is based on a certain pattern, the amount and direction of the force pulse of cotton to the various edges of the grid changes periodically, which leads to a significant increase in the release of pollutants from cotton.

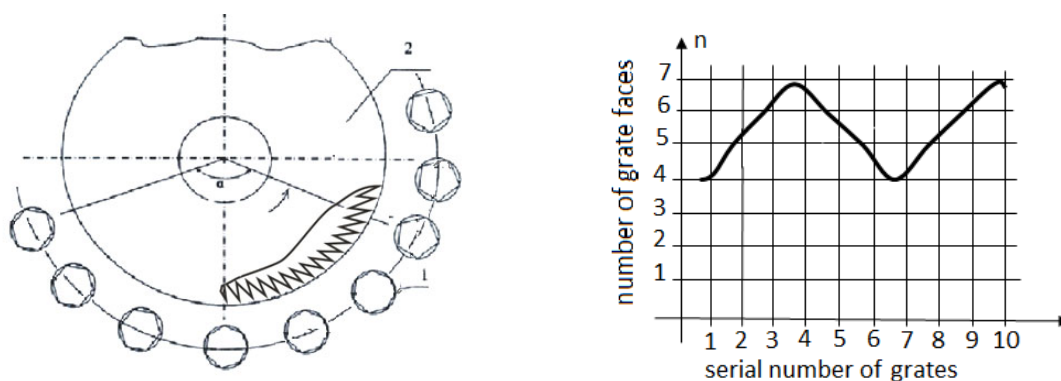


Figure 11. Scheme of grate with multi-sided fence: there are 1 - grates and 2 - worker drum.

3. Conclusion

Based on the results of the presented study of the working bodies of a cotton cleaning machine, we note that combined cotton cleaner allows to increase the effect of cleaning raw cotton on fine and coarse trash up to (25-26) % relative to the UHC cleaner.

REFERENCES

- [1] Sayitqulov, S.O. Development of a Nev Design for Drying Cotton Seeds with Purpose of efficient Use of Heat / S.O. Sayitqulov, S.Kh. Fayziev, F.B. Mardonova, Kh.K. Rakhmonov // International Journal of Advanced Research in Science, engineering and Technology. – 2020. – № 7(4). – P. 13440-13445.
- [2] Fayziev, S.Kh. Creation of a New Design of a System for Feeding raw Cotton to a Cylinder / S.Kh. Fayziev, Kh.K. Rakhimov // International Journal of Recent Technology and Engineering. – 2019. – № 8(4). – P. 12753-12759.
- [3] Abrorov, Akbar. Vacuum Installation of Technology of Deep Ion-Plasmic Nitriding Disc Saw Of Fiber Separating Machines / Akbar Abrorov, Shukhrat Salimov, Sohobov Ibodullo, Matluba Quvoncheva // International Journal of Advanced Research in Science, engineering and Technology. – 2020. – № 7(1). – P. 12406-12409.
- [4] Rakhmonov, Kh. Relative speed and temperature effect investigation of the of the drying agent on the moisture content of cotton / Kh. Rakhmonov, S. Fayziev, Kh. Rakhimov, D. Kazakova // E3S Web of Conferences. – 2021. – 264 04008.
- [5] Juraev, Anvar. Analysis of the interaction of Fibrous Material with a Multifaceted Grid of the cleaner / Anvar Juraev and Ozod Rajabov // International Journal of Recent Technology and Engineering. – 2019. – № 8(1). – P. 2661-2666.
- [6] Fayziyev, S.Kh. Study of effect of speed and temperature of the drying agent in the feeder-loosened of new design on the quality of fiber / S.Kh. Fayziyev, Kh.K. Rakhmonov // International Journal of Advanced Research in Science, engineering and Technology. – 2020. – № 8(10). – P. 7008-7013.
- [7] Dzuraev, A. Research on improving the working bodies of the machine for cleaning cotton from waste / A. Dzuraev, S.O. Sayitqulov // International Journal of Research and Development. – 2021. – № 6(3) 36713.