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# **Researches Gained in Process with Developed CC-15A Separator**

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**ABSTRACT:** This article is written to offer a new developed construction in order to solve the problem of damaging the natural peculiarities of cotton in CC-15A Separator. It is used to escape from mechanical breaking of cotton seeds and their unequal sharing in the long vacuum valve. The new offering construction showed the effectiveness of new offered separator in the result of research testing with the old one.

**KEYWORDS:** Separator, Cotton, Mechanical Breaking, Working Process, Seeds Separated, Aerodynamic Condition, Ventilator.

## **I. INTRODUCTION**

It is clear that, at present time CC-15A Separator is widely used in cotton cleaning industry. The process of working of CC-15A Separator is based on the working process of aerodynamic condition of air.

In CC-15A Separator cotton seeds acting together with air coming through the net with the aid of ventilator, is gathered on net and seeds separated in shavings are thrown into the vacuum valve.

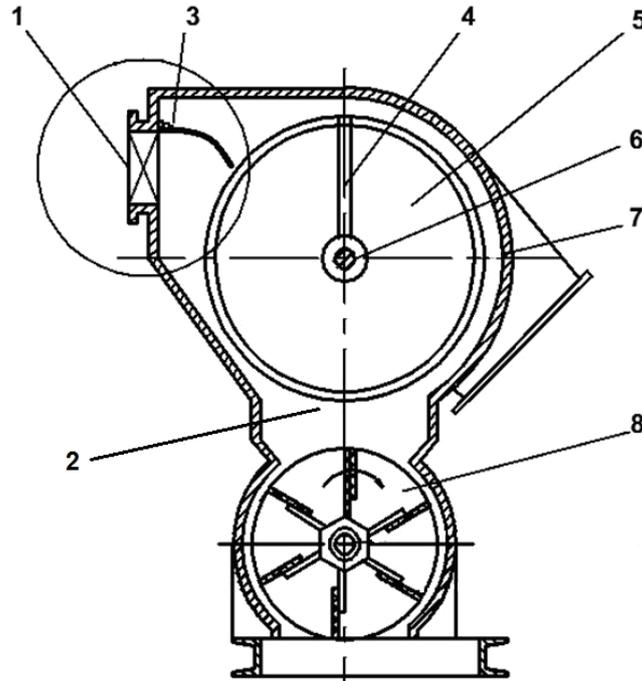
## **II. METHODOLOGY**

CC-15A Separator is developed in the following ways:

In the introduction part of the separators in order not to be struck against the walls and to share equally in the long worker of vacuum valve, strand of cotton which is entering the vacuum valve must be kept its natural peculiarities and that is our main aim. Thus, strand of cotton is struck in the back wall of the separator with 10-12m<sup>2</sup>/s in speed. Then through the net surface it is fallen into two sides of the vacuum valve. To solve this kind of case it is aimed to install the construction to distribute the gathered cotton and to send it to the place.

To solve the problem of crashing to the back wall and to diminish the speed twice, to 4-5 m<sup>2</sup>/s moving to the vacuum valve and to escape the destruction of the back wall of the separator and the vacuum valve, it is needed a separator to guarantee the pneumonia-transport to be functioned in long-term. Accounting all of these, the main view of the offered separator is shown in Fig. 1.

The working process of the separator: Cotton seeds come with air through the pipe 1 into the distributing camera 2. Then the deviation angle 3 diminishes its speed and sends to the scraper 4 and with the aid of the vacuum valve it comes down from the separator. The rest 20-30 percentage of the cotton together with air flow moves to the net surface. In this case with the deviation angle in the form  $a$  the cotton is sent to the vacuum valve, as a result its speed diminishes twice, mechanical damage of seeds is minimized, striking against the wall is removed, and the distribution of the cotton to the vacuum valve is improved.



1. a pipe for cotton seeds and air; 2. a camera; 3. a deviation angle; 4. a scraper;  
A. 5. a net surface; 6-9 a roller; 7 a back wall; 8. a vacuum valve.

Fig. 1. The view of across cut of the developed separator

In Fig. 2 is given the situation of the deviation angle installed in the entrance of the separator. The flow of cotton entering through the pipe comes to deviance angle 3 which controls the cotton flow striking against the back wall 7 of the separator.

In Fig. 2 the deviation angle which has opportunity to bias in the form  $a$ . The main part of the flow of cotton moves straight to the center of the net surface. In the result, the cotton flow is directed straight to the vacuum valve 8 and not to strike against the wall of the separator.

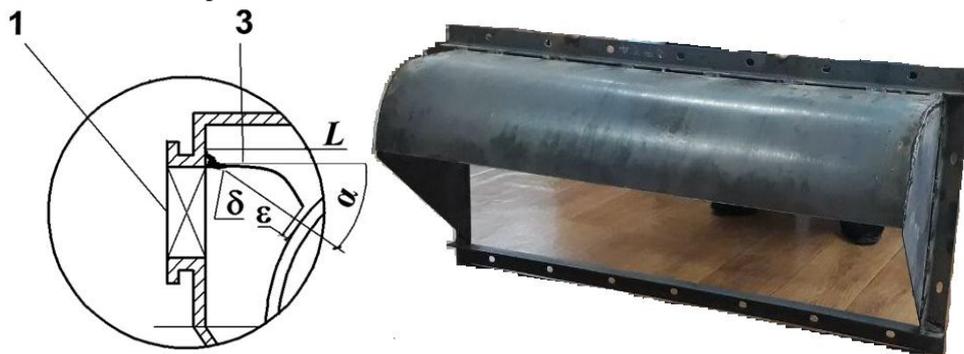


Fig. 2. The deviation angle which is installed in the entrance of the pipe and the view of the main part

After the CC-15A Separator developed great experiences have been done in the process. The experiences have been done in two kinds of separators: the first in the developed separator, the second one in the separator CC-15A which has been used by now.

The research testing has been done in cotton cleaning industry in Chelak, the province of Samarkand. The analyzing object is the mechanical damaging levels of seeds which has been tested in the following way. Cotton seeds separated from the air and models of the air pipe have been gathered. Then this cotton seeds is send to the laboratory to clarify the level of mechanical damages of seeds with the aid of acid on the base of existed method.

II, III, IV and V quality of industry cotton is has been used in the experience. The cotton of a closed storehouse has been used to test the separator.

In the experience is used the selection sort of “Sulton” cotton. The dirtiness of the second quality of the cotton is 3,05 %, and the humidity is 9,6 %. The dirtiness of the third quality of the cotton is 3,98 %, and the humidity is 10,92 %. The dirtiness of the fourth quality of the cotton is 6,8 %, and the humidity is 13,5 %. The dirtiness of the fifth quality of the cotton is 11,4 %, and the humidity is 16,5 %.

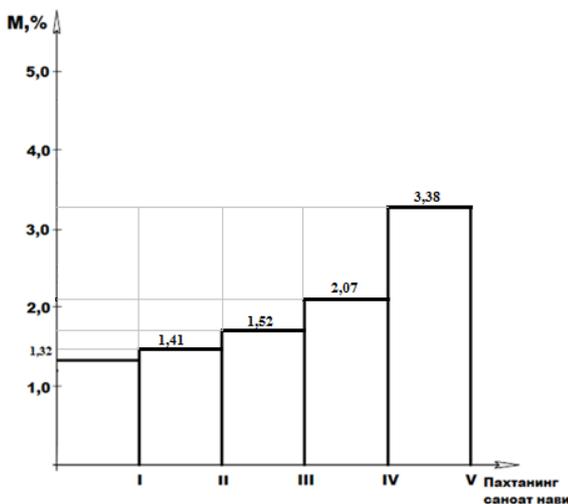
The quantity of spending of air is the same level and the productivity of work is 9-10 ton/h.

The results gained in the experience are given 1 Table1.

**Table1. Practical testing results of CC-15A Separator with developed CC-15A Separator.**

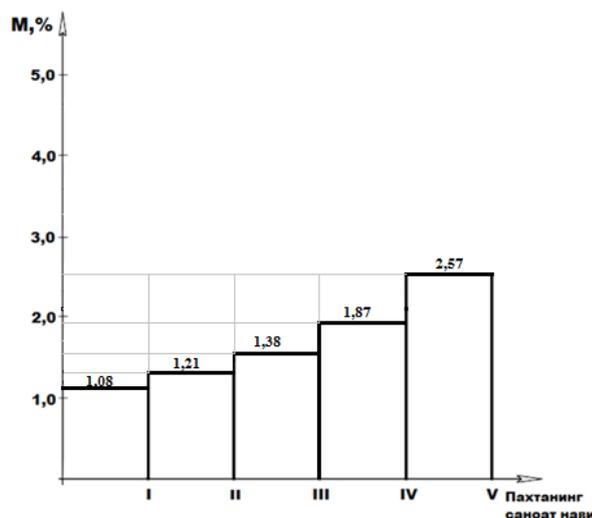
Quality of cotton	The mark of separator	Mechanical damages of seeds, in percentage	The level of dirtiness and humidity of the cotton, in percentage
II	CC-15A	1,32	3=3,05 W=9,6
	Developed Separator	1,08	3=3,05 W=9,6
III	CC-15A	1,52	3=3,98 W=10,92
	Developed Separator	1,38	3=3,98 W=10,92
IV	CC-15A	2,07	3=6,8 W=13,5
	Developed Separator	1,87	3=6,8 W=13,5
V	CC-15A	3,38	3=11,4 W=16,5
	Developed Separator	2,57	3=11,4 W=16,5

It is clear that the level of mechanical damages of seeds is the main index to separate the cotton from the air. In the experiences explored this index has been clarified in both variants: CC-15A separator and developed separator. The gained results are shown in Figs 3 and 4 in the histogram.



**Industry sort of cotton**

Fig. 3. The changing levels of mechanical damages of seeds on quality of cotton in CC-15A separator.



**Industry sort of cotton**

The changing levels of mechanical damages of seeds on quality of cotton in developed separator



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The results gained in the simple variant of CC-15A separator is given in Fig. 3. The histogram shows that there is a definite connection between mechanical damages of seeds on quality of the cotton. When the first quality of the cotton passes through the separator, mechanical damages of seeds increase to 1,32 %, in the second quality of the cotton 1,41 %, in the third quality of the cotton 1,52 %, in the fourth quality of the cotton 2,07 %, and in the fifth quality of the cotton 3,8 % increased. When the same types of cotton are passed through the developed CC-15A separator, mechanical damages of seeds decrease to 15 – 18 %. The gained results are shown in the histograms in Fig. 4. Mechanical damages of seeds in the developed CC-15A separator on quality of cotton have the following quantity: The first quality of the cotton equals to 1,08 %, the second quality of the cotton to 1,21 % , the third quality of the cotton to 1,38 %, the fourth quality of the cotton to 1,87 % and the fifth quality of the cotton to 2,57 %.

### III. CONCLUSION AND FUTURE WORK

The main reason is, there is installed a developed convey in the entrance of the separator to diminish twice the speed of cotton and the cotton colliding with netting surface decreases to 70 %, then happens equal distributing in the long worker of the vacuum valve. In this case, through the diminishing the speed of cotton mechanical damages of seeds aimed to decrease to 35-40 %.

In the conclusion, it can be said that the offered convey-distributor mechanism in the developed separator decreases mechanical damages of seeds to 35-40 %, and it helps to keep the natural peculiarities of the cotton.

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