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Fraction Structure of Cotton Cleaning Equipment in Cotton Enterprises and Their Cleaning Effectiveness

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ABSTRACT: This article discusses the fractional composition of fibrous waste in the dusty stream and the results of the experiments on their retention. In addition, ginning factories have information on how to place dust collectors in technological processes and their types. The effect of the amount of fiber wastes to improve the efficiency of cleaning the dust slots used in dusty air purification has been studied. It has been proven based on practical research on improving the efficiency of dust collectors if they are able to hold them.

KEYWORDS: Dust holder, laminar, turbulent, cleaning efficiency

I. INTRODUCTION

There are many kinds of dust collectors at present and they are used according to the dust properties. For example, small dust particles are widely used in filthy filters or electro filters. These dust slots are mainly used in places where dust particles are relatively rare.

In cotton ginning enterprises, it is mainly ЦП-6, ЦС-6, ЦП-3, ЦС-3, ВЗП-1200, etc., which are mainly used for central air purification. as well as various types of dust collectors. One of the main reasons for the use of such dust slots is the size and plenty of dust particles coming from ginneries. The resulting dusty air contains organic, mineral and fiber waste. ВЦ-8М, ВЦ-10М, ВЦ-12М fans are widely used to deliver these dust particles to the dust sleeve.

Transportation of dust and cotton in enterprises is mainly driven by pneumatizations. Pneumatic conveying is as follows (Figure 1). Cotton is pumped through ventilator 4 and the suction cotton pumps out to the pneumotransport 1 and separates the air from the air through the separator 2. The airflow is then directed to the ventilator 3 through the net surface. Together with the dusty stream passing through the surface, small particles and short fibers in the cotton shaft also pass. This dusted air stream is cleaned at the dust slot 5 [1].

Separator has a 2x2 mm net face to remove cotton from the airflow, which is optimally optimized for the aeronautic resistance of the air flow in theoretical investigations. Therefore, it is impossible to solve the problem by minimizing the size of the net surface. To solve the problem, it is necessary to analyze the flow of dust from every technological process.

II. AN ANALYSIS OF SCIENTIFIC RESEARCH

At the start of the technological process of pneumatic transport, mainly, up to 80% of the smallest minerals are deposited up to 20% of the major organic material. Large-scale dispersed polymers, which are larger than 50 mkm, account for 70% of the total mass of pollutants. In the process of ginning and lining, the percentage of mineral fractions in dust decreases, and the organic particles of the powder increase to 80-90%. The dust particles are smaller than 50 microns. In the system of technological equipments, the level of air pollution changes from 0.8 to 2 g/m^3. High level of

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dusting is 3-4 gr/m^3. At large speeds, the number of dust on the wall decreases, the efficiency of cleaning results decreases, and the hydraulic resistance increases. the investigation of the study of the laminar and turbulent motions in the air ducts to prevent the hydraulic resistance in the air flow is investigated [2].

So the speed of the polished stream it should be between 15-25 m/h. For the dusty air coming out at such a speed, a streamlined and countercurrent, two-threaded dust extenders are widely used.

The dust-driven dust-collectors are divided into three types: single-threaded, cylindrical (Figure 2). The reason for the non-use of the cylinder dust slots is that the cleaning efficiency is low. According to the analysis, the effectiveness of dust collectors is not dependent on dust fractions and the number of particles perpendicular to the wall. In order to test this connection and improve the efficiency of cleaning the dust sump, experimental tests were carried out at the "Qorasuv Paxta tozalash" enterprise. The reason for this is that the number of dust particles in the air flowing into it has been minimized due to the fact that the centerpiece of the air flows from the center. The efficacy of dust collectors has been proven based on theoretical and practical findings on the proportion of dust particles circulating on the center of the escaping force to the number of rotations around the wall [3]. In these dust slots, the number of dust particles in the dust slot wall is very low.

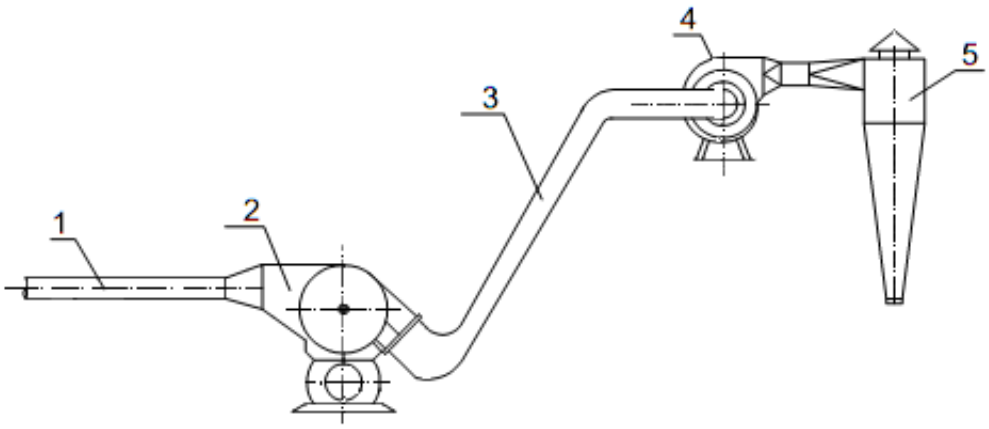

Fig 1. Technological process of dust removal system
1.3 Pneumotransport pipeline; 2-separator; 4-ventilator; 5 dust sockets.

Container dust bags include a dustbag type ІЦП-3. One of the main drawbacks of this dust slot is that dusty cuffs penetrate the cone on the opposite side when the dusty air flow into the dust slot enters the dust separating chamber (Figure 3). This results in a certain amount of air flow in the upper part of the dust slot. This force prevents the spiral movement of the airflow, resulting in loss of spiral absorbing energy of the sprinkled air and the efficiency of the dust collector cleaning.

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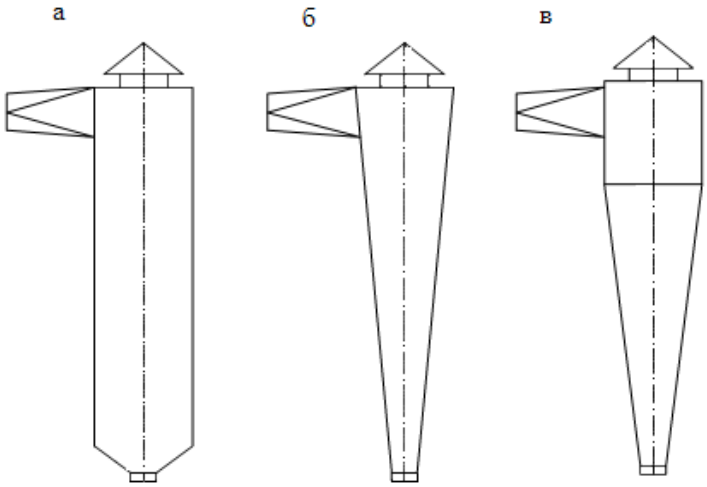

Fig2. A flowchart changer scheme.
a) cylinder; b) the subject; c) cylinder-threaded.

Polluted dust in the conduit sleeve is inflicted on the conical side wall. This divides airflow in two directions. In this case, the air flow through P in the horizontal direction is divided into two forces P_1 and P_2 (Fig. 3). This results in a reduction in the airflow capacity and, consequently, the decrease in the number of dust particles in the dust slot.

$$P=P_1+P_2$$

Studying the dust slots showed that the flow of the airflow into the dust sleeve increases the efficiency of cleaning when consumed in the same direction. Taking this into consideration, dust slots have been designed and implemented with a cylindrical slider, which keeps the air pressure in one direction.
The function of the dust slot of the cylinder head is also based on the center frame power, resulting in the power of the air flow as a result of rotation in the dust slot and pushes the dusty particles into the outer wall of the dust sleeve. The most effective in a stream of dusty slots are cylinder-threaded dust holders.

The ВЗП powder holder has been successfully used in chemical and other industries. When compared to other dust collectors, one of the key features is the high effectiveness [4].

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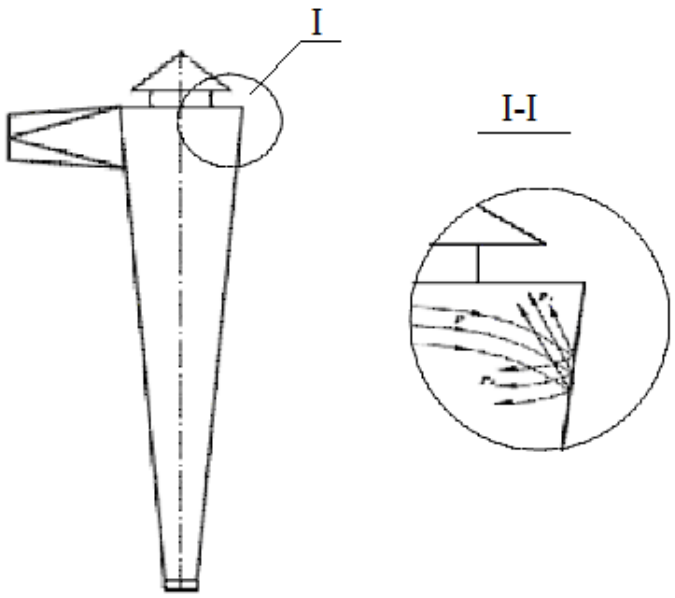

Fig3. Loss of pressure on dust catcher

В3П dust holders operate as follows: the dusty airflow that rotates in two directions can be pulled down through the inlet pipe and downstream from the center of the escape force by hitting the wall. From there, it is pumped out through the vacuum valve. As the downstream secondary air stream flows along the wall of the unit through the spiral direction, the repeating reference is withdrawn and added to the primary stream. Together they cleave together to the atmosphere [2].

В3П is a kind of aerodynamic equipment. The large dust particles coming from the СС-15 A separation are diminished due to the rotation of the airflow, reducing the efficiency of the В3П dust slot (Figure 4).

In the cotton industry, the В3П-800 and В3П-1200 slopes with aerial efficiency of 3 and 6 m^3/h have been widely used. These dust-collectors are now out of the industry. In order to determine the cause of this, experiments on the effect of fossil wastes on the effluent treatment of dust slots.

III. EXPERIENCE RESULTS

In order to determine the weight of garbage from the cotton ginning enterprise, the fractional composition of waste from technological processes at the enterprises of Karasuu cottonseed cleaner, Mustakillik pakhta tozalash, Samarkand region and Mitan pahta tozalash were examined.

At the beginning it was investigated on the dust extraction system ЦС-6, which was studied the advantages and disadvantages of this equipment. Initially, each technological process separated dust into the dustbin of ЦС-6 by fractions and analyzed its constituents. The results are shown in Table 1.

Gathering of fibrous waste at ginneries will increase the efficiency of cleaning, if the remaining dust particles are transferred to the В3П-1200 dust slot. Practical experiments on two types of В3П-1200 and ЦС-6 dust collectors were conducted to find out which results would be obtained if the fiber garbage enters the dust sockets. According to this, a casing bag with a 2x2 mm hole made of special wire mesh surface was placed at the connection of air transport pipelines at the "Mitan Paxta tozalash" enterprise.

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Table 1 Fractional composition of garbage generated from technological processes of cotton ginning enterprise,%

Fractional Structure	I	II	III	IV	V
Waste from the drying shop					
Mineral	48	48	47	46	44
Organic	31	32	33,5	35	37
Fibrious	21	20	19,5	19	19
Wastes from sewage treatment plant					
Mineral	38	40	40	40	42
Organic	35	35	34	33	30
Fibrious	27	25	26	27	28
Waste from the ginning shop					
Mineral	4	5	6	7	7
Organic	39	40	38	36	35
Fibrious	57	55	56	57	58

The surface of the air transport pipeline was determined by the formula:

$$f = \frac{\pi \cdot d^2}{4} \quad \text{m}^2$$

here: d -Inner diameter of the air transport pipeline, 420 mm

The diameter of the casing is equal to the inner diameter of the air transport pipeline. It was selected as 2 m, depending on the maximum amount of wastes that were produced for 30 minutes in length. Then the aerodynamic resistance of the general air passage pipe is less. The surface of the tube is defined by the following formula.

$$f_{tur} = h \cdot \pi \cdot d \quad \text{m}^2$$

here: h -Extending the hardened surface, 2 m.

The technological process has been started after laying the nets on the tubular surface by placing the surfaces of the same type in the bottom and outer holes of the dust slots. Watching the dust collectors for 30 minutes, check that the amount of incoming air does not drop below 6 m^3/h. If the amount of air is dropped, the air space will be full of air, and the aerodynamic resistance will start at a moderate level. This adversely affects the functioning of the technological process. Therefore, controlling the amount of air is one of the most important tasks. After 30 minutes, the technological process was stopped and the accumulated waste on net surfaces was packed in paper sacks and mass was measured electronically.

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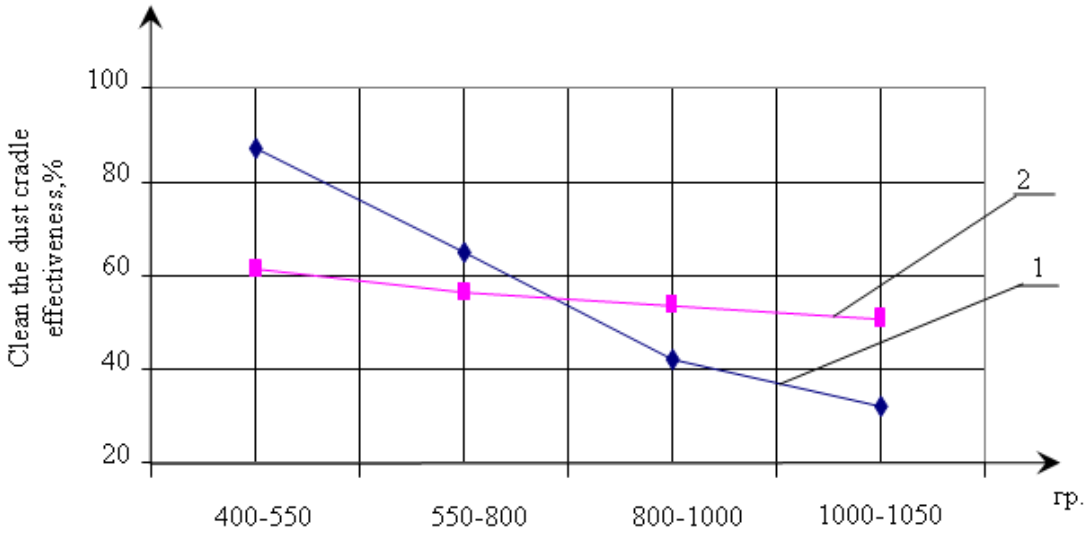

Fig 4. The impact of fibrous waste in every technological process on the efficacy of dust collectors.
1 - ВЗП-1200 dust holder; 2 - dust holder ЦС-6.

By analyzing these results, fibrous wastes have been substantiated by the fact that the VZP-1200 has a major impact on the dustbin's performance. It is clear from Figure 4 that it is desirable to reduce fiber emissions to increase its efficiency.

The cotton-cleaning enterprises analyzed the efficacy of the cleaning of the ВЗП-1200 and ЦС-6 dust slots, depending on the amount of fiber emissions from technological processes.

As illustrated in Figure 4, on the basis of experiments on the ВЗП-1200 dustbin, we can say that the amount of fibrous emissions into the dustbin is about 400 gr. the efficiency of the cleaning will decline as compared with the dustbin of the ЦС-6 [5].

At the bottom bunker of the ВЗП-1200 dust collector there is a fibrous debrian debris. The dust particles from the top and bottom collide with one another and do not allow them to slow down the speed of movement. As a result, the ВЗП-type dust collector is broken down and the cleaning efficiency is dramatically reduced.

IV. CONCLUSION

In order to identify fossil fuels from cotton ginning enterprises, experimental work was carried out at the enterprises of "Qorasuv paxta tozalash" and "Mitan paxta tozalash". According to the results, the cleaning efficiency of the ВЗП-1200 dust collector is high, but the efficiency of cleaning at the ginneries decreases within 30-45 minutes, in order to prevent this, the fiber wastes entering the ВЗП-1200 dustbin are removed from the dust stream, it has proven to be effective in achieving 92-95% cleaning efficiency in line with its technical performance.

From the obtained results, the amount of dust emitted by the atmosphere decreases by 60-70% if the residual dust falls into the dust sleeve and the residual dust is removed from the ВЗП-1200 dust collector.

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