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STUDYING THE TECHNOLOGY OF CLEANING WOOL FIBER FROM SMALL AND LARGE IMPURITIES

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Abstract: The article contains information about the composition of wool fiber, the average level of dirt, the principle of operation of the 2BT-150SH cleaning and cleaning equipment, and the shortcomings of this cleaning equipment, which affect the process of improving the mechanism of cleaning and cleaning equipment.
Key words: enterprise, dirt, mechanical, chemical, cleaning, equipment, roller, drum, raw material, mixture, supply roller.

There are two types of wool fibers supplied to primary wool processing plants filth there will be: dirt released from the animal itself and includes non-animal impurities. Apart from the animal itself as impurities - oil, sweat, dirt, manure residues, etc it is said. Non-animal pollution - minerals, plants, food, include fragments of soil [1; 26 pp.]. The impurity content of wool fiber is on average 32-47%.

Wool fiber mainly cleaned in 2 different ways: mechanical and chemical methods [2]. Nowadays 2BT-150SH is mainly used in wool fiber processing plants in our country model cleaning equipment is used. The technology of this equipment scheme is presented in Figure 1.1.

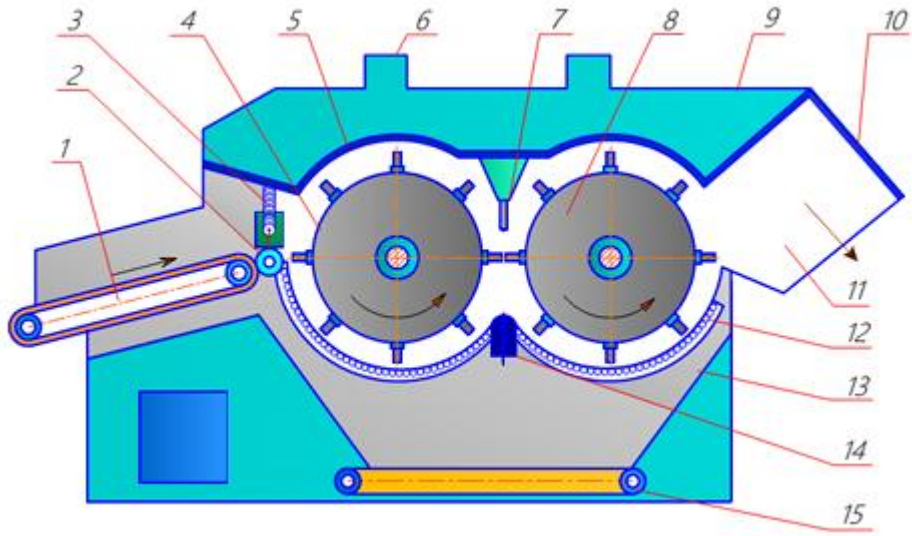

Figure 1.1. Technological scheme of the 2BT-150SH type of inspection equipment

The principle of operation of the 2BT-150SH cleaning-cleaning equipment is as follows: unwashed woolen fiber of the same thickness is thrown to 1 (Fig. 2.1). The belt moves at speeds of 0.067-0.133 m/s.

Supply shaft 2 (upper-ribbed, bottom-smooth) with a diameter of Ø-125 mm, tightly compresses the wool fiber and cleans 34 transmits to the camera. Form the compression of the supply rollers with a pair of springs 3 and its compressive strength is 1.75 kN [3; pp. 26-28].

The upper roller moves and straightens the wool pieces, and the lower roller rotates relatively quickly. The first reel 4 has eight rows of pegs, 12.5 m/s and the second drum 8 rotates at 14.3 m/s. Supply chain conveys the compressed wool pieces to the first pile drum. Pile drum drag the pieces of wool over the colosnik grid 12 and into the second drum transmits. The second drum sifts the wool fiber and cleans it from impurities. Wool filth separated from the tuft from the slats of the colosnik grate to the filth hopper 13 ha falls, then it is removed from under the equipment using the conveyor 15. The process of grinding is when the pieces of wool picked up by the drum piles hit the prism 14 accelerates [4; pp. 179-180].

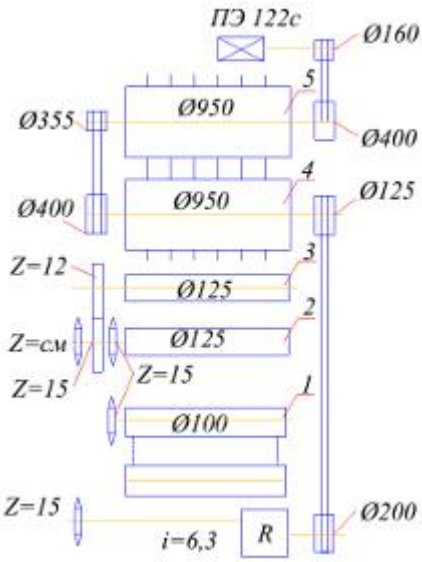

Figure 1.2. Kinematic scheme of the 2BT-150SH cleaning equipment.
1- supply belt; 2 - lower supply shaft (smooth); 3 - upper supply shaft (ribbed); 4 - the first peg drum; 5 - the second pile drum

Centrifugal force of the drum after carding and cleaning the wool fiber speed controller 10 turns off and changes the take-off trajectory. When passing from the first drum to the second, some parts of the tuft of wool do not move the pile is caught at 7, wool as a result of the impact of the second drum with the pile 35 will be added. Kinematic scheme of the 2BT-150SH cleaning equipment on the basis of which work productivity is determined (Fig. 1.2).

A02-61-8 electric motor for moving the working bodies of the equipment is used, its rotation speed is 750 r/min Rotation of supply rollers speed depends on the number of sprocket teeth—ysm=14; 16; 19; 22; 25 teeth.

The number of rotations of the rollers in the 2BT-150SH cleaning equipment its change depends on the teeth of the star and is presented in table 2.1 below 3; pp. 28-29].

Table 1.1
Rotations of the rollers in the 2BT-150SH cleaning equipment number change

	Supply chain		Smooth roller		Corrugated rollers	
y_{sm}	n, s^{-1}	v, m/s	n, s^{-1}	v, m/s	n, s^{-1}	v, m/s
14	0.42	0.13	0.42	0.17	0.5	0.2
16	0.37	0.11	0.37	0.15	0.45	0.175
19	0.31	0.1	0.31	0.12	0.38	0.15
22	0.27	0.08	0.27	0.11	0.33	0.12
25	0.24	0.075	0.24	0.09	0.29	0.11

Speed of rotation of the ribbed roller 3:

n_3=(5,9/y_{sm}) (15/12) =7,3 /y_{sm}s -1;
v_3=3,14 ·0,125 (7,3/ y_{sm}) = 2,86/ y_{sm} m/s.
Smooth roller rotation speed 2:
n_4 = [4,1 (125/200) (1/6,3) (15/ y_{sm})]0,97 = 5,9/ y_{sm} s-1 ;
v_4=3,14 · 0,125 (5,9/ y_{sm}) =2,31/ y_{sm} m/s.
The rotation speed of the roller on the supply belt 1:
n_5= (5,9/ z_{sm}) (15/15) =5,9/ y_{sm}s -1 ;
v_5 = 3,14·0,1(5,9/z_{sm}) = l,85/ y_{sm} m/s.
Theoretically, the productivity of the grinding machine is Aunum (kg/h).
the following formula is used for calculation:
$A_{unum.}$ = $v_{t.t}$ $b_{t.t}$ q· 60 · 60;
$v_{t.t}$ is the speed of the supply belt, m/s; $b_{t.t}$ - supply tape
36 width, m; q is the weight of wool in the supply belt in kg/m_2, the actual productivity
U_h (kg/h) is determined by the following formula:
U_h = $A_u K_{ch} K_{m.t}$,
K_{ch} is the yield coefficient, the wool that has fallen between the colostrums
mass; $K_{m.t}$— taking into account the time the car spent on stops
useful time factor.
The coefficient of wool output from the machine is determined by the following formula:
K_{ch}= (M_{tol} – M_{mos})/M_{tol},
M_{tol} - mass of wool before combing, kg;
M_{mos} is the mass of wool poured under the machine, kg

The useful time coefficient is defined as follows;
K_{ch} = 1-(P_{mt}/100);
Or:
$K_{m.t}$= (t_{si}- t_{sm})/t_{si};
P_{mt} is the number of stops of the car in a shift, %;
t_{si}—working duration of the shift, min;
t_{sm} — smenadagi mashinaning to‘xtashlar vaqti, min.

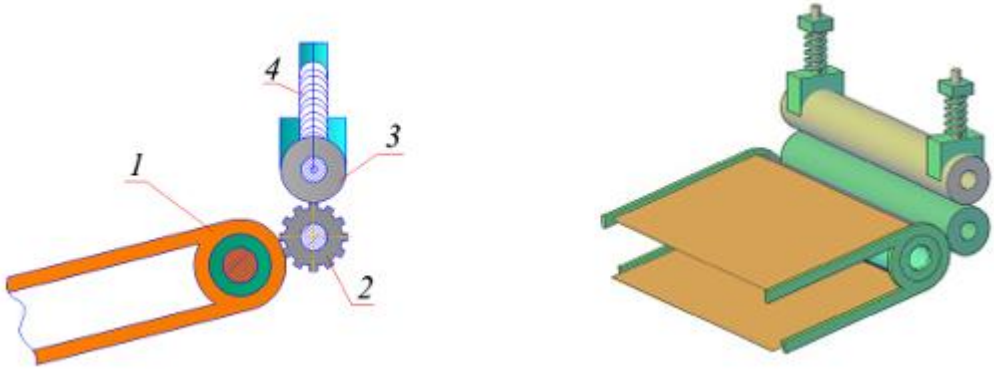

Figure 1.3. 2BT-150SH model cleaning unit supply mechanism
1-supplier transporter; 2nd supply roller; 3-leveling cylinder; 4th spring.
The biggest drawback of the 2BT-150SH cleaning equipment,
The design of the supply mechanism does not provide fiber in a uniform manner, fiber clogging occurs, resulting in excessive energy consumption of the equipment, time causes consumption and decrease of fiber quality. Also a tuft of wool Inconvenient formation of piles and fiber exit, plant partially clean from the mixture or completely separate them can't.

Mechanisms for providing equipment to solve these problems improved (Fig. 1.3), the solution to the problems was solved and higher efficiency is achieved. Provision mechanism of the proposed equipment works as follows: the speed of the sorted wool fiber was 0.067-0.133 m/s The supply goes to the raw material hopper using conveyor 1 [5; pp. 25-29]. The length of the supply conveyor belt is 900-1200 mm,

the width is 1000 mm, two next to it there are rollers with a cylindrical smooth surface with a diameter of 100 mm.

The base of the oscillating raw material hopper 6 is made of mesh grid 5, Light organic and mineral wool fibers falling into the hopper vibrate purified from impurities [6; pp. 27-31]. In addition, a constant reserve in the bunker fiber will be available, uninterrupted fiber transmission to the equipment is ensured and the provider fiber jamming in mechanisms is prevented. Raw material hopper thickness Made of 5 mm steel sheet, oval with a diameter of 12-15 mm consists of holes (Fig. 4).

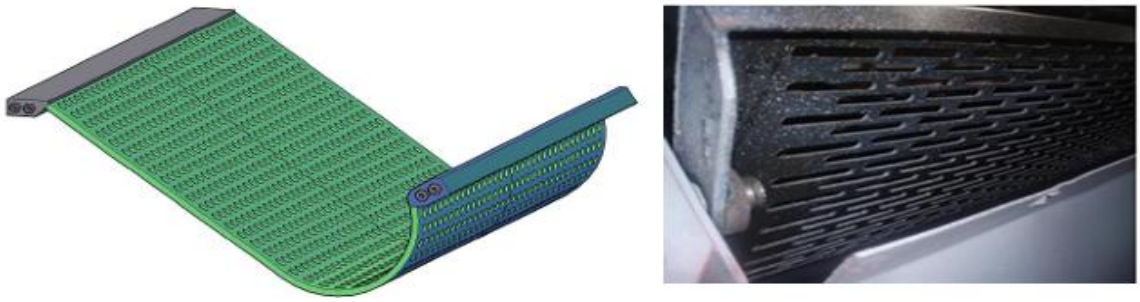

Figure 4. View of a vibrating (vibration) raw material hopper

The wool fiber falling into the raw material hopper, the speed is 0-14 r/min. was supply rollers 7 rotate towards each other and connect. Supply valve increased in size and made 200 mm in diameter [7; pp. 59-62, 63; pp. 132-134].

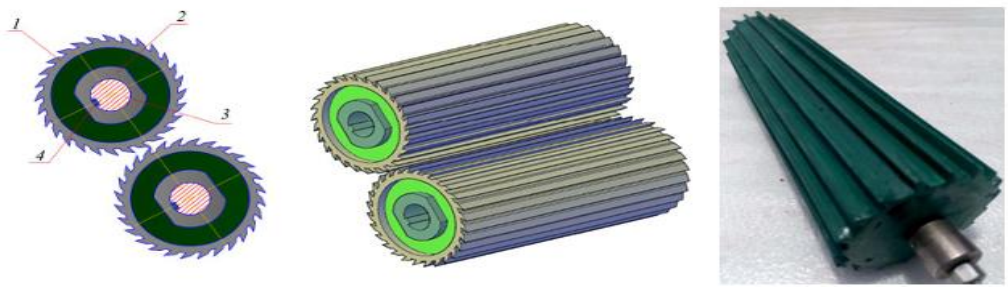

Figure 5. View of supply rollers

1-supplier roller teeth; 2nd gasket; 3rd shaft; 4th key.

The teeth of the supply roller are installed obliquely at an angle of 40° degrees, the number of teeth is 28. The supply roller is at a 55° angle to the equipment fitted to the raw material hopper (Fig. 5).

The feed roller hangs the wool fiber from the raw material hopper with the help of its teeth taking 15-30 r/min. a small toothed roller that rotates at high speed and adjusts the fiber 10 and smoothing cylinder 11 with a smooth surface. Small roller and cylinder Its function is to press and adjust the wool fiber, compact it, and tangle it creates a bundle of fibers and throws it into the working chamber. A small roller the diameter is 100 mm, the number of teeth is 12, making 90 degrees to the roller installed (Fig. 6). A smooth roller with a diameter of 100 mm is also a raw material presslab presses, and a pair of springs 13 is installed in its upper part.

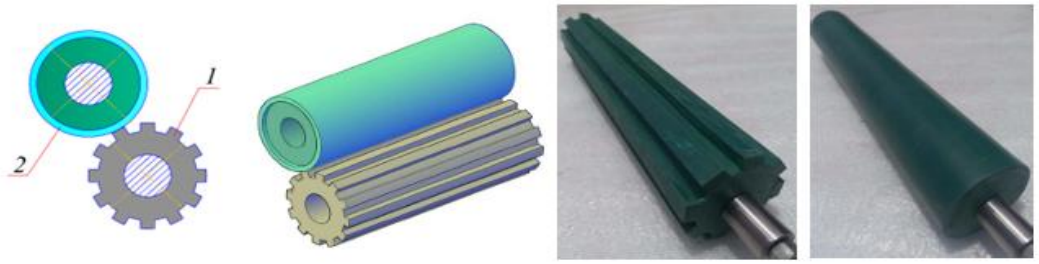

Figure 6. A small roller and a cylindrical roller structure are provided

1-supplier small roller; 2-leveling cylindrical roller.

The improved provisioning mechanism (Fig. 7) is the following sequence at the end, he receives the wool fiber and throws it into the drum with a pile. Sorted raw material through the fiber input chute 3 with the help of conveyor 1 providing wool fiber 6 drops into the bunker. The base of the bunker, i.e. the

swinging fence, is 5 wool cleans by sieving from light impurities that are not deeply mixed. Fiber in the bunker smooth-surfaced roller 11 and the small roller is transferred to 10. It is formed from the impurities contained in the wool fiber small and large mixtures are set in motion with the help of spring 13 and axis 12 It is pressed using an adjustable roller with a smooth surface and thrown into the working chamber [8; 315-321 p. 65; pp. 241-244]. The main function of pile drums is wool from screening and cleaning as a result of dragging the fiber over the ribbed grid consists of

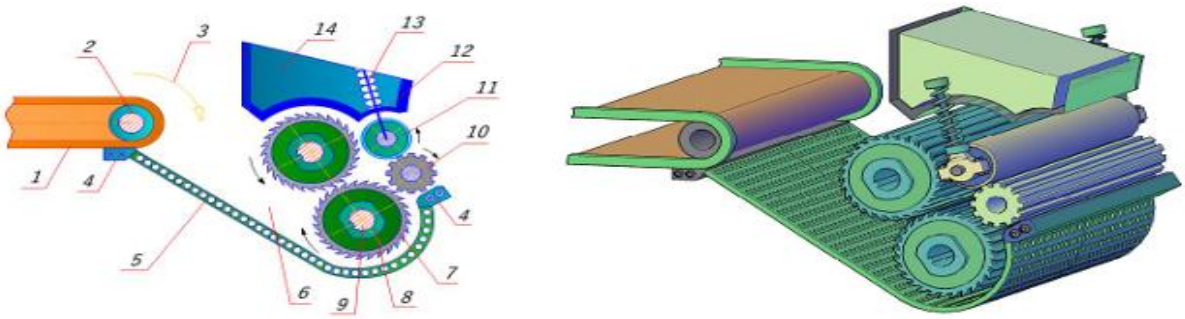

Figure 7. Improved provisioning mechanism

1st supply carrier; 2nd guide roller; 3-fiber input channel; 4th consolidation Brusi; 5-oscillating fence; 6th raw material bunker; 7-supply valve; 8th gasket; 9th shaft; 10-supplier grooved cylinder; 11-smooth surface cylinder; 12th axis; 13-spring; Part of the 14th corps.

Improvement of the mechanism providing the equipment for cleaning wool The rate of continuous fiber transmission has improved and the performance of the equipment is significant has improved.

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