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EXISTING PROBLEMS WITH THE QUALITY OF FLUFF

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Abstract

A number of scientists, such as; D. Michel, W. Stanley, J. Mangialardi, B. L. Levkovich, I. B. Markin and others, were engaged in improving the linting process and improving the quality of lint and seeds abroad and in our republic. At the same time, the issues of obtaining high-quality seeds and fluff during the transfer of seeds from a lint supplier, the creation of a technology for the effective extraction of fine impurities from the composition of the seed mass without disrupting the technological process, as well as improving the quality of fluff, cleaning fine impurities from the seeds contained in the cleaning device and the degree of purification and issues of determining optimal parameters, have not been sufficiently studied. The seeds coming from the gin are clogged with sand, litter, accidentally fallen metal parts and small stones. In addition, during transportation by a belt conveyor and an elevator, they are crushed, increasing the clogging of the lint. Based on the above, the main purpose of this work is to clean the quarrel using a vibrating mesh surface in the feeder of a 5 LP linter machine.

Keywords: Letter, Lint, Seeds, Vibrating Mesh Surface, Problem, Scientific And Practical, Result, Technology, Machine, Disadvantages, Quality.

When determining the coefficient of friction of the seeds, it was believed that this coefficient decreases by increasing the pressure on the seeds, ensuring the cleanliness of the surface and reducing the humidity. Depending on the slip, an increase in speed up to 0.4-0.8 m/s leads to an increase in the coefficient of friction. This coefficient becomes less important in low hairiness and low pressure. When the speed is increased again, the coefficient of friction decreases.

The coefficient of friction in sliding is found by the following formula known from theoretical mechanics for linear models. $\mu_0 = tg\alpha - \frac{g_H}{g \cdot \cos\alpha}$ (1)

hereα- slope of the plane to the horizon; g H – acceleration of the sample along the plane; g – acceleration of gravity.

Taking the sample acceleration constant (*a*=const), we find it using the following formula: $a = \frac{2S}{t^2}$ (2)

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where S is the path of the sample in time t.

The following conditions must be met for the vibration of cotton seeds:

$N + G = 0$ or $G\cos\alpha - cy_1 = 0$;

$G\sin\alpha - F = -P$; $N = G\cos\alpha$; $P \cdot r = Nk$

here G– seed weight; N – normal reaction of the support plane; r – seed radius; f0 is the sliding friction coefficient; k – k/r=-tgα+$f0$friction coefficient of vibration found by the formula.

The area of contact with the surface also increases with the increase of fiber of the seeds. Therefore, seeds with a high fiber level in most cases slide, movement by vibration occurs at large slope angles.

Results of conducted studiesshows that the coefficient of vibration friction of seeds with 8, 10, 13% fiber content is 0.91; 1.21;2.1 hais equal. The results of these studies can be used in the sorting of cotton seed according to the fiber level, and also in calculations related to the friction forces on the surfaces of different materials.

The degree of their damage also has a significant impact on the process of cleaning seeds. Studies on seed damage during ginning and lintering revealed the following. For example, S-6524 type I50 g. For cotton seeds, 2-3%, 9-22% in the middle, 3-6% in the stem are damaged, for S-6524 II seeds, this value is 1-3% in the third, 8-19% in the middle, 2-5% in the stem. it is. This "distribution" of hull damage can also be described in terms of natural physical properties of cotton seeds.

Taking into account the importance of impurities and quality indicators in the next technological process for the processing of ginned fiber seeds, in addition, taking into account the introduction of new cotton varieties with specific physical and mechanical properties into production in recent years, research was conducted to study the fractional composition of impurities in production seeds. was conducted.

Many gins have now removed the arc mesh surface found on the feeder on the 5LP type linter equipment. As a result, it is observed that the amount of impurities in fluff and seed exceeds the standard values several times.

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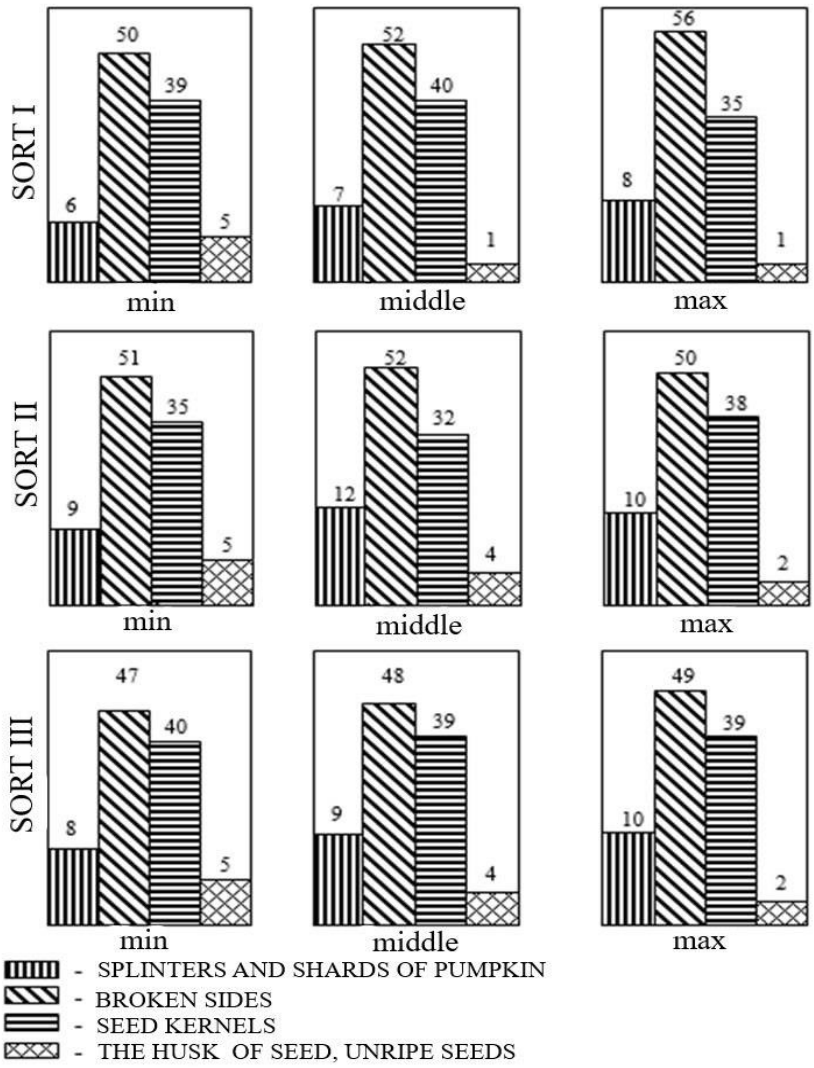

Figure 1: Fractional composition diagram of ginned seeds for medium fiber cotton.

Information About Seed Sweepers

SXA, ChSP or USM pneumatic seed cleaners are installed in front of each linter battery to clean the seeds from debris, and the screw conveyors carrying the seed are equipped with large mesh bars with a mesh size of 3-5 mm.

SXA-10 and SXA-3 pneumatic seed cleaners (Fig. 2) differ in size and performance. Ustanovka seed cleaner consists of a fan and a cyclone that captures fibrous seeds. If the amount of seed processed per hour is 4-5 tons, the SXA-3 brand, and if more, the SXA-10 brand seed cleaner is installed.

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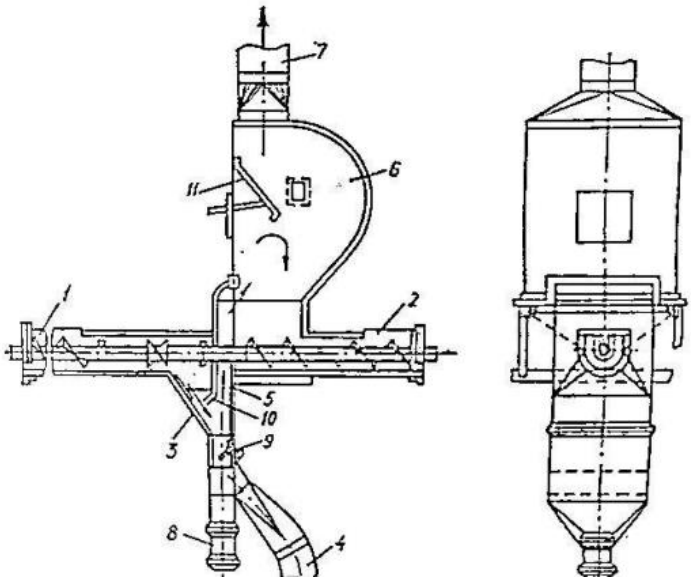

Figure 2: scheme of the SXA-10 pneumatic seed cleaner.

1-supply conveyor, 2-tube conveyor, 3-inclined plane, 4,7-pipe,

5th channel, 6th camera, 8th puller, 9th, 10th, 11th barriers.

The seeds coming out of the gin were fed to the supply conveyor 1 of the cleaner by means of an elevator. There is a break in the windings of the conveyor screw (Figure 2), where the seeds accumulate and form a plug. Therefore, the seeds on the ground cannot be blown towards the conveyor head by the air stream coming from below. Such a plug is also formed on conveyor 2 and blocks the exit of the seed. The seeds fall down from the place of collection to the inclined plane 3, then, joining the air stream coming from the fan along the tube 4, it rises up through the channel 5 and exits to the separation chamber 6. In the chamber 6, the size of which is much larger than that of the channel 5, the air speed decreases several times, as a result, the light particles are separated from the completely normal seeds and go out with the air through the tube 7.

Small particles, dust, loose fibers, loose seeds coming out with air through pipe 7 are collected in a special cyclone and separated from the air.

When the seeds rise up along the vertical channel 5 with the air flow, the heavy inclusions in them (small stones, iron fragments and hakazo) fall into the crusher 8 without rising up. In these cleaners, the seed cleaning effect is adjusted by changing the position of barriers 9, 10 and 11. Then it affects the cleaning effect by changing the speed and direction of the air flow.

The amount of air supplied to the pneumatic system of the seed cleaner, and therefore its static pressure, is adjusted by changing the position of the obstruction located in the suction or driving pipe. SXA-10 and SXA-3 seed cleaners separate 10-12% of weeds, 14-17% of loose seeds and 70-80% of heavy impurities from the seed.

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It is necessary to check the correct operation of the working bodies of seed cleaners, the level of seed cleaning, the timely removal of stones collected in the stone catcher and the waste collected in the cyclone chambers, and the level of cleaning depending on the performance. The separation of heavy inclusions can be adjusted by changing the cross section of the rock trap shaft through the barrier 10.

The amount of air coming out of the chamber can be changed with the barrier 9. The normal operation of the seed cleaner is to move the handle 20 mm to turn the fence 12° from the vertical. By changing the cross section of the separating chamber 6 with the help of the barrier 11, it is possible to adjust the amount of additives going to the cyclone. Garbage collected in bins is sieved with two flat meshes (upper meshes 8×15 mm and lower meshes 6×15 mm) and normal seeds and seeded cotton pieces are separated from them.

The ChSP weed remover (Figure 3) works similarly to the SXA weed remover. However, since the vacuum valves are installed instead of seed delivery and removal conveyors, the aerodynamic conditions of the seed cleaner are much improved.

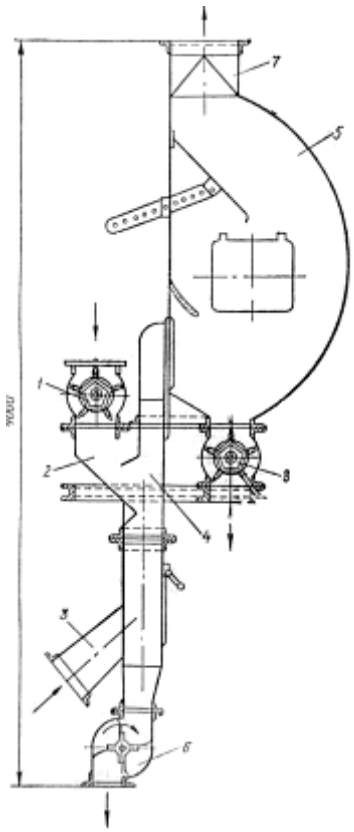

Figure 3: ChSP model lippneumatic seed cleaner

1-vacuum-valve, 2-slanted plane, 3-tube, 4-channel, 5-chamber, 6-vacuum-valve, 7-tube, 8-vacuum-valve.

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Seeds are supplied to the ChPC seed cleaner through the vacuum valve 1, then passing through the inclined plane 2, encountering the effect of the air flow provided by the fan through the pipe 3, rising up through the vertical channel 4 and falling into the separation chamber 5. While the seed and small impurities rise up through the vertical channel 4, the heavy compounds fall down and are taken out through the vacuum valve 6. Light additives, loose seeds and dust are sent to the cyclone through tube 7 with air, and healthy hairy seeds and unseparated dirty ingredients fall down from the chamber and are taken out through the vacuum valve 8 and taken away by the conveyor.

Since 1968, the USM pneumatic seed cleaner has been used for seed cleaning. This seed cleaner is more compact than others, simple and convenient to use Figure 4 shows the scheme of the USM pneumatic seed cleaner.

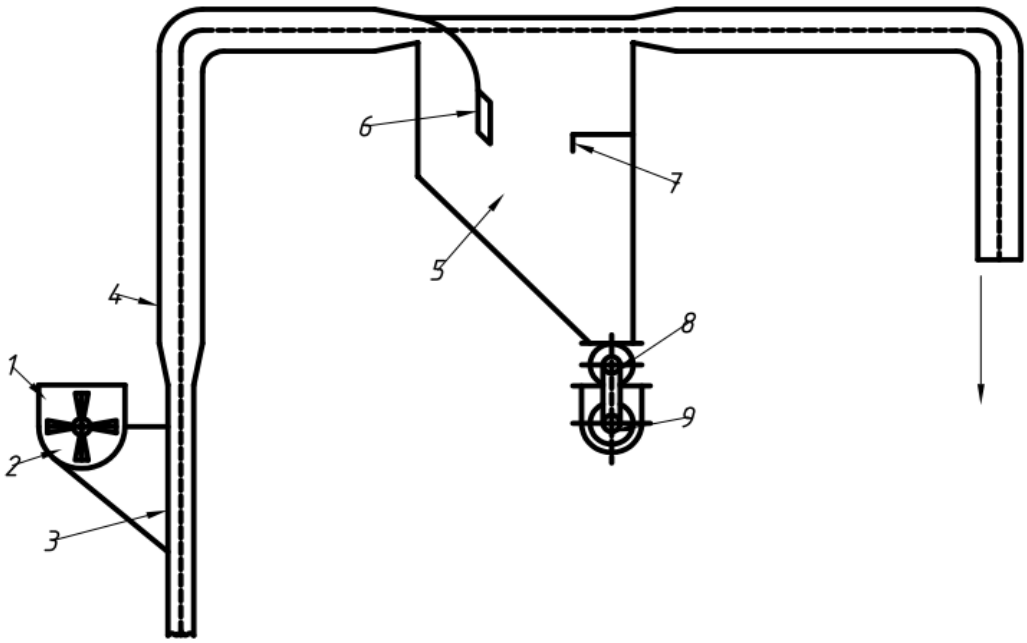

Figure 4: Schematic diagram of USM model pneumatic seed cleaner.

1-vacuum-valve, 2-slanted plane, 3-pipe, 4-vertical channel, 5-separation chamber, 6-vacuum-valve, 7-pipe, 8-vacuum-valve, 9-conveyor.

The seeds are fed by the collecting conveyor 1 of the linter battery and are fed through the shovel drum 2 to the hole 3 in the seed suction pipe 4 and fall into the separation chamber 5. As the air current lifts the seeds up, the heavy objects fall to the bottom of the shaft and are separated. Cleaned healthy seeds are brought down to the vacuum valve 8 by the barriers 6 and 7 and transported to the desired place through the conveyor 9, and free hairs and small

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impurities are transferred to the cyclone by the air flow of the dusty seeds. The cleaning effect of the USM seed cleaner reaches 25% when cleaning cotton seeds picked by hand, and up to 35% when cleaning machine-picked cotton seeds. The effect of separation of heavy compounds reaches 91% if the weight of the stones is 1.5...2.5 g, 99% if the weight is up to 2.5...3.5 g, and 100% if the weight is heavier than 3.5 g.

Summary

1) It will be necessary to study and analyze the models of foreign countries of fluff and seed-producing linters.
2) It is necessary to expand scientific and practical research and comparison tables in the direction of drastic reduction of impurities in fluff and seeds.
3) Planning to prepare other technological schemes as well as carrying out scientific and practical work on the reduction of impurities in fluff and seeds with the help of a vibrating mesh surface.
4) It is necessary to produce a technological regulation for cotton ginning enterprises in order to thoroughly eliminate problems in the production of seed and fluff by cleaning their quality indicators.

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