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Research on the Efficiency of Equipment for Harvesting Flush From Seed

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Abstract: *It has been studied that the productivity of 5LP linters used in cotton ginning enterprises is on average 50-60% lower than the productivity in its technical characteristics. Therefore, in order to pass the amount of seeds produced from two 5DP-130 type sawing gins through 5LP linters at the same time, 5LP linters of 6 pieces in each row of two rows, 12 pieces in total, are used in the linter shop according to PDI70-2017 - "Coordinated technology of preliminary processing of cotton".*

The result of the research carried out on the MR-160-11S type linter brought from the People's Republic of China and installed at the Juma cotton ginning enterprise, the efficiency of the equipment in the linting of high and low grade technical seed is on average 50-65% for the seed and 25-30% for fluff compared to the performance in the technical characteristics. showed that it is less than %. The degree of damage of lintered seed was on average 5.5-6.0%, which was 1.2%-1.7% higher than the required standard. The mass fraction of impurities and whole seed in fluff obtained from seed linter was high and averaged 7.0-11.0 %. As a result, the quality of seed and lint produced from MR-160-11S linters was low, and the consumer's demand for quality seed and lint was not fully satisfied. Experimental work on the working condition of the 5LP linter and the quality index of the produced seed and lint showed that the actual productivity of the equipment on seed and lint was on average 53% and 34% less than the productivity in its technical characteristics, and the quality indicator was due to the high level of seed damage and lint contamination. Showed that it is low.

From the conducted research, it was determined that for cotton ginning enterprises in the cotton-textile cluster system, it is necessary to develop and introduce into production modern domestic linter equipment that meets the consumer's demand for quality seed and lint, saves electricity and spare parts, and has high work efficiency.

Keywords: *linter equipment, working chamber, mixer, saw cylinder, straw, cotton, seed, lint, productivity, density, quality indicator.*

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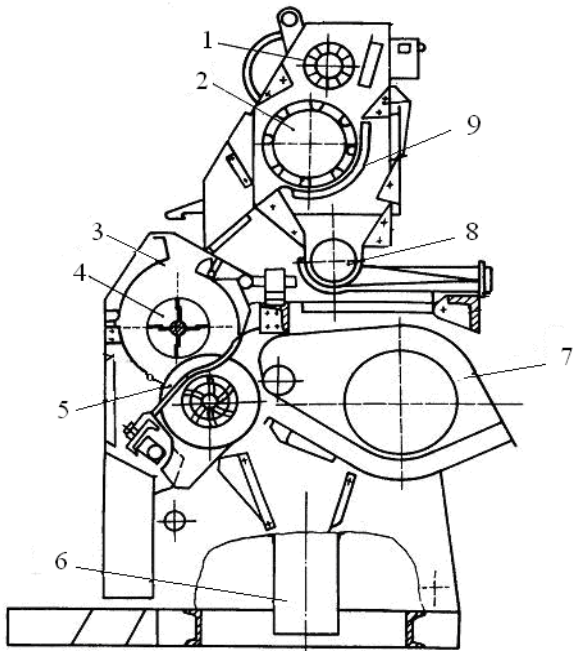
Introduction. One of the main tasks facing cotton ginning enterprises in the cotton-textile cluster system is to introduce modern local techniques and technologies to the enterprises, increase productivity, improve the quality of manufactured products, save electricity and spare parts

consumption, improve economic efficiency and profitability by improving the ecological environment.

A labor-intensive, electricity- and parts-intensive process in the cotton pretreatment process is the linting process [1]. In the process of linting, fluff is scraped from the surface of the seed with the help of saw teeth in the saw cylinder. This process is mainly based on scraping the fluff from the pile of seeds passing through the smallest gap between the agitator blades in the linter working chamber and the saw cylinder. Researches have been conducted by many scientists to increase the efficiency of the linter and positive results have been achieved. Today, cotton gins use 5LP linters with positive results. 5LP linter last century

It was created by scientists of PSMITI (TsNIIXprom) in the 80s and produced by the enterprise "Uzbekpakhtamash" [2]. The 5LP linter is mainly composed of two parts, the supply system and the seed linter. The supply system consists of a supply roller 1, a leveling-cleaning drum 2, a mesh surface 3, a waste auger 4, a waste pipe 5, a drain 6. The linter part consists of a working chamber 7, a mixer 8, a seed comb 9, a colosnik grid 10, a density valve 11, a saw cylinder 12, an air chamber 13, a slag visor 14 and a slag discharge pipe 15 (Fig. 1). The productivity of the 5LP linter based on its technical characteristics is 1200-1360 kg/h when removing 2-2.5% fluff from the surface of the seed, and 1500-1700 kg/h when removing 3.0-3.2% fluff from the surface of the seed. constitutes [2].

Production research on the 5LP linter, actual performance of the linter.



1- supply roller, 2- leveling-cleaning drum, 3- working chamber,
4- mixer, 5- saw cylinder, 6- discharge pipe, 7- air chamber, 8- waste auger, 9- mesh surface.

Picture 1. Schematic of the 5LP linter

showed that the work in its technical characteristics is on average 50-60% less than the productivity [3]. Therefore, in order to pass the amount of seeds produced from two 5DP-130 type sawing gins through 5LP linters at the same time in the linter shop according to PDI70-2017 - "Coordinated technology of initial processing of cotton", 5LP linters of 6 pieces in each row of two rows, 12 pieces in total, are used. [4].

Despite the large number of linters in the workshop, the quality of seed and fluff produced is low in terms of varieties, and does not satisfy the consumer's demand for quality seed and fluff. The low wholesale price of the produced wool has a negative impact on the economic efficiency of the enterprise. In addition, the cross-sectional surface of the working chamber, which is the main working part of the linter, has been increased, and the outer diameter of the mixer has been increased from 150 mm to 178 mm in accordance with the chamber. Increasing the cross-sectional surface of the working chamber and the external diameter of the mixer increased the linter efficiency by only 5-8%. But the working chamber increased the cross-sectional surface, increased

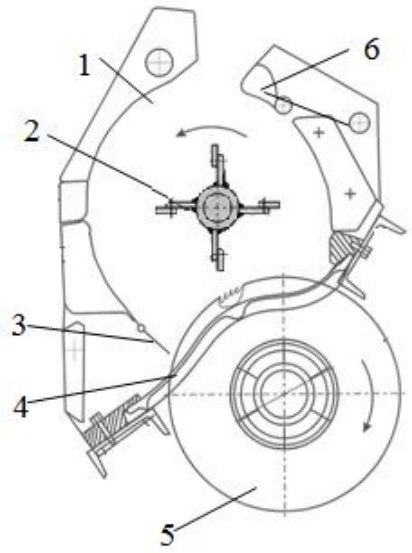
the mass and density of the seed roller, and increased the load on the electric motor. The increase in density in the chamber reduced the speed of the seed roller, causing the roller to clog more often, the linter's productivity decreased, and the quality of the produced seed and lint decreased, while the increase in the load on the electric motor caused the motor to heat up and in some cases burn out. [5].

One of the main working parts affecting the efficiency of the 5LP linter is the working chamber, which basically consists of an apron 1, a mixer 2, a seed comb 3, a colossal grid 4, a saw cylinder 5 and a density valve 6 (Fig. 2). There are 161 colosniks in the working chamber, which are assembled on the toothed rack of the upper and lower brushes and form a colosnik grid [2].

Камерадаги аррали цилиндр

160 saws and 159 saws have intermediate seals and are assembled on a 61.8 mm diameter shaft. The working part, which causes the seed mass to rotate in the working chamber and forms a roller, and performs the main function in the process of linting the seed, is the mixer, which is placed in the center of the working chamber.

Linter equipment is used for linting of seed in USA, China, Turkey and India, which are developed in the field of cotton [6]. In these countries, linter equipment is adapted to linter technical seed, and they are used in oil plants. Seed seeds are not linters in linters. The process of their preparation is carried out chemically [7].

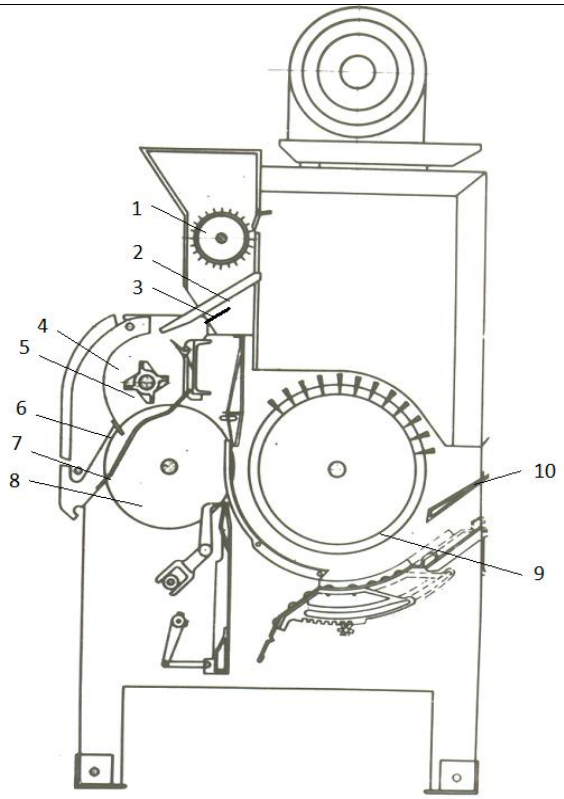


1- фартук, 2- аралаштиргич, 3- чигит тароғи, 4- колосник, 5- аррали цилиндр, 6- зичлик клапани.

2- расм. 5ЛП линтер ишчи камерасини схемаси

Several US companies manufacture linter equipment. For example, "Lyummus" company produces 630 model linters (Fig. 3). The research work on the efficiency of the linter in the production of linters of high and low grade technical seed showed an average of 2.8-3.2% fluff scraped from the surface of the seed. In this case, the mechanical damage of the lintered seed was high, on average it was 5-6%. The actual working productivity of the linter for seed and lint in seed lintering is 550-600 kg/m.h. and 20-22 kg/m.h., compared to the productivity in the technical characteristics, it is on average 60-70% for seed and 25-35% for fluff showed that it is less than [8].

MR-160-11S type linters produced by the Chinese company "Lebed" are currently installed in the seed linting technological system of the "Juma" cotton ginning enterprise of Samarkand region. The appearance of the MR-160-11S type linter is shown in Fig. 4, the scheme of the working chamber is shown in Fig. 5. Working chamber - apron 1, mixer 2, shaft 3, seed comb 4, colossus fence 5, saw



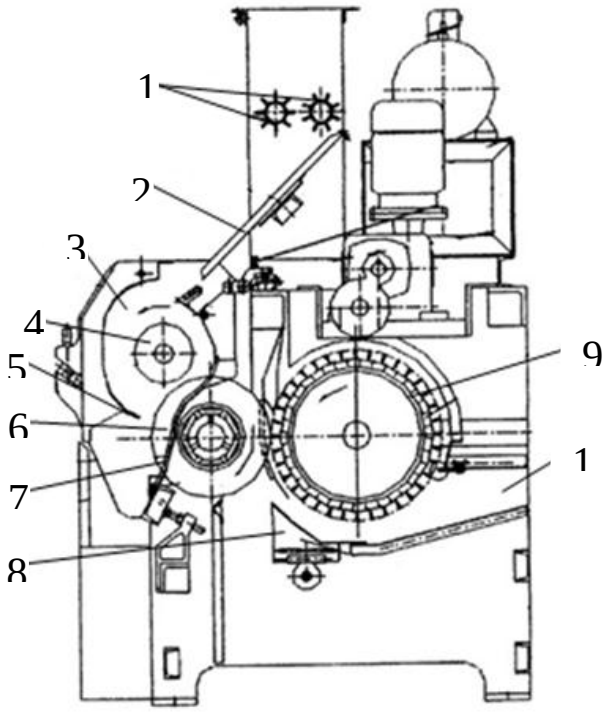
1- supply roller, 2- tension, 3- magnet,

4- working chamber, 5- mixer, 6- seed comb, 7- colosnik grid, 8- saw cylinder, 9- drum with brushes, 10- fluff carrying channel

Figure 3. 630 model linter diagram (USA)

cylinder 6, saws consist of an intermediate gasket 7 and a density valve 8. The diameter of the mixer shaft 3 is 45 mm, the outer diameter of the mixer with the edge of the blades is 150 mm. The number of columns in the column grid is 161 pieces, the number of saws in the saw cylinder is 160 pieces, and the intermediate gasket of the saws is 159 pieces [9].

The research conducted at the "Juma" cotton ginning enterprise on the efficiency of the MR-160-11S linter showed that the productivity of the equipment in the linting of high and low grade technical seed was on average 650 kg/h and 720 kg/h, and 25-30 kg/h for lint. and showed that the work in technical characteristics is 50-65% less for seed and 25-30% less for fluff than productivity. Due to the high speed of the saw cylinder and mixer in the linter, the speed of the saw cylinder is 1150 rev/min, and the mixer is 700 rev/min, the damage rate of the lintered seed is on average 5.5-6.0%, 1.2%-1 of the required rate. .7%



1- supply rollers, 2- threshing machine, 3- working chamber, 4- mixer, 5- seed comb, 6- saw cylinder, 7- colosnik, 8- kozerog, 9- brush drum, 10- fiber conveyor channel.

Figure 4. Model MR-160-11S linter schematic

is higher than The mass fraction of impurities and whole seed in fluff from linter was high, on average 7.0-11.0%, and the amount of short staple fluff (puch) in the fluff was 5-7% higher than the required standard. As a result, the quality of seed and lint produced from MR-160-11S linters was low, and the consumer's demand for quality seed and lint was not fully satisfied [10].

In order to study the effectiveness of 5LP linter in production, research work was carried out at the Toragorgon cotton ginning enterprise belonging to the Namangan textile cluster. Before starting the research work, one of the 5LP type linters in the technological system was selected.

The initial moisture content of the research works was 8.5%, dirtiness was 2.3%

1- apron, 2- mixing blade, 3- shaft, 4- seed comb, 5- colosnik, 6- saw cylinder, 7- intermediate gasket of saws,

8- density valve. Figure 5. Scheme of the MR-160-11S linter working chamber

Bukhara-102 selection I variety of cotton was held in the 2nd class. In this case, the average moisture content of the seed produced from 3 pieces of 5DP-130 seeds at the enterprise was 8.0%, hairiness was 11.0%, damage was equal to 3.6% [11, 12].

During the period of research work, samples of seed produced before and after linter of 5LP, fluff after linter were taken and analyzed in laboratory conditions. Samples were replicated 7 times to

ensure accurate results. The performance of the 5LP linter on the seed was determined by the timing method. The seeds coming out of the linter working chamber were collected every 3 minutes and weighed on the electronic scale of the enterprise. In order to determine the productivity of fluff, the rest of the linters in the technology were temporarily stopped during the research period, and the fluff falling into the press box was collected every 5 minutes after the use of the linter set aside for the experiment. In order for the results to be clear, the experiments were repeated 7 times and the average value of the result was obtained. As a result, when calculated hourly, the productivity of 5LP linter for seed is 675 kg/h on average, productivity for lint is 24.3 kg/h on average, and it is 53% less for seed and 34% less for lint than the productivity in the technical characteristics. showed that The degree of hairiness of the seed produced from linter was 7.3% on average, damage was 5.0% on average [13].

The mass percentage of dirty mixtures and whole seeds in fluff is on average 9.3%, the length of the staple is 6/7 mm, and according to the state standard UzDst 645:2016 "Cotton fluff" belongs to class I type B type "Ifilos" according to the technical conditions was determined [14, 15].

Experimental work on the working condition of the 5LP linter and the quality indicator of the produced seed and fluff showed that the actual productivity of the equipment for seed and fluff was on average 53% and 34% less than the performance in its technical characteristics [2], and the seed damage and fluff pollution showed that the quality indicator is low.

Conclusion. The results of the research conducted on the performance of foreign and domestic linters showed that the low productivity of the MR-160-11S linter produced by the "Lebed" company and currently used at the Juma cotton ginning enterprise in our Republic does not meet the technological requirements set for linters in terms of the performance of seed linters. The high percentage of seed damage and impurities in the fluff and the mass fraction of whole seeds showed that it could not satisfy the consumer's demand for quality seed and fluff, and especially the seed was not suitable for lintering.Domestic 5LP linters are mainly suitable for lintering of technical and seed seed, but due to the lack of construction of mixer, which is the main working part in the linter, it showed low productivity, low quality of produced seed and fluff. Today, all of this is for the cotton-textile cluster cotton ginning enterprises, which reduce the number of linters in the shop by working at high productivity, ensure that the ecological environment is normal, save their consumption through the rational use of electricity and spare parts, satisfy the consumer's demand for quality seed and lint, modern indicating that a localized linter should be introduced into production and production.

References

1. Salimov A.M., Lugachev A.E., Khodzhiev M.T. Technology of primary processing of cotton. “Adabiyot uchqunlari” . Tashkent. 2018.- 184 b.
2. Passport of saw linter 5LP.-Tashkent: TGSKB for cotton cleaning, 1981.-18 p.
3. R.Sh. Sulaimonov. Improvement of the basic links of the saw linter and its development in production. Report of the public association “Paphtasanoat ilmiy markazi”. Tashkent. 2016. - 51 p.
4. Coordinated technology of cotton preliminary processing (PDI 70-2017). A.S. Under the general editorship of Kamalov. "Cotton Industry Scientific Center" JSC. Tashkent, 2017. - 91 p.
5. R.Sh. Sulaymonov, B.Ya. Kushakeev, D.U. Madrakhimov. Finding ways to improve the efficiency of the seed linting process. Report of Pakhtasanoat ilmiy markazi JSC. Tashkent. 2011.-65 p.

6. T.M. Kuliev, R.Sh. Sulaymanov and dr. Handbook of Cotton Preprocessing. Tashkent - "Avto-nashr". 2019. -477 p.
7. Anthony W.S. and A.C. Griffin. 2001 b. Fiber breakage at gins: moisture and heat. Cotton Gin and Oil Mill Press 102(24): 6-9.
8. R.Sh. Sulaimonov, B.Kh. Marufkhanov, U.K. Karimov. Study of imported linter equipment operated at domestic ginneries. Report of Pakhtasanoat ilmiy markazi JSC. Tashkent. 2014.- 30 p.
9. Operating manual for linter machine MR160-11C. China changjiang machinery manufacturing Co., Ltd. China. 2012. - 48 p.
10. Rs. Sulaymanov, U.Q. Karimov, B.Kh. Marufkhanov. To study foreign technology and equipment used in cotton ginning enterprises and to give recommendations on cotton ginning, linting of seed, fiber and fluff cleaning. Scientific report. "Rakhtasanoat Scientific Center" JSC. Tashkent, 2016.-28 p.
11. UzDst 615:2018. Cotton. Technical conditions. Tashkent, 2018.- 4 p.
12. UzDst 601:2016. Technical seed of cotton, Technical conditions. Fertility determination methods. Tashkent, 2016.- 11 p.
13. UzDst 597:2016. Technical seed of cotton, Technical conditions. Methods for determining the mass fraction of defective seeds. Tashkent, 2016.- 10 p.
14. UzDst 662:2016. Cotton wool. Methods for determining the mass fraction of impurity mixtures and whole seeds. Tashkent, 2016.- 14 p.
15. UzDst 660:2016. Cotton wool. Methods of determining length. Tashkent, 2016.- 12 p.