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By Welding Increase in Working Resource of Gin Colosniks that Working Surface is Woren

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Abstract: This article talks about increasing the work resource by welding using the welding materials based on the sawed gin colosniks with the working surface woren.

Keywords: ginning, sawn gin columns, friction, corrosion, welding materials, ribs, hardness.

Introduction. On average, 26-27 million tons of cotton are grown annually in the world. In order to obtain finished products from cotton raw materials, several technological processes are carried out. One of the most basic technological processes is ginning [1].

Ginning is the process of separating the fiber from the seed, and it is considered the first technological process of obtaining a finished product from raw cotton, and its quality and productivity determine the efficiency of the technological processes that follow. Separating the fiber from the seed is carried out using two main roller ginning and saw ginning devices [2].

Today, saw ginning is widely used in the cotton industry. The main reason for this is the high productivity and the extraction of relatively short fibers from the seed.

Saw ginning - the main working parts of the machine consist of a saw cylinder and a grid formed by installing the columns on the support burs, which is the result of the technological interaction of these two main working parts with each other, the fiber is separated from the seed [3].

The fibers caught in the teeth of the saw are carried between the colosniks, and the seeds are not able to pass, and the fibers are separated from the seed. The fibers on the saw teeth are separated by the air stream from the nozzle and transferred to the common fiber drawing pipe [4].

A number of failures can be observed in the process of separating the fiber from seed cotton. These shortcomings lead to the violation of the demonization technology.

Below we will analyze the malfunctions that occur between the saw disc and the colosnik grid.

Clogging of the ribs slit in the working chamber – the origin of this malfunction is due to the high humidity of the cotton and the fact that the saw touches the colosnik on one side without passing through the middle of the interval of the ribs. As a result, Jinning leads to a violation of the technological process, that is, to damage fiber and pollen. To eliminate these malfunctions, the work of the Gin machine is stopped, the working chamber is raised and the raw material roller in it is lowered and then the range of the shells is cleaned.

The slits between the ribs are enlarged or the rib fracture – as the cause of this malfunction, it can be cited that the cotton moisture is high and the saw touches the colosnik on one side without passing through the middle of the interval between the ribs. As a result, the technological process of demining leads to a violation and the addition of the seeds in the raw material roller to the

fiber. To eliminate these malfunctions, the work of the Gin machine is stopped, and the working camera rises the slits between the ribs are cleaned if the colosniks are broken and replaced with a new one.

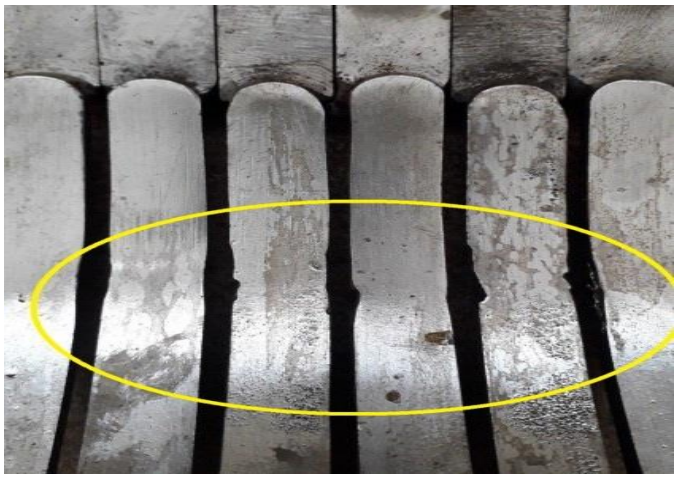


Figure 1. The working surface is worn saw gin colosnik

The burning of the fiber during the Jinning process-as the cause of this malfunction, it can be cited that the range of the ribs is broken, the Saw is spinning in contact with the colosniks, and the angle of stay of the saw relative to the shaft is broken. As a result, Jin's productivity decreases, which is explained by the fact that time was spent to eliminate the malfunction. To eliminate these malfunctions, it is recommended to prepare the colosnik material from cast iron and fix the gaskets firmly.

The above malfunctions were analyzed and it was found that one of the main factors affecting the quality indicators of the fiber was the rotation of the saw disc by touching the working part of the colosnik. The elimination of these shortcomings and the improvement of the sawn Jinn construction are considered the most pressing problems today, many scientists and researchers have worked on this.

The shelf life of colosniks and the edifices in the working part of them were studied by R.X.Mustafin. To increase the working life of the colosniks, it was recommended to install a solid alloy plate on the working part of the colosniks [5].

E.N.Avazovich carried out scientific work on improving the design of existing colosniks on sawed gin machines, and recommended the use of a 65Г branded legalized alternating element plate for the working part of the kolosnik in increasing the service life of jin colosniks [6].

Researcher R.G.Maxkamov [7] showed that the shrinkage of the slit between the Saw and the colosnik, taking into account the practical aspects of this process, can also give ruy due to the deformation of the saw.

Sh.Sh.Shonasirov proposed a plasma coating method to restore working parts of his colosniks [8].

But the materials needed to implement the methods analyzed above have not been widely introduced into production due to the expensive cost from the economic aspect and the lack of technological equipment. One promising solution to increasing the work resource of working surface edible colosniks is to weld and coat their surfaces with materials with high hardness and high absorbency.

All available methods of welding coating are divided into two groups. Welded coating under pressure and melt coating. Welding under pressure, taking into account the fact that gin colosniks are made from cast iron, is considered irrational to cover. There are many methods of melt-coating, but considering the small size and shape complexity of the working surface, jin

colosniks can be manually arc-melt-coated and choose a melt-coating method in a protective gas environment.

Materials. Melt-coating is performed with soluble single electrodes, electrode bond, laid plate-shaped electrodes, Welding Wires, arc and three-phase arc, which are directly and indirectly affected.

Welding with electrode coating can be performed in all spatial situations. This work is performed by melting and depositing successive rollers on the surface of the product when the electrodes are melted. In this case, the surface to be covered by melting should be clean (the metal should be cleaned by rubbing so that it shines). The surface of each laid roller and the place of the next laid roller is also cleaned of slag, soot and splashes.

To form a layer of glued metal by dissolving a monolithic monolith, each subsequent roller must seal the previous one with 1/3 -1/2 of its width.

One layer of melt-coated metal is 3-6 mm thick. If a melt-coated layer is formed with a thickness of more than 6 mm, the second layer is covered by melting the rollers, perpendicular to the first layer. In this case, the first layer of rollers should be thoroughly cleaned of splashes, burns, slag additives and other impurities.

Covering in a carbon dioxide environment has a number of advantages. The main of them is their high productivity compared to automatic welding under the flyus (18...20cm^2/min) and has a high capping coefficient of. This method has a number of technological advantages:

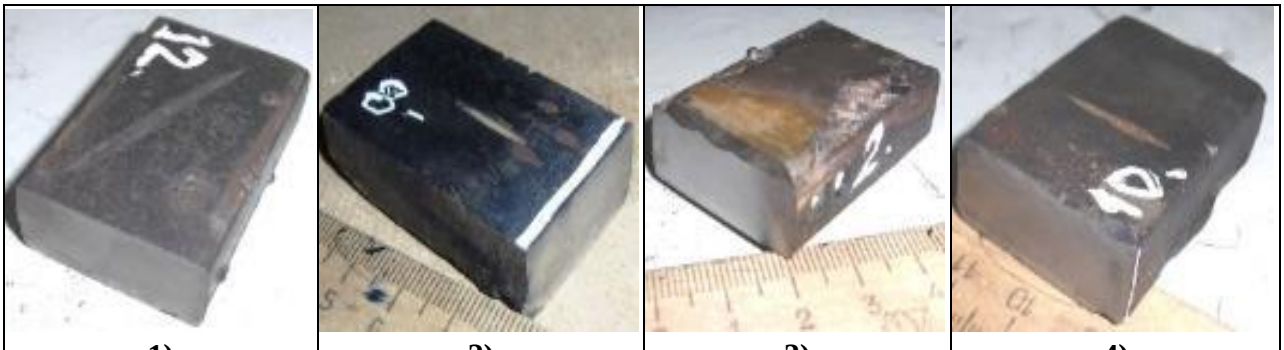
- covering process can be monitored;
- that several shafts can be covered without interrupting the process;
- can be applied to small diameter details;
- thin layer (0.8...1.0 mm) coverage.

Disadvantages include:

- burning and evaporation of cathode elements;
- electrode materials (10...15%) splashing;
- it is possible to obtain a layer with a high hardness only with a high legible wire or powder wire and, later, with thermal processing.

Taking into account the advantages and disadvantages of welding coating methods, as well as the complexity of welding equipment, the method of manual arc melting coating was chosen.

Method. For experiments, plates with dimensions of 30x30x10 mm were obtained from cast iron of the brand Сч15-35. Their surfaces were coated using a ВДУ-301У3 welding Corrector using Т-620, JSL422, Т-590, УОНИ-13/55 electrodes. In this melt coating mode: welding current 90-110 A, arc voltage 24-28 V, current polarity reverse, electrode diameter 3-4 mm. To ensure at least 90% contact of the coated surfaces, the samples were smoothed by special mechanical processing on a grinding machine.



1) **2)** **3)** **4)**

Figure 2. Welded coated samples.

1. Sample coated with with T590 brand electrode on surface;
2. Sample coated with УОНИ-13/55 brand electrode on surface;
3. Sample coated with JSL422 brand electrode on surface;
4. Sample coated with T-590 brand electrode on surface;

Results. Their hardness has been studied in order to give more accuracy to the strength of the coated electrodes, the composition of which has been determined.

The hardness of the welded-coated samples was determined by the TK-2M brand Rockwell press. The results obtained and their average values are listed in Table 1 on the HRC scale.

Table 1. The average hardness of the Weld layer obtained from welding electrodes is

Electrode brand	T- 590	УОНИ -13/45	JSL 422	T-620
Hardness HRC	61	49	46	60

Based on the data shown in the table, the following graph was built.

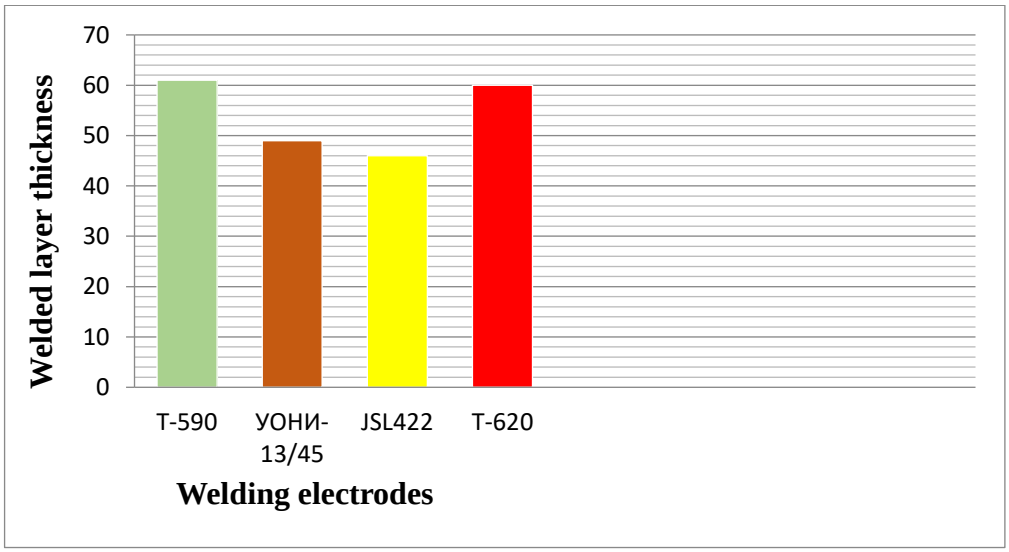


Figure 3. Average hardness graph of Weld layer from electrode welding

Discussion. From the above information it can be seen that the hardness of T-620 and T-590 brand electrodes is much higher than that of other electrodes. The main reason for this can be expressed in the presence of Cr and B elements in the composition of T-620, T-590 branded electrodes.

Conclusion. As a result of the conducted researches, it was found that the restoration of sawed gin colosniks with worn working surface by welding with based welding materials is the most effective way to increase the working resource of gin colossals. An increase in hardness was found to have a positive effect on wear, and it was proven that wear time was reduced. This increases the service life of gin colosniks and leads to economic efficiency.

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