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INCREASING WORK EFFICIENCY BY IMPROVING THE WORKING CAMERA AND CONSTRUCTION OF SAW AND ROLLER MECHANISM

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ABSTRACT:

Increasing the fibre yield by improving the machines for sorting raw cotton, which are currently working on the technology of primary processing of cotton. The working chamber of saw and roller machine.

KEY WORDS: Saw and roller raw cotton sorting machines, fibre, the working process of cotton cleaning factories, geometry of the saw tooth, the process of ginning.

MAIN BODY:

In our period, improving fibre yield, improving quality, efficiency, productivity and ensuring timely seed germination of cotton by developing the seed sorting machines, which are currently working on the technology of primary processing of raw cotton is one of the urgent issues. The efficiency of the ginneries and the quality of the product depends on the smoothly operation of the machines installed in the technological process. This, in turn, is due to the effective working of gin machine, which separates the fiber from the seed, located in the technological process. After drying and cleaning the cotton from various contaminants in the cleaning factories, it is sent to the main part of the factory in order to separate the fibre from the seeds. Ginning is the main process in the technology of processing seed cotton, in which the fibre is separated from the seed by mechanical force.

The main working body in saw blades is a cylinder made of saws. The cotton that falls into the gin`s working chamber is picked up by sawing teeth that rotate next to the seed comb and carried to the grate. This raw material roller rotates in the opposite direction to the saw cylinder rotation, and it provides the saw teeth cotton fibre continuously. The fibres attaches to the saw teeth are passed through the columns, and the seeds do not pass so that the fibres are separated from the seeds.

Over the years, a number of studies have shown the different ways to increase the effectiveness of gins. These includes the configuration of the working chamber , the position of the seed comb for the free exit of ginned seeds from the working chamber, the shape of the column , the geometry of the saw tooth, the speed mode of the saw cylinder , the diameter of the saw cylinder, the distance between the saws.

It is known that, the saw cylinder is the main working tool in the process of ginning cotton. The process of ginning occurs as a result of the gin coming into the working chamber and the raw cotton coming into contact with the rotating saw teeth.

In the working process, the raw cotton material also rotates like a gin saw, forming a massive roller consisting of fully depleted, and partially depleted seeds. This mass increases the density of the roller towards to the center of working chamber. As a result, over time, due to the formation of a crack between the

working chamber and the grate, the depleted seeds move downwards under the influence of their own weight and separate from the gin machine. In many cases, the rotation of the saw cylinders slows down due to the improvement in the density of the mass roller in the working chamber.in some cases, the process of ginning may stop. Despite the existence of practical, scientific work devoted to the study of these cases from a physic mechanical point of view, the problem has not been completely resolved.

R.M. Kattaxodjaev studied the effect of large diemeter of saws on the technological parameters of the process of ginning in different modes. He found that the main factor influencing the stability of the ginning process was the separation of the depleted seeds from the raw material roller and their removal from the working chamber. The efficiency of the seed separation depends on the density of the raw material roller, the diameter of the saws and the length of the sawing bow , and the output from the working chamber depends on the covex part of the saw.

The process of ginning is not only depends on a saw gin machine, but also on a roller gin machine.

The main function of the roller gin machine is to separate the fibres of the long-stemmed cotton from the seeds.

The first production of XDG roller gins in our industry began in 1954. Then the XDV – type of roller gins began to be cast out, with its beating device being soft because the beating hammers were attached to the bullet leather.

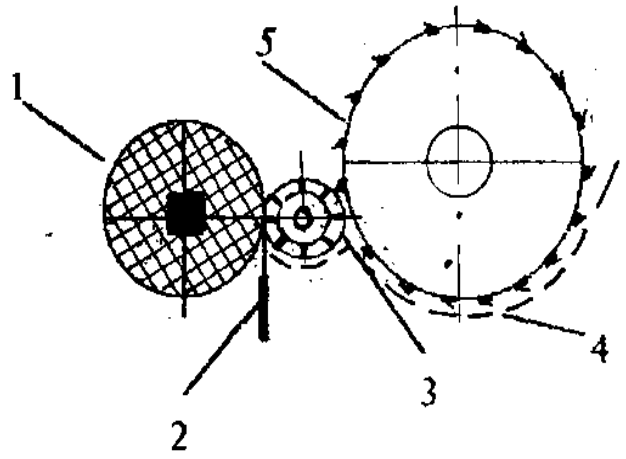
The productivity of this machine was much higher at that time (40 kg fibre/ h), but still the seed damage was much lower. Its disadvantage again, was its novelty, namely, it was fastened with leather, which made it much more unreliable, as it would break at high speeds (2200 rpm) and hit the seed, leading to disruption or cessation of the whole process. Of course the quality of the fibre and the seed would deteriorate.

Therefore, further scientific research was engaged in providing cottonto roller coasters, finding a way to change the structure and base of warhead, as well as changing the material and structure of the working roller. As a consequence of these studies, the types of roller gins XDV-2M, DV-1M, 2DV appeared.

The roller ginning process has been established to separate the high – grade varieties of cotton from the fibre seed. The essence of the roller gin is that the fibre cotton from the seeded cotton is transferred to the surface of the working rollerunder a stationary knife, and the remaining seeds is knocked down by sliding device.

The roller ginning process is as follows: the cotton from the mine passes through the receiving rollers and falls into a drum with a pile or a knife, in which the cotton is cleaned of fine impurities and falls into the saw drum. The saw drum rotates to pick up the cotton with its needles and carry it to the working roller surface. To return the excess cotton, the return roller rotates and lowers the excess, passing the cotton through it to the needle drum accelerator roller, which in turn throws the cotton onto the working roller surface. The working roller is made of RKM material, as a result of which the fixed blade is pressed against it, the sirface heats up and the bonding property of the fibre increases. The fibre adhering to the surface of the working roller is moved under the stationary blade, amd the seed remains out of reach, so that the beating device separates it from the fibre by striking or sliding it along a horizontal axis. The separated seed falls on the mesh surface under the tresher, passes through its holes and exits the machine. If there are seeds whose fibre has not been completely removed they cannot pass through the fibre hole in the surface of the net and pass into the needle drum, after which the

needle drum repeats the above process together with the new seed cotton. This situation continues several times until there is a normal amount of fibre hair on the surface of the seed. The fiber completely separated from the seed is lowered down from the surface of the working roller by its own weight or by means of a brush drum and removed from the machine.



The main working parts involved in the ginning process:

1- Working roller,
2- Fixed blade,
3- Percussion device,
4- Mesh surface,
5- Needle-shaped drum.

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