REDUCED ROVING BREAK AND SLEEVE WAVING WITH AN ADDITIONAL SUPPORT INSTALLED ON THE ROVING MACHINE

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Abstract: In this article, the physical and mechanical properties of the roving with an additional movable support installed on the walking table of the leveling machine are investigated. The basics of the technological processes of the latest, modern German-made Zinser Speed 5A roving machine with the unique E3 concept, as well as stretching, twisting and winding the roving, are also outlined.

Key words: linear density, winding, packing, roving, flyer, tape, reel, sliver, exhaust device, movable support, roving machine.

УМЕНЬШЕНИЕ ОБРЫВ РОВНИЦЫ И КОЛЕБАНИЕ МЫЧКИ С ДОПОЛНИТЕЛЬНОЙ УСТАНОВЛЕННОЙ ОПОРОЙ НА РОВНИЧНОЙ МАШИНЕ

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Аннотация: В данной статье исследовано физико-механическая свойства ровницы с установленной дополнительной подвижной опоры на рогулечный столе ровночной машине. Также изложены основы технологических процессов новейшего, современного ровничного машины немецкого производства Zinser Speed 5A с уникальной концепцией E^3, также вытягивания, кручения и наматывания ровницы.

Ключевые слова: линейная плотность, намотка, паковка, ровница, рогулька, лента, катушка, мычка, вытяжной прибор, опора, ровничная машина.

At present, there are several problems in the spinning industry regarding the spinning of various fibers to make yarn in the ring spinning process. Although this is considered one of the most difficult methods, spinners still choose the ring method for the production of yarn. Because the yarn produced with this method is of much higher quality and has many textures and features that are important for weaving.

This is connected, in turn, with the quality of the roving that the roving machine produces, since in the ring spinning method the yarn is directly spun from the roving. There are quite a few companies in the world that produce roving machines, including Trutzschler, Zinser, Marzoli, Rieter, Tayoda and others, although different companies, but roving machines have much in common between their design, features and characteristics [1,2,3].

On all roving machines, processes such as stretching, twisting and winding are carried out, i.e. the formation of a slightly twisted product from the tape, rovings and the formation of a roving package. The roving machine can process cotton, viscose, natural fibers, man-made fibers and their mixtures with a staple fiber length of up to 63 mm. To perform these processes, the roving machine has a feed frame, an exhaust device, a twisting and winding mechanism [4,5]. To feed the roving machine, 4 rows of round cans with a diameter of 500 mm to 600 mm are installed with one pass, necessary for machine maintenance. The sliver cans are taken out by slowly rotating feed rollers and these rollers reduce latent sliver draft. Since the distance of the tape from the basin of the last row to the exhaust device may exceed 5 meters, and the removal of the tape should not be forced. The drive of the supply shafts is carried out by a chain transmission from the supply cylinder, there is also a sensor, an automatic stop mechanism when the tape comes off or breaks and ends. For entry into the exhaust device, the tape passes through the carrier, which moves the tape along the cylinders [6,7,8].

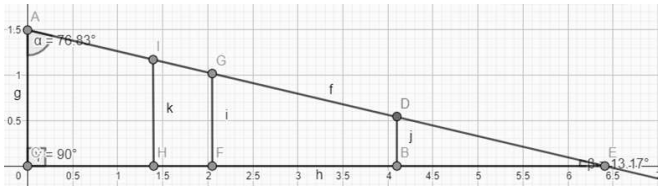
The tape is thinned in a three-cylinder two-strap or four-cylinder two-strap drafting device with three seals 3.0 - 15.8 times and is produced in the form of a weak sliver. The sliver is strengthened by direct torsion due to the rotation of the hanging flyer, which, after thinning, is directed into the hole in the upper part of the flyer, put on by a rapidly rotating spindle. The sliver is directly clamped with one end in the exhaust device, and with the other end in the upper part of the flyer, and for each revolution it receives one twist, where the twist range is 10–100 twists per meter, resulting in a roving rounded along the length [9,10,11]. And here there can be the main problems on the roving machine, such as the breakage of the roving or sliver, blockage of the sliver on the flyers, thinning and thickening of the roving in different places, jumping out and oscillation of the sliver, which will be introduced into the second row of the flyer of the roving machine. To prevent such problems in science, a lot of research has been done to this day. Since the smoother the roving, the fewer

breaks in the leveling machine itself, the productivity of the machine increases, the subsequent process, that is, the operation of the spinning machine is ensured, and the productivity increases[12,13,14].. With the installation of additional swivel supports on the leveling machine before the sliver hits the second row guide rail coming out of the last pair of drafting device, in order to prevent partial stretching, oscillation, jumping out and breakage, also improve the quality of the roving and optimize the drawing process, investigate the properties of the outgoing product and develop an economical technology [15,16,17].

It is recommended to install an additional rotating support on the flyer table, since the connection of a large distance between the last pair of drafting device and the guide of the second row can cause problems such as special stretching of the roving, jumping out and oscillation of the sliver and this also affects the quality of the roving. It is possible with the installation of rotating supports before the sliver hits the second row guide to prevent partial stretching, oscillation and breakage, as well as improving the quality of the roving and optimizing the drawing process, the properties of the roving will change and this may also affect the economic side of the machine. . The recommended scientific idea, in turn, does not interfere with the technological process, the additional movable support recommended by us receives movement from the outlet cylinder of the machine's exhaust device and ensures a uniform supply of the sliver [18,19,20].

Since the design of all roving machines is almost the same, this scientific idea is recommended for all machines. For this we have chosen a German-made Zinser Speed 5A roving machine. To do this, you need a polymer pipe d = 15 mm and steel material for support and bearings, gear, gear, chain drive. The support is 2080 mm long, like the output cylinder, with one post per section, 14 posts in total [21,22,23].

The location structure of the recommended movable support relative to the x and y axes of the coordinate line is shown.



Note:

CA= (150.0) mm height of the last exhaust cylinder;

CB= (410.0) mm distance of the second row carrier;

D= (55.410) mm;

F= (205.0) mm;

G= (205.102) mm;

H= (140.0) mm;

I = (139.117) mm;

E= (641.0) mm;

beam f = A, E in beam f=150x+641y=96 mm;

notch i = (F,G)= 102 mm height recommended additional swivel supports;

notch j = (B,D) j = 55 mm height of the second row of carrier;

notch k = (H,I) k = 117 mm height of the second row carrier;

point G is the recommended additional swivel support.

Conclusion: By installing additional swivel supports on the leveling machine before the sliver hits the second row runner coming out of the last pair of drafting device, it is possible to prevent a number of problems such as frequent stretching, oscillation, jumping and breaking, as well as improving the quality of the roving and optimizing the drawing process.

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