SLIP DRAFT DEVICE IN A SPINNING MACHINE

Filed April 5, 1960

Fig. 1

Fig. 2

Fig. 3

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SLIP DRAFT DEVICE IN A SPINNING MACHINE
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Filed Apr. 5, 1960, Ser. No. 20,061
3 Claims. (Cl. 19—259)

This invention relates to a slip draft device in a spinning machine, wherein a slip roller is provided between front and back rollers.

In a known slip draft device, the spindle of a slip roller is slidably mounted in a guide slot, and the roller is in contact with the cylindrical surface of a bottom roller mounted on a fixed bearing, and an intermediate bottom roller is provided under the slip roller and is spaced slightly therefrom. A sliver or fleece, which is called a strand hereinafter in this specification, fed from a pair of back rollers passes through the contacting parts between the slip roller and the bottom rollers, and is drawn by a pair of front rollers, being drafted between the back and slip rollers and again between the slip and front rollers as usual.

The main object of this invention is to obtain a means to automatically adjust the space between the intermediate roller and the top slip roller according to the thickness of strands treated, whereby the strand of fibers is always held at substantially a constant pressure regardless of variation of its thickness.

In the accompanying drawing, FIGURE 1 is a schematic front elevation of a slip draft device according to this invention; FIGURE 2 is a sectional view taken on lines 2—2 of FIGURE 1; and FIGURE 3 shows a modification of a part of FIGURE 2.

On a roller stand 3 of a spinning frame are adjustably fixed slide blocks 4, 5 and 6, and back, middle and front bottom rollers 7, 8 and 9 are rotatably mounted on respective blocks, and are driven by driving shafts, not shown. The spindles of top rollers 10, 11 and 12 are slidably held in respective guide slots 13, 14 and 15 by means of sleeves 16a, 17a and 18a, and each roller is loaded by its own weight and well-known loading means such as springs or weights, and is rotated by the contacting friction with respective bottom rollers. The chain-like spindles of the feed sliver or fleece to the draft.

The large top roller 11 between the front and back rollers, which is called "slip roller," is slidably fitted in the guide slot 14 and rests on the bottom roller 8. The spindle 17 of a roller 16, which is called an "intermediate roller" in this specification is mounted on a floating block 18 sitting on an elastic bed made of coil springs 19. Needle bearings 20 are employed in the floating block for the holding roller.

The cylindrical surface of the intermediate roller presses only lightly against the cylindrical surface of the slip roller under the influence of the springs 19 acting on floating block 18 when no strand of fiber is present between the intermediate roller and the top roller, and the contacting pressure can be adjusted by means of adjusting screws 22. However, since the load on the slip roller is far larger than the elastic force of the springs 19, the nipping action of the slip roller 11 on middle bottom roller 8 is not affected by the adjustment of the screws. Moreover, the pressure of intermediate roller 16 on slip roller 11 is never great enough to do more than straighten and align the fibers as they slip over roller 16.

A modification of the floating bed is illustrated in FIGURE 3, wherein a bellows 21 is employed instead of a spring, and the pressure of a fluid in the bellows can be adjusted by a regulating valve provided in the pipe led from a fluid source.

The adjusting screws 22 are set to adjust the pressure of the springs 19 on the bearing blocks 18. These adjusting screws force the springs against the bearing blocks so that when the intermediate roller 16 is spaced from the slip roller 11 by a strand of fibers of average thickness passing between these rollers, the desired pressure will be exerted on the strand of fibers by the intermediate roller. In a spinning operation, if a thicker part of a strand passes between the slip roller and the intermediate roller, the bearing blocks 18 are pushed by the strand against the spring or bellows so that the spacing is automatically varied.

In known slip draft devices, the bearing blocks for the intermediate roller are fixed keeping a definite clearance between the slip roller and the holding roller. Therefore, if a thicker part of a strand passes the clearance, the pressure acting on the strand is abnormally increased, while if a thinner part passes the clearance, almost no pressure acts on the strand, so that the sliver cannot be smoothly drafted and even threads cannot be obtained.

And, if the spacing is required to be changed, the bearing blocks of the slip roller have to be removed in the horizontal direction when the machine is not in operation. For this purpose, the slip roller on which the slip roller is supported is generally divided into two pieces, upper and lower, and the upper piece having therein the slot for the slip roller can be adjusted relative to the lower one which has the intermediate roller mounted thereon.

According to the present invention, however, the bearing blocks for the intermediate roller are resiliently maintained in the guide slot, so that the roller automatically varies its position so that the pressure against the strand is kept almost constant, so that the difficulties which were heretofore caused by the predetermined spacing of the rollers are overcome, and the drafting action is smoothly carried out under a proper condition resulting in a superior spinning effect. In view of this the adjustment of the bearing blocks need not be changed if the average size of the sliver is not greatly changed.

I claim:
1. In a drafting mechanism, the combination of a pair of top and bottom front rollers, a slip roller immediately behind the top front roller, a bottom roller against which said slip roller runs and having a diameter smaller than the diameter of said slip roller for gripping a sliver as it is drawn toward the front rollers, an intermediate roller between said bottom front roller and said bottom roller and contacting said slip roller and being driven by said slip roller, and resilient mounting means on which said intermediate roller is mounted resiliently urging said intermediate roller against said slip roller, whereby the clearance between the slip roller and the intermediate roller is varied by the resilient mounting means during the operation of the mechanism depending on the thickness of the sliver which is passing between the slip roller and the intermediate roller, and pressure rollers are always nipped at a substantially constant pressure.
2. In a drafting mechanism, the combination of a pair of top and bottom front rollers, a slip roller immediately behind the top front roller, a bottom roller against which said slip roller runs and having a diameter smaller than the diameter of said slip roller for gripping a sliver as it is drawn toward the front rollers, mounting means on which said slip roller is mounted and on which said bottom roller is fixedly mounted, an intermediate roller between said bottom front roller and said bottom roller and having a diameter less than the diameter of said bottom roller and contacting said slip roller and being driven by said slip roller, a pair of bearing blocks slidably mounted...
3. In said mounting means for movement substantially perpendicular to the direction of the sliver and on which said intermediate roller is mounted, and resilient means acting on said bearing blocks and resiliently urging said intermediate roller against said slip roller, whereby the clearance between the slip roller and the intermediate roller is varied by the resilient means during the operation of the mechanism depending on the thickness of the sliver which is passing between the slip roller and the intermediate roller, and the fibers are always nipped at a substantially constant pressure.

3. The combination as claimed in claim 2 in which said resilient means comprise a spring acting on each bearing block, and means bearing on said spring for adjusting the compression of said spring.

4. The combination as claimed in claim 2 in which said resilient means comprise a bellows acting on each bearing block, and means connected to each bellows for adjusting the fluid pressure therein.

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