March 16, 1954 R. RULON-MILLER 2,671,934

TOP ROLL FOR SPINNING FRAMES OR THE LIKE

Filed Aug. 30, 1948

FIG. 1

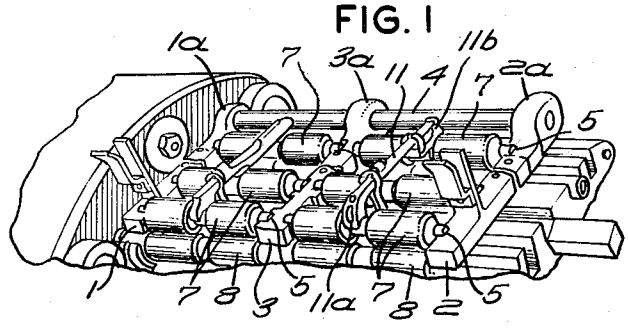


FIG. 2

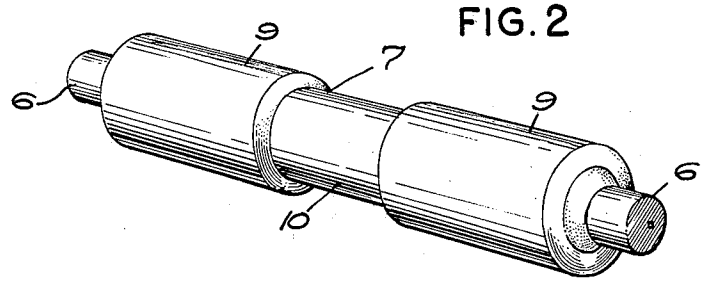


FIG. 3

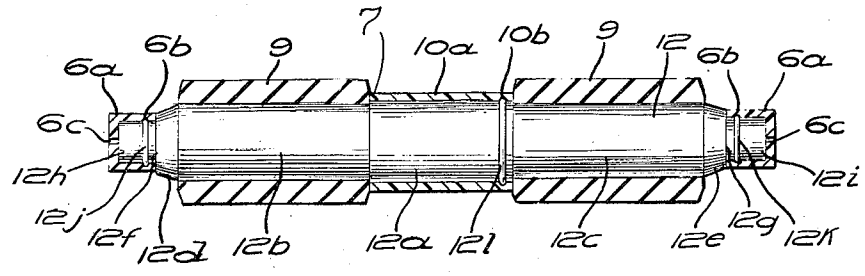
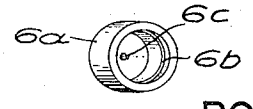


FIG. 4



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TOP ROLL FOR SPINNING FRAMES OR THE LIKE

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2 Claims. (Cl. 19—142)

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This invention relates to improvements in a top roll for a spinning frame or the like. More especially it has to do with the provision of improved bearing surfaces on such a roll.

The usual top roll of a sipinning frame "floats," as it were, in open slots of metal cap bars. The bearing surfaces of such a top roll are also of metal and the contact between the metal surfaces of the roll and the metal surfaces of the cap bar leads to very great wear. This wear is frequently not uniform and when the unevenness becomes excessive the top roll gets out of alignment with its co-operating bottom roll and this interferes with the desired drawing of the yarn being processed. Lubricating the bearing surfaces will naturally reduce or retard the wear but this presents another undesirable result in that the yarn itself may absorb some of the lubricant and be thereby damaged. Also the lubrication gradually spreads over adjacent surfaces of the machine and serves as a trap for lint and other particles of dirt.

The present invention has for its primary object to provide a top roll having bearing surfaces which require no lubrication, which have a very low coefficient of friction, and which are extremely durable. This principal object is attained by providing plastic bearing surfaces on the roll. For example, the entire shaft of the roll could be made of plastic material but I prefer to apply plastic caps or sleeves to a metal shaft. Another object has to do with simple but effective means for normally retaining these sleeves or caps in place and yet permitting their ready removal if desired.

The best mode in which it has been contemplated to apply the principles of the present improvements is shown in the accompanying drawings but these are to be deemed illustrative for it is intended that the patent shall cover by suitable expression in the appended claims whatever features of patentable novelty exist in the invention disclosed.

In the accompanying drawings:

Fig. 1 is a perspective of a portion of a spinning frame equipped with improved top rolls embodying the present invention;

Fig. 2 is a perspective of the improved top roll itself;

Fig. 3 is a medial longitudinal sectional view of the improved top roll; and

Fig. 4 is a perspective of the novel end cap sleeve.

Referring more particularly to the drawings, Fig. 1 shows a portion of a spinning frame having a pair of end cap bars 1 and 2 and an intermediate cap bar 3, all having hubs 1*a*, 2*a* and 3*a*, mounted on a cap bar rod 4. Each end cap bar has a series of slots 5 in one of its sides into which the end bearings 6 of top rolls 7 project. The intermediate cap bar 3 has similar slots on opposite sides to receive the other end bearings of aligned top rolls. Underneath each top roll is a corresponding bottom roll 8 which is power driven and coacts with the top rolls to draw the yarn through the frame.

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Adjacent the end bearings of each top roll are so-called "cots" 9 (see Fig. 2) which may be made of rubber, fibre or other material suitable for engaging yarn passing between the top rolls and their corresponding bottom rolls. Between these cots the top roll has an intermediate bearing 10 upon which rides the front saddle 11*a* or the backsaddle 11*b* of a saddle assembly 11. By means of this assembly weight is imposed upon the top rolls so that they in turn exert a desired pressure on the yarn.

Heretofore the several cap bars have been made of metal and so likewise has the end and intermediate bearings of the top rolls. As already stated the consequent metal to metal contact has resulted in considerable wear of both the cap bars and the top rolls. It is obvious that if lubrication is applied to the surfaces subject to such wear it can and frequently does reach the surface of the cots and is then likely to be absorbed by the yarn being processed. The lubricant also spreads over the cap bars and over the saddles and this thin film of lubricant retains particles of dirt and lint which may be in the atmosphere and come to rest on the lubricant-filmed parts.

The improved top roll avoids all such troubles due either to excessive wear or arising from the use of any lubricant because the roll is provided with plastic bearing surfaces which have an exceedingly low coefficient of friction, are extremely durable, and do not need any lubricant. These bearing surfaces are the surfaces of a plastic sleeve 10*a* (see Fig. 3) fitted onto the top roll shaft 12 between the cots, and the surfaces of plastic cap sleeves 6*a* fitted on the ends of the shaft outside the cots.

It is to be noted that the middle portion 12*a* of the top roll shaft has a larger diameter than the adjacent portions 12*b* and 12*c* on which the cots 9 are mounted. Beyond the outer ends of these latter portions the shaft is tapered, as at 12*d* and 12*e*, and at the outer end of each tapered portion is a radially extending shoulder 12*f* and

12g. From each shoulder the shaft extends as a hub 12h and 12i to its end, being cylindrical except for a slight ridge 12j and 12k near the said shoulders. A similar ridge 12l is provided on the middle portion 12a of the shaft, preferably near one end thereof. The size of all these ridges is somewhat exaggerated in Fig. 3 for purposes of clearness.

The sleeve 10a has a circumferential groove 10b in its inner surface to receive the ridge 12l when this sleeve is slipped along the portion 12a of the shaft, the material of the sleeve expanding slightly to permit the short passage of the end of the sleeve over the ridge just before the latter registers in the groove 10b. The end cap sleeves 6a are similarly formed with grooves 6b to receive the ridges 12j and 12k as these end sleeves are pushed onto the end hubs of the shaft. Each of the end cap sleeves has a minute hole 6c in its otherwise closed end to enable air to escape as the sleeve is pushed along the hub into contact with the shoulder (12f or 12g) on the shaft.

As the cots wear and need to be replaced they can be removed from the portions 12b and 12c of the shaft by simply slipping them off their respective ends of the shaft. With the left cot 9 removed, it is to be noted that the plastic sleeve 10a can also be slipped off the shaft since its inside dimension is greater than that of the portion 12b of the shaft. The end sleeves 6a can of course be removed anytime if they should need to be. Removal of any of the plastic sleeves is not anticipated, however, because the material of which they are to be made is extremely durable and highly resistant to wear.

This plastic material may be that known under the trade-name of nylon or any like material having a hardness substantially equal to a Rockwell hardness of 90–95 on the M scale. This material can be cast or molded to any desired shape, such as that of the sleeves disclosed herein, to provide the desired bearing surfaces for the improved top roll.

Since this plastic material has a very low coefficient of friction there is very little wear on the sleeves and on the metal surfaces of the cap bars with which the plastic bearing surfaces are in contact. Likewise, because of the greatly reduced friction, there is no need for any lubricant to be used. In the event of any unanticipated damage

to a sleeve it can readily be removed and replaced by a new one, but the interengagement of the ridges on the shaft and the grooves in the sleeves insures that the latter will remain in place until intentionally removed.

I claim:

1. A top roll for a spinning frame or the like having a metal shaft with a portion thereof cylindrical except for a raised circumferential ridge of the same piece of material as said shaft, and a nylon sleeve constituting a bearing element of said roll having an internal circumferential groove to receive said ridge; the said sleeve yielding sufficiently as it is slipped along the said shaft portion to permit the groove and ridge to be brought into register.

2. A top roll for a spinning frame or the like having a metal shaft with hub portions at each end of cylindrical shape except for a circumferential ridge therearound of the same piece of material as said shaft, and nylon end sleeves fitted over said hubs constituting bearing elements of said roll, each sleeve having an internal circumferential groove to receive the ridge on said hub and thereby retain the sleeve in place.

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