Dec. 1, 1959 B. C. COLE ET AL 2,914,811

TOP ROLL SUPPORTING MEANS

Filed Aug. 18, 1954 2 Sheets-Sheet 1

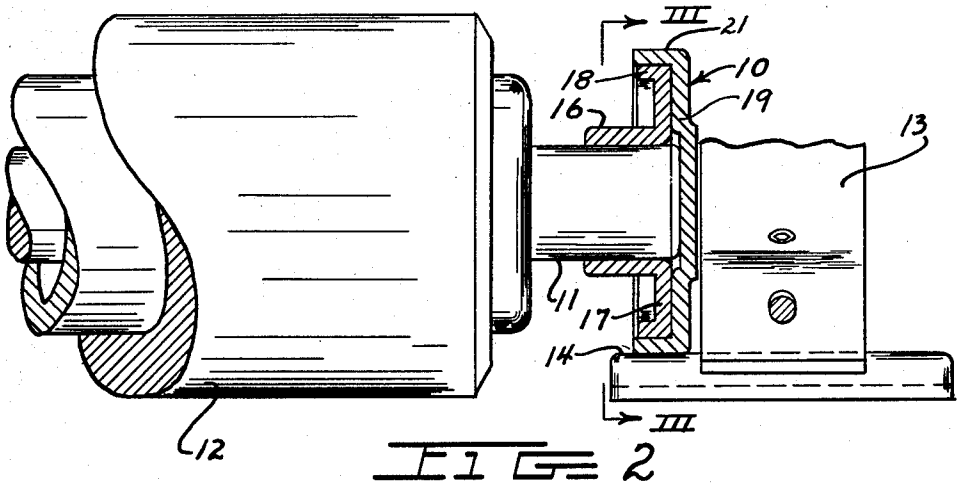


FIG 2

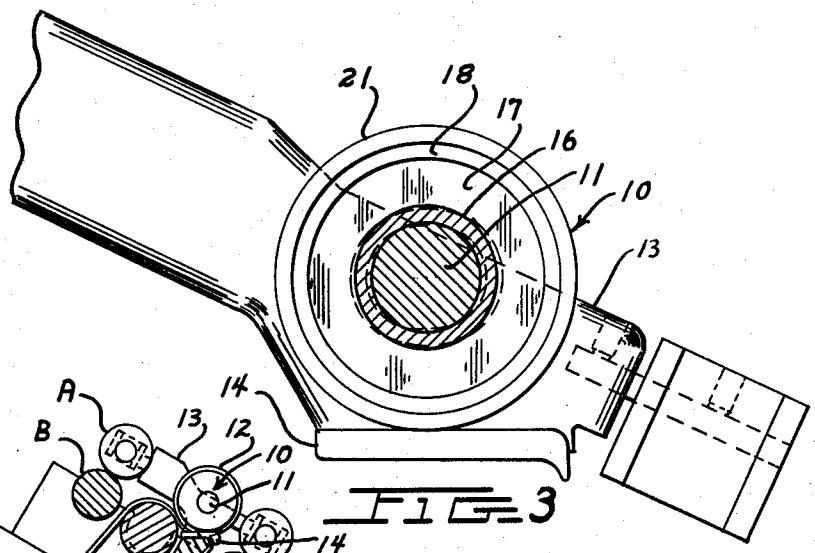


FIG 3

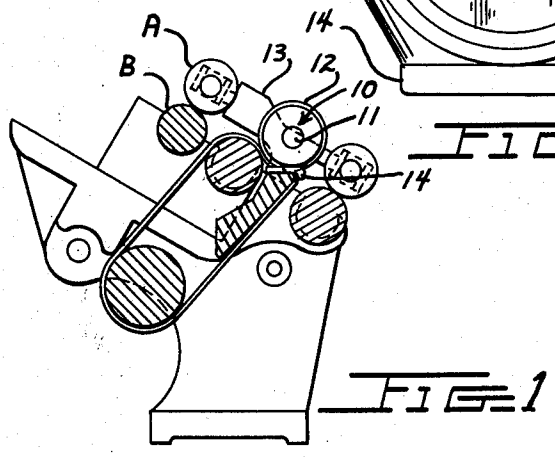


FIG 1

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TOP ROLL SUPPORTING MEANS

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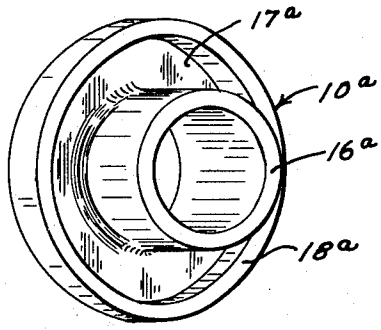


FIG. 4

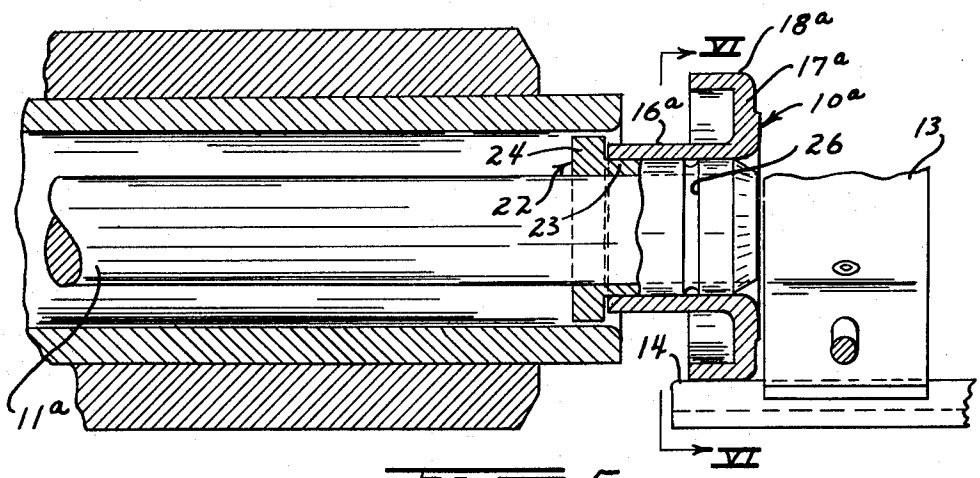


FIG. 5

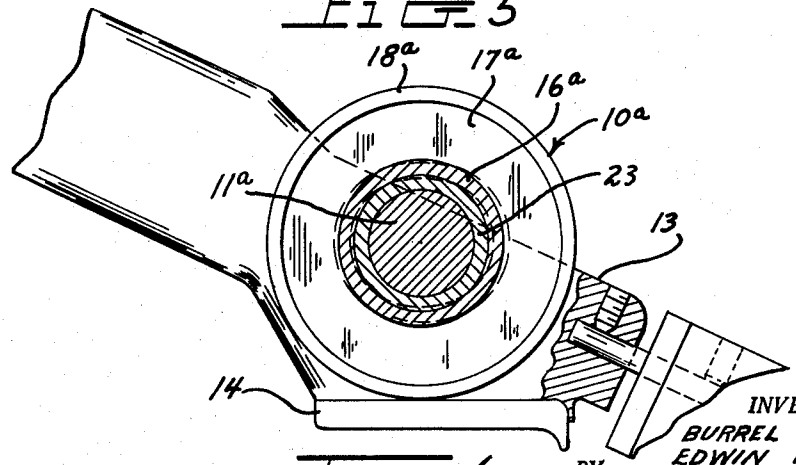


FIG. 6

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2,914,811

TOP ROLL SUPPORTING MEANS

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Application August 18, 1954, Serial No. 450,702

14 Claims. (Cl. 19—134)

This invention relates to means for supporting middle line top rolls of fiber attenuating apparatus, such as spinning frames, roving frames and the like and more particularly to removable support assemblies at the ends of the middle line top rolls.

An object of our invention is to provide a simplified and less expensive support assembly for supporting the ends of the middle line top rolls which may be readily installed on the ends of the spindle of the roll with an accurate and concentric fit and without the necessity of grooved adaptors on the spindle or internal wire snap rings within the support assembly.

As is well known in the art to which our invention relates, some drafting units do not have the top rolls weighted directly against the corresponding driven bottom rolls but are positioned slightly forward of the bottom rolls so that the fibers being drawn between the rolls will not follow a straight line but will follow the circumference of the rolls. Accordingly, there must be a resting point on some part of the frame to control the downward position of the weighted top rolls. Heretofore, the middle line top rolls have been supported by round support members at each end of the roll spindle which are locked in position by providing grooved adaptors on the spindle for receiving internal wire snap rings in the support member. Since the diameter of the support member at the end of the spindle is usually larger than the cylinders of the roll, it is necessary that the support member be removable for replacement of cots or coverings on the roll cylinders. Also, the support members are usually changed when the mill changes its product due to the fact that different products call for support members having different outside diameters. The support member must not be loosely fitted on the spindle due to the fact that should it drop off while the frame is running serious damage would be caused to the apparatus.

To overcome the above and other difficulties we provide a support assembly having a hub portion formed of a resilient material which is pressed over the spindle. The inner end of the hub portion is normally slightly elliptical, so that upon pressing the same over the spindle it assumes a shape which is concentric with the center line of the spindle. Tension is thus applied at opposite points on the hub due to the fact that the inner end of the hub tends to resume its normal elliptical shape thereby causing the support assembly to cling to the spindle.

A support assembly embodying features of our invention is illustrated in the accompanying drawings forming a part of this application, in which:

Fig. 1 is a vertical sectional view through one side of the roll stand of a conventional type of spinning or roving frame, certain parts being omitted for the sake of clarity;

Fig. 2 is a fragmental side elevational view of a middle line top roll showing our improved support assembly attached thereto and in section;

Fig. 3 is a sectional view taken generally along the line III—III of Fig. 2;

Fig. 4 is a perspective view showing a modified form of support assembly, which is adapted for replacement of conventional types of support members on spindles having an adaptor for receiving the support members;

Fig. 5 is a sectional view of the support assembly shown in Fig. 4, showing the same applied to the end of a top roll having a grooved adaptor for receiving a conventional type support assembly; and

Fig. 6 is a sectional view taken along the line VI—VI of Fig. 5.

Referring now to the drawings for a better understanding of our invention, we show our improved support member **10** mounted at the outer end of the spindle **11** of a middle line top roll indicated generally at **12**. As is well known in the art, the top rolls, indicated at A, rest on their respective lower rolls B and the front and rear top rolls are held in cooperative relationship to their respective lower rolls by suitable guides mounted at the ends of the cap bar indicated at **13**. The middle line top roll **12** is not so supported by the cap bar but is mounted for fore and aft movement relative to the cap bar on horizontal members **14**. That is, the middle line top roll **12** rotates on the spindle **11** and the spindle is supported at its ends by support members **10** which rest on the horizontal members **14**.

Our improved support member **10** comprises an elongated sleeve-like hub **16** formed of a resilient material and having substantially the same internal circumference throughout the length thereof. Also, the hub is of a size to fit about the spindle **11** with a close clearance. Formed integrally with the hub **16** and projecting radially from the outer end thereof is an annular flange **17** having an inturned annular flange **18** at the perimeter thereof which extends in a direction substantially parallel to the axial center line of the hub. Pressed over the inturned flange **18** with a permanent fit is a cup-shaped member **19** having an annular side wall **21**. The inner surface of the cup-shaped member **19** engages the outer end of the spindle **11**, as shown in Fig. 2 and limits inward movement of the support member **10** thereon.

The inner end of the hub **16** is normally slightly elliptical, whereby when it is pressed over the end of the spindle **11** it assumes a shape which is concentric with the center line of the spindle. Due to the fact that the hub **16** is formed of a resilient material, the inner end thereof tends to resume its normal elliptical shape after it is pressed over the spindle, thereby maintaining a tension fit between the hub and the spindle regardless of the number of times the hub is pressed on or removed from the spindle. The normally elliptical shape of the inner end of the hub **16** is shown in dotted lines in Fig. 3, while the circular form assumed when it is pressed over the end of the spindle **11** is shown in solid lines. The outer portion of the hub **16** adjacent the radially extending flange **17** is in the form of a circle, as viewed in transverse section. Preferably, both parts of the support member **10** are made of drawn resilient metal and the hub portion **16** thereof is hardened by heat treatment so that there will be a tension fit between the hub and the spindle **11** regardless of the number of times the hub is pressed on or removed from the spindle.

As shown in Fig. 2, the annular flange **21** of the cup-shaped member **19** extends in a direction substantially parallel to the center line of the spindle, thus providing a relatively flat annular bearing surface which is concentric with the center line of the spindle. Lateral movement of the middle line top roll assembly is limited by the cap bars **13** which bear against the outer surface of the cup shaped members **19** at each end of the top roll assembly.

In Figs. 4 to 6 we show a slightly modified form of our invention which is adapted for use on middle line top

roll assemblies having grooved adaptor members **22** pressed onto the ends of the spindle **11***a*. The adaptor **22** embodies a sleeve portion **23** having an annular collar **24** at the inner end thereof for limiting inward movement of the support member and the usual annular groove **26** for receiving a suitable internal wire snap ring positioned in the conventional types of support members. In view of the fact that the annular collar **24** on the adaptor **22** limits inward movement of the bearing member, we eliminate the cup like member **19** in our modified form of support member indicated at **10***a*. The support member **10***a* comprises an elongated hub **16***a* formed of a resilient material and having an internal circumference which is substantially the same throughout the length thereof and of a size to fit snugly over the sleeve portion **23** of the adaptor **22**. The inner portion of the hub **16***a* is normally slightly elliptical as viewed in transverse section, whereby it assumes a shape concentric with the sleeve portion **23** when pressed over the same. The outer portion of the hub **16***a* is substantially concentric with the center line of the spindle **11***a* and the sleeve **23**, and fits about the sleeve with a close clearance thereby providing an accurate and concentric fit between the hub and the sleeve. Projecting radially from the outer end of the hub **16***a* is an annular flange **17***a* having an inturned annular flange **18***a* at the outer perimeter thereof. The inturned flange **18***a* is relatively wide and extends in a direction substantially parallel to the axial center line of the shaft **11***a* and the sleeve **23** thus providing a relatively flat annular surface for engaging the horizontal members **14** mounted alongside the cap bars **13**. The elliptical shape of the inner end of the hub **16***a* is shown in dotted lines in Fig. 6, while the circular position that the inner end of the hub **16***a* assumes when pressed over the sleeve **23** is shown in solid lines.

From the foregoing description, the operation of our improved support member will be readily understood. Where middle line top rolls are employed having adaptors **22** mounted on the ends of the spindle thereof, our improved support members **10***a* are employed as a replacement. The hub **16***a* of the support member **10***a* is pressed over the sleeve portion **23** of the adaptor, thus causing the elliptical inner portion of the hub **16***a* to assume a circular shape concentric with the sleeve portion **23** and the spindle **11***a*. In this position, the inner portion of the hub **16***a* fits about the sleeve portion **23** with tension at opposite points thereby causing the hub to cling to the sleeve. Where middle line top rolls are employed having a standard spindle or journal without an adaptor, our improved support member **10**, shown in Figs. 2 and 3, is employed. The hub **16** is pressed onto the spindle **11** whereby the inner elliptical portion of the hub **16** assumes a circular shape which is concentric with the spindle **11** thereby attaching the support assembly **10** onto the spindle. Inward movement of the support assembly relative to the spindle **11** is limited by the cup shaped member **19** which engages the outer end of the spindle **11**.

From the foregoing it will be seen that we have provided an improved, removable support assembly which may be readily installed on the ends of the spindle of an anti-friction top roll with an accurate and concentric fit. Also, our support assembly is adapted for attachment to the end of the spindle without the necessity of grooved adaptors on the shaft which cooperate with internal wire snap rings in the support members. Furthermore, it will be seen that we have provided an assembly for supporting middle line top rolls which is simple of construction, economical of manufacture and one which readily lends itself to mass production.

While we have shown our invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and we desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What we claim is:

1. In means for supporting a middle line top roll for fore and aft movement relative to a cap bar in fiber attenuating apparatus having an axially extending spindle projecting from an end thereof, an axially extending sleeve-like hub having a resilient inner end normally slightly elliptical as viewed in transverse section and of a diameter to assume a shape which is concentric with the center line of the spindle when pressed over the end thereof, and an annular support member at the outer end of said hub extending outwardly from said hub and having an outer surface which is concentric with the center line of said spindle when the hub is pressed over the end of the spindle whereby the end of the spindle is supported on said support member for movement relative to the cap bar.

2. Means for supporting a top roll as defined in claim 1 in which the support member extends radially from the outer end of the hub.

3. Means for supporting a top roll as defined in claim 2 in which the outer edge of the support member extends in a direction parallel to said hub to form a relatively flat annular supporting surface.

4. In means for supporting a top middle line roll for fore and aft movement relative to a cap bar in fiber attenuating apparatus having an axially extending spindle projecting from an end thereof, an elongated sleeve-like hub of a diameter to encircle the outer end of said spindle with a close clearance, the inner end of said hub being resilient and normally slightly elliptical as viewed in transverse section whereby it assumes a shape concentric with the center line of said spindle when pressed over the end thereof, a radially extending annular flange adjacent the outer end of said hub, and an annular inturned supporting flange at the outer perimeter of said radially extending annular flange and forming a relatively flat annular supporting surface whereby the end of the spindle is supported on said supporting flange for movement relative to the cap bar.

5. In means for supporting a top roll for fiber attenuating apparatus having an axially extending spindle projecting from an end thereof, an elongated hub of a size to encircle the outer end of said spindle with a close clearance, the inner end of said hub being resilient and normally slightly elliptical as viewed in transverse section whereby it assumes a shape concentric with the center line of said spindle when pressed over the end thereof, a radially extending annular flange adjacent the outer end of said hub, and a cup shaped member pressed over said annular flange forming an annular supporting surface and limiting inward movement of said hub.

6. In means for supporting a top roll as defined in claim 5 in which the radially extending annular flange is provided with an annular flange at the outer perimeter thereof which extends inwardly in a direction substantially parallel to the axial center line of the hub and engages the inner wall of the cup shaped member with a permanent fit.

7. The combination with a top roll for fiber attenuating apparatus having an axially extending spindle projecting from an end thereof and an adaptor member including a sleeve portion with a collar at the inner end thereof pressed over the end of the spindle, of an elongated hub member of a size to encircle the sleeve portion of the adaptor member with a close clearance, the inner end of said hub member being resilient and normally slightly elliptical as viewed in transverse section whereby it assumes a shape concentric with the center line of the spindle when pressed over said sleeve portion, and an annular support member at the outer end of said hub member.

8. The combination set forth in claim 7 in which the

support member is in the form of a radially extending annular flange at the outer end of the hub member.

9. The combination set forth in claim 8 in which the radially extending annular flange is provided with an annular flange at the outer perimeter thereof which extends inwardly in a direction substantially parallel to the axial center line of the hub member to form a relatively flat annular supporting surface.

10. In an article of manufacture, an elongated sleeve-like hub having substantially the same internal circumference throughout the length thereof, one end of said hub being resilient and normally slightly elliptical and the other end being substantially circular as viewed in transverse section and a radially extending annular support member at said other end of the hub.

11. An article of manufacture as defined in claim 10 in which the support member is in the form of a radially extending annular flange formed integrally with the hub.

12. An article of manufacture as defined in claim 11 in which the radially extending annular flange is provided with an annular flange at the outer perimeter thereof which extends inwardly in a direction substantially parallel to the axial center line of the hub to define a relatively flat annular supporting surface.

13. In an article of manufacture, an elongated sleeve-like hub having substantially the same internal circumference throughout the length thereof, one end of said hub being resilient and normally slightly elliptical and the other end being substantially circular as viewed in transverse section, a radially extending annular flange at said other end of the hub, and a cup shaped member pressed over said annular flange.

14. An article of manufacture as defined in claim 13 in which the radially extending annular flange is provided with an annular flange at its perimeter extending in a direction substantially parallel to the axial center line of the hub and engages the inner wall of the cup shaped member.

References Cited in the file of this patent

UNITED STATES PATENTS

561,441	Schmidt	June 2, 1896
1,696,553	Owen	Dec. 25, 1928
2,329,655	Shaw	Sept. 14, 1943
2,465,726	Hoffar	Mar. 29, 1949
2,536,388	Murray	Jan. 2, 1951
2,546,061	De Beauvais	Mar. 20, 1951
2,621,374	Waite	Dec. 16, 1952
2,667,373	Holsing	Jan. 26, 1954