June 10, 1924. 1,496,835

W. E. WARDWELL

TOP ROLL CONSTRUCTION FOR SPINNING FRAMES

Filed Nov. 17, 1922

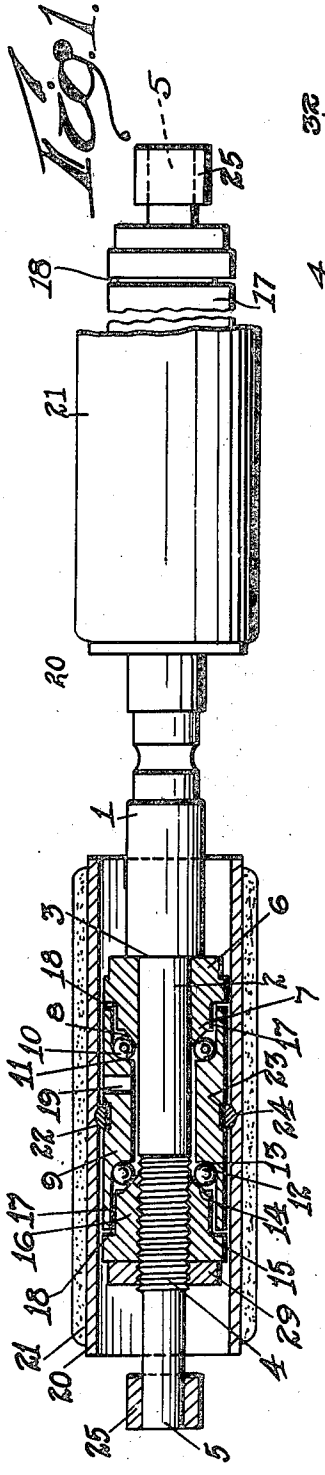


Fig. 1.

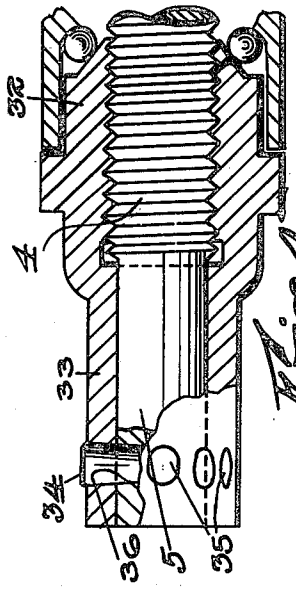


Fig. 4.

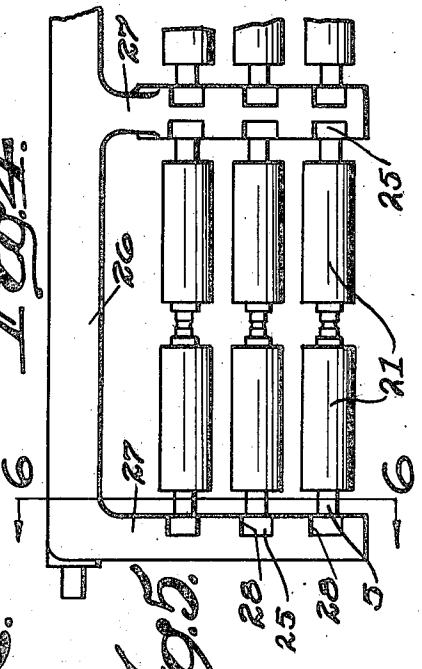


Fig. 5.

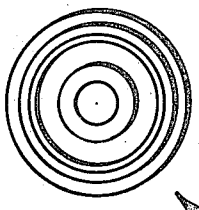


Fig. 2.

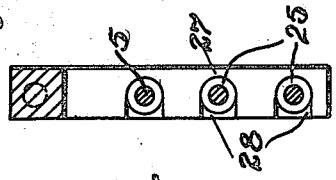


Fig. 6.

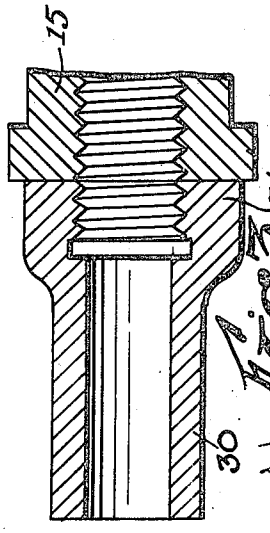


Fig. 3.

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UNITED STATES PATENT OFFICE.

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TOP-ROLL CONSTRUCTION FOR SPINNING FRAMES.

Application filed November 17, 1922. Serial No. 601,581.

To all whom it may concern:

Be it known that I, WILLIAM EMORY WARDWELL, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented new and useful Improvements in a Top-Roll Construction for Spinning Frames, of which the following, together with the accompanying drawings, is a specification.

My invention relates to top rolls for spinning frames, drawing frames, speeders, and other similar textile machines, and has for its object to provide certain improvements in the construction and arrangement of the parts of top rolls, whereby top rolls embodying my invention may be cheaply and easily manufactured, and when employed in a spinning frame, will be more effective in operation than top rolls heretofore constructed.

My invention contemplates an improved top roll construction in which the individual top rolls are adapted to rotate independently of each other on a one piece central arbor having suitable end pieces coacting therewith, whereby the top roll assembly can be supported in the usual cap bars provided on spinning frames, without necessitating any alteration of the cap bars. My invention further contemplates a novel arrangement of the several parts entering into the top roll assembly, whereby the detrimental effects, due to the collection of fly, lint and dust, are reduced to a minimum, owing to the fact that the only rotating parts of the top roll assembly are completely enclosed within the rolls and that novel effective means are provided for preventing the access of fly, lint and dust to the rotating parts. My invention further contemplates an improved arrangement for readily lubricating the bearings of the top rolls without changing the position of any of the parts entering into the dust proof construction. The above and other advantageous features of my invention will hereinafter more fully appear, reference being had to the accompanying drawings in which,

Fig. 1 is a view, partially in longitudinal section, and partially in elevation, of a top roll construction embodying my invention.

Fig. 2 is an end view of the parts shown in Fig. 1.

Fig. 3 is an enlarged transverse sectional view of a portion of the parts shown in Fig. 1, and illustrating a modification of the means for supporting the central arbor.

Fig. 4 is a sectional view similar to Fig. 3, showing a further modification in the means for supporting the central arbor.

Fig. 5 is a plan view of a portion of a cap bar supporting a number of top rolls constructed in accordance with my invention.

Fig. 6 is a sectional view along the line 6—6 of Fig. 5, looking in the direction of the arrows.

Like reference characters refer to like parts in the different figures.

Referring to Figs. 1 and 2, my improved top roll construction comprises a central arbor 1 having reduced portions 2 on each side of its middle section, thereby providing shoulders 3. Each reduced portion 2 is provided with screw threads 4, and the end portions 5 of the arbor 1 are further reduced beyond the screw threads 4. A collar 6 is pressed on each reduced portion 2 to abut the shoulder 3, and is provided with a portion 7 of reduced diameter, beyond which is formed a conical ball seat 8.

A cylindrical sleeve 9 having an internal diameter somewhat greater than the diameter of a reduced portion 2 of the arbor, is rotatably supported with respect to the arbor 1 by a series of balls 10 interposed between the conical seat 8 of the collar 6 and a concave seat 11 provided near one end of the sleeve 9. A second series of balls 12 are interposed between a concave seat 13 provided at the other end of the sleeve 9 and a conical seat 14 provided on a collar 15 coacting with the screw threads 4 of the arbor portion 2. The collar 15 is provided with a reduced portion 16, and the sleeve 9 is extended beyond each ball seat 11 and 13 to provide annular lips 17, surrounding the collar portions 7 and 16. The lips 17 have an inside diameter slightly greater than the reduced portions 7 and 16, and each lip 17 terminates just short of the shoulder at the end of each reduced portion 7 and 16, thereby leaving a narrow space 18 extend-

ing substantially at right angles to the concentric surfaces of the collars 6 and 15 of the sleeve 9. The sleeve 9 is further provided with a passage 19 extending transversely therewith, the purpose of which will be hereinafter described.

A hollow cylindrical shell 20, covered with a layer 21 of suitable frictional material, such as leather, surrounds each sleeve 9, the inside diameter of each shell 20 being such that it may be slipped over a sleeve 9 and secured in position thereon by means of a spring locking ring 22. Each locking ring 22 is seated in a groove 23 provided on a sleeve 9, and normally projects beyond the periphery of the sleeve 9, so that when the shell 20 is slipped over the sleeve 9, the ring 22 is compressed. The inner surface of the shell 20 is provided with a groove 24 which is adapted to receive the ring 22, and thereby position the shell 20 on the sleeve 9 and cause it to rotate therewith on the balls 10 and 12.

Each reduced portion 5 of the arbor 1 has an end piece 25 pressed thereon, which is adapted to fit closely in any one of the several notches provided on the usual form of cap bar. A portion of such a cap bar is indicated at 26 in Fig. 5, the cap bar being provided with a plurality of spaced arms 27. The opposed surfaces of adjacent arms 27 are provided with pairs of alined notches 28 which have been heretofore adapted to receive the ends of top roll shafts. The outside dimension of each end piece 25 is slightly less than the width of the notches 28 in the cap bar arms 27, so that the central arbor 1 is held in axial alinement with respect to the cooperating knurled steel rolls, and at the same time is capable of free movement in a plane at right angles to the cap bar arms. It is apparent from an inspection of Figs. 5 and 6, that the clearance between adjacent top roll shells 20 is such that in order to employ my improved top roll construction in connection with a unitary central arbor extending from one cap bar arm to another, it may be necessary to so reduce the end portions of the arbor that they will not fit the notches in the usual cap bar arms. Consequently, the provision of the end pieces 25 permits my improved top roll construction to be used in connection with existing cap bars without necessitating any changes therein.

Referring again to Fig. 1, it is apparent that when the various parts previously described have been assembled on the arbor 1, the respective series of balls 10 and 12 may be properly adjusted with respect to their seats, by turning the adjusting collar 15 on the threaded portion of the arbor. When the proper adjustment has been obtained, the collar 15 is secured in position against axial movement, by means of a lock nut 29, after which, each end piece 25 is pressed on the end portions of the arbor. When the collars 15 have been locked in position and the end pieces forced on, it is most desirable that this adjustment be maintained, and in order to insure that the ball bearings may be conveniently lubricated after their assembly, I have provided a passage 19 in each sleeve 9. When it is desired to insert lubricant through the passage, all that is necessary is to slip the shell 20 off of its sleeve 9, the ring 22 compressing enough to be unseated from the groove 24. Lubricant may then be inserted through the opening 19 without disturbing in any way the adjustment of the ball bearings, whereupon the shell 20 may be replaced and the opening 19 completely covered to prevent the entrance of fly, lint, and dust therein.

As previously stated, it is one of the objects of my invention to provide a novel construction in which the detrimental effects, due to the collection of fly, dust, and lint on the rotating parts, are reduced to a minimum. This particular object is obtained by the construction of the ball collars 6 and 15 and the sleeve 9 in such a manner that the necessary clearance spaces between these members are so disposed as to practically exclude all foreign matter from the balls 10 and 12. From a consideration of Fig. 1, it is apparent that any fly, lint, or dust, collecting on the inner surface of a shell 20, must first pass through the spaces 18 before it can reach either set of balls, but as these spaces 18 are disposed in planes substantially at right angles to the axis of rotation of the arbor, rotation of the arbor itself, will tend to keep these spaces clear by centrifugal action. As a matter of fact, any leakage of lubricant from the bearings will be radially outward through the spaces 18, so that the only lubricant that can come into contact with fly, lint or dust, will be lubricant which cannot return to the ball bearings themselves.

A modification in the manner of locking the adjustable bearing collar 15 on the arbor 1, is shown in Fig. 3, in which a locking sleeve 30 surrounds the end portion 5 of the arbor, and is provided with an enlarged head 31 internally threaded, so that it may be employed to lock the adjusting collar 15 on the arbor. The outer end portion of the sleeve 30 is substantially of the same diameter as the end piece 25, so that it may be received in a notch 28 of a cap bar arm 27, and thereby serve to properly support the end of the arbor on a cap bar.

A still further modification is shown in Fig. 4, in which a ball adjusting collar 32 is extended, as indicated at 33, to surround the end portion 5 of the arbor 1, the extend-

ed portion 33 being of substantially the same dimensions as an end piece 25. A tapered pin 34 extends through the portion 33 and the arbor 1 in order to secure the collar 32 against axial movement on the arbor 1, after it has been adjusted. The portion 33 is provided with a number of angularly spaced holes 35 for registering with the opening 36 in the arbor 1, which receives the pin 34, thereby allowing the collar 32 to be locked in different angular positions.

From the foregoing it is apparent that by my invention I have provided an improved top roll construction characterized by a one piece central arbor, on which the top roll shells are supported for independent rotation, by anti-friction bearings completely enclosed and shut off from the fly, lint, and dust which is always present in large quantities in the vicinity of textile machines. The bearings in my improved construction are also capable of being readily lubricated without disturbing their adjustment in any way. Furthermore, my improved construction is adapted to be applied to any existing form of cap bar, by the provision of end pieces on the arbor of the proper size to fit the notches in a cap bar.

While I have shown my invention in its simplest and preferred form, it is not so limited, but is susceptible of various modifications within the scope of the appended claims.

I claim,

1. An improved top roll construction, comprising a central arbor, a cylindrical shell surrounding said arbor and open at one end and anti-friction devices interposed between said arbor and said shell, the inner surface of which is in communication with said devices through a narrow clearance space having a right angled turn therein.

2. An improved top roll construction, comprising a central arbor, a cylindrical shell surrounding said arbor and open at one end, and anti-friction devices interposed between said arbor and said shell, the inner surface of which is in communication with said devices through a narrow clearance space, a portion of which is disposed in a plane at right angles to the axis of rotation of said arbor.

3. An improved top roll construction, comprising a central arbor, a cylindrical shell surrounding said arbor, a sleeve secured to said shell to turn therewith, a collar mounted on said arbor, and anti-friction members interposed between said sleeve and said collar, a portion of said sleeve overlapping said collar, with a narrow clearance space therebetween, portions of which space are at right angles to each other.

4. An improved top roll construction, comprising a central arbor, a cylindrical shell surrounding said arbor, a sleeve secured to said shell to turn therewith, a collar mounted on said arbor, and anti-friction members interposed between said sleeve and said collar, a portion of said sleeve overlapping said collar, with a narrow clearance space therebetween, a portion of said space being disposed in a plane extending at right angles to the axis of rotation of said arbor.

5. An improved top roll construction, comprising a central arbor, a shell surrounding said arbor, a collar mounted on said arbor and provided with a portion of reduced diameter, a sleeve secured to said shell and having a portion thereof extended to surround the reduced portion of said collar, with narrow annular clearance spaces at right angles to each other between said sleeve and said collar and anti-friction members interposed between said collar and said sleeve.

6. An improved top roll construction, comprising a central arbor, a shell surrounding said arbor, a collar mounted on said arbor and provided with a portion of reduced diameter, a sleeve secured to said shell and having a portion thereof extended to surround the reduced portion of said collar, with a right angled clearance space between said sleeve and said collar, and anti-friction members interposed between said collar and said sleeve.

7. An improved top roll construction, comprising a central arbor, a cylindrical shell surrounding said arbor, a sleeve detachably secured to said shell to turn therewith, anti-friction devices interposed between said sleeve and said arbor, and a passage for lubricant extending inwardly from the outside of said sleeve to said devices, the said passage being normally covered by said shell.

8. An improved top roll construction, comprising a central arbor, a cylindrical shell surrounding said arbor, a sleeve detachably secured to said shell to turn therewith, anti-friction devices interposed between the ends of said sleeve and said arbor, collars mounted on said arbor for securing said sleeve and said devices against longitudinal movement on said arbor, and a passage for lubricant extending from the outside of said sleeve between said collars to said anti-friction devices.

9. In a top roll mechanism, the combination with a cap bar provided with spaced arms having notches therein, and a top roll assembly comprising a one piece arbor extending between said arms, the said arbor having reduced end portions for receiving bearing retaining members of members carried by the end portions of said arbor to

fit within the notches on said cap bar arms to axially aline said arbor.

10. In a top roll mechanism, the combination with a cap bar provided with spaced arms having notches therein, and a top roll assembly comprising a one piece arbor extending between said arms, and having its end portions reduced to a diameter less than the width of said notches for the reception of bearing retaining members, of members carried by said reduced portions of the arbor to fit within alined notches on said cap bar arms.

Dated this tenth day of November, 1922.

WILLIAM EMORY WARDWELL.