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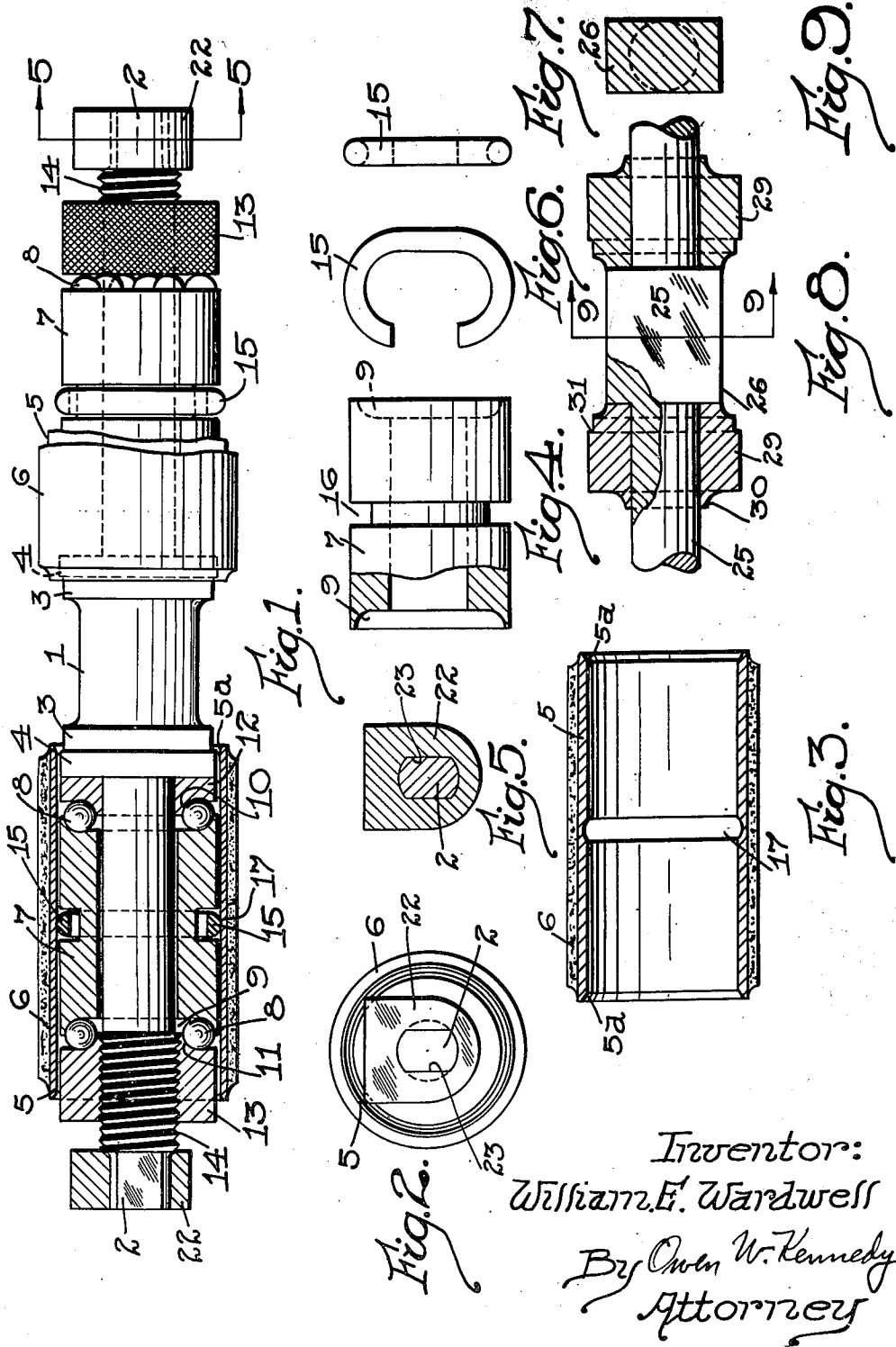
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W. E. WARDWELL

TOP ROLL FOR SPINNING FRAMES

Filed Oct. 17, 1921.

2 Sheets-Sheet 1



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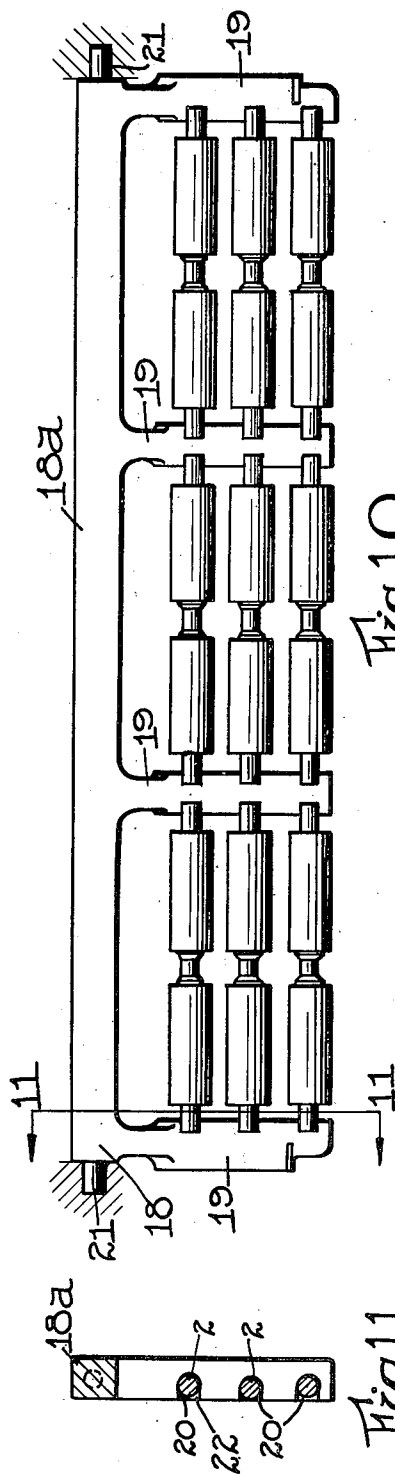


Fig. 10.

Fig. 11.

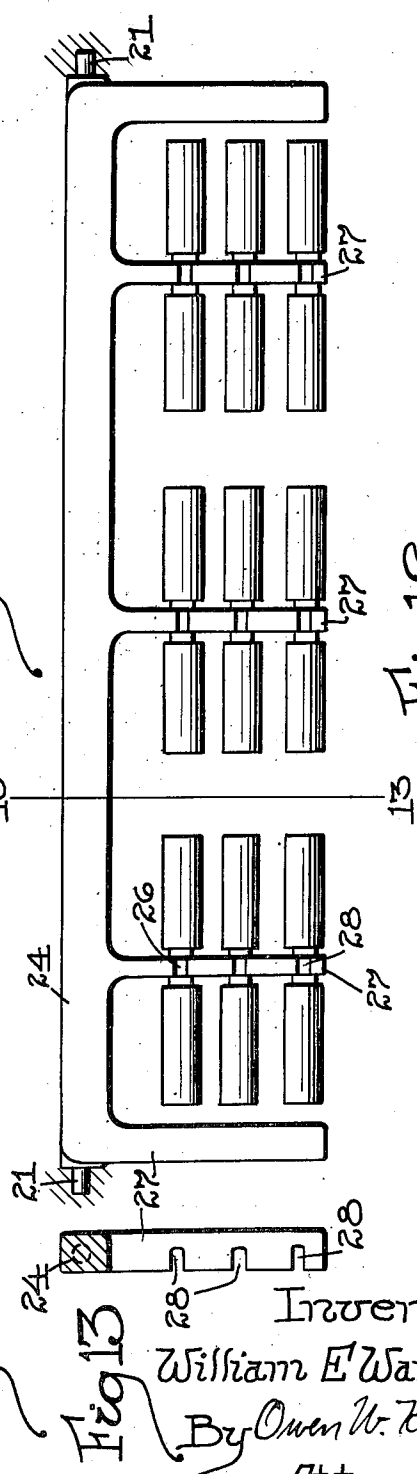


Fig. 12.

Fig. 13.

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UNITED STATES PATENT OFFICE.

WILLIAM EMORY WARDWELL, OF WORCESTER, MASSACHUSETTS.

TOP ROLL FOR SPINNING FRAMES.

Application filed October 17, 1921. Serial No. 508,208.

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 a new and useful Improvement in Top Rolls 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 as previously 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 central arbor rigidly held against rotation by the cap bar or other member which supports the top roll structure. My invention further contemplates a novel arrangement of parts in which the detrimental effects due to the collection of fly or lint are reduced to a minimum, owing to the fact that the only rotating parts of the construction are completely enclosed within the rolls and that effective means are provided for preventing the access of fly to the rotating parts. These 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 elevation and partially in longitudinal section of a top roll construction embodying my invention.

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

Fig. 3 is a longitudinal sectional view showing one of the top roll shells.

Fig. 4 is a view partially in section and partially in elevation of a ball bearing cup for carrying the shell shown in Fig. 3.

Fig. 5 is a sectional view along the line 5, 5 of Fig. 1.

Fig. 6 is an end view of one of the retaining rings for the shell shown in Fig. 3.

Fig. 7 is a side view of the ring shown in Fig. 5.

Fig. 8 is a fragmentary view showing a portion of a modified form of arbor.

Fig. 9 is a sectional view along the line 9, 9 of Fig. 8.

Fig. 10 is a plan view of a cap bar supporting a set of top rolls constructed in accordance with my invention.

Fig. 11 is a sectional view along the line 11, 11 in Fig. 10, looking in the direction of the arrows.

Fig. 12 is a plan view similar to Fig. 10, showing a modified form of cap bar for receiving the form of arbor illustrated in Figs. 8 and 9.

Fig. 13 is a sectional view along the line 13, 13 in Fig. 12.

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

Referring to Figs. 1 and 2, my improved top roll comprises essentially a central arbor 1, the end portions 2 of which are squared or made generally oval in section. The central section of the arbor 1 is provided with spaced portions 3 of greater diameter than the remaining portions of the arbor and each enlarged portion 3 is provided with a shoulder 4, the purpose of which will be hereinafter described. A pair of cylindrical shells 5, each covered with a layer 6 of suitable frictional material, such as leather, are rotatably supported on the arbor 1 between the end portions 2 and the portions 3 by means of ball cups 7, each adapted to confine a series of balls 8 within a recess 9 provided at each end thereof.

Each series of balls 8 is adapted to rotate on cone-shaped race ways 10 and 11 provided on collars 12 and 13, respectively. The collar 12 is adapted to be forced on the arbor 1, so that its peripheral surface is flush with the surface of the portion 3 beyond the shoulder 4. The collar 13 is inter-

nally threaded so that it may be screwed on a threaded portion 14 of the arbor 1 and so positioned thereon as to properly adjust the balls 8 for free rotation on the ball cup member 7.

Referring now to Figs. 3 and 4, the inside diameter of each shell 5 is such that the shell may be slipped over the cup member 7 and secured in position thereon by means of a spring locking ring 15. The locking ring 15 is located in a groove 16 provided on the member 7 and, as best shown in Figs. 6 and 7, has a portion thereof cut away. The ring 15 normally projects beyond the periphery of the member 7 so that when the shell 5 is slipped over the member 7 the ring 15 is slightly compressed. The inner surface of the shell 5 is provided with a groove 17 which is adapted to receive the ring 15 and thereby position the shell 5 on the member 7 and cause it to rotate therewith on the balls 8.

When a shell 5 is so positioned on the member 7, its inner end extends over the portion 3 of the arbor 1 and terminates just beyond the shoulder 4, for a purpose to be hereinafter described, the inner surface of the shell being beveled as indicated at 5^a. The other end of the shell 5 extends over a portion of the collar 13.

Referring now to Fig. 10, there is shown a cap bar 18 which consists of a longitudinal portion 18^a provided with a plurality of spaced arms 19. The opposed surfaces of each pair of arms 19 are provided with a plurality of aligned notches 20 which are rounded at the bottom as best shown in Fig. 11. The complete cap bar is adapted to be pivotally supported at its ends by studs 21 which are received in openings provided at the ends of the longitudinal portion 18^a. The cap bar, as above described, is similar in all respects to the usual cap bars heretofore employed in spinning frames and it has been customary to support the rounded ends of the top roll shafts or arbors in the notches 20 provided in the arms 19. It has been found that this arrangement is open to the objection that the top roll shafts are liable to turn in the notches 20, with the result that there is considerable wear between these parts. Obviously, such wear will result in the top rolls getting out of alignment with respect to the draft rolls with resulting undesirable effects on the product of the spinning frame.

As previously stated, it is one of the objects of my invention to provide a top roll construction in which the arbors are non-rotatably supported by the cap bar and to this end I provide a plurality of sockets 22 which, as best shown in Figs. 5 and 11, are adapted to fit closely in the notches 20 in the cap bar 18. Each socket 22 is provided with an opening 23 of substantially the same

form as the end portions 2 of the arbor 1. Consequently, when the arbor 1, provided at its ends with sockets 22, is mounted on the cap bar 18, the sockets 22 are adapted to seat closely in the notches 20 and effectively prevent rotation of the arbor 1. The only rotating parts of the entire top roll construction are the shells 5 and the member 7 which are adapted to rotate freely on the balls 8.

Referring to Figs. 12 and 13 there is shown a modified form of cap bar 24, which is adapted to receive a modified form of arbor 25, shown in Figs. 8 and 9. The central portion 26 of the arbor 25 is squared or slabbed off as shown in Fig. 9, and the arms 27 of the cap bar 24 are provided with notches 28 of substantially the same form as the angular portions 26 of the arbors 25. In this modified arrangement, each pair of top rolls is supported at the center with the arbor held against rotation. The cap bar 24 is of substantially the same overall dimensions as the cap bar 18, and is adapted to be pivotally supported at its ends by the same studs 21 which are usually provided on spinning frames to support the cap bars 18. In this way the modified form of cap bar may be applied to any existing machine without altering any of the parts thereof. The arbor 25 is provided with collars 29 which about the squared central portion 26 and are adapted to be forced on the arbor. Each collar 29 is provided with a ball race 30 and a shoulder 31 having the same functions as the previously described race ways 10 and shoulders 4.

From the foregoing it is apparent that I have provided an improved top roll construction which is extremely effective in operation owing to the fact that the individual top rolls are adapted to rotate separately on a central arbor which is positively held against rotation on the cap bar. With this improved construction frictional losses and wear are reduced to a minimum, owing to the fact that the only moving parts are supported by balls which are completely enclosed within the top roll shells and are protected from the collection of fly thereon by means of the collars 12 and 13. The shoulders 4 also effectively prevent the fly from creeping in between the portions 3 and the inner surfaces of the shells 5, for it is obvious that fly passing into the inner ends of the shells 5 will collect on the shoulders 4. My improved construction is also adapted to be applied to existing types of cap bars, by the use of the end sockets, or may be used in connection with the modified form of cap bar and the same members which support the old style cap bar.

I claim:

1. In a top roll mechanism, the combination with a cap bar provided with spaced

arms, of a top roll unit comprising a pair of rolls rotatably mounted on an arbor which is non-rotatably supported between said rolls by an arm of said cap bar.

5 2. In a top roll mechanism, the combination with a cap bar provided with spaced arms having notches therein, of a top roll unit comprising a pair of rolls rotatably mounted on an arbor, a portion of which be-
10 tween said rolls is seated in one of said

notches and positively held against rotation with respect to said cap bar.

3. In a top roll mechanism, the combination with a cap bar provided with spaced arms, of a top roll unit comprising a pair 15 of rolls rotatably mounted on an arbor having an angular portion between said rolls received in one of said arms whereby said arbor is positively held against rotation.

WILLIAM EMORY WARDWELL.