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ANTI-FRICTION TOP ROLL

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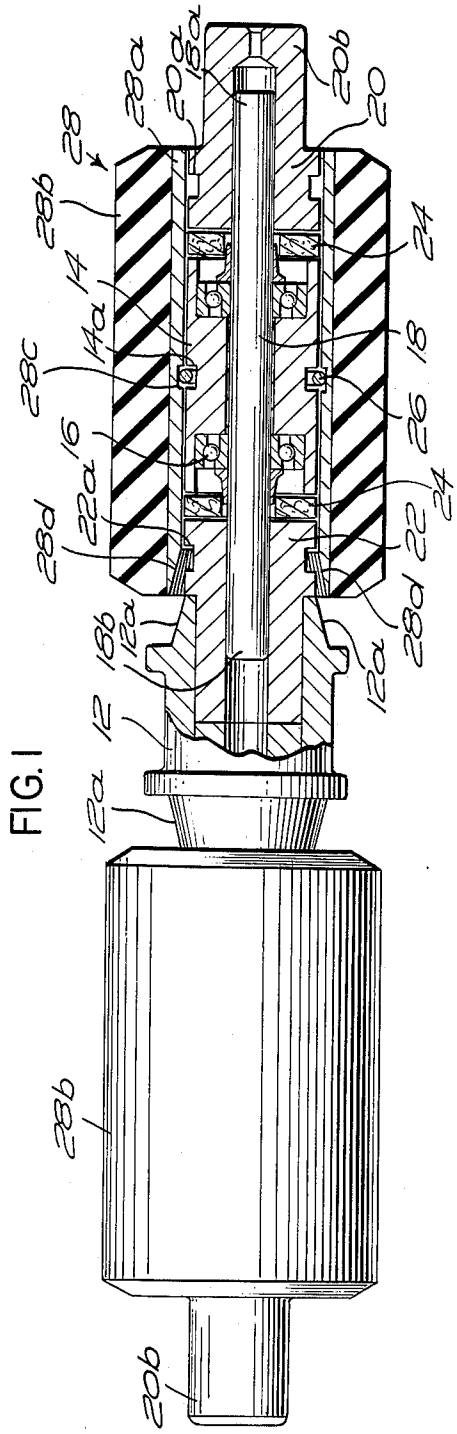


FIG. 1

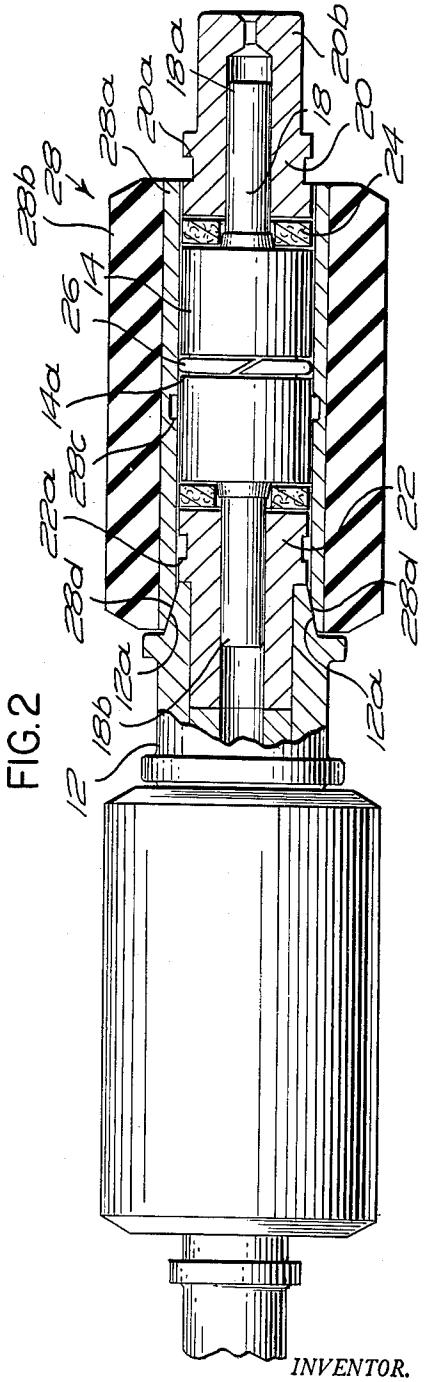


FIG. 2

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ANTI-FRICTION TOP ROLL

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3 Claims. (Cl. 19—142)

This invention relates to improvements in an anti-friction top roll. More especially it has to do with the provision in such a top roll of simple clutching means for frictionally locking the cots to the shaft of the top roll when the cots require buffing.

Heretofore, so far as I am aware, it has been necessary with top rolls having free running cots to remove the latter from the shaft of the top roll and separately buff each cot—which is quite unsatisfactory because of the extreme difficulty of buffing both cots to the same diameter—or to have a more or less complicated attachment for a buffing machine whereby each cot can be positively turned on the top roll shaft while being treated by the buffing means.

The principal object of the present invention is to provide simple clutching means between each cot and the shaft of the top roll whereby the cots can be slipped along the shaft into frictional engagement with the latter so that the top roll shaft and cots can then be rotated as a unit and the cots be easily and accurately buffed.

The best mode in which it has been contemplated applying the principles of my invention is shown in the accompanying drawings but these are to be deemed merely illustrative because 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 an elevation partly in medial section through a top roll embodying my improvements, showing the cots in their freely rotating positions; and

Fig. 2 is a like elevation in medial section showing the cots in clutched relation to the top roll shaft in position to be buffed.

Referring now more particularly to the drawings, the improved top roll has, in effect, a main shaft made up of two identical sections joined together by a single sleeve **12** which constitutes the central arbor of the top roll. Since the two sections are identical only one need be described in detail. Each section comprises a ball bearing unit having a cylinder **14** rotatable on balls **16** which turn on a shaft **18** having portions projecting on both sides of the cylinder. On one of these portions **18***a* is pressed a cap sleeve **20** which forms an end gudgeon of the top roll, and on the other portion **18***b* is pressed another sleeve **22** which extends somewhat beyond the end **18***b* of the roller bearing shaft **18**. Between the sleeves **20** and **22** and the cylinder **14** are felt washers **24** to absorb any lubrication that may exude from the ball bearing unit.

The extending sleeves **22** of each section are pressed into the common sleeve **12** which provides the central arbor. Both the sleeves **20** and **22** on the ends of the roller bearing shaft **18** have portions of substantially the same diameter as the outside diameter of cylinder **14** and in these portions are circumferential grooves **20***a* and **22***a* respectively forming so-called lint traps. Around the outer surface of cylinder **14** is another circumferential groove **14***a* in which is located a split ring **26** normally slightly expanded so as to stand out beyond the surface of the cylinder but which can yield toward the axis thereof.

On the cylinder **14** in each section is placed a rotatable unit **28** having an inner metal shell **28***a* which has a nice sliding fit with the outer surface of the cylinder **14** and also with portions of the outer surface of sleeves **20** and **22** frictionally secured to the ends of shaft **18**. The external covering or cot **28***b* of this shell runs on the yarn that passes between it and a bottom roll (not shown) of a spinning or roving frame.

At the middle of the internal surface of the metal shell **28***a* is a circumferential groove **28***c* adapted to receive the extending portion of the aforesaid split ring **26** when the unit **28** is slipped onto the cylinder **14**. As the unit is placed on the cap sleeve **20** and pushed toward the arbor **12** the split ring **26** yields into its groove **14***a* on the cylinder **14** until the other groove **28***c* on the inside of the shell **28***a* comes opposite the ring, whereupon the latter springs outward slightly and is engaged by both grooves to position the unit. In this position the unit **28** is freely rotatable with respect to the main shaft of the top roll.

The clutching means of the present invention is provided by having the inner surface of the end of the metal shell **28***a* which is next to the central arbor **12** tapered slightly outward, as at **28***d*, and by having each end of the central arbor **12** tapered inward, as at **12***a*, to match the taper on the shell. These tapers provide the clutching means, because when the unit **28** is pushed toward the arbor **12**, the split ring **26** yields into groove **14***a* of cylinder **14** and allows the unit to slip toward the central arbor until the tapered surface **28***d* of its metal shell **28***a* engages the tapered surface **12***a* of the arbor **12**. Thus the unit is frictionally clutched to the arbor and is no longer freely rotatable. It must now turn with top roll shaft which comprises the arbor **12**, the sleeves **20** and **22** and the shafts **18**. By exerting pressure on the inner surface of the metal shell **28***a* the split ring **26** helps to hold the above mentioned tapered surfaces in proper engagement.

With both cots thus frictionally held to the shaft of the top roll the ends **20***b* of the cap sleeves **20** can be secured to usual means on a buffing machine to cause the shaft and the cots of the top roll to be rotated simultaneously as a unit, whereupon the grinding or buffing wheel of the machine can be moved back and forth across the cots to resurface their external covering **28***b* and bring them in accurate alignment with one another.

After the buffing is completed the units can be slipped away from the central arbor **12**, and upon reengagement of each split ring with its cooperating groove **28***c* in the metal shell **28***a* the cots are again restored to their proper positions on the cylinders **14** and are freely rotatable. When it becomes necessary to renew the external covering or cots **28***b* of the units **28** the latter can be slipped off of their cylinders away from the arbor **12** and have new coverings or cots put on metal shells **28***a*. Thereafter, the newly covered units are slipped back on their cylinders, clutched to the arbor and buffed, before being used, to bring the two into accurate alignment.

I claim:

1. An anti-friction top roll having a pair of anti-friction bearings, each bearing having an element thereof which is rotatable relative to another element of the bearing, a common shaft for connecting similar elements of each bearing, a central arbor mounted on the inner end of said shaft, a cylinder mounted on each of the other of said elements to rotate therewith so as to be freely rotatable relative to said arbor, a shell on said

cylinder, a cot on said shell, said shell being mounted for axial movement along its cylinder, and clutch means on said shell and on the central arbor for clutching the shell to the arbor for rotation therewith when the shell is axially moved into engagement with the arbor.

2. A top roll having a shaft, an anti-friction bearing mounted on said shaft and provided with an external cylinder having an external circumferential groove in its surface, a split resilient ring mounted in said groove, a shell mounted on said cylinder for rotation therewith and axially slidable along said cylinder having an internal circumferential groove for engagement by said ring, the latter yielding into the external groove of said cylinder to permit movement of the shell past said spring, said spring expanding into engagement with said internal circumferential groove to frictionally hold the shell in rotatable position on said cylinder, a cot on said shell, an arbor mounted on said shaft in separated relation to said shell when said ring is engaged with both said grooves, said arbor and said shell having oppositely tapered means to clutch them together upon said shell being axially moved along said cylinder into engagement with said arbor for connecting said shell to said shaft for rotation therewith.

3. An anti-friction top roll for a textile drawing machine comprising a pair of axially aligned rotatable shafts, an arbor connecting said shafts for rotation together, a bearing mounted on each shaft for rotation relative thereto, a shell mounted on each bearing for rotation therewith and for axial movement relative to said bearing, cots on said shells, and clutch elements carried by said arbor and said shells engageable with each other upon relative axial movement of said shells towards said arbor for connecting said shells and said shafts for rotation together.

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