July 26, 1960 F. HIGGINS 2,946,176

YARN CONTROL DEVICE FOR UPTWISTERS

Filed Jan. 10, 1958

FIG. 1.

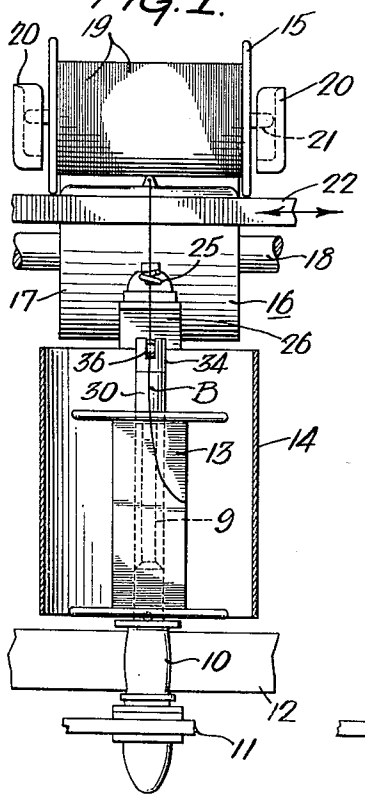
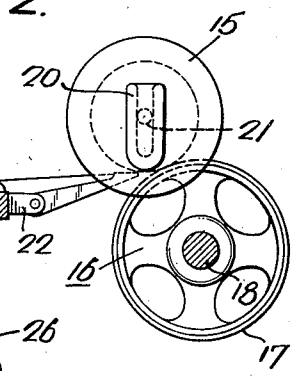


FIG. 2.



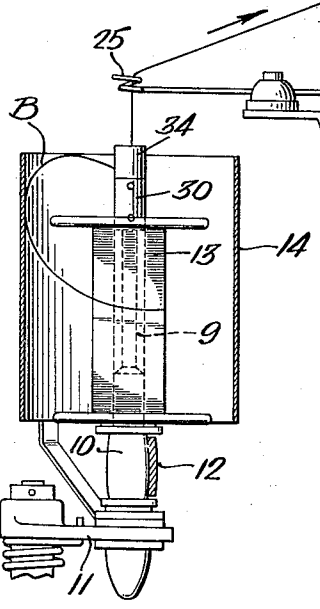


FIG. 5.

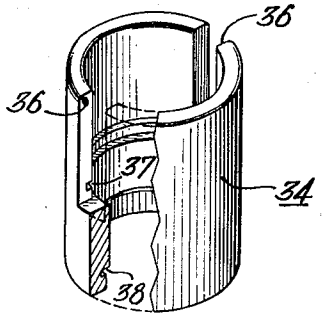


FIG. 7.

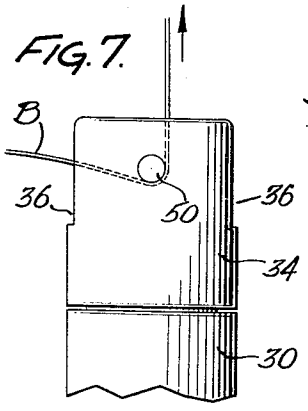


FIG. 3.

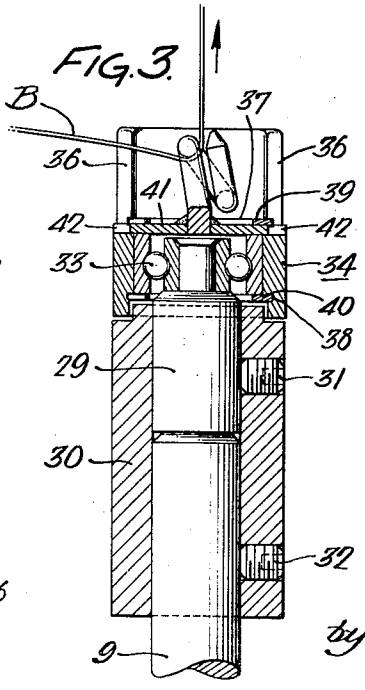


FIG. 6.

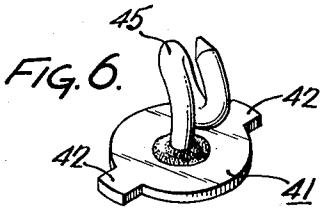


FIG. 8.

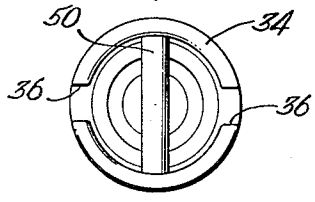
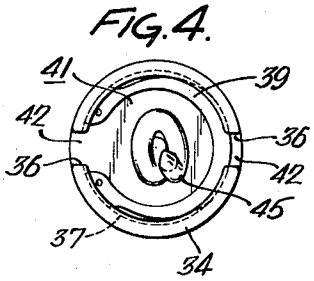


FIG. 4.



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YARN CONTROL DEVICE FOR UPTWISTERS

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1 Claim. (Cl. 57—62)

This invention relates to an attachment for yarn twisting machines and more particularly to a twist block for a carpet yarn uptwister.

It has been found that uptwisters commercially sold to handle heavy yarns such as those used in the manufacture of pile floor coverings do not operate satisfactorily when more than five turns per inch twist are imparted to the yarn. In order to provide proper control of the yarn under conditions of relatively high twist, it has been proposed to use a device referred to as a "twist block" on the spindle which carries the spool or bobbin from which the yarn is being drawn. The optimum requirement for such a twist block includes the ability to thread the yarn through the block with a minimum of difficulty and, also, the positive ability to prevent breakage or injury to the yarn strand regardless of the shape of the yarn balloon.

A primary object of the present invention, therefore, is to provide a twist block for a yarn twister which will not damage the yarn and which may be readily threaded by the operator.

A further object of the invention is to provide a twist block for a twisting machine having a sleeve portion clamped to the twister spindle and a top relatively rotatable portion containing a yarn guide which will not damage the yarn passing therethrough.

A still further object of the invention is to provide a twist block for an uptwister having a dual guiding zone in which the yarn passes through an open-ended slot in a sleeve and thence through a pigtail guide for changing the direction of travel of the yarn.

Further objects will be apparent from the specification and drawings in which:

Fig. 1 is a view partly sectioned showing one of the spindles of a carpet yarn uptwister,

Fig. 2 is a side view of the structure of Fig. 1,

Fig. 3 is an enlarged vertical section of the twist block shown in Figs. 1 and 2,

Fig. 4 is a top view of the structure of Fig. 3,

Fig. 5 is a perspective of the guide sleeve shown in Fig. 3,

Fig. 6 is a perspective of the pigtail and mounting shown in Fig. 3,

Fig. 7 is an enlarged side view of a modified form of twist block, and

Fig. 8 is a top view of Fig. 7.

The invention comprises essentially the provision of a slotted sleeve journaled by means of a bearing on a sleeve fixed to the top of the spindle of a twisting machine. The slotted sleeve contains guide means for changing the direction of yarn travel at approximately the center line of the spindle. In one form the guide means takes the form of a helical open-ended wire commonly known as a "pigtail" and in another form the guide means comprises a horizontal bar secured in the sleeve at right angles to the diametrically positioned slots.

The elements of a conventional uptwister such, for example, as the Whitin "Cable King" model RM–2 consists of a spindle 9 having a pulley 10 and journaled in frame member 11. The spindle 9 is driven by a flat belt 12 in contact with pulley 10. The spool 13 or other forms of yarn package constituting the yarn supply is positioned vertically on spindle 9 as shown in Figs. 1 and 2. A guard or balloon guide 14 encloses the spool 13, this guard being in the form of an open-ended sleeve. The take-up yarn package 15 shown in Figs. 1 and 2 in the form of a spool or bobbin may also be in the form of a cone or yarn cake of any desired shape. In accordance with customary practice, the take-up package is rotated by means of a roller 16 having a frictional surface such as a natural or synthetic rubber sleeve 17 mounted on a shaft 18. The rubber sleeve 17 of roller 16 bears against the layers of yarn 19 being wound on the package 15 to rotate the package at a constant peripheral speed during build-up of the package. A slotted supporting element 20 permits the package to build-up from start to finish by allowing the package spindle 21 to gradually rise in the bracket 20 in accordance with the number of wraps of yarn on the package. The conventional traverse 22 oscillates back and forth to guide the yarn onto the package in the usual helical layers in accordance with whatever builder mechanism may be employed on the uptwister.

For relatively low turns, for example up to five turns per inch, a pivoting pigtail guide element 25 mounted on the frame of the uptwister 26 is positioned to align itself with the center line of spindle 9. However, it has been found that for higher twist such guide is insufficient and an additional twist block located directly on the center line of the spindle is required.

A twist block constructed in accordance with the present invention comprises a lower sleeve 30 (Fig. 3) secured to the spindle 9 by means of setscrews 31 and 32. Sleeve 30 carries an annular ball bearing assembly 33 on which is journaled upper sleeve 34 (Fig. 5). Sleeve 34 has diametrically opposite slots 36, 36 cut partially down from the top of the sleeve. Also, suitable grooves 37 and 38 are provided for retaining the snap rings 39 and 40 shown in Fig. 3. A plate 41 (Fig. 6) having two ears 42, 42 is positioned in the upper portion of sleeve 34 so that the ears 42, 42 fit in slots 36, 36. Plate 41 is retained securely in sleeve 34 by means of snap ring 39. A pigtail 45 formed of a helix of rod material is secured to plate 41 by brazing, welding, or in any other suitable manner. The bore of pigtail 45 is preferably but not necessarily aligned with the slots 36, 36 as shown in Figs. 3 and 4.

The yarn coming from yarn supply 13 forms the balloon B due to centrifugal force, whereupon it passes through either of the slots 36 which control the relative rotation of sleeve 34 and always insure that the yarn is fed into the eye of pigtail 45 without becoming disengaged therefrom. These additional guides perform this important function since otherwise there would be a tendency for the yarn coming from the balloon under conditions of high twist to wrap around the pigtail guide 45 and break or become disengaged therefrom. After passing through the pigtail 45 the yarn is threaded through the pigtail guide 25 and thence to traverse 22 in accordance with the usual practice.

A modified form is shown in Figs. 7 and 8 in which a round bar or rod 50 is used instead of the pigtail 45. This bar 50 is positioned or staked in sleeve 34 at substantially 90° to slots 36, 36. The yarn is then threaded through either of the slots and under bar 50 as shown in Fig. 7. While the modified form requires no plate 41 and snap ring 39, its disadvantage resides in the fact that the end of the yarn must be threaded through slot 36 and under bar 50, whereas in the form of Fig. 3 the

operator can thread the pigtail 45 at any time without the necessity of using the terminus of the yarn.

The invention has been found to be extremely effective in preventing damage to the yarn where relatively higher twists are needed. It is low in cost and permits the operator, particularly in the preferred form, to thread the twist block with great ease. The dual effect of the slots in sleeve 34 and the guide substantially at the center line of the spindle provides desirable and beneficial results heretofore not obtainable with previously known devices.

Having thus described my invention, I claim:

In a yarn uptwister having a spindle, a twist block comprising a lower sleeve, means for non-rotatably securing said lower sleeve to the top of the spindle, a second sleeve positioned above said lower sleeve, bearing means

for rotatably journaling said second sleeve with respect to the spindle and the lower sleeve, walls defining an upwardly facing bore in said first sleeve, walls defining an open-ended slot at the top of said second sleeve, and a pigtail yarn guide supported on a plate detachably secured to the second sleeve inside the bore for changing the direction of the yarn travel substantially at the center line of the spindle.

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