May 1, 1951 H. J. POTTS 2,551,462

YARN TWISTER OR PLIER

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Fig. 2.

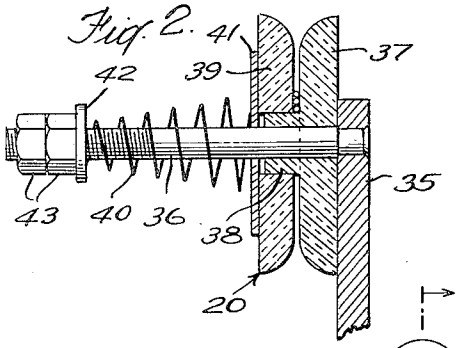


Fig. 1.

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YARN TWISTER OR PLIERS

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1 Claim. (Cl. 57—75)

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This invention relates to yarn twisters or pliers and has for an object to provide means for imparting a uniform and controlled twist to the yarn on a ring-type twisting frame.

Another object is to provide novel and improved mechanism for imparting a controlled high twist to yarn.

Another object is to provide means for holding the twist while the machine is shut down due to yarn breakage so that the mechanism can be restored without removing long untwisted sections.

Various other objects and advantages will be apparent as the nature of the invention is more fully disclosed.

It has been found that when the spindles of a ring-type twisting frame are operated at high speed relative to the feed rolls for the purpose of imparting a high twist to the yarn, for example in twisting frieze yarn, the spindles tend to pull the yarn through the feed rolls and cause slippage which results in a non-uniform twist. Also, when the yarn breaks the ends are loosened and tend to untwist.

In accordance with this invention this difficulty is avoided by providing a tensioning device for the yarn, disposed in advance of the feed rolls and arranged to exert a drag sufficient to prevent the yarn from slipping on the feed rolls. In addition, the tensioning device holds the twist in the portion of the yarn between the feed rolls and the spool in case of breakage of one of the ends between the tensioning device and the bobbins.

The details of the invention will be better understood from the following description, taken in connection with the accompanying drawings in which a specific embodiment has been set forth for purposes of illustration.

In the drawings:

Fig. 1 is a side elevation of a portion of a ring winding machine embodying the present invention; and

Fig. 2 is an enlarged section taken on the line 2—2 of Fig. 1 showing the construction of the tensioning device.

Referring to the drawing more in detail, a standard twisting or plying machine is shown as comprising a frame 10 carrying a bracket 11 to which a bobbin carrier 12 is attached. The bobbin support carries a set of pins 13 on which bobbins 14 of yarn are placed. In the form shown the bobbins contain singles yarn which is to be plied. The singles yarn 15 from the bobbins 14 is fed through guides 16 on a bar 17 through

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a set of knock-off drop wires 18 which serve to stop the feed in the case of breakage of any of the ends.

From the drop wires 18 the ends 15 are fed through a tensioning device 20 and around a set of feed rolls 21, 22 and 23 which are mounted on the frame 10. The roll 23 is usually the driven roll, the roll 22 is mounted to rest on the driven roll and the roll 21 contacts the roll 22. The pressure exerted by the respective rolls serves to frictionally grip and feed the yarn. The feed is stopped when desired, or in response to actuation of one of the drop wires 18, by shifting the rolls 21 and 22 out of driving contact with the driving roll 23.

In the embodiment shown three ends 15 are combined for plying the form, a three-ply high-twist, frieze yarn 24. The number of plies or ends may of course be altered. A three-ply yarn has been shown for illustration only.

The yarn 24 from the feed roll 23 passes through a guide 25 to a ring traveller 26 on a ring 27, thence to a spool 28 on a spindle 29 for winding and twisting in the usual manner. The spindle is driven by a belt 30 or other suitable means, and the ring 27 is mounted on a frame 31 which is advanced axially of the spindle to lay a smooth layer of yarn on the spool 28. The spindles are journalled in a bracket 32 on the frame 10.

The tensioning device 20 comprises a bracket 35 attached to the frame 10 and carrying a pin 36. A friction disc 37 is journalled on the pin 36. The disc 37 has a hub 38 on which a second disc 39 is seated. A spring 40 is seated around the pin 36 between a washer 41 bearing against the disc 39 and a washer 42 which is secured by lock nuts 43. The spring 40 may be welded to the washer 41. The tension is adjusted by the nuts 43. The ends 15 pass between the discs 37 and 39 and ride around the hub 38. The discs and hub are made of a hard non-wearing material, such as porcelain.

In operation the spindle 29 and feed roll 23 are driven at predetermined speeds the relation of which determines the twist (number of turns per inch) of the yarn. The tensioning device is adjusted to exert sufficient drag on the yarn to prevent slippage on the feed rolls. This results in a uniform twist and a tight winding on the spool 28. If any one of the ends 15 should break, causing the rolls 21 and 22 to be disengaged from the roll 23, the discs 37 and 39 hold the yarn 24 between the discs and the spool 25 under the same tension as during the winding.

Hence the winding cannot loosen nor can the yarn **24** untwist or kink. The break can thus be mended and the feed re-started without loss of yarn and without re-threading.

The tensioning device also permits a higher twist to be imparted to the yarn than could be controlled by the feed rolls alone.

What is claimed is:

A yarn plying machine for twisting a plurality of single ends into a plied yarn comprising a driven spindle, a ring and traveller positioned to guide the yarn for winding onto said spindle and to impart a controlled twist to said yarn, feed rolls driven to feed a plurality of single ends of yarn to said traveller for twisting into a plied yarn, a tensioning device engaging said ends in advance of said feed rolls, said tensioning device comprising a pair of discs having flat surfaces between which said ends pass, spring means holding said discs in positive gripping engagement with all of said ends, and adjusting means to control the pressure of said spring means, said tensioning device exerting a uniform drag on all of said ends and holding the twisted yarn under controlled tension in the event of a breakage of one or more of said ends in advance thereof.

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