Feb. 5, 1952 M. W. TAYLOR 2,584,640

TEXTILE DRAWING ROLL

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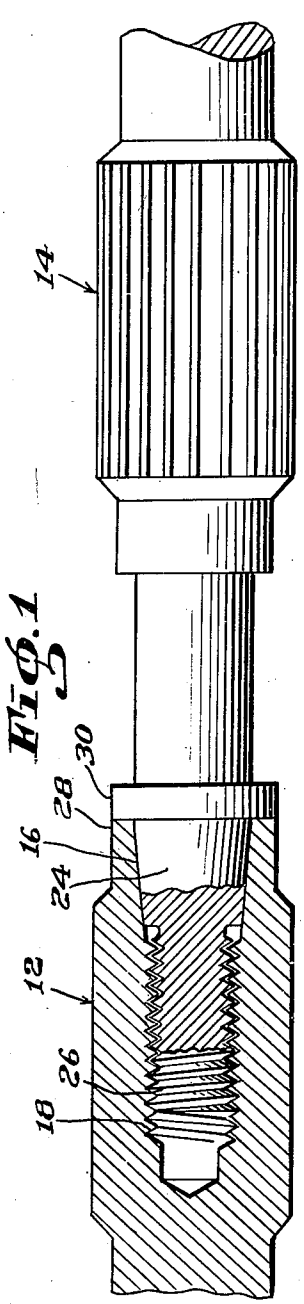

Fig. 1

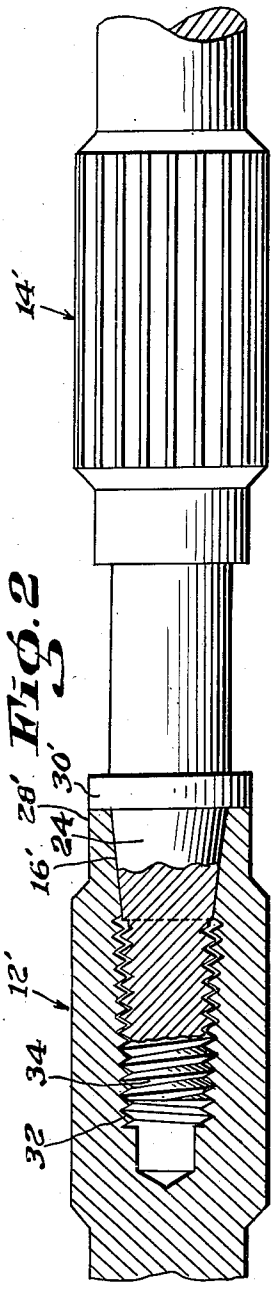

Fig. 2

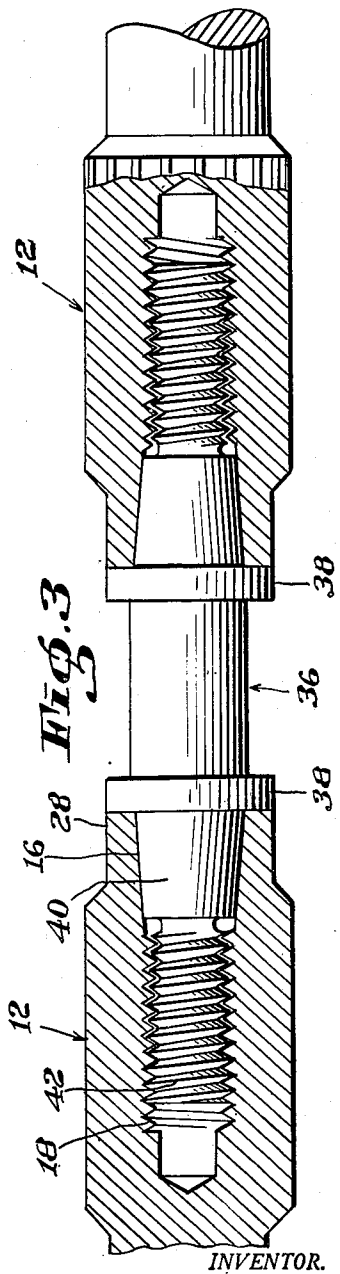

Fig. 3

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TEXTILE DRAWING ROLL

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4 Claims. (Cl. 19—141)

1

This invention relates to textile drawing rolls, such as are commonly used in spinning, roving and other similar textile machines, and more particularly to a coupling for the sections of such rolls.

Textile drawing rolls are built up to a desired length by joining successive sections together, and are frequently as much as forty feet or more in total length. The accuracy and uniformity with which such rolls are made has a definite effect on the quality of the yarn produced, particularly in the modern high-draft systems, since any eccentricity or runout of the rolls will cause varying conditions which undesirably affect the drafting and thus the uniformity of the sliver being drafted. To reduce such eccentricity or runout and produce a roll of sufficient straightness for use in modern high draft systems requires a considerable amount of straightening.

The screw joint for the sections of textile drawing rolls is practically in universal use today. The internal part of the joint has an accurately bored hole, followed by a conventional internal thread. The mating part has a conventional thread followed by a cylindrical portion that fits tightly in said accurately bored hole, the cylindrical portion being pulled tightly into place by the screw thread. It is difficult, however, to tap an internal thread and have the axis of the thread in line with the axis of the roll section with any degree of accuracy, thus, after assembling a screw joint of the conventional type, during the required straightening operation a very high stress is set up in the screw due to the bending of the male thread trying to aline itself with the mis-alined female thread. Such condition produces an excessive bend in the roll at the joint, requiring considerable straightening of the final length of the roll in order to obtain a usable roll, and an even greater amount in order to produce a roll straight enough for use with modern high draft systems.

The object of my invention is to eliminate or greatly reduce the above mentioned stress, thus eliminating or greatly reducing the amount of necessary straightening and producing a more accurate textile drawing roll which is particularly suitable for use with modern high draft systems in which an accurate drawing roll is essential.

A preferred form of my invention is shown in the drawing, in which:

Fig. 1 is a side elevation of a portion of a textile drawing roll, partly in section, embodying my invention;

Fig. 2 is a side elevation of a portion of a textile drawing roll, partly in section, embodying a modified form of my invention; and

Fig. 3 is a side elevation of a portion of a textile drawing roll, mostly in section, embodying still another modified form of my invention.

Referring to Fig. 1, I have shown end portions of a pair of drawing roll sections, generally indicated at 12 and 14, adapted to be assembled with other similar sections to build up a drawing roll of any desired length. The drawing roll section 12 is provided with an axially alined recess in one end thereof, said recess having a smooth portion 16 adjacent the end of said section 12. The smooth portion 16 may be either slightly tapered, as shown, or of cylindrical shape as may be desired. An inner threaded portion 18 is provided in said recess adjacent said smooth portion 16, said inner threaded portion having threads formed in a substantially cylindrical bored hole as is conventional. The roll section 14 has an axially alined male threaded portion 26 adjacent the end thereof, and an inner smooth portion 24 adapted to fit closely into smooth portion 16 on roll section 12. The threaded portion 26 has threads formed on a tapered cylindrical surface, the diameter of said threaded portion 26 being greater at the end of roll section 14 (the left end as shown in Fig. 1) than at the end of said threaded portion 26 adjacent the smooth portion 24, thus producing a back taper on said threaded portion 26, the larger diameter of said threaded portion 26 being adapted to fit closely into threaded portion 18 on roll section 12.

2

When roll sections 12 and 14 are assembled by screwing the threaded portion 26 of roll section 14 into the threaded portion 18 of roll section 12, the accurately fitting smooth portions 16 and 24 will act to aline the roll sections 12 and 14, while the tapered threaded portion 26 of roll section 14 and the threaded portion 18 of roll section 12 will retain the roll sections in closely adjacent assembled relation. The tapered threaded portion 26 and the internally threaded portion 18 have substantially greater clearance on the diameter at the end adjacent the smooth portions 16 and 24 than at the other end, thus the closely fitting smooth portions will aline the roll sections, while the clearance between said threaded portions adjacent said smooth portions will allow such alinement without setting up high stresses in the joint, since the clearance allows the bend of the threaded portion 26 to be distributed over the major portion of the length of said threaded portion. I prefer that the clearance on the diameter be between 0.005 and 0.05 inch per inch of length, and within such range preferably about 0.01 inch per inch of length, since such taper is great enough to allow alinement but still leaves a considerable portion of the threads of roll section 14 in position to be gripped by the threads of roll section 12, though obviously a greater or lesser degree of taper may be used without departing from the spirit of my invention.

In order to provide a means for predetermining the lengths of the finished roll, roll sections 12 and 14 may be provided with opposing shoulders 28 and 30 respectively, said shoulders abutting when the roll sections 12 and 14 are as-

sembled to provide a roll assembly of predetermined overall length. Though I prefer to use straight shoulders, the smooth portions 16 and 24 of roll sections 12 and 14 may be given a sufficient taper to similarly provide a means for predetermining the length of the finished roll.

The clearance between the threaded portions of the roll sections may also be provided by tapering the female threaded portion of the recess in roll section 12 as shown in Fig. 2. In this modification of my invention, in which corresponding parts have been numbered similarly to Fig. 1, the roll section 12' is provided with an axially alined recess having a smooth portion 16' adjacent the end of said section 12'. An inner threaded portion 32 is provided in said recess adjacent the smooth portion 16', said female threaded portion 32 being tapered, with the larger diameter of said threaded portion 32 adjacent the smooth portion 16'.

The adjoining roll section 14' has an axially alined threaded portion 34 adjacent the end thereof, and an inner smooth portion 24 adjacent said threaded portion. The male threaded portion 34 has straight threads of uniform diameter adapted to fit into the minimum diameter of the taper threaded portion 32, so that, when roll section 14' is screwed into the tapered threaded portion 32 of roll section 12', a clearance is thus provided at the end of said threaded portions 32 and 34 adjacent the smooth portions, such clearance acting to allow alinement of the roll sections 12' and 14' as hereinbefore explained.

It will thus be seen that either threaded portions may be tapered or both might be tapered, the only requirement being that they be so tapered as to provide a clearance adjacent the smooth alining portions of the roll joint while at the same time providing the necessary grip to retain the roll sections in closely adjacent assembled relation.

In Fig. 3 I have shown a still further modification of my invention, in which two similar roll sections 12 are coupled by a bearing section 36, said bearing section being provided at each end with a shoulder 38 adapted to fit against shoulder 26 of roll section 12, a smooth portion 40 adapted to fit the smooth portion 16 of the roll section 12, and a threaded portion 42, shown as a back tapered thread similar to threaded portion 26 of Fig. 1, though of course the means of Fig. 2 may be employed. Such back tapered thread 42 is adapted to fit into the internally threaded portion 18 of roll section 12 as hereinbefore explained. By such an arrangement I am enabled to replace roll sections as they become worn, without any change in the length of the finished roll, and with little or no required straightening of the roll after replacing such bearing section, since my novel roll coupling and alining means greatly reduces the stress at such roll joint.

It will be understood from the above description that various expedients may be resorted to in order to provide clearance between the tapered portions adjacent the straight alining portions which characterize my novel textile drawing roll, and I do not wish to be understood as limiting my invention to the details disclosed, except as set forth in the appended claims.

I claim:

1. In a textile drawing roll having a plurality of roll sections; coupling means for said sections including an axially alined recess having an internally threaded portion in one of said sections and an axially alined externally threaded portion on an adjacent section adapted to be retained by said internally threaded portion on said first section, said threaded portions having substantially greater clearance at the end adjacent the end of said first section than at the end away from the end of said first section, whereby the sections of said roll are easily alined.

2. In a textile drawing roll having a plurality of roll sections; means predetermining the length of said drawing roll, coupling means for said sections including an axially alined recess in one of said sections having an internally threaded portion, and an axially alined member on an adjacent section having an externally threaded portion adapted to be retained by said internally threaded portion on said first section, said threaded portions having substantially greater clearance at the end adjacent the end of said first section than at the end away from the end of said first section, whereby the sections of said roll are easily alined.

3. In a textile drawing roll having a plurality of roll sections; alining and coupling means for said sections including an axially alined recess in one of said sections having a smooth portion adjacent the end of said section and an internally threaded portion adjacent said smooth portion, an axially alined externally threaded portion on an adjoining second section adjacent the end thereof adapted to be retained by said internally threaded portion, and an axially alined smooth portion on said second section adjacent said externally threaded portion closely fitting the smooth portion of said first section, said threaded portions having substantially greater clearance at the end adjacent said smooth portions than at the end away from said smooth portions, whereby said sections are easily alined by said smooth portions.

4. In a textile drawing roll having a plurality of roll sections; means predetermining the length of said drawing roll, alining and coupling means for said sections including an axially alined recess in one of said sections having a smooth portion adjacent the end of said section and an internally threaded portion adjacent said smooth portion, and an axially alined externally threaded portion on an adjoining second section adjacent the end thereof adapted to be retained by said internally threaded portion, and an axially alined smooth portion on said second section adjacent said externally threaded portion closely fitting the smooth portion of said first section, said threaded portions having substantially greater clearance at the end adjacent said smooth portions than at the end away from said smooth portions, whereby said sections are easily alined by said smooth portions.

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