July 7, 1936. F. B. JAVERY ET AL 2,046,559

SPOOL MOUNTING FOR TEXTILE MACHINES

Filed Aug. 23, 1934 2 Sheets-Sheet 1

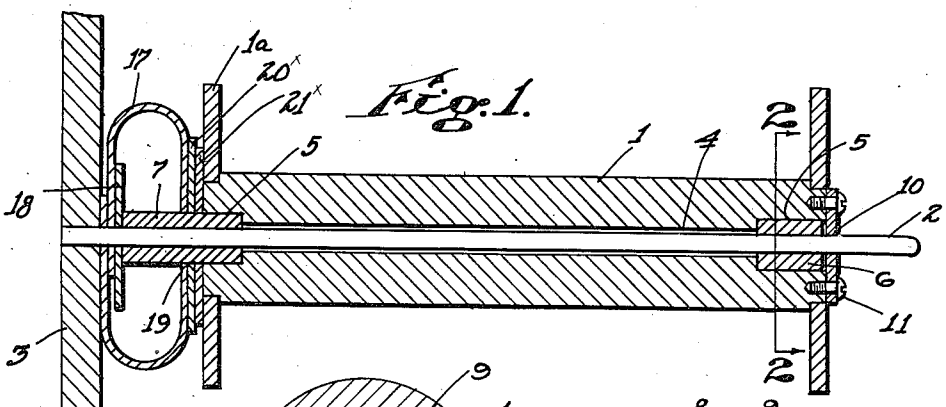


Fig. 1.

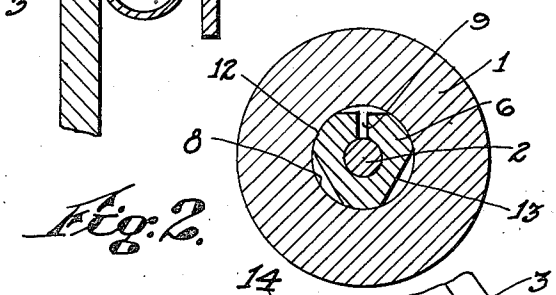


Fig. 2.

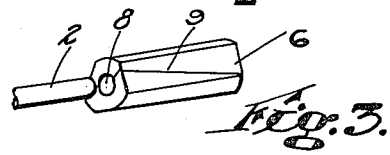


Fig. 3.

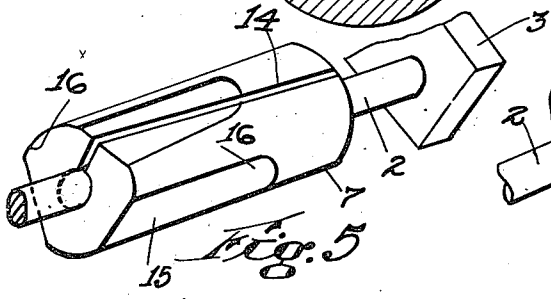


Fig. 5

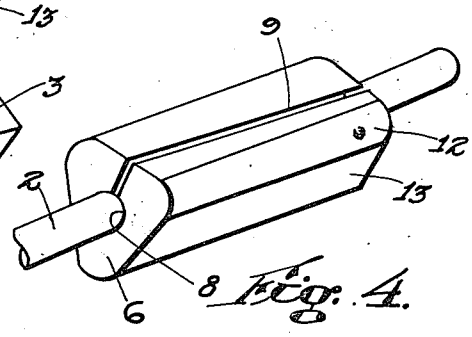


Fig. 4.

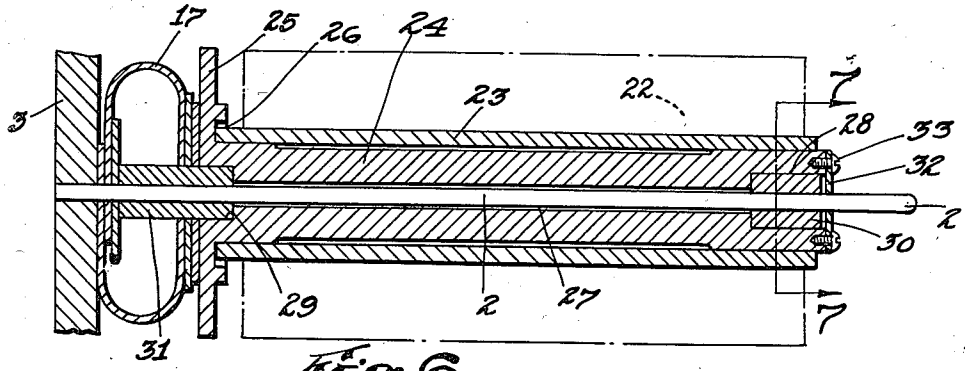


Fig. 6.

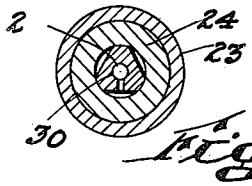


Fig. 7.

Inventors:
Frank B. Javery
Armon J. Javery
By Owen W. Kennedy
Attorney

July 7, 1936. F. B. JAVERY ET AL 2,046,559

SPOOL MOUNTING FOR TEXTILE MACHINES

Filed Aug. 23, 1934 2 Sheets-Sheet 2

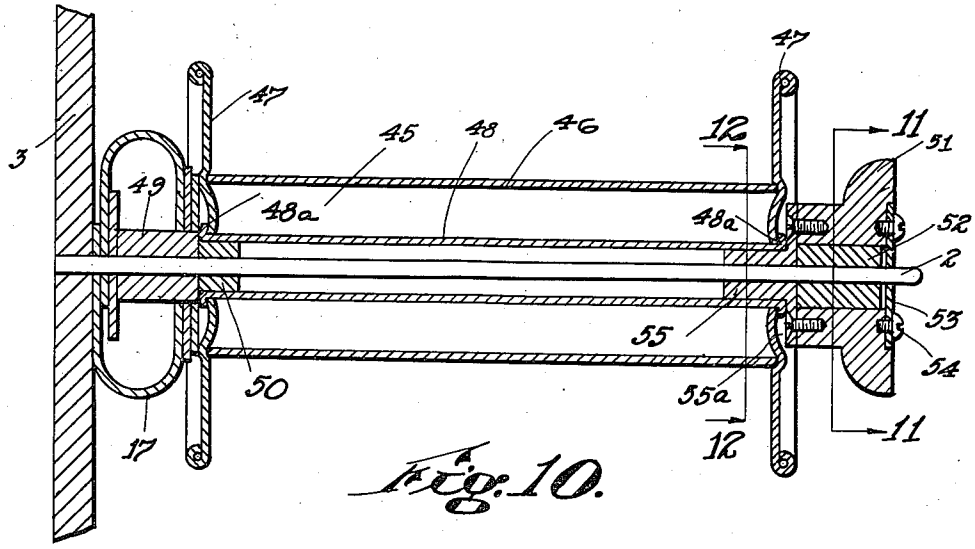


Fig. 10.

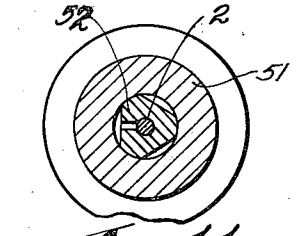


Fig. 11.

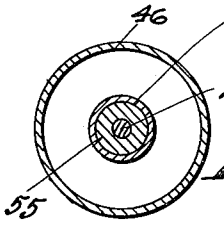


Fig. 12.

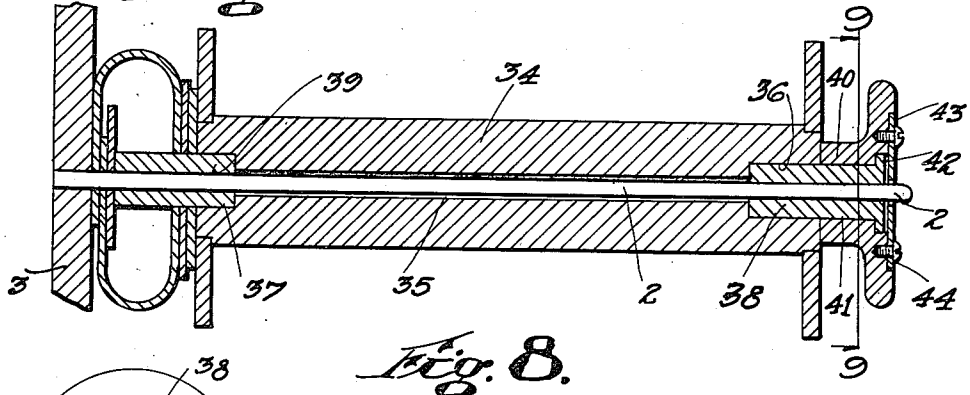


Fig. 8.

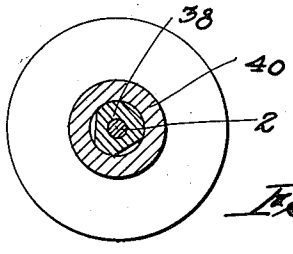


Fig. 9.

Inventors:
Frank B Javery
Armon J. Javery
By Owen W. Kennedy
Attorney

Patented July 7, 1936

2,046,559

UNITED STATES PATENT OFFICE

2,046,559

SPOOL MOUNTING FOR TEXTILE MACHINES

Frank B. Javery, Worcester, and Armon J. Javery, Oxford, Mass., assignors to Warp Compressing Machine Company, Worcester, Mass., a corporation of Massachusetts

Application August 23, 1934, Serial No. 741,128

5 Claims. (Cl. 242—130)

The present invention relates to an improved mounting for the spools and yarn packages of textile machines such as creels, twisting frames and the like, wherein yarn is drawn from a rotatable spool or package. The object of the invention is to provide a mounting for rotatably supporting a spool or package so that the yarn may be drawn therefrom at high speed without vibration, and without exhibiting any tendency towards endwise movement on the supporting spindle.

The improved mounting of the present invention may be readily applied to the spindles and spools of existing winding machinery and in no way interferes with the doffing of the spools and yarn packages in the usual manner. Furthermore, the invention contemplates the provision of means for preventing over-running of a spool upon cessation of the winding or drawing operation. The above and other advantageous features of the invention will hereinafter more fully appear from the following description taken in connection with the accompanying drawings, in which:—

Fig. 1 is a horizontal sectional view showing the mounting of a spool in accordance with the invention.

Fig. 2 is a vertical sectional view along the line 2—2 of Fig. 1, on an enlarged scale, the end flange not being shown.

Fig. 3 is a perspective view illustrating the positioning of a spool bearing member on a spindle.

Fig. 4 is a perspective view on an enlarged scale, showing the bearing of Fig. 3 mounted on the spindle.

Fig. 5 is a perspective view similar to Fig. 4, illustrating the construction of the bearing for the opposite end of the spool.

Fig. 6 is a horizontal sectional view illustrating the mounting of a yarn package in accordance with the invention.

Fig. 7 is a vertical sectional view along the line 7—7 of Fig. 6, looking in the direction of the arrows.

Fig. 8 is a horizontal sectional view illustrating a modified form of spool mounting.

Fig. 9 is a vertical sectional view along the line 9—9 of Fig. 8, looking in the direction of the arrows.

Fig. 10 is a horizontal sectional view illustrating a still further modification of the invention.

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

Fig. 12 is a vertical sectional view along the line 12—12 of Fig. 10.

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

Referring first to Fig. 1, the invention contemplates the rotatable mounting of a spool 1 on a spindle 2 that is supported in a substantially horizontal position by a suitable frame member 3 forming part of a textile machine, such as a creel or drawing frame. The barrel of the spool 1 provides an opening 4 extending longitudinally therethrough, the opening 4 being of appreciably larger diameter than the spindle 2. This opening 4 is countersunk at its ends to provide seats 5, 5 concentric with the opening 4 for receiving bearing members 6 and 7 on which the spool is freely rotatable.

As best shown in Figs. 3 and 4, the bearing 6 or the outer end of the spool 1 comprises a sleeve preferably formed of wood impregnated with a lubricant, with a bore 8 extending axially through the sleeve. The bore 8 is slightly smaller in diameter than the spindle 2, and the sleeve provides a radial slot 9 communicating with the bore 8, the purpose of the slot 9 being to permit a certain amount of expansion of the sleeve when the bearing 6 is pressed on the spindle 2. Such expansion of the bearing 6, due to spreading of the slot 9, is illustrated on a somewhat exaggerated scale in Fig. 4. When the bearing 6 is so positioned on the spindle, it is apparent that the inherent resiliency of the bearing material will exert a clamping action on the spindle, tending to oppose any axial movement of the bearing thereon.

The bearing 6 is adapted to be freely received in one seat 5 in the barrel of the spool, and the bearing 6 is retained in the seat 5 by means of a plate 10 suitably secured to the end of the spool barrel by screws 11. The bearing 6 is slightly shorter than the axial length of the seat 5 to prevent binding at the end surfaces of the bearing, and the outer surface of the bearing 6 provides spaced curved bearing surfaces 12 alternating with flat surfaces 13. As best shown in Fig. 2, the bearing surfaces 12 are concentric about the axis of the bore 8, and this arrangement of spaced symmetrically arranged bearing surfaces has been found to result in extremely free rotation of the spool on the bearing when the latter is frictionally clamped on the spindle 2. It is also to be noted that the radial slot 9 extends entirely through one of the flat surfaces

13 rather than one of the curved bearing surfaces 12.

The bearing 7 for the inner end of the spool 1 is constructed of the same material as the bearing 6 and is of substantially the same form, in that it provides a slot 14 which permits expansion of the bearing when it is forced onto the spindle 2. The end portion of the bearing 7, nearest the frame member 3 which supports the spindle 2, is cylindrical in form, while the opposite end which is received in the seat 5 of the spool is cut away to provide flat surfaces 15 alternating with curved bearing surfaces 16 which are concentric about the axis of the bearing, in common with the curved surfaces 12 of the other bearing 6.

When it is desired to mount a spool on a spindle in accordance with the present invention, a bearing 7 is first pressed on the spindle 2 with its cylindrical end portion in substantial engagement with the frame member 3, as shown in Fig. 1. A spool 1 with a bearing 6 loosely retained in an end seat 5 by the plate 10 is then placed on the spindle with its opposite bearing seat 5 receiving the free end of the bearing 7. With the spool 1 so mounted, the frictional engagement of the slotted bearings 6 and 7 with the spindle 2 effectively prevent any movement of the spool axially of the spindle, without in any way interfering with free rotation of the spool itself on the clamped bearings. The fact that each of the bearings 6 and 7 provides spaced concentric surfaces 12, or 16, disposed substantially at the corners of an equilateral triangle insures that the spool will rotate freely on the bearings, without any possibility of lateral movement which would result in vibrations when the spool 1 turns at high speed. That is to say, the barrel of the spool is always supported with its axis substantially coinciding with the axis of the spindle, so that it is practically impossible for the spool to wobble at either end, as often occurs when a spool is loosely mounted on a round spindle extending the entire length of the spool. When it is desired to replace an exhausted spool with a full one, it is an easy matter to withdraw the exhausted spool by pulling its upper end far enough to free the bearing 6 from the spindle, whereupon the spool is entirely free of the spindle.

As previously pointed out, the invention also contemplates the provision of means for preventing over-running of a spool upon the cessation of the winding or drawing operation, and such an arrangement is shown in Fig. 1. To this end, a strip of rubber 17 in the form of a loop is mounted on the spindle 2, with one side of the loop clamped between the frame member 3 and a washer 18 which is engaged by the cylindrical end of the bearing 7. The other side of the loop provides an opening 19 freely encircling the bearing 7, and washers 20 and 21 composed of fiber and felt respectively, are interposed between the free side of the rubber loop and the end flange 1a of the spool 1. When the spool 1 is positioned on the spindle with its bearings 6 and 7 in frictional engagement therewith, the rubber loop 17 is slightly compressed, although the very small amount of friction resulting from the slight pressure of the felt washer 21 against the end of the spool is not sufficient to interfere with free rotation of the spool on its bearings. However, upon cessation of the winding or drawing operation with no further draft on the yarn, the friction exerted by the felt washer is sufficient to cause a braking action on the spool which effectively prevents any appreciable over-running thereof.

Referring now to Figs. 6 and 7, there is shown a modified form of mounting for supporting a yarn package 22 which is wound on a hollow cylindrical core 23 of paper or fiber, or any other suitable light durable material. In order to receive the package 22, a core holder or spool 24 is provided, the outer diameter of which is such as to tightly fit the inside of the cylindrical core 23. One end of the spool 23 provides a flange 25 having a groove 26 for receiving one end of the yarn package core 23, so that when the package 22 is placed on the spool, it is adapted to rotate therewith.

The spool 24 provides an opening 27 extending longitudinally therethrough and of appreciably larger diameter than the spindle 2, and the opening 27 is countersunk at its ends to provide seats 28 and 29 for receiving bearing members 30 and 31 on which the spool 24 is freely rotatable. The bearing member 30 is retained in position with the bearing seat 28 by means of a plate 32 and screws 33 passing into the end of the spool, and it is apparent from a comparison between Fig. 1 and Fig. 6 that the bearings 30 and 31 are of substantially the same construction as the bearings 6 and 7. Therefore, the spool 24 when rotatably supported on the spindle 2 by the bearings 30 and 31 functions in substantially the same manner as the spool 1.

With the modified construction of Figs. 6 and 7, it is possible to equip the spindles of a creel, or drawing frame with package holders or spools 24 and mount on these spools standard yarn packages, whereupon the apparatus will operate in the same manner as with the yarn wound directly on the spools, as described with reference to Fig. 1. When doffing, with the arrangement shown in Fig. 6, either the empty cores 23 may be withdrawn separately from the spools 24 without removing the latter from the spindles, or each spool and yarn package may be handled as a unit, if desired.

Referring now to Figs. 8 and 9, there is shown a modification of the invention, whereby spools may be rotatably mounted in accordance with the invention, without the necessity of providing a bearing at one end of the spool, as shown in Fig. 1. In Fig. 8 a spool 34 provides an opening 35 extending longitudinally therethrough of appreciably larger diameter than the spindle 2, with the ends of the spool barrel providing bearing seats 36 and 37 for receiving bearings 38 and 39. The bearing 39 nearest the frame member 3 is formed identically with the bearing 7 described with reference to Fig. 1, and is adapted to frictionally engage the spindle in the same manner as the bearing 7. The bearing 38, however, is not carried by the spool 34, but extends beyond the end of the spool into a removable cap 40. An opening 41 in the cap through which the bearing 38 extends is countersunk at one end to receive a shoulder 42 provided at one end of the bearing 38, and the bearing 38 is retained in the cap 40 by means of a plate 43 and screws 44. The thickness of the bearing shoulder 42 is somewhat less than the distance between the plate 43 and the bottom of the countersunk opening, so that the bearing 38 has a certain amount of end play in the cap, for the same purpose as with the bearing 6.

When mounting a spool 34 on a spindle 2 the bearing 39 is first positioned at the base of the

spindle as before, whereupon the spool is placed on the spindle with one end supported by the bearing 39. The opposite end of the spool is then loose on the spindle, but upon pressing the cap down upon the spindle, the end of the bearing 38 rotatably supports the end of the spool 34 in the same manner as does the bearing 6 previously described. In other words, positioning of the cap 40 completes the assembly, and since the bearing 38 carried by the cap 40 frictionally clamps the spindle, the spool is free to rotate on the bearings 38 and 39, without possibility of end play or vibration. In the construction of Fig. 8 the spools 34 are of substantially standard form and it is entirely immaterial which end is first placed on the spindle, due to the fact that the outer bearing 38 does not constitute part of the spool.

Referring now to Figs. 10, 11 and 12, there is shown a still further modification of the invention for rotatably mounting a spool of the type that employs pressed metal parts, such spools being used to a considerable extent due to their strength and durability. In Fig. 10 such a spool is indicated by the reference character 45, and comprises a hollow cylindrical core 46 clamped between pressed metal end flanges 47. The spool 45 further comprises a metal sleeve 48, and the several parts are retained together in concentric relation by riveting over the ends of the sleeve, as indicated at 48*a*.

In mounting the spool 45 on the spindle 2, a bearing 49 is provided near the base of the spindle which is similar in construction to the bearing 7 of Fig. 1, with the exception that it provides an extension 50 of such diameter as to be received freely in the bore of the sleeve 48. Preferably the bearing extension 50 is composed of metal, although it can be composed of the same material as the bearing 49, namely lubricant impregnated wood. A cap 51 is provided at the opposite end of the spindle 2, which cap carries a bearing 52 retained within the cap by a plate 53 and cooperating screws 54. The end of the bearing 52 opposite the plate 53 abuts a flange 55*a* provided on a bearing extension 55, which is preferably composed of metal.

With the above described arrangement, the bearing 49 with its extension 50 are first positioned at the base of the spindle 2, and the spool 45 placed in position with the extension 50 received in the end of the sleeve 48. The cap 51 is then placed on the spindle 2, with the extension 55 entering the sleeve 48 and the bearing 52 frictionally clamping the end of the spindle. The spool 45 is then free to rotate between the bearings without possibility of end play, due to the clamping of the cap 51 on the spindle. Obviously, the spool 45 may be readily doffed upon removal of the cap 51, it being evident that either end of the spool may be placed first on the spindle.

From the foregoing, it is apparent that by the present invention there is provided an improved mounting for rotatably supporting spools or yarn packages so that the yarn may be drawn therefrom at high speed without substantial vibration, and without exhibiting any tendency towards endwise movement on the supporting spindle. The improved mounting is readily adapted for application to the spindles of existing creels or twisting frames, inasmuch as the slotted bearings may be formed to frictionally clamp any desired size of spindle. Furthermore, the invention is adapted for the mounting of standard spools or yarn packages wound on cores, without in any way interfering with the ready doffing of the spools or packages and their handling in the usual manner.

We claim:—

1. The combination with a spindle and a spool turnable thereon, of a bearing member for each end of said spool, each of said members comprising a split sleeve frictionally engaging said spindle with an outer surface of said sleeve providing a bearing surface for said spool.

2. The combination with a spindle and a spool turnable thereon, of a bearing member at each end of said spool on which the latter is journaled, each of said bearing members comprising a split sleeve normally having a bore slightly smaller than the spindle to frictionally engage said spindle when positioned thereon.

3. The combination with a spindle and a spool turnable thereon, of a split bearing sleeve engaging said spindle adjacent the outer end thereof for retaining the spool against axial movement on said spindle, said sleeve normally having a bore slightly smaller than the spindle, whereby expansion of the sleeve causes it to frictionally clamp the spindle.

4. The combination with a spindle and a spool having an axial bore therethrough for said spindle, of a split bearing sleeve secured to said spool in alinement with said axial bore, said sleeve having a bore normally slightly smaller than the spindle.

5. The combination with a spindle and a spool having an axial bore therethrough for said spindle, of a split bearing sleeve positioned within the spool in alinement with the axial bore thereof, said sleeve engaging the spindle and by its frictional engagement therewith retaining the spool against axial movement thereon, the outer surface of said sleeve providing a bearing surface for said spool.

FRANK B. JAVERY.
ARMON J. JAVERY.