Jan. 13, 1953 R. ATWOOD 2,625,335

TEXTILE SPOOL DRIVING CONNECTION

Filed May 29, 1948

Fig. 1

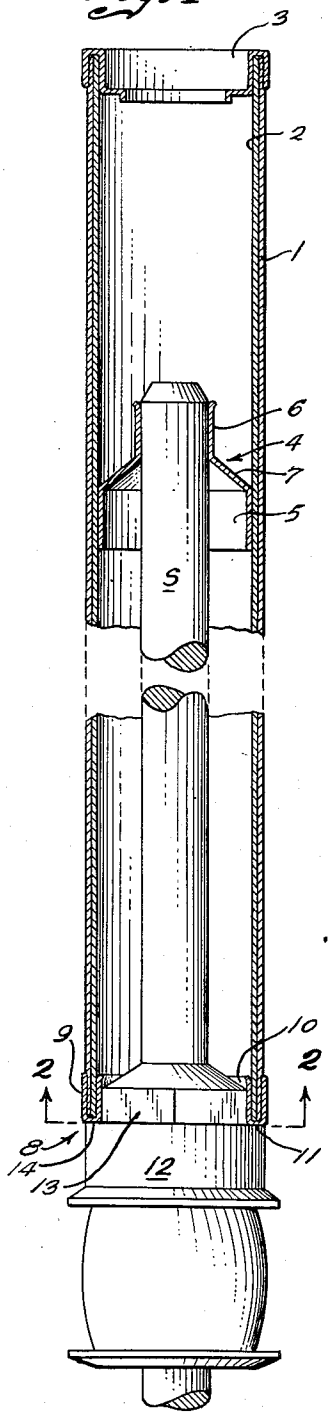
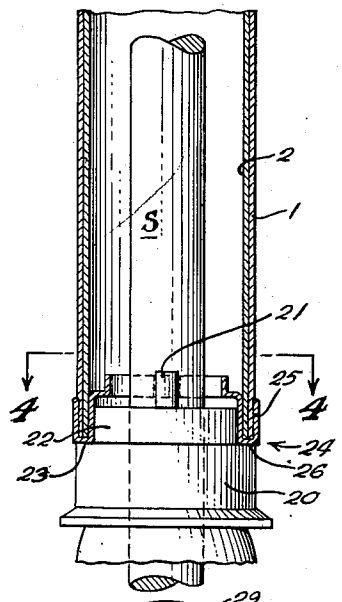


Fig. 3



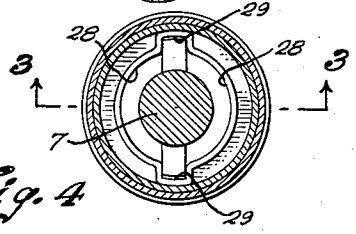


Fig. 4

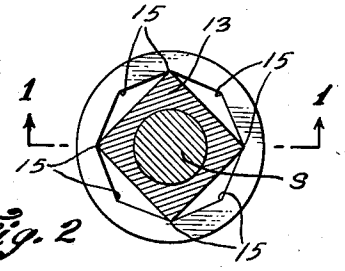


Fig. 2

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TEXTILE SPOOL DRIVING CONNECTION

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Application May 29, 1948, Serial No. 30,049

6 Claims. (Cl. 242—46.2)

1

This invention relates to improvements in textile spools.

More particularly, the invention is concerned with textile spools which are adapted to sit in vertical position on a spindle and be driven thereby for winding textile and other fibers. Such a spool is hereinafter referred to for brevity as a pirn, meaning thereby any spool designed and adapted for fitting vertically on a spindle and being driven by a whorl at its lower end.

It is an object of the invention to provide a pirn which may be removed from a spindle in locations where the vertical space or clearance is limited, by permitting a tilting of the pirn with reference to the spindle axis, after only a small lifting thereof and through a relatively large angle, so that the pirn may be raised up and tilted forwardly to clear any obstruction which may be located above the spindle.

A further object of the invention is to provide an improved pirn having novel arrangements for seating, centering and driving the same.

Still another object of the invention is to provide an improved combination of a pirn and spindle, adapted to work together during the winding operation, and so formed as to facilitate removal and replacement of the pirn from and onto the spindle, resulting from the fact that the pirn is released from close engagement to the spindle when it has been raised sufficiently to disengage the top and bottom bearings from the spindle and the whorl respectively.

For a full understanding of the invention a detailed description of a pirn and spindle embodying the invention in a preferred form will now be given in connection with the accompanying drawing and the features forming the invention will be specifically pointed out in the appended claims.

In the drawing:

Figure 1 is a view in central vertical section, on line 1—1 of Fig. 2, of a pirn, embodying the invention in one form of embodiment, and showing the same in position upon a spindle (not sectioned);

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section taken on the line 3—3 of Fig. 4, but showing another form of pirn and spindle; and

Figure 4 is a section on the line 4—4 of Figure 3.

Referring now to Figures 1 and 2, the pirn selected for purposes of illustration is of generally familiar construction, comprising an outer tubular barrel 1, of pasteboard or similar material, an inner tubular barrel member 2 of steel or other material and an upper end cap 3 which is fitted within the upper end of the barrel. A generally cup-shaped member 4 is placed within the barrel and includes a cylindrical portion 5 fitting into the tubular member 2 and a cylindrical portion of reduced diameter 6 which serves as a spindle bearing, together with the generally conical intermediate portion 7 which serves to support the spindle bearing 6 and also to guide the tip of the spindle S into the same when the pirn is placed upon the spindle. The lower end of the pirn is provided with a drive end member in the form of a ferrule 8 having a cylindrical outer flange 9 and a polygonal inner flange 10. The inner flange 10 preferably forms a polygon with an even number of sides and is preferably octagonal, as shown. Ferrule 8, intermediate the flanges 10 and 9, also forms an annular end surface 11 for supporting the pirn.

2

The whorl 12 of the pirn is formed with an upper portion 13, preferably in the form of a square inscribed within a circle of less diameter than the whorl generally, providing a shoulder 14 for seating the pirn. When the inner part of the pirn drive end member is not octagonal, the part 13 of the whorl is preferably formed as a polygon having half the number of sides.

The pirn sits upon the spindle with the bearing 6 engaging the tip thereof, with the annular surface 11 seated on the shoulder 14 of the whorl and with the corners of the square portion 13 of the whorl fitting into vertices 15 of the inner octagonal flange 10 of the drive end member 8. The bearing member 6 may be fastened immovably within the tubular member 2 but is preferably placed therein with a driving fit which permits sliding of the same along the pirn where desired but prevents accidental dislodgment thereof. In this way the pirn may be adjusted to spindles whose tips are located at different heights from the whorl. The spindle height in a typical case may be eight or nine inches, while the pirn may be a foot long or thereabouts.

In removing the pirn from the spindle, the pirn is first raised until the bearing 6 is lifted above the tip of the spindle or the drive end member is lifted above the square portion 14 of the whorl and, as soon as either condition has occurred, the pirn may be tilted somewhat with relation to the spindle. The pirn may now be further lifted and tilted, the tip of the spindle being in contact, or substantially so, with the inner wall of the tubular barrel, and the opposite side of the drive end of the barrel being also in contact with the spindle. Since the polygonal configuration of the

inside of the drive end of the barrel departs only slightly from the circular, the extent of tilting permitted is substantially equal to that obtainable with a plain cylindrical tube of equal inside diameter.

In Figures 3 and 4, the invention is shown in another form as to the lower end of the pirn and cooperating parts of the whorl. In this form of the invention, a whorl **20**, having the usual drive lugs **21**, is provided. The upper part of the whorl, as at **22**, is of reduced diameter, thus forming a shoulder **23** for seating the pirn. The pirn is provided with a drive end member **24** having an outer flange **25**, an annular lower supporting surface **26** and an inner cup-shaped portion, in which there is formed a key-hole shaped central aperture comprising a generally circular central aperture **28** of substantially greater diameter than the spindle S, and having lateral enlargements **29** which fit around the lugs **21** in driving engagement therewith. The aperture **28—29** may fit the lugs **21** with any desired closeness but is spaced from the spindle S so as to permit tilting of the pirn with relation to the spindle as soon as it has been lifted off the whorl and the spindle bearing has been lifted off the spindle. The lateral enlargements **29** of the central aperture need be only marginal to insure proper driving engagement with the lugs of the whorl. It will thus be apparent that the inside diameter of the lower end of the pirn may be almost as great as that of the pirn barrel generally, providing substantially the same possibility of tilting as in the embodiment of Figures 1 and 2.

While the invention has been shown as applied to a spool of pasteboard or other outer construction, and steel or other inner construction, it will be apparent it is applicable to pirns having tubular barrels in general and regardless of their specific construction.

What is claimed is:

1. A pirn comprising a tubular barrel, a spindle bearing within the barrel and spaced from the bottom end thereof for engaging the top of a spindle of small diameter by comparison with the inner diameter of the barrel, and a drive end of polygonal inner configuration having an inside diameter substantially equal to the inside diameter of the barrel.

2. A pirn according to claim 1, in which the drive end comprises a sheet metal member fitted over the lower end of the barrel, having an outer flange fitting the outer surface of the barrel, an inner flange of polygonal configuration fitting inside the barrel and a connecting portion between the flanges forming an anular surface for receiving and supporting the pirn upon the whorl of the spindle.

3. A pirn according to claim 1, in which the drive end of the barrel is of octagonal inner configuration.

4. The combination with a pirn according to claim 1, of a spindle supporting the pirn with its tip engaging in the bearing and having a whorl comprising a shoulder for seating and supporting the lower end of the pirn and means above the shoulder for engaging in the vertices of the polygonal inside of the drive end for forming a driving connection to the pirn.

5. The combination with a pirn comprising a tubular barrel, a spindle bearing within the barrel and spaced from the bottom end thereof for engaging the top of a spindle of small diameter by comparison with the inner diameter of the barrel, and a drive end of inner diameter substantially equal to the inner diameter of the barrel and formed with means for engaging the whorl of a spindle in driving relation therewith, of a spindle with its tip engaging within the bearing and having a whorl comprising a shoulder for receiving and supporting the lower end of the pirn and means above the whorl for engaging the means formed within the drive end of the pirn for forming a driving connection with the whorl.

6. The combination with a pirn comprising a tubular barrel, a spindle bearing within the barrel and spaced from the bottom end thereof for engaging a spindle of small diameter by comparison with the inner diameter of the barrel, and a drive end formed with means for forming a driving connection with the whorl of the spindle and having an unobstructed central aperture of greater diameter in all directions than the spindle for permitting tilting of the spindle in any direction about the center of the aperture to bring the tip of the spindle against the inner wall of the pirn barrel, when the pirn is lifted so that the spindle bearing is above the tip of the spindle; of a spindle supporting the pirn with its tip engaging in the bearing and having a whorl comprising a shoulder for supporting the lower end of the barrel and means above the shoulder forming a driving connection to the pirn.

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