

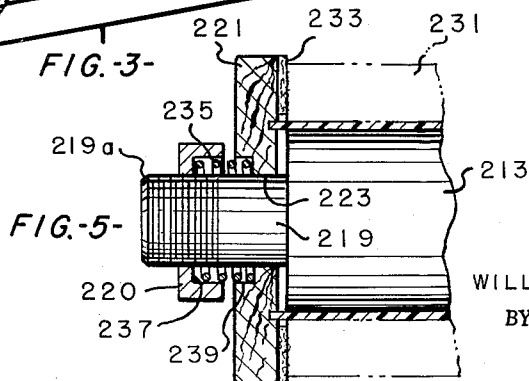
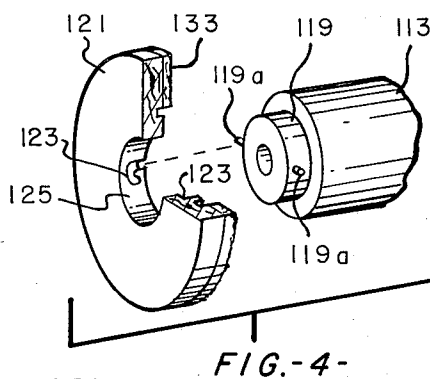
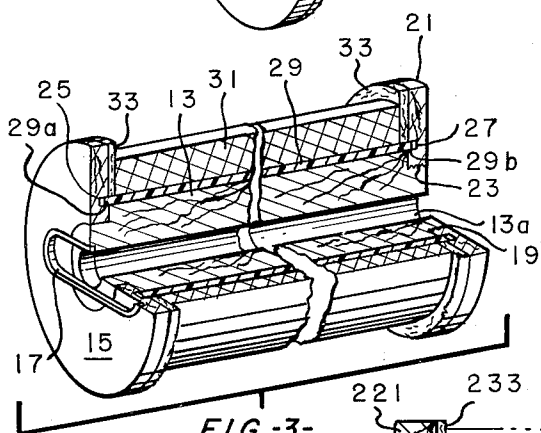
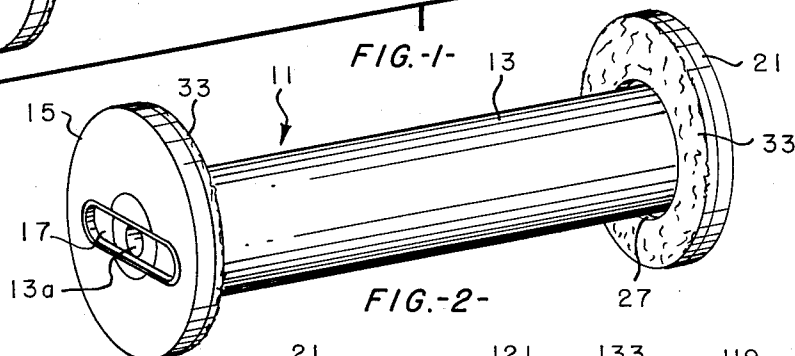
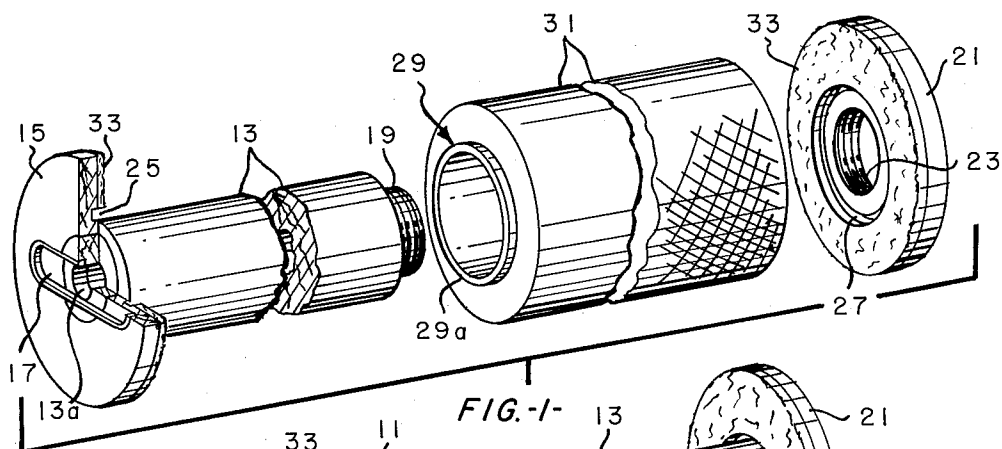
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METHOD FOR HANDLING YARN

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METHOD FOR HANDLING YARN

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This invention relates to an improved method and arrangement for handling yarn, and more particularly to an improved method and arrangement for using prewound yarn packages formed on headless tubes without the necessity for rewinding in textile operations where a flanged bobbin yarn package is required.

In various textile handling yarn operations, as for instance in an up-twister operation such as is sometimes employed in the twisting of tire cord strands in preparation for plying such strands together, it is desirable or necessary to unwind the yarn overend from a flanged bobbin package. On the other hand, however, the yarn as supplied by manufacturers is commonly formed on a disposable compressed paper tube, and accordingly heretofore it has been necessary and conventional to rewind the yarn from the headless tube as supplied by the manufacturer onto a flanged bobbin in order to form a flanged bobbin package suitable for the overend unwinding and up-twisting operation. This rewinding operation is time consuming and costly, particularly since substantially the only value achieved thereby is the mere transfer of the yarn onto a flanged bobbin for subsequent twisting of the yarn as it is unwound from the flanged bobbin. It is accordingly a major object and feature of this invention to eliminate the necessity for the rewinding of the yarn from a manufacturer's package onto a flanged twister bobbin for subsequent twisting of the yarn as it is unwound from the twister bobbin, while retaining the advantage of unwinding the yarn overend from a flanged bobbin package.

A further feature of the invention is the provision of a unique method of assembling a yarn package on a flanged bobbin.

Still a further feature according to the invention is the provision of a unique flanged bobbin package holder adapted to receive and hold a yarn package preformed on a headless tube.

Still other objects, features and attendant advantages will become apparent to those skilled in the art from a reading of the following description of various physical embodiments constructed in accordance with the invention, taken in conjunction with the accompanying drawing wherein

FIGURE 1 is an exploded perspective view of the normally separable elements of a physical embodiment constructed according to the invention and including a headless yarn package.

FIGURE 2 is an assembled view in perspective of the arrangement of FIGURE 1 illustrating the flanged bobbin package holder without the headless package.

FIGURE 3 is a perspective view with one-quarter section cut away, of the arrangement illustrated in FIGURE 1, with a headless yarn package in place.

FIGURE 4 is an exploded view in perspective of the removable head end of a modification wherein a bayonet type connection is employed for removably mounting the removable flange on the bobbin barrel.

FIGURE 5 is a diametral section view of a further modification.

Referring now to the figures of the drawing, in FIGURES 1-3 a flanged bobbin package holder, generally indicated at 11, has a barrel or core 13, which may be of any suitable material such as wood, fiber, metal, etc., and which has suitably secured at one end thereof a disc

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flange or head 15 having a suitable drive connection 17 formed on its outer end face. The end flange 15 may be secured to the barrel 13 in any suitable manner as for instance by bonding, screws, etc., as is conventional practice in the art. The flanged end having the drive connection 17 formed thereon serves as the support and driving end of the yarn package assembly for employment in a conventional manner as an up-twister bobbin. The barrel, as in conventional practice, has an axial bore formed therethrough for receiving a spindle upon which a flyer (not shown) may be mounted at the outer end thereof.

The opposite end of the barrel has a reduced diameter threaded portion 19, upon which a second removable flange 21 is adapted to be removably mounted through the medium of a complementary screw threaded bore 23 formed in the center thereof.

Formed on the inner face of each of the end flanges 15 and 21 is an annular recess or groove 25, 27 which is preferably substantially complementary to the ends of a headless tube 29, upon which tube a yarn package 31 has been prewound prior to putting the tube 29 onto the barrel 13 of the flanged bobbin holder 11.

Preferably the manufacturer's or other prewound yarn package formed on the headless tube 29 has a build such that the ends of the yarn package are substantially flat, although the invention is adaptable to employment with yarn packages wherein the ends of the packages are not precisely flat. To this end the inner faces of the end flanges have formed or secured thereon, as by cement, a layer 33 of soft resilient, preferably somewhat elastic, material such as felt, sponge rubber, etc., in order to permit the inner face which is contiguous to the yarn package to conform substantially to the yarn package end surface so as to prevent possible yarn entrapment difficulties which might arise in unwinding.

In utilizing the arrangement described above, the yarn package 31 is formed on the disposable headless cardboard tube 29 in any conventional or other suitable manner, and the tube with the yarn prewound thereon, forming a prewound headless yarn package, is then slipped over the barrel with the removable flange removed from the barrel during this assembly operation. It is conventional practice to form a yarn package on the tube with the ends 29a, 29b of the tube protruding out for 1/8 to 1/4 inch or the like beyond the ends of the yarn package build. The protruding end 29a of the tube adjacent the end flange 15 is fitted into the annular recess 25, with the adjacent end of the yarn package resting on the soft resilient inner facing 33 of the end flange 15. Then the removable end flange 21 is screwed onto the complementary screw threaded end 19 of the barrel, while the adjacent protruding end of the tube is fitted into the annular recess 27 formed on the inner wall of the removable flange 21. The removable flange 21 is screwed onto the barrel with sufficient tightness to suitably hold the tube 29 in place while providing a light resilient end force on the yarn package 31 wound on the tube in order to permit ease of unwinding of the yarn therefrom.

The package assembly thus formed is now ready for use as in a conventional up-twister, and when employed for such use the assembly is placed with the drive connection 17 in engagement with a suitable complementary drive means on a driven spindle, a flyer of any desired or conventional construction being mounted on the outer end of the spindle extending through the axial bore 13a formed in the barrel, the flyer being disposed as in conventional practice adjacent the outer face of the end flange 21 and being rotatable about the spindle axis to provide for over-end unwinding and twisting of the yarn from the bobbin. Upon the exhaustion of the yarn from the package assembly the exhausted bobbin assembly may be re-

moved from the spindle, the removable flange unscrewed from the barrel and the disposable tube removed, whereupon a fresh full tube 29 may be slipped onto the barrel 13 and the removable flange 21 again secured to the barrel. The package assembly is thus once again ready for use as an unwinding twister bobbin assembly.

In FIGURE 4 there is shown an alternate arrangement employing a bayonet type coupling for removably mounting the removable end flange onto the bobbin package holder barrel. In this arrangement a pair of detents 119a are formed on a reduced diameter end portion 119 of the barrel 113 and a complementary bayonet grooved locking portion in the form of two complementary cam grooves 123 formed on the inner surface of a complementary axial bore 125 formed in the removable end flange 121. The operation of this arrangement is substantially similar to that of the arrangement illustrated in FIGURES 1-3, except that the removable end flange is attached to the barrel by the simple procedure of sliding the end flange axially onto the complementary end portion and then imparting an angular motion to the end flange 121 relative to the barrel 113 in order to lock the complementary bayonet connection 119a, 123 between the barrel 113 and the end flange 121. This arrangement is advantageous in providing for quick connection and disconnection of the removable end flange, however the arrangement of FIGURES 1-3 is in some instances more advantageous in that it is adaptable to varying lengths of headless packages.

In FIGURE 5 a further mode of practicing the invention is illustrated, wherein the removable end flange 221 is resiliently biased into contact with the adjacent end of the preformed yarn package 231. To this end, the barrel 213 has formed at the removable flange end a reduced portion 219 having threads 219a formed on its outer end and being adapted to receive a securing nut 220. The removable end flange 221 has a smooth bore 223 complementary to the reduced end portion 219 of the barrel 213 and is resiliently biased toward the opposite end flange through the medium of a compression spring 235 surrounding the reduced barrel end portion 219 and seated preferably in recesses 237, 239 formed respectively in the outer end face of the removable end flange 221 and the adjacent end face of the removable securing nut 220. This arrangement is also advantageous in that it accommodates various lengths of headless packages and tubes.

Although various physical embodiments have been illustrated and described in detail herein, it will be apparent to those skilled in the art that such is only by way of illustration and that many modifications and improvements may be made without departing from the scope and spirit of my invention. For instance various other disconnect couplings may be employed between the barrel and the

removable end flange, or in some instances one might make the barrel separable into two sections each having an end flange secured thereon, the tube and prewound package being inserted and the tube removed by uncoupling the barrel sections. Accordingly, it is to be understood that the invention is not limited by the specific illustrated embodiments but only by the scope of the appended claims.

That which is claimed is:

1. The method of handling yarn comprising fitting a disposable headless tube having a substantially plano-ended yarn package wound thereon about the barrel of a bobbin having a plano-faced flange mounted at one end of said barrel and a removable plano-faced flange adapted to be removably fitted onto the opposite end of said barrel, then removably mounting said removable flange on said opposite end of said barrel and inter-engaging each of said plano-faced flanges in contiguous relation with a respective plano end face of said package, and unwinding said yarn over-end over one of said end flanges.

2. The method of handling yarn comprising winding a plano-ended yarn package onto a disposable headless tube, sliding said tube with said package thereon onto the barrel of the bobbin having a plano-faced flange mounted at one end of said barrel and a removable plano-faced flange adapted to be removably secured to the opposite end of said barrel, then removably securing said removable flange and barrel together with said removable yarn and package disposed in secured relation about said barrel and in substantially fully contiguous package-to-flange interengaging relation between said flanges, and then unwinding said yarn overend over one of said end flanges of said bobbin while imparting a twist to said yarn as it is unwound.

3. The method according to claim 1, further including the resilient cushioning of said package at both ends thereof at the zone of package-to-flange interengagement.

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