

[54] **YARN TUBE**

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3,544,034 12/1970 Jurney et al. 242/118.32

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[52] **U.S. Cl.** **242/118.32**

[51] **Int. Cl.** **B65h 75/10**

[58] **Field of Search**..... 242/118.32, 118.31, 118.3,
242/118, 118.7

[56] **References Cited**

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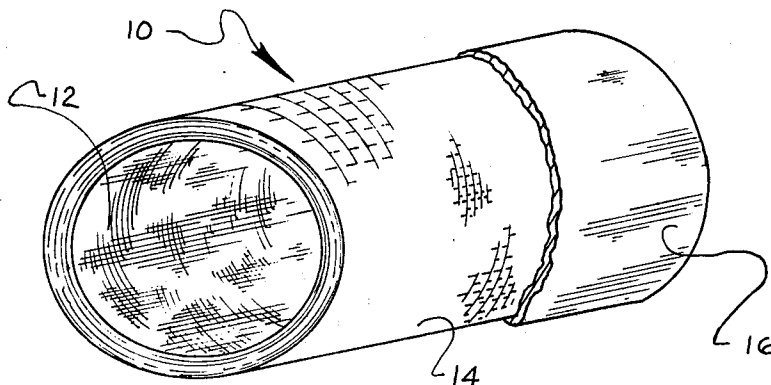
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[57]

ABSTRACT

A yarn carrier having a penultimate ply of embossed paper upon which a smooth, soft ply of material such as parchment, or film is applied to form a resilient slip resistant surface for textile yarns.

6 Claims, 2 Drawing Figures



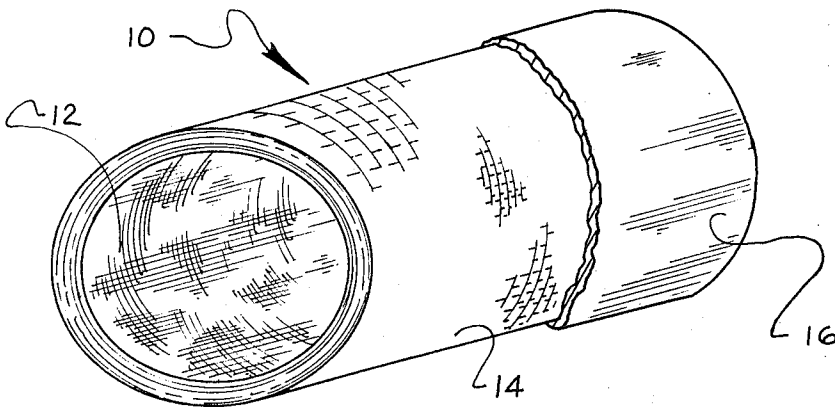


Fig. 1

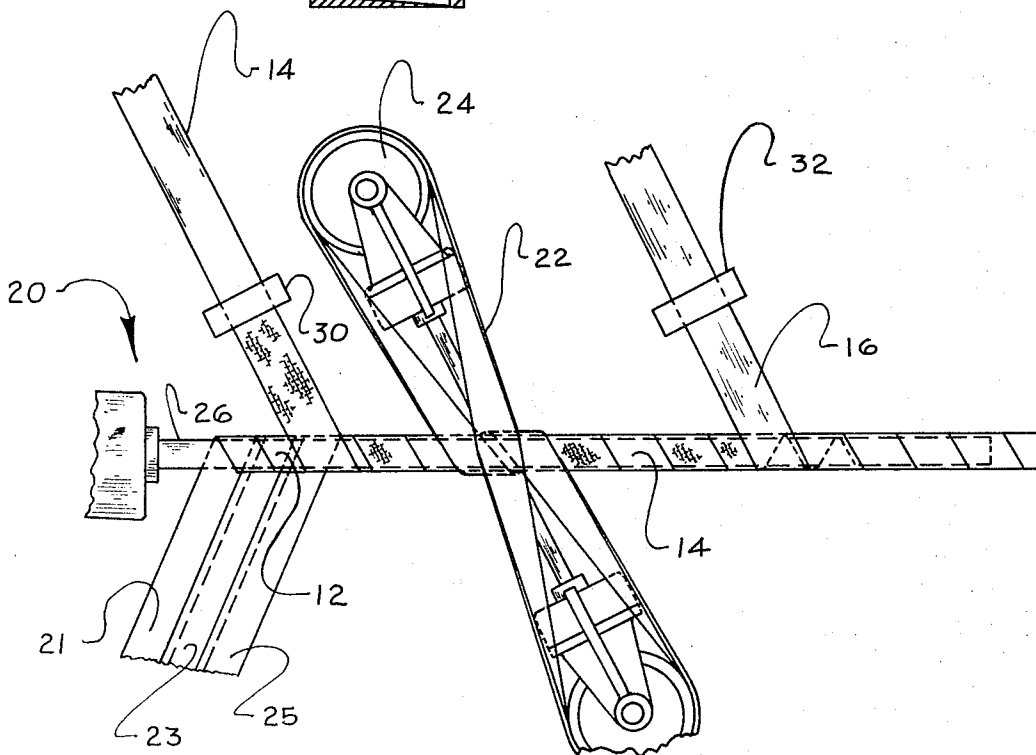


Fig. 2

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YARN TUBE

This invention relates generally to yarn carriers and, more particularly, to draw twister tubes for storage and transportation of textile yarn.

In the production of yarn, especially during the processing known as draw twisting, it is necessary that yarn carriers or tubes have given surface characteristics such, for example, as those permitting smooth delivery of the yarn at the point of use. The smoothness of the surface necessarily creates the disadvantage of the potential sliding or slipping of the yarn package from the tube. In an attempt to avoid the slipping, the tubular structures having surface characteristics such as ribbed or creped parchment set forth in U.S. Pat. Nos. 3,362,655 and 3,544,034, respectively, were developed. However, these constructions have undesirable features in that there are breaks and sharp corners caused by the ribbing or creping which damage the yarn and prevent proper delivery, especially of the primary winds close to the surface of the carrier.

It is an object of the instant invention to provide a yarn carrier which will have smooth delivery characteristics and a sufficiently roughened surface to provide proper delivery of yarn from the carrier.

A further object of the instant invention is to provide a yarn carrier wherein a penultimate ply of embossed material is covered by an ultimate ply of smooth material.

Still another object of this invention is to provide a base tube upon which an embossed paper is applied as the penultimate ply and having an outer ply of smooth, low pointage, parchment-type paper.

The above advantages of the instant invention will become more apparent with reference to the following description when taken in conjunction with the attached drawings wherein like numerals refer to like elements and:

FIG. 1 is a diagrammatic perspective view of a portion of a yarn carrier of the instant invention; and

FIG. 2 is a diagrammatic top view of a machine showing a method of production of the tube of the instant invention.

Referring now to FIG. 1 wherein yarn carrier 10 is shown to include base tube 12 which may be of any number of plies of material. Generally base tube 12 would be constructed of fibrous material such as paper of substantial strength and sufficient for retention of the crushing forces of the yarn which is applied thereto. A penultimate ply of embossed material 14 is wrapped around base tube 12. It is to be understood that ply 14 may be made of paper, such as "low-mark" cone paper, woven material, cloth, or an embossed paper having crests and troughs or high and low portions of some desirable configuration. It is not necessary that the depressions or raised portions have any given designs or area. However, it is anticipated that a reasonable degree and size should be anticipated.

The ultimate or outer ply 16 on carrier 10 is generally of a smooth, pliable, low pointage, parchment or parchment-type paper. However, it is to be understood that ply 16 could be of a film such as polyethylene or any given type of woven or non-woven material having relatively smooth surface characteristics.

FIG. 2 shows a conventional spiral machine 20 in substantially diagrammatic form wherein drive belt 22 is shown passing over drive rollers 24 and wrapped

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about mandrel 26. Spiral machine 20 is of conventional construction.

Base tube 12 is made by application of plies 21, 23 and 25. Although base tube 12 is shown in FIG. 2 as comprised of three base plies, it is to be understood that any number of plies may be utilized which would generally be wound as shown in FIG. 2 utilizing a conventional adhesive. Ply 14 of embossed paper is applied to base tube 12 with conventional adhesives. It is to be understood that, depending upon the undulation and degree of depression and length of span from rise to rise of the material in ply 14, rollers 30 may be utilized to insure uniform and proper thickness of ply 14. It is also possible to utilize rollers 30 for embossing or application of the ridges and valleys immediately prior to the application of ply 14 to base tube 12. In this regard it is to be noted that the application of adhesive may be before, at or after the rollers 30.

Parchment or smooth ply 16 is generally applied beyond belt 22 in the configuration shown in FIG. 2. However, it is understood that ply 16 may be applied prior to belt 22 in order to utilize the pressure of belt 22 which wraps about the completed tube in insuring proper adhesion of ply 16 to ply 14. In some constructions it may be advisable to apply ply 14 beyond the belt. Depending upon the surface characteristics desired, it also may be advisable to utilize a "softening" process, such as wetting or other treatment in order to provide the desired characteristic to the completed tube.

Thus it is seen that the instant yarn carrier 10 provides a smooth, soft surface which has depressions and ridges which will permit proper delivery of a yarn and prevent slipping of the yarn from the carrier. It is also observed that any given surface characteristic may be utilized by appropriate selection of outer ply 16. The degree of undulation or surface configuration will depend to a large extent upon the type of embossing or marking of penultimate ply 14. It is to be understood that appropriate selection of the materials from which ply 14 is made may permit an effect upon the winding of yarn on carrier 10. For example, a soft material will compress at the ridges in response to the constrictive forces of the yarn to increase yarn slip resistance. Outer ply 16 may be treated in order that when wound on the tube the thin sheet will be permitted to shrink onto the surface of the tube and thereby conform more to the configuration of the markings on the ply to which it is adhered. It has been found that wetting a parchment ply 16 causes the parchment to stretch tighter from ridge to ridge and thereby span the depressions more than in other constructions and thereby provide a smooth surface capable of compression of differing amounts to hold the yarn on the carrier.

What is claimed is:

1. A yarn carrier comprising a base tube; a penultimate ply of embossed material having ridges and depressions; and an outer ply of thin, smooth and pliable material which generally follows the contour of the embossed ply and having portions spaced therefrom, whereby a yarn carrier is provided having an undulating surface that precludes slipping of the yarn package while allowing proper yarn delivery.

2. A yarn carrier comprising a base tube; a penultimate ply of embossed material having ridges and depressions; and an outer ply of thin, smooth material

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spanning said depressions to provide a surface having differing compression characteristics.

3. The method of making a yarn carrier comprising the steps of forming a base tube; applying at least one ply of embossed material to said base tube; applying at least one outer ply of a pliable, smooth material over said embossed ply; and applying adhesive to adhere said penultimate and outer plies to one another.

4. The method of claim 3 further including the step of embossing said embossed ply just prior to application thereof to said base tube.

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5. The method of claim 3 including the step of treating said outer ply just prior to application thereof to said embossed ply.

6. The method of claim 3 including the step of passing said embossed ply through leveling means just prior to application thereof to said base tube, whereby said embossed ply is of a substantially constant thickness between the tops of the embossing and the opposite surface of said ply.

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