

United States Patent

[11] 3,544,034

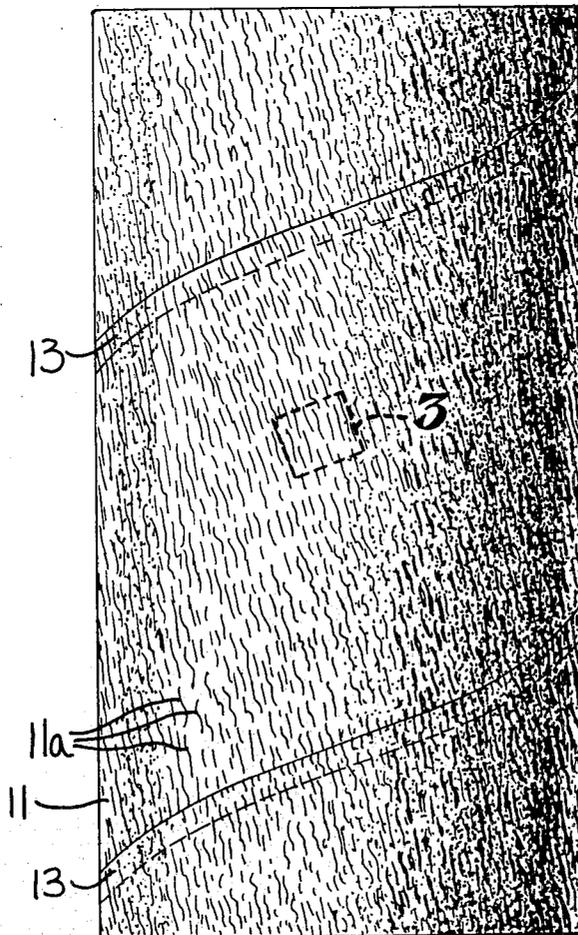
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[21] Appl. No. **732,734**
[22] Filed **May 28, 1968**
[45] Patented **Dec. 1, 1970**
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[54] **YARN CARRIER TUBE**
6 Claims, 5 Drawing Figs.
[52] U.S. Cl. **242/118.32**
[51] Int. Cl. **B65h 75/10,**
B65h 75/26
[50] Field of Search **242/118.32,**
118.31, 118.3, 118; 138/144

ABSTRACT: A thin outer ply of creped parchment paper is secured to the outer surface of a supporting core to provide an excellent slip-resistant and moisture-resistant outer winding surface for textile yarns.



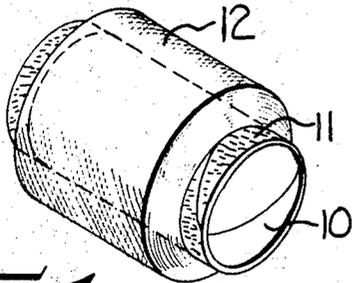


Fig-1

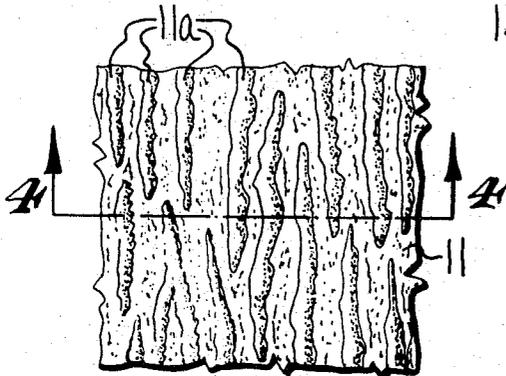


Fig-3

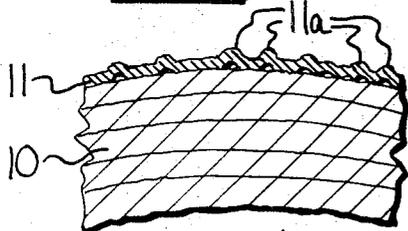


Fig-4

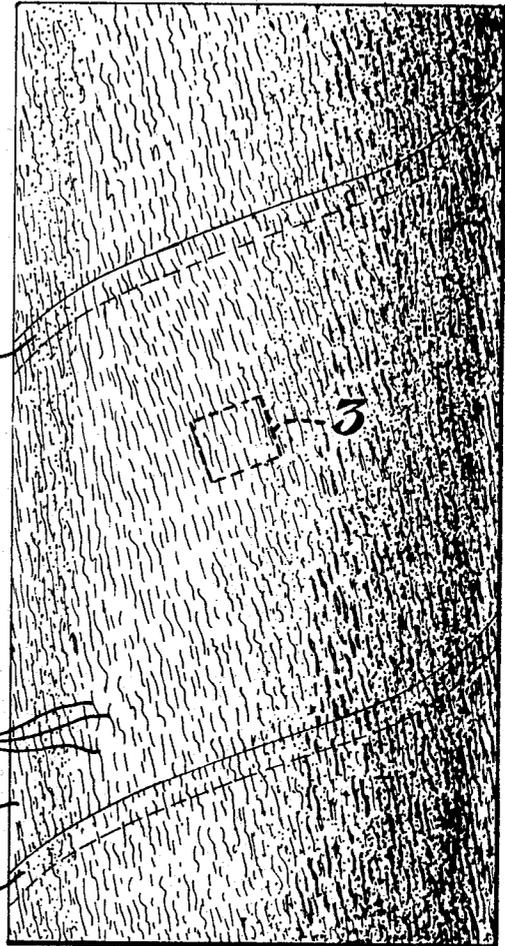


Fig-2

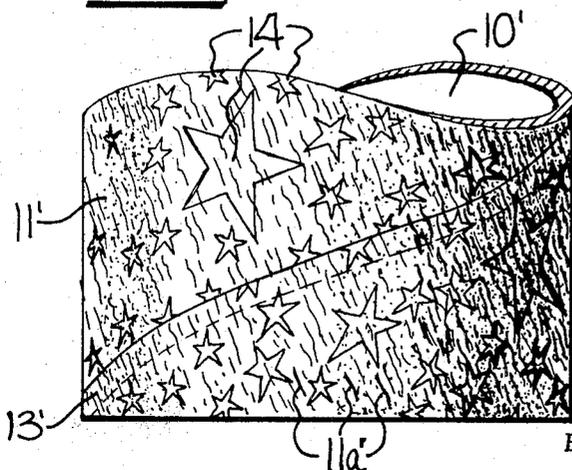


Fig-5

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YARN CARRIER TUBE

This invention relates to an improved laminated paper tube of the type adapted to have textile yarn wound thereon and more particularly to such a tube having an improved outer ply which provides an excellent slip-resistant and moisture-resistant outer surface onto which the yarn is wound.

In winding heavy twisted cotton yarn and the like, the type of winding surface on the yarn carrier tube is not critical because the yarn is so heavy and rough that it is not likely to be damaged or slip off the tube. However, as more and more different types of synthetic yarns have been produced with very fine slick filaments, the likelihood of "sloughing" or axial movement of the yarn on the tube has increased and more care has been taken to produce a slip-resistant winding surface on the yarn carrier which does not snag, catch or otherwise damage the fine filaments during the winding and unwinding operations. Many of these new synthetic yarns are textured by crimping or curling the filaments to increase the bulk and/or produce stretch therein. When winding these textured yarns, it is desirable to maintain a low tension on the yarn so that the bulk is not removed and the resulting "soft" package is more likely to slough or slip along the tube during shipment.

This sloughing problem may be overcome by many known methods. For example, the outer surfaces of textile yarn carriers have been formed with molded rings, flocking and latex have been applied to the outer surface, the outer surface has been sanded, and a length of thin kraft paper having preformed ribs has been spirally wound around the supporting core. While each of these methods increases the slip resistance of the outer surface of the yarn carrier, to greater or lesser degrees, none of them has been completely satisfactory in other respects.

The yarn carriers having molded rings, flocking or latex on their surfaces are expensive, since they require additional manufacturing operations. It is necessary to subject the wound packages of many of types of textured yarns to steam under pressure in an autoclave to set the desired degree of bulk or stretch in the yarns and the yarn carriers having ribbed kraft paper or sanded surfaces readily absorb moisture. The surfaces of these yarn carriers also tend to absorb the lubricant with which most types of synthetic yarns are coated.

Easy identification of the type of yarn wound on the yarn carrier tube has also been a problem to the industry. It is the usual practice to print the yarn identification information on a label and stick the label on the inside of one end of the tube. This method is time consuming and expensive and requires lifting the yarn package to read the label. In an attempt to overcome the problems associated with this type of identification label, color identification bands have been printed on one or both ends of the yarn carriers. This has also increased the cost of the tubes, since the printing requires a separate operation.

With foregoing in mind, it is an object of the present invention to provide a tubular yarn carrier having an outer winding surface formed of a thin outer ply of creped parchment paper which provides an excellent slip-resistant and moisture-resistant out winding surface which will not damage the yarn wound thereon.

It is another object of the present invention to provide a tubular yarn carrier wherein the slip-resistant characteristics of the creped winding surface may be easily varied by changing the degree or number of crepes or crinkles formed in the thin outer ply of paper surrounding the supporting core.

It is a further object of the present invention to provide a tubular yarn carrier including color coded indicia imprinted on the outer surface of the thin outer ply and which serves to identify the type of yarn wound onto the yarn carrier.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which:

FIG. 1 is an isometric view of the tubular yarn carrier of the present invention and illustrating a package of yarn wound thereon;

FIG. 2 is an elevational view of the tubular yarn carrier with the yarn removed;

FIG. 3 is a greatly enlarged fragmentary elevation of a small portion of the winding surface of the yarn carrier, being taken in the rectangular area 3 of FIG. 2, and illustrating the manner in which raised wrinkles or crinkles are formed in the thin outer ply of the creped paper;

FIG. 4 is a vertical sectional view taken along line 4-4 in FIG. 3 and illustrating the manner in which the elongated wrinkles or crinkles of the creped paper form upstanding ridges or ribs on the outer winding surface; and

FIG. 5 is a fragmentary elevational view of one end of a modified form of tubular yarn carrier and illustrating the manner in which the color coded indicia are arranged on the outer surface of the creped paper outer ply.

Generally, the yarn carrier tube of the present invention includes a tubular supporting core 10 having a substantially smooth outer surface, and a slip-resistant and moisture-resistant thin outer ply 11 of flexible material surrounding and adhesively secured to the supporting core 10. A yarn package 12 is wound in layers in the usual manner on the outer surface of the thin outer ply 11, in the manner shown in FIG. 1.

The supporting core 10 may be made of any suitable material, such as paper, plastic, metal or the like, and is preferably formed of successive layers of spirally wound lengths of relatively narrow paper. The lengths of paper are wound so that opposite edge portions abut and the succeeding layers overlap the junctures of the preceding layers so as to provide substantially smooth inner and outer surfaces. The thickness, length, diameter and type of material of which the supporting core 10 is formed may be varied as desired and is usually determined by the type of yarn to be wound thereon, the type of winding and unwinding equipment on which the tube is to be used, etc. Similarly, the surface smoothness of the supporting core 10 may vary within the range of conventional core constructions, depending generally on the texture of the material used, the surface treatment, and the type of spiral seam.

The thin outer ply 11 is preferably spirally wound onto the supporting core 10 and is applied as the final step in the tube-forming process. A length of the thin outer ply 11 of a predetermined width is spirally wound around the supporting core 10 at such an angle that the trailing edge portion of each succeeding wrap overlaps the leading edge of the preceding wrap by the desired amount. Thus, adjacent edge portions form an overlapped seam, as indicated at 13 in FIG. 2.

The width of the length of outer ply material is usually determined by the diameter of the supporting core on which it is wrapped. The thickness of the outer ply 11 should not exceed about 0.003 to 0.004 of an inch so that the overlapped edge portions do not form an objectionable seam or bulge. Since the outer ply 11 is very thin, the exposed edge of the length of outer ply material is not thick enough to snag or otherwise damage the yarn and it does not interfere with the winding and unwinding operations.

The outer ply 11 is creped to form elongated crinkles or wrinkles, such as indicated at 11a in FIG. 3. The wrinkles 11a extend up from the normal plane of the outer ply 11, as indicated in FIG. 4, and form elongated ridges or ribs in a somewhat irregular manner, depending upon the degree and type of creping imparted thereto. The wrinkles 11a extend generally perpendicular to the direction in which the paper runs through the crepe machine so that they extend in a generally longitudinal direction on the tube. Even though the wrinkles 11a extend in the direction in which the yarn tends to slip, they provide sufficient slip resistance because they are irregular and are not continuous.

The degree or number of crepes or wrinkles on the surface of the yarn carrier may be varied, as desired, to thereby vary the slip-resistant characteristics. The desired degree of creping of the surface of the outer ply 11 will depend upon the particular characteristics of the type of yarn to be wound on the yarn carrier tube.

The creped outer ply 11 of flexible material is formed of parchment paper to impart moisture-resistant characteristics to the outer winding surface. As is well known, parchment paper is made by dipping unsized paper in a solution of sulphuric acid which converts the cellulose on the outer surfaces to amyloid. This parchment paper is somewhat transparent, and does not readily absorb moisture as easily as regular kraft paper. Also, parchment paper does not readily absorb oil, grease and other lubricants. Thus, the parchment paper outer ply 11 withstands moisture during steam treatment in the autoclave and withstands liquids in a dye bath. Also, any lubricant on the yarns is not absorbed by the parchment paper.

Any suitable type of adhesive material may be applied to the inner surface of the thin outer ply 11 to securely adhere it to the outer surface of the supporting core 10. The thin outer ply of creped parchment paper thus provides a slip-resistant and moisture-resistant outer winding surface which is suitable for a wide variety of different types of textile yarns.

In the embodiment shown in FIG. 5, the supporting core is indicated at 10' and the thin outer ply of creped parchment paper is indicated at 11'. The outer surface of the outer ply 11' is imprinted with suitable indicia, illustrated as stars 14 of varying size. The stars 14 are preferably imprinted with 11', which are coded to identify the particular type of yarn which is to be wound on the yarn carrier. The stars 14 are preferably imprinted on the length of creped parchment paper prior to the winding operation and with a color-fast type of ink which will not damage the yarn wound thereon.

The identifying indicia are not limited to the stars 14, but may be in the form of imprinted circles, squares, triangles, and other suitable symbols which serve to identify the type of yarn which is to be wound onto the yarn carrier. When the indicia 14 are imprinted on the outer surface of the outer ply 11', they appear throughout the length of the yarn carrier. Although the wound yarn package covers the indicia in the medial portion

of the carrier, both end portions are still exposed so that the indicia are still visible.

In the drawings and specification there have been set forth preferred embodiments of the invention, and although specific terms are employed, they are used in generic and descriptive sense only and not for purpose of limitation, the scope of the invention being defined in the claims.

We claim:

1. A tubular yarn carrier comprising a supporting core of predetermined diameter, a thin ply of creped parchment paper surrounding said supporting core and providing a crinkled slip-resistant outer winding surface suitable for maintaining a wound yarn package thereon and being substantially moisture and lubricant resistant, and means for adhering said thin ply of creped parchment paper to said supporting core.

2. A tubular yarn carrier according to claim 1 wherein said thin ply of creped parchment paper is within the range of about 0.003 to 0.004 of an inch thick, said thin ply of creped parchment paper is of a predetermined width and is spirally wound about said supporting core with the adjacent edge portions of successive wraps being overlapped and forming a thin seam.

3. A tubular yarn carrier according to claim 2 including indicia imprinted on the outer surface of said thin ply of creped parchment paper, said indicia serving to identify the yarn to be wound on said yarn carrier.

4. A tubular yarn carrier according to claim 3 wherein said indicia are printed in a predetermined color which is coded to identify a particular type of yarn to be wound on said yarn carrier.

5. A tubular yarn carrier according to claim 1 wherein said supporting core has a substantially smooth outer surface to which said thin surrounding ply is adhered.

6. A tubular yarn carrier according to claim 1 wherein said outer winding surface is irregularly crinkled.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,544,034 Dated December 1, 1970

Inventor(s) Joseph F. Journey and Herman R. Roediger

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 58, "out" should read -- outer --. Column 3, line 24, "ll'" should read -- colors --.

Signed and sealed this 22nd day of June 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents

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