

June 20, 1967

I. E. HARTLEY, JR
YARN PACKAGE SUPPORT

3,326,494

Filed July 14, 1964

2 Sheets-Sheet 1

Fig. 1.

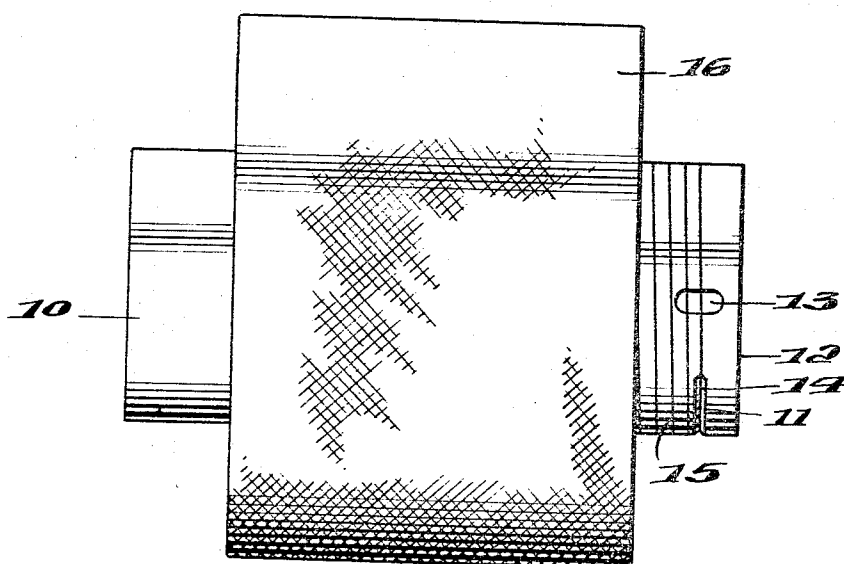
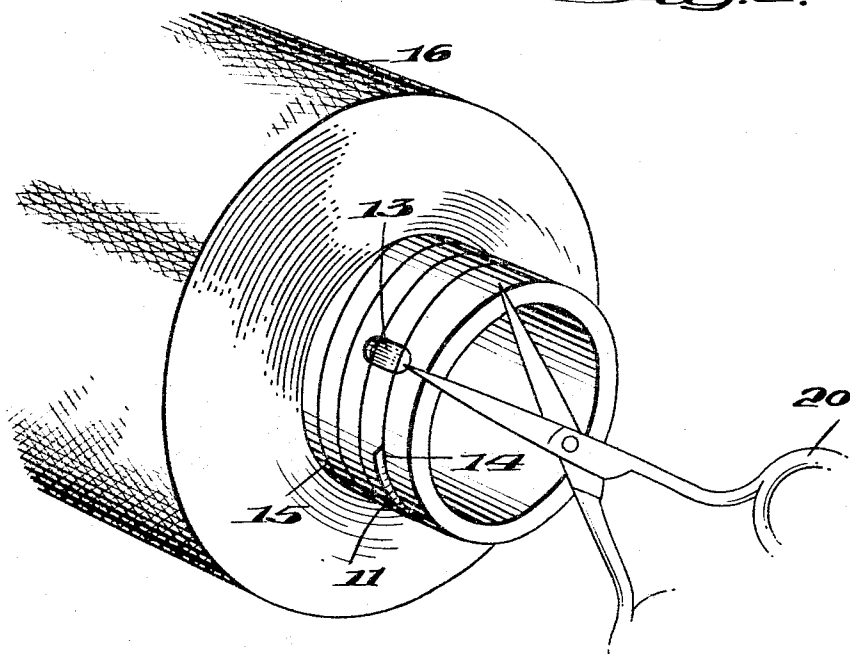


Fig. 2.



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Fig. 3.

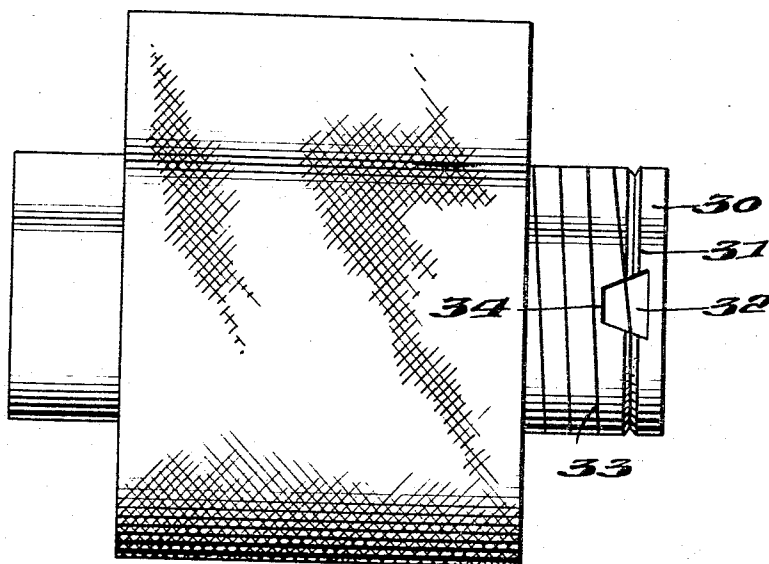
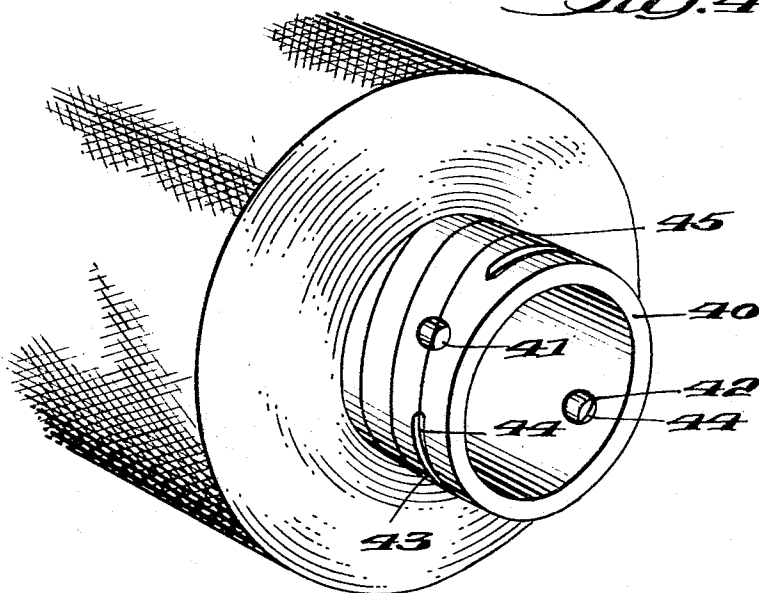


Fig. 4.



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YARN PACKAGE SUPPORT

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3 Claims. (Cl. 242-125.1)

This invention relates generally to the winding and unwinding of yarn packages and, more particularly, to the supports on which textile yarn packages are wound.

Such supports generally comprise some form of bobbin or core adapted for use in a particular windup installation. Various types are available, depending on the size and shape of the yarn package desired and on its ultimate use. In the case of packages which are to be wound at high speeds and to be later employed for warping operations, the structure of the yarn support must be economical, light in weight, dynamically balanced and capable of receiving a large quantity of yarn. The support must also be adapted for unwinding at high speed without abrasion or snagging which would cause damage and tension variations. These requirements are generally best met by a headless tubular or conical core.

It is known in the art that a transfer tail can be included in the initial length of yarn wound on a support and be positively secured during the winding of the remainder of the yarn package, yet readily available for tying directly to the outer end of yarn on another package. The purpose in providing a transfer tail on the yarn package is to enable an uninterrupted flow of yarn from a creel or other holder on which the packages are supported in adjacent positions. Continuity of yarn flow into textile processes may thus be sustained.

Equipment for winding textile yarns on headless cores, preferably with transfer tails, is available. Oftentimes, the winding operation is initiated by snagging running yarn in a stringup groove on the surface of a core mounted on a rotatably driven spindle, as disclosed by Heatherly in U.S. Patent No. 3,103,305. The first few turns are wound circumferentially, e.g., by the guide in a transfer tail-winding mechanism. After transfer of the yarn to a reciprocating traverse guide, the package is then formed on a major portion of the core. In situations where the core or other package support is not provided with a stringup groove, various auxiliary means are used for securing the transfer tail. For example, the free end may be anchored with a small bit of cement, gum or adhesive tape. Mechanical tabs or clips on the end of the core have also been proposed as a means for gripping the free end.

Although the known techniques are effective for holding the starting end of yarn securely in position on a textile core, the transfer tail is not readily accessible when the time comes for tying the end of one package to the yarn on another package. When cemented, the glue or adhesive tab must be removed, a time-consuming manual operation. One may dig at the transfer tail with a fingernail, small hook or other means to loosen it, thereby wasting considerable time, stretching the yarn and damaging the transfer tail. An alternative is to sever the yarn with a knife or other edged blade, requiring care to avoid cutting too many turns of the transfer tail or damage to the surface of the package core.

The principal objective of this invention is to provide an improved yarn package support with which the above and other deficiencies can be overcome. A more particular object is the provision of a support on which a yarn package can be wound with a transfer tail which is secure, yet readily accessible for tying.

The above objects are achieved by providing an elon-

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gated yarn package support of the type on which a starting end of yarn is secured before initiation of a helical transfer tail with at least one surface cavity which facilitates access to the transfer tail. This cavity is spaced from the end of the support, leaving a smooth continuous edge.

Other objectives and advantages will be apparent from the following descriptions in which reference is made to the accompanying drawings wherein:

FIGURE 1 is an elevational view of a yarn package wound on a preferred embodiment of the support tube;

FIG. 2 is a perspective view showing accessibility of the transfer tail to a severing tool;

FIG. 3 is a fragmentary illustration of a package wound on a modified support tube; and

FIG. 4 is a fragmentary perspective view of another support tube modification.

As shown in FIG. 1, the preferred support core 10 is a hollow cylindrical tube having a partial circumferential groove 11 cut into its outer surface near and in parallelism with one end 12 and a shallow cavity 13 intersected by the plane of groove 11. The cross section of groove 11 is substantially a narrow V-shaped, a configuration which permits the starting end 14 to be introduced into the groove, snagged and held as the spindle or chuck (not shown) which supports core 10 is rotated at the start of a package-winding operation. The yarn is wound over cavity 13 and continues as a transfer tail 15, consisting of a plurality of helical turns, toward the central portion of core 10 where a package 16 is wound. Some portion of cavity 13 should be aligned with groove 11 to insure that starting end 14 will pass over the cavity. In order to provide a convenient length of yarn for tying to the outer end of another package, transfer tail 15 should be at least six inches long and the number of yarn turns may be made as required to provide the desired length.

The package of FIG. 1 may be wound on readily available winding equipment. For example, the bare core 10 may be placed on a chuck. After bringing the chuck to the required rotational speed, the running yarn may be introduced into groove 11 with a sucker gun or other similar stringup tool. After starting end 14 is snagged and broken, tail 15 is wound as a transfer mechanism guides the yarn laterally to a position where it is picked up by a suitable traverse guide through which it advances as the package 16 is wound.

FIG. 2 demonstrates the convenience of this invention in providing ready access to the transfer tail 15. When one wishes to loosen the transfer tail, package 16 is held in a convenient position and the end of a scissors or other edged tool 20 is inserted into the cavity 13 and the transfer tail 15 is severed. Tail 15 may then be readily unwrapped and tied to the outer end of the second full package.

The size and shape of the shallow access cavity 13 are dictated primarily by the cutting instrument to be used. It has been found that an elongated groove approximately $\frac{1}{8}$ to $\frac{1}{4}$ -inch wide, $\frac{1}{2}$ -inch long and $\frac{1}{16}$ to $\frac{1}{8}$ -inch deep will accommodate the tip of ordinary scissors. A smaller cavity will suffice for a sharp pointed knife blade. The cavity may take any shape, elliptical, circular, triangular, square or rectangular. Only a short end length (about $\frac{3}{4}$ -inch) of the core 10 is required to accommodate stringup groove 11, access cavity 13 and transfer tail 15.

The cavity must lie inward from the end of the core so as to maintain a smooth continuous edge at end 12. Thus, there is no need for gripping tabs, clips, sharp corners and the like which would interfere with winding and unwinding at high speeds.

In the alternate embodiment of FIG. 3, a core 30 has an otherwise continuous stringup groove 31 which is inter-

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rupted by a cavity 32. After being snagged, the yarn continues in groove 31 until it reaches cavity 32 at which point transfer tail 33 commences. To insure passage of tail 33 over cavity 32, the latter projects a short distance inwardly from the plane of groove 31 to a limiting edge 34 which allows a cutting tool to advance only that far and thus prevents cutting of the entire tail 33 or damage to the yarn package.

Where the core interior is always accessible at one end, the modification of FIG. 4 may be employed. As illustrated, a core 40 has opposed access cavities or holes 41, 42 aligned with a V-shaped, stringup groove 43. Hole 42 interrupts the groove. Thus, starting end 44 and transfer tail 45 are accessible from either the interior or exterior of core 40.

Any desired number of access cavities may be provided in the surface of the core. If more than one is provided, they should be equally spaced about the circumference so that the dynamic balancing of the core will be maintained. As a matter of convenience, access cavities may be provided adjacent both ends of the core.

The means of access to a textile yarn transfer tail as herein disclosed is applicable to cylindrical or conical headless cores, either solid or hollow. Any of the usual materials of textile core manufacture may be employed, e.g., spiral-wound kraft paper, molded paper pulp or plastic, wood or metal. The access cavities may be impressed by pressure dies or punches, machined by mechanical cutting devices, molded or otherwise fabricated. All edges of the completed core should be reasonably smooth to avoid hazard to the operator in handling and damage to the yarn when in service. For processes requiring an expensive reusable core, the access cavity eliminates damage to the core surface which would be incurred with techniques or cores of the prior art. The transfer tail is secure and withstands the rigors of shipping and handling. Specialized tools or appliances are not required to wind or remove the transfer tail. The ease of access to the transfer tail for the tying-in operation provides a significant increase in operator efficiency, a major consideration in the textile industry.

In each of the illustrated embodiments, the starting end of a transfer tail is guided from the startup groove at the first available exit, e.g., at the termination of groove 11 in FIG. 1 and at cavity 32 in FIG. 3. With some transfer mechanisms and yarn counts, winding may continue in the startup groove for one or more wraps until tension on the yarn line is sufficient to overcome the inertia of the mechanism.

The yarn support of this invention is useful for coning or other winding operations for textile yarns. As men-

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tioned previously, a starting end of yarn from a supply package may be secured manually on the core by an adhesive tab or other means of attachment at a point of origin in circumferential alignment with a surface cavity.

A few initial wraps of yarn are then made around the core with at least one turn passing over the cavity, the core is placed on the braked spindle of the winding machine and the winding of the new package is begun.

It is apparent that various modifications and adaptations may be made without departure from the spirit of the present invention which is accordingly intended to be limited only by the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A yarn support tube having a surface stringup groove extending partially around its circumference and located adjacent one of its ends for initiation of a helical transfer tail, said tube also being provided with a surface cavity intersected by the plane of said groove, said cavity being spaced from said one end and being spaced circumferentially from said groove, said cavity also extending longitudinally inwardly beyond any portion of said groove so that the cavity will lie beneath and facilitate access to at least one helical wrap of the transfer tail.

2. The yarn support tube of claim 1 wherein is provided a pair of opposed access cavities, each cavity being a through hole whereby to facilitate access from either the interior or the exterior of said tube.

3. An elongated cylindrical tube adapted to support a package of yarn wound thereon, said tube being provided with a V-shaped stringup groove extending partially around its circumference adjacent one of its ends for initiation of a helical transfer tail, there being a shallow cavity in the surface of said tube, said cavity being spaced from said one end, spaced circumferentially from the groove and extending longitudinally inwardly beyond any portion of said groove so that the cavity will be beneath and facilitate access to at least one helical wrap of the transfer tail.

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