June 12, 1951 W. C. HANSE 2,556,272

DOWN WINDING DEVICE

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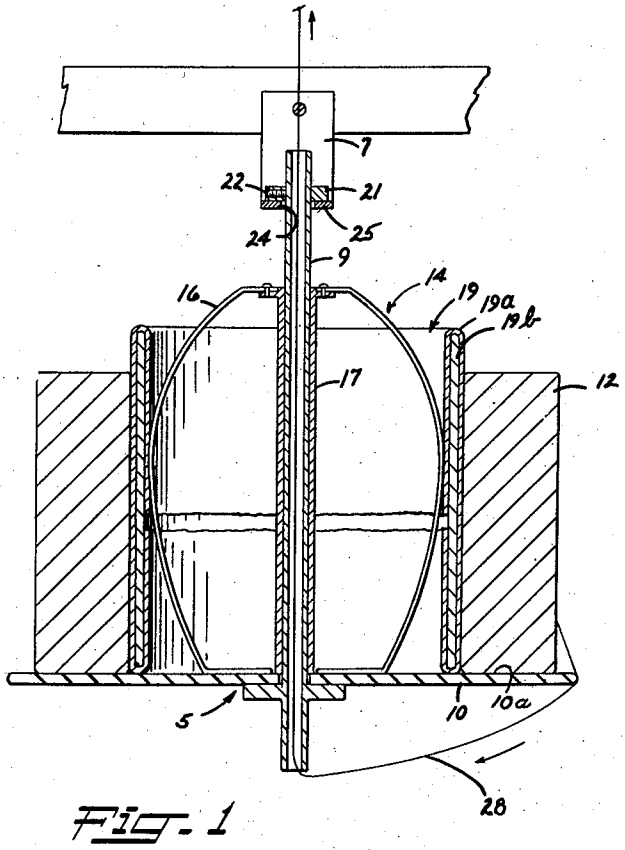


Fig. 1

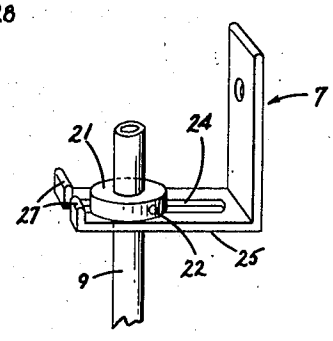


Fig. 2

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DOWN WINDING DEVICE

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2 Claims. (Cl. 242—128)

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This invention relates to apparatus for unwinding strands and particularly to apparatus for unwinding packages of filamentary material from which the strand is preferably removed in a direction tangential to the outer periphery of the package.

In manufacturing rayon yarn, cakes of the yarn as taken from the spinning machine are subjected to various treatments including washing and drying. During such processing the cakes become thoroughly loosened and limp and the strands thereof often become curly, snarled, tangled or otherwise disarranged. These processed cakes are normally placed on a package-building or twisting machine for unwinding and reforming the strand into more compact accurately formed packages suitable to the requirements of weavers, knitters, dyers and the like. In these machines, the simplest and most common arrangement for withdrawing the strand from the cake is to support it on a non-rotatable holder and draw the strand or yarn through a guide placed over the center of the end or top of the cake. By this arrangement the strand is removed from the cake in a direction considerably at variance with the direction taken by the helical windings in which the strand occurs on or within the cake.

Irregularities in strand deposition while forming the cake, or irregularities introduced by the subsequent processing thereof, may cause the strand to be tufted or snarled within the cake. Although measurable tension or draft is required for withdrawal of the strand laterally of the direction in which it occurs on the cake, the tension required is greatly intensified if for any reason there are interferences with the departure of the strand from the cake such as tangling, snarling and the like. Added to the tension produced by a tangle or snarl is the additional force required to overcome friction produced when the strand tightens against the lateral surface and edge of the cake. Very frequently, the strand breaks under such conditions, and the winding or twisting machine is inoperative until the strand is again laced through the machine. Very often, the forming of cakes or the processing thereof is such that a high percentage of the cakes cannot be unwound on conventional repackaging or twisting machinery and consequently are rejected as waste.

The principal object of the present invention is to provide unwinding apparatus for tangled and snarled strand packages such as cakes or viscose rayon unwindable by conventional means.

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Another object is to provide apparatus for high-speed strand withdrawal. Still another object is to provide simple and inexpensive apparatus easily adapted to, or installable on, conventional winding and twisting machinery. Other objects, features and advantages will be apparent from the following description and the drawing illustrative of the invention in which

Fig. 1 is an elevational section of a preferred embodiment; and

Fig. 2 is a fragmentary side view of supporting means for the holder illustrated in Fig. 1.

Briefly the invention comprises a pendulously supported, quickly removable, package holder comprising an annular thread guiding surface of greater diameter than the package supported by the holder for unwinding, and having a central tubular thread guiding member into the lower end of which the unwinding strand proceeds after passing around the annular guiding surface. The strand then passes upwardly thru the central member to a take-up device.

In Fig. 1 a preferred embodiment is shown in which a package holder 5 comprises a central vertically extending tubular shaft 9 and a coaxial plate 10 fixed to the shaft near the lower end thereof having an upwardly facing annular surface 10*a* for supporting the package to be wound. About the tubular shaft 9 is provided a package centering and extending device 14 for engaging the inner surface of a package 12 or an inner supporting core 19 for the package. As shown in the drawing, the core 19 may comprise separate portions such as a cover 19*a* which is a sleeve-like piece of cloth normally inserted through the central opening of the cake 12 and folded over its sides during washing and drying of the cake prior to unwinding to protect the yarn. When the cake is being prepared for unwinding an annular sheet such as paste board, is formed into a cylindrical cuff 19*b*, and inserted within the annular portions of the cover 19*a* covering the inner surface of the cake. The portions of the cover 19*a* extending over the ends and the outer annular surface of the cake, are removed therefrom and folded inwardly over the end portions of the cuff and along its inner cylindrical surface to form the core 19 as illustrated in Fig. 1.

As a centering means or support, any conventional arrangement may be used; in the apparatus illustrated by the drawing, steel spring members 16 attached to the upper end of a sleeve 17 slidably fitting the shaft 9 and extending radially away from the sleeve, springably engage the inner surface of the package 12 or a core 19

therefor. Affixed to the upper end of shaft 9 is a collar 21 held in place thereon by such a means as a set screw 22.

The package holder 5 is pendulously supported on the bracket 7 which has a slot 24 in a horizontal portion 25 thereof illustrated in Fig. 2. The slot 24 extends from an end or side of the portion 25 of bracket 7 and is of sufficient width to amply receive the shaft 9 and of sufficient length to provide ample bearing area for the collar 21 on the upper surface of bracket portion 25. Along the edge of bracket 7 wherein the slot 25 terminates, ridges 27 are provided to prevent the collar from sliding along the surface of the bracket and the holder 5 from becoming detached during an unwinding operation.

An important advantage of the supporting arrangement for a package holder, such as shown in Fig. 2 is the facility with which the package holder may be instantly detached and quickly reloaded with new packages. The device shown is merely illustrative of many other mechanical arrangements providing detachability. Another important advantage of the invention is the facility with which packages may be unwound which are normally unwindable by conventional equipment. As shown in Fig. 1, the strand 28 is drawn from the package over the rounded circumferential edge of the plate 10. As the plate 10 is of greater diameter than the package 12, strand is removed from the package by draft that is applied in a direction almost tangential to the package surface at the portion of the package where draft of tangential direction is most needed, that is, about the lower edge of the package adjacent to the plate 10. It is at this portion of the surface that the strand is often tangled and folded under the edge of the package. Pulling the strand 28 from this portion of the surface often requires such draft as to break the strand, particularly if the strand is pulled in a direction substantially parallel to the package axis. However, when the strand is pulled away from the package in a direction radial to its axis or tangential to its surface, the strand leaves the package readily even though moderately tangled and snarled. For example, a satisfactory annular thread-guiding element such as plate 10 may be used, having a diameter two inches greater than that of a package to be unwound. Such an element has its periphery an inch from the nearest portion of the package surface. Consequently, the tensile force applied to strand being removed from any part of the surface of the package and pulled over the edge of the annular element includes considerable component radial to the package axis. The tensile force is almost entirely radial or tangential when the surface from which the strand is being withdrawn is almost directly radially inward of the outer edge of the element. Although the diameter of the element is not critical, it is preferably from one to several inches greater than a package to be unwound. The apparatus described has no inherent limitations as to rate of strand removal when compared to conventional package unwinding supports; in fact it is possible to remove a strand at somewhat higher rates than where the strand is removed through a guide mounted centrally over an end of the package.

While a preferred embodiment has been shown, it is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In combination; a support having an upwardly facing seat; a package holder consisting of a vertical tube having an axial thread passage, a plate secured to the tube djacent its lower end and having an upwardly-facing annular surface for supporting an annular package to be unwound, said plate having a circular periphery of large diameter than the package to be unwound, resilient means carried by the tube above the plate for centering the package thereon, said resilient means being compressible by the package to an outer diameter less than the inside diameter of the package, and a small fitting secured to the outside of the upper end of the tube having a downwardly-facing bearing surface adapted to engage the seat; and a slot in the support extending into the seat and having a width allowing free passage of the tube but narrower than the fitting.

2. In combination; a support having an upwardly facing horizontal seat terminating in a ridged surface; a package holder consisting of a vertical tube having an axial thread passage, a plate secured to the tube adjacent its lower end and having an upwardly-facing annular surface for supporting an annular package to be unwound, said plate having a circular periphery of larger diameter than the package to be unwound, resilient means carried by the tube above the plate for centering the package thereon, said resilient means being compressible by the package to an outer diameter less than the inside diameter of the package, and a small fitting secured to the outside of the upper end of the tube having a downwardly-facing bearing surface adapted to engage the seat; and a slot in the support extending through the rigid surface into the seat and having a width allowing free passage of the tube but narrower than the fitting.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
441,266	Volz	Nov. 25, 1890
1,095,068	Bate	Apr. 28, 1914
1,367,387	Hayes	Feb. 1, 1921
1,393,705	Seed	Oct. 11, 1921
1,515,682	Hughes	Nov. 18, 1924
1,520,748	Brown	Dec. 30, 1924
1,547,178	Long	June 28, 1925
1,606,064	Evans	Nov. 9, 1926
2,283,079	McDermott	May 12, 1942

FOREIGN PATENTS

Number	Country	Date
680,833	Germany	Sept. 7, 1939