June 5, 1945. P. W. MARKWOOD 2,377,799

UNWINDING YARN

Filed Dec. 2, 1943

Fig. 1.

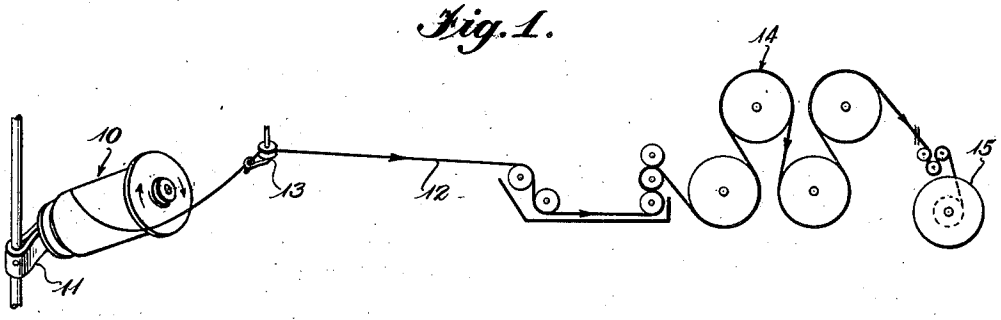


Fig. 2.

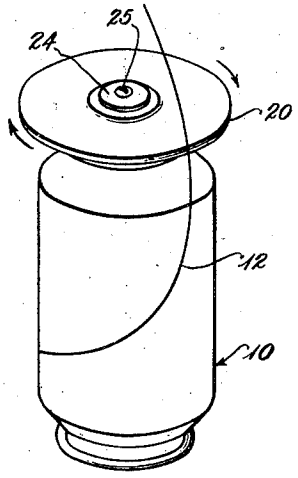
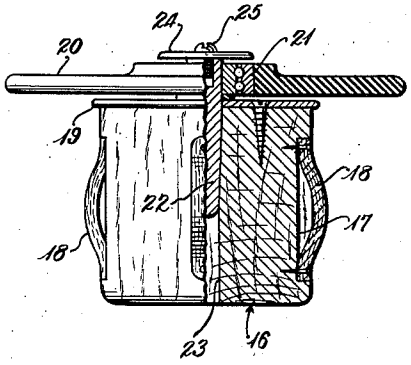


Fig. 3.



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UNWINDING YARN

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2 Claims. (Cl. 242—128)

The present invention relates to the unwinding of packages of yarn and more particularly to a method and apparatus for continuously withdrawing yarns, threads, and the like from a stationary package. During such an operation, the yarns often become entangled or entrapped, whereby the continuous unimpeded withdrawal thereof is prevented. These difficulties occur as a result of numerous factors, e. g., the manner in which the yarn has been wound into the package, which may result in overwinds at the ends, so that as the layers are withdrawn the possibility of entanglement is created. Packages which have been tightly wound may bulge or "mushroom" at the ends to cause difficult unwinding. Imperfections in the yarn per se may also cause tangling to develop.

Whereas it is contemplated that this invention can be employed and have utility in any operation wherein a yarn is to be unwound from a package, the following description will refer to the more specific process of unwinding viscose rayon from packages which have been spun onto foraminated bobbins. Recently such packages have been either placed on a creel and the yarn passed in a continuous manner through treating baths and thence to a slasher as disclosed in co-pending application Serial No. 456,914, or the yarn is washed and aftertreated while being retained in the original package form. In either case the yarn constituting the bobbin package may be in a wet condition at the time of unwinding.

Although, this tangling problem may be experienced in the unwinding of dry yarn such as rayon and the like, it is particularly inherent in the unwinding of wet yarns. The passing of wet yarns from the original spinning bobbins directly to the slasher is a rather recent development, and one which has been evolved for simplifying the production of high strength, or high tenacity rayon to be used as a reinforcing element in the manufacture of rubber articles such as cord tires and the like. The initial development involved merely positioning a standard foraminated bobbin on a creel and unwinding the rayon therefrom without providing any additional means to facilitate the unwinding thereof. During such unwinding the yarn has a tendency to balloon to some extent, but when the yarn becomes entangled at any particular point, the tension on the running strand is increased thereby causing the balloon to straighten out and catch on the end of the bobbin. This will result in breakage which will necessitate the shutting down of the machine until the condition has been corrected, and accordingly, the speed of the unwinding operation is materially reduced plus the disadvantage that the yarn per se will contain numerous knots.

It is therefore an object of the present invention to overcome the foregoing difficulties and objections experienced during the unwinding operation.

The invention further contemplates the provision of a simple device the use of which will permit an uninterrupted unwinding operation and result in knot free thread.

Other objects and advantages of the invention will be apparent upon consideration of the following detailed description of an embodiment thereof in conjunction with the accompanying drawing, wherein:

Figure 1 is a schematic representation of an apparatus with which the present invention may be conveniently employed;

Figure 2 is a perspective view of the invention showing a bobbin package with a plug and rotatable member in operative position thereon; and

Figure 3 is a view partially in vertical section, showing the plug adapted to be inserted into one end of the bobbin and carrying thereon the freely rotatable member.

Referring more particularly to the drawing, the numeral 10 indicates a bobbin on which a package of rayon or other strandular material has been previously wound. The bobbin 10 is mounted in a stationary manner on a support 11 and the yarn 12 is unwound from the bobbin 10, drawn through tension device 13 by slasher 14 and taken up by means of beam 15. Any number of bobbins may be employed and normally several hundred are rewound in parallel relationship onto one beam. As a matter of fact, interiorly unsupported cakes of yarn may be substituted for the bobbins as the use of any normal type of package is contemplated by the present invention.

A plug 16 constructed of wood, metal or plastic material is adapted to be inserted in that end of the bobbin 10 over which the yarn 12 is unwound in an overend manner. The wooden plug 16 contains, in its periphery, cut-out portions 17 in which are mounted flexible strips 18 such as canvas, for the purpose of sealing, in an immobile manner, the plug when it is inserted in the end of the bobbin. An aluminum disk 19 is mounted on the top of the plug.

A circular cap 20 constructed of a fibrous, metallic or resinous material contains a bearing 21 in its center and is thereby rotatably mounted on a steel pin 22, which in turn is rigidly fitted into

core 23 of the plug 16. The cap 20 is retained in a freely rotatable position with respect to the plug by means of a washer 24 and screw 25 the threads of which engage an internally threaded portion of the steel pin 22.

In operation, the plug carrying the freely rotatable cap member 20 is rigidly inserted in one end of the bobbin 10 as shown more particularly in Figure 2. When the unwinding operation is initiated, the yarn takes the form of a balloon (also shown in Figure 2), and the unwinding proceeds until the draw-off of the yarn is impeded for some reason. Immediately, a tension is imposed on the yarn which causes the size of the balloon to decrease to the extent where the yarn contacts the rotatable cap member. Upon contact with the cap member 20, the latter is rotated in the direction in which the yarn is unwound as shown by the arrows in Figure 2 by reason of the tension on the yarn. This rotation of the cap member will decrease the angle of the yarn with respect to the axis of the bobbin and will thereby give extra impetus to the yarn between the point where it is trapped and the point at which it touches the rotatable member. This will act to free the entrapped yarn and facilitate the continued unwinding thereof uninterruptedly. Of course, as soon as the yarn is freed, it will again balloon to the extent of rotating substantially out of contact with the rotatable cap member and will continue to be unwound in this manner until the next time the yarn becomes entrapped.

It is, of course, within the purview of my invention to make alterations in the mechanical details of the system specifically described without departing from the spirit thereof. The invention is limited only by the scope of the appended claims.

What is claimed is:

1. In an apparatus for unwinding yarn from the exterior of hollow yarn packages, means positioned within one end of a hollow package of yarn for supporting the same, means for withdrawing yarn from the package at such speed as to normally effect the formation of a balloon, means for collecting the yarn, and a guiding disk rotatably mounted at the end of the package remote from the supporting means, such disk being of a diameter larger than that of the package whereby upon the imposition of sufficient tension upon the yarn to affect the balloon to an extent such that it would normally cause the yarn to be drawn across the convolutions of the package the yarn will actually contact the disk and rotate the same with minimization of friction, said disk being mounted upon a support detachably secured in position solely by the engagement thereof with the inner wall of the package.

2. In an apparatus for unwinding yarn from bobbins, means engaging within one end of a bobbin for supporting the same, means for withdrawing yarn from the bobbin at such speed as to normally effect the formation of a balloon, means for collecting the yarn, and a guiding disk rotatably mounted adjacent the end of the bobbin remote from the supporting means, said disk having a diameter larger than that of the bobbin whereby upon the imposition of sufficient tension upon the yarn to affect the balloon to an extent such that it would normally cause the yarn to be drawn across remaining convolutions of the yarn will actually contact the disk and rotate the same with minimization of friction, said disk being mounted upon a member having spaced frictional surfaces which engage the inner wall of the bobbin for holding the disk in operative position.

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