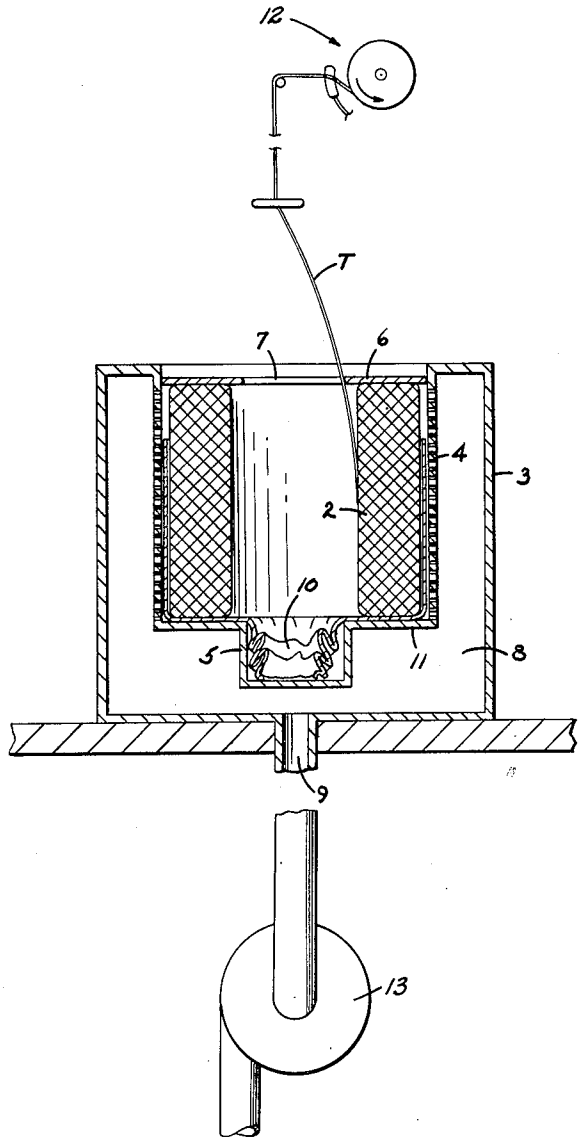
March 3, 1953

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2,630,280

METHOD AND MEANS FOR UNWINDING WOUND PACKAGES FROM THE INSIDE

Filed May 26, 1947



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Patented Mar. 3, 1953

2,630,280

UNITED STATES PATENT OFFICE

2,630,280

METHOD AND MEANS FOR UNWINDING WOUND PACKAGES FROM THE INSIDE

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Application May 26, 1947, Serial No. 750,463

27 Claims. (Cl. 242—128)

1

This invention relates to a method and an apparatus for holding a wound package in a stationary position so that the inside layers of yarn, filaments, threads or the like may be unwound. More particularly this invention relates to a system for holding centrifugally wound packages in a stationary position so that the yarns, filaments, threads or the like may be unwound from the inside.

According to the centrifugal spinning process for the manufacture of viscose rayon yarn, the freshly formed yarn leaving the spinning bath is collected in package form in a rotating spinning bucket. It is a general practice to process these packages and then rewind them on cones, bobbins, or the like.

Heretofore when it was necessary to unwind these cakes or to form cones, bobbins, or the like a Vinylite insert was used inside the packages to hold them upright and properly expanded while the yarn was being unwound from them. These inserts were found unsatisfactory because they did not have enough force to hold the cake properly expanded at the start of the cycle. At the end of the cycle, the insert expanded too far, binding the last few layers of yarn together and causing breaks.

It is the primary object of the present invention to provide a system which will suitably hold a wound package in a stationary position so that the package can be unwound from the inside.

Other objects and advantages of the present invention will become more apparent from a study of the following description and accompanying drawing.

The drawing which is illustrative of the invention is a side view in section of a preferred embodiment of the present invention.

Referring now to the drawing, reference character 2 indicates a wound package which is placed in the hollow walled container 3. As shown in the accompanying drawing the outside wall of the container 3 is substantially cylindrical in shape. The inside wall of the container 3 is divided into two sections. The wall of the upper section 4 is constructed of an air permeable material or is perforated as shown in the drawing. The lower section 5 is generally in the shape of a cylinder having a smaller diameter and is connected with the upper section 4, by the base member 11. As illustrated in the drawing the diameter of the lower section is equal to the diameter of the upper section minus twice the thickness of the cake annulus. However it can readily be understood that this diameter may be varied

2

in different constructions to correspond to cakes having varying thicknesses. The lower section 5 of the container 3 accommodates the paper or knitted cover in which the cake is generally wrapped for preliminary treatment.

An annular, washer-like member 6 placed on the wound package 2 acts as a thread guide, as a means for aiding in the restraint of vertical movement of the package 2 and as a means for confining the flow of air inside the hollow walled container. The inner periphery of the washer-like member 6 is bevelled or rounded off as shown by reference character 7, to provide a smooth surface which acts as a guide for the filament or the like T.

A conduit or the like 9, suitably located in the base of the container 3, has suction means 13 connected thereto to evacuate the air therefrom. This suction acting through the perforations acts to hold the wound package 3 in a stable position. It can be seen that this suction will vary as the thickness of the cake decreases in an inverse ratio thereto. This is important since at the start of the unwinding process the cake will remain in a stable position, because of its own weight as the cake is unwound the suction acts more and more to hold it in position and to prevent the cake walls from collapsing.

In the operation of the present invention the wrapping means 10 is stripped off the top and center of the wound package 2 and the complete package assembly is placed in the container 3 so that the free portion of the wrapping means 10 is pocketed in the lower section 5, and the annulus of the package is positioned in the upper section 4. Suction is then applied to the outer surface of the cake adjacent the inner walls of the container and the unwinding from the center of the package is initiated. The yarn, filaments, threads or the like in the package are unwound by a device arranged to draw yarn or the like therefrom, such as beamers, warpers, or other winders 12, for example cone winders.

By using an apparatus of the type described in the present invention, which permits unwinding wound packages from the center, less snags and tangled filaments are encountered. Since the outside threads were wound first, it is understandable that in the unwinding methods of the present invention that the last thread wound is being unwound first. From the foregoing, it can readily be seen that the present invention insures a faster and more economical means for unwinding wound packages or the like.

Although the present invention has been de-

scribed with reference to improvements shown, it can be readily understood that changes and variations may be made without departing from the spirit and scope of the invention as described in the appended claims.

I claim:

1. An apparatus for holding a wound package so that it may be unwound from the center comprising a hollow-walled container having perforations on its inner side wall, said perforations being adjacent the outer side-surfaces of the wound package which is seated therein, and means for applying suction to the space within the wall.

2. An apparatus for supporting an open-center wound strand package so that it may be unwound from the center without collapsing inwardly comprising a container having an endless wall, the inner surface of which surrounds and is complementary in contour to the outer peripheral surface of a package mounted therein, said wall having a plurality of circumferentially spaced perforations extending from its inner surface to its outer surface, and means for applying suction to said perforations at the outer surface of the wall.

3. An apparatus for holding a wound strand package having a permeable wrapper so that the package may be unwound from the center comprising a container in which the wound package is seated having perforated side-walls, the inner surfaces of which surround and are complementary in contour with the outer peripheral surface of the package and the portion of the wrapper wrapped thereabout, said container having a base portion for engaging an end of the package, a recess in the base of the container to house a portion of the wrapper, and means for applying suction to the outer side-surfaces of the wound package through the perforated side-walls.

4. An apparatus for holding a wound strand package having a permeable wrapper so that the package may be unwound from the center comprising a container in which the wound package is adapted to be seated having air-permeable side-walls, the inner surfaces of which surround and are complementary in contour to the peripheral surface of the package, said container having a base portion for engaging an end of the package, a thread guiding means, a recess in the base portion of the container to house a portion of the wrapper, and means for applying suction to the outer side-surfaces of the wound package through the air-permeable walls.

5. An apparatus for holding a wound strand package having a permeable wrapper so that the package may be unwound from the center comprising a container in which the wound package is adapted to be seated having perforated side-walls, the inner surfaces of which are complementary in contour to the peripheral surface of the package, said container having a base portion for engaging an end of the package, a thread-guiding means in superimposed relationship with the wound package, a recess in the base portion of the container to house a portion of the wrapper, and means for applying suction to the outer side-surfaces of the wound package through the perforated side-walls.

6. The method of unwinding an open-center wound strand package comprising the steps of applying suction to the outer peripheral surface of the package, and unwinding the strand from the center thereof.

7. The method of unwinding an open-center wound strand package comprising applying suction to circumferentially spaced portions of the outer peripheral surface of the package to support it against, and to force said surface into engagement with, a supporting surface, and unwinding the strand radially outwardly from the center of the package.

8. Method of supplying a yarn comprising holding the yarn against a pervious support by differential air pressure while drawing off the yarn.

9. Method of supplying a yarn comprising maintaining a flow of air through a pervious support in a direction to urge the yarn against said support while drawing off the yarn.

10. Method of supplying a yarn comprising retaining the yarn in arrangement for drawing off by establishing suction at one side of a pervious support to hold the yarn against the opposite side of said support.

11. Method of supplying a yarn comprising supporting a package of yarn in position for progressive withdrawal of its yarn from a given surface of the package, and increasing the compactness of the yarn forming said surface by establishing a differential of air pressure between said surface and a further surface of the package, with the lower pressure at said further surface.

12. Method of removing yarn from a package comprising drawing off yarn from a surface of the package while holding the yarn forming said surface against underlying yarn of the package by differential air pressure.

13. Method of removing yarn from the interior of a package comprising drawing off yarn from an interior surface of the package while holding the yarn forming said surface against underlying yarn of the package by differential air pressure.

14. A method of removing yarn from a package comprising drawing off yarn from an exposed layer of the package while holding such exposed layer against an underlying layer by differential air pressure.

15. Method of removing yarn from a package comprising drawing off yarn from a surface of the package while holding the yarn forming said surface against underlying support by differential air pressure.

16. Method of supplying a yarn comprising supporting a package of yarn in position for progressive withdrawal of its yarn from an interior surface of the package, and preventing collapse of convolutions of the yarn defining said interior surface by causing a flow of air to enter the body of the package through said interior surface and pass through the package.

17. Method of supplying a yarn comprising supporting a package of yarn in position for progressive withdrawal of its yarn from an interior surface of the package, and preventing collapse of convolutions of the yarn defining said interior surface by causing a flow of air to pass radially through the package from said interior surface outwardly.

18. Method of removing yarn from a package comprising drawing off yarn from a surface of the package and forcing the yarn against said surface preparatory to such drawing off by maintaining a differential in air pressure between said surface and a further surface of the package, with the lower pressure at said further surface.

19. Method of removing yarn from a package comprising drawing off yarn from a surface of

the package while urging the body of yarn of the package against a pervious support by differential air pressure.

20. A method of unwinding a yarn package consisting of supporting the yarn package and unwinding the package by drawing yarn from the surface most remote from the support while subjecting the diminishing package to a differential of air pressure wherein the lower pressure exists at the support.

21. A method of unwinding yarn from a package comprising supporting the package, drawing yarn from the package so as to diminish the yarn package toward the support, and when the residue consists of but a few layers holding the residual layers against the support by differential air pressure.

22. A method of unwinding yarn from a package by supporting the package within a perforated holder, drawing yarn from an interior surface of the package so as to diminish the package toward the wall of the holder, and when the residual yarn of the package consists of but a few layers, holding such residual yarn against the wall of the holder by differential air pressure.

23. In combination with a device arranged to draw yarn away from a place of supply, a perforate backing against which a yarn is adapted to lie, and a suction connection connecting one side of said perforate backing to a source of suction and arranged to apply differential air pressure to retain the yarn in place against the opposite side of said backing pending withdrawal thereof by said device.

24. In combination with a device arranged to draw yarn away from a place of supply, a container adapted to confine a body of yarn, said container having a perforate wall, the perforations leading to the yarn body, and means for applying suction to the container to provide a flow of air from a free surface of the body of yarn through said body and through said perforate wall, thereby to retain the yarn of the body in place pending withdrawal thereof by said device.

25. Apparatus for unwinding a package of yarn comprising a support having a perforated wall with which a surface of the package is engaged, means for drawing yarn from a surface of the package which is not in contact with the perforated wall to diminish the package toward said wall, and means for establishing a differential air pressure, with the lower pressure on the side of the wall opposite the side with which the package is in contact and with the higher pressure at the surface from which yarn is drawn.

26. Apparatus for unwinding a package of yarn comprising a supporting cup having a perforated peripheral wall, within which the yarn package is disposed with its outer surface adjacent to the perforated wall, means for drawing yarn from the interior of the package to diminish the package toward the wall, and means for establishing a differential air pressure, with the lower pressure outside of the perforated wall and with the higher pressure at the surface from which yarn is drawn.

27. Apparatus for unwinding a package of yarn comprising a supporting cup having an open top and a perforated peripheral wall within which the yarn package is disposed with its outer surface adjacent the perforated wall, a housing around said perforate wall but exposing the open top of the cup, means for drawing yarn from the interior of the package through the open top of the cup to diminish the package toward the perforated wall, and means for maintaining a sub-atmospheric pressure within the housing.

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