Feb. 1, 1938. W. J. ELVIN ET AL 2,106,799

PACKAGE CORE HOLDER FOR YARN PACKAGING DEVICE

Original Filed Aug. 30, 1934

Fig. 1.

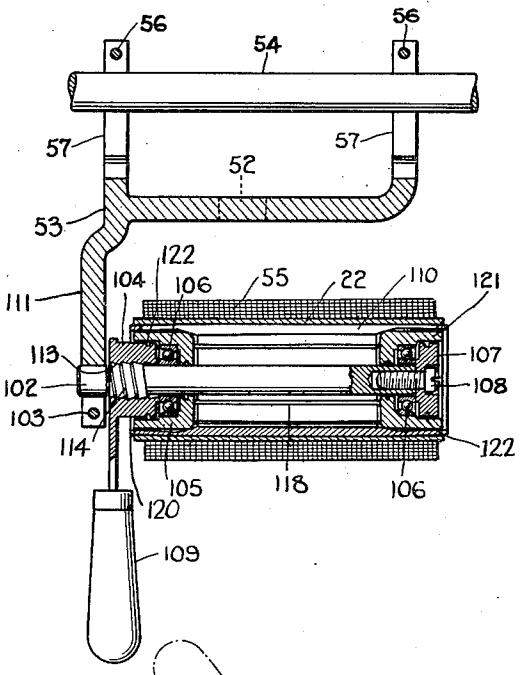


Fig. 2.

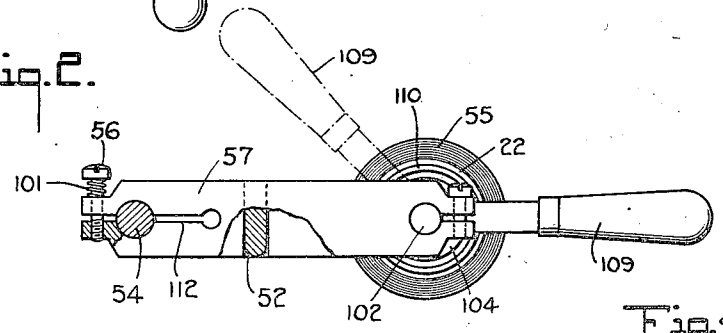


Fig. 3.

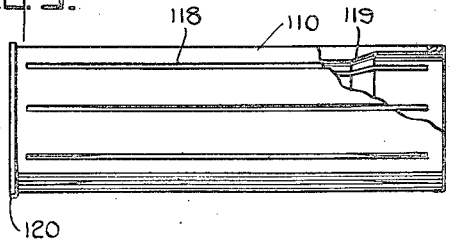
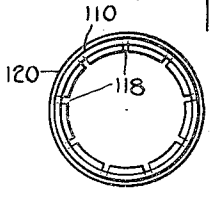


Fig. 4.



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PACKAGE CORE HOLDER FOR YARN PACKAGING DEVICE

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Original application August 30, 1934, Serial No. 742,108. Divided and this application February 13, 1936, Serial No. 63,730

5 Claims. (Cl. 242—72)

This invention relates to a yarn packaging device and more particularly to such a device that draws yarns from a package such as a bobbin, imparts a twist to the yarn and winds the same into a cross-wound package such as a cheese. This invention relates more particularly to a tube holder for holding the core, about which the package is wound, positively in position yet adapted for quick removal and replacement of the package.

This application is a division of our co-pending application S. No. 742,108, filed August 30, 1934, which has issued as Patent No. 2,048,787.

An object of the invention is a commercially practical device which will twist and package fine filaments of yarns such that the resulting package may be large, say 1½ lbs., firm, free from tendencies to fluff at the ends at which is uniform in tension, without soft spots. Another object of the invention is a commercially practical device in which full packages may be removed and empty cores inserted within a minimum time. Another object of the invention is a device so designed that the package formed thereon is uniform throughout. Other objects of the invention will appear from the following detailed description and drawing.

In the drawing, wherein like numbers refer to the same or equivalent elements,

Figure 1 is a side elevation partially in section of the package lifting elements and core holding elements,

Figure 2 is an end view of the package lifting elements shown in Figure 1,

Figure 3 is a detail, partially in section, of a part of the core holding device and

Figure 4 is an end view of the core holding device shown in Figure 3.

In the cross-winding of packages, such as cheeses, the yarn is guided to the take-up package by means of a reciprocating guide member while the take-up package is rotated by resting upon a power driven rotating roller. If the take-up package, especially when of a large size, is held against the rotating roller solely by its own weight it has a tendency to bounce or jump which gives it a non-uniform rate of rotation and also a variable relationship to the reciprocating guide member. This results in a package that is easily fluffed, i. e. increments of yarn form arcs across the end of the package. These types of packages cannot be roughly handled nor even be employed in certain types of textile operations. By employing this invention, however, the take-up package, although movable to and away from the rotating roller, has a more determined action.

In accordance with our invention, we have devised a device for winding yarns and threads into cross-wound packages, which packages are solid and free from ununiform ends. The device is also constructed to make the replacing of an empty core or package base for the loaded core or package base very simple and requiring a minimum of time.

The device shown in the drawing and described in this specification is particularly adaptable for use on the complete device shown in the parent application S. No. 742,108, Patent No. 2,048,787, July 28, 1936, referred to above.

The invention included in this application is a lifter for a take-up package and also an expansible core holder for holding the take-up package. This device is so designed and when used in connection with the bobbins shown in the parent application acts automatically. To still further increase the number of packages that one operator can maintain in running condition there is need of a quick yet positive means of removing a completely filled package and inserting an empty package core or tube. This desired result is accomplished according to this invention by means of an expansible tube holder shown in detail in Figures 1 to 4 on the drawing.

This tube holder consists of a suitable bracket **53** for supporting a tube **22** having means at **52** for raising same on failure of thread or by the operator when a complete package has been formed on the tube. This bracket may be of any suitable construction but for the particular device shown in Figure 1 it may consist of a bracket body **53** having a U shaped portion, the ends of which are split bearings **57** adapted to be mounted for pivotal movement about a stationary rod **54**, and an arm **111** for supporting an expanding tube holder **110**. Arms **57** are drilled for rod **54** and slotted in an approved manner at **112** to provide a spring action about the rod **54**. The spring action of the arms **57** may be governed by screws **56**. Screws **56** are preferably long enough for a suitable compression spring **101** to be placed under its head for forming a resilient adjustment for arms **57**. The more pressure applied to stationary rod **54** by bearing arms **57** causes the bracket **53** to pivot about the rod with a more determined action.

The U shaped bracket may be provided with an extended arm **111** having a split bearing controlled by the clamping screw **103**. This bearing is adapted to hold a non-rotating shaft **102**. The U shaped bracket may also be rounded where it

engages at 52 for more sure registry with the lifting means.

The shaft 102 is provided with a suitable male right hand buttress or other fast-feed screw thread 114 on which is threaded, by means of a similar female thread 113, a sleeve or collar 104, which sleeve or collar acts as a thrust collar. The buttress thread is preferably reversed so as to provide a self-locking action when tightened.

An expanding tube holder 110 is counterbored at each end, leaving an inclined shoulder 119, and is slotted along the length of the tube with slots 118 about its circumference. Expanding tube holder 110 is also provided with an external shoulder 120 at one end that acts as a stop when placing in position the tube or core 22 on which the thread or yarn is to be cross-wound.

Thimble 105 which is suitably formed to receive radial thrust bearing 106 and thrust sleeve or collar 104 and thimble 121 which is suitably formed to receive radial thrust bearings 106 and retainer collar 107 are placed one in each end of the expanding holder 110. This assembly is placed on shaft 102. The retainer collar 107 may be held in place in the assembled device by means of a left hand threaded cap screw 108. The purpose of using a left hand thread on 108 is to insure that the retainer collar 107 shall always be held tightly in place, since the direction of rotation of the assembly is left handed when viewed from the outer end of the shaft 102. Other locking means may, however, be employed.

Thrust collar or sleeve 104 is provided with a suitable handle 109. Thrust collar 104, retainer collar 107, and thimbles 105 and 121, may also be provided with suitable oil grooves, such as is shown at 122 in Fig. 1, and washers (not shown) to prevent throwing of lubricating oil. Thimbles 105 and 121 are so constructed that they will ride freely and easily along inclined surfaces or shoulders 119 of expanding holder 110.

In operation, handle 109 is raised to position shown in dotted lines in Fig. 2, and when in this position there is no expansion of tube holder 110. The tube or core 22 may be freely slid on or off the holder. In loading, a tube or core 22 is placed in position on holder 110 and against the stop shoulder 120. Handle 109 is then moved to the position shown in full lines in Fig. 3 which causes the actuating thrust sleeve or collar 104 to rotate about shaft 102 through buttress threads 114 and 113 in a direction that will force it against the bearing 106. Thimble 105 being forced inwardly of the holder, by action of feed of the buttress threads 114 and 113 through bearing 106 causes an opposite and equal pressure on thimble 121 through expanding holder 110, since thimble 121, its bearing 106 and retainer collar 107 are held in an axial stationary position by cap screw 108. The action of thimble 105 moving inwardly and exerting pressure to thimble 121 through expanding holder 110 causes expanding holder 110 to expand in a radial direction. This expansion grips the tube or core 22 and holds it in place during the winding operation.

The rotation of the core is effected by a frictional drive acting on the yarn forming the surface of the package, whereby the package may readily be rotated with a constant peripheral speed.

At the completion of the winding operation, the handle 109 is again moved to dotted line position, which causes, through buttress threads 113 and 114 acting on collar 104 and shaft 102, respectively, to relieve the pressure on the bearings 106, and on the thimbles 105 and 121. This pressure being relieved, and the expanding tube holder not having been forced past its elastic limit, resumes its original shape and in so doing forces the thimbles 105 and 121 apart. The internal pressure on the tube or core 22 is then released and the completed cheese or other package 55 may be removed.

It is to be understood that the foregoing detailed description and drawing are merely given by way of illustration and many alterations may be made therein without departing from the spirit of our invention.

Having described our invention, what we desire to secure by Letters Patent is:

1. In a machine for producing on a core a cross-wound package of yarn, the combination with a stationary support forming a part of the machine and a bracket adapted to rotate on said stationary support, of means for releasably holding the package, said means including a non-rotatable shaft mounted in said bracket and supported at one end only, an expansible cylinder for expanding against the inside of a core, shoulders near each end of the cylinder and on the interior thereof, a pair of thrust bearings mounted on said shaft and supporting said expansible cylinder by said shoulders and means for moving one of said thrust bearings including a sleeve having a handle attached thereto.

2. In a machine for producing on a core a cross-wound package of yarn, the combination with a stationary support forming a part of the machine and a bracket adapted to rotate on said stationary support, of means for releasably holding the package, said means including a non-rotatable shaft mounted in said bracket and supported at one end only, an expansible cylinder for expanding against the inside of a core, said expansible cylinder having shoulders on the inside thereof and axial slots running substantially the full length thereof, a pair of thrust bearings mounted on said shaft and supporting said expansible cylinder and means for moving one of said thrust bearings including a sleeve having a handle attached thereto.

3. In a machine for producing on a core a cross-wound package of yarn, the combination with a stationary support forming a part of the machine and a bracket adapted to rotate on said stationary support, of means for releasably holding a core, said means including a non-rotatable shaft mounted in said bracket and supported at one end only, an expansible cylinder for expanding against the inside of said core, shoulders near each end of the cylinder and on the interior thereof, a pair of thrust bearings mounted on said shaft and supporting said expansible cylinder by said shoulders and means including a movable sleeve mounted on said shaft for moving one of said thrust bearings.

4. In a machine for producing on a core a cross-wound package of yarn, a combination with a stationary support forming a part of the machine and a bracket adapted to rotate on said stationary support, of means for releasably holding a core, said means including a non-rotatable shaft mounted in said bracket and supported at one end only, an expansible cylinder for expanding against the inside of said core, said expansible cylinder having shoulders on the inside thereof and axial slots running substantially the full length thereof, a pair of thrust bearings mount-

ed on said shaft and supporting said expansible cylinder and means including a movable sleeve mounted on said shaft for moving one of said thrust bearings.

5. In a machine for producing on a core a cross-wound package of yarn, the combination with a stationary support forming a part of the machine and a bracket adapted to rotate on said stationary support, of means for releasably holding a core, said means including a non-rotatable shaft mounted in said bracket and supported at one end only, said shaft being screw threaded to receive a screw threaded sleeve, an expansible cylinder for expanding against the inside of said core, shoulders near each end of the cylinder and on the interior thereof, a pair of thrust bearings mounted on said shaft and supporting said expansible cylinder by said shoulders, said sleeve being adapted, on rotation, to move one of said thrust bearings axially.

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