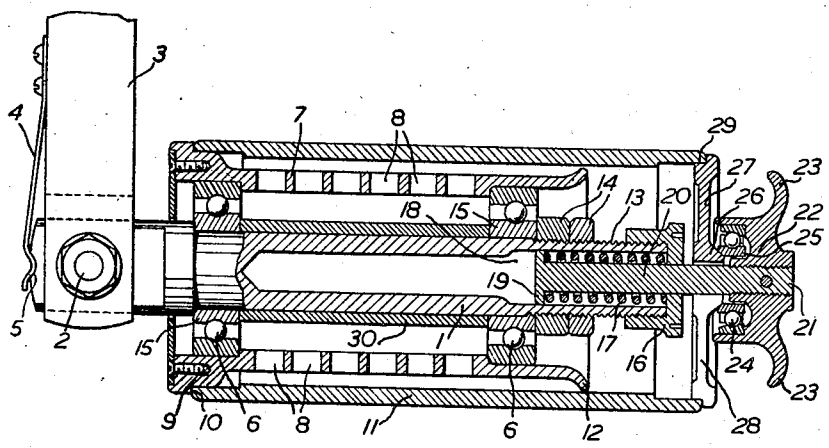
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YARN WINDING MACHINERY

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YARN WINDING MACHINERY

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This invention relates to yarn winding machinery, and is particularly concerned with means in such machinery for mounting yarn package supports and for the rapid removal and replacement of yarn packages on the machine.

According to the present invention a mounting for a yarn package support comprises a central spindle, an end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, an end plate adapted to engage the other end of the package support and removable from said spindle, and means for securing said removable end plate on said spindle, so as to clamp the yarn package support between said end piece and said end plate. The spindle may be driven or may be stationary. In the latter case, as is required in drum winding, the end piece and the end plate are rotatable on the spindle, advantageously on ball bearings.

The means for securing the end plate to the spindle may be of a quick-release character. One convenient form of quick-release securing means comprises a spring-loaded plunger protruding from the end of said spindle and drawn into the spindle by the spring means, the plunger terminating in a knob that serves as a handle for withdrawal of the plunger and when released presses against the end of the package support a removable end plate slipped between the knob and the end of the package. The end plate is slotted to fit over the stem of the plunger. A conical fitting between the knob and the end plate accurately centres the package support.

The axially located end piece may be formed as an enlargement at the end of a cylindrical member or carrier surrounding the spindle, over which member the package support fits with a small clearance only, so as to be steadied while it is being secured.

The invention is particularly applicable to the mounting of package supports of such yarn packages as cheeses and cones, especially in drum winding. The invention is particularly useful in the winding of artificial yarns continuously with their production, since it provides for a very rapid doffing and replacement of the yarn package support when full, and thus reduces the time in which the rapidly and continuously produced material must be collected as waste. Thus, the invention may be employed in machines for the winding of yarns of cellulose acetate or other organic derivative of cellulose, either by the dry or evaporative method or by the wet or coagulation method. The invention may also be applied to the winding continuously with their production of yarns of reconstituted cellulose, such as viscose and cuprammonium filaments.

By way of example, one form of package mounting according to the invention for a drum winding machine will now be described in greater detail with reference to the accompanying drawing which is a sectional view of the mounting.

The mounting comprises a non-rotating central spindle 1, which is pivotally carried at 2 on an arm 3 of a drum winding machine and held in winding position by means of a spring 4 engaging a notch 5 in the end of the spindle 1, so that the spindle 1 may be swung at right angles to its winding position for the purpose of doffing and replacement. Mounted on two sets of ball bearings 6 on the non-rotating spindle 1 is a cylindrical carrier 7 lightened by the provision of holes 8 over the greater part of its surface. One end of the carrier 7, constituting the axially located end piece, is enlarged at 9 and cut to form a lip 10 against which the edge of a cylindrical yarn package support 11, made for example of aluminum or a synthetic resin, is adapted to fit. The other end of the carrier is slightly flared at 12 so as to provide only a small clearance between it and the inside of the package support 11. The end of the spindle 1 is screw-threaded at 13 to receive lock nuts 14 which secure the ball races 15 on the spindle 1 and a cap 16 that retains a compression spring 17 in a recess 18 in the end of the spindle 1. The ball races 15 are spaced apart by a spacing piece 30. The spring 17 bears on the head 19 of a plunger 20 seated in the recess 18, so as to tend to draw the plunger 20 into the recess. The end of the plunger is screw-threaded at 21 and carries a knob 22 provided with finger lugs 23 and fitted with a ball bearing 24 facing the end of the spindle 1. The inner race 25 of the bearing 24 is counter-sunk to fit a conical projection 26 on an end plate 27 slotted at 28 to slip over the plunger 20. The end plate 27 is spigoted at 29 to fit into the end of the package support 11 and the pressure of the spring 17 pulls the knob 22 against the end plate 27 to nip the support 11 in place, the conical fitting at 25, 26 between the knob and the end plate centring the support.

In order to mount the package support 11 on the mounting described above, the support 11 is slipped over the knob 22 and the carrier 7 and is seated on the lip 10 at the bottom of the carrier 7. The knob 22 is then pulled out by hand by means of the lugs 23 provided thereon, and the removable end plate 27 is slipped in from one side and lodged in the end of the package support 11.

The knob 22 is then released so that it clamps the package support 11 between the end piece 9 and the end plate 27.

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

1. A mounting for a yarn package support, comprising a central spindle, an end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, a plunger protruding from the end of said spindle, spring loading means for drawing said plunger toward said spindle, an end plate adapted to engage the other end of the yarn package support, said end plate being radially slotted for fitting round said plunger so as to be removable from said spindle, and an enlargement on the end of said plunger adapted to act on the outer face of said removable end plate and to hold it in place on said spindle.

2. A mounting for a yarn package support, comprising a central spindle, a freely rotatable end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, a plunger protruding from the end of said spindle, spring loading means for drawing said plunger toward said spindle, an end plate adapted to engage the other end of the yarn package support, said end plate being radially slotted for fitting round said plunger so as to be removable from said spindle, and an enlargement rotatably mounted on the end of said plunger and adapted to act on the outer face of said removable end plate and to hold it in place on said spindle.

3. A mounting for a yarn package support, comprising a central spindle, an end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, a plunger protruding from the end of said spindle, spring loading means for drawing said plunger toward said spindle, an end plate adapted to engage the other end of the yarn package support, said end plate being radially slotted for fitting round said plunger and having a conical depression on the outer face thereof, and a coned enlargement on the end of said plunger adapted to engage said conical depression so as to locate and hold said removable end plate in place on said spindle.

4. A mounting for a yarn package support, comprising a central spindle, a freely rotatable end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, a plunger protruding from the end of said spindle, spring loading means for drawing said plunger toward said spindle, an end plate adapted to engage the other end of the yarn package support, said end plate being radially slotted for fitting round said plunger and having a conical depression on the outer face thereof, and a coned enlargement on the end of said plunger adapted to engage said conical depression so as to locate and hold said removable end plate in place on said spindle.

5. A mounting for a yarn package support, comprising a central spindle, an end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, a cylindrical member secured to said end piece and adapted to steady the package support being mounted, a plunger protruding from the end of said spindle, spring loading means for drawing said plunger toward said spindle, an end plate adapted to engage the other end of the yarn package support, said end plate being radially slotted for fitting round said plunger so as to be removable from said spindle, and an enlargement on the end of said plunger adapted to act on the outer face of said removable end plate and to hold it in place on said spindle.

6. A mounting for a yarn package support, comprising a central spindle, a freely rotatable end piece axially located with reference to said spindle and adapted to engage one end of the yarn package support, a cylindrical member secured to said end piece and adapted to steady the package support being mounted, a plunger protruding from the end of said spindle, spring loading means for drawing said plunger toward said spindle, an end plate adapted to engage the other end of the yarn package support, said end plate being radially slotted for fitting round said plunger and having a conical depression on the outer face thereof, and a coned enlargement on the end of said plunger adapted to engage said conical depression so as to locate and hold said removable end plate in place on said spindle.

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