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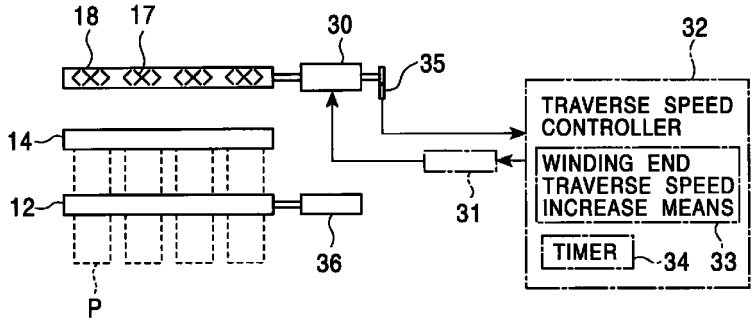
(54) Take-up winder

(57) The present invention provides a take-up winder capable of preventing a yarn wound around an outer surface of a package from dropping from the end face of the package. According to the present invention, the traverse width W of a yarn Y is reduced at a winding end period Tn for a package P.

FIG. 1



EP 1 008 546 A2

Description

Field of the Invention

[0001] The present invention relates to a take-up winder such as a winder that winds a filament yarn produced by a spinning machine.

Background of the Invention

[0002] As shown in Figures 6 and 7, in a conventional take-up winder 10, a body 11 comprises a turret plate 13 from which two bobbin holders 12 protrude and which rotates through 180 degrees to switch the bobbin holders 12 between a winding position and a standby position, and a slide box 15 including a contact roller 14 and provided in the body 11 so as to elevate and lower. By bringing a contact roller 14 in contact with a plurality of bobbins B inserted into bobbin holders 12 at a winding position, a plurality of continuously supplied filament yarns are respectively wound on the bobbins B while being traversed using a traverse device 16 provided for each bobbin opposite to the slide box 15, thereby forming a plurality of packages P.

[0003] As shown in Figures 5A and 5B, the traverse device 16 is composed of a traverse cam 18 with a cam groove 17 formed therein, a traverse shoe 19 engaging with the cam groove 17, and a cover 20 provided in the outer circumference of the traverse cam 18 to regulate the movement of the traverse shoe 19 only in the axial direction. While the filament yarn continuously supplied and wound around the package P is captured by the traverse shoe 19, the traverse cam 18 rotates to traverse the yarn Y over a predetermined width in order to wind it around the package P.

[0004] Figure 4B shows control of the traverse speed from winding start to winding end. A solid line (a) shows the traverse speed, and a dotted line (b) shows a ribboning area curve in which ribboning occurs when the number of winding N is 1.

[0005] In Figure 4B, a yarn is wound in such a way that during a winding start, the traverse speed is increased, that a specified speed is maintained during winding, and that the traverse speed is gradually reduced so as not to exceed the ribboning area curve (b) until a winding end.

[0006] A profile of the package P wound by controlling the traverse speed in this manner is as shown in Figure 4A.

[0007] In particular, if yarns wound by the take-up winder 10 are elastic yarns, an outermost layer yarn Ya of the wound-up elastic yarn is likely to drop (end drop) due to handling during a post process or during transportation. If the yarn supply from the package is started in the post process, a defect such as a yarn break any occur due to the end drop.

[0008] An object of the present invention is to solve this problem in order to provide a take-up winder capable of preventing a yarn from dropping from the end face of a package after wound the yarn around the package.

Summary of the Invention

[0009] To achieve this object, the present invention is a take-up winder for winding a continuously supplied filament yarn around a bobbin inserted into a bobbin holder in order to form a package, while using a traverse device to traverse yarn, characterized in that at the end of package winding, the yarn traverse speed is increased to reduce the traverse width.

[0010] The aspect of the present invention is a take-up winder, characterized in that at the end of package winding, the yarn traverse speed jumps a ribboning occurrence area.

Brief Description of the Drawing

[0011]

Figure 1 is a schematic block diagram showing one embodiment of the present invention.
Figure 2 shows a change pattern of the traverse speed according to the embodiment of the present invention.
Figure 3 shows a profile of a package wound up by the present invention.
Figure 4 shows a profile of a package wound up by a conventional take-up winder and a variation of the traverse speed in the conventional take up winder.
Figure 5 shows a traverse device of a take-up winder in detail.
Figure 6 is an overall view of a take-up winder.
Figure 7 is a right side view of Figure 6.

Detailed Description of the Preferred Embodiments

[0012] One preferred embodiment of the present invention is described below with reference to the accompanying drawings.

[0013] First, the overall configuration of a take-up winder is as shown in Figures 6 and 7, and the details of a traverse device 16 are as described in Figure 5. The take-up winder according to the preferred embodiment of the present invention described herein is a take-up winder for elastic yarns that winds elastic yarns.

[0014] According to the present invention, as shown in Figure 1, the traverse speed can be varied by using an inverter 31 or the like to drive a drive device 30 for rotationally driving the traverse cam 18 of traverse device 16 in Figure 5A.

[0015] The drive device 30 is controlled by a traverse speed controller 32 via the inverter 31. The traverse speed controller 32 is input a detecting value of a rotating sensor 35 for detecting the rotation speed (traverse speed) of the traverse cam 18, and comprises a timer 34 for counting the time from the winding start of

the package P to its winding end, and a winding end traverse speed increase means 33 for instructing the inverter 31 to increase the traverse speed at the winding end of the package P.

[0016] 36 is a rotation drive means for rotating the bobbin holder 12. The rotation drive means 36 is connected to the contact roller 14, and the contact roller 14 is rotated to come into contact with the package P and make it rotate.

[0017] Figure 2 shows an example in which the traverse speed controller 32 controls the traverse speed.

[0018] In Figure 2, the horizontal axis denotes the time from package winding start (empty bobbin state) to winding end (full bobbin state), while the vertical axis denotes the traverse speed (= winding angle).

[0019] In Figure 2, the dotted line is a curve denoting a ribboning occurrence area (ribboning speed) R when the number of winding N is 1, while the solid line is a curve denoting a variation in traverse speed (winding angle pattern) TS.

[0020] In the take-up winder, the winding angle pattern TS is located under the curve of the ribboning occurrence area R, and at a winding start To, a traverse speed is gradually increased from an initial traverse speed tso to a specified value tsc. Subsequently, the traverse speed is gradually reduced so as not to intersect the curve of the ribboning occurrence area R, and during a time Tn (several seconds to several minutes) immediately before a winding end Te, the traverse speed is increased from the traverse speed tsn to a value tsm that jumps the ribboning area R. Then, the traverse speed tsm is maintained until the winding end Te.

[0021] Thus, by increasing the traverse speed ts from tsn to tsm during the time (several seconds to several minutes) Tn immediately before the winding end Te, the actual traverse width is reduced to prevent the outermost layer yarn from dropping from the end face of the bobbin.

[0022] Figure 3 shows a profile of the package P in which the yarn Y has been wound around the bobbin B with the winding angle pattern TS shown in Figure 2. By increasing the traverse speed immediately before the winding end, the winding angle is increased to become the winding width Wm smaller than the width W of a normal package. An outermost layer section 110 having a traverse width smaller than the width between the end faces of the package P is formed in an outer circumference 100 of the package P, and a yarn Ye at the winding end is located in the outermost layer section 110. Consequently, even if the yarn Ye drops as shown by the arrow, it remains on the outer circumference 100 of the end face side of the package P and can be prevented from dropping from the end face during a post process.

[0023] In addition, by increasing the traverse speed so as to jump the ribboning occurrence area R of the winding number N=1, which poses a problem during large-diameter package winding, ribboning can be prevented from occurring in the outermost layer section 110, and the traverse width can be maintained within the winding width W.

[0024] The above embodiment uses the inverter to control the rotation speed of the traverse cam to reduce the traverse width during the winding end, but in the case of a blade traverse device, this device may adjust the traverse width.

Claims

1. A take-up winder for winding a continuously supplied filament yarn around a bobbin inserted into a bobbin holder in order to form a package, while using a traverse device to traverse the yarn, characterized in that at the end of package winding, the yarn traverse speed is increased to reduce the traverse width.

2. A take-up winder as in Claim 1, characterized in that while being increased, the yarn traverse speed jumps a ribboning occurrence area.

3. A take-up winder as in Claim 2, characterized in that the traverse speed is controlled so that at a winding start, the traverse speed is gradually increased until it is reached to a specified traverse speed, so that the traverse speed is then gradually reduced in such a way that the traverse speed does not intersect the ribboning occurrence area, and so that during a time immediately before a winding end, the traverse speed is increased so as to jump the ribboning occurrence area and the resulting traverse speed is maintained to finish winding.

4. A take-up winder for winding a continuously supplied filament yarn around a bobbin inserted into a bobbin holder in order to form a package, while using a traverse device to traverse the yarn, characterized in that the winder comprises a drive device for driving a traverse device and a traverse speed controller for controlling the drive device to control the traverse speed, and in that the traverse speed controller has traverse speed increase means for directing the drive device to increase the traverse speed at the end of package winding.

FIG. 1

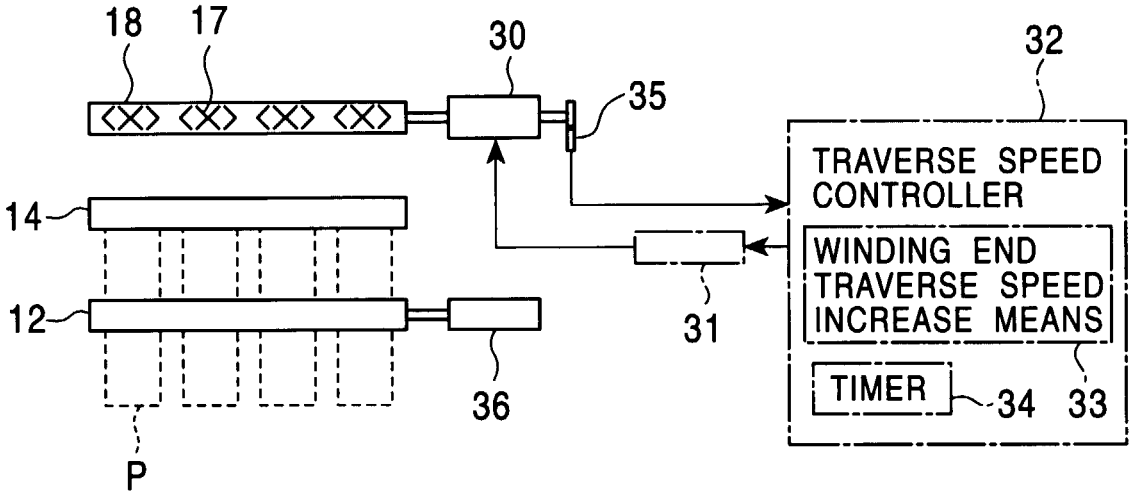

18
17
30
35
32
TRAVERSE SPEED CONTROLLER
14
WINDING END TRAVERSE SPEED INCREASE MEANS
12
31
TIMER
34
33
36
P

FIG. 2

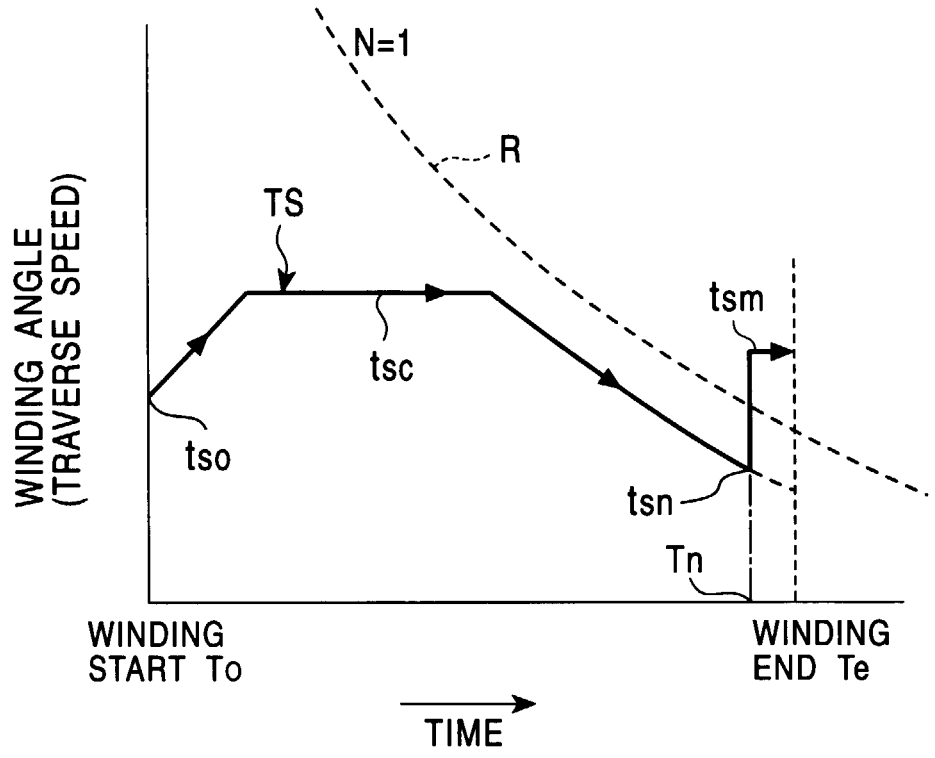

N=1
R
TS
tsm
tsc
tso
tsn
Tn
WINDING ANGLE (TRAVERSE SPEED)
WINDING START To
WINDING END Te
TIME

FIG. 3

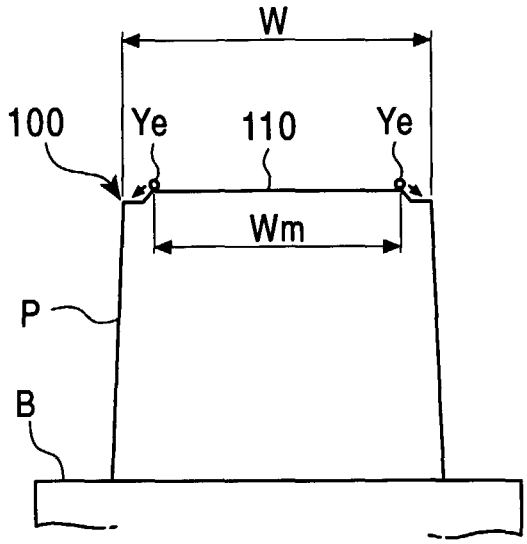


FIG. 4A
PRIOR ART

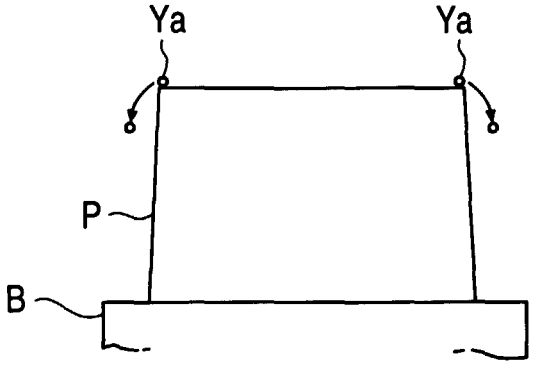


FIG. 4B
PRIOR ART

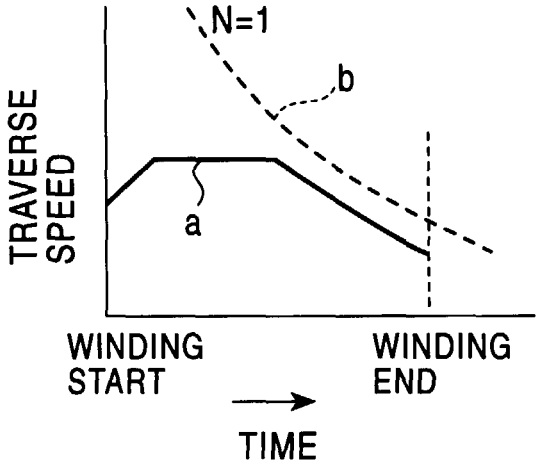


FIG. 5A

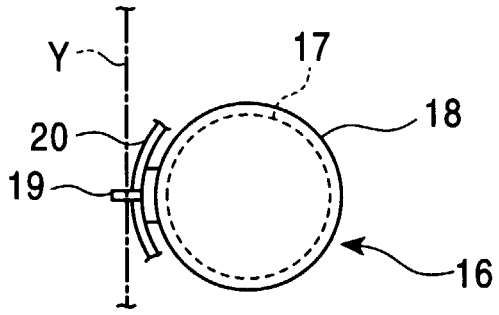


FIG. 5B

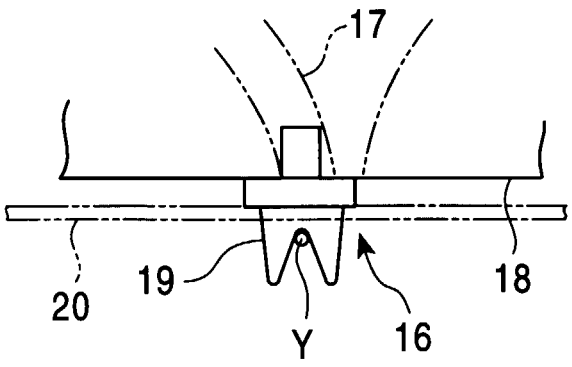


FIG. 6

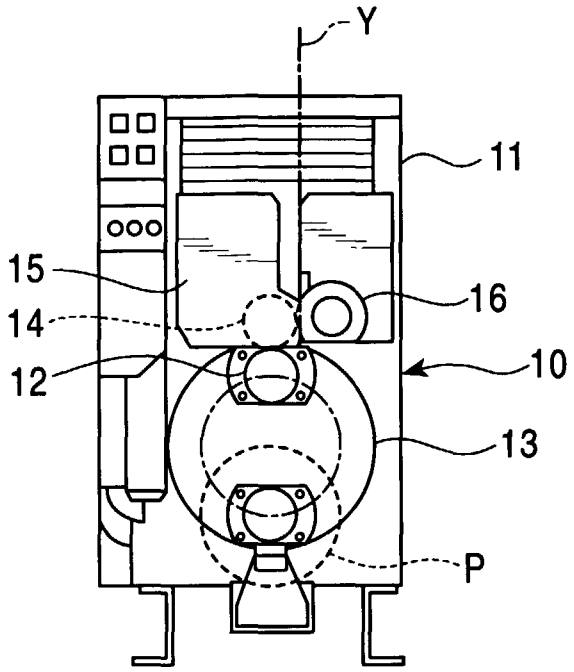


FIG. 7