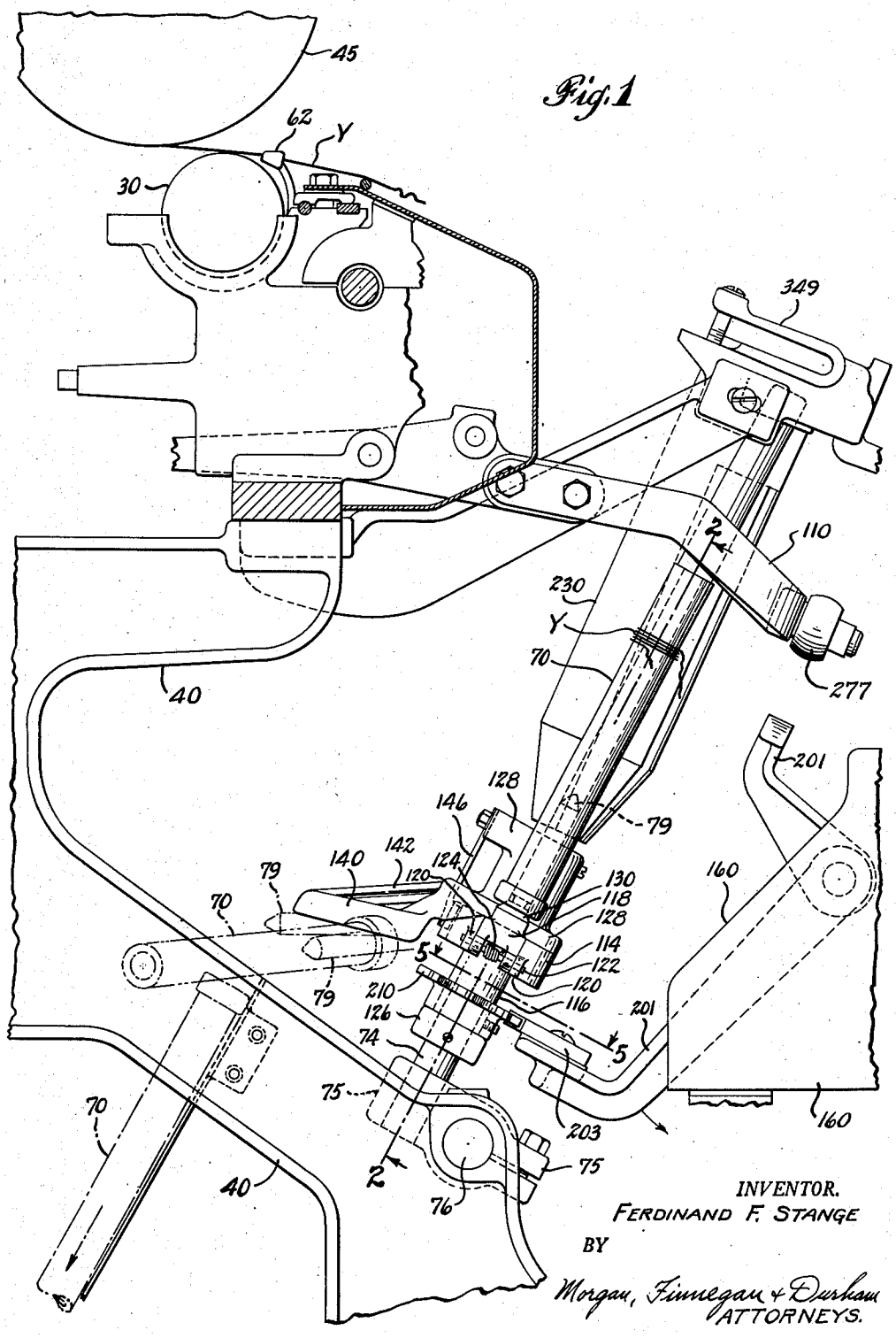
March 24, 1953 F. F. STANGE 2,632,612

BOBBIN SUPPORTING MECHANISM FOR AUTOMATIC YARN WINDERS

Filed April 11, 1950 2 SHEETS—SHEET 1

Fig. 1



March 24, 1953 F. F. STANGE 2,632,612

BOBBIN SUPPORTING MECHANISM FOR AUTOMATIC YARN WINDERS

Filed April 11, 1950 2 SHEETS—SHEET 2

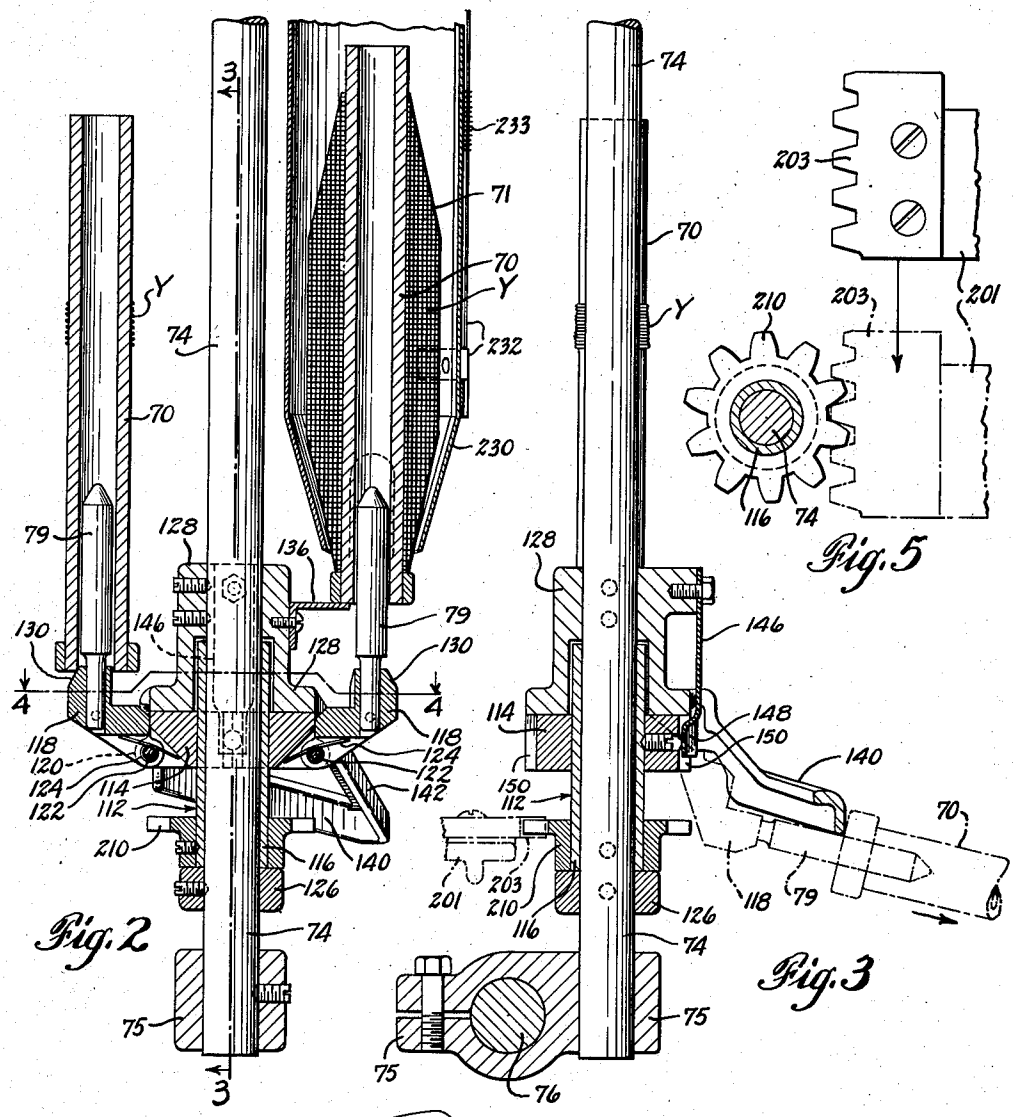


Fig. 2

Fig. 3

Fig. 5

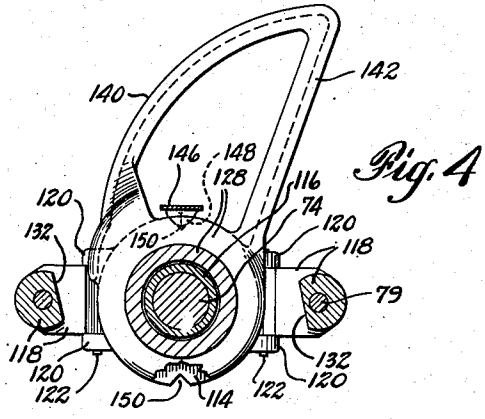


Fig. 4

INVENTOR.
FERDINAND F. STANGE
BY
Morgan, Finnegan & Durham
ATTORNEYS.

Patented Mar. 24, 1953 2,632,612

UNITED STATES PATENT OFFICE

2,632,612

BOBBIN SUPPORTING MECHANISM FOR AUTOMATIC YARN WINDERS

Ferdinand F. Stange, Westfield, Mass., assignor to Foster Machine Company, Westfield, Mass., a corporation of Massachusetts

Application April 11, 1950, Serial No. 155,165

3 Claims. (Cl. 242—130)

1

The present invention relates to a novel and improved bobbin support for multi-unit winding machines, and more particularly to an improved mechanism in which a reserve bobbin may be automatically moved to an unwinding or feeding position as the exhausted bobbin is doffed.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:

Figure 1 is a fragmentary detailed sectional view of a multi-unit yarn winding machine showing the novel and improved bobbin support and its associated parts;

Figure 2 is a longitudinal section taken on the line 2—2 of Figure 1;

Figure 3 is a similar sectional view taken on the line 3—3 of Figure 2, the dot-dash lines showing a temporary position of a bobbin supporting pin as the exhausted bobbin is doffed therefrom;

Figure 4 is a sectional view taken on the line 4—4 of Figure 2, with certain parts broken away; and

Figure 5 is a fragmentary sectional view taken on the line 5—5 of Figure 1 and showing two positions of a moving rack for actuating the bobbin support.

The present invention is an improvement upon the yarn winding machine of the patent to Louis M. Cotchett No. 2,395,462, granted February 26, 1946, although in many respects the present invention is of more general application and may be applied to multi-unit winding machines where an exhausted bobbin is to be doffed and replaced by a fresh bobbin carrying a supply of yarn to be fed therefrom.

The present invention has for its object the provision of a new and improved bobbin support for a plurality of bobbins, one of the bobbins being a reserve bobbin and the other being a bobbin from which yarn is being fed to a winding machine or other yarn-using apparatus.

2

Still another object of the invention is the provision of an improved bobbin support for a plurality of bobbins by which on exhaustion of the yarn from one bobbin, it is automatically and positively doffed and its place is taken by a reserve bobbin at the same time that the support which held the doffed bobbin is returned to a loading position to receive another reserve bobbin containing a fresh supply of yarn.

In accordance with the present invention there is provided in a winding machine a rotatable member carrying a plurality of bobbin supports each of which may support a bobbin or other package from which yarn is to be fed and these supports are individually pivotally mounted with respect to the rotatable member so that they may be moved relative to the rotatable member. The rotatable member is intermittently rotated, for instance by the passage of a tender, after one of the supporting bobbins has been exhausted of yarn. As it is rotated, the bobbin support holding the exhausted bobbin is positively moved about its pivot by cam means which depress the bobbin support from its normally upright position and move it to a doffing position, and these cam means also positively move the bobbin off from its support. Continued rotation of the rotatable member, interchanges the positions of the bobbin supports so that a reserve bobbin moves into the feeding position previously occupied by the exhausted bobbin and the associated bobbin support moves to a position where it may be provided with a new reserve bobbin so as to prepare it for subsequent movement to a yarn feeding position.

It will be understood that the foregoing general description and the following detailed description as well are exemplary and explanatory of the invention but are not restrictive thereof.

Referring now in detail to the present preferred and illustrative embodiment of the invention as shown in the accompanying drawings, many of the parts are substantially identical with those shown in the prior Patent No. 2,395,462 and for convenience these parts are identified in the present drawings by the same reference characters as in said patent.

The present invention is illustratively shown as providing a bobbin supporting means which serves as the yarn supply to a multi-unit winding machine, a portion of one such unit being shown in Figure 1 of the present drawings. As there shown, there is provided a frame 40 on which is supported a rotating driving roll 30 and a traversing yarn guide 62 serving to guide the

yarn Y as it is drawn from a bobbin through the yarn tension means 349 and is wound onto the package 45.

As more fully explained in said prior patent the winding operation is automatically stopped upon a failure of the yarn Y and the winding operation may be restarted by depressing the starting lever or handle 110, which action is preferably carried out automatically as the tender 160 moves past the idle winding unit, the raised handle 110 allowing rack 203 to remain in the position shown rather than to be depressed by engagement of the lever 201 with roller 277, so that replacement of the exhausted bobbin, or the bobbin from which the yarn has failed, is accomplished.

The bobbin supporting and changing mechanism of the present invention is mounted on a bracket 75 which is supported on a rod 76 extending lengthwise of the winding machine and fast in the frame members 40. Extending upwardly from bracket 75 is a shaft member 74 on which is rotatably mounted a rotatable member 112 comprising a disc 114 which is rigidly connected to sprocket gear 210 by means of sleeve 116 so that the disc 114 may be driven by gear 210. Mounted on disc 114 are a plurality, preferably two, upwardly extending bobbin receiving pins 79, which are diametrally spaced on the disc and are pivotally supported thereon so as to be movable toward and from shaft 74 in a plane radial to the shaft. At the lower end of each pin 79 is a pin supporting bracket 118 which is received between lugs 120 formed integrally with the disc 114 and carrying the pin 122 by which the bracket 118 is pivotally mounted on the disc. A coil spring 124 coiled around the pin 122 and having its ends bearing against the disc and the bracket, is provided for each of the brackets 118 so as to hold the bobbin pins 79 in a normally upright position as shown in Figure 2, at the same time permitting the pins 79 to be swung downwardly as shown in the dot-dash lines of Figure 3.

The rotatable member 112 is held against axial movement on the shaft 74 by means of a lower collar 126 and an upper collar 128, these collars being secured to the shaft in proper position by means of suitable set screws.

For the purpose of anchoring the bobbin core 70 on the bobbin supporting pin 79, the upper end of the brackets 118 is bevelled for a major portion of its circumference as at 130, and the bracket is cut away as at 132, the dimensions of this upper portion of the bracket being such as to allow the smallest portion of the bracket to enter into and snugly engage the lower portion of the cylindrical bore extending axially through the bobbin core 70.

Means are also provided in accordance with the present invention for automatically dropping a bobbin from an intermediate position on the pin 79 to its lowermost position, the force of this dropping being sufficient to push the lower end of the bobbin core onto the tapered upper end of the bracket 118. For this purpose, a ledge 136 is fixed to the collar 128 and extends at right angles to the shaft 74 for a small portion of its circumference. Ledge 136 extends sufficiently close to the pin 79 in bobbin-loading position so that the bottom end of the bobbin core rests on the ledge but is released therefrom by rotation of the bobbin supporting mechanism about its shaft 74. As this rotation occurs, the lower end of the bobbin core rides off the edge of the ledge 136 allowing the bobbin to drop with some force and to be securely engaged by the tapered upper end of the bracket 118.

Means are also provided for positively depressing each of the bobbin pins 79 as the bobbin pin is moved from its feeding position back to its loading position, and these means also include means for positively pushing the exhausted bobbin or core 70 from its supporting pin 79 so that the bobbin is discharged into a suitable chute or box and may be removed from the machine.

As embodied, these means comprise a stationary cam which is preferably formed integral with the collar 128 and is formed as a cam rail 140 which extends laterally from shaft 74 and the collar 128. The cam rail 140 is of a generally spiral form, the outer end being supported by a portion 142 which returns to the collar 128 and may be integral with the collar and cam 140. The cam portion 140 extends downwardly as well as outwardly, and its upper and inner end is preferably so located with respect to the bracket 118 and pin 79 that rotation of the disc 114 in a clockwise direction (Figure 4) causes the pin 79 to be moved about its pivot 122 from the position shown in Figure 2 to the dot-dash shown in Figure 3. Simultaneously with the pivotal lowering of the pin 79, the cam rail 140 engages with the bottom end of the bobbin core 70 so as to positively push the bobbin from the bobbin pin 79, thereby freeing the bobbin from the tapered portion 130 of the bracket 118 and moving the bobbin to the point where it will fall off the pin and be discharged or doffed as shown in Figure 1.

Means are also provided for definitely locating each bobbin supporting pin 79 in its proper position with respect to the remainder of the machine, and for this purpose, collar 128 supports a leaf spring 146 which extends downwardly and has its lower rounded end 148 in contact with the generally cylindrical periphery of disc 114. At suitable points around the circumference of the disc 114 are provided notches 150 into which the rounded end 148 is adapted to enter thereby forming a resilient detent locating the rotational position of the disc 114 and holding it against accidental displacement.

Means are provided for rotating the bobbin supporting means about the shaft 74, and these means operate to turn it a half revolution in case only two bobbin supports are provided and include a rack 203 carried by the tender 160 on the pivoted arm 201, the rack 203 being adapted to engage sprocket gear 210 and rotate it the desired amount.

In case the bobbin is not to be shifted, as is the case where yarn is still being wound from a bobbin on the unit in question, arm 110 is depressed and rollar 277 engages with the upper end component of arm 201 so as to lower the rack 203 sufficiently to move it out of possible engagement with the gear 210. As shown in Figure 1, the rack 203 may be considered as traveling in a direction toward the observer, and in Figure 5 the rack is shown in a top plan view and travelling toward the bottom of the sheet.

In order to facilitate location of a replenishment bobbin on its bobbin supporting pin 79, a generally cylindrical chute 230 is provided and extends upwardly beyond the bobbin pin 79 in reserve loading position. The chute 230 has its lower end slightly tapered to facilitate guiding of the bobbin onto the pin 79, and chute 230 is formed in two parts, hinged by means of hinge 232, and normally held in closed position by means of coil spring 233, the hinging of the

chute being so constructed, as in the Cotchett patent, so that the chute is opened as the bobbin support is rotated, thereby allowing the reserve bobbin to be moved from the loading position to its yarn feeding position.

In operation, and where only two bobbin supporting or receiving pins are provided one is normally at the loading position within the chute **230** where it may receive a fresh reserve bobbin, and the other is located at the yarn feeding position where yarn is drawn from it and is wound onto the package. Figure 2 shows the parts after a reserve bobbin has been loaded onto the empty bobbin receiving pin **79**, and as the yarn on the other bobbin core **70** has been exhausted, and the bobbin receiving pins are to be interchanged in their positions with the doffing of the exhausted bobbin.

Assuming that the yarn has been exhausted from the lefthand bobbin, or that a break has occurred between the bobbin and the package **45**, either of which conditions has already caused the starting lever **110** to be moved to its uppermost position so that rack **203** will be in a position to engage gear **210** as the tender **160** advances past the particular winding unit; under these conditions the rack **203** rotates gear **210** one-half revolution, and in so doing rotates both bobbin supporting pins **79** about the shaft **74** so that each bobbin pin finally assumes the position formerly occupied by the other pin.

At the beginning of this rotation, the full bobbin **71** causes the chute **230** to be opened and the lower end of the full bobbin **71** rides off the end of the arcuate ledge **136** dropping the bobbin onto the tapered end **130** of bracket **118**. Simultaneously the other bracket **118** on which the exhausted bobbin **70** is mounted, is swung outwardly away from the shaft **74** by engagement with the cam rail **140**, the downward inclination of the cam rail lowering the pin to the position shown in Figure 3, while the spiral or lateral sweep of the cam rail causes the bobbin core to be pushed off the pin **79** to the point where it is completely doffed and falls into a suitable chute or box in the lower part of the winding machine. This rotation continues for the full half revolution, by which time rack **203** is disengaged from the gear **210** and the detent **148**, **150** again holds the bobbin supporting mechanism in its new position with the reserve yarn bobbin now forming the active yarn supply from which yarn is drawn, and the other bobbin supporting pin, now empty, is located within the chute **230** and is ready to receive a new reserve supply.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made there-

from within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. In a yarn winding machine, an upwardly extending shaft, a member rotatable thereon, a gear connected therewith, a bobbin receiving pin normally parallel to the shaft and pivoted to move in a plane radial to the shaft, spring means tending to restore the pin to its normal position, cam means extending laterally from the shaft and stationary therewith and having a surface extending outwardly and downwardly from the rotatable member whereby rotation of the pivoted pin causes the pin to be depressed against the force of the spring and also causes a bobbin to be positively doffed from the pin and a ledge extending laterally from the shaft to support a bobbin as it is placed on the pin, said ledge being interrupted whereby rotation of the pin about the shaft causes the bobbin to be fully seated on the pin.

2. In a yarn winding machine, as claimed in claim 1 in which the pin has a tapered portion to engage with the bottom of an axial hole in the bobbin.

3. In a yarn winding machine, an upwardly extending shaft, a member rotatable thereon a bobbin receiving pin normally parallel to the shaft and pivoted to move in a plane radial to the shaft, means for individually depressing the pins one-by-one as the member is rotated including a cam track for positively doffing bobbins from the pins, means for restoring the pins to their normal position and a ledge extending laterally from the shaft to support a bobbin as it is placed on the pin, said ledge being interrupted whereby rotation of the pin about the shaft causes the bobbin to be fully seated on the pin.

FERDINAND F. STANGE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,115,509	Colman	Nov. 3, 1914
1,125,679	Fessmann	Jan. 19, 1915
1,978,550	Reiners	Oct. 30, 1934
2,040,023	Reiners	May 5, 1936
2,124,499	Swanson	July 19, 1938

FOREIGN PATENTS

Number	Country	Date
261,258	Germany	June 18, 1913