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BOBBIN DRIVE FOR WINDING MACHINES

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FIG. 1

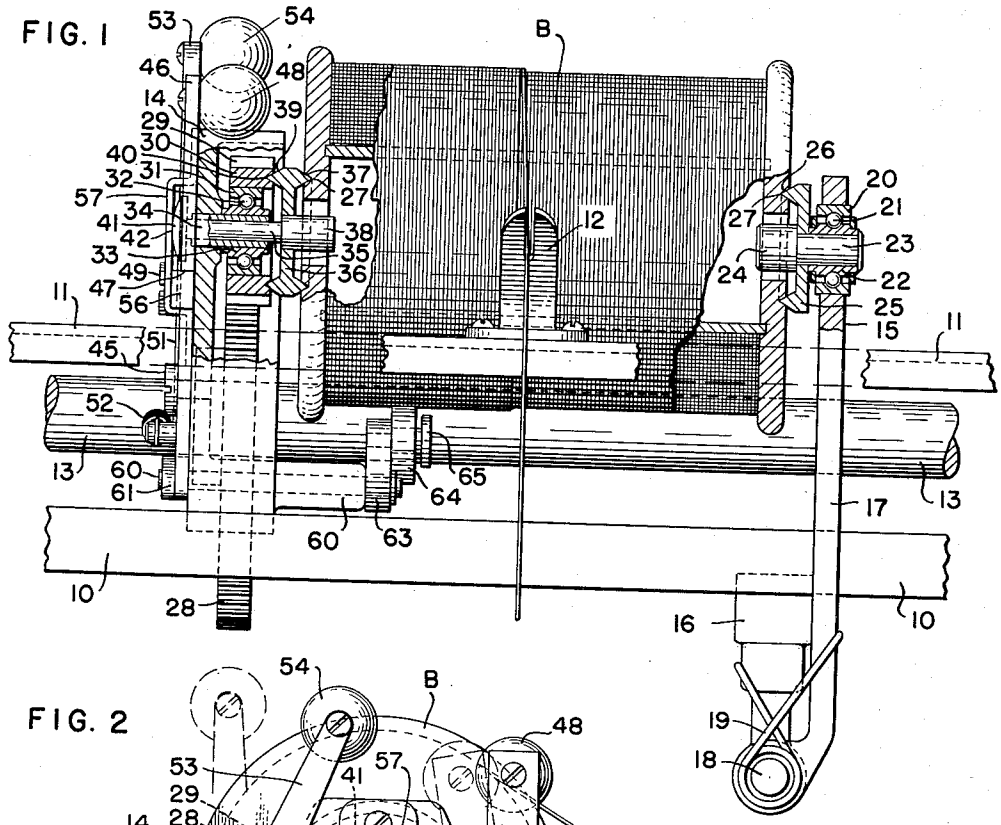
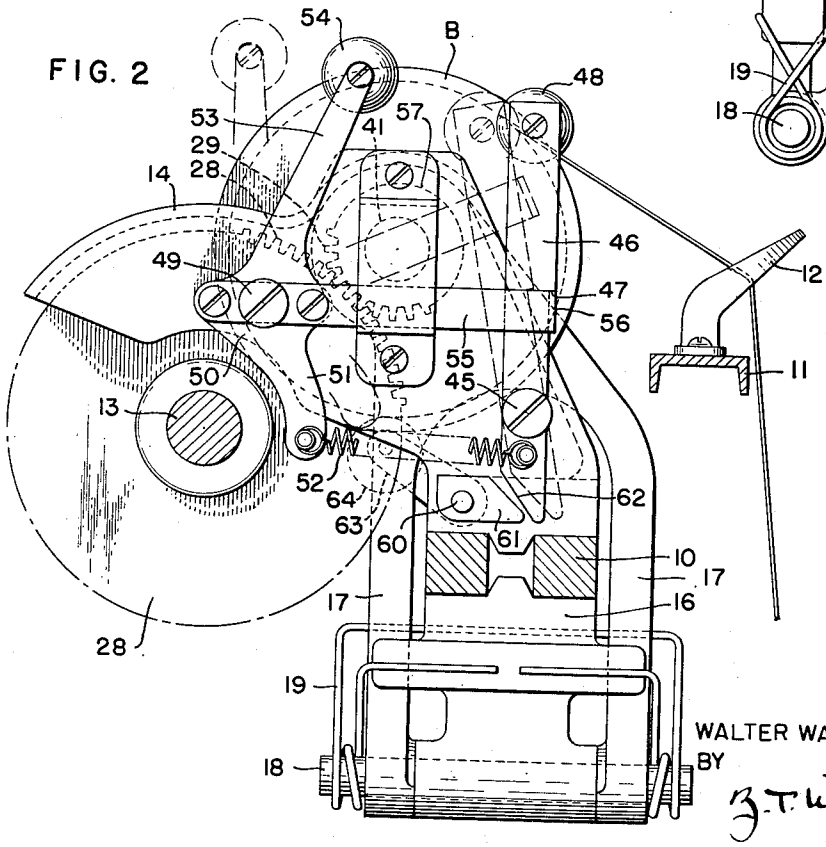


FIG. 2



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BOBBIN DRIVE FOR WINDING MACHINES

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10 Claims. (Cl. 242—18)

1

This invention relates to bobbin drives for winding machines.

Various drives for winding bobbins have heretofore been proposed but these have different objectionable features. For example, it has been proposed to drive the bobbin by a friction roll or wheel which engages the yarn wound on the bobbin, and with the bobbin carried on a pivotal mounting which is moved out of contact with the friction roll upon breaking of the yarn being wound or upon filling of the bobbin. The yarn package thus produced, while reasonably satisfactory, is capable of improvement and, for some kinds of winding, the shifting of the bobbin is undesirable.

It has also been proposed to wind bobbins on fixedly mounted centers but the drive for the bobbins has not been wholly satisfactory, particularly because the bobbin cannot be held free from rotation at the commencement of the winding, or the resumption of the winding after an interruption, or when the bobbin is filled. No satisfactory separate and individual bobbin drive, independent of the drive for other bobbins in the machine, has heretofore been available in winding machines operating with fixed centers.

It is the principal object of the present invention to provide an improved bobbin drive for winding machines which will overcome the objections heretofore encountered with prior bobbin winders.

It is a further object of the present invention to provide a bobbin drive, working on fixedly mounted centers, in which the bobbin drive may be connected and disconnected as desired, while the bobbin is supported on its axis.

It is a further object of the present invention to provide an improved bobbin drive which may be connected and disconnected as desired, without swinging the axis of the bobbin, and in which the bobbin may remain at rest when disconnected from its drive.

It is a further object of the present invention to provide an improved bobbin drive which includes mounting elements on which the bobbin is supported for rotation, a driving member which is normally continuously operated, and an axially movable controlling member interposed therebetween.

It is a further object of the present invention to provide an improved bobbin drive which includes, with the driving mechanism, suitable control mechanism for disconnecting the driving mechanism under certain conditions.

Other objects and advantageous features of

2

the invention will be apparent from the specification and claims.

The nature and characteristic features of the invention will be more readily understood from the following description, taken in connection with the accompanying drawings forming part hereof, in which:

Figure 1 is a front elevational view of a bobbin drive in accordance with the present invention, parts being broken away to show the details of construction; and

Figure 2 is an end elevational view, as seen from the left.

It should, of course, be understood that the description and drawings herein are illustrative merely, and that various modifications and changes may be made in the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

Referring now more particularly to the drawings, a horizontal rail 10 is shown, as a fragmentary portion of the frame of a winding machine, together with a traverse bar 11, having mounted thereon and movable therewith a yarn or strand guide eye 12, and a drive shaft 13 extending parallel to the rail 10, the traverse bar 11 and shaft 13 being actuated in any desired manner common to winding machines.

At a plurality of predetermined locations on the rail 10, dependent upon the size and capacity of the winding machine, and for each bobbin B to be wound, a housing 14 is provided rigidly secured to the rail 10.

At a location spaced from the housing 14, dependent upon the length of the bobbin B, a bobbin end support 15 is provided which includes a bracket 16, secured to the rail 10. The bracket 16 has an upwardly extending arm 17, pivotally mounted thereon by a pivot pin 18. A spring 19, carried by the bracket 16 and in engagement with the arm 17, normally resiliently urges the upper portion of the arm 17 towards the left (see Fig. 1), while permitting movement to the right for insertion and removal of the bobbin B, as hereinafter explained.

The arm 17, at its upper end portions, has the outer race 20 of a ball bearing 21 fixedly mounted therein. The inner race 22 of the bearing 21 has a bobbin supporting spindle 23 carried therein. The bobbin engaging end of the spindle 23 is adapted to engage the end of the bobbin B in any desired manner in supporting relation, and for this purpose, and to increase the usefulness and

adaptability thereof, it is preferred to employ a stub end 24 extending into the central opening in the bobbin end and a plate 25 having a beveled rim 26 engaging in a beveled groove 27 in the end of the bobbin B.

The housing 14, partially encloses a driving gear 28, keyed or otherwise secured to the shaft 13 for rotation therewith. The gear 28 is in mesh with a driven pinion 29 mounted on and secured to a clutch ring 30 for rotation therewith, the ring 30 being mounted on and secured to the outer race 31 of a ball bearing 32. The inner race 33 of the ball bearing 32 is secured to a supporting sleeve 34 which is fixedly mounted in the housing 14. It will thus be seen that the clutch ring 30 is supported on the sleeve 34 by the bearing 32 and can be continuously rotated.

Extending through the sleeve 34 a clutch shaft 35 is provided, axially movable a limited distance, having a clutch plate 36 on the inner end thereof. The clutch plate 36 has, on the inner face thereof, a beveled rim 37 for engagement in a a beveled groove 27 in the end of the bobbin B and a stub end 38 extending into the central opening in the bobbin end.

The provision of grooves 27, in both ends of the bobbin, permits the insertion of the bobbin B without the necessity for selecting the driven end.

The clutch plate 36 has, on the outer face thereof, a beveled rim 39 for engagement for driving in a beveled groove 40 in the clutch ring 30.

On the outer end of the clutch shaft 35, an operating disc 41 is provided having an outer beveled end face 42.

The housing 14 has pivotally mounted thereon, by a pivot pin 45, a latch lever 46. The latch lever 46 has a locking shoulder 47 thereon, and at the upper end may be provided with a handle 48 for manual drive releasing actuation.

The housing 14 also has mounted thereon, by a pivot pin 49, a latch control lever 50; the lever 50 has a downwardly extending arm 51, which preferably has one end of a tension spring 52 connected thereto, the other end of the spring 52 being connected to the lever 46 below the pivot pin 45.

The lever 50 also has an upwardly extending arm 53 with a handle 54 for manual actuation of the lever 50 for resetting or effecting drive engagement.

The lever 50 has a central locking and drive controlling arm 55 with a hooked portion 56 at the free end thereof for engagement with the edge of the lever 46 at the shoulder 47. The arm 55, between its ends, is movable within a bracket 57, which is carried on the housing 14. The arm 55 in its downward and locked position is out of engagement with the operating disc, and in its upper position, as limited by the bracket 57, is adapted to engage the disc 41 and move the clutch shaft 35 inwardly to disengage the rim 39 from driving contact with the clutch ring 30.

The latch lever 46, in addition to its manual actuating handle 48, may be actuated in any desired manner to release the lever arm 55 from engagement at the shoulder 47, permit its upward movement and disengage the rim 39, from contact with the clutch ring 30. One suitable actuating mechanism is shown and includes a shaft 60, pivotally mounted in the housing 14, with a finger 61 for engagement with a tapered end 62 on the lever 46. The shaft 60 also has an arm 63 mounted thereon, at a location between the ends of the bobbin B. The arm 62 has at its outer end an eccentrically mounted roller 64 carried by a roller pin 65. The roller 64 is adapted to be actuated, as hereinafter pointed out, when the bobbin B has been filled to the desired extent.

The mode of use of the bobbin drive in accordance with the invention will now be pointed out.

The drive shaft 13 is rotated and the traverse bar 11 is continuously reciprocated in any desired manner. The rotation of the shaft 13 is effective, through the gear 28 and the pinion 29, for continuously rotating the clutch ring 30, which as previously indicated is supported by the bearing 32 on the fixed sleeve 34.

Before the insertion of a bobbin B, the lever 50 will be in its upper position with the arm 55 out of engagement at the shoulder 47. The arm 55, in this upper position, will be in engagement with the operating disc 40, and the clutch shaft 35 will be moved and held axially so that the rim 39 will be out of engagement with the clutch ring 30.

A bobbin B, having end grooves 27, has one end moved into contact with the stub end 24, and rim 26, and the arm 17 moved, against the force of the spring 19, to a position such that the other end of the bobbin B can be brought with the stub end 38 of the shaft 35 therein and with the rim 37 in engagement in the groove 27 at that end. The bobbin B will now be supported, may be rotated manually if desired, but is not driven.

When it is desired to drive the bobbin B, the handle 54 is moved forwardly so that the arm 55 of the lever 50 is engaged at the shoulder 47. The downward movement of the lever 50, through the spring 52, tends to position the lever 46 for such engagement. The downward movement of the arm 55 moves it out of engagement with the operating disc 41 so that the shaft 35, by reason of the force of the spring 19, acting on the arm 17 is effective, through the bobbin B and the clutch plate 36 for moving the rim 39 into engagement with the clutch ring 30. The bobbin B is then driven by the clutch ring 30 and the clutch plate 36 for winding, with yarn guided thereon by the guide eye 12. Upon the actuation of the latch lever 46, in any manner, to release the lever 50 and permit its upward movement, urged by the spring 52, the arm 55 engages the operating disc 41, and moves the clutch shaft 35 and clutch plate 36 so that the rim 39 is out of engagement with the clutch ring 30.

The bobbin B will then come to rest or may be stopped manually, if desired.

When a predetermined quantity of yarn has been wound on the bobbin B, the outer face of the yarn comes into engagement with the peripheral face of the eccentric roller 64, causes it to rotate and by forcing the arm 63 away from the face of the bobbin B causes the shaft 60 to be moved. This movement of the shaft in turn moves the finger 61 against the lever end 62, and the lever 46 is moved to release the lever 50 and permit movement thereof to its upper position, and with its arm in engagement with the operating disc 41. The bobbin B, if filled, may be removed by a reverse of the operations for initially placing it in position.

The position of the clutch plate 36, as to driving or non-driving engagement, will be indicated to the operator by the positions of the handles 48 and 54.

With a plurality of bobbins operated with drives as herein described, the stopping of one bobbin, for any cause, does not interfere with the continued operation of other bobbins.

I claim:

1. Driving mechanism for bobbin winders comprising a support, a sleeve fixedly carried by said support, a clutch ring surrounding said support and coaxial therewith, said clutch ring having teeth on the exterior thereof, a bearing interposed between the interior of said clutch ring and said sleeve, members in engagement with said teeth for rotating said clutch ring, a clutch shaft axially movable in said sleeve having a clutch member with oppositely disposed converging portions for respective engagement with one end of the bobbin and with the clutch ring, a member engageable with said shaft for moving said shaft to a position for disengaging said clutch member and said clutch ring, and a resiliently urged support for the other end of the bobbin.

2. A bobbin winding machine comprising a frame, a traverse bar movable parallel to said frame and having a yarn guiding eye for the bobbin to be wound, a continuously rotatable driving member, means for rotatably supporting the bobbin at a fixed location with respect to said frame, said means including supporting members for the ends of the bobbin, one of said supporting members being at a fixed location and the other of said supporting members being spaced therefrom for the reception of the bobbin, said one of said supporting members having a bobbin engaging driving member carried on a slidable shaft, said bobbin engaging member being movable to a non-driving position in which said bobbin is supported for free rotation and to a position in engagement with said rotatable driving member for rotating said bobbin, and a member engageable with said shaft for controlling the positioning of said shaft.

3. A bobbin winding machine comprising a frame, a traverse bar movable parallel to said frame and having a yarn guiding eye for the bobbin to be wound, a continuously rotatable driving member, and means for rotatably supporting the bobbin at a fixed location with respect to said frame, said means including supporting members for the ends of the bobbin, one of said supporting members being at a fixed location and the other of said supporting members being movable axially of the bobbin, said one of said supporting members having a bobbin engaging driving member carried on an axially slidable shaft, said bobbin engaging member being movable to non-driving position in which said bobbin is supported for free rotation and to a position in engagement with said rotatable driving member for rotating said bobbin, and a member engageable with said shaft for moving said shaft and bobbin engaging member to non-driving position.

4. A bobbin winding machine comprising a frame, a traverse bar movable parallel to said frame and having a yarn guiding eye for the bobbin to be wound, and means for rotatably supporting the bobbin at a fixed location with respect to said frame, said means including supporting members for the ends of the bobbin, one of said supporting members being at a fixed location and the other of said supporting members being resiliently urged axially of the bobbin, a continuously rotatable driving member carried by said one of said supporting members, a rotatable bobbin engaging driving member having an axially slidable supporting shaft mounted in said one of said supporting members, said bobbin engaging member being engageable with said rotatable driving member and movable out of engagement therewith, and a control member engageable with said shaft for controlling the positioning of said shaft and said bobbin engaging member.

5. A bobbin winding machine comprising a frame, a traverse bar movable parallel to said frame and having a yarn guiding eye for the bobbin to be wound, means for supporting the bobbin at a fixed location with respect to said frame, said last means including supporting members for the ends of the bobbin, one of said supporting members being at a fixed location and the other of said supporting members being resiliently urged axially of the bobbin, a continuously rotatable driving member carried by said one of said supporting members, a rotatable bobbin engaging driving member carried on an axially slidable shaft mounted in said one of said supporting members, said bobbin engaging member having a portion for driven engagement with said rotatable driving member in one position of said shaft and being movable with said shaft out of engagement with said rotatable driving member, and a control member engageable with said shaft for moving said shaft against the force exerted by said resiliently urged supporting member to an out of engagement position.

6. A bobbin winding machine comprising a frame, yarn guiding means for the bobbin movable with respect to the frame, a supporting member for one end of the bobbin at a fixed location with respect to the frame, a supporting member for the other end of the bobbin movably mounted with respect to the frame, a continuously rotatable driving member carried by said first mentioned supporting member, a rotatable bobbin engaging member movable axially to a non-driving position and to a driving position in engagement with said rotatable driving member, said bobbin engaging member in said non-driving position being freely rotatable, and a member engageable with a portion of said bobbin engaging member for controlling the positioning of said bobbin engaging member.

7. Driving mechanism for bobbin winders comprising a support, a fixed member carried by said support, a clutch ring rotatably mounted on said fixed member, means for continuously rotating said clutch ring, an axially slidable clutch shaft mounted in said fixed member for free rotation with respect thereto, said clutch shaft having secured thereto a clutch member with a portion for driving engagement with one end of the bobbin and a portion for driven engagement with the clutch ring, members for moving said shaft to a position for disengaging said clutch member and said clutch ring, and a support for the other end of the bobbin.

8. Driving mechanism for bobbin winders as defined in claim 7 in which the support for the other end of the bobbin comprises a resilient member in engagement therewith for urging said other end support into engagement with said bobbin and said bobbin and clutch member into engagement with said clutch ring.

9. Driving mechanism for bobbin winders as defined in claim 7 in which a bearing is interposed between said clutch ring and said fixed member.

10. Driving mechanism for bobbin winders

comprising a support, a sleeve fixedly carried by said support, a clutch ring rotatably mounted on said sleeve, members for continuously rotating said clutch ring, an axially slidable clutch shaft mounted in said sleeve for free rotation with respect thereto, a clutch member mounted on and positioned by said shaft, said clutch member having a portion for driving engagement with one end of the bobbin and a portion for driven engagement with the clutch ring, members for disengaging said second mentioned portion and said clutch ring, and a support for the other end of the bobbin.

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