June 20, 1961 E. SCHÜLER ET AL 2,989,257

APPARATUS FOR HOLDING BOBBINS

Filed June 4, 1956 3 Sheets-Sheet 1

FIG. 1

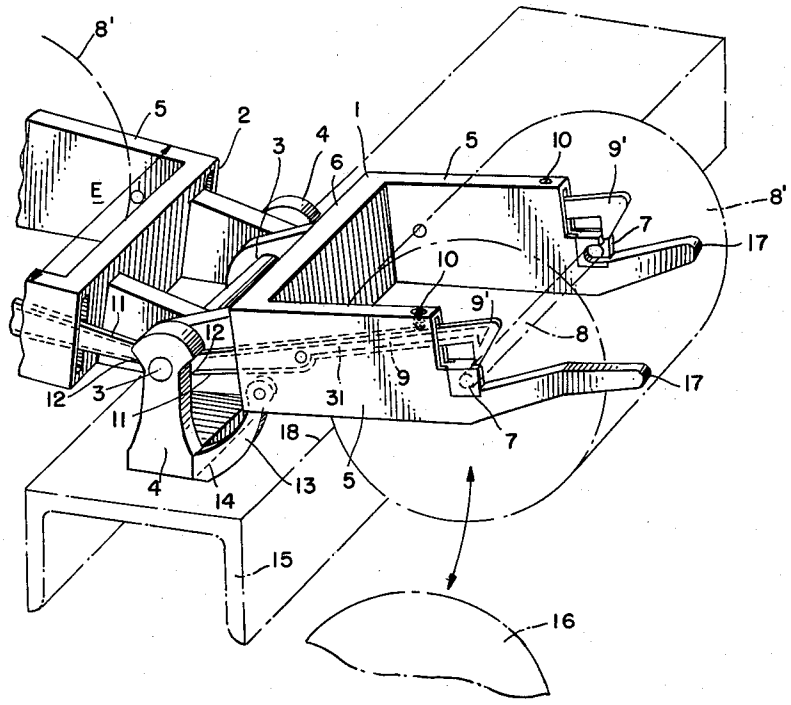

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FIG. 2

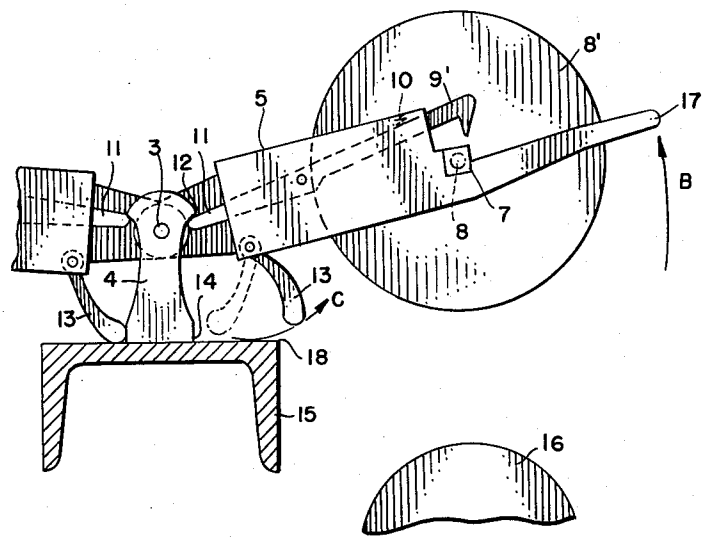

FIG. 3

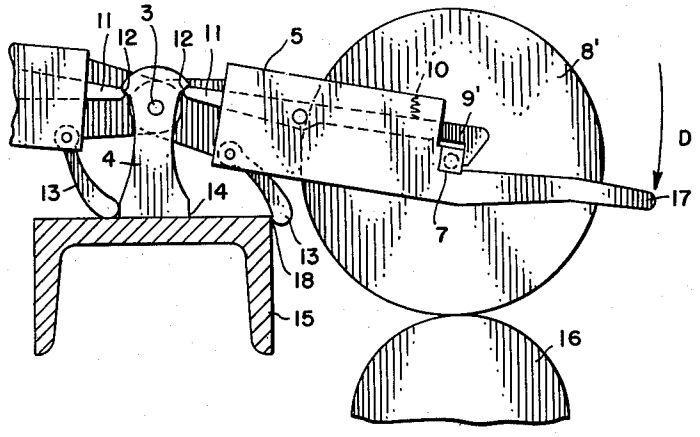

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FIG. 4

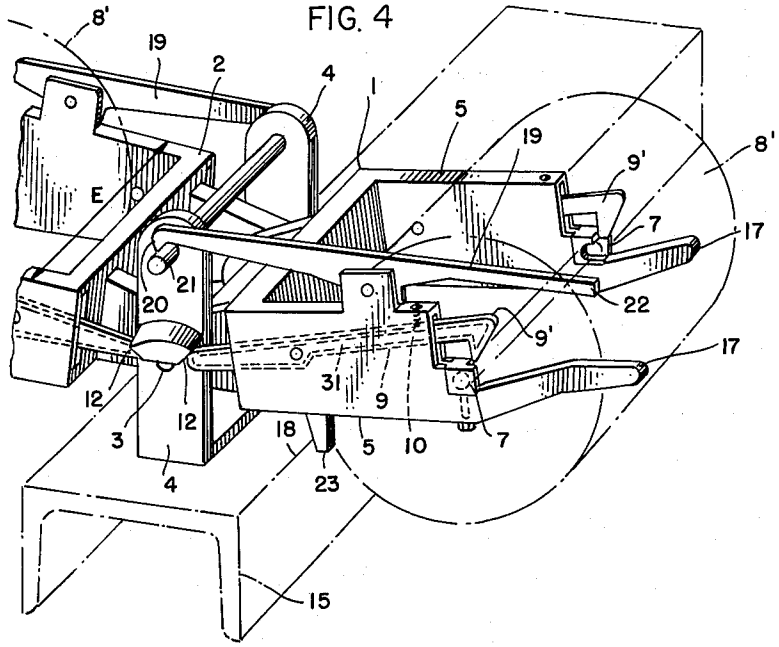
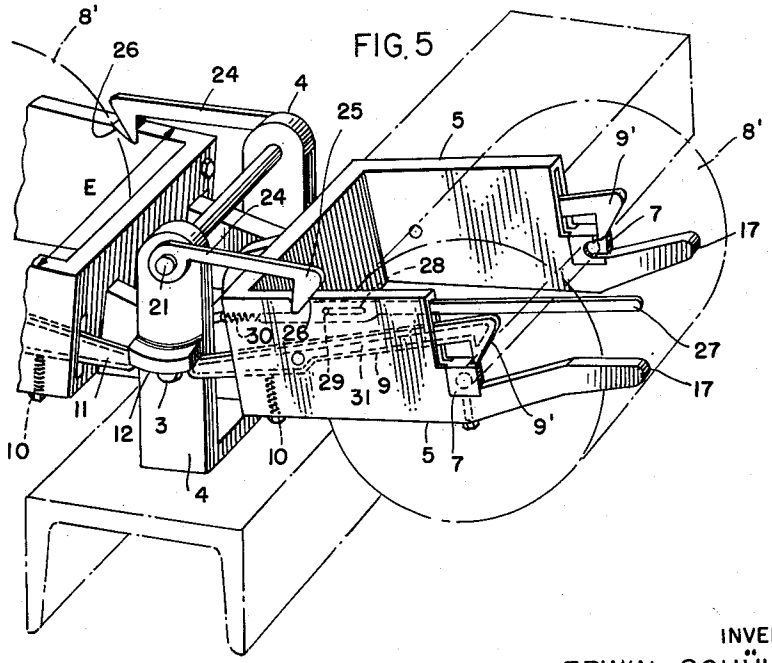


FIG. 5



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APPARATUS FOR HOLDING BOBBINS

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3 Claims. (Cl. 242—18)

This invention relates in general to machinery for winding thread on bobbins, and in particular to apparatus for holding the bobbins.

One of the most important operations prior to the weaving of textile fabrics is the winding on bobbins of the spun thread from which the textiles are to be woven. If this winding operation is faulty in any respect, the resulting defects in the wound thread may be carried through the entire weaving operation resulting in an inferior product and consequent economic loss. Accordingly, the proper winding of the spun thread on the bobbins and the trouble-free operation of all devices employed in the winding process is of utmost importance.

The winding operation is customarily accomplished on machines having a large number of winding bobbins arranged side by side on a common support member or shaft. The individual bobbins are generally rotatably supported in U-shaped holders which are pivotally mounted so that the bobbin can be pivoted between a winding position in driven engagement with a drive roll and a bobbin-changing position where the wound bobbin can be removed and replaced with an empty bobbin.

The aforementioned apparatus is usually of either of two forms. One form is intended for hollow bobbins and includes spring-urged holder arms having pins on the ends thereof for supporting insertion in the hollow bobbins. To remove the bobbin, one or both of the arms must be pivoted outwardly from the bobbin. Accordingly, there must be sufficient space between successive bobbin holders to allow for the outward or lateral pivoting of the holder arms. This is disadvantageous in that the space required for the pivoting lessens the number of bobbins which may be included in a given winding machine.

The other form of bobbin holder apparatus is intended for bobbins of the type mounted on individual shafts. In this type of bobbin holder the holder arms are rigidly fixed to their common base which is in turn pivotally mounted on the winding machine frame. Tong-like supports are provided on the ends of the rigid arms for rotatably supporting the ends of the bobbin shaft. Lever devices are provided which open or close the tong-like supports when the bobbin holder is pivoted between the bobbin-winding position and the bobbin-changing position. The disadvantage of this type of holder lies in the fact that the devices for opening and closing the tong-like supports are positioned in spaces provided between adjacent bobbin holders. This is a waste of space which could otherwise be used for additional bobbins. Also, there is a great risk of injury to the operator in reaching between adjacent bobbin holders to manipulate the control devices. Furthermore, the manipulation of the controls is likely to be clumsy with consequent damage to the thread being wound.

One of the objects of the invention is to provide apparatus for holding bobbins of the type mounted on individual shafts, which apparatus is compact in form so as to permit employment of a maximum number of bobbins in a given machine.

Another object of the invention is to provide apparatus for holding bobbins in which each bobbin is individually supported and operationally controlled so that the entire winding machine need not be stopped for individual bobbin changes.

A further object of the invention is to provide apparatus for holding bobbins which is both safe and economical to operate.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same:

FIG. 1 is a perspective view of an apparatus embodying the invention;

FIGS. 2 and 3 are side elevational views illustrating operation of the apparatus shown in FIG. 1;

FIG. 4 is another embodiment of the invention; and

FIG. 5 is a further embodiment of the invention.

In accordance with the invention, the aforementioned objects are accomplished by an apparatus comprising a pair of carrier members pivotally mounted in generally opposing relation on a common stand member. Each of the carrier members include a pair of generally parallel arm members, an open bearing member fixed to each of the arm members for rotatably supporting an end of a bobbin shaft, and a bearing-closure member which is operatively associated with each of the arm members for closing the open bearing thereon when the carrier member and arm members thereon are pivoted from a bobbin-changing position to a bobbin-winding position. All of the aforementioned members are spatially disposed within the lateral boundries defined by the parallel arm members.

In a preferred embodiment of the invention, illustrated in FIG. 1, a pair of holder members or carrier members **1** and **2** are shown which are individually and rotatably mounted on a common shaft **3** provided by a stand member **4**. The two carrier members are of like structure and include a pair of arm members **5** parallel to each other, rigidly mounted on and normal to a common back member **6** which is, in turn, parallel to and rotatably mounted on the shaft **3**. Each of the arm members **5** have a longitudinally slotted portion therethrough and have a bearing member **7** fixed on the ends thereof for rotatably supporting the ends of a bobbin shaft **8** which, in turn, supports a bobbin **8'**. The bearing members **7** are open on one side to permit removal and replacement of the bobbin shaft. A double-armed lever member **9** or bearing-closure member is provided in the slotted portion of each of the arm members **5**, being pivotally mounted therein and having its opposite ends protruding from the slotted portion. The lever member **9** extends over the bearing **7** and has a tong-like bearing-closure end **9'** urged by a spring **10** to closing engagement with the open bearing. The other end **11** of the lever member **9** serves as a cam follower, engaging a cammed surface **12** on the stand member **4**. A support member for supporting the carrier member **1** in a bobbin-changing position is provided by a pivotal leg member **13** depending from the carrier member. The free end of the leg member **13** is engageable with the stand member **4** in a groove **14** between the stand member **4** and a supporting channeled frame member **15**.

Operation of the bobbin holder is illustrated in FIGS. 1–3. FIG. 1 shows the bobbin **8'** in the bobbin-changing position, in which position the carrier member **1** is supported by the pivotal leg member **13**, and the cam follower ends **11** of the lever members **9** are held down by the cammed surface **12** placing the opposite bearing-closure ends **9'** in the open position against the urging of the springs **10**. In this position, the bobbin shaft **8** and bobbin **8'** thereon may be removed and replaced by an empty bobbin.

To place the bobbin 8' in a winding position in driven engagement with a drive roll 16, the carrier 1 is raised slightly in the direction of the arrow B using handles 17 on the ends of arm members 5, as shown in FIG. 2, causing the pivotal leg member 13 to swing outwardly in the direction of the arrow C. The carrier 1 is then lowered in the direction of the arrow D as shown in FIG. 3 so that the pivotal leg member 13 rests on the edge 18 of the machine frame 15 and the bobbin 8' is in driven engagement with the drive roll 16. Simultaneously, the cammed surface 12 engaged by the cam follower ends 11 of the lever members 9 permits the springs 10 to move the bearing-closure ends 9' downwardly to closing engagement with the bearing members 7.

To stop the winding operation and replace a full bobbin with an empty bobbin, the carrier member 1 shown in FIG. 3 is pivoted upwardly in a direction opposite to that of the arrow D, causing the pivotal leg member 13 to swing in a direction opposite to that of the arrow C in FIG. 2 until it catches in the groove 14. The carrier 1 is permitted to rest in this position in which the bearing-closure ends 9' of the lever members 9 become again disengaged from the bearing members 7.

Another embodiment of the invention is shown in FIG. 4, which is generally similar to the embodiment shown in FIG. 1, the main difference being in the support member pivotally associated with the apparatus for supporting the carrier member 1 in the bobbin-changing position. The support member in this embodiment is a holder-lever 19 pivotally mounted on an upper portion of one of the arm members 5 of the carrier members 1 and 2 having a tong-like end 20 with an angled edge adapted to engage a shaft 21 across an upper portion of the stand member 4 when the carrier member 5 is pivoted to the bobbin-changing position shown in FIG. 4. To return the carrier 5 to the bobbin-winding position, a handle 22 is provided on the opposite end of the holder-lever 19. A downward movement on the handle 22 disengages the end 20 of the holder-lever from the shaft 21 permitting the carrier to be lowered to the bobbin-winding position. A stop leg 23 depends rigidly from the bottom of the arm member 5 and serves to support the carrier at the proper angle on the edge 18 of the machine frame 15.

FIG. 5 illustrates a further embodiment of the invention generally similar to that shown in FIG. 1, the main exception being in the support member for supporting the carrier member in the bobbin-changing position. The support member in this embodiment comprises a holder arm 24 pivotally mounted on a shaft 21 across an upper portion of the stand member 4. The holder arm 24 has a tong-like end 25 which is shaped to catch in a notch 26 provided in an upper portion of one of the slotted arm members 5 to support the carrier member when the carrier member is in the bobbin-changing position. This embodiment further includes an ejector member 27 slidably mounted in the slotted portion of the notched arm member 5 to engage and eject the end 25 of the holder arm 24 from the catching position in the notch when it is desired to place the carrier in the bobbin-winding position. The ejector member 27 has an elongated aperture 28 to permit the ejector member 27 to slide on a pin 29 fixed in the slotted portion of the arm member 5. A spring 30 is provided in the arm member 5 to urge the ejector member 27 back to a non-ejecting position. In this embodiment of the invention, the spring 10 for the lever member 9 is positioned in a lower portion of the arm member 5 and on the opposite side of the pivotal mounting of the lever arm 9.

In all embodiments of the invention, all of the members are spatially disposed within the lateral boundaries defined by the parallel arm members 5. This lateral distance is indicated by the dimensions E of FIGS. 1, 4 and 5.

The bearing members 7 and the lever members 9 are preferably comprised of an organic plastic material. Metallic inserts, such as the reinforcement 31 in the lever members 9, may be provided to strengthen the plastic structures. Suitable plastic materials include polyamides and other plastic materials which resist abrasion and require no particular maintenance. Employing these materials it is possible to design very slim lever members conveniently housed in the slotted arm members and which have sufficient strength to withstand the wear and tear of ordinary operations.

By the invention the disadvantages of the prior art structures have been overcome. For example, the bobbin holders can be operated independently and the individual holders may be positioned with a minimum space between adjacent bobbins since the devices employed in pivoting the holders are positioned within the lateral boundaries defined by the outer periphery of the individual holders. If it is necessary to replace parts in one of the bobbin holders, it can be accomplished without stopping the winding operation of the other bobbins. The feature of the invention wherein a pair of bobbin holders are mounted back to back on a common support is advantageous in that there is better use of the available space and double use of some of the supporting structure, for instance, the stand member 4. Accordingly, there is a saving in material and in the cost of the whole machine. A further advantage of the invention lies in the feature whereby the lever members 9 are housed in a slotted portion of the arm members 5. By this structure, the somewhat delicate lever members are protected from external influences and the operators, in turn, are protected from injury by these parts.

The invention is hereby claimed as follows:

1. In a machine for winding thread on bobbins of the type mounted on individual shafts, apparatus for holding one of the bobbins, said apparatus comprising a stand member having a cammed surface, a carrier member pivotally mounted on the stand member, said carrier member including a pair of arm members parallel to each other and normal to the axis of the stand member, each of said arm members having a longitudinally slotted portion therethrough, an open bearing member fixed to each of said arm members for rotatably supporting an end of the shaft of the bobbin and a double-armed lever member pivotally mounted in the slotted portion of each of said arm members and protruding therefrom, said lever member having a bearing-closure end spring urged to closing engagement with the open bearing member and a cam follower end engaging the cammed surface of the stand member whereby the bearing-closure end is disengaged from said bearing member on pivoting the carrier member from a bobbin-winding position to a bobbin changing position, and a support member comprising a holder lever pivotally mounted on an upper portion of said carrier member and adapted to engage an upper portion of said stand member to support the carrier member when the carrier member is placed in the bobbin-changing position.

2. In a machine for winding threads, a stand member having a horizontal axle, a bobbin-carrier member pivotally mounted on said axle, said carrier member having a pair of spaced, parallel arms extending outwardly from a side of said stand member, a bearing member for one end of a bobbin shaft at the outer end of each arm, the bearing surfaces of each bearing member consisting of a groove having a bottom wall and side walls in the shape of a U with the open end of the U opening radially outwardly with respect to said axle, each groove facing the other groove and the bottom wall of each groove being a bearing surface for one end of the shaft of a bobbin adapted to be supported in said bearing members, a drive roller beneath said carrier member, a movable bearing closure member operatively associated with the open outer end of each groove, and means operatively associated with said bearing closure members and responsive to pivotal movement of said bobbin-carrier member for moving said bearing closure members to

positions across the open, outer ends of said grooves when the bobbin is in driving contact with said drive roller and for moving said bearing closure members to positions away from open, outer ends of said grooves when the bobbin-carrier member is in bobbin-changing position.

3. The apparatus of claim 13 wherein said arms are slotted, one of said arms contains a notch communicating with the slot in said one of said arms, said apparatus also includes a holder arm pivotally mounted upon an upper portion of said stand member with latch means on the end of said holder arm adapted to catch in said notch to thereby support the carrier member when the carrier member is placed in the bobbin-changing position with said latch means caught in said notch, and an ejector

member slidable in the slotted portion of said one of said arms with means for engaging the latch means and ejecting said latch means of the holder arm from the catching position in the notch.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 2,989,257 June 20, 1961

Erwin Schüler et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 5, line 7, for the claim reference numeral "13" read -- 2 --.

Signed and sealed this 12th day of December 1961.

(SEAL)
Attest:

ERNEST W. SWIDER
Attesting Officer

DAVID L. LADD
Commissioner of Patents

USCOMM-DC