Sept. 28, 1948. R. J. BARTHOLOMEW 2,450,074

BOBBIN LIFTER

Filed Nov. 12, 1947

FIG. 1

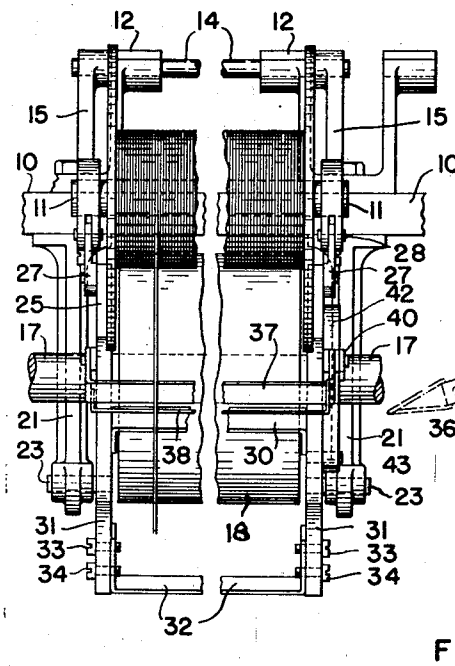


FIG. 2

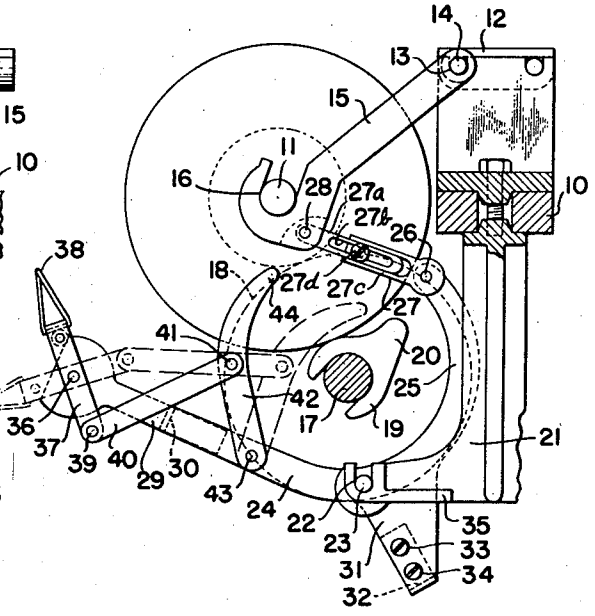


FIG. 3

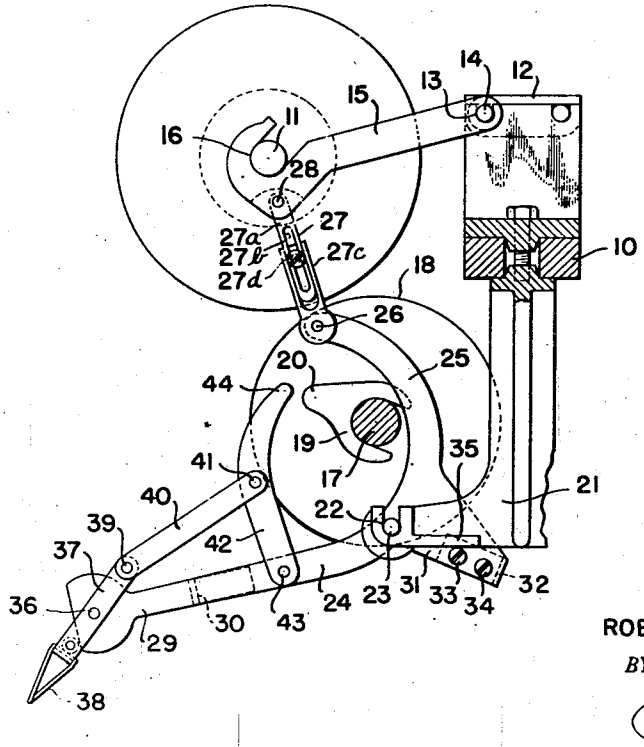
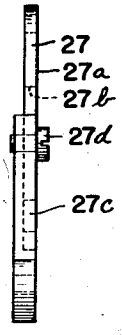


FIG. 4



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Patented Sept. 28, 1948

2,450,074

UNITED STATES PATENT OFFICE

2,450,074

BOBBIN LIFTER

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Application November 12, 1947, Serial No. 785,477

12 Claims. (Cl. 242—37)

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This invention relates to bobbin lifters, and more particularly to a bobbin supporting and lifting mechanism suitable for use with winding machines, spinning machines, doubling machines, and the like.

In yarn winding mechanism heretofore available various devices have been proposed for discontinuing the winding of yarn package under certain conditions, such as the breaking of the yarn, the decrease of the yarn tension, or the attainment of a predetermined size of yarn package. For this purpose latches were provided, which upon release, permitted springs to move the yarn package out of engagement with the driving roll. These and other detector devices heretofore available have not proven wholly satisfactory under operating conditions.

It is the principal object of the present invention to provide a bobbin lifter which is adapted to lift the bobbin out of contact with the driving roll upon a break or reduction in tension of the yarn being wound, or upon the completion of the yarn package.

It is a further object of the present invention to provide a bobbin lifter which may be installed on new machines but which is also capable of use with machines now operating, for discontinuing the rotation of the bobbin or yarn package upon a break or reduction in tension of the yarn being wound or upon the completion of winding of the yarn package.

It is a further object of the present invention to provide a bobbin lifter which is simple in construction, which is automatic in its operation, and which does not require the use of springs, spring-held latches, or the like.

It is a further object of the present invention to provide a bobbin lifter in which power from the driving roll operating shaft of the machine on which the bobbin lifter is mounted is utilized for elevation of the yarn package.

Other objects and advantageous features of 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 lifter in accordance with the present invention;

Fig. 2 is a side elevational view thereof showing the position during the normal winding operation and showing in broken lines an intermediate position of the lifter mechanism;

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Fig. 3 is a view similar to Fig. 2 showing another position of the lifter with the yarn package in elevated position; and

Fig. 4 is an end view, enlarged, of one of the links employed in connection with the lifter.

It should, or 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.

Referring now more particularly to the drawings in which a preferred embodiment is illustrated, a fragmentary portion of the frame 10 of a machine is shown, which machine may be a winding machine, a spinning machine, a doubling machine or any other machine on which a plurality of yarn packages are wound, usually with their axes horizontal and alined and in one or more rows. The yarn packages may be of any desired type, with a bobbin or spool, and with a flange at one end, a flange at both ends, or in which no flanges are employed. Each of the yarn packages is adapted to be supported on a spindle 11.

The frame 10 is provided with spaced upper brackets 12, each having trunnions 13 in which pins 14 carried by spaced yarn package supporting levers 15 are adapted to be pivotally mounted. The trunnions 13 are of a character to permit the removal of the pins 14 and the levers 15 supported thereby, if desired.

The lower ends of the levers 15 are provided with hooked portions 16 within which the spindle 11 is adapted to be removably mounted, the spindle 11 providing a support for the yarn package.

The machine has mounted in the frame 10 thereof the customary longitudinally extending shaft 17 having thereon a driving roll 18 for each yarn package, the outer or peripheral face of which is adapted for engagement with the periphery of a yarn package being wound for rotating the yarn package. The shaft 17 is also provided, for each yarn package, with a cam 19 having at least one lobe 20 thereon for purposes to be explained.

The frame 10 is also provided with spaced lower brackets 21, one pair for each yarn package, which brackets 21 have trunnions 22 for the reception of pins 23 carried by lifter levers 24.

Each of the lifter levers 24 has an arcuate portion 25 to the rear of the pivot pins 23 which extends upwardly and is pivotally connected by a pin 26 to a link 27 which is in turn pivotally connected by a pin 28 to one of the supporting levers 15. The length of the link 27 and the

location of the pivot pin 26 are such that the pivot pin 26 may move past its dead center position with respect to the link 27 for holding the supporting levers 15 in elevated position, as hereinafter explained.

The link 27 may be of fixed and predetermined length but as illustrated is adjustable in length. For this purpose one section 27a of the link 27 is slotted as at 27b and is slidably mounted with respect to the other section 27c. A screw 27d is mounted in the link section 27c and extends through the slot 27b for locking the link 27 at the desired adjustment of its length.

Each of the lifter levers 24 also has a forwardly extending portion 29, and a cross bar 30 is provided for connecting the forwardly extending portion 29 of each pair of lifter levers 24.

Each of the lifter levers 24 also has a rearwardly disposed downward extension 31 and a connecting bar 32 extends between each pair of lifter levers 24. The connecting bar 32 is connected to the lifter levers 24 by screws 33 and 34.

The lower brackets 21 each have rearwardly extending portions 35 against which the screws 33 are adapted to abut to serve as a stop when the lifter levers 24 are moved to one of their positions, as illustrated more paricularly in Fig. 3.

The forwardly extending portions 29 of the lifter levers 24 are provided at the front ends thereof with pivot pins 36 on which detector levers 37 are pivotally mounted. The detector levers 37 support, at their outer ends, a horizontal detector bar or rod 38 which extends between the levers 37 for each yarn package. The rear end of the detector lever 37, beyond one end of the yarn package, is pivotally connected by a pivot pin 39 to a detector link 40, the link 40 being pivotally connected by a pivot pin 41 to an actuating finger 42. The actuating finger 42 is pivotally connected to and mounted at one end on the lifter lever 24 by a pivot pin 43, and has an end portion 44 which is adapted to be positioned as hereinafter explained, for engagement by the cam 19 on the shaft 17.

The length of the detector link 40 and the location of the pivot pin 39 are such that the pivot pin 39 may move past its dead center position with respect to the detector lever 40 for holding the actuating finger 42 in locked position, as hereinafter explained.

The mode of operation will now be pointed out.

In normal operation the yarn package is supported by the spindle 11, in engagement in the trunnions 16 in the supporting levers 15, and with the periphery of the yarn package in driving engagement with the periphery of the driving roll 18. The detector bar 38 is in the uppermost position, indicated in solid lines in Fig. 2, and is held in this position by the engagement therewith of the yarn being delivered to the peripheral surface of the yarn package.

In this position the actuating finger 42 is held in a position away from and out of engagement with the cam 19. The lifter lever 24 is also in the position shown in solid lines in Fig. 2.

If the yarn should break or if the tension thereof is greatly decreased for any reason, the detector bar 38 is no longer held in its uppermost position and by its own weight swings about the pivots provided by the pins 36 to a position to move the actuating finger 42 into the path of the lobe 20 of the cam 19, as shown in broken lines in Fig. 2. In this movement the lever 37 moves with respect to the link 40 past dead center position so that the actuating finger 42 is locked in

position. The cam 19, in its rotation, engages with the end portion 44 of the actuating finger 42 and the force thus applied is effective through the finger 42 and on the lifter lever 24 which is moved about the pivots provided by the pins 23. The movement of the lifter lever 24 is effective through the link 27 for elevating the supporting levers 15. The periphery of the yarn package is thus separated from its engagement with the driving roll 18. Movement of the lifter lever 24 also moves the actuating finger 42 to a position out of engagement with the cam 19 so that continued rotation of the cam 19 is permitted. As the link 27 swings past its dead center position with respect to the pivot pin 26 the supporting levers 15 are locked or held in elevated position, as indicated in Fig. 3.

Upon the swinging of the lifter lever 24, the heads of the screws 33 engage with the underside of the lower bracket extensions 35 and limit the further movement of the lifter lever 24.

Upon the adjustment of the tension of the yarn or upon the repair of the break, the detector bar 38 and the lifter lever 24 may then be swung manually by movement of the detector bar 38 back to the initial position with the periphery of the yarn package again in engagement with the periphery of the driving roll 18 for rotation of the yarn package. The detector bar 38 will then be held by the tension of the yarn, as before, in its uppermost position.

If, during the winding of the yarn package, a predetermined amount of yarn has been delivered thereto, the elevation of the yarn package in the supporting levers 15 tends to carry the links 27 upwardly and to a position where they swing past the dead center position referred to above and separate the yarn package from the driving roll 18, thereby discontinuing rotation of the yarn package.

The adjustment of the length of the link 27 permits of discontinuance of driving by the driving roll 18 when a predetermined size of yarn package has been attained. A link 27 of predetermined fixed length could be utilized where the size of yarn package is determined in a specific winding operation.

I claim:

1. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral driving engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is adapted to be rotatably supported for engagement with the driving roll, a lifter lever pivotally mounted with respect to said frame for moving said supporting members to position said yarn package out of engagement with said driving roll, a detector bar in axial alinement with the yarn package pivotally mounted with respect to said lifter lever for engagement by the yarn delivered to said yarn package, said detector bar being held in one position by the tension of said yarn and being movable to another position upon release of the yarn tension, an eccentric member carried by said shaft, an actuating finger for effecting actuation of said lifter lever and movement of said supporting members pivotally mounted on said lifter lever and movable to a position for engagement with said eccentric member, and members connecting said detector bar and said actuating finger for positioning said actuating finger for engagement by said eccentric member

upon movement of said detector bar to said other position.

2. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral driving engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is adapted to be rotatably supported for engagement with the driving roll, a lifter lever pivotally mounted with respect to said frame and connected to said supporting members for elevating said supporting members and separating said yarn package from engagement with the driving roll, a detector bar in axial alinement with the yarn package pivotally mounted with respect to said lifter lever for engagement by the yarn delivered to said yarn package, said detector bar being held in an upward position by the tension of said yarn and being movable to a downward position upon release of the yarn tension, an eccentric member carried by said shaft, an actuating finger for said lifter lever pivotally mounted on said lifter lever and movable to a position for engagement with said eccentric member, and members connecting said detector bar and said actuating finger for positioning said actuating finger for engagement by said eccentric member upon movement of said detector bar to its downward position.

3. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral driving engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is adapted to be rotatably supported for engagement with the driving roll, a lifter lever pivotally mounted with respect to said frame and connected to said supporting members for moving said supporting members to a position for separating the yarn package from the driving roll, members for retaining said supporting members in said position, a detector bar in axial alinement with the yarn package pivotally mounted with respect to said lifter lever for engagement by the yarn delivered to said yarn package, said detector bar being held in one position by the tension of said yarn and being movable to another position upon release of the yarn tension, an eccentric member carried by said shaft, an actuating finger for effecting actuation of said lifter lever pivotally mounted on said lifter lever and movable to a position for engagement with said eccentric member, and members connecting said detector bar and said actuating finger for positioning said actuating finger for engagement by said eccentric member upon movement of said detector bar to said other position.

4. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral driving engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is adapted to be rotatably supported for engagement with the driving roll, a lifter lever pivotally mounted with respect to said frame and connected to said supporting members for moving said supporting members to a position for separating said yarn package from said driving roll, a detector bar in axial alinement with the yarn package pivotally mounted with respect to said lifter lever for engagement by the yarn delivered to said yarn package, said detector bar being held in one position by the tension of said yarn and being movable to another position upon release of the yarn tension, an eccentric member carried by said shaft, an actuating finger for effecting actuation of said lifter lever pivotally mounted on said lifter lever and movable to a position for engagement with said eccentric member, and members connecting said detector bar and said actuating finger for positioning and holding said actuating finger for engagement by said eccentric member upon movement of said detector bar to said other position.

5. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral driving engagement with a yarn package, the combination of lever members connected for movement in unison pivotally mounted with respect to said frame and in which a yarn package is adapted to be rotatably supported for engagement with the driving roll, a lifter lever pivotally mounted with respect to said frame, a link connecting one end of said lifter lever and said lever members, detector bar levers pivotally mounted on the other end of said lifter lever, a detector bar between the ends of said detector levers and in axial alinement with the yarn package for engagement by the yarn delivered to said yarn package, said detector bar being held in an upward position by the tension of said yarn and being movable to a downward position upon release of the yarn tension, an eccentric member carried by said shaft, an actuating finger for moving said lifter lever pivotally mounted on said lifter lever and movable to a position for engagement with said eccentric member, and a link connecting said detector bar levers and said actuating finger for positioning said actuating finger for engagement by said eccentric member upon movement of said detector bar to its downward position.

6. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral driving engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is adapted to be rotatably supported for engagement with the driving roll, a lifter lever for positioning said supporting member pivotally mounted with respect to said frame, connections between said lifter lever and said supporting members for holding said supporting members and maintaining said yarn package out of engagement with said driving roll, yarn tension controlled members carried by said lifter lever, an eccentric member carried by said shaft and engageable by one of said yarn tension responsive members upon release of the yarn tension for effecting actuation of said lifter lever and movement of said supporting members to position said yarn package out of engagement with said driving roll, said yarn package being adapted upon its completion to actuate said connections to hold said package out of driving engagement with the driving roll.

7. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is rotatably mounted for engagement with the driving roll, means responsive to the release of the tension of the yarn delivered to the yarn package for moving said supporting members to a position to separate the yarn package from engagement with

the driving roll, said means including a lever pivotally mounted with respect to said frame and a link member interposed between said supporting members and said lever, said link member being of predetermined length for controlling the size of the yarn package by the separation of said package from the driving roll.

8. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral engagement with a yarn package, the combination of supporting members movably mounted with respect to said frame in which a yarn package is rotatably mounted for engagement with the driving roll, means responsive to the release of the tension of the yarn delivered to the yarn package for moving said supporting members to a position to separate the yarn package from engagement with the driving roll, said means including a lever pivotally mounted with respect to said frame and a link member interposed between said supporting members and said lever, said link member being adjustable in length for controlling the size of the yarn package by the separation of said package from the driving roll.

9. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral engagement with a yarn package, the combination of a pair of supporting members pivotally movable with respect to said frame and having outer end portions in which a yarn package is rotatably mounted for engagement with the driving roll, and means for separating said yarn package from driving engagement with said driving roll including a pair of spaced lever members pivotally mounted with respect to said frame, and a pair of link members each of which is interposed between one of said lever members and one of said supporting members, said link members being of predetermined length for controlling the size of the yarn package by the separation of said package from the driving roll.

10. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral engagement with a yarn package, the combination of a pair of supporting members pivotally movable with respect to said frame and having outer end portions in which a yarn package is rotatably mounted for engagement with the driving roll, and means for separating said yarn package from driving engagement with said driving roll including a lever member pivotally mounted with respect to said frame, and a link member interposed between said lever member and said supporting members, said link member being of predetermined length for controlling the size of the yarn package by the separation of said package from the driving roll.

11. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral engagement with a yarn package, the combination of supporting members pivotally movable with respect to said frame and having outer end portions in which a yarn package is rotatably mounted for engagement with the driving roll, and means for separating said yarn package from driving engagement with said driving roll including a lever member pivotally mounted with respect to said frame, and a link member interposed between said lever member and said supporting members, the combined lengths of said link member and lever member controlling the size of the yarn package by the separation of said package from the driving roll.

12. In an attachment for a yarn winding machine having a frame and a horizontal shaft with a driving roll for peripheral engagement with a yarn package, the combination of supporting members pivotally movable with respect to said frame and having outer end portions in which a yarn package is rotatably mounted for engagement with the driving roll, and means for separating said yarn package from driving engagement with said driving roll including a pair of lever members pivotally mounted with respect to said frame, and link members interposed between each of said lever members and one of said supporting members, the combined lengths of each pair of said link member and lever member controlling the size of the yarn package by the separation of said package from the driving roll.

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No references cited.