

W. P. WOOD.
WINDING MACHINE.
APPLICATION FILED JUNE 29, 1918.

1,334,427.

Patented Mar. 23, 1920.
2 SHEETS—SHEET 1.

Fig. 1.

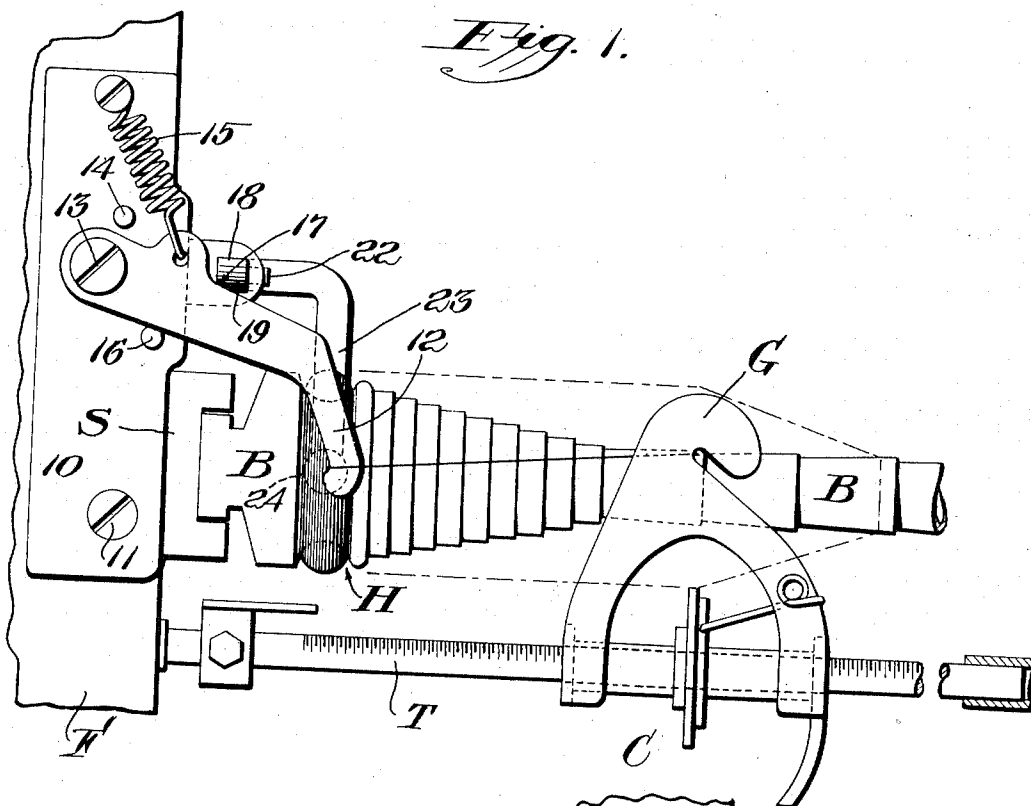
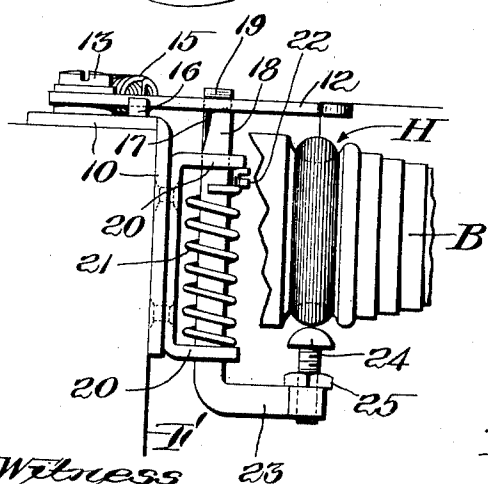
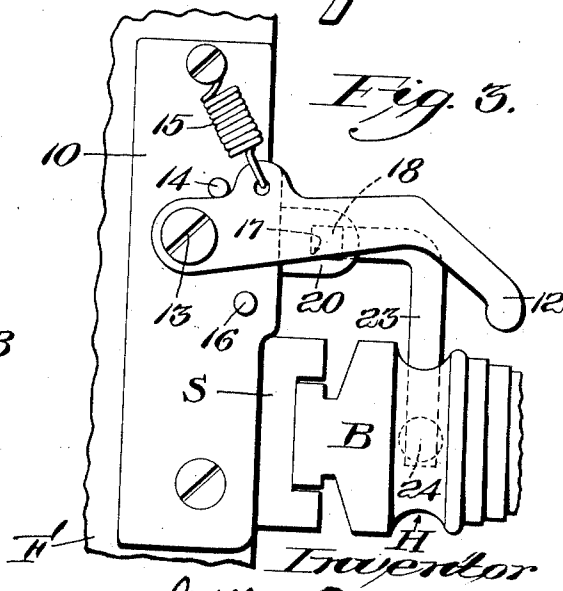


Fig. 2.



Witness
Jas. J. Maloney.

Fig. 3.



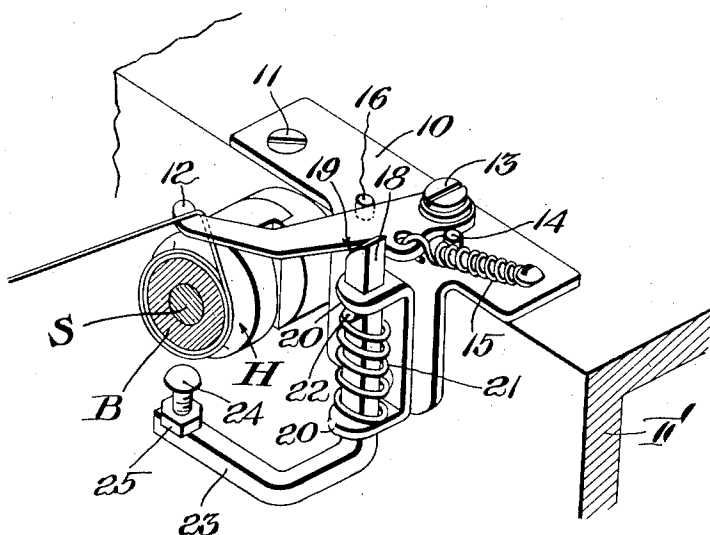
Inventor
William P. Wood
by Van Orman Fish & Hildreth
Attys

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2 SHEETS—SHEET 2.

Fig. 4.



Witness
Jas. J. Maloney.

Inventor
William P. Wood.
By *Paul Ernest Fish & Hildebrandt*
Atty's

UNITED STATES PATENT OFFICE.

WILLIAM P. WOOD, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR TO JENCKES SPINNING COMPANY, OF PAWTUCKET, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

WINDING-MACHINE.

1,334,427.

Specification of Letters Patent. Patented Mar. 23, 1920.

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To all whom it may concern:

Be it known that I, WILLIAM P. WOOD, a citizen of the United States, residing at 34 Brook St., Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Winding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in winding machines for winding yarn on to filling-holders or bobbins to be subsequently used in the shuttles or looms. More particularly the invention relates to bunch-building mechanism for controlling the winding so as to cause a bunch of yarn to be formed on the bobbin before the main body of the winding is laid thereon.

Prior bunch-building mechanisms have been more or less complicated, and have required considerable attention to keep them in proper working condition, whereas this invention provides a simple and rugged construction which is durable and unlikely to get out of order.

This invention may be and preferably is embodied in an attachment adapted to be readily secured to the frame of a winding machine without the necessity of altering the machine or making any adjustments or operative connections.

Provision is made for adjusting the mechanism to predetermine the size of the bunch to be laid on the bobbin, so that the amount wound therein may be varied according to the width of the woven fabric to be produced.

The invention further contemplates the building up of the bunch in the groove which is formed in the butt of a certain type of bobbin which is commonly used in the shuttles of filling-replenishing looms.

The several features of the present invention may be readily understood by referring to the accompanying drawings which illustrate what is now considered to be a preferred form of the invention. Like characters of reference designate like parts throughout the several views, in which Figure 1 is a top plan view showing the bunch-building mechanism in the form of an attachment applied to the frame of a winding machine, together with so much of the

mechanism of the winding machine as is necessary to make clear the relation of the attachment thereto; Fig. 2 shows the attachment in front elevation and in its active relation to the bobbin on the winding spindle; Fig. 3 is a view similar to Fig. 1, but showing the controller finger of the attachment in inoperative position; and Fig. 4 is a perspective view, showing the attachment as seen from the rear, with the controller finger in operative position guiding the yarn into the groove of the bobbin to start the building of the bunch.

The invention is herein shown as applied to one of the well-known Universal filling winders, but it may be adapted to other styles of winding machines in which a rotating spindle and reciprocating yarn-guide are employed.

As shown in Fig. 1, the essential elements of the winding machine are the rotating winding spindle S and the reciprocating traverse bar T which carries the yarn-guide G. The winding spindle extends through the frame F to receive the filling-holder or bobbin B which rotates with the spindle. The winding-spindle is driven and the traverse-bar is reciprocated, each by means well known to those familiar with the art, and for that reason not shown in the drawings, nor described. The yarn-guide causes a double conical layer of filling to be wound on the bobbin at each reciprocation thereof, after which it is automatically advanced one step toward the free end of the bobbin to effect a longitudinal building up of the filling by means of progressively laid superimposed layers of yarn. This endwise feeding movement of the yarn guide is effected by means of a contact-wheel C, carried on an internally-threaded sleeve which engages thread-segments on the traverse-bar; the contact-wheel receiving a momentary rotation, after each reciprocation of the yarn guide by coming in contact with the outer edge of the filling which has just been built up on the bobbin by the winding thereon of the last conical layer of yarn.

The bunch-building mechanism shown comprises a controller finger, which is moved into position to engage the yarn, and detent mechanism which acts to maintain the controller finger in operative position, in engagement with the yarn, and which is actuated, first, by the bunch, after it has been built up to the required size, to effect the re-

lease of the controller finger, and then by the controller finger itself, as it returns to inoperative position, to prevent further contact between the said detent mechanism and the bunch.

The manner of attaching the bunch building device to the winding machine, and its relation to the principal elements thereof, is clearly illustrated by Fig. 1. As therein shown, the working parts of the bunch-building attachment are carried by a plate 10 adapted to be bolted or otherwise secured to the frame of the winding machine. A single screw 11 may be a sufficient means of attachment. The controller finger 12 is pivoted to the plate at 13, and is held retracted against a stop 14 by a spring 15 while occupying its inoperative position. At the beginning of the winding, the controller finger is brought forward against a stop 16, so as to engage the yarn and guide it without any traverse motion into a groove H in the bobbin to cause the building up of the bunch therein. The controller finger is held in this forward position by contact with a surface 17 near the upper end of a spring-pressed detent bar 18. The top of the detent bar is inclined upwardly and away from the surface which engages the controller finger, to form a cam face 19, the purpose of which will be hereinafter explained. The detent-bar is rectangular in cross section and is slidably mounted in rectangular openings in guides 20 projecting laterally from an extension depending from the plate 10. This construction prevents twisting of the detent-bar in its guides and maintains the surface 17 and the cam face 19 always in the same relation to the controller finger when the said finger is in its operative position. The detent-bar is arranged in perpendicular relationship to the controller finger and is pressed upwardly by a spring 21, which surrounds it and is interposed between an abutment 22 thereon, and the lowermost of the guides 20. While the controller finger is in its inoperative position, as shown in Fig. 3, it overlies the detent-bar, holding it depressed, against the action of its spring, but as the controller finger is shifted forward into the position shown in Fig. 1, it moves clear of the detent-bar, permitting the spring 21 to force the bar upward behind the controller finger and lock it in its operative position. The abutment 22 may be conveniently utilized as a stop, cooperating with the uppermost of the guides 20 to limit the upward movement of the detent-bar.

At its lower end, the detent-bar is provided with an arm 23 projecting laterally therefrom and extending beneath the bobbin. Since the detent-bar cannot be twisted in its guides, the arm 23 is held in fixed angular relationship to the bobbin. A con-

tact member in the form of a screw 24 projects upwardly, toward the bobbin, from the outer end of the arm 23, and is provided with a lock nut 25. The screw 24 is directly below the groove G in the butt of the bobbin, and is adjustable toward and away from the bottom of the groove. The screw 22 is designed to be so positioned, relatively to the groove, that its head will be engaged by the bunch of yarn which is to be wound in the groove when it has been built up to a predetermined size, so as to actuate the detent-bar to release the controller finger, thereby stopping the bunch building and starting the laying of the main winding with the full traverse of the yarn guide. The head of the screw is smooth and semi-spherical in form so that the yarn in the bunch will not be injured by coming in contact therewith.

The operation of the device is as follows: An empty bobbin having first been placed on the winding spindle, the end of the yarn leading from the traverse guide is made fast thereto. The controller finger is then manually swung forward into operative position, as shown in Fig. 1, where it is held by the detent-bar. This moving of the controller finger is the only act to be performed by the operator to set the bunch building mechanism to control the laying of the preliminary winding or bunch in the groove of the empty bobbin, and inasmuch as it is necessary for the operator to reach over to the winding spindle in order to place the empty bobbin thereon at the beginning of each winding operation, he may accomplish the setting of the control arm, instantly and almost without effort, while withdrawing his hand from the spindle. The yarn now leads from the source of supply through a slot in the traverse guide and over the controller finger to the bobbin. When the machine is started, the spindle will be rotated to wind the yarn on the bobbin, and although the yarn guide will be reciprocated as hereinbefore described, it will have no effect to traverse the yarn on the bobbin because the yarn is guided by the controller finger after leaving the yarn guide and immediately before reaching the bobbin. The yarn is thus guided until the preliminary winding or bunch has been built up sufficiently to come in contact with the head of the adjustable screw carried by the extension of the detent-bar. This contact of the growing bunch with the screw on the detent-bar, withdraws the latter against the action of its spring sufficiently to release the controller finger, which is retracted into inoperative position by its spring, as shown in Fig. 3. The controller arm, during this return movement, cooperates with the cam face at the top of the detent-bar to effect continued down-

ward movement of the latter to retract the contact screw so that it will not drag on the yarn which is now being built up on the bobbin. The yarn, being clear of the controller arm, now leads from the yarn guide directly to the bobbin and is traversed during the remainder of the winding to build up the layers which are to constitute the main body of the filling.

10 The simplicity both of the construction and mode of operation of the new device is apparent, and the absence of ratchets, gears, or rotating parts of any sort, which are liable to wear or get out of order, is particularly noticeable. The device may be
15 easily and quickly adjusted to cause the winding of different amounts of yarn in the bunch. Moreover the device may be manufactured at very low cost, may be readily
20 attached to the winding machine without requiring any changes to be made in the machine, and will not therefore require the usual careful attention on the part of the operator to keep it in good working condition.

25 While the construction and arrangement herein shown and described is in accordance with what is now considered to be the preferred form of the invention, it will be understood that the same may be varied or
30 modified in different particulars without departing from the spirit and scope thereof.

Neither is the invention necessarily limited, in its operation, to the building of the bunch in a groove of the bobbin, as the
35 device may be so positioned relatively to the bobbin as to cause the bunch to be built upon any part thereof.

Having now described the invention, what is claimed is:—

40 1. In a winding machine, the combination with the winding spindle and reciprocating yarn guide, of independent means to guide the yarn on to the bobbin to cause the building of a bunch thereon and to pre-
45 vent the yarn from being traversed until the bunch has attained a predetermined radial size, and means controlled by the bunch to release the yarn from said independent guiding means to permit it to be
50 traversed by the yarn guide to lay the main body of the winding.

2. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a yarn controller
55 adapted to be operated to engage the yarn to prevent it from being traversed as it leads to the bobbin on the spindle, so as to cause the building of a bunch on the bobbin, means to retain said controller in operative po-
60 tion, and means controlled by the radial growth of the bunch for releasing said retaining means.

3. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger

adapted to be operated manually to bring it into position to engage the yarn, to prevent it from being traversed as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, a detent to
70 maintain said finger in its operative position, and means controlled by the bunch to release said finger to permit the yarn to be traversed by the yarn guide to lay the main body of the winding.

4. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger adapted to be moved into position to en-
80 gage the yarn, to prevent it from being traversed as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, means to retain said finger in its operative position, means engaged by the
85 bunch to release said finger to permit the yarn to be traversed by the yarn guide to lay the main body of the winding, and means for adjusting said releasing means to regulate its time of action.

5. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger adapted to engage the yarn to prevent it
90 from being traversed as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, a detent to retain said finger in its operative position, means actuated by the radial growth of the bunch
95 to withdraw said detent to release said finger so as to disengage the yarn, and means to move said detent withdrawing means out of operative relation to the bunch upon the
100 release of said finger.

6. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger
105 adapted to engage the yarn to prevent it from being traversed as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, a detent to retain said finger in its operative position, means
110 actuated by the bunch to withdraw said detent to release said finger so as to disengage the yarn, and means including a cam face on said detent to move said detent withdrawing means out of the area to be oc-
115 cupied by the main body of the winding after it has been built up on the bobbin.

7. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger
120 adapted to be set in position to engage the yarn between the guide and the spindle to effect the building of a bunch on the bobbin, means to return said finger to inoperative position, a detent to retain said finger in op-
125 erative position, means actuated by the bunch to withdraw said detent and release said finger, and means actuated by the return of said finger to move said detent with-
130

drawing means out of engagement with the bunch.

8. In a winding machine, the combination with the winding spindle and reciprocating yarn guide, of a controller finger adapted to be set in position to engage the yarn between the guide and the spindle to effect the building of a bunch on the bobbin, a spring to return said finger to inoperative position, a detent bar to retain said finger in its operative position against the action of said spring, means actuated by the bunch to withdraw said detent bar to release said finger, a cam face on said detent bar adapted to be acted upon by said finger on its return to inoperative position so as to retract said detent withdrawing means from engagement with the bunch and with the body of the winding as it is built up on the bobbin, and means to maintain said last named means in retracted position while said finger remains inactive.

9. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger adapted to be set in position to engage the yarn as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, a slidable detent bar adapted to maintain said finger in operative position, an arm on said detent bar adapted to be actuated by the bunch to withdraw said detent bar to release said finger, and means for returning said finger to inoperative position.

10. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger adapted to be set in position to guide the yarn as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, a slidable detent bar adapted to hold said finger in operative position, means to move said detent bar to engage said finger, and an arm on said detent bar adapted to be actuated by the bunch as it is built up on the bobbin to withdraw said detent bar to release said finger so as to disengage the yarn.

11. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a supporting plate, a controller finger pivoted on said plate and adapted to be set in position to guide the yarn as it leads to the bobbin on the spindle to cause the building of a bunch on the bobbin, a detent bar mounted to slide perpendicularly with relation to said finger on said plate, a spring to actuate said detent bar to hold said finger in operative position, an arm extending from said detent bar and adapted to be actuated by the bunch when it has been built up to a predetermined radial size to withdraw said detent bar to release said finger so as to disengage the yarn.

12. In a winding machine, the combination with the winding spindle and reciprocating yarn guide of a controller finger adapted to be set in position to guide the yarn as it leads to the bobbin to cause the building of a bunch on the bobbin, a detent bar adapted to hold said finger in operative position, an arm on said detent bar extending transversely of the bobbin, a contact on said arm adapted to be actuated by the bunch when it has been built up to a predetermined radial size to withdraw said detent bar from engagement with said finger to disengage the yarn, and means for adjusting said contact toward and away from said bobbin so that it may be actuated by the bunch at different stages of its radial growth for the purpose of regulating the length of yarn in the bunch.

13. In a bunch building attachment for winding machines, the combination of a yarn controller adapted to be operated to engage the yarn to guide it to the bobbin to cause the building of a bunch thereon, means to retain said controller in operative position, and means actuated by the radial growth of the bunch for releasing said retaining means.

14. In a bunch building attachment for winding machines, the combination of a supporting plate, a finger pivoted on said plate and adapted to be set in position to engage the yarn to guide it to the bobbin to cause the building of a bunch thereon, a slidable detent bar mounted on said plate in perpendicular relation to said finger and adapted to hold said finger in operative position, an arm extending from said detent bar, and an adjustable contact projecting from said arm and adapted to be engaged by the bunch when it has been built up to required size to actuate said detent bar to release said finger so as to disengage the yarn.

15. In a bunch building attachment for winding machines, the combination of a supporting plate, a hooked finger pivoted on said plate and adapted to be set in position to engage the yarn to guide it to the bobbin to cause the building of a bunch thereon, a slidable detent bar mounted on said plate in perpendicular relation to said finger and adapted to hold said finger in operative position, an arm extending from said detent bar, an adjustable contact projecting from said arm and adapted to be engaged by the bunch when it has been built up to required size to actuate said detent bar to release said finger so as to disengage the yarn, and a cam face on said detent bar adapted to be engaged by said finger on its return to inoperative position to actuate said detent bar so as to move said contact out of engagement with the bunch.

WILLIAM P. WOOD,