

B. PHILLIPS.
TAKE-UP FOR SEWING MACHINES.
APPLICATION FILED FEB. 10, 1904.

944,498.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

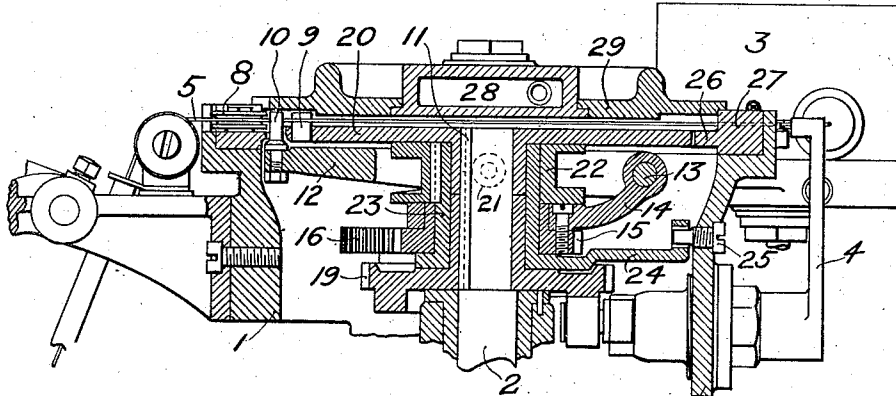


Fig. 1

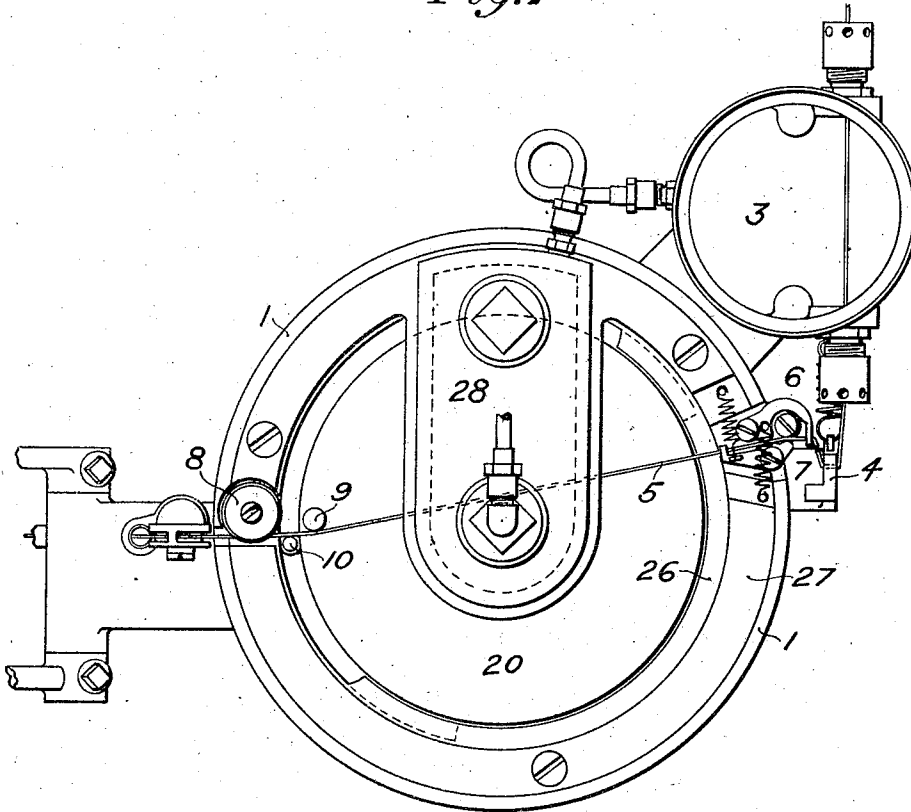


Fig. 2

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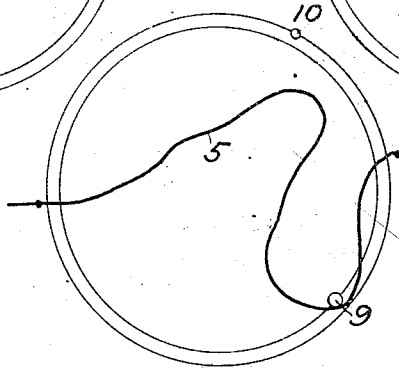
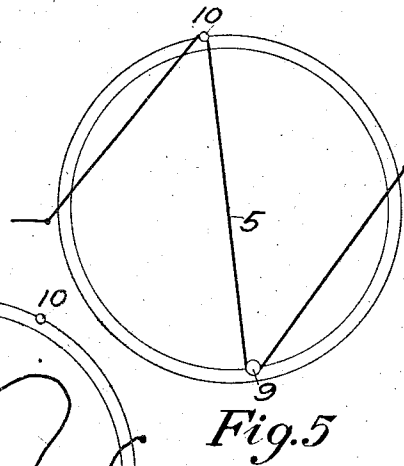
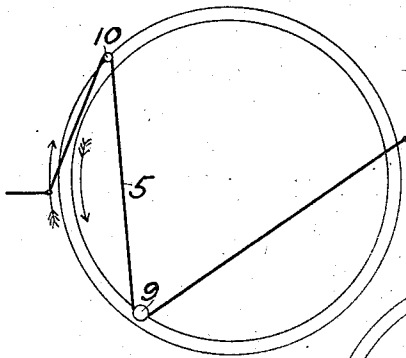
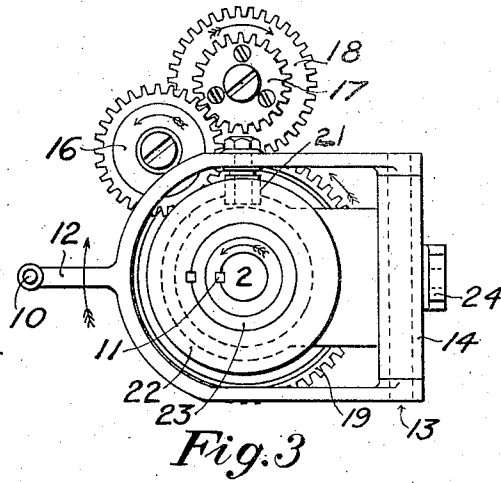
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UNITED STATES PATENT OFFICE.

BENJAMIN PHILLIPS, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TAKE-UP FOR SEWING-MACHINES.

944,498.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed February 10, 1904. Serial No. 192,894.

To all whom it may concern:

Be it known that I, BENJAMIN PHILLIPS, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Take-Ups for Sewing-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.

This invention relates to an improvement in take-ups for sewing machines.

In sewing machines operating at high speed it is desirable that continuous movement of the parts be employed as far as possible in preference to intermittent or vibratory movements. It has, therefore, been proposed to substitute for the ordinary vibratory take-up a take-up having a continuous rotary movement. In order that such a device, as usually constructed, may not be of inconvenient size, it is necessary to use substantially a half-revolution thereof for the thread-drawing movement, so that the amount of thread taken up may equal substantially the diameter of the circular path of the thread-engaging device. If, therefore, such a take-up be secured to or operatively connected with the driving shaft of the machine so as to make one rotation for each actuation of the needle or other sewing instrumentalities, one-half of the time of operation of the machine is consumed by the operation of taking up, during which the other instrumentalities must remain for the most part inactive, and this necessitates an undesirably rapid movement of such parts. In order to avoid this objection, it has been further proposed to so actuate the take-up that it shall make two rotations for each actuation of the needle, so that the half-rotation required for the operation of taking up shall consume only one-fourth of the time of operation of the machine, the remaining three-fourths being available for the operation of the other instrumentalities. But this arrangement is subject to the obvious disadvantages connected with high speed of rotation, particularly where gears are used as the actuating means.

The object of the present invention is to obviate the disadvantages of the devices above described, and to this end the invention contemplates a take-up in which two

moving thread-engaging devices are used, the said devices being arranged to move continuously in curved paths, and cooperating to take up the required amount of thread during a part of the time required for a complete passage of the said devices through their paths of motion, and to slacken the thread at the end of such taking-up operation to facilitate the release of the thread from the said devices.

Other features of the invention will be apparent from the description of the illustrated embodiment thereof.

In the drawings Figure 1 is a vertical section of the take-up and a portion of the sewing machine in which it is embodied; Fig. 2 is a plan view of the same; Fig. 3 is a plan view of the rotary arm and its actuating mechanism, and Figs. 4, 5, and 6 are diagrams representing successive stages in the operation of the take-up.

The invention, in the illustrated embodiment thereof, is shown in connection with a sewing machine of the kind described in a pending application for Letters Patent of the United States, Serial No. 147,888, filed Mar. 16, 1903, by Geo. E. Warren, for improvements in sewing machines, to which reference is made by permission. The invention is applicable, however, not only to different kinds of machines of the type illustrated in said application, but also to many different types of sewing machines. Only so much of the sewing machine is shown as is necessary to an understanding of the present invention. The frame 1, shaft 2, wax-pot 3, and pull-off 4 are all constructed and arranged as in the machine of the said application, the shaft carrying the cams for actuating the needle and other sewing instrumentalities and being arranged to rotate once for each actuation of the needle.

The thread 5 extends from the wax-pot through an eye in the pull-off arm 4, thence, through thread locks 6 and 7, across the take-up, to a thread truck 8, and thence to the looper of the machine.

The take-up comprises two thread-engaging members 9 and 10, having the form of round pins. The pin 9 is carried by a disk 20 mounted on the shaft 2 and secured thereto by a key 11, so that the pin 9 revolves constantly in unison with the rotation of the shaft. The pin 10 is carried by an arm 12 pivoted at 13 to a bracket 14 secured

to a gear 15 mounted to rotate concentrically with the shaft. The gear 15 meshes with an intermediate gear 16 journaled on the frame of the machine, and the gear 16 engages a gear 17 fixed to rotate with a larger gear 18 which is journaled on the frame and is actuated by engagement with a driving gear 19 keyed to the shaft 2. These gears are so proportioned that the bracket 14 and arm 12 are caused to rotate in the opposite direction from the shaft but at the same speed. Thus the pins 9 and 10, starting from the position shown in Fig. 2 move as shown in Figs. 4, 5, and 6, cross after moving through 180°, and then arrive simultaneously at their starting point. The thread is engaged on opposite sides, as in Fig. 2, and is drawn out until the pins have completed a quarter revolution as in Fig. 5, at which point the tension on the thread ceases and further movement causes it to slacken. Immediately upon such slackening it is desirable to release the thread in order to give it up to the sewing instrumentalities, and to this end the pin 10 is arranged to be withdrawn below the level of the disk 20. The arm 12 carries a cam roll 21 which engages a groove in a cam 22 keyed to a sleeve 23 concentric with the shaft 2 and prevented from rotation by an arm 24 secured to the sleeve and engaged by a screw 25 in the frame of the machine. The cam is designed to cause the pin 10 to drop upon reaching the position of Fig. 5 and to remain down until shortly before reaching the position of Fig. 1, and then to rise into position to engage the thread again. While the pin 10 is rotating in its lowered position it is covered by a ledge 26 extending from a ring 27 seated in the frame 1, so as to obviate the possibility of the slack thread catching on the pin. The thread-lock 7 acts, as in the above mentioned application, to prevent the take-up stealing thread from the thread supply, and the thread-lock 6 acts to prevent the pull-off 4 stealing thread from the take-up. In order to keep the wax on the thread in a fluid condition a heating chamber 28 is secured to the ring 27 and provided with suitable steam connections. A cover 29, shown in Fig. 1 but removed in Fig. 2, serves to confine the thread and to keep it warm.

The above-described take-up operates to extend the thread to its maximum length during approximately one-fourth of a revolution of the thread engaging devices, and thus if it be arranged to revolve once for each rotation of the shaft the operation of taking up will consume only one-fourth of the time of operation of the machine. It is within the scope of the invention, however, to arrange the take-up to revolve two or more times for each rotation of the shaft, means being provided to prevent engagement of the thread upon the extra revolu-

tions; and with such an arrangement the time of taking up will be proportionately reduced.

While the thread-engaging devices have been shown, in the illustrated embodiment of the invention, as endued with a motion of revolution, and as moving about a common axis, these features of construction are not essential to the invention, as the said devices may be moved by other means, and along paths of a different character, the advantageous features of the invention being substantially preserved so long as the paths of the said devices are curved and their movement continuous, so that intermittent or vibratory movement is avoided.

Having now described my invention, what is claimed is:

1. A take-up for sewing machines, having, in combination, two movable thread-engaging devices and means for moving them toward and from each other along continuous curved paths, substantially as described.

2. A take-up for sewing machines, having, in combination, two thread-engaging devices acting to engage the thread upon opposite sides, and means for moving the thread-engaging devices continuously along curved paths and in opposite directions, substantially as described.

3. A take-up for sewing machines, having, in combination, two movable thread-engaging devices acting to first pull upon and then slacken the thread, and means for moving the thread-engaging devices continuously along curved paths in opposite directions, substantially as described.

4. A take-up for sewing machines, having, in combination, two thread-engaging devices revolving in opposite directions, and means for actuating the said devices, substantially as described.

5. A take-up for sewing machines, having, in combination, two thread-engaging devices revolving in opposite directions about a common center and engaging the thread upon opposite sides, means for actuating the thread-engaging devices, and means for disengaging the thread therefrom, substantially as described.

6. A take-up for sewing machines, having, in combination, two thread-engaging devices revolving in opposite directions about a common center and engaging the thread upon opposite sides, means for actuating the thread-engaging devices, and means for moving one of them to disengage the thread after it has been slackened, substantially as described.

7. A take-up for sewing machines, having, in combination, two constantly revolving thread-engaging devices acting to draw the thread to its maximum length during substantially one quarter-revolution and thereafter to slacken and then disengage the

thread, and means for actuating the thread-engaging devices, substantially as described.

8. A take-up for sewing machines, having, in combination, two continuously moving thread engaging devices movable in opposite directions at decreasing thread drawing speeds, and means to actuate them, substantially as described.

9. A take-up for sewing machines, having, in combination, two fixed thread guides, two movable thread-engaging devices arranged to move on continuous curved paths between the fixed thread guides, and acting to engage the thread on opposite sides and to first pull upon, then slacken, and then disengage the thread, and means for actuating the thread-engaging devices, substantially as described.

10. A take-up for sewing machines, having, in combination, two fixed thread guides, two movable thread engaging devices arranged to move on continuous curved paths in opposite directions between the fixed thread guides, and acting to engage the thread on opposite sides to take up thread during the formation of a stitch, and means for actuating the movable thread engaging devices, substantially as described.

11. A take-up for sewing machines, having, in combination, two fixed thread guides and two continuously revolving thread engaging devices acting at each revolution to engage the thread on opposite sides at adjacent points, and means for actuating the thread engaging devices, substantially as described.

12. A take-up for sewing machines, hav-

ing, in combination, two fixed thread guides, two continuously revolving thread engaging devices movable with relation to each other acting to engage opposite sides of a length of thread extending between said guides and to draw the thread to its maximum length during substantially a quarter revolution of the thread engaging devices, and means for actuating said devices, substantially as described.

13. A take-up for sewing machines, having, in combination, two fixed thread guides between which the thread runs, thread engaging devices movable with relation to each other arranged to rotate between the fixed thread guides and acting to engage opposite sides of a length of thread extending between said guides to form bights and to draw these bights to their maximum lengths during one quarter revolution of the thread engaging devices, and means for actuating the said devices, substantially as described.

14. A rotary take-up for sewing machines having, in combination, two fixed thread guides, and two continuously moving thread guides operating to engage the threads on opposite sides at adjacent points and to move past each other so as to draw out two opposite bights of thread, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

BENJAMIN PHILLIPS.

Witnesses:

ALFRED H. HILDRETH,
FARNUM F. DORSEY.