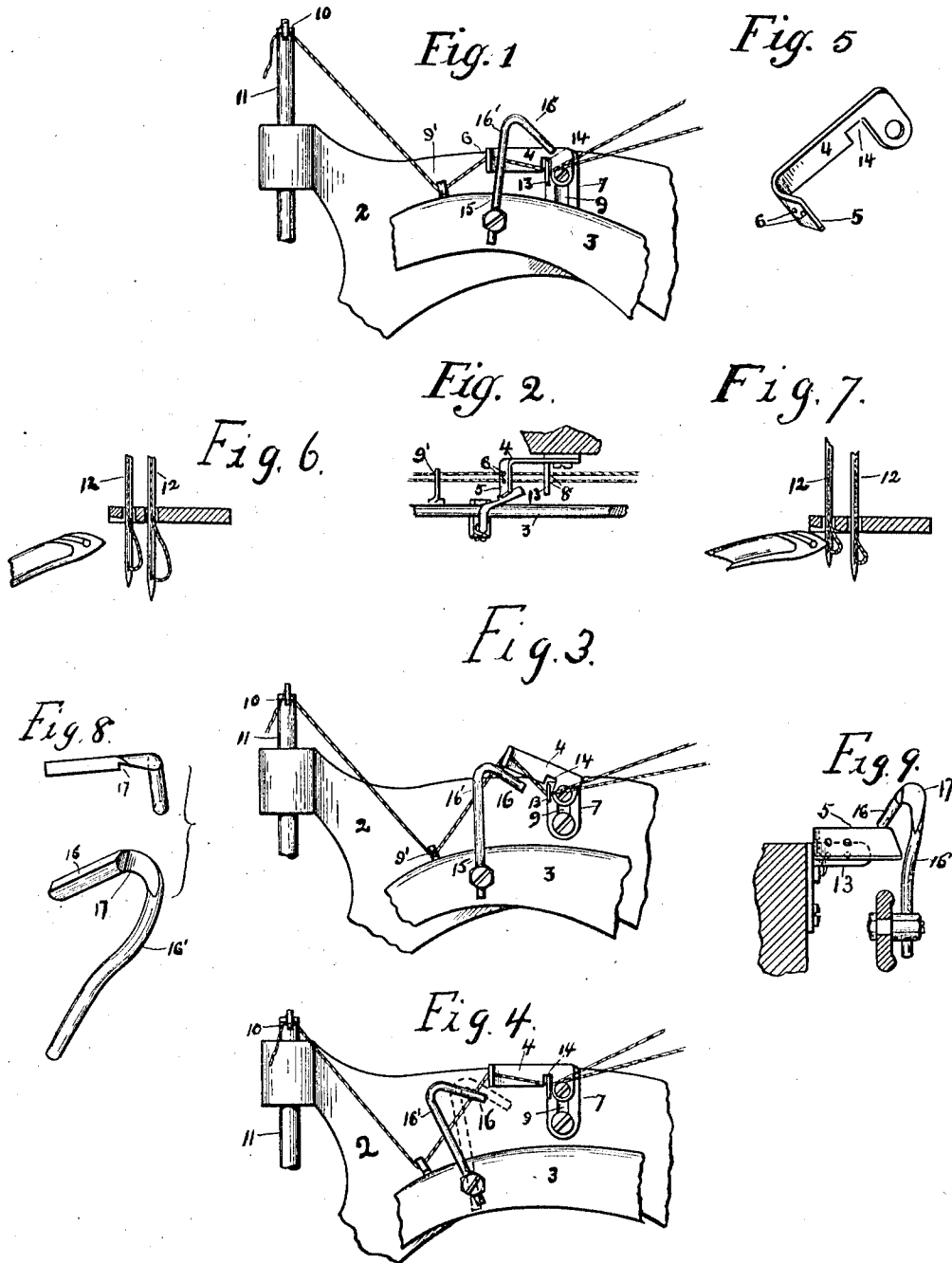


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 NEEDLE LOOP TAKE-UP FOR SEWING MACHINES.
 APPLICATION FILED APR. 9, 1912.

1,061,645.

Patented May 13, 1913.



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NEEDLE-LOOP TAKE-UP FOR SEWING-MACHINES.

1,061,645.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed April 9, 1912. Serial No. 689,598.

To all whom it may concern:

Be it known that I, ALBERT H. WEIS, a citizen of the United States, residing at Sparkill, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Needle-Loop Take-Ups for Sewing-Machines, of which the following is a specification.

This invention relates to sewing machines, and more particularly to that class thereof known as twin needle machines, the improvement particularly relating to improved needle loop take-ups, the object of the invention being to provide a simple and effective improved needle loop take-up for sewing machines having a plurality of needles and in the use of which the size of the needle loops will be effectively controlled, the overlapping and tangling of the needle loops prevented and a more uniform formation of the needle loops obtained.

Heretofore it has been impossible to control the size of the needle loops in those machines having a plurality of needles and frequently designated as twin needle machines, in which each needle carries a thread and co-operates with a thread carrying looper to form an ornamental or covering stitch on the bottom of the work. In narrow-gage machines, in which the needles are spaced comparatively close together, the needle loops very frequently overlap or become tangled with one another, which causes an imperfect formation of the stitch and also results in the skipping of stitches and the breaking of threads. In those machines known as wide-gage machines, while the loops do not tangle with one another, yet the farther apart the needles are the more difficult it is to control the size of the needle loops, because the single looper coöperating with the two needles necessitates that the needles be set one lower than the other a distance corresponding with the width or gage of the needles; that is to say, in a quarter-inch gage machine the outside or left-hand needle must be a quarter of an inch lower than the right-hand needle. From this it will be seen that the loop of the thread deflected by the longer needle is much greater than that deflected by the shorter needle, and consequently has a tendency to turn away from the looper as it is about to enter the same. Consequently, in machines where two or more needles are used there

has been considerable difficulty in controlling the needle loops. By means of the present improvement, however, which has proved very effective and efficient in service, the needle loops are controlled, the tangling thereof prevented and a more uniform formation of the loops obtained for the passage of the looper therethrough.

In the accompanying drawings, Figure 1 is a front view illustrating a portion of a sewing machine overhanging arm and needle actuating arm or lever with this improvement attached thereto; Fig. 2 is a detail top view of a part of the improvement shown in Fig. 1; Fig. 3 is a similar view to that shown in Fig. 1, but illustrating the take-up device in a different position; Fig. 4 is a similar view to that shown in Figs. 1 and 3, but illustrating the needle actuating lever in its lowest position; Fig. 5 is a perspective detail view of the take-up lever; Figs. 6 and 7 are views of a pair of needles and looper, illustrating the formation of the loops and the position of such loops as the looper is about to enter the same; Fig. 8 illustrates two views of the take-up actuating device; and Fig. 9 is a detail view, partly in cross section, of the parts of this improvement.

Similar characters of reference indicate corresponding parts throughout the figures of the drawings.

Only so much of a sewing machine as is necessary to illustrate the present improvement is shown herein, and this comprises the usual overhanging arm or gooseneck 2, on which the needle actuating arm 3 is pivotally supported for movement relatively thereto.

In the present embodiment the needle loop take-up device is in the form of a lever 4 of resilient or spring formation and is provided with a bent or flanged end 5 provided with thread eyes 6 for the passage of the threads. This lever is pivotally secured to a thread guide 7 likewise having eyes 8 for the passage of the threads. This thread guide is secured to the overhanging arm and is adjustable relatively thereto, for which purpose it is provided with a slot 9. The threads pass through the eyes 8 of this thread guide 7 as they come from the tension devices, from thence they pass through the eyes 6 of the take-up lever 4, then pass to eyes 9' carried by the needle actuating arm or lever 3, from thence to eyes 10 car-

ried by the presser foot bar 11, and from thence to the needles 12. The thread guide is provided with a projection 13 adapted to fit into a recess 14 located in the under edge of the take-up lever 4, whereby downward movement of the lever 4 is limited.

Adjustably secured to the needle actuating lever or bar 3 is a take-up operating device, shown in the present instance as a hook-formed member or wire 15, the hook 16 of which is located at an angle to the shank 16' of the wire and in an inclined position relative to the perpendicular.

In operation, as needle actuating lever or arm 3 moves downward the wire forces the spring take-up lever in toward the overhanging arm of the machine, thus enabling the hook to pass so that the spring take-up lever will spring over the inclined portion of the wire as shown in Fig. 4. At this time the needle actuating lever 3 is at its lowest position. As the needle actuating lever starts to ascend the inclined end of the hook comes into contact with the flanged or bent end of the take-up lever, as shown in Fig. 3, causing the take-up lever to ride up such inclined portion of the wire, so that the needle threads will be lifted or have a movement greater than that of the needles themselves and therefore of the needle actuating lever.

The take-up operating device or wire is adjusted so that when the needle loops are drawn up sufficiently to control them at the time the looper enters the same the take-up lever will automatically cast itself off of the hook member, this being obtained by providing in the hook member a notch or cut away portion 17 at the side of the inclined portion of the wire, thus automatically releasing and giving slack to the needle threads while the looper is passing through the loops.

From the foregoing it will be observed that by reason of the inclined end of the hooked wire the upward movement of the wire does not give the same movement to the spring take-up lever that it would if the hooked end were straight or at right angles to the shank thereof, but that the take-up lever gradually gains in movement or speed as compared with the upward movement of the hook by reason of the inclined end of such hook, resulting in the proper drawing up of the loop. After the take-up lever has been cast off the tension of the thread tends to pull it down, and this, together with its own weight, causes it to assume the position shown in Fig. 1.

In Fig. 4 the dotted position of the hook illustrates how the timing of the upward movement of the take-up lever is controlled by the adjustment of the hook; that is to say if the hook be adjusted by swinging it to its dotted line position the take-up lever would

have only a short upward movement. Thus it will be observed that by adjusting the hook by swinging it relatively to the needle actuating lever the action of the take-up lever will be quickened or shortened. In other words, if the angle of the hook portion is greater than that shown the take-up lever will lift faster.

Fig. 6 illustrates the manner in which the needle loops are deflected when this improved loop take-up device is not used and it will be observed that one loop is much larger than the other.

Fig. 7 illustrates the two loops when this improved loop take-up is used and from which it will be observed that both loops are maintained of the same size and lay closer to the two needles.

I claim as my invention:

1. In a sewing machine having an overhanging arm, a plurality of needles and a needle actuating lever, needle loop take up means for giving to the needle threads a movement greater than that of said needle lever during the upward movement of such needles and prior to the needles leaving the work thereby to insure a uniform formation of all of the needle loops.

2. In a sewing machine having an overhanging arm, a movable arm, and a plurality of needles, needle loop take up means for controlling the needle loops and comprising a movable part carried by the overhanging arm and a part carried by the movable arm for shifting said movable part during the upward movement of the needles and prior to the needles leaving the work thereby to obtain uniformity in the sizes of all of the loops.

3. In a sewing machine of the class described having an overhanging arm and a pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a movable part carried by the overhanging arm and a normally fixed part carried by the needle actuating arm for shifting said movable part on the upward movement of the needle and prior to the needle leaving the work thereby to obtain uniformity in the sizes of the loops.

4. In a sewing machine of the class described having an overhanging arm and a pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a shiftable resilient member carried by the overhanging arm and a normally fixed part carried by the needle actuating arm for shifting said resilient member prior to the needle leaving the work thereby to obtain uniformity in the sizes of the loops.

5. In a sewing machine of the class described having an overhanging arm and a pivotally supported needle actuating arm,

needle loop take-up means for controlling the needle loops and comprising a resilient member carried by the overhanging arm and a normally fixed part carried by the needle
 5 actuating arm, said fixed part having an inclined portion and a notch for casting off the resilient member.

6. In a sewing machine of the class described having an overhanging arm and an
 10 oscillating arm, needle loop take up means for controlling the needle loops and comprising a lever pivotally secured to said overhanging arm, and means carried by said
 15 oscillating arm and effective on its upward movement to raise said lever thereby to take up the needle loop during the upward movement of the needle and prior to the needle leaving the work thereby to obtain uniformity in the sizes of the loops.

7. In a sewing machine of the class described having an overhanging arm, a plurality of needles and a pivotally supported
 20 needle actuating arm, a single needle loop take up means for controlling the needle loops of all the needles and comprising a
 25 lever pivotally secured to said overhanging arm, and means carried by the needle actuating arm for raising said lever during the upward movement of the needles and prior
 30 to the needles leaving the work thereby to obtain uniformity in the sizes of all of the loops.

8. In a sewing machine of the class described having an overhanging arm and a
 35 pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops to maintain uniformity thereof during the formation of such loops and comprising a lever pivotally secured to
 40 said overhanging arm and means for raising said lever at a predetermined time and carried by the needle actuating arm, said lever raising means having an inclined lever-engaging portion riding under said
 45 lever during the raising thereof to effect the complete disengagement of such parts at a predetermined time by the gradual slipping of the lever down the inclined portion of said lever raising means.

9. In a sewing machine of the class described having an overhanging arm and a
 50 pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a lever
 55 pivotally secured to said overhanging arm and means for raising said lever at a predetermined time and carried by the needle actuating arm, said means having an inclined lever-engaging portion and a notch
 60 at the side thereof.

10. In a sewing machine of the class described having an overhanging arm and a
 65 pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a lever

pivotally and adjustably secured to said overhanging arm and means for raising said lever prior to the needle leaving the work thereby to maintain uniformity in the sizes of the loops.

11. In a sewing machine of the class described having an overhanging arm and a
 70 pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a lever
 75 pivotally and adjustably secured to said overhanging arm and means adjustably secured to the needle actuating arm for raising said lever prior to the needle leaving the work thereby to maintain uniformity in the
 80 sizes of the loops.

12. In a sewing machine of the class described having an overhanging arm and a
 85 pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a resilient lever pivotally secured to said overhanging
 90 arm and means adjustably secured to the needle actuating arm for raising said lever prior to the needle leaving the work thereby to maintain uniformity in the sizes of the loops.

13. In a sewing machine of the class described having an overhanging arm and a
 95 pivotally supported needle actuating arm, needle loop take-up means for controlling the needle loops and comprising a resilient lever pivotally secured to said overhanging
 100 arm and means adjustably secured to the needle actuating arm for raising the said lever and comprising a hook-formed member having the hook thereof located in an inclined position relative to the shank of such member.

14. In a sewing machine of the class described having an overhanging arm and a
 105 needle actuating arm pivotally supported thereon, needle loop take-up means for controlling the needle loops and comprising a resilient lever pivotally secured to said overhanging
 110 arm and having a bent end provided with openings for the passage of the needle threads, and a hook-shaped member secured to the needle actuating arm and having an inclined upper end for raising
 115 and lowering said means.

15. In a sewing machine of the class described having an overhanging arm and a
 120 needle actuating arm pivotally supported thereon, needle loop take-up means for controlling the needle loops and comprising a resilient lever pivotally secured to said overhanging
 125 arm and having a bent end provided with openings for the passage of the needle threads and a hook-formed member secured to the needle actuating arm and having an inclined upper end for raising
 130 and lowering said means, and a thread-guide secured on said overhanging arm and adjustably supporting said lever.

16. In a sewing machine of the class described having an overhanging arm and a needle actuating arm pivotally supported thereon, needle loop take-up means for controlling the needle loops and comprising a resilient lever pivotally secured to said overhanging arm and having a bent end provided with openings for the passage of the needle threads and a hook-formed member secured to the needle actuating arm and having an inclined upper end for raising and lowering said means, and a thread guide secured on said overhanging arm and adjustably supporting said lever, said guide and lever having means for limiting the downward movement of said lever.

17. In a sewing machine, the combination with a pair of supporting members, one a fixed member and the other movable relatively thereto, of loop take up means comprising a pair of members one carried by each of said supporting members, one movable with said movable member and the other movable relatively to said fixed member and cooperating to insure a uniform formation of the needle loops during the upward movement of the needle and prior to the needle leaving the work.

18. In a sewing machine having an overhanging arm and an oscillating needle actuating lever, needle loop take up means for controlling the needle loops and comprising cooperating means carried by the overhanging arm and the needle actuating lever and effective for giving to the thread a greater speed or movement than the needle actuating lever itself has during the upward movement of the needle and prior to the needle

leaving the work whereby uniformity in the sizes of the loops is obtained.

19. In a sewing machine, the combination with a pair of supporting members, one a fixed member and the other a movable member movable relatively thereto, of loop take up means comprising a pair of members one carried by each of said supporting members, one movable with said movable member and the other shiftable on said fixed member and shiftable upwardly by the member carried by said movable supporting member to insure a uniform formation of the needle loops during the upward movement of the needle and prior to the needle leaving the work.

20. In a sewing machine having an overhanging arm and an oscillating needle actuating lever, needle loop take up means for controlling the needle loops and comprising cooperating means carried by the overhanging arm and the needle actuating lever and comprising a thread carrying member shiftable supported for rising and falling movement on the overhanging arm and means carried by the oscillating needle lever and having an inclined portion for engaging said thread carrying member and causing the same to ride up such inclined portion so that the needle threads will have a movement greater than that of the needle actuating lever whereby uniformity of the thread loops is obtained.

Signed at Nyack, N. Y., this 2nd day of April, 1912.

ALBERT H. WEIS.

Witnesses:

JOHN P. WEIS,
EDWARD L. RUSSELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."