LOOPER MECHANISM FOR BLIND-STITCH SEWING MACHINE

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5 Claims. (Cl. 112—176)

1 This invention relates to sewing machines and more particularly to an improved looper mechanism for a single thread chain-stitch blind-stitch sewing machine of the type disclosed in the U. S. patent of C. A. Dearborn, No. 814,642, dated March 6, 1906.

In the machine disclosed in the above mentioned Dearborn patent, the looper is actuated by a crank having a crank-pin disposed so that its axis is arranged at an inclination to the longitudinal axis of the shaft carrying the crank. The manufacture of this inclined crank within the required tolerances involves a relatively costly procedure. Also, when an inclined crank is employed, it is customary to use a crank-pin embracing sleeve to impart the necessary compound motion to the looper. While this looper driving actuator is satisfactory in imparting the necessary motions, it requires considerable lubrication and more particularly so during high speed operation of the machine.

2 It is the primary object of the present invention to simplify the looper driving mechanism to the extent that a looper-actuating crank may be used having a crank-pin disposed parallel to the longitudinal axis of the shaft carrying the crank.

Another object of the invention is to provide the looper mechanism of a blind-stitch sewing machine with an anchor link, whereby the rotary actuator for the looper may comprise a simple crank.

The foregoing and other objects and advantages, together with means whereby the same may be carried into effect, will best be understood from the following description of a preferred embodiment thereof illustrated in the accompanying drawings, in which:

Fig. 1 is a left side elevational view of a blind-stitch sewing machine embodying my improved looper mechanism.

Fig. 2 is a horizontal sectional view taken substantially along the line 2—2, Fig. 1.

Fig. 3 is a vertical sectional view taken substantially along the line 3—3, Fig. 1.

Fig. 4 is a vertical sectional view taken substantially along the line 4—4, Fig. 1.

Referring to the drawings, the machine illustrated is one of the well known single thread blind-stitch sewing machines and comprises a frame including a bed 18 to one end of which is pivoted a work-supporting frame 14 and from the other end of which rises a standard 12 terminating in a forwardly extending arm 13. Journaled in the standard 12 is a rotary main-shaft 14 carrying at one end a belt-driven pulley 15 in the manner clearly shown in the previously mentioned Dearborn Patent No. 814,642. Journaled in the forwardly extending arm 13 is a rock-shaft 16 actuated at one end by means of a rock-arm 17 and pitman 18 (Fig. 4) from a crank 19 carried by the rotary shaft 14. At its other end, the rock-shaft 16 has clamped upon it a needle-carrier 20 in which is fastened a curved needle 21. As is customary in blind-stitch machines, the curved needle during the normal course of sewing enters and emerges from the material on the same side thereof. The material to be stitched is adapted to be advanced past the needle 21 by a feed-dog 22 carried on the free end of a feed-bar 23, which feed-bar is fulcrumed intermediate its ends on a pivot-pin 24 (Figs. 1 and 2) carried in the upper portion of an oscillatory link 25 supported by a short shaft 26 journaled in the arm 13 of the machine frame. At its end remote from the feed-dog 22, the feed-bar 23 is enlarged to embrace an actuating eccentric 27 carried by the main-shaft 14. Rotation of the main-shaft 14 will impart substantially a four-motion travel to the feed-dog 22, which feed-dog engages the top of the work and, during its work-advancing stroke, is opposed by the work-supporting frame 11.

Cooperating with the thread-carrying curved needle 21 in the formation of single thread stitches is a looper 28 of conventional construction. The looper 28 is adjustably mounted in an offset looper-clamp 29 which is secured on one end of a looper-carrying shaft 30 journaled for oscillation in the spaced bearing lugs 31 and 32 of a looper-frame 33. At its rear end, the looper-frame 33 is apertured to receive a needle-bearing 34 (Fig. 2) mounted on a crank-pin 35 having its axis disposed parallel to the longitudinal axis of the main-shaft 14. The crank-pin 35 is preferably formed on a mounting plate 36 having a centrally disposed locating projection 37 and an arcuate slot 38 (Fig. 1) through which extends a clamping screw 39 threaded into a disk or counterweight 40 of the needle-actuating crank 19.

The purpose of the arcuate slot 38 and the clamping screw 39 is to permit adjustment of the crank-pin 35 about the locating projection 37 to change the timing of the looper 28 with respect to the needle 21.

It will be understood that in blind-stitch sewing machines of the type illustrated in the drawings, the looper after advancing to enter and seize the thread-loop presented by the needle carries the seized thread-loop upwardly and backwardly over the material and then down-
wardly to position the seized needle-thread-loop for entrance by the needle just before said needle is actuated. The oscillations of the looper are obtained by means of an anchor-link connection between the looper-carrying shaft 30 and the stationary arm 13. As shown in Figs. 1 and 4, the looper-carrying shaft 30 has clamped on it a short-armed, vertically pivoted, double-throw eccentric 41, which is brace-ted to the lower end of an extensible anchor-link 49 connected at its upper end by a stud 50 to the machine-arm 13. As the looper-carrying shaft 30 travels in response to the rotation of the crank-pin 35 and the swinging motion of the link 41, the anchor-link 49 causes the looper-carrying shaft 30 to turn in its supporting bearing lugs 31 and 32.

From the above description, it will be understood that the necessary looper motions are derived from a simple rotary crank which is mounted directly on the main-shaft of the machine. Not only is the crank 35 simple to manufacture, but by having the crank 35 fastened for limited circular adjustment about the axis of the shaft 14, as by the slot 33 and the screw 39, convenient adjustment in the looper-timing may be made. Facilitating the proper timing and positioning of the looper 28 relative to the curved needle 21, is the eccentrically mounted pivot-stud 42 for the depending link 41; adjustment of the sleeve 44 in which the pivot-stud 42 is mounted serving to raise or lower the looper 28. Additional adjustment of the looper 28 can be obtained by turning the offset looper-clamp 25 on the looper-carrying shaft 30, and/or by adjusting the length of the anchor-link 49. It will be understood that the provision of the anchor-link 49 not only simplifies the type of rotary actuator 25 employed for actuating the looper 28, but also permits which is imparted to the looper 28 to be reduced to the minimum required for proper stitch-formation. In other words, by properly locating the anchor-link 49 with respect to the rotary crank 35 and the link 41 the required minimum oscillation of the looper can be obtained. In prior machines in which the looper is actuated by an inclined crank, the inclination of the crank must be such to satisfy a plurality of critical positions of the looper relative to the needle and, in satisfying certain of these, the inclination of the crank is determined, leaving the oscillations of the looper about the longitudi-
chain-stitches, a looper-frame movable in a single plane thereby to impart certain of the motions to said looper, means for moving said looper-frame including a member supporting one end portion of said looper-frame and a rotary actuator operatively connected to the other end of said looper-frame, a looper-carrying shaft journeled in said looper-frame and movable to impart other of the motions to said looper, and means for moving said looper-shaft relative to said looper-frame including a rock-arm carried by said looper-carrying shaft, and an anchor-link connected at one end to said rock-arm and at its other end to said machine-frame.

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REFERENCES CITED

The following references are of record in the file of this patent:

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<thead>
<tr>
<th>Number</th>
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<td>814,642</td>
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