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LOOPER ACTUATING MECHANISM FOR CHAIN STITCH SEWING MACHINES.

APPLICATION FILED FEB. 12, 1914.

1,127,755. **Patented Feb. 9, 1915.**

Fig. 1.

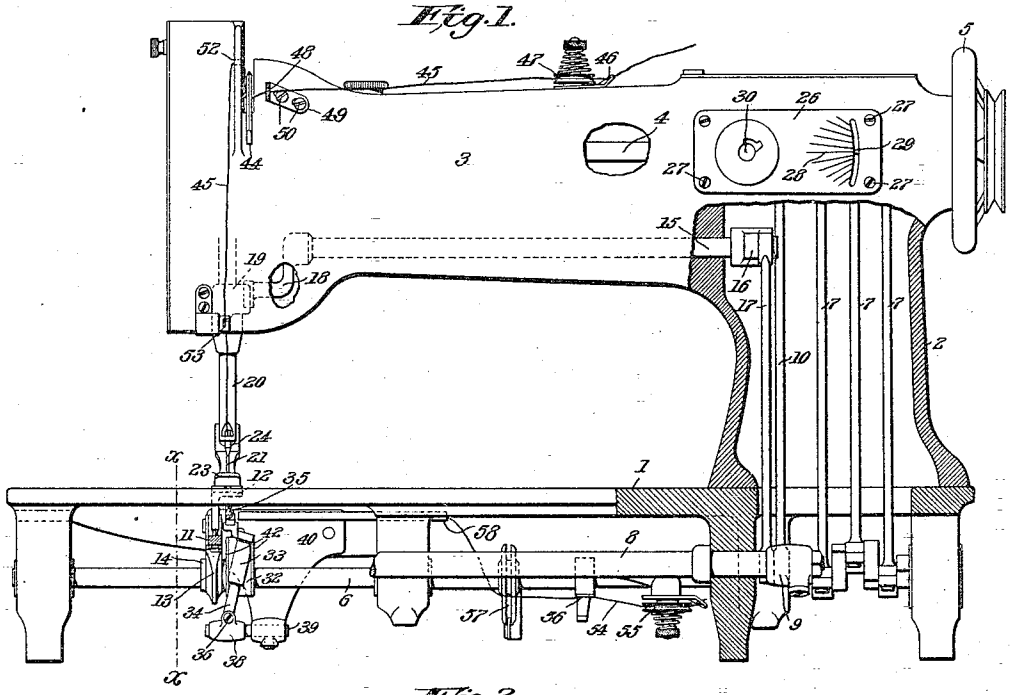


Fig. 2.

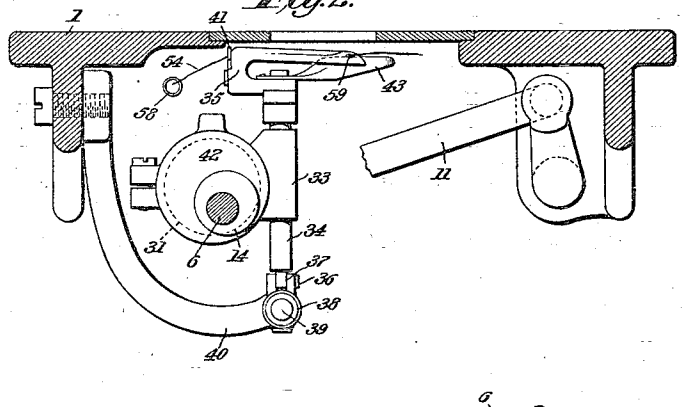


Fig. 4.

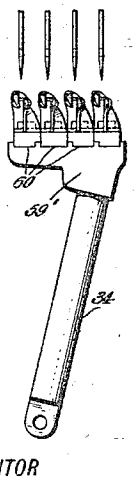
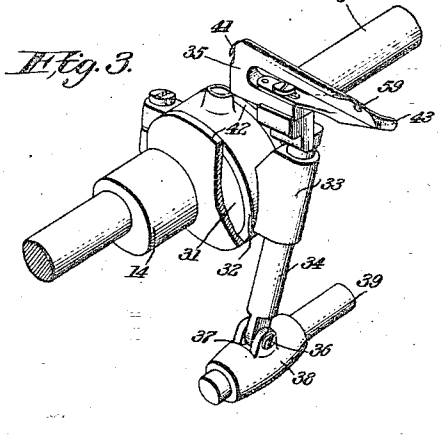


Fig. 3.



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LOOPER-ACTUATING MECHANISM FOR CHAIN-STITCH SEWING-MACHINES.

1,127,755. Specification of Letters Patent. Patented Feb. 9, 1915.

Application filed February 12, 1914. Serial No. 818,198.

To all whom it may concern:

Be it known that I, CHARLES F. GRAY, a citizen of the United States, residing at Sierra Madre, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Looper-Actuating Mechanisms for Chain-Stitch Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in looper-actuating mechanisms for chain-stitch sewing machines and has for its object to simplify and better adapt the like mechanism represented by U. S. Patent No. 1,085,801 dated Feb. 3, 1914 to Albert H. De Voe, to multiple needle machines, especially such constructions as are represented by my pending application Ser. No. 817,737, filed Feb. 10, 1914, for "improvements in sewing machines."

The present invention, in substantially its present form, is disclosed in the pending application above referred to and for a better understanding of its application it is herein combined with the like bed-plate, bracket-arm, needle-thread take-up, under looper-actuating shaft and cloth-feeding mechanism; omitting the tension devices, thread leaders, loop-takers and the elements connecting the latter with the looper-actuating shaft, common to lock-stitch seam construction.

Referring to the drawings, Figure 1, is a view in front side elevation of the present machine, the frame being shown partly in section to better illustrate certain details later to be referred to, Fig. 2, a cross section on the line *x*—*x* Fig. 1. Fig. 3, a perspective of the looper-actuating shaft; the looper and its carrier, together with the mechanism for operatively connecting the latter with said shaft. Fig. 4, a front elevation of the looper-carrier constructed to accommodate a multiple of loopers.

Referring to the figures, 1 represents the sewing machine bed-plate upon which is mounted the bracket-arm comprising the standard 2 and arm-bracket 3, 4 the main or needle-bar driving shaft provided with the band or hand-wheel 5 and operatively connected with the lower or looper-actuating shaft 6 by connections as 7.

8 denotes the feed rock-shaft mounted in suitable bearings depending from the bed-plate and at its rear end provided with a crank-arm 9 pivotally connected to the lower end of the feed connection 10, the opposite end of the latter being connected to the main-shaft through a suitable feed eccentric (not shown), thus transmitting from the latter rocking movements to the feed rock-shaft 8. To the front end of the feed rock-shaft is pivotally connected the feed-dog carrying-bar 11 provided with the feed-dog 12, the opposite end of the feed-dog carrying-bar having rigidly secured to it a forked connection 13 which embraces an eccentric 14 carried by the looper-actuating shaft, thus transmitting from the latter vertical movements to said feed-dog.

15 represents a needle-feed rock-shaft journaled in suitable bearings formed in the arm-bracket and at its rear end provided with a rigidly secured crank-arm 16 to the outer end of which is pivotally connected a needle-feed connection 17, the lower end of the latter being pivotally connected to the crank-arm 9 and having the same axis as the lower end of the connection 10. To the forward end of the needle-feed rock-shaft is suitably secured a needle vibrating arm 18 whose free end enters a suitable slot formed in the collar 19 (shown in dotted lines only Fig. 1) carried by the needle-bar 20, thus transmitting from the main-shaft through the feed eccentric and connections 10, 9, 17, 16, 15, 18 and 19, feed movements to the needle 21 corresponding in amplitude to the feed movements of the feed-dog 12, and 23 denotes the cloth-presser suitably secured to the lower end 24 of one form of commonly employed cloth-presser carrying bar. The plate 26 secured by screws, as 27, to the front side of the bracket-arm and provided with the index 28, pointer 29 and opening 30 comprises elements forming a part of the feed-adjusting mechanism, but as the latter has no particular bearing on the present invention, further reference to its constructive features is deemed unnecessary.

31 represents a looper-actuating eccentric carried by the main-shaft 6 and encircled by an eccentric strap or collar 32 provided with a bearing 33 inclined to the plane of rotation of said eccentric, and into said bearing is mounted the looper-carrying rod 34 provided with the looper 35, the opposite end of said rod being secured by means of the pivot screw 36 in a forked opening 37 of

the sliding sleeve 38, which latter is mounted on the pin 39 carried by a bracket 40 secured by suitable screws, to a stationary part of the sewing machine frame. The providing of the pivotal connection 36 insures that the rod 34 will not be directed out of alinement with its bearing 33 through any fault due to the mounting of the pin 39. The looper 35 comprises a straight blade having the usual thread eye at its point, its opposite end being provided with the thread-leader 41 through which the looper thread is passed to the thread eye, the eccentric strap or collar 32 being confined between the flanges, as 42, carried by the eccentric 31.

43 denotes a needle-thread loop-guard carried by the looper between which and said guard the needle rises in the formation of its thread loop, the guard acting to better insure the formation of the loop at the side of the needle next the looper.

From the foregoing it will be readily understood that the eccentric 31 transmits to the looper needle-thread loop-engaging and loop-shedding movements in directions transverse to the looper-actuating shaft, and that the angularly arranged bearing 33 acts upon the looper-carrying rod 34 to effect needle avoiding movements of the loop-taker in directions corresponding to the length of said shaft. It is not deemed necessary to herein define the relative action of looper and its coacting needle to form stitches, as such relative action is common to earlier constructions and well understood by those versed in the art, except to explain that as the looper is moved toward the front of the machine it enters the needle-thread loop as the needle is being moved upward, the next subsequent descent of the needle entering the looper-thread loop when the looper in its further movement in a direction away from the front of the machine sheds the needle-thread loop which is drawn into the fabric in the formation of the stitch, during which time the looper has reversed its motion to form a succeeding stitch, the looper being at the left of the needle during its forward movement and at the opposite side during its retracted movement.

Nearly, if not all, chain-stitch stitch-forming mechanisms employ a needle-thread take-up for controlling the slack of the thread after the looper has entered the thread loop to substantially the completion of the upward stroke of the needle. Such take-up in some varieties of constructions being independent of the needle-bar and in others effected by passing the thread through a suitable opening in the upper end of the needle-bar. In the present construction the like control of the like thread is effected by the downward movement of the lock-stitch take-up 44 which, as is well understood, effects its most important functions of controlling the formation of a lock-stitch seam on its upward movement when, after the loop has been cast about the under cop or bobbin, acts to control the slack of the diminishing loop, and at substantially the completion of such movement acts to set the stitch. In the present construction the lock-stitch seam take-up, in connection with the thread opening 48, effects the same control of the chain-stitch needle-thread as the needle-bar or independent take-up common to chain-stitch sewing machine construction.

In the threading of the needle and looper the needle-thread 45 is passed from the supply through the thread eye 46, tension device 47, thread opening 48 formed in the bracket 49 adjustably secured by screws, as 50, to the arm-bracket, beneath the take-up 44, through the thread opening 52, thread-retaining check 53, from which latter it is passed through the eye of the needle. The looper or under chain-stitch thread 54 is passed through the tension 55, thread-check 56 to the action of the under take-up 57, then through the tubular opening 58 to the thread-leader 41 carried by the looper 35, and through the thread eye 59 of said looper.

The present looper-actuating mechanism is adapted for either the eyed or non-eyed looper, dependent upon whether a single or double chain-stitch is desired. To adapt the present looper-carrier to single or multiple seam products, as shown by Fig. 4, the head 59′ of the carrier 34 is provided with a multiple of looper seats, as 60, thus effecting a stitch-forming mechanism for producing either single or multiple seams by a single chain of connections connecting either a single looper or a multiple of the latter with the prime actuating member, as shaft 6 of the present construction.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a stitch-forming mechanism for sewing machines, the combination with an upper stitch-forming mechanism and actuating means therefor, of an under coöperating stitch-forming mechanism including a looper-actuating shaft operatively connected with said actuating means and carrying a looper-actuating eccentric provided with an eccentric strap having a bearing arranged at an angle to the plane of rotation of said eccentric, a stationary bearing provided with a sliding sleeve, a looper-carrying rod mounted in said angularly arranged bearing and connected at one end with said sleeve and at its opposite end provided with means coacting with said upper stitch-forming mechanism to form stitches.

2. In a stitch-forming mechanism for sewing machines, the combination with an upper stitch-forming mechanism and actuating means therefor, of an under coöper-

ating stitch-forming mechanism including a looper-actuating shaft operatively connected with said actuating means and carrying a looper-actuating eccentric provided with an eccentric strap having a bearing arranged at an angle to the plane of rotation of said eccentric, a stationary bearing provided with a sliding sleeve, a looper-carrying rod mounted in said angularly arranged bearing and pivotally connected at one end with said sleeve and at its opposite end provided with means coacting with said upper stitch-forming mechanism to form stitches.

3. In a stitch-forming mechanism for sewing machines, the combination with an upper stitch-forming mechanism and actuating means therefor, of an under coöperating stitch-forming mechanism including a looper-actuating shaft operatively connected with said actuating means and carrying a looper-actuating eccentric provided with an eccentric strap having a bearing arranged at an angle to the plane of rotation of said eccentric, a stationary bearing provided with a sliding sleeve, a looper-carrying rod provided with a multiple of looper securing seats, said rod being mounted in said angularly arranged bearing and connected at one end with said sleeve and at its opposite end provided with means coacting with said upper stitch-forming mechanism to form stitches.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES F. GRAY.

Witnesses:
W. L. GILLILAND,
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