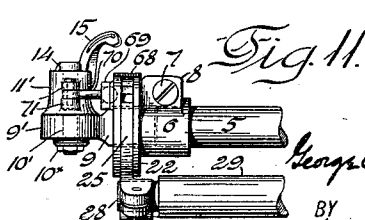
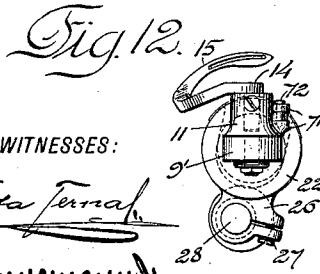
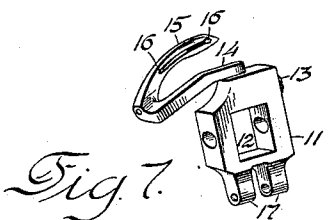
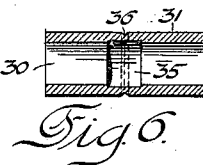
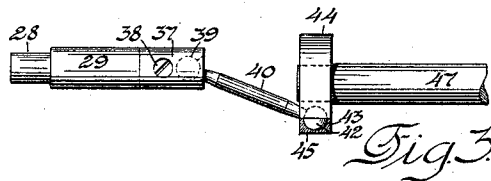
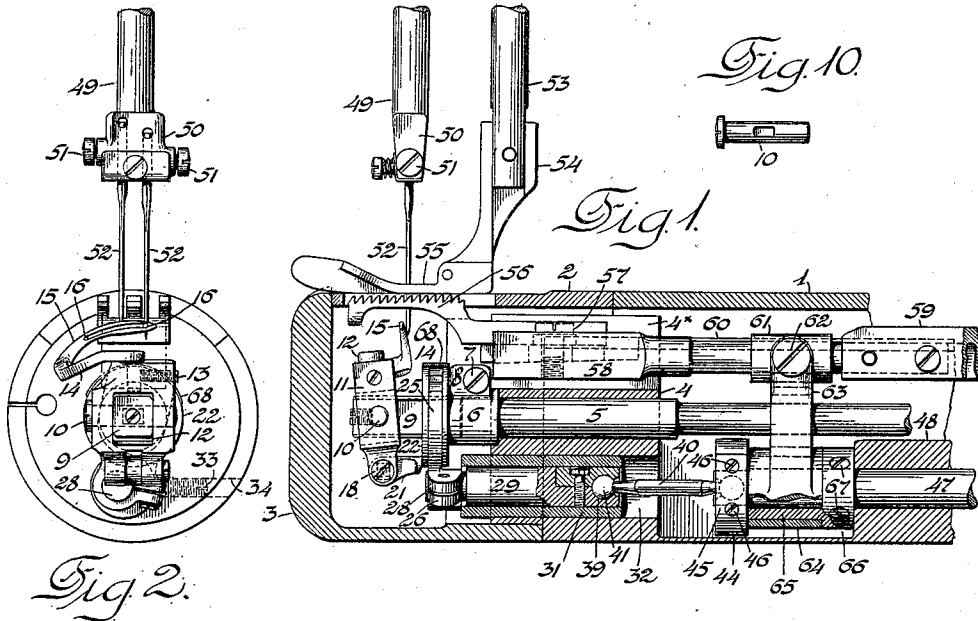


G. E. MOLYNEUX.
 LOOPER MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED OCT. 15, 1909.

1,000,836.

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LOOPER MECHANISM FOR SEWING-MACHINES.

1,000,836.

Specification of Letters Patent. **Patented Aug. 15, 1911.**

Application filed October 15, 1909. Serial No. 522,815.

To all whom it may concern:

Be it known that I, GEORGE E. MOLYNEUX, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Looper Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to an improvement in looper-actuating mechanism for chain-stitch sewing machines more particularly of the class constructed with a cylindrical bed or work-supporting horn and feeding mechanism designed to advance the work longitudinally of the latter; and it has for its object to provide a simple and compact mechanism for imparting the sidewise or needle-avoiding movements to the looper.

As preferably constructed, the looper-carrier is pivotally mounted upon a rock-shaft which imparts to the looper through its carrier the endwise loop-seizing movements, rocking movements being imparted to the looper-carrier to transmit the sidewise looper-movements by a connection with a jog-bar slidingly mounted in bearings parallel with the looper rock-shaft and pivotally connected with one end of a gyratory thrust-rod whose opposite end has a pivotal connection with a rotary shaft at a point of the latter offset from its axis of rotation, which axis is also offset from the point of connection of the thrust-rod with the jog-bar. The looper-supporting rock-shaft carries adjacent the looper-carrier a peripherally grooved sliding collar whose groove is entered by a yoke fixed upon the jog-bar, while a lug carried by said collar has a pivotal connection with the looper-carrier below its point of attachment with the rock-shaft. As will be observed, the rotation of the shaft causes the thrust-rod to assume different angular relations with the jog-bar to which is thus imparted its jogging endwise movements. A bushing affording a bearing for the jog-bar is provided with an eccentric bore to which the jog-bar is fitted, so that the circular adjustment of the bushing acts to vary the degree in which the jog-bar is offset from the axis of its actuating rotary shaft, thereby correspondingly

varying the amplitude of its jogging movements. The resultant endwise and sidewise movements of the looper-blade confine it to a continuous oval path embracing the path of reciprocation of the needle whereby, when an eyed or thread-carrying looper is employed, the lead of the looper-thread from the looper-eye to the work is alternately upon opposite sides of the needle-path.

In the accompanying drawings, the present improvement is shown in two modifications, as applied to the machine forming the subject of my pending application Ser. No. 521,801, filed October 9, 1909.

Figure 1 is a transverse sectional elevation of the forward portion of the cylinder-bed of the machine with the needle and presser-foot and the lower portions of their carrying bars, and Fig. 2 a front end view of the same with the end cap of the cylinder-bed removed. Fig. 3 is a side view of the forward portion of the actuating rotary shaft and its connection with the jog-bar. Fig. 4 is a perspective view of one of the connecting members between the jog-bar and looper-carrier. Fig. 5 is a transverse sectional view and Fig. 6 a longitudinal sectional view of the bearing bushing for the jog-bar. Fig. 7 is a perspective view of the looper-carrier and looper mounted thereon. Fig. 8 is a perspective view, partly in section, of another member of the connection between the jog-bar and the looper-carrier and Fig. 9 a perspective view of the protecting cap applied to the latter. Fig. 10 is a view of the fulcrum-pin of the looper-carrier. Fig. 11 is a side elevation and Fig. 12 an end elevation showing an alternative form of looper-actuating mechanism.

The cylinder-bed or work-supporting horn 1 is provided with the throat-plate 2 and the removable end-cap 3 inclosing the looper. Mounted axially of the arm 1 in the bearing member 4 is a longitudinally extending looper rock-shaft 5 which derives its rocking movements from any suitable actuating means, as for instance those shown and described in my said application. Mounted upon the forward end of the looper-shaft 5 is the split collar 6 secured adjustably thereon by means of the clamp-screw 7 passing through spaced lateral ears

8 of said collar. The collar 6 is formed with a forwardly projecting stud 9 of angular cross-section with parallel sides.

Pivotally mounted upon a transverse fulcrum-pin 10 passing through the stud 9 is the looper-carrier 11 which is formed with a rectangular aperture 12 fitted to the sides of the stud 9. Secured in a suitable socket in the upper end of the looper-carrier by means of the set-screw 13 is the shank 14 of the looper whose blade 15 is formed with eyes 16 for the lower thread and is disposed transversely of the looper-shaft 5 and the axis of the horn 1. Depending from the looper-carrier beneath the aperture 12 are the spaced perforated lugs 17 between which is pivotally mounted by means of the screw-pin 18 the perforated slide-block 19 fitted within a rectangular aperture 20 in the lug 21 projecting from the face of a sliding collar 22 which is formed with an angular aperture 23 fitted to the looper-carrier supporting stud 9. The collar 22 is formed with a peripheral groove 24 entered by a yoke 25 formed with a split hub 26 clamped by means of the screw 27 upon the reduced forward end 28 of a reciprocating plug or jog-bar 29 mounted within an eccentrically arranged bearing aperture 30 of the cylindrical bushing 31 which is in turn mounted within a cylindrical aperture 32 of the bearing member 4 parallel with and beneath the looper rock-shaft 5. The bushing 31 is adapted to be turned within its aperture 32 to change the position of the jog-bar 29 laterally, but is normally secured against turning by means of the set-screw 33 introduced through a transverse aperture 34 in the wall of the horn 1. The bushing is shown in Figs. 5 and 6 provided with an internal annular oil cavity 35 and with an external annular groove 36 to receive the point of the set-screw 33 as the latter is slightly withdrawn for the described adjustment while retaining the sleeve from endwise displacement.

The rearward end portion of the reciprocating plug or jog-bar 29 is formed with a removable lateral section 37 secured in position by means of the screw 38, and partly within this removable section and partly within the adjacent portion of the jog-bar is formed an axial spherical socket 39 with a flaring rearwardly extending opening entered by the reduced forward portion of the gyratory thrust-rod 40 terminating at its forward end in the ball 41 fitted within said cavity. The similarly formed opposite end of the thrust-rod is provided with a ball 42 fitted within a similar cavity or socket 43 formed partly in the disk 44 and partly in a removable peripheral section 45 thereof secured in place by means of screws 46. The socket 43 is disposed in eccentric relation to the disk 44, which is fixed upon the forward

end of a rotary shaft 47 journaled in the bearing member 48 of the work-supporting horn 1. This rotary shaft is or may be an extension of the main-shaft to which power is applied from the source of power, as shown and described in my said pending application.

As herein represented, the machine is provided with a reciprocating needle-bar 49 provided with a needle-clamp 50 in which are secured by means of clamp-screws 51 the shanks of two eye-pointed needles 52 with which the single looper cooperates in the production of stitches. The machine is also provided with the usual presser-bar 53 to the reduced lower end of which is secured the shank 54 of the hinged presser-foot 55 normally resting upon the throat-plate 2 and opposed to the serrated operative face of the feed-dog 56 which is secured by means of the screw 57 upon a block 58 at the forward end of the longitudinally reciprocating feed-bar 59, which is formed with a necked portion 60 fitted within the tilting bearing sleeve 61 which is in turn pivotally mounted by means of center-screws 62 upon the yoked upper end of the post or standard 63 provided at its lower end with a strap 64 embracing a lifting eccentric 65 whose hub 66 is secured by means of set-screws 67 upon the rotary shaft 47. It will thus be seen that the feed-dog 56 has feeding movements longitudinally of the work-supporting horn, being prevented from lateral movement by means of a guideway 4* of the bearing member 4 in which the sides of the block 58 are fitted, and the feed-dog receives its rising and falling movements from the eccentric 65.

To cover the upper side of the groove 24 of the sliding collar 22, a segmental cap-plate 68 is secured by soldering or other means to the periphery of the collar, this plate being of sufficient length to enable its opposite ends to overlap the upper extremities of the yoke 25 to exclude dirt from the wearing parts within the collar.

In the operation of the machine as thus described, the needles descend and present their loops which are entered by the looper-blade 15 in its advance endwise movement imparted by the rock-shaft through the carrier 11 and fulcrum-pin 10. As the needles rise, the carrier 11 is rocked upon its fulcrum-pin 10 to impart the sidewise needle-avoiding movements to the looper, through the advance movement of the jog-bar 29 produced by the thrust-rod 40 in the rotation of the collar 44 through the yoke 25 and sliding ring 22 with its sliding pivotal connection with the carrier. As the looper recedes from forward position under the reverse movement of its supporting rock-shaft 5, the needles descend through the looper-loop extended from the eye of the looper

to the work, and as its point clears the rearward needle it performs its reciprocal side-wise needle-avoiding movement under the reverse action of the jog-bar 29. The feeding action longitudinally of the work-supporting horn takes place, as usual, while the needles are raised and their thread-loops are engaged by the blade of the looper.

Referring to the modification represented in Figs. 11 and 12, the adjustable collar 6 upon the looper-shaft 5 is provided with a stud 9 of rectangular cross-section terminating in a lug 9' with flattened upper and lower faces, and upon the upper face is seated the bottom of the oscillating looper-carrier 11' whose fulcrum-pin 10', while perpendicular to the supporting shaft 5, extends vertically through the lug 9' and has upon its threaded lower end the nut 10". The jog-bar 29 is or may be actuated by the means already described, its yoke 25 entering the peripheral groove of the sliding collar 22. The collar 22 has upon its outer face a boss 69 provided with a spherical socket in which is fitted the ball-shaped extremity of the connecting rod 70 whose eyed opposite end is embraced by lateral lugs 71 upon the looper-carrier with which it is pivotally connected by means of the pin 72. As the looper-blade 15 is offset from its shank 14 and from the axis of the fulcrum-pin 10', it will be observed that the rocking motion of the carrier imparted from the sliding sleeve through the rod 70 causes the looper-blade not only to change its angular position relatively to the needle-paths, but to cross the latter so as to perform the requisite needle-avoiding movements in the cooperation of the looper with the needles in the production of stitches.

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

1. In a sewing machine, the combination with a reciprocating needle, of an eyed looper cooperating therewith and having a blade movable both endwise and sidewise in a continuous path embracing the path of reciprocation of said needle whereby the lead of the looper-thread from the looper-eye to the work is alternately at opposite sides of the needle-path, a looper-carrier upon which said looper is secured, a rock-shaft upon and relative to which said looper-carrier is mounted for lateral movement but is restrained against longitudinal movement, a jog-bar parallel with said rock-shaft, means for imparting endwise reciprocations to said jog-bar, and a sliding connection between said jog-bar and the looper-carrier, from which the looper derives its sidewise movements longitudinally of said rock-shaft.

2. In a sewing machine, the combination with a reciprocating needle, of an eyed looper cooperating therewith and having a blade movable both endwise and sidewise in

a continuous path embracing the path of reciprocation of said needle whereby the lead of the looper-thread from the looper-eye to the work is alternately at opposite sides of the needle-path, a looper-carrier upon which said looper is secured, a rock-shaft upon and relative to which said looper-carrier is mounted for lateral movement but is restrained against longitudinal movement, a jog-bar parallel with said rock-shaft, a rotary shaft also parallel with said rock-shaft, an operative connection between said rotary shaft and the jog-bar for imparting to the latter endwise reciprocations, and a sliding connection between said jog-bar and the looper-carrier, from which the looper derives its sidewise movements longitudinally of said rock-shaft.

3. In a sewing machine, the combination with the frame comprising a laterally closed work-supporting horn, of a reciprocating needle, a looper-supporting rock-shaft mounted within and longitudinally of said work-supporting horn, a looper cooperating with said needle, a looper-carrier mounted upon and circularly movable with said rock-shaft but movable longitudinally in relation to the same, a jog-bar also mounted within said work-supporting horn substantially parallel with said rock-shaft, a rotary shaft journaled within and longitudinally of the work-supporting horn, an operative connection between said rotary shaft and said jog-bar for imparting to the latter endwise reciprocations, and an operative connection between said jog-bar and the looper-carrier for imparting endwise movements to the looper.

4. In a sewing machine, the combination with a needle, of a looper having an eyed blade, a looper-carrier upon which the same is mounted, a rock-shaft, a support for said carrier fixed upon said rock-shaft and upon which said carrier is fitted to derive from the rock-shaft rocking movements endwise of the looper-blade and to receive sidewise movements transversely of the looper-blade, a jog-bar parallel with the rock-shaft, means for imparting endwise reciprocations to said jog-bar, a peripherally grooved sliding collar fitted upon the looper-carrier support, a yoke fixed upon said jog-bar and entering the groove of said collar, and a connection intermediate the sliding collar and the looper-carrier for imparting sidewise movements to the latter.

5. In a sewing machine, the combination with a needle, of a looper having an eyed blade, a looper-carrier upon which the same is mounted, a rock-shaft, a supporting stud for said carrier fixed upon said rock-shaft, a transverse fulcrum-pin mounted in said supporting stud and upon which said looper-carrier is mounted, a jog-bar parallel with the rock-shaft, means for imparting end-

wise reciprocations to said jog-bar, a peripherally grooved sliding collar fitted upon the looper-carrier supporting stud, a yoke fixed upon said jog-bar and entering the
5 groove of said collar, and a pivotal connection intermediate the sliding collar and the looper-carrier for imparting rocking movements to the latter upon its fulcrum-pin.

In testimony whereof, I have signed my name to this specification, in the presence of 10 two subscribing witnesses.

GEORGE E. MOLYNEUX.

Witnesses:

HENRY J. MILLER,
H. A. KORNEMANN, JR.

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