J. P. WEIS.

LOOPER MECHANISM FOR SEWING MACHINES.

APPLICATION FILED APR. 10, 1909.

990,414. Patented Apr. 25, 1911.

Fig. 1

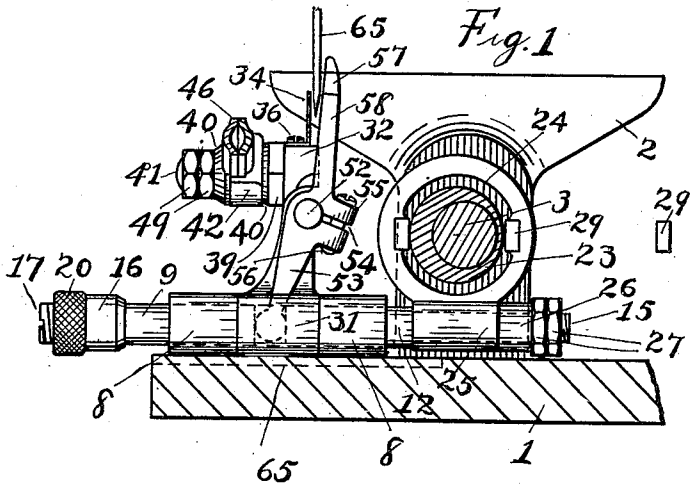


Fig. 4

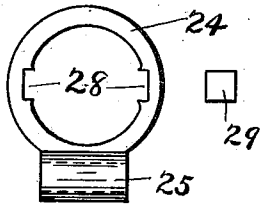


Fig. 2

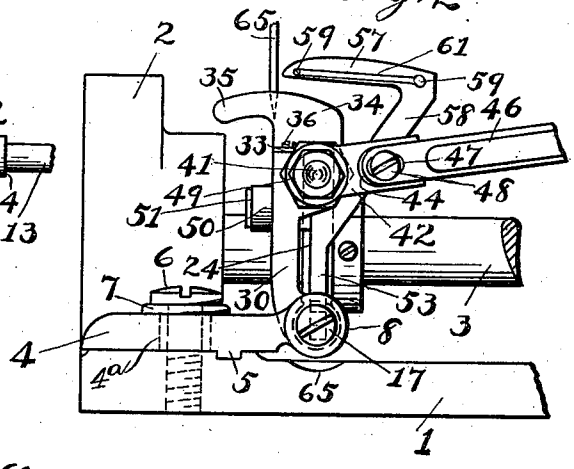


Fig. 3

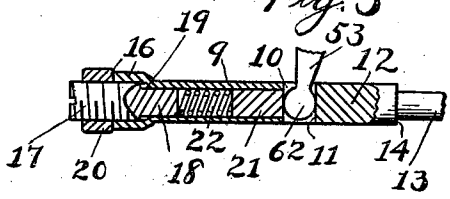


Fig. 5

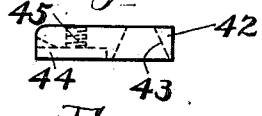


Fig. 6

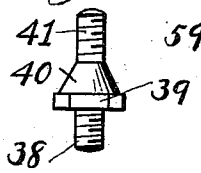


Fig. 7

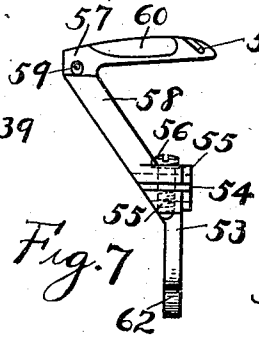


Fig. 8

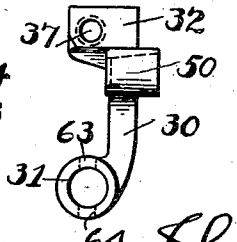


Fig. 9



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LOOPER MECHANISM FOR SEWING-MACHINES.

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To all whom it may concern:

Be it known that I, JOHN P. WEIS, a citizen of the United States, residing in Nyack, county of Rockland, and State of New York, have invented a new and useful Improvement in Looper Mechanisms for Sewing-Machines, of which the following is a description.

This invention relates to sewing machines, and more particularly to the looper mechanism thereof, and has for its object to provide simplified features of construction which give positiveness to the movements of the looper, ease of action and, in many ways, improve and simplify the construction.

My invention consists in the parts, features, elements and combinations of elements as hereinafter described.

In order that my invention may be clearly understood, I have provided a sheet of drawings wherein:

Figure 1 shows so much of a sewing machine as is deemed necessary to illustrate the application of my invention, the bed-plate and driving-shaft of the machine being shown in transverse section, as is also the looper-rod, and the looper mechanism being shown in rear end elevation; Fig. 2 is a front end elevation of Fig. 1; Fig. 3 is a sectional detail showing the construction of the looper-shaft; Fig. 4 is a side elevation of the eccentric strap, which gives to the looper its sidewise movement, the bearing-blocks being shown separate and one in end and the other in front elevation; Fig. 5 is a top plan of the looper-rod socket; Fig. 6 is a plan of the journal-pin of the looper-rod socket; Fig. 7 is a rear elevation of the looper; Fig. 8 is a rear elevation of the looper-support; and Fig. 9 is a plan of the looper pivot-pin.

Referring to the drawings, the numeral 1 indicates the bed-plate of the machine, from which, at its forward end, rises the vertical standard 2, which helps to support the cloth-plate and in which the forward end of the driving-shaft 3 is journaled. At its forward end, in front of the standard 2, the bed-plate 1 has secured to it a bracket 4, provided with a tongue 5, which enters a groove of corresponding form in the bed-plate 1, extending transversely thereof, this feature having the effect of enabling the bracket to be quickly placed and preventing the same from being twisted or moved out of proper operative position when once properly set. To properly set the bracket in position so as to obtain the proper relation of looper and needle, the bracket 4, is provided with a slot 4^a, extending parallel with the tongue 5, so as to permit the bracket to be moved transversely of the bed-plate 1. The effect of this adjustment will be presently described. The bracket 4 is secured to the bed-plate by means of a screw 6, the shank of which passes through the slot 4^a of said bracket into the bed-plate, as shown by dotted lines in Fig. 2. If desired, a washer 7 may be placed under the head of the screw to afford a greater clamping surface. The bracket 4 is provided with two separated, rearwardly-extending, tubular bearings 8, affording bearings for a short shaft, one portion 9 of which, see Fig. 3, is tubular and the passage through which terminates in a transverse slot 10, one wall 11 of which slot is solid, being the end of the solid portion 12 of said shaft beyond which said shaft is reduced in size, as at 13, to provide the shoulder 14, and the outer end of which reduced portion is screw-threaded at 15. The end of the tubular portion 9 of the shaft is enlarged as at 16, to provide a socket for a screw 17, the forward end 18 of which is reduced in size and made smooth so as to operate in the bore or passage of the part 9 of the shaft. The movement of the screw 17, within the bore of the shaft, is limited by the internal shoulder 19 of the socket-portion 16 of the shaft, said shoulder coöperating with a like shoulder at the junction of the reduced portion 18 of the screw with its body-portion 17. A jam-nut 20 is applied to the outer end of the screw to engage the end of the socket 16 to hold said screw from accidental turning. Within the bore of the tubular portion 9 of the shaft is set a short, smooth plug 21, the inner end of which affords a wall of the transverse slot 10, opposite the wall 11; and between the outer end of said plug 21 and the inner end of the screw 17, a space is provided within which operates a coiled-spring 22, the normal tendency of which is to force the said plug 21 into the transverse slot 10, and the stress of which spring can be regulated by the screw 17. Obviously, the plug 21 may yield under the tension of the spring 22. The driving-shaft 3 has fixed upon it, in any suitable manner, an eccentric 23, surrounded by a circular yoke or strap 24, provided on its periphery with a sleeve 25, for

the reception of the reduced portion 13 of the looper-shaft, the outer end of said sleeve 25 engaging the shoulder 14 and being held against it by a collar 26, on said reduced portion 13 of the shaft, which collar in turn is held in place by the holding and jam nuts 27, secured to the inner end of said shaft. The sleeve 25 is not bound tightly against the shoulder 14, but is allowed to have play so that said shaft may have freedom of axial movement therein to prevent torsion and twisting of said shaft and binding of the parts. The eccentric strap is grooved at opposite sides, as at 28, in which grooves are set the blocks 29, against which operates the periphery of the eccentric 23, so as to take the wear thereof and thus save the yoke or strap 24, the blocks 29 being held in place by friction only.

The looper-support 30 is provided at its lower end with the tubular journal-bearing 31, through which the looper-shaft passes and on which latter the looper-support journals and has oscillating movements. The upper end of the looper-support is provided with an angular head 32, the top surface of which is flattened for the reception of the shank-portion 33 of a needle-guard 34, the forward end of which is elongated and extended forwardly in the form of a finger 35. The shank of this guard is secured to the head of the looper-support by means of one or more screws 36. The head 32 of the looper-support is also provided with a transverse screw-threaded aperture 37, for the reception of screw-threaded end 38 of a journal-pin, the body of which is formed into an angular head 39, the rear face of which binds tightly against the front face of the head 32 of the looper-support. Forward of the head 39, the journal-pin is made conical as at 40, and then extended into a cylindrical screw-threaded portion 41. Upon the conical portion of the journal-pin is set the looper-rod socket-piece 42, the same being formed with a conical aperture 43, corresponding to the cone 40 of the said journal-pin, and said socket-piece being also provided with a surface-groove 44, extending to the forward end thereof; and this portion of the socket-piece is also provided with a transverse screw-threaded aperture 45. In the groove 44 is set the forward end of the looper-rod 46, said forward end being provided with an elongated slot 47, through which passes the clamping-screw 48, into the screw-threaded aperture 45 of said socket-piece 42. This provides a simplified driving connection between the looper-support and looper-rod and permits of the adjustment of the latter upon the socket-piece for changing the throw of the looper-support, and also provides a means by which the looper-rod can be, through its socket-piece 42, properly clamped to the head of the looper-support with capability of adjustment to compensate for wear, since the screw-threaded end 41 of the journal-pin receives thereon the holding and jam nuts 49, which hold the parts properly together.

The looper-support, below its head 32, is provided with the journal-bearing 50, the aperture through which is tapered to correspond with the conical end 51 of the looper journal-pin, the other end of which is formed cylindrical, as at 52, and projects rearwardly from said journal-bearing 50. Upon the cylindrical portion 52 of the journal-pin is clamped the looper, having the depending-lug 53, the clamp being formed by splitting an enlarged portion of the looper, as at 54, which split terminates in a cylindrical socket for the reception of the cylindrical portion 52 of the pin. The two jaws 55 of the clamp are brought together by means of the screw 56, so as to cause the walls of the socket to firmly engage the cylindrical portion 52 of the pin. In this manner, the looper is firmly secured in place with ability to rock on the looper-support and the conical formation of the head 51 and corresponding aperture in the bearing 50 provide means by which wear may be compensated for, and at the same time afford a substantial and firm bearing for the looper upon which it may have its lateral vibratory movement. The looper, at its upper end, is provided with the loop-taking portion 57, extended laterally from the shank 58, the leg, socket, shank and looper, in this instance of my invention being formed integral, this being a simple and cheap mode of construction. As shown, the shank of the looper is offset laterally from the leg and socket, and the looper-body 57 extends parallel with the axis on which it oscillates and overhangs said axis. The looper-body 57 is provided with the thread-eyes 59, at heel and toe, and on its back is provided with the beveled or scooped out portion 60, to prevent the needle, in its descent, from striking the same, while, on its face, said looper-body is provided with the thread-groove 61, connecting the thread-eyes 59. The lower end of the looper-leg is formed into a cylindrical head 62, which passes through a vertical slot 63, in the top of the journal-bearing 31 of the looper-support, the said slot 63 permitting the head 62 to pass into and operate in the bore of its journal 31, and in the slot 10 in the looper-shaft, the periphery of said head 62 engaging, on its sides, the wall 11 of the solid part 12 of the looper-shaft, and the inner end of the plug 21. Directly below the vertical slot 63, in the bearing 31, is formed a like vertical slot 64.

The foregoing sets forth the details of structure; but, it remains to be stated that the looper-support journals upon, and has movement around, the looper-shaft as an

axis, obtaining its oscillatory movement through the medium of the looper-rod 46, and said looper-support is confined to such oscillatory movement which is longitudinal of the driving-shaft. The needle-guard 34, carried on the head 32 of the looper-support, in consequence, is confined to longitudinal reciprocations imparted thereto by the looper-support. The looper has the resultant of four motions, viz., a longitudinal reciprocation or oscillation imparted to it by the looper-support, and a lateral vibration imparted to it by the looper-shaft through the medium of the eccentric 23, on the driving-shaft 3, the eccentric-strap surrounding the same, which latter is connected, as previously described, to said looper-shaft, the said eccentric 23 thus imparting longitudinal reciprocations to said looper-shaft, which also receives a slight axial vibratory movement through the medium of the looper-leg 53, the head of which operates in the transverse slot 10 thereof. This axial oscillation results from the movement given to the looper by the looper-support. The resultant movement of the looper, above referred to, imparted by the proper timing of the eccentric and the looper-rod is a forward movement behind the needle 65 to take the loop thrown out thereby during its retrograde movement, a sidewise movement toward the front of the machine substantially at the limit of its forward movement, a rearward movement in front of the needle to permit the needle to descend through a loop of looper-thread carried around, and a lateral movement toward the rear of the machine into position to repeat its forward loop-taking movement. The bevel 60, on the back of the looper, permits the close coöperation of the needle with the latter and prevents both the needle and the looper from being injured or broken. The needle-guard 34 is arranged to travel in front of the needle and prevents the latter from being deflected aside and operates to maintain the needle in its proper path so that the looper will infallibly engage the loop of needle-thread. To enable the looper to be adjusted properly with reference to the needle, the bracket 4, as previously stated, is rendered adjustable transversely of the machine; that is to say, by moving the bracket in, or to the right in Fig. 1, the looper can be made to operate farther from the needle in its forward loop-taking movement, and by moving the bracket out, or to the left in Fig. 1, the needle can be made to operate farther from the back of the looper and, under certain adjustments run down the bevel 60 of the latter as said needle descends. The proper adjustment is to set the bracket so that the looper, on its forward movement, will pass close to, without touching, the needle and on its backward movement will be in position such that the needle, on its downward movement, will just touch the bevel 60 and slide between the looper and its thread to enchain the latter with the needle-thread. In the rapid operation of the machine, the bearing 25, the collar 26 and the shoulder 14 of the looper-shaft may become worn, in which case the nuts 27 can be adjusted to compensate therefor. Likewise, the head 62 of the looper-carrier may become worn, or even broken, in which case the plug 21, impelled by the spring 22, will properly coöperate and compensate for the wear or accident, and the spring will always maintain its control upon the plug 21 by a proper adjustment of the screw 17. Furthermore, the spring-pressed plug 21 prevents all possibility of rattling of the head 62 in the slot 10, this being an important factor in the operation of the machine, since it prevents wear, and it is a great desideratum to reduce noise in the running of the machine. The plug 21, of course, can be renewed at any time and wear on the wall 11 is compensated for by the plug and avoids the necessity of renewing the shaft in case of such wear. As previously stated, the looper-body, shank, leg and socket, made all in one piece, is a simple and cheap construction and its mode of connection to the looper-support is effective, positive and enables the parts to be quickly detached and assembled when desired. By providing the slot 64, in the journal 31 of the looper-support, directly under the head 62 of the looper-leg 53, a means is provided by which lint, dust, grit, or other friction-producing means, or any impediment, can be quickly ejected from the bearing, since the parts in movement will grind the lint and dust particles, which will readily pass through the said slot 64, and can be quickly cleaned away because of the depression 65 formed in the bed-plate 1, directly under the said bearing.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A looper mechanism for sewing machines comprising a longitudinally-reciprocating and laterally-vibrating looper; means for imparting the longitudinal reciprocations; and means for imparting the lateral vibrations, said last named means comprising a longitudinally-reciprocating shaft, one end of which is reduced to provide a shoulder and the outer end of which reduced portion is screw-threaded; an eccentric-strap provided with a tubular bearing surrounding the said reduced portion and one end of which engages said shoulder; a collar engaging the other end of said bearing; means for holding the collar on the shaft in engagement with said bearing; and means for actuating said strap to impart longitudinal reciprocations to said shaft.

2. A looper mechanism for sewing machines comprising a longitudinally-reciprocating and laterally-vibrating looper; means for imparting the longitudinal reciprocations to said looper; and means for imparting the lateral vibrations to said looper, said last named means comprising a longitudinally-reciprocating shaft one portion of which is hollow, a plug set in said shaft, a spring engaging one end of said plug, and means engaging the spring for adjusting the tension thereof.

3. A looper mechanism for sewing machines comprising a looper; and means for actuating the same, said means including a longitudinally-reciprocating shaft provided with a transverse slot; the looper being provided with a leg having at its lower end a rounded head which operates in the slot of said shaft; a solid wall engaging one side of the said head; and a yielding wall engaging the other side of said head.

4. A looper mechanism for sewing machines comprising a looper-support; a shaft upon which said support is journaled; a tubular bearing carried by said support having a conical bore therein; a pin having a conical end journaled in said bearing, said pin having a cylindrical portion; a looper; means for clamping the same upon the cylindrical end of said pin; and means for actuating the looper-support.

5. A looper mechanism for sewing machines comprising a looper-support; a journal-bearing for said support; a looper-rod; and a connection between said rod and support comprising a pin having a screw-threaded portion passing into said support, said pin having a conical portion terminating in a screw-threaded cylinder, a socket-piece having a conical aperture therethrough for coöperation with the conical portion of the pin, means coöperating with said cylindrical end for clamping the socket-piece in place, and means for connecting the looper-rod and said socket-piece.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN P. WEIS.

Witnesses:
FRITZ BENDER,
OSCAR DE VOE.

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