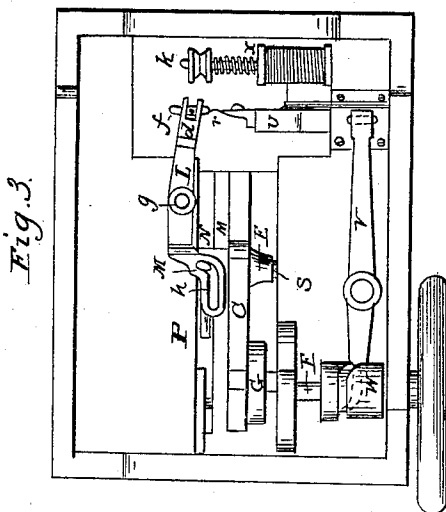
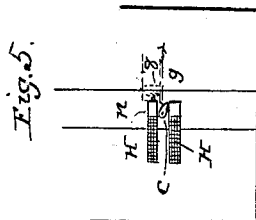
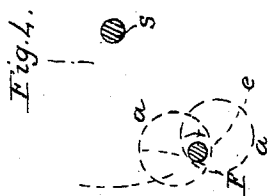
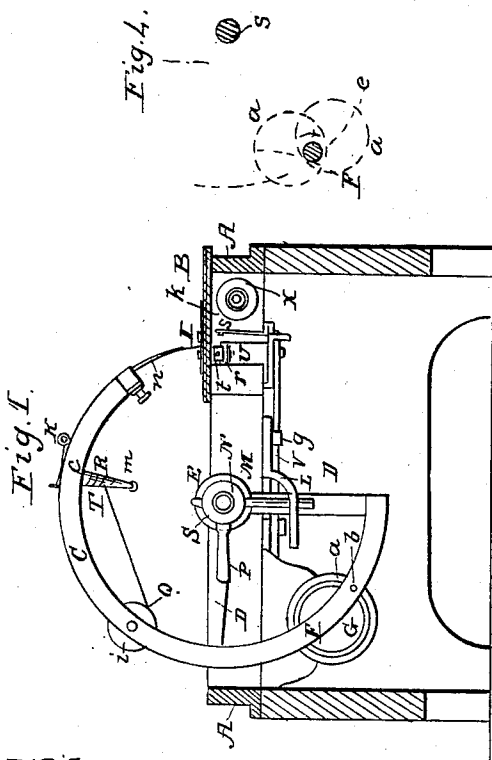
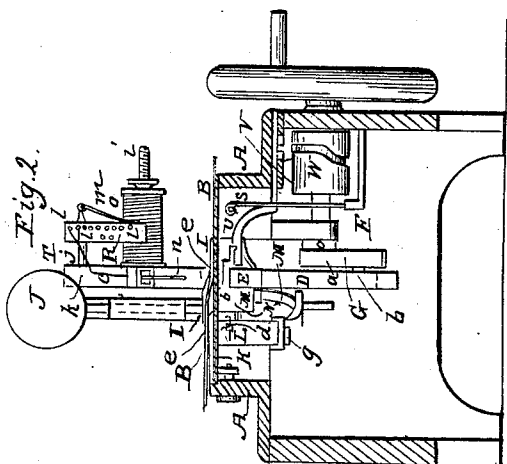


J. C. SILVEY.  
Sewing Machine.

No. 25,471.

Patented Sept. 13, 1859.



Witnesses:  
J. J. Ott  
J. E. Ott

Inventor:  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 25,471, dated September 13, 1859.

*To all whom it may concern:*

Be it known that I, JOSEPH C. SILVY, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of a machine with my improvements, taken in a plane at right angles to the direction of the feed movement. Fig. 2 is a vertical section of the same in a plane passing close to the needle in a plane parallel with the feed movement. Fig. 3 is an inverted plan of the same. Fig. 4 is a diagram illustrating the mode of operating the needle-arm. Fig. 5 is a plan of part of the feed-table, showing the arrangement of the needle-slot.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists, first, in a certain mode of applying an eccentric, in combination with the needle-arm, for the purpose of driving the needle, whereby the perforating-needle is caused to have a slower motion in perforating the cloth and a quicker motion on its return to take up the stitch, and to have its motion almost suspended for a considerable time while in the cloth.

It consists, secondly, in the construction or arrangement of that portion of the surface of the feed-table which surrounds a feeding-dog working through the said table, and below or at the back of the cloth or material being sewed in such manner as to form an inclined plane or occupy an inclined position relatively to the plane or direction of the movement of the roughened surface of the feeding-dog, whereby the said dog is made to operate effectively with only a simple reciprocating motion.

It consists, thirdly, in a novel combination of springs attached to the needle-arm for the purpose of controlling the thread between the eye of the perforating-needle and the spool from which the thread is supplied to the said needle and for regulating the tightness of the said thread in the stitch.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the bed-plate, by which all the working parts of the machine are supported.

C D E is the needle-arm, constructed like a portion of a wheel and having its hub E secured upon or cast with a rock-shaft, S, arranged to work between centers or in bearings in the bed-plate A. The perforating eye-pointed needle *n* carried by the said arm is curved in the form of an arc concentric with the rock-shaft S.

F is the driving-shaft of the machine, fitted to suitable bearings below the bed-plate and having its axis parallel with the axis of the rock-shaft S.

G is the eccentric carried by the said driving-shaft for the purpose of operating the needle-arm, said eccentric having a circular groove, *a*, in the face, to receive a pin, *b*, attached to one side of the needle-arm, which is arranged close to the said eccentric, and the center of the shaft F being arranged some distance within a prolongation of the arc described by the oscillation of the pin *b* with the needle-arm, as is illustrated in the diagram Fig. 4, where the said arc *c* is represented by a red line. The revolution of the eccentric G causes the needle-arm to derive the necessary oscillating motion to operate the needle through the action of the groove *a* of the eccentric upon the pin *b* on the needle-arm, and the arrangement of the centers of the shaft F within the arc described by the pin *b* (illustrated in Fig. 1) causes the downward movement of the needle to require to effect it considerably more than half a revolution of the eccentric and the upward movement thereof a corresponding less portion than one-half of such revolution, as is illustrated by the two positions of the eccentric represented in the diagram Fig. 4, where the eccentric and pin *b* are represented in the positions they occupy at the extremities of the stroke of the needle, the upper position of the eccentric being that which it occupies at the termination of the upward stroke of the needle, and the arrow shown in the diagram indicating the direction of the revolution of the eccentric. The action of the so-applied eccentric on the needle-arm is such that the eccentric makes a very considerably portion of its revolution while the needle remains nearly stationary in

its lowest position protruded through the cloth to gain time for the entrance into the loop of the needle-thread by the device which carries the locking-thread. This mode of applying the eccentric, in combination with the needle-arm, constitutes a very simple method of producing a most effective movement of the needle.

B is the feed plate or table upon which the cloth or other material to be sewed is laid.

H is the toothed or roughened feeding-dog, by which the material is moved, said dog working through a slot in the feed-table B.

I is the pressure-pad for confining the material to the surface of the feed-dog and holding it down as the needle is drawn out, said pad being made to produce the requisite pressure upon the cloth by means of a weight, J, at the top of its stem.

The general surface of the feed-table is horizontal and perpendicular to the plane of motion of the needle; but the part through which the needle passes, and through which the feeding-dog works, is formed with an inclined plane, *ee*, (see Fig. 2,) which crosses the plane of motion of the needle obliquely with a descent in the direction of the feeding movement of the dog, which is indicated by an arrow in the last-named figure. The feed-dog H is fitted to slide between the plate B and a plate, K, arranged below and parallel with the said plate B, and has its roughened or toothed surface inclined to correspond with the inclined plane *ee*, and hence by its movement back and forth in the direction of the arrow marked upon it in Fig. 2, and vice versa, it is caused to be alternately protruded above and retracted within the surface of the inclined plane *ee*, its protrusion taking place while moving in the direction to feed, and its retraction within the plate taking place during its return. By providing an inclined plane on the feed-plate in this manner the feeding-dog is caused to release itself from the cloth as its returning movement commences, while having only a simple reciprocating motion, and the complicated mechanism employed to effect the release of the feed-dog from the cloth to permit its return without dragging the cloth is dispensed with. The pressure-pad has its face inclined in a similar manner to fit the inclined plane *ee* and the inclined face of the feeding-dog. The feeding-dog is furnished on its under side with a pin, *d*, which passes through a slot, *f*, in the plate K, and enters the forked end of one arm of a horizontal lever, L, which works on a fixed pin, *g*, secured below the bed-plate A, and whose other arm contains a curved slot, *h*, receiving an arm, M, attached to the rock-shaft S of the needle-arm. The vibration of the arm M with the needle-arm gives the lever L the movement necessary to operate the feeding-dog.

To provide for varying the feed movement to vary the length of the stitch, the hub M' of the arm M is fitted loosely to the shaft and clamped against the needle-arm by means of

a nut, N, which screws onto the rock-shaft S. By unscrewing this nut, for which purpose it is furnished with a handle, P, which can be reached through a hole in the bed-plate, the arm M can be shifted so as to operate more or less in the curve of the slot *h*, and thus vary the stroke of the lever L, and consequently that of the feeding-dog.

Q is the spool from which the thread represented in red color is supplied to the perforating-needle N, working on a pin, *i*, secured in the back part of the needle-arm.

R T is a thin V-shaped or two-leaved spring attached at the extremity of one leaf by a stem, *j*, to one side of the needle-arm, between the spool Q and the needle. This spring has in each leaf a number of holes, *ll*, through which the thread passes on its way from the spool Q to a fixed guide, *k*, on the needle-bar, which guide conducts it to the needle *n*.

*m* is another spring attached at its lower end to the spring R T, at the bend or junction of its two leaves, and arranged to work laterally to or between the leaves of the spring R T. This spring has an eye at its upper extremity, (see Fig. 2,) through which the thread passes once in passing from one leaf to the other of the spring R T.

The operations of the above-described springs are as follows: When the needle is rising to draw up the stitch, the friction produced upon the thread by passing through the holes *ll* prevents any thread being drawn off from the spool, and the tension produced on the thread between the needle and the spring R T causes the free leaf T of the said spring to be drawn toward the leaf R and the spring *m* to be drawn toward or into the opening between the leaves of the spring R T, and the springs, while keeping the thread tight between themselves and the needle, yield up as much of what is laced through their holes as is necessary to permit the rise of the needle. As the needle descends again the thread, which would be left slack below its eye, is drawn up by the opening of the leaves of the spring R T and the lateral outward movement of the spring *m*. The opening of the leaves R T at the same time causes the quantity of thread requisite for the next stitch to be drawn off from the spool Q, which is arranged to work with very slight or no more than an accidental friction. The principal duty of the spring *m*, which is made very light, is to continue drawing up the slack of the thread, if any remains between the spring R T and the needle after the full opening of the latter spring has been completed. This combination of springs, it will be seen, effects in an entirely automatic manner the complete control of the thread between the needle and the spool, and causes the stitch to be drawn up tight without the use of any mechanical agency than that of the thread itself.

*r*, Figs. 1, 2, 3, and 5, is the non-perforating eye-pointed needle, which carries the locking-thread, arranged below the plates B K,

and working parallel with the feed-motion, said needle being straight on the side which works next the perforating-needle *n*. This needle is attached to a slide, U, working in suitable guides, and deriving motion from a horizontal lever, V, operated by a cam, W, on the main shaft F.

X is the spool from which the thread represented in blue color is supplied to the needle *r*, the said thread passing from the spool through an elastic guide, *s*, Fig. 3, and from thence through an eye, 6, in the head of the needle *r*, as indicated in Fig. 1 and in dotted lines in Fig. 3, and from thence along a groove in the back of the needle and through the eye 7, (see Fig. 2,) near the point thereof.

*t*, Figs. 1, 2, and 5; is the needle-slot in the feed-plate B, said slot having the edge 8, next to which works that side of the perforating-needle *n* on which the thread issues from the eye, so obliquely arranged as to cross the plane of the line of sewing on that side of the needle from which the cloth is moved by the feeding operation, as is illustrated in Fig. 5, where the direction of the feed is indicated by an arrow. The point of the perforating-needle *n* is in line with the side from which the thread issues, as shown in Fig. 1, which side works next the needle *r*, and next the oblique edge 8 of the slot, the bevel which forms the said point being made from the opposite side.

By the above-described oblique arrangement of the edge 8 of the slot the portion 9 (see Fig. 5) of the locking-thread remaining between the eye 7 of the needle *r* and the seam on the completion of each stitch is caused to be drawn by the succeeding feed movement into contact with the said edge, and so carried to a position indicated in Fig. 5 that the perforating-needle will pass between it and the

needle *r*, and the said portion 9 of the thread will be caused to be carried round the perforating-needle *n* in the form of a loop by the retraction of the needle *r*, and by this means the curvature and lateral movement of the needle *r* are dispensed with.

I do not claim, broadly, giving the perforating-needle a quicker movement during its withdrawal from than during its perforation of the material being sewed, nor effecting suspension of its movement. Neither do I claim the employment of springs to produce friction and tension upon the thread of the perforating-needle between the seam and the spool from which the said thread is supplied; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. Operating the needle-arm by means of a grooved eccentric, G, and a pin, *b*, on the needle-arm, arranged relatively to each other, to operate in the manner herein described, and illustrated in Fig. 4.

2. The construction or arrangement of the portion of the feed-plate or table B through which the needle and the feeding-dog work to form an inclined plane relatively to the direction of the movement of the feeding-dog, substantially as herein described, and illustrated in Fig. 2, for the purpose set forth.

3. The combination of springs R, T, and *m*, applied in the manner described to effect the tightening of the stitch and otherwise control the thread between the perforating-needle and its spool by the automatic operation herein explained.

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Witnesses:

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S. E. OTT.