

S. L. OTIS.

Machine for Embroidering the Tops of Stockings, &c.

No. 221,093.

Patented Oct. 28, 1879.

fig. 1

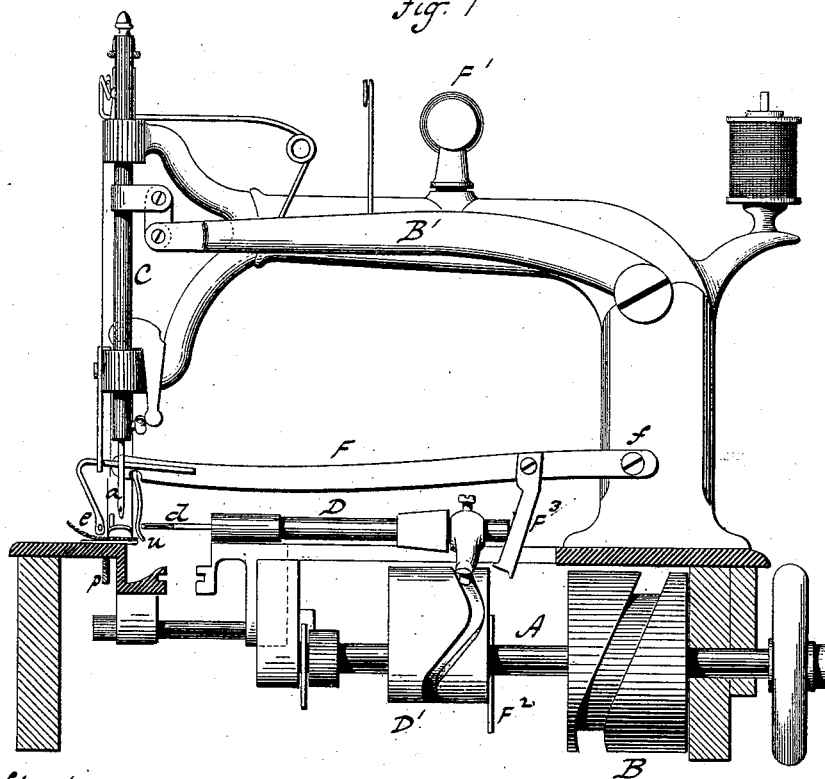


fig. 4

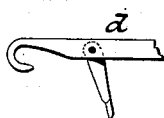
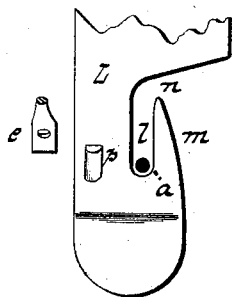
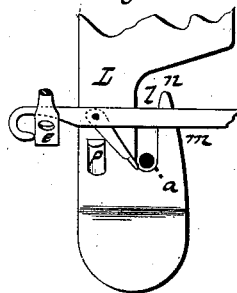


fig. 5



Witnesses.

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fig. 3.

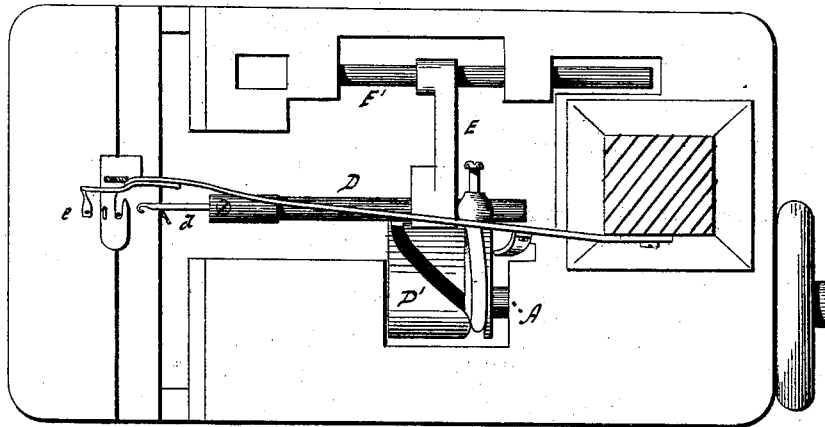


fig. 2.

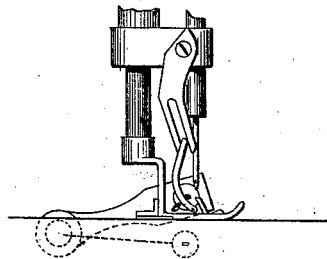


fig. 6.

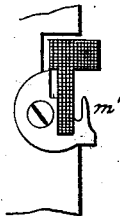


fig. 7.



fig. 8.



fig. 9.



fig. 10.



fig. 11.



fig. 12.



fig. 13.



fig. 14.



Witnesses.

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UNITED STATES PATENT OFFICE

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IMPROVEMENT IN MACHINES FOR EMBROIDERING THE TOPS OF STOCKINGS, &c.

Specification forming part of Letters Patent No. **221,093**, dated October 23, 1879; application filed
June 9, 1879.

To all whom it may concern:

Be it known that I, SAMUEL L. OTIS, of Birmingham, in the county of New Haven and State of Connecticut, have invented a new Improvement in Machines for Embroidering the Tops of Stockings, &c.; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a partly-sectional side view of an embroidering-machine with my improvements applied thereto; Fig. 2, a partial end view of the same; Fig. 3, a top view of said machine and improvements; Figs. 4, 5, and 6, detached views of various parts; and Figs. 7 to 14, inclusive, diagrams to illustrate the operation of making the stitch.

This invention relates to an improvement in sewing-machines for embroidering the edges of fabrics, with special reference to the tops of stockings, but applicable to other uses, and also to the construction of a machine for producing the stitch; and it consists in the construction hereinafter described, and particularly recited in the claim.

The machine shown in the accompanying illustration, and to which the attachments are made, is or may be substantially any of the well-known vertical-needle machines, and in which A is the driving-shaft; B, the cam which works the needle-arm B'; C, the vertical needle-spindle, in the lower end of which is an eye-pointed needle, the needle reciprocating up and down through the work-plate in the usual manner.

The usual feed is applied; but shuttle or similar interlacing mechanism below is dispensed with.

D is a second needle-spindle, arranged to work in a plane at right angles to the plane of the spindle C, and carries a latch-needle, *d*. A reciprocating movement is imparted to the spindle D by a cam, D', on the driving-shaft, and so as to carry the needle *d* back and forth across the vertical plane of and near the vertical needle *a*. The spindle D is arranged in an arm, E, extending from a sliding rod, E', at

one side, and so that, turning on the said rod E' as a center, the spindle may be raised or lowered, so as to receive a vertical reciprocating movement from the surface-cam D', and the groove in the cam D' is of a shape to impart two full longitudinal reciprocating movements to the spindle D to each of the full reciprocating movements of the vertical needle—that is to say, the spindle D moves forward and backward while the vertical needle is above the work, and again forward and backward while the vertical needle is below the work. In the first forward-and-backward movement the needle *d* passes above the work-plate, and in the second it passes below the work-plate.

The vertical reciprocation before referred to as produced by the cam D' presents the spindle D into the respective positions to be thus moved. (Seen in Fig. 2.) The vertical needle is provided with a thread from above in the usual manner for vertical-needle sewing-machines.

e is a second thread-carrier, consisting of an eye in the end of an arm, F, hung at the rear, as at *f*, the eye *e* being outside the path of the needle, as seen in Fig. 1. The second thread is conveyed to this eye from a spool, F', or other convenient point above.

The presser-foot is shown enlarged in Figs. 4 and 5, and is constructed with a slot, *h*, in line with the path of the feed, and through the front end of which the needle *a* works. This slot turns inward, as at *n*, and so as to form a point or horn, *m*, over which a stitch is made on the top of the work. Below the presser-foot the work-plate is of substantially the same form as seen in Fig. 6, *m'* denoting the hook or horn, and around which the stitch is made on the under side of the work.

The operation of the machine is as follows: The vertical needle carrying one thread passes through the work *w*, as seen in Fig. 7, carrying the thread in its eye *x* in the usual manner for vertical-needle sewing-machines. Then the latch-needle *d* passes beneath the work, so as to engage one side of the needle-loop, and then, moving backward, as in Fig. 8, draws the loop of needle-thread with it, then rises, as in Fig. 9, still carrying the needle-loop. At

the same time the needle itself has risen. Then the needle *d* advances through the needle-thread loop *s*, as seen in Fig. 10, and takes the second thread, which runs through the eye *e* of the second thread-carrier, the eye being in its most elevated position, and to which it has been raised by the cam *F*² on the driving-shaft working against an arm, *F*³, on the thread-carrier lever *F*. The needle *d* now returns, taking with it the second thread, and also the needle-loop *s*, as seen in Fig. 11, and, casting off the needle-loop, it then drops, carrying with it the loop *t* of second thread. At the same time the vertical needle passes through the work as before, and the needle *d*, (see Fig. 12,) running through the loop *t*, again takes the needle-thread and draws it out, re-engaging the loop *t* of second thread, and rises with both loops engaged, as seen in Fig. 13; then goes forward again through both loops and takes the second thread, as in Fig. 10, returning, as in Fig. 11, with the loop of second thread, casts off the two loops, and then proceeds as before. The loop of second thread being carried below and engaged with loops of first thread, the two are brought up and a new loop of second thread drawn through them, and the two loops cast onto this succeeding loop of second thread, and so on. This operation forms a chain of second thread on the loops of first thread, and so that the chain will lie at the edge of the work, and the first thread

drawn from the perforations to the edge and engaged with the loops, as seen in Fig. 14, broken lines denoting the first thread, and solid lines the second thread or chain. By using threads of different colors a variety of ornamentation may be produced.

u is the cast-off, and *p* the latch-opener, applied and arranged to operate in the usual manner of latches and cast-offs in latch-needle machines.

The horns *m m'* are used to support the work and stitch, which is made around them, and so that the stitches will pass therefrom as the work progresses, substantially as in other machines for this purpose.

I claim—

The combination of the eye-pointed needle carrying one thread, and mechanism for imparting to said needle a vertical reciprocating movement, and a second thread-carrier above the work, with a latch-needle and mechanism for imparting a reciprocating movement to said latch-needle in a plane across the path of the vertical needle, and with mechanism to impart to the said latch-needle an up-and-down movement, whereby the reciprocating movement will be made alternately above and below the work, substantially as described.

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Witnesses:

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