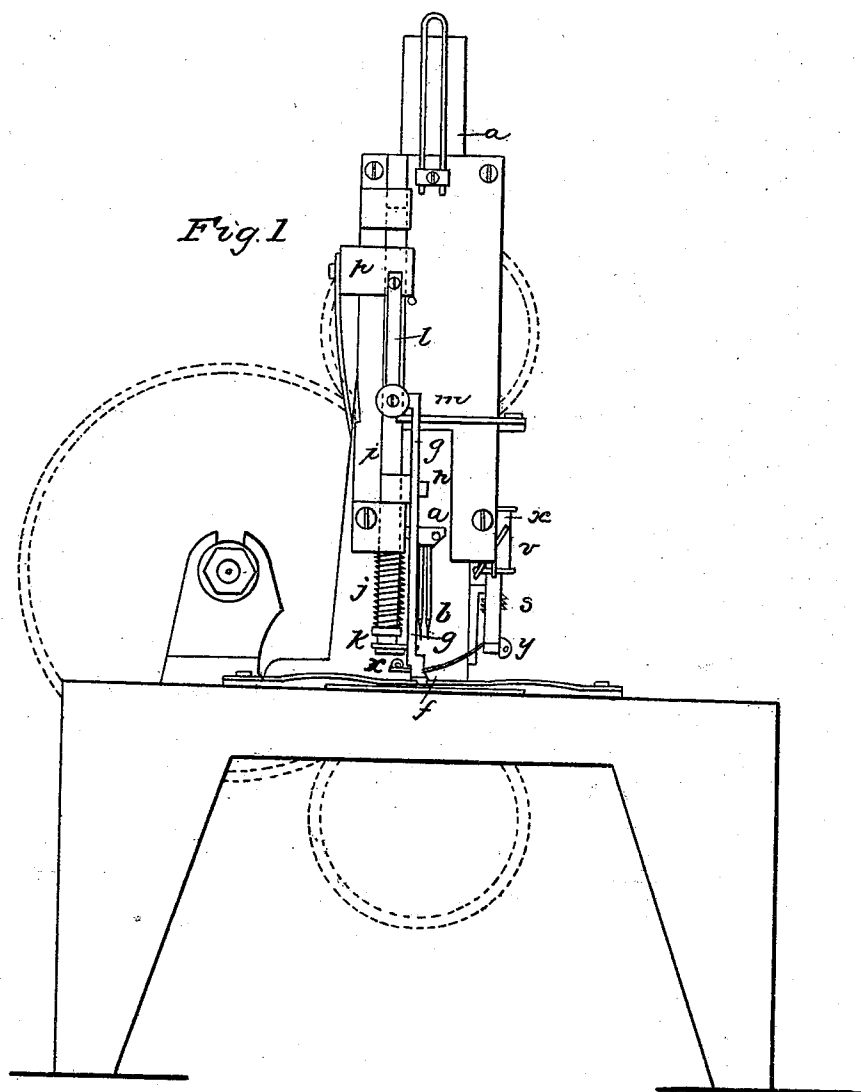


I. M. SINGER.  
Sewing Machine.

No. 13,662.

Patented Oct. 9, 1855.



Witnesses  
W. B. Bishop  
Andrew De Laey

Inventor  
Isaac M. Singer



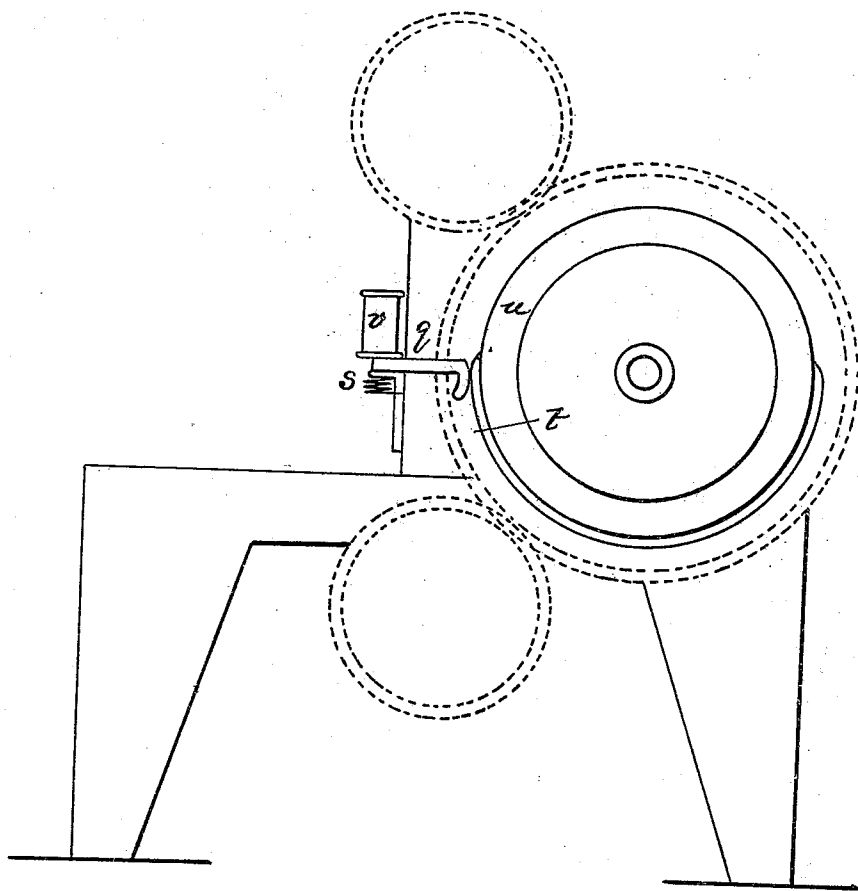
I. M. SINGER.  
Sewing Machine.

4 Sheets—Sheet 3.

No. 13,662.

Patented Oct. 9, 1855.

*Fig. 3*



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I. M. SINGER.  
Sewing Machine.

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Fig 4

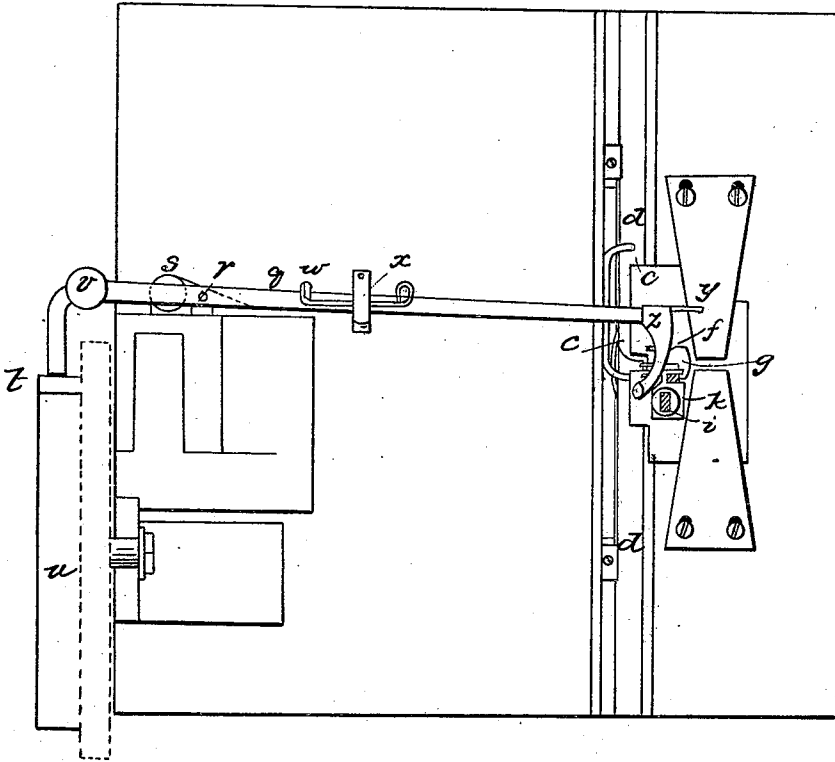


Fig. 6



Fig. 5



Fig. 7

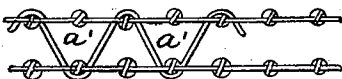
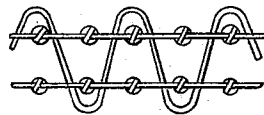


Fig. 8



witnesses  
Wm. H. Birt  
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# UNITED STATES PATENT OFFICE.

ISAAC M. SINGER, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **13,662**, dated October 9, 1855.

*To all whom it may concern:*

Be it known that I, ISAAC M. SINGER, of the city, county, and State of New York, have invented certain new and useful Improvements in Machinery for Sewing Compound Seams, which improvements are also applicable to embroidering, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front and Fig. 2 a side elevation of the parts above the table; Fig. 3, an elevation of the rear end; Fig. 4, a horizontal section taken at the line A a of Fig. 2; Figs. 5 and 6, bottom views of the seam; Fig. 7, a top view of a compound seam, and Fig. 8 a view of the embroidered surface.

The same letters indicate like parts in all the figures.

The first part of my invention consists in the employment of a tongue on the bed of the machine and placed between the two needles for sewing fine or thin fabrics, which tongue is a narrow strip of metal lying between the two needles, and under which the threads pass that unite the two rows of stitches. This gives support to the cloth or other fabric during the perforation by the needles and prevents it from being puckered by the operation of drawing the stitches tight; and as the seam progresses the stitches are drawn off from the end of the tongue, which merely acts as a support during the operation of forming and tightening the stitch.

The second part of my invention relates to a method of guiding the cloth to the needle or needles in forming seams when one or both pieces of cloth to be sewed is or are lapped or folded over to make a flat seam; and this part of my invention consists in the employment of two guide-plates attached to the bed or frame of the machine, and having the guiding-cord made thin and sufficiently elevated from the bed or table to be embraced by the fold of the piece of cloth which is thus guided by having the bottom of the fold embraced between the edges of the two guide-plates. When two pieces of cloth are to be connected by a compound seam, both pieces being previously lapped or folded, then the lap or fold of each piece embraces one of the guide-plates, and in this manner the folded edges of the two pieces of cloth are thus held together and

presented in a proper manner to the two needles, to sew one range of stitches on each side of the junction of the two folded edges; and in other forms of flat seams one of the guide-plates is made double, to embrace the guiding-edge of the other and the cloth on it.

The last part of my invention relates to a method of uniting compound seams on the upper surface of cloth or other substances by means of a laying thread or compound thread, which is connected with the two threads forming the two rows of stitches, and extends from the one to the other, whereby the two lapped or folded edges of the two pieces of cloth or other substance can be united at one operation, and thoroughly bound together by such thread or threads passing alternately from the one to the other; and this part of my invention is also applicable to laying embroidery or ornamental work on the surface of cloth or other substance, whether in connection with two or more, or only one needle; and this part of my invention consists in combining with the eye-pointed needle or needles a vibrating thread-carrier or any equivalent therefor, which, after the needle or needles are drawn up, carries a single or compound thread across the surface of the cloth and in front of the needle or needles, so that when the feed motion advances the cloth, (with such thread lying on it) to space the stitches, and the needle or needles are operated to make the next stitch, they descend in front of the thread so laid on the surface of the cloth, and thereby interlace and secure it. On the return motion of this carrier the thread is again laid on the cloth in front of the needle thread or threads, but running in the opposite direction, so as to be again interlaced in the manner named.

The accompanying drawings represent a sewing-machine such as is well known and in extensive use, with a shuttle carrying one thread to interlace the needle-thread, and being well known, it is not necessary to be described.

On the needle-carrier *a*, operated in the usual manner, there are two eye-pointed needles, *b b*, placed side by side, and each carrying its appropriate thread in manner similar to single-thread machines.

The shuttle *c*, constructed and operated in the usual manner, moves in the usual shuttle-race, *d*, in a line parallel with a plane passing

through the two needles, so that when the two needles perforate the cloth and carry their appropriate threads below the cloth, and there form two loops, the shuttle, instead of passing through the loop of only one needle-thread, passes in succession through the loops of both needle-threads, and therefore when the two needles are withdrawn two stitches are formed, each with a needle-thread and the shuttle-thread, while at the same time the two stitches are connected by the shuttle-thread, which extends from the one stitch to the other. If the shuttle moves back without passing through the loops of the needle-threads, as in the accompanying drawings, the cloth having advanced to space the next stitches, the shuttle-thread *e* will appear on the under side of the cloth, as in Fig. 5, at right angles to the progress of the seam in the forward movement of the shuttle, and diagonally on the return movement; but if a double-pointed or double-acting shuttle be used, as in many well-known machines; then the shuttle-thread will appear, as in Fig. 6, straight across the seam for all the stitches; and in the direction of the seam between the several stitches of each row.

The cloth to be sewed must be fed or moved forward for spacing the stitches in a line at right angles to a plane passing through the two needles, or, what is the same thing, at right angles to the line of motion of the shuttle. The feeding is effected by a pad, *f*, on the lower end of a lever, *g*, which turns on a fulcrum-pin, *h*, attached to the pressure slide-bar *i*, which is forced down toward the surface of the table by a helical spring, *j*, thereby causing the pad to make pressure on the surface of the cloth lying on the table in manner well-known.

The lower end of the pad-lever *g* is fitted to work in a slot in the foot *k* of the pressure-bar *i* toward and from the needles. The lower end of the lever, with the pad, is forced outward from the needles to take the required position for the feed by the tension of a spring, *l*, at the upper end, and it is moved toward the needles to give the feed by a U-formed lever, *m*, one end of which acts on the lever; the other end being acted upon by a cam, *n*, on the needle cam-shaft, so located as to give the feed motion just before the needles enter the cloth. After the needles have entered the cloth, the pad is lifted to permit it to be thrown back by the tension of the spring *l* by a cam, *o*, which acts on an arm, *p*, attached to the pressure sliding bar *i*, before named.

There is a lever, *q*, which turns on a fulcrum-pin, *r*, attached to the standard of the frame. This lever is vibrated in one direction by a spring, *s*, which keeps the rear end of the arm in contact with the surface of a cam, *t*, on the driving-wheel *u*, and so formed as to vibrate the said lever in one direction the moment the needles have risen, and keep it in a state of rest during the descent and rise of the needles, and then to permit it to be vibrated back in the opposite direction at the end of the up motion of the needles, and there to hold it until

the needles have again risen. The lever carries a spool, *v*, at its rear end, the thread from which, whether single or compound, passes through a guide, *w*, also on the lever, and then around a tension-wing, *x*, to regulate the tension by the turning thereof; and from this the thread passes through an eye or guide, *y*, on the forward end of the lever, and thence through an eye in the extreme end of the thread-carrier *z*, attached to and projecting laterally and downward from the side of the lever at its forward end. The position of this carrier is such, as shown in the drawings, as to lay its thread on the surface of the cloth just in front of the needle-threads before the feed motion takes place, so that by the feed motion the said thread shall be carried back of the line of motion of the needles, and in consequence, when the needles descend, their threads pass over and bind this upper thread onto the cloth, so that the needle-threads pass over it, while it passes around first outside of one needle-thread and then around outside of the other. In this way it will be seen that if considerable tension be given to this laying thread it will be drawn tight from one row of stitches to the other, alternately in opposite directions, as at *a'*, Fig. 7, thus binding together the two rows of stitches on the upper surface of the cloth as effectually as they are bound together below by the shuttle or its equivalent; but if a slight tension be given to the laying thread, as the extent of motion of the carrier is greater than the distance between the two rows of stitches, the thread will be laid so as to occupy a much greater width than the distance between the two rows of stitches, thus leaving a series of loops, formed by this laying thread, to project on each side of the two ranges of stitches, as represented by Fig. 8 of the accompanying drawings. In this way, by varying the tension on this thread, embroidery can be laid and secured to the surface of the cloth, which, by turning the cloth, can be made to assume the lines of any desired design.

This part of my invention can be employed for ornamental work with one, two, or more needles. When employed in connection with one needle, the one series of loops will project on each side of the row of stitches, and when more than two needles are employed they are to be mounted and operated as in the case of two needles herein specified.

I do not wish to be understood as limiting myself to the special construction or arrangement of the parts herein specified, nor to the special arrangement of mechanism by which the required motions are imparted, but claim the privilege of changing these so long as I attain the same ends by equivalent means.

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

1. The employment of a supporting-tongue, substantially as described, placed between and in combination with the two needles, to support the cloth or other substance and prevent

its being puckered during the operation of sewing and drawing the two rows of stitches tight, substantially as described.

2. The employment of the guide-plates, substantially as described, to guide cloth that has been folded in making flat, or lapped, or other analogous seams, as described, so that the row or rows of stitches shall be made at a regular and determined distance from the folded edge, as set forth.

3. In combination with one or more eye-pointed needles and shuttle, or the equiva-

lent therefor, for sewing one or more seams, the employment of a vibrating thread-carrier for carrying a thread or threads alternately in opposite directions across the seam or seams and laying it on the face of the cloth, substantially as described, so that it shall be secured to the face of the cloth by the needle thread or threads, as described.

ISAAC M. SINGER.

Witnesses:

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ANDREW DE LACY.