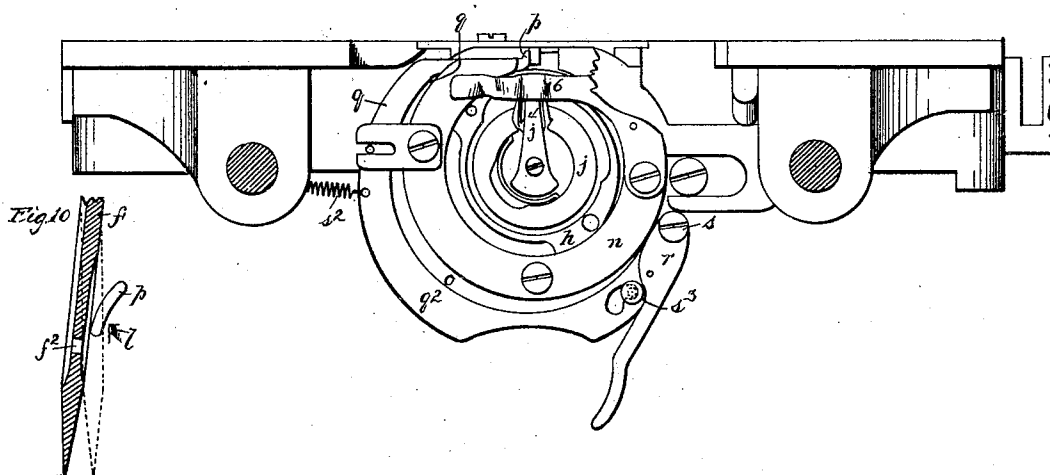
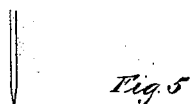
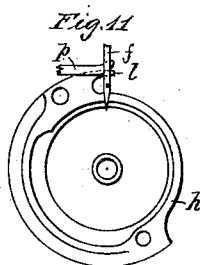
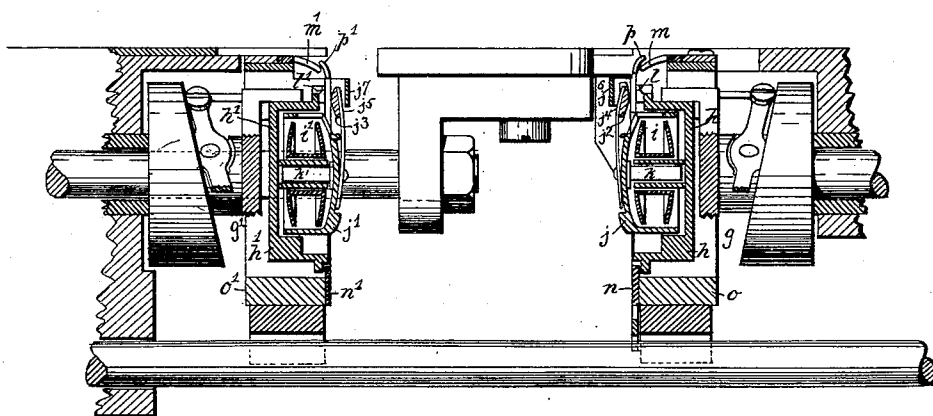
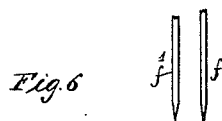


F. KERN.
SEWING MACHINE.

No. 479,369.

Patented July 19, 1892.



Witnesses
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UNITED STATES PATENT OFFICE.

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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 479,369, dated July 19, 1892.

Application filed November 3, 1891. Serial No. 410,716. (Model.)

To all whom it may concern:

Be it known that I, FERDINAND KERN, of Linden, Union county, State of New Jersey, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

Figures 1, 2, and 3 represent the work done by the machine at various stages. Fig. 4 is an elevation looking toward one of the shuttles. Fig. 5 is an elevation looking toward the other of the shuttles. Fig. 6 is a sectional elevation taken longitudinally through the axes of the shuttles, which are for clearness shown in their separated positions. Figs. 7, 8, and 9 are sectional details showing the relationship of the parts for different positions of the shuttles and needles. Figs. 10 and 11 are enlarged details showing the relative positions of the needle, its eye, and groove, and the shuttle hook or horn and the separating-finger at the instant when the point of the shuttle-horn is passing the needle, the dotted lines indicating the deflection which the needle receives by the separating-finger.

It is old to construct a duplex sewing-machine, such a machine being described in Letters Patent granted to me numbered 411,104, dated September 17, 1889, and also numbered 447,880, dated March 10, 1891; but no means, so far as I am aware, have ever heretofore been devised whereby a duplex machine was capacitated for properly turning a corner; and to accomplish this is the object of my present invention. I will first describe in general terms by reference to Figs. 1, 2, and 3 how it is done and subsequently by reference to other figures by what mechanism it is done.

Referring to Fig. 1, suppose the two needles have sewed seams side by side in the direction of the arrow from *a* to *b* and from *a'* to *b'*. The feed is now continued until the needles have advanced, respectively, to *c* and *c'*; but as the inside needle advances from *b* to *c* it is by mechanism hereinafter described prevented from forming stitches, and produces merely a row of punctures, as shown. The operation of the machine is now suspended and the work is revolved from the position shown in Fig. 1 to the position shown in Fig. 2. This brings the inside needle from

c to *b'*, the outside needle remaining at *c'*. Then the operation of the machine is resumed and the needles advance in the direction of the arrow, Fig. 2, to *b* and *c*, respectively, the outside needle producing the ordinary stitches and the inside needle producing merely a series of punctures without stitching, as shown in Fig. 3. As soon as the inside needle reaches the point *b* the stitch-forming mechanism is thrown into full operation and the two needles sew on the lines *d* and *e* in the ordinary manner.

The manner in which I cause the stitching to be suspended by the inside needle is by preventing the loop in the needle-thread from being entered by the shuttle, so that when the needle is withdrawn the thread has not passed around the shuttle and there is nothing to hold the needle-thread below the fabric, and consequently it does not form a stitch, and it is withdrawn by the retreat of the needle from the needle-hole. In the drawings I have shown this principle applied to a duplex double-threaded machine having a rotary shuttle similar to that shown in the patents already referred to, and a detailed description of many of the parts is therefore unnecessary. *f* and *f'* are the two needles arranged to reciprocate in unison.

g is the shaft for driving the shuttle *h* for the needle *f*.

g' is the shaft for driving the shuttle *h'* for the needle *f'*.

i and *i'* are respectively the shuttle-bobbins.

j and *j'* are respectively the bobbin-cases, loosely mounted upon the shuttle-studs *k* and *k'*, respectively. The bobbin-cases are provided with upwardly-projecting noses *j²* *j³* and tension-springs *j⁴* *j⁵* and are held by the overlapping stationary springs *j⁶* and *j⁷*.

l *l'* are the shuttle hooks or horns by which the loops of the needle-threads are caught beneath the fabric.

m *m'* are fingers which assist in the stitching operation.

n *n'* are the stationary face-plates behind which the shuttles revolve in the stationary heads *o* and *o'*.

When the stitching mechanism is in normal operation, every time the needle descends,

as shown in Fig. 7, the loop which it leaves in the cloth is caught by the shuttle hook or horn *l* and held and disposed of thereby in the well-known manner necessary for the formation of a stitch.

p p' are fingers by the forward movement of either of which the stitch-making operation of one needle may be suspended, while both the shuttle and the needle continue to go through their normal motions. This finger in its forward position intercepts the normal path of the needle, and the finger is inclined laterally toward the top on the side next the needle, so that the needle in its descent will impinge against this incline and be deflected away from the point of the shuttle. The thread, extending from the eye of the needle on the side next the shuttle up to the fabric, will lie between the needle and the finger *p* so long as the needle remains down, in which position it is impossible for the horn *l* of the shuttle to engage it, and the horn therefore passes the needle without engaging the thread, and when the needle ascends it carries the thread up and out of the fabric. When, therefore, the sewing of either needle is to be suspended, the finger *p* or *p'*, as the case may be, is thrust forward, and when the sewing is to be resumed it is retracted.

To mount and operate the fingers *p* and *p'*, it will be found convenient to form the fingers on the extremities of the slides *q q'*, held in guideways between the face-plates *n n'* and the heads *o o'*. Any mechanism convenient for the hand of the operator may be used for reciprocating these slides. In the case of the slide *q'*, which in its retracted position is on the same side of the needle as the operator, I prefer to employ a hand-lever *r'*, fulcrumed at *s'* on the stationary head *o'* and pivoted at *q³* to the slide *q'*, the action of which is limited by a stationary pin *q⁴*, projecting into a notch in the slide *q'*, which pin and the overlapping edge of the face-plate *n'* serve to guide the slide *q'*. In the case of the slide *q*, which in its retracted position is on the opposite side of the needle from the operator, I prefer to extend the slide in the form of a yoke *q²* around the face-plate *n* to a convenient point on the same side with the operator, at which point I connect it with a lever *r*, fulcrumed as *s* to the stationary head *o*. In this case I prefer to employ the spiral spring *s²*, having a tendency to hold the yoke *q²* in the retracted position of the finger *p*, and I employ a pin *s³*, operating in a curved slot in the yoke as a latch to hold the yoke forward in antagonism to the spring *s²* even when the operator has let go the lever *r*. The finger *p* advances from the same side of the needle as that from which the thread-engaging point

l advances and the finger *p'* advances from the same side of the needle as that from which the thread-engaging point *l'* advances.

Having now described the form of mechanism in which I prefer to embody my invention, I do not wish to be understood as limiting myself thereto, since I am well aware that the details may be varied and the principle may be applied to other classes or constructions of sewing-machines without departing from what I consider to be the scope of my invention.

I claim—

1. In a sewing-machine, in combination, the needle, a loop-taker disposed in such position with respect to the needle as to normally engage the needle-thread beneath the fabric and co-operate with the needle in forming the stitch, and a member interposed between said needle and said loop-taker, whereby the engagement of the needle-thread by its loop-taker is prevented, and a support for said member admitting of its being retracted to permit the formation of stitches, substantially as described.

2. In a sewing-machine, in combination, the needle, a loop-taker disposed in such position with respect to the needle as to normally engage the needle-thread beneath the fabric and co-operate with the needle in forming the stitch, a member whereby the needle-thread is shoved out of position to be engaged by said loop-taker, and means whereby said member may be retracted to permit the formation of stitches, substantially as described.

3. In a duplex sewing-machine, in combination, the two needles, a loop-taker for each of said needles disposed in such position with respect to the needle as to normally engage the needle-thread beneath the fabric and co-operate with the needle in forming the stitch, and a movable member whereby the needle-thread of one of said needles may be shoved out of position to prevent the engagement thereof by its loop-taker, substantially as described.

4. In a sewing-machine, in combination, the needle, the loop-taker by which the needle-thread is engaged beneath the fabric, an inclined member located in the normal path of said needle, whereby said needle may be deflected away from said loop-taker, and means whereby said member may be retracted, leaving the needle and loop-taker in the normal relative position for forming stitches, substantially as described.

FERDINAND KERN.

Witnesses:

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