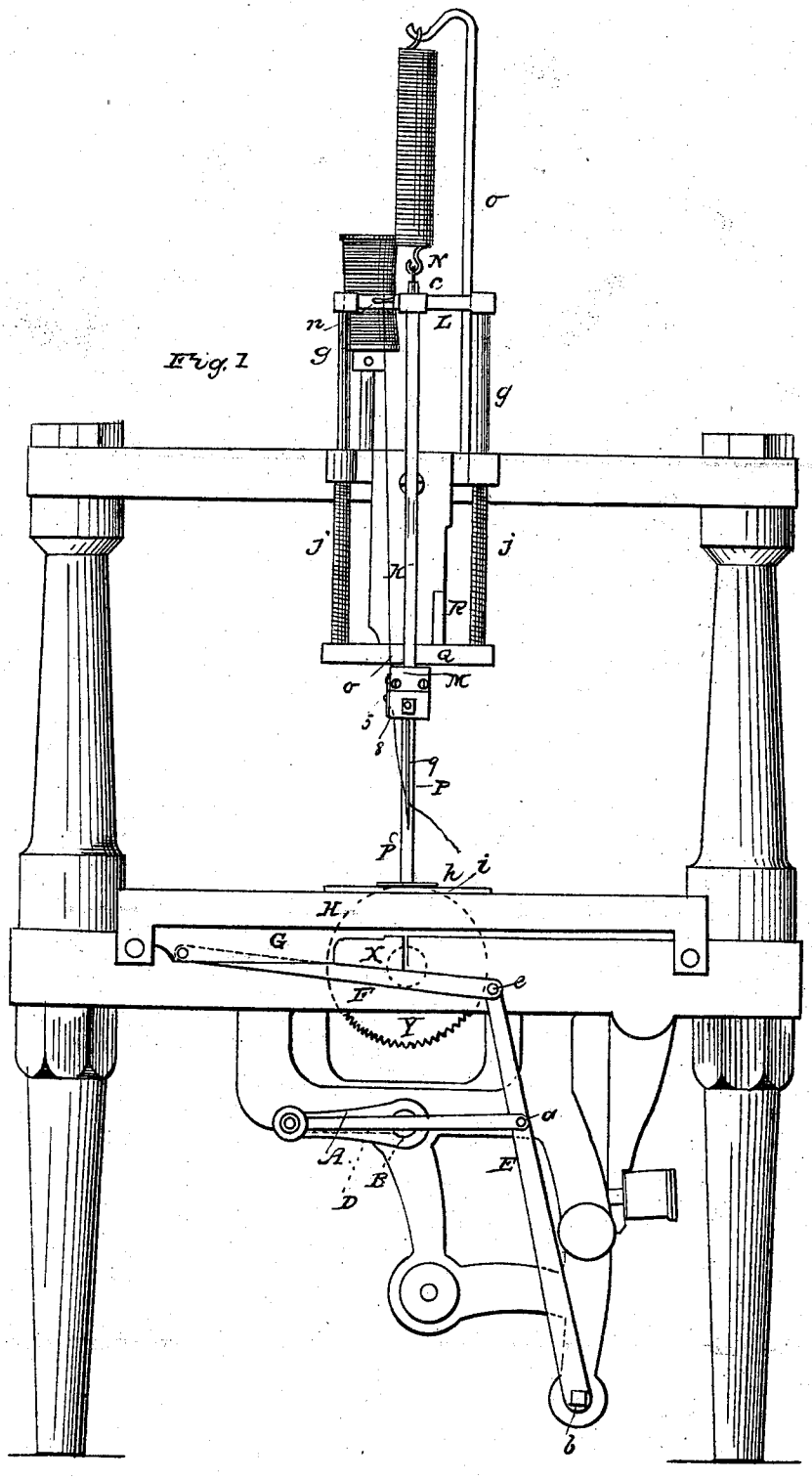
2 Sheets—Sheet 1.

S. COON.

Sewing Machine.

No. 10,875. Patented May 9, 1854.

Fig. 1



2 Sheets—Sheet 2.

S. COON.

Sewing Machine.

No. 10,875. Patented May 9, 1854.

Fig. 2.

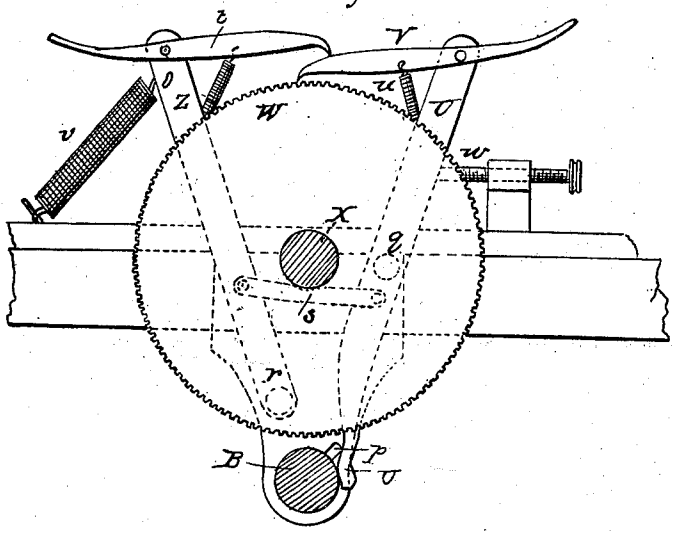


Fig. 2

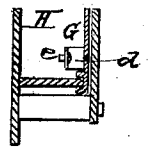


Fig. 4

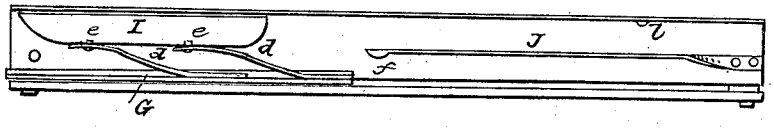


Fig. 5

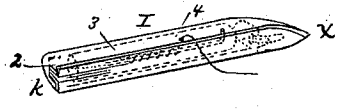
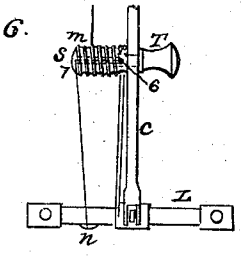


Fig. 6.



UNITED STATES PATENT OFFICE.

SIMEON COON, OF ITHACA, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **10,875**, dated May 9, 1854.

To all whom it may concern:

Be it known that I, SIMEON COON, of Ithaca, in the county of Tompkins and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part thereof, in which—

Figure 1 denotes a view from the front of the machine. Fig. 2 denotes a view of the feeding apparatus. Fig. 3 represents a cross-section through the raceway. Fig. 4 represents a top view of the raceway and shuttle. Fig. 5 represents a perspective view of the shuttle from its under side. Fig. 6 represents the device for adjusting the strain on the needle-thread.

Similar letters in the several figures denote like parts.

The nature of my invention is two-fold—first, in drawing a sufficient quantity of thread from the shuttle-bobbin to form the stitch in advance of the forming or drawing up of the stitch, so that in paying off the thread from the shuttle the tension or strain shall be always uniform and not variable, as is the case where the act of drawing up the stitch must draw the thread from the spindle, spooler, or cop, besides the drawing of it from the shuttle; second, in a double-acting feed-motion, which feeds the cloth either way to the needle, when said feed-motion always retains the same relative motion with regard to the needle, or so that the feed shall take place while the needle is advancing toward the cloth, and not when it is leaving the cloth to draw up the stitch, and this whether the cloth is fed to the right or to the left.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings, stating, however, beforehand that the description will be confined more especially to those features of the machine upon which the claims are founded.

The machine may be driven by hand or any other power, the first mover being applied to the crank A. This crank A is placed on the end of a shaft, B, the extreme rear end of said shaft B carrying a cam-wheel for operating the needle-bar C, a portion of which is seen in Fig. 6, the cam being so made as to give a reciprocating motion to the needle-bar. An arm, D, is attached by one of its ends to the crank A and the other end is connected at *a* to a lever, E, pivoted or hinged to the frame at *b*. To the top of the lever E is hinged the bar F at the point *c*, the other end of said bar being connected to a plate, G, extending up into the raceway H, as seen in Fig. 3, which said plate G drives the shuttle I to and fro by the spring-arms *d d*, which have small projections *e e* on them, which catch into corresponding holes in the shuttle. In the center of the raceway, extending through a portion of its length, is a plate, J, having a small cam projection, *f*, on its end directly opposite the needle, or the point where the needle enters the cloth, to form the loop for the shuttle-thread, and this cam *f* at this point releases the spring-arms—first one and then the other—so as to allow the shuttle to pass through the top formed in the needle-thread, said loop being formed by slightly raising the needle after it has pierced the cloth.

The needle rod or holder K is connected with and passes up a short distance through a cross-head, L, which moves up and down on guide-rods *g g*, and said holder also, for further security, passes through an additional guide, M, near its lower end. The portion of the needle-holder which extends above the cross-head is provided with a hole for one end of the helical spring N, the other end being hooked over a standard, O. The end of the needle-bar is forked so that the needle-holder may pass through between the jaws of the needle-bar, and the point of the needle-bar has some play between, but is prevented from being detached from the needle-holder by the end of the spring N above it, and the cross-head L below it. The needle is driven down into the cloth by the cam-wheel, which motion elongates the spring N, and the recoil of the spring, when the cam ceases to act, draws up the needle-holder and needle for the next operation. A rod, P, attached to the cross-head Q, has a foot, *h*, upon it which holds the cloth against a plate, *i*, on the table while the needle is being drawn out of the cloth. This cross-head may also slide upon guide-rods around which are coiled helical springs *j j*, so that the foot *h* may adapt itself to the varied thicknesses of material to be sewed. There is also a spring, R, behind the cross-head Q, which, when the cross-head is raised up, springs under it and

holds it up when the needle is to be threaded, or for removing the cloth or replacing it. So much of the machine as is heretofore described is not what constitutes the novel matter in this machine, and no claim is set up for this much, as it may be changed at pleasure.

I will now more specifically describe the parts which I believe to be new and very necessary to the perfect working of a sewing-machine.

The shuttle I is a closed one, having for its face a hinged plate, as seen in Fig. 5. This plate, at the rear of the shuttle, has a slot, *k*, in it, and the thread inside of the shuttle (represented in red) passes from near the point of the shuttle back underneath the hinged face of the shuttle (calling that part of the shuttle the face which is in close contact with the raceway) to near the rear of the shuttle, where it passes through an eye, 1, thence across the slot *k*, thence through another eye, 2, and after a sufficient number of turns around the friction-pin 3 (in red lines) comes out of the shuttle at 4.

In the face of the raceway (Fig. 4) is a stud, *l*, so arranged as that the slot *k* in the shuttle as it is driven that way will take in said stud, and the thread which crosses said slot, strikes against the projection, which causes it (the thread) to pay off from the bobbin. By this device the thread is slack between the friction-pin 3 and the bobbin, and in drawing up the stitch the only strain upon the shuttle-thread is the coils or turns around the friction-pin 3, which makes the stitch with great uniformity. If, in drawing up the stitch, the shuttle should have also to draw the thread from the bobbin, the sewing could not be regular, from the fact that the thread is harder to draw from one end of the bobbin than from the other, and this inequality must cause the stitches to be tightened up with greater or less strain on the thread which causes a corresponding inequality in the sewing.

The needle-thread (represented in blue lines) passes from the spool, which may be located in any convenient position on the frame, first around the spiral grooves *m* on the stud S, Fig. 6, a sufficient number of turns to make the friction between them sufficient to draw up the stitch, and at the same time allow the thread to be fed up to the needle; then through the hole 6, and out of the end of the stud at 7, or vice versa; thence it passes through an eye, *n*, in the upper cross-head, L, Fig. 1; thence through a hole, *o*, in the lower cross-head, Q, and underneath the spring 5, and through a hole, 8, and through the eye of the needle 9. The spool containing the needle-thread need not be retained or held on its spindle, but may be free to turn with the least tension upon its thread; and in order that this degree of tension upon the thread may be regulated, so as to be the same relatively with that of the shuttle-thread, the stud S, in which the spiral grooves *m* are cut, is held by a set-screw, T, passing through the needle-bar, and by this arrangement a fraction of a turn of said stud may be made and then held by said screw, which admits of the most perfect adjustment of the thread, for it is obvious that if the thread passes around a roller, wheel, or friction-pin a whole turn—and not a fractional one—must be made, and this prevents the perfect uniformity of tension between the two threads, which perfect sewing, especially in fine work, requires. The needle-thread pays off as the needle goes toward the cloth and before the stitch is made, and, this being done, it is only necessary to draw up the slack of the thread against its adjustable friction to tighten up the stitch; and it might, in brief, be added that the needle and shuttle, with their threads, do the sewing, the threads in suitable quantities for forming the stitch being supplied to them by other means, and not requiring them to supply themselves; for, as before stated, the degree of tension to draw the threads from their bobbins constantly varying, must, when the needle and shuttle is required to perform this function, as well as that of sewing also, cause irregularities in the stitch.

The shaft B, on which the crank and cam-wheel are arranged for giving motion to the machine, has near its rear end a projection, *p*, Fig. 2, which, at each revolution of said shaft, and at the proper time, (viz., as the needle is coming toward the cloth,) strikes against the lower end of the cam-lever U, which is pivoted at *q*, and throws it out, causing its dog or pawl V to move the ratchet-wheel W to feed the cloth in one direction. The ratchet-wheel W is arranged on a shaft, X, which extends to or near the front of the machine, and supports on its front end the spur-wheel Y, which takes into the cloth and feeds it along under the cloth-holder *h*. On the opposite side of the shaft X from the cam-lever U is another lever, Z, pivoted at *r*, and connected to the lever U by the strap *s*.

It will be perceived by reference to the drawings, Fig. 2, that by the manner shown of connecting the two levers by the strap below the fulcrum of one lever and above that of the other both levers have the same motions at the same time. The lever Z also carries a pawl, *t*, which, when not feeding the cloth, rests upon the pawl V, and holds it into connection with the ratch-wheel W, and when the pawl *t* is feeding the cloth the pawl V performs a similar duty upon it. Each of the pawls *v t* is provided with a coiled spring, *u*, which also holds them, or aids to do so, in their places; and when it becomes necessary to change the direction of the feeding of the cloth, it is only necessary for the operator to press down the extreme end of the pawl (at the time of feeding) until the other pawl slips under it, and then by letting go the pawl just thrown out is drawn by its spring *u* down on top of the feeding-pawl and holds it into gear with the ratch. The importance of this reversible feed is obvious. It prevents the turning of the cloth end for end when a new

seam is to be commenced, or when a seam parallel to the one sewed is to be made. It enables the operator the better to control the material fed in, especially in sewing curved seams. But the simple idea of a reversible feed is not what I claim, for those heretofore used are imperfect from the fact that when the feed was reversed it also reversed the time of feeding the cloth relatively with the needle.

To illustrate more fully my object, I would state that I believe the proper time to feed forward the cloth is when the needle is going down, and have so arranged my machine. Now, if the ordinary double-acting pawl were used, when the feed is reversed by the change of the action, the cloth would feed when the needle is going up, and as the stitch is being tightened up by the upward motion of the needle, and would in the first place remove the stitch from the place where it was made; and, secondly, the act of moving would draw the threads and throw additional stress upon them, which, to make perfect work, should be specially avoided.

As I have constructed and represented my machine, the cloth is fed forward when the needle is approaching the cloth, whichever pawl may for the time being be in action with the ratch; and a controlling element in my machine, which I have endeavored to maintain, is that the duty of forming the stitch shall be that of the needle and shuttle, while the paying out of their threads and the feeding up of the cloth, although timed to the motion of said needle and shuttle, should be done by separate means.

The throw of the levers U Z by the cam *p* causes the feed of the cloth, and the spring *v* brings them back in place to be struck again by the next revolution of the shaft B, and a set-screw, *w*, regulates the distance that the levers shall be drawn back for the next feeding operation. That end of the shaft X which carries the spur-wheel Y should be hung in an adjustable bearing, so that said wheel may be raised or lowered as it wears away, or as a more or less rank hold upon the material being fed in should require.

Having thus fully described the nature of my invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of the slot in the shuttle and the pin or stud in the raceway, or their equivalents, for the purpose of drawing the thread from the shuttle-bobbin, so that there may be a uniform tension upon the shuttle-thread when drawing up the stitch, substantially as described.

2. In contradistinction from the double-acting dog or pawl and ratchet, which changes the time of feeding forward the cloth relatively in regard to the motion of the needle, the separate pawls operated by a cam and levers, or otherwise, so that the feed, whether reversed or not, shall always remain relatively the same with regard to the motion of the needle, or so that the feed shall take place while the needle is going down or toward the cloth, and not when it is leaving the cloth to draw up the stitch, substantially as described.

SIMEON COON.

Witnesses:

A. B. STOUGHTON,

T. C. DONN.