

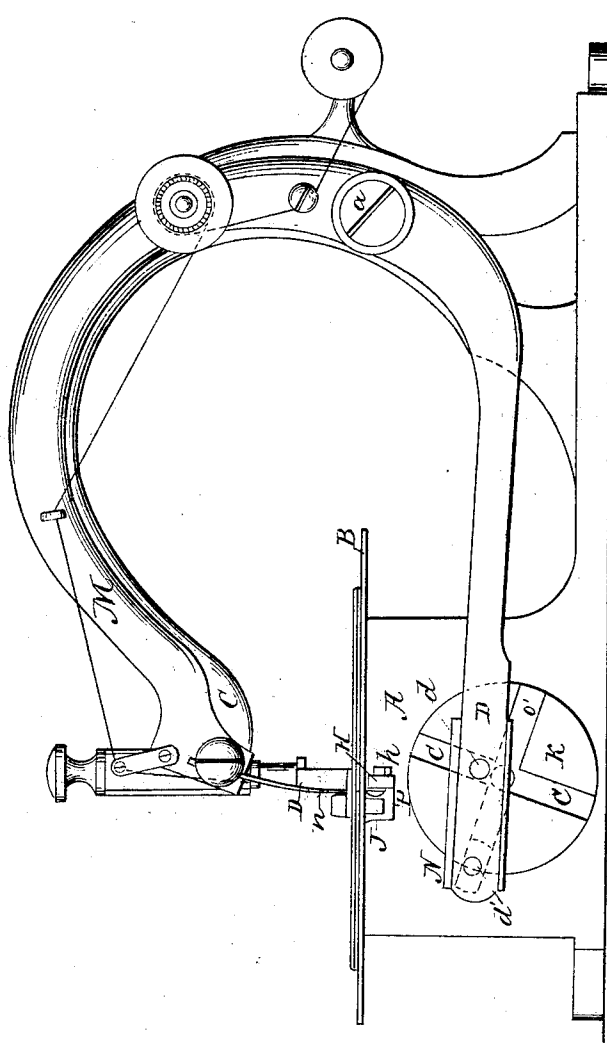
J. S. McCURDY.
Sewing Machine.

2 Sheets—Sheet 1.

No. 28,097.

Patented May 1, 1860.

Fig. 1.



Witnesses
G. M. Thompson
M. Livingston

Inventor.
James S. McCurdy

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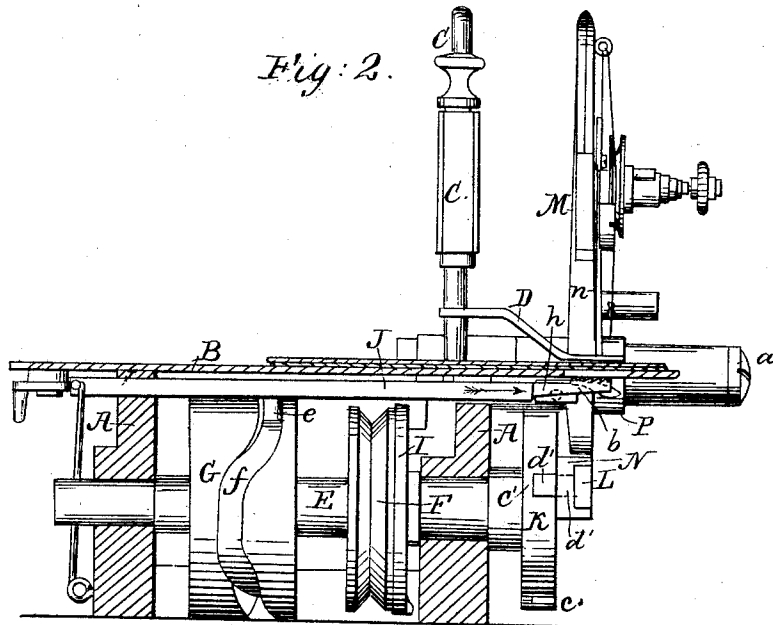


Fig: 2.

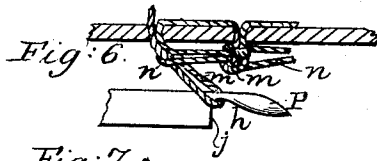


Fig: 6.

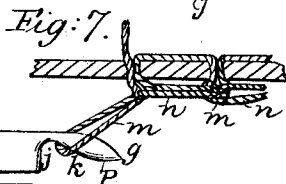


Fig: 7.

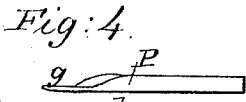


Fig: 4.

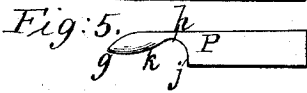


Fig: 5.

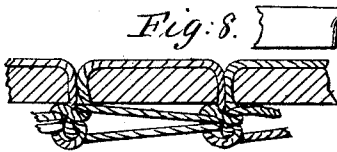


Fig: 8.

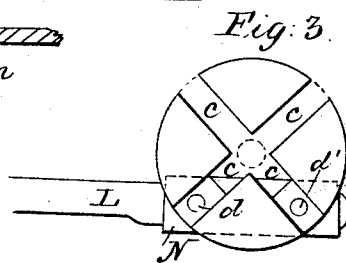


Fig: 3.

Witnesses.

Wm. Thompson
Wm. Thompson

Inventor.

James S. McCurdy

UNITED STATES PATENT OFFICE.

JAMES S. McCURDY, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 28,097, dated May 1, 1860.

To all whom it may concern:

Be it known that I, JAMES S. McCURDY, of Brooklyn, in the county of Kings and State of New York, 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 side view of a machine with my improvements. Fig. 2 is a vertical section of the same at right angles to Fig. 1 and parallel with the feed-movement. Fig. 3 is a back view of the needle-operating device partly in section. Fig. 4 is a top view of the looper on a larger scale than the other figures. Fig. 5 is a side view of the same. Figs. 6 and 7 are views illustrating the operation of the looper. Fig. 8 represents the stitch made by the machine.

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

My invention consists in so applying the feed device, in combination with the needle of a sewing-machine, and with the device or devices operating in conjunction with the needle to enchain the loops of a single thread carried by it through the fabric to be sewed, that the feed-movement is imparted to the fabric only after every second passage of the needle into the cloth and corresponding operation of the looping or enchainning device for the purpose of producing a stitch such as is hereinafter described.

It also consists in certain novel means of combining the needle-arm or needle-operating lever with the main shaft or other rotary shaft of a sewing-machine which carries the feeding-cam, for the purpose of producing two vibrations of said arm or lever back and forth by every revolution of the said shaft.

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 frame supporting the cloth plate or bed B and the stationary arm C, which holds the presser D, all arranged in a well-known manner.

E is the main shaft of the machine, arranged in suitable bearings below the bed B, and having firmly secured to it a pulley, F, to receive

the driving-band, a cam, I, for operating the feed-bar J, a cam, G, for operating the looper-slide H, and a slotted plate, K, for operating the needle-lever L M.

The feed-bar J, which is furnished with a serrated dog, *b*, of well-known character, is arranged in a well-known manner to work longitudinally in guides in the frame A for the purpose of moving the fabric to be sewed, and also to be capable of a vertical movement to make it bite and release the fabric; and the cam I is so formed as to give it both movements, as in many other sewing-machines, producing one movement of the fabric for every revolution of the main shaft E. The feed takes place in the direction of the arrow shown on the bar J in Fig. 2.

The needle-bar L M, which works upon the fixed fulcrum *a*, secured to the stationary arm C, is represented as having the curved eye-pointed needle *n* attached directly to its upper arm, M; but this lever may constitute merely the means of transmitting motion from the plate K to a straight slide carrying a straight needle. The plate X, from which the needle derives two movements into and out of the fabric during every revolution of the shaft E, has its face square with the axis of the shaft E, and has two similar grooves, *c c'*, in its face, running directly across the axis of the shaft at right angles to each other, said grooves receiving the oblong rectangular heads of two pins, *d d'*, which are fitted loosely to two holes provided for them in the back of a grooved slide, N, which is fitted to slide along the lower arm, L, of the needle-lever. The pins *d d'* (shown best in Fig. 3) are arranged with their centers at a distance apart equal to the length of oscillation desired to be imparted to that portion of the arm L which, in its oscillation, would be intersected by a prolongation of the axis of the shaft. By the revolution of the plate K with the shaft E the heads of the two pins *d d'* are caused to slide back and forth in their respective grooves *c c'*, and the slide N is thereby caused to receive twice during each revolution of the shaft a movement such as is given by a crank once during its revolution to the head of a connecting rod or pitman; but the arm L, instead of receiving such a movement, is caused by the longitudinal movement of the

slide N upon it to receive only a simple oscillating movement on its fulcrum, such movement taking place twice up and down during every revolution of the shaft, and so giving the needle two movements into and out of the fabric for every movement of the fabric by the feeding-dog.

The looper-slide H is fitted to work longitudinally in suitable guides in the frame A, and is furnished with an anti-friction roller, *e*, which is received in the groove *f* of the cam G, such groove being of such form as to give the looper-bar two movements back and forth for every revolution of the shaft and one for every movement of the needle into and out of the cloth, that the looper P, which is attached to the said bar by a screw, *h*, may take from the needle the loops of thread that are protruded by it through the cloth. The form of the looper is represented in Figs. 4 and 5. It consists of a tongue of steel flattened and made thin at the point, as shown at *g*, so that it may enter easily between the needle and the thread—that is, protruded with it through the fabric and gradually spreading in a lateral direction to extend the loop laterally as the needle is withdrawn through the cloth—diminishing in depth as it commences to increase in width laterally, so as to form a neck, *h*, from which it is curved downward both toward the point, as shown at *i*, in Fig. 5, to give it a slightly hook-like character, and also away from the point, so as to form a gradual shoulder, *j*.

I have now described the construction of the machine, and before describing its operation will explain the character of the stitch produced by it. (Represented in Fig. 8.) Two loops of thread are passed successively through each perforation made by the needle in the fabric. The second, *n*, of such loops is passed through the first one, *m*, and has passed through it the first of the two similar loops passed through the next perforation, and the thread on one side of the fabric is thus made to present the appearance of a plain stitch and on the other side the appearance of a series of knotted loops. This operation is performed by the machine in the following manner: The needle having perforated and carried the thread through the fabric, and being in the act of withdrawing, the looper advances between the needle and thread and retains the thread in the form of a loop, while the withdrawal of the needle continues, the looper spreading the said loop and holding it in such a position that the needle, in passing again through the same perforation, (no feed yet taking place,) passes also through the said loop just before the looper is withdrawn from it. As the withdrawal of the needle again takes place the looper advances again to form a new loop, which it retains and spreads, as before, and after this second withdrawal of the needle the feed-movement of the fabric takes place, so that the needle, in its next advance or de-

scend, passes through the cloth in a new place, but passes through the loop on the looper, as before. The feed thus only taking place after every second operation of the needle and looper, (although every loop passes through and locks the one previously formed,) the first loop, *m*, that is carried through a perforation is simply drawn tight round the second one, *n*, like a knot, and the second one extends from one hole in the fabric to the next hole, as shown in Fig. 8. This stitch, as shown at the right hand of Fig. 8, where it was commenced, is not properly formed till the needle has made two perforations in the cloth, for under the first hole, there being nothing to hold the first loop, the two loops merge into one; but under the second and every succeeding hole the first loop is knotted round the second one, as shown.

In the above operation the shoulder *j* on the looper performs the duty of preventing the long loops *n n* from passing through each other, and permitting them only to pass through the loops *m m*, and this it effects in the following manner: The looper, in advancing between the needle and thread to form and extend the loop moving in the same direction as the feed and the said shoulder, pushes each loop away from the hole through which it passed in the slanting manner shown in Fig. 6—that is to say, in the opposite direction to that in which it will have to lie in the finished sewing—and as the needle completes its ascent and the tightening of the last previously-formed loop while the looper is in its most advanced position, with the new loop in the position described, every one of the loops *n n*, as it is tightened, is allowed to be drawn away from under the perforation in which the new loop *n* has been introduced, so that when the needle descends to protrude the new loop *n* through the same perforation it cannot pass through the old one. The pressure of the shoulder *j* against the loop is only required to continue till the old loop has been tightened, and after that has been done the looper commences to retire from the loop, and in so doing its downwardly-curved portion *i* draws the loop in an opposite slanting direction to that shown in Fig. 6, as shown in Fig. 7, so that the needle cannot fail to pass into it in its next descent.

The above-described operation of the looper, illustrated by Fig. 7, takes place with every loop; but it is only in the loops *m m* that it is of any importance.

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

1. So applying the feeding device, in combination with the needle of a sewing-machine and with a device operating in combination with the needle to enchain the loops of a single thread carried by it through the fabric to be sewed, that the feed-movement is imparted to the fabric only after every second with-

drawal of the needle from the fabric, and a stitch is produced of the structure herein described.

2. Combining the needle-arm or needle-operating lever with the main shaft, or with any rotating shaft of a sewing-machine which carries the feeding-cam, by means of the rectangularly-grooved plate K, sliding pins *d d*, and

slide N, the whole applied and operating substantially as and for the purpose herein set forth.

JAMES S. McCURDY.

Witnesses:

WM. THOMPSON,
M. W. LIVINGSTON.