(Model.) 3 Sheets—Sheet 1.

L. L. MILLER.

SEWING MACHINE.

No. 384,059. Patented June 5, 1888.

Fig. 1.

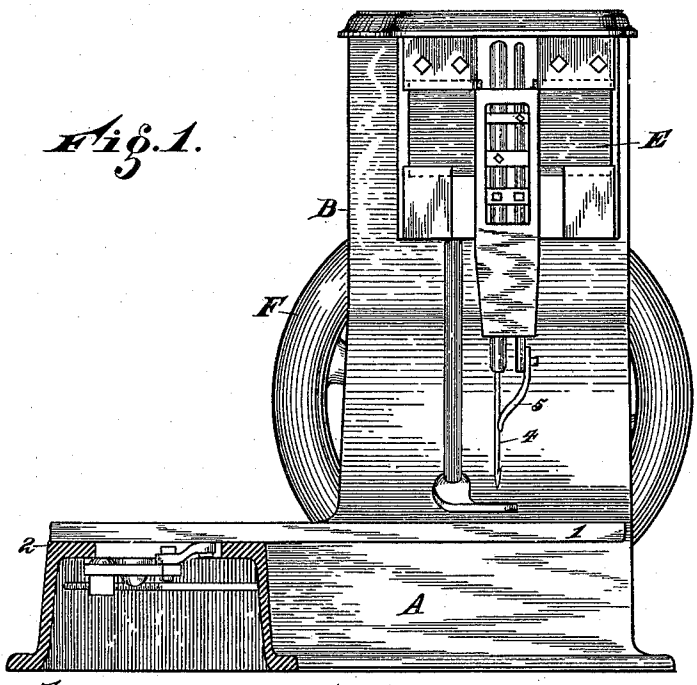


Fig. 4.

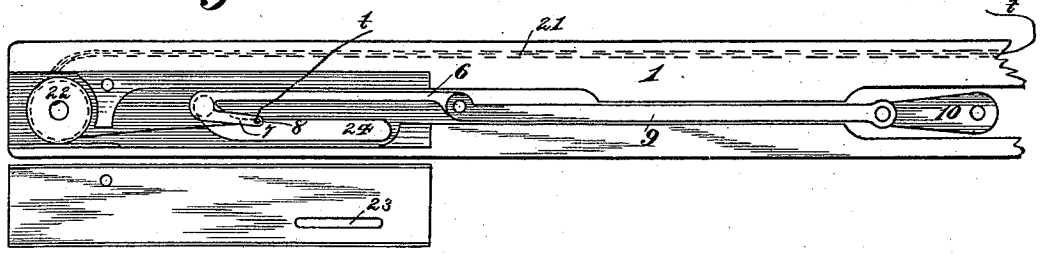
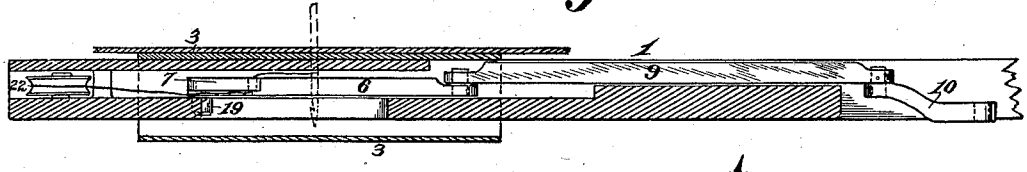


Fig. 5.



Attest.

J. Waterus Sims.

M. C. Millikan.

Inventor

Louis L. Miller

by Wood & Boyd

his Attorneys &c.

(Model.)

3 Sheets—Sheet 2.

L. L. MILLER.

SEWING MACHINE.

No. 384,059. Patented June 5, 1888.

Fig. 2.

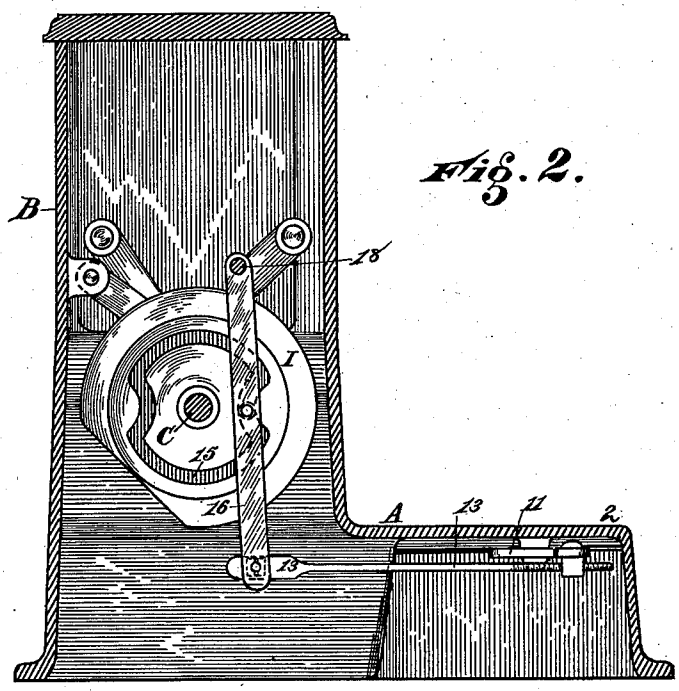


Fig. 6.

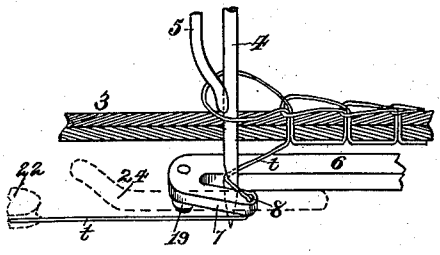


Fig. 7.

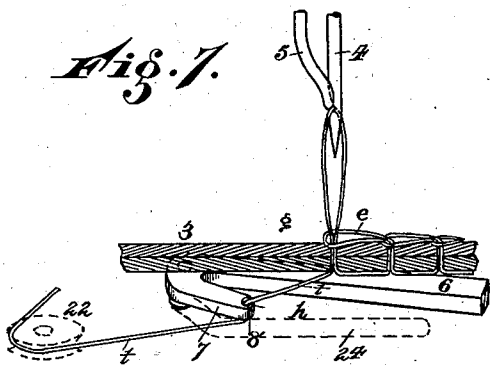
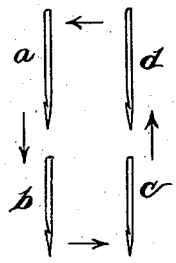


Fig. 8.



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(Model.)

3 Sheets—Sheet 3.

L. L. MILLER.

SEWING MACHINE.

No. 384,059. Patented June 5, 1888.

Fig. 3.

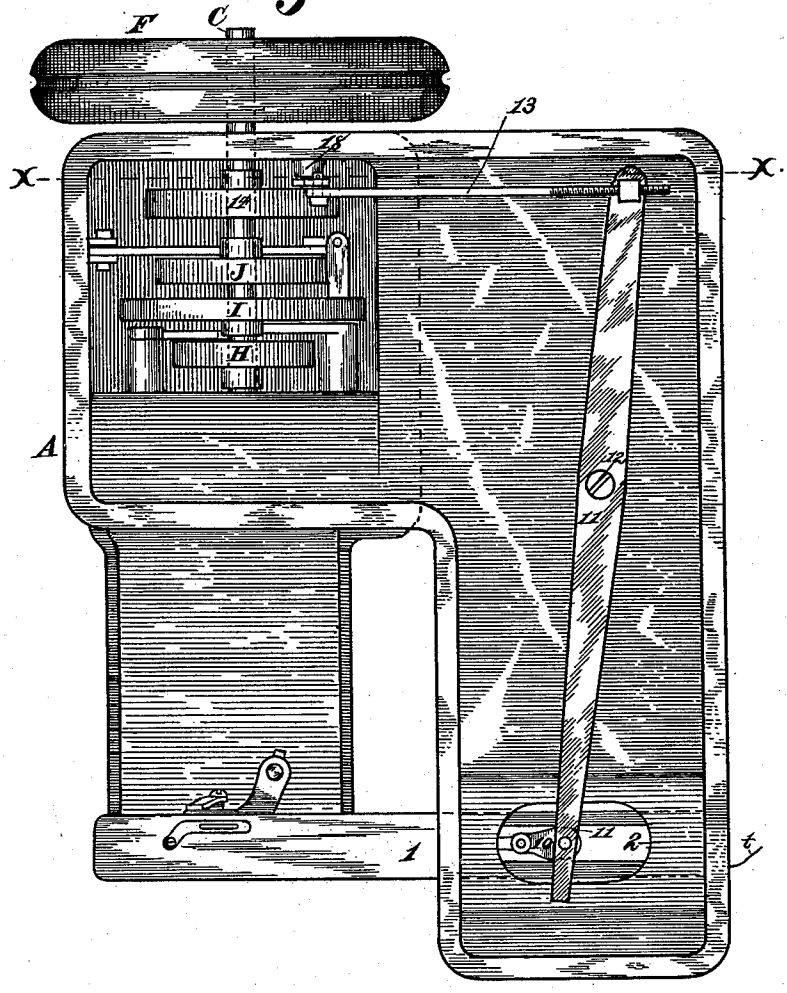
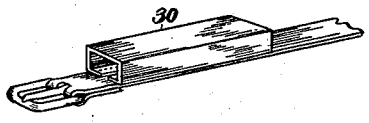


Fig. 9.



Attest.

Watson & Sims.

M. E. Millikan

Inventor.

Louis L. Miller.

by Wood & Boyd.

his Attorneys &c.

UNITED STATES PATENT OFFICE.

LOUIS L. MILLER, OF NEWPORT, ASSIGNOR OF ONE-HALF TO FRANK H. PERKINS, OF COVINGTON, KENTUCKY.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 384,059, dated June 5, 1888.

Application filed February 28, 1887. Serial No. 229,180. (Model.)

To all whom it may concern:

Be it known that I, LOUIS L. MILLER, a resident of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to an improvement in sewing-machines. It is especially adapted to sew a seam on one side of tubes, such as box-loops, carriage-bows, whip-sockets, or other articles of this kind.

It consists of several parts or features.

The first or principal part of my invention relates to a tube-supporting bar, within which the stitch-looping mechanism is located and operated.

Other features of my invention relate to the details of construction, all of which will be fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front elevation of the sewing-machine, with a section broken away to show the attachment of my improvement. Fig. 2 is a section on line *x x*, Fig. 3. Fig. 3 is a bottom plan view showing the driving mechanism. Fig. 4 represents a plan view of the stitch-looping mechanism within the tube-supporting bar 1, with the top of the bar removed to expose the parts. Fig. 5 is a longitudinal central section of the same. Fig. 6 is a diagram, partly in section and partly in elevation, enlarged, to illustrate one of the positions of the needle. Fig. 7 is a similar enlarged diagram illustrating a second position of the needle. Fig. 8 is a diagram of the different needle positions. Fig. 9 is a plan view of the finished tube sewed.

I have shown my improvement attached to that class of machine known as "needle-feed," which employs a hooked needle and a cast-off with looping mechanism for throwing the thread around the needle, making a chain-stitch.

A represents the base of the machine; B, the upright portion of the case, within which is mounted and operated the driving mechanism.

C represents the main driving-shaft, on which are mounted the cams H I J. These cams are of the ordinary construction for operating the needle-bar, cast-off, and reciprocating needle-carriage, and need not be specially described.

E represents the needle-feed carriage.

F represents the fly-wheel mounted on the main shaft C.

I preferably employ a cam for driving my stitch-looping mechanism, which will be hereinafter described.

1 represents my tube-supporting bar, within which the stitch-looping mechanism is mounted and operated.

2 represents a ledge on the machine, to which one end of the tube-supporting bar is rigidly attached. It projects laterally across the front of the machine under the needle-bar and presser-foot, as shown in Figs. 1 and 3, a sufficient distance to allow the box-loop to be suspended on said bar, which is elevated a sufficient distance above the table to allow said loop to be readily slipped on and off said bar. This supporting-bar 1 is gained or made hollow to receive the stitch-looping mechanism.

3 represents a tube which is to be sewed by the machine and attachment.

30, Fig. 9, represents a completed box-loop.

4 represents the needle; 5, the cast-off.

6 represents a reciprocating bar; 7, a looping-hook; 8, an eylet, through which the thread passes; 9, a pitman hinged to the bar 6; 10, a link to which the pitman 9 is pivoted, which is in turn pivoted to the lever 11, pivoted at 12 within the hollow frame of the under side of the machine, and vibrated by the connecting-rod 13 and mechanism connecting it to the cam 14, which consists of a link, 16, carrying a friction-roller working in a cam-groove, 15. It is pivoted to a link, 17, which is in turn pivoted to the frame of the machine at 18.

The principle of converting rotary into reciprocating motion is common, and this form is adopted simply for the purpose of converting rotary into reciprocating motion for operating the stitch-looping mechanism or looping-bar by the rotary motion of the main driving-shaft of the machine, and I do not wish to confine myself to the details of this portion of the mechanism, as the principal thing to be accomplished is looping the thread around the nee-

dle within the tube-supporting bar at stated intervals, in unison with the needle movement, to throw the thread around the needle at one position of the needle, and to carry it back out of the way to allow the needle to come upon the opposite side of the thread when it is in position to receive the loop. The principal position of these parts in connection with the needle is shown in Figs. 4, 5, 6, 7, and 8, which illustrate my improvement applied to that class of machines which employ the needle-feeds, in the usual manner. The thread *t* passes from the ball or spool support (not shown) preferably through a groove or passage, 21, pierced in the bar 1, thence around the friction-roller 22, pivoted at the free end of the bar, thence up through the eyelet 8 in the hook 7 of the reciprocating bar 6, and thence up through the needle-slot 23, pierced in the top plate of Fig. 4, which is shown removed and placed at one side so as to expose the mechanism.

The operation of my improvement is as follows: The needle is advanced by the carriage E forward into the position shown at *a*, diagram Fig. 8, when it is forced by the descending motion of the needle-bar through the material to be sewed to the position *b*, in which position it is momentarily held until the hook 7 of the reciprocating bar 6 is carried laterally into the position shown in Fig. 6, which brings the thread *t* into the notch of the needle.

24 represents a guide-slot which gives direction to the looping-hook 7.

19 represents, preferably, a friction-roller or stud-guide projecting down through said slot, which is formed in the bottom of the plate, as shown in Fig. 5.

When the needle 4 and hook 7 have arrived in the position shown in Fig. 6, they are together moved laterally to the position indicated by *c*, Fig. 8, feeding the tube forward upon the supporting-bar ready for another stitch. The needle is then retracted and drawn up through the material into the position shown in Fig. 7, and the hook 7 is carried back into the position there shown. This operation, after the first stitch has been taken, draws the loop for the second stitch up through the previously-formed loop *e*, when the needle is advanced by its carriage mechanism forward over the point *g*, Fig. 7, ready for the second stitch. It passes down to the point *h* in Fig. 7 in front of the thread *t*, when the operation of the looping-hook 7 is repeated by bringing the thread forward into the notch of the needle. This looping-hook 7 is carried back laterally, as indicated by the previously-formed slot 24, so that the needle may pass down in front of the thread to secure the engagement of the thread with the hook when it is brought forward.

The method of forming the chain-stitch and feeding the goods forward by the action of the needle and advancing the needle for the second stitch is in common use, and need not be more fully described. The reciprocating bar 6 is operated by the pitman 13 and cam mechanism before described.

I have shown the cam as having two reciprocating operations at one revolution of the shaft, as the ordinary needle mechanism of this form of machine makes two stitches to one revolution of the driving-shaft.

It is essential that one end of the tube-supporting bar be free, so that the tube may be slipped upon it, and it is essential to have it sufficiently small to allow the tube to be slid laterally by the needle for the purpose of feeding the goods.

The mechanism here shown by looping the thread around the needle by means of the reciprocating hook 7 is an essential feature of my invention, as it allows the mechanism to be easily placed within the bar of sufficient size adapted to hold small-sized tubes.

My invention is intended to employ a waxed thread, such as is used in harness and saddle work. It is distinguished from two threaded and shuttle machines, which could not be operated within the small supporting-bar having a free end adapted to receive the small loops necessary for harness use. The thread-looping mechanism herein shown is different from that employed in other machines; but the chief novel feature of my invention is the placing of such mechanism within a small supporting-bar having the free end projected above the table, as before described.

The tube-supporting bar 1 has a slot, 23, upon the top side, and slot 24 is elongated in the under side of the bar, so as to allow dirt to fall through. The slot 23 allows the lateral movement of the needle for feeding the goods and moving the needle forward for the second stitch.

Having described my invention, what I claim as new is—

1. The combination, with a hook-needle of a sewing-machine, of the tube-supporting bar 1, having a free end projecting above the machine-table and under the needle, and the reciprocating hook and thread-looper 7, having an eyelet, 8, and provided with a stud moving in a cam-groove, 24, substantially as described.

2. In combination with the supporting-bar 1 of the sewing-machine, the thread-looper mechanism consisting of the vibratory reciprocating bar 6, hook 7, located within said bar, and provided with a slotted guide, 24, and an elongated slot, 23, in the upper side of said bar, whereby the looper is operated in unison with the movement of the hook-needle by the driving mechanism of the machine, substantially as specified.

3. The combination, with the tube-supporting bar 1, provided with a slot, 23, and a lower slot, 24, and having its free end projected under the needle, of the reciprocating

bar 6, having hook 7, the latter provided with eyelet 8, the connecting-bar 9, link 10, and lever 11, the hook 7 being guided by a cam-groove, 24, substantially as described.

4. In combination with the slotted hollow supporting-bar 1, the thread-looping mechanism located within said bar, consisting of the reciprocating vibratory bar 6, hook 7, eyelet 8, and friction-roller 22, slot 23, and guide 24, for looping the thread over a hooked needle, substantially as specified.

In testimony whereof I have hereunto set my hand.

LOUIS L. MILLER.

Witnesses:
ROBERT ZAHNER,
M. E. MILLIKAN.