2 Sheets—Sheet 1.

C. DANCEL.

MACHINE FOR SEWING BOOTS AND SHOES.

No. 190,709. Patented May 15, 1877.

Fig. 1.

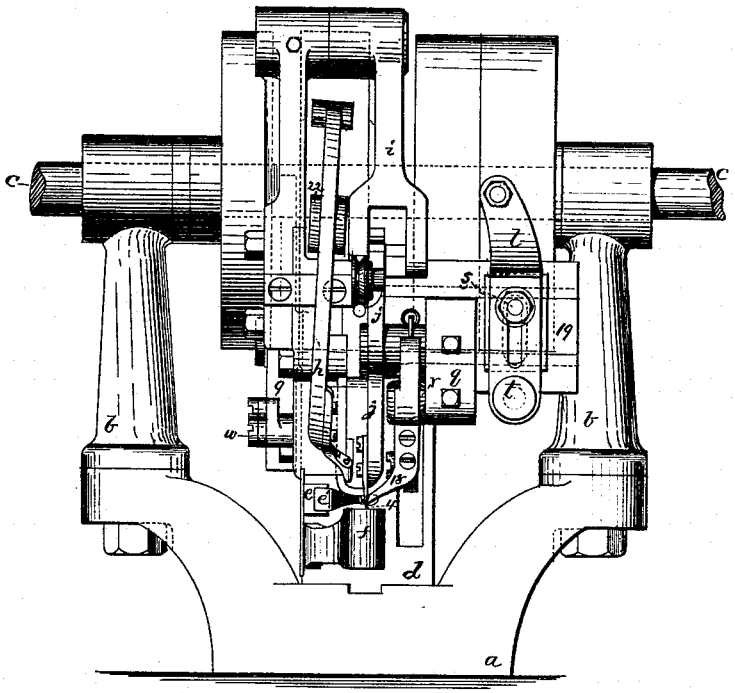
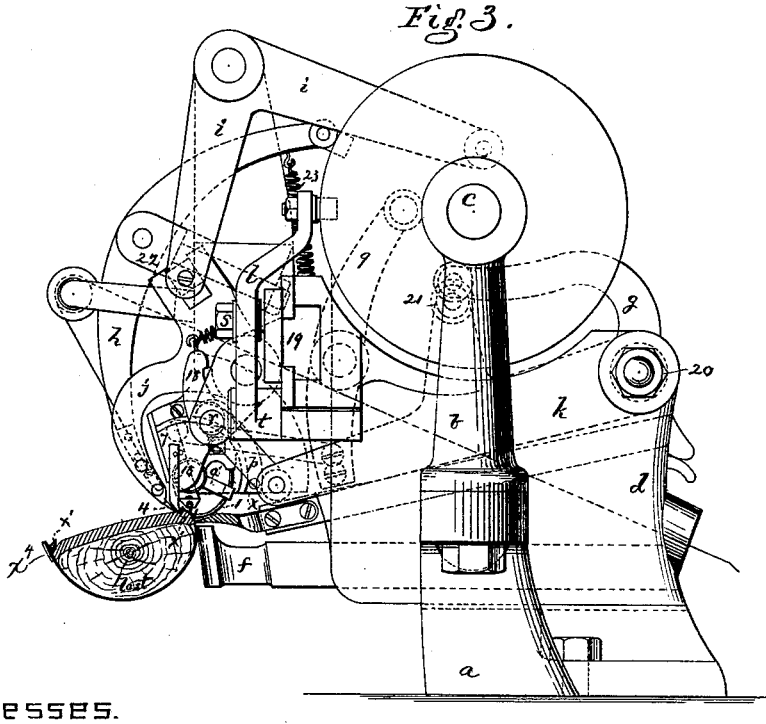


Fig. 3.



Witnesses.
L. A. Latimer.
W. J. Pratt.

Inventor.
Christian Dancel.
per Crosby & Gregory.

2 Sheets—Sheet 2.

C. DANCEL.

MACHINE FOR SEWING BOOTS AND SHOES.

No. 190,709. Patented May 15, 1877.

Fig. 2.

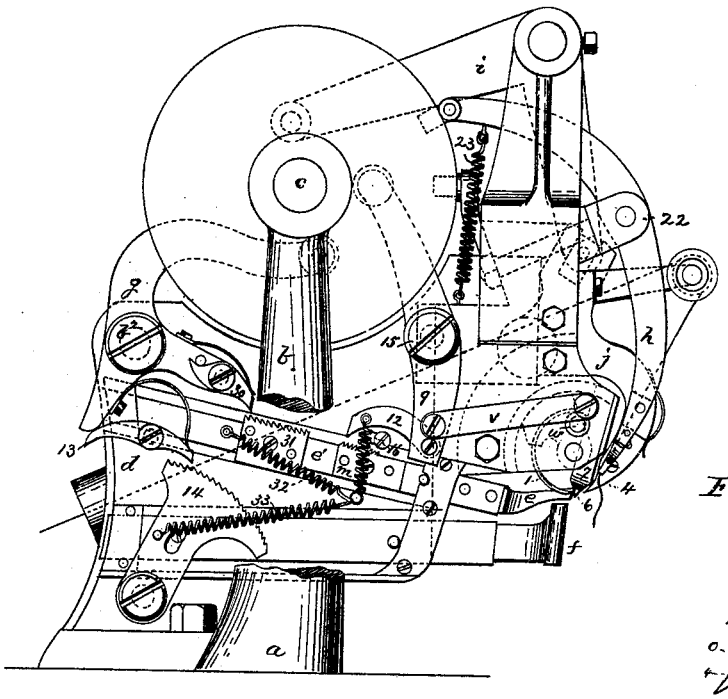


Fig. 4.

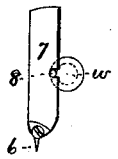


Fig. 5.

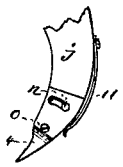


Fig. 7.

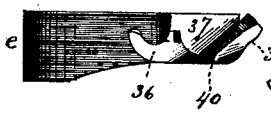


Fig. 6.

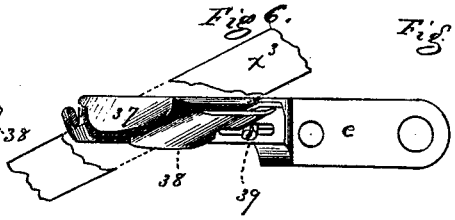
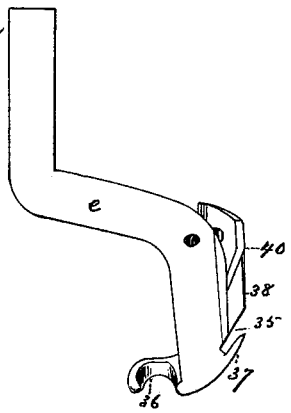


Fig. 8.



Witnesses.
H. L. Latimer.
W. A. Pratt.

Inventor.
Christian Dancel
per Crosby Gregory Attys.

UNITED STATES PATENT OFFICE.

CHRISTIAN DANCEL, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR SEWING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **190,709**, dated May 15, 1877; application filed November 27, 1876.

To all whom it may concern:

Be it known that I, CHRISTIAN DANCEL, of the city, county, and State of New York, have invented an Improvement in Sewing-Machines for Boots and Shoes, of which the following is a specification:

This invention relates to sewing-machines for sewing what are known as turned shoes, or for sewing welts to uppers and inner soles for welted work.

In this class of work the edge of the upper or the upper and welt are sewed to a lip-like portion, extending about the sole near its edge, such lip being that portion of the substance of the sole left between the inner channel and the outer edge or channel of the sole. This lip is sometimes called the "between substance."

In sewing a heavy upper to the lip of a poor or spongy insole, the stitch is liable to pull through or tear away from and destroy the lip, the only portion to which the upper can be sewed, and so, when the stock is very close and dry, the lip is liable to be broken away by the stitch.

In this invention, this difficulty is overcome by the use of a lip-holder, a device similar to an awl-point, and adapted to penetrate the lip in the direction of the thickness of the sole. This lip-holder enters the lip just after the feed takes place and before the needle passes through the lip, the needle entering the lip close to the lip-holder, and the latter holding the lip until the needle recedes and draws its loop taut, thereby preventing the portion of the lip inclosed by the thread forming the stitch from becoming torn or destroyed by drawing the stitch taut. The lip-holder pins or fastens the fibers of the lip in place, and forms a point of resistance around which the thread is drawn, and toward which the upper is, or the upper and welt are, drawn.

The lip-holder is also beneficial in that it holds the lip and shoe firmly and steadily, both while the needle penetrates the lip and until it draws the stitch taut.

In this invention I employ a curved awl to perforate the lip for the passage of the needle, it also holding the lip, and moving laterally with, and assisting and co-operating with, the channel-guide to feed the shoe, and it also assists in holding the lip and sole until the needle is about to enter the lip from the opposite side.

In this invention, the edge or welt guide has imparted to it a positive motion away from the shoe after each stitch. The welt-guide has usually been mounted concentrically with the needle, and so as to cause the welt to be borne at all times against the shoe with a yielding pressure. Such plan is, however, objectionable, for when the shoe is imperfectly lasted, or does not fit the last, the fullness of the upper is, by the action of the welt-guide rubbing against it, formed into a plait or fold, which causes imperfect work. By giving the welt-guide a slight motion away from the shoe after each stitch, as herein provided for, this difficulty is avoided.

Figure 1 represents, in front view, a machine embodying my invention. Fig. 2 is a side view from the left, showing the arrangement of the back gage and edge or welt-guide, with the devices for intermittently locking them, and the arrangement of the lip-holder, hereinafter described, to hold the lip of the sole in its place, and Fig. 3 is a side view, from the right of the machine. Fig. 4 is a detail of the lip-holder. Fig. 5 is a detail of the awl, and Figs. 6, 7, and 8 represent, side, end, and top views of the welt-guide.

This machine is usually mounted upon an iron column or stand, and is driven by a foot-treadle with connecting-rod and fly-wheel, or by steam-power, as preferred.

The base *a* of the machine has arms projecting upward on each side to receive and support the pillar-posts *b b*, on the upper ends of which are the bearings for the driving-shaft *c*, upon which are mounted the actuating-cams of the machine.

Upon the central portion of the base, under the cams, is fitted another casting, of a suitable form to receive and support the principal levers and working parts of the machine. This casting is indicated by the letter *d*.

The curved needle 1 is mounted in an oscillating needle-segment, guided in a guide *x*, and it is provided with a needle-guard, *a'*, as in United States Patent No. 116,947, it being mounted upon the same center, and working concentrically with the needle. The curved

awl 4 (shown in Figs. 3 and 5) penetrates the lip x' at its inner side, and moves toward the upper. The lip-holder for piercing the lip is shown as an awl-point, 6, (see Fig. 2,) fastened by a suitable set-screw in the bar 7, which is reciprocated by means of a crank-pin, 8, on a shaft, w, rocked through the connecting-link v attached at one end of the lever 9 that operates the edge or welt-guide, the lip-holder being moved so as to penetrate the lip and hold it from being broken or pulled apart when the needle is entering the lip and when it draws the stitch taut, as before described. The motion of the lever 9 is so controlled and timed by a proper shaped cam on shaft c as to move the edge or welt-guide e back, away from the shoe intermittingly after each stitch and while the feed-motion is taking place.

The thread-carrier or looper lever h is pivoted upon a swiveling-pin, 22, forming a universal joint, and it is actuated by a combined cam-groove and surface-cam, of suitable form, on shaft c, and the spring 23, so as to cause it to carry its thread completely around the point of the needle, and to lay the thread properly in its barb, as fully described in another application, case A, filed concurrently with this, such movement of the thread-carrier being common.

The awl-lever j is pivoted upon the slide 19, adapted to be moved laterally back and forth the length of the stitch by the lever l, pivoted at t, and adjustably connected with such slide by a set-screw, s, so as to regulate the length of stitch. This lever l is moved by a suitable grooved cam-hub on shaft c. The channel-gage 18 is pivoted, at r, on a lug, q, projecting from slide 19, and it and the awl move laterally together. A suitable cam moving with the hub of the awl-lever will impart a slight out-and-in motion to the channel-gage, so as to relieve its point from pressing too close in the bottom of the channel in its backward motion after feeding the shoe.

The lever which imparts motion to the needle-segment is represented in dotted lines in Fig. 3 by the letter k. Its pivot 20 is preferably made movable, so as to place it at a greater or less distance from its actuating roller-stud 21, to vary the throw of the needle, and make the loop longer or shorter, according to the thickness of the material to be sewed. The lever k is connected with the needle segment by means of a link, p. The out-and-in motion of the awl is produced by the action of the lever i, operated by a suitable cam on shaft c.

The curved awl 4 operates in the inside channel of the sole as a feeding device, in connection with the channel-gage 18. The function and operation of this channel-gage has been substantially described in a former patent in the United States, issued to Charles Goodyear, Jr., dated July 11, 1871, No. 116,947, and it is therein described as a combined channel-gage and feed-dog.

In this my invention the channel-gage will be so made and operated that in the absence of the awl it will feed the shoe, but not with so much certainty and precision as with the awl. This awl performs the function of piercing the hole through the lip, thereby assisting the needle, and it also serves to engage and hold the work up to its place until the needle is just about to enter the work. This is one of its most important functions. I do not broadly claim an awl-feed.

If desired, the awl may be mounted upon a pivot, o, (see Fig. 5,) and be provided with a slot, in which is placed a stop-pin, n. A spring, 11, causes the awl to assume a certain position with its point depressed to its lowest position while out of the work. The tendency of the awl so held is to strike down into the bottom of the channel; but after it strikes with sufficient force to overcome the action of the spring the awl turns upon its pivot, and the point of the awl is deflected, so that instead of going deeper into the leather it will assume a different course, and point in a more upward direction. The amount of this deflection will be governed by the length of the slot.

In this invention I provide for giving to the welt-guide a motion proportioned to, or governed by, the thickness of the stock or of the upper, so that it will be thrown from the work or stock equally distant, whether the stock be thick or thin, this obviating plaiting the upper under the welt, or drawing the welt too tight.

This object is effected by the use of a lever, 9, (shown in Fig. 2,) which is mounted upon a pivot or stud, 15. The upper end of this lever is provided with a roller-stud, operating in a suitable cam-groove in a hub on shaft c, and attached to its lower end is a pawl or ratchet lever, 12, one end of which rests upon a toothed plate, m, which is fastened by screws to the sliding bar e' of the welt or edge guide e.

The piece e (shown in Figs. 1, 2, 3) is what is termed an edge-guide for sewing "turns." It is fastened by screws to the sliding bar e'; but in sewing welts this piece is removed, and a proper welt-guide (shown in Fig. 6) is put in its place.

Under the pawl 12 is the device which positively governs the amount of throw, or the motion of the welt-guide away from the work. It consists of a short pawl-lifter, 16, pivoted between the pawl 12 and the sliding bar e'. The pawl 12, held down by a suitable spring, is moved an equal distance at each rotation of the shaft c. When it is moved backward it is lifted from the ratchet-teeth on the plate m, permitting the spring 32 to press the guide against the material being sewed, the guide moving forward to a variable position depending upon the thickness of the stock. When the pawl is moved forward it engages into one of the series of teeth on the plate m, according to which tooth of the series is in position to be engaged by the pawl 12, that depending entirely upon the thickness of the stock, and when the tooth is engaged then the guide is moved away from the work a fixed distance.

In other words, the guide is moved backward at each stroke an equal distance from a variable base-line, which is represented by the stock, and it varying in thickness changes the base-line.

I do not intend to limit my invention in this respect to the exact mechanical devices to move the welt-guide in this way for such devices may be variously modified without departing from this invention.

The gage *f* presses at all times against the shoe with a yielding pressure, except during the time that the needle pierces the work and tightens the stitch, when it is rigidly locked by the action of the detent or pawl 13, which is caused to engage the teeth of the segmental lever 14, provided with a slot to receive a pin projecting from the shank of the gage *f*. The pawl 13 is moved by the lever *g*, pivoted at b^2, and operated by a proper cam on shaft *c*, the lever being moved at proper time to permit the two pawls 13 30 to be operated by their springs to lock both gages when the needle penetrates the stock, and when the stitch is being drawn up. The pawl 30 engages a toothed block or portion, 31, upon *e'*, to hold it forward positively. Spring 32 holds the guide *e'* forward with a yielding pressure, and the spring 33 holds the gage *f* in the same way. This guide *e'* is so arranged that at the time the stitch is being taken through the welt it is pressed firmly against the upper and sole, so as to relieve the needle of the strain which would be required to draw these parts firmly together.

The lip-holder may be timed to enter the lip after the needle penetrates it, and then it will hold the lip as the stitch is completed.

In Fig. 6, the dotted lines x^3 represent the welt, a way, 35, being formed at the end of the welt-guide to receive the welt, and present it between the upper and the point of the needle.

In Fig. 3 I have shown a welt, x^4, on one side of the shoe, the upper being upon the last.

The welt-guide has at its forward end the curved lip 36, for the passage of the needle. A channel or way, 35, for the reception of the welt, is formed by cutting the guide away, leaving a hook, 37, under which the welt passes, the lower edge of the welt being overlapped and guided by an adjustable finger, 38, held in position by a set-screw, 39. A spring, 40, connected with the finger 39, bears against the edge of the welt, and holds it up in the way 35, behind the hook 37.

Having thus described my invention, I wish it understood that I do not confine myself to the precise form of construction herein shown and described, as the form may be very much changed without essentially altering the principle of the machine; but

What I claim, and desire to secure by Letters Patent, is as follows:

1. In a machine to sew turns or welts to uppers and insoles, the combination, with stitch-forming mechanism, of a lip-holder, to penetrate the lip of the sole transversely to the path of the awl or needle, so as to hold the lip and sole in its place for the formation of the stitch, substantially as described.

2. The combination, with the welt-guide, of mechanism to impart to it an intermitting motion away from the shoe, substantially as and for the purpose described.

3. The combination, with the welt-guide, of mechanism to move it away from the shoe a uniform distance, irrespective of variations in the thickness of the upper, substantially as and for the purpose described.

4. In combination, the lever *g*, pawls 30 and 13, and a toothed block, and segmental lever 14, substantially as described, to lock and release the back or edge and welt guides, as set forth.

5. The awl-carrying lever, in combination with the awl, pivoted thereto, substantially as described, to permit the point of the awl to be elevated, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHRISTIAN DANCEL.

Witnesses:
G. W. GREGORY,
L. H. LATIMER.