

Everett P. Richardson's Improvement in Sewing Machines for sewing Boots and Shoes.

117207

Fig. 1

PATENTED JUL 18 1871.

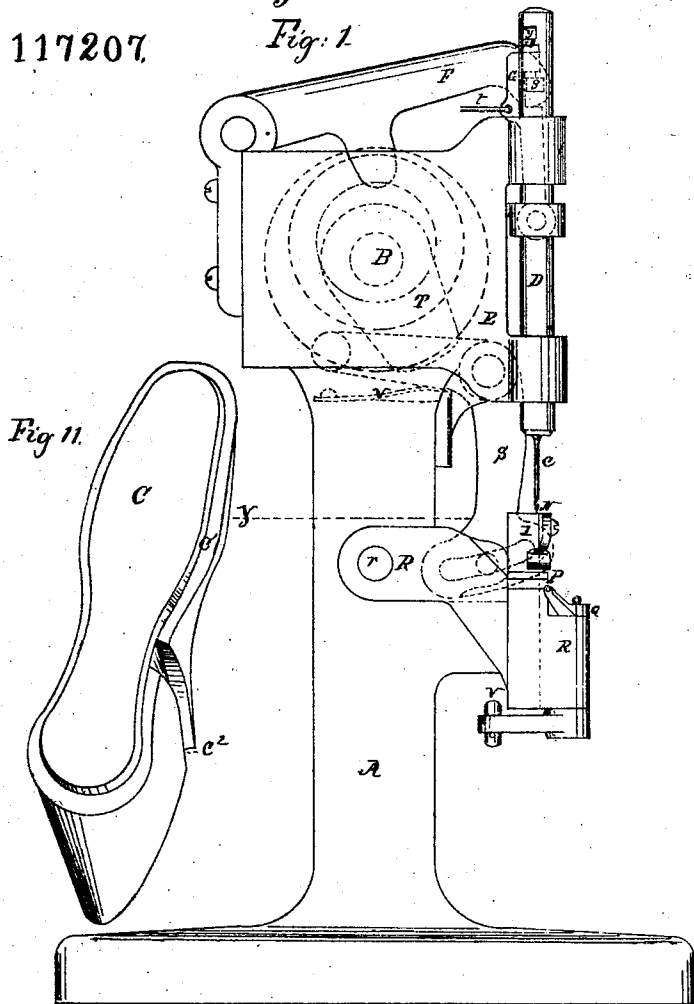


Fig. 11



Fig. 5

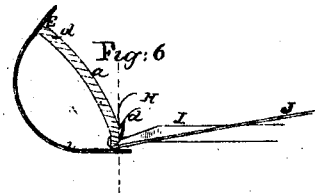


Fig. 6

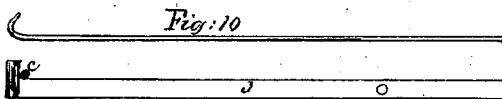


Fig. 10



Fig. 7



Fig. 8

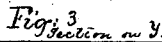


Fig. 9

Witnesses
 Octavius Knight
 W. B. Deming

Everett P. Richardson,

sewing Boots and Shoes.



Everett P. Richardson,

UNITED STATES PATENT OFFICE.

EVERETT P. RICHARDSON, OF LAWRENCE, ASSIGNOR, BY MESNE ASSIGNMENT,
TO MCKAY SEWING-MACHINE ASSOCIATION, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES FOR BOOTS AND SHOES.

Specification forming part of Letters Patent No. 117,207, dated July 18, 1871.

To all whom it may concern:

Be it known that I, EVERETT P. RICHARDSON, of Lawrence, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Machinery for Sewing Boots and Shoes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing.

My invention relates more particularly to sewing-machines for sewing together the soles and uppers of shoes known as turned shoes, they being wrong side out while the sewing is being done, and afterward turned; but is also applicable to the sewing of welted boots and shoes; and consists chiefly in means for bringing the sole and upper to a proper position and holding them successively for each stitch, insuring the entrance and exit of the needle at the proper points.

The looping and feeding mechanism and the cast-off are similar to those in other machines of this class, in which a waxed thread is used and a chain-stitch made.

Figure 1 is an end elevation, and Fig. 2 a front elevation of the machine, the scale being about half size. Fig. 3 is a section at the line *y*. Figs. 4 and 6 are sections of shoes prepared for sewing; Figs. 7 and 8, the same after being sewed and turned; Fig. 5, the needle and a section of the sole; Fig. 9, section of a shoe called "thick edge" or "mock welt," after being turned, same as shown in Fig. 2; Fig. 10, the hook-gauge, full size.

A, Figs. 1, 2, and 3, is the bed or frame of the machine; B, the main shaft; C, the needle; and D, the needle-bar working in the slide E, which has a movement at right angles to the shaft, being actuated by a cam on the shaft (not shown) moving in one direction, while the needle is in the work, and returning after the needle is withdrawn, thus feeding the shoe along, constituting what is known as the "needle-feed." Q is the looper, deriving its motion from a cam on the shaft through the connecting-rod V. The cast-off is not shown. The slotted plate P serves to force the work up to the foot H, and serves the purpose of the throat in ordinary sewing-machines resisting the thrust of the needle. The looper Q and the throat-plate P are attached to the movable frame R, which is pivoted at *r*, and is made to drop down, after the needle has en-

tered the work, by means of the cam T and the slotted lever S, thereby releasing the work so that it can be fed along by the needle; then, before the needle is withdrawn, the plate P is brought back against the shoe by the action of the spring U, thus adjusting itself to any variation in the width of the channel or in the thickness of the upper, which, from the thinnest parts to the part around the heel, in which there is a thick stiffening, is considerable. The throat or plate P is held up without severe pressure on the shoe, but very firmly, by means of the cam or wedge-shaped slot in the lever S, the comparative slowness of the spring U contributing to the easy working of the machine. Uniform pressure can be attained by properly shaping the slot in the lever S. In Fig. 2 is shown a section of a shoe near the toe, adjusted for sewing. *a* is the sole; *b*, the upper; and *c*, the last. The sole, being previously shaped, has the channel *d d* cut at or nearly at an equal distance from the edge all around on the flesh side of the sole, or that side which is to be inside when the shoe is finished. The channel may be made either before or after the sole is tacked to the last—preferably before. After the sole is attached to the last the upper is put upon the last and drawn over the edge of the sole with sufficient margin for sewing, and fastened temporarily by tacking or in any convenient manner; the sleeve is then ready for sewing. This preparation for sewing differs from that of hand-work only that in hand-work the channel is raised or opened, and for convenience and certainty the holes usually are made after the sole is attached to the last, but before the upper is put on; these holes to be followed by the awl and the holes made in the upper when the sewing is done. The holes are made in hand-work by a curved awl made to enter the sole at the bottom of the channel and come out at the surface of the sole near the edge. The sole is held to the last near where the hole is being made, and the awl assisted in coming through at the proper distance from the edge by the thumb of the left hand. When the awl is found to be coming out too near the edge and the point cannot be raised sufficiently by depressing the handle, the sole is bent slightly over the edge of the last, the bottom of which is somewhat convex and smaller than the sole. In my method of sewing that class of turned shoes

known as mock welts, in which the edge of the sole is left the full thickness, (not chamfered off as in thin edges, so called, Figs. 6 and 8, but making the edge as thick as the leather will allow, as at Figs. 2 and 9,) bending of the sole is a prominent feature, by which means a passage through the substance of the sole is made with a straight needle, which passage, after the needle is withdrawn and the sole straightened out, will be curved like the path of the curved awl in hand-sewing. In this way I avail myself of the many advantages in the use of a straight needle over any attempt to use a curved needle for this purpose.

I am aware that turned shoes have been sewed by machines using a straight needle, the sole being prepared, prior to putting it on the last or putting on the upper, by bending the edge all around, causing a flap to stand out from the body of the sole, through which the sewing is done, and not through the substance of the sole, the needle leaving a straight passage, the sole not being bent between the points of entrance and exit. There is much difficulty in bringing the sole to this condition with uniformity. The leather is much compressed, and a permanent set is put into it to make it retain its position while the shoe is being sewed, which it is very difficult or impossible to remove in finishing, while in my method the sole is bent and held only for the making of one stitch, requiring comparatively little pressure; and after the needle is withdrawn it assumes nearly or quite its original shape, and very little bend or compression is visible, and never more than can be readily removed.

In the two classes of turned-shoe sewing known as "thin edges" and "French edges" no bending of the sole is required, the devices used to bend and hold it in mock welts being used here only to hold it. In thin edges, Figs. 6 and 8, the preparation for sewing is the same except that the edge of the sole is chamfered off; then, when the sole is molded to the last, as it is done in hand-work, making it somewhat convex, there is enough of the substance of the sole projecting, when the edge is gripped and, perhaps, slightly compressed, for sewing without further bending. In French edges, Figs. 4 and 7, the sole is either beveled or left square at the edge, and is left full thickness. The needle (or the awl in hand-work) is made to enter at the bottom of the channel and protrude at the edge between the two surfaces, near the surface which is to be outside when the shoe is finished, no edge being visible after the shoe is turned. In this work the hook-gauge J determines the point at which the needle shall come through, and the sole is merely held up to the gauge by the griper I, which may have a spring interposed to allow for variation in thickness of sole. In sewing mock welts the bending of the sole is effected by the reciprocating bender and griper I, in connection with the hook-gauge J and the stationary foot H. The bender and griper is moved forward to grasp the sole, by means of a cam on the shaft and the lever L, to a point adjustable by the set-screw M, which determines where the needle shall come

through, and, consequently, the distance of the line of sewing from the edge of the sole. When released by the cam the bender is carried back by the spring N. The hook on the gauge J, over which the sole is bent, is between the sole and last, (a portion of the last being cut away all around for the purpose,) thence passing out between the sole and the upper over the rest *p*, then hooking onto the pin in the lower end of the bent lever K, at the other end of which is a set-screw for adjusting the gauge to different thicknesses of sole. In practice thin sheet-steel is found to answer for this gauge. The foot H serves to open the channel to hold the sole in position for the needle to enter at the bottom of the channel, and to partially resist the pull of the thread when the stitch is drawn in, and also forms one of the three points of contact necessary in bending the sole. The sole may be bent over the last instead of the gauge J, if preferred, the last being held firmly in position for the needle to enter the channel and at the proper angle; but there is less complication and more certainty in the use of the gauge. This manner of gripping the sole retains the shoe in position and prevents the compression or drawing up of soft or thin stock between the channel and the edge, which would result if it were held only by the foot in the channel when the stitch was being drawn up instead of being grasped near the edge. I use the same devices for holding and gauging in the three different classes of work, with perhaps a slight variation in shape. In French edges the gauging, so that the needle shall protrude at the edge of the sole at a proper and uniform distance from the surface, which is to be outside when the shoe is turned, is done by the hook-gauge J, which is fixed, while the pressure to keep the sole against it may be yielding. But in mock welts and thin edges the needle must come out uniformly on the surface of the sole, which is to be inside when the shoe is turned. It is, therefore, necessary that this surface of the leather, where the needle protrudes, be brought to a fixed point at every stitch. This is done by the griper I, which is brought to a position for every stitch, determined by the set-screw M, thus forming an effectual gauge, and in this case the hook J may be yielding. The needle, Fig. 5, is straight, and the point is on one side, being in a line or nearly so with that side of the needle which is next the shoe, the object being to have the displacement of the material caused by the entrance of the needle wholly on that side of the needle opposite the shoe, that part of the material being free to move, while the other side or body of the sole is held fast and cannot yield, except slightly, by compression, causing the needle, if its point were central, to be deflected from the body of the sole, and as different soles and different parts of the same sole are more dense than others, there would be different degrees in the springing of the needle, and so varying the distance from the edge of the sole at which the needle emerges, causing unevenness in the sewing. The shoe is held fast during the time the needle is out of the work by the gripping devices, so as to remove the

shoe after it is sewed and to adjust another. I stop the needle while it is out of the work and continue the motion in the other parts of the machine till the shoe is released, which leaves the machine in position to receive another. This is effected by throwing back the hook-connecting rod G of the needle, releasing it from the pin s in the needle-lever F, allowing the lever to proceed without the connecting-rod, thus permitting the needle to stand still while the other parts of the machine are in motion. The connecting-rod G is thrown back by a treadle or a handle, in any convenient place, attached to the wire t. It is also provided with a set-screw, v, which adjusts the length of loop for different lengths of stitch and thickness of stock by changing the height to which the needle is raised. W is the thread, and X the thread-spring for taking up the slack in the same.

The operation of the machine is as follows: The shoe is brought to the position for sewing by first inserting the stationary foot H in the channel d, then adjusting the gauge J between the last and the upper and hooking it onto the pin in the lever K, when the machine is ready to start. The throat P then comes up against the upper; then the binding and gripping device I comes forward and grasps the sole, bringing it to a position to be properly pierced by the needle; then the pin s in the needle-lever F catches in the notch of the connecting-rod G, and the needle goes down through the sole and upper. The bender and griper and the throat are then drawn back and the needle feeds the work along for the next stitch; the griper and throat again grasp the sole, and the thread is laid into the hook of the needle by the loopers Q and drawn up through the leather; the feed-slide E and the needle then

return to be in position for the next stitch, and so on until the shoe is nearly sewed, when the gauge J is unhooked from the lever K and pushed through and taken out at the top of the shoe, the last being cut away for that purpose. The one or two remaining stitches are taken, the connecting-rod G is then thrown back, and the machine turned slightly to release the shoe.

In sewing welted work the welt is sewed on by simply inserting it between the upper and the throat P and guiding it by any suitable means.

I am aware that reciprocating devices have before been employed for holding the work in machinery for sewing boots and shoes. This, therefore, I do not broadly claim. My device differs from others in that the reciprocating bar I is actuated with an absolutely positive motion by a cam movement without the intervention of a spring. I am enabled to thus work the device with an absolutely positive movement and bring it accurately to the same place at each stroke, so that it will constitute an unyielding bearing, by adapting the said bar to bear directly on the sole instead of employing it to hold the sole and upper together, as is done in other machines.

I claim as my invention—

The reciprocating bar I, when the same is actuated with an unyielding movement from a cam or its equivalent without the intervention of a spring, and which operates in connection with a last cut away at its edges, as shown, and is adapted to bear directly on the sole near its edge, other means being depended on to hold the upper in its proper relative position.

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Witnesses:

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