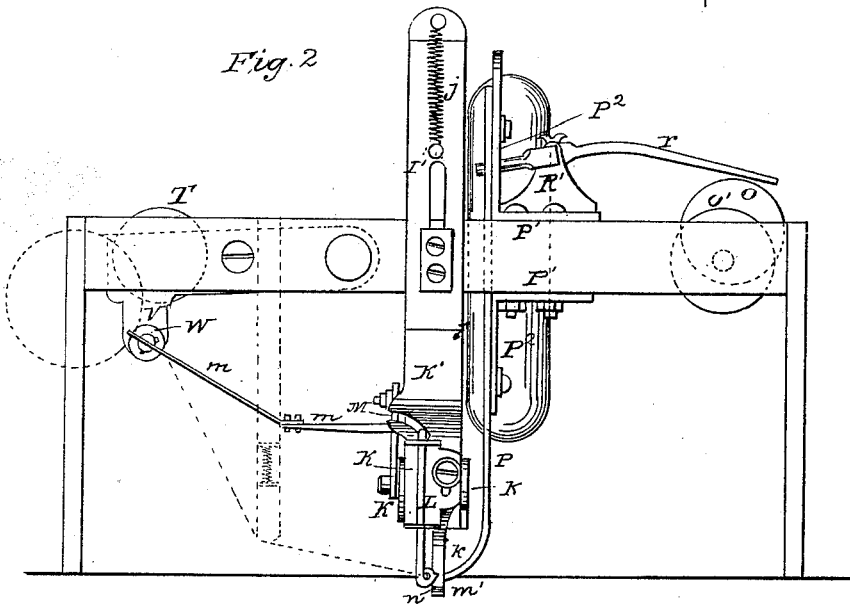
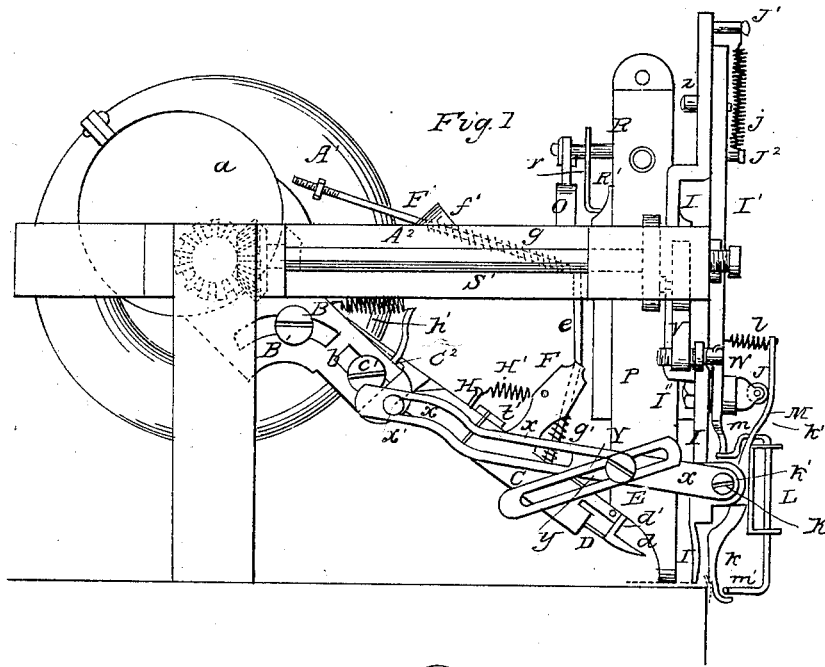


J. P. GREELY.

Sole Sewing Machine.

No. 108,132.

Patented Oct. 11, 1870.



Witnesses
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Fig.3

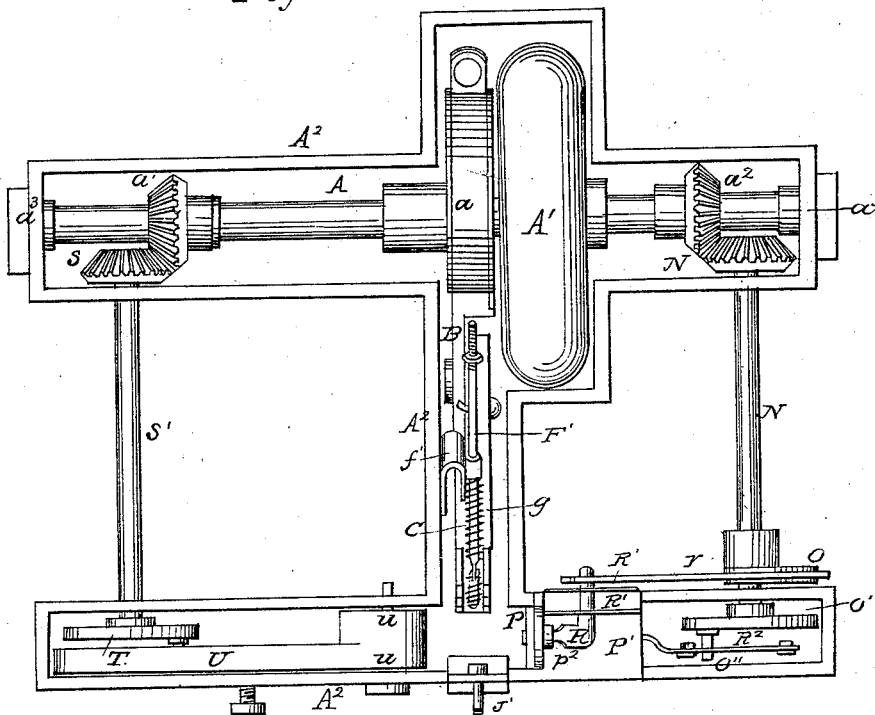


Fig. 5

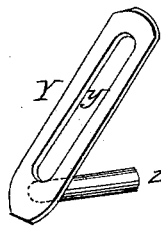
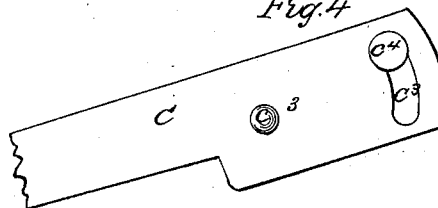


Fig. 4



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UNITED STATES PATENT OFFICE.

JOHN P. GREELY, OF BOSTON, ASSIGNOR TO HIMSELF, JOSEPH B. LEONARD OF CHELSEA, AND BENJAMIN GREELY, OF DEDHAM, MASSACHUSETTS.

IMPROVEMENT IN SOLE-SEWING MACHINES.

Specification forming part of Letters Patent No. 108,132, dated October 11, 1870.

I, JOHN P. GREELY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Boot and Shoe Sewing Machines, of which the following is a specification:

Figure 1 is a side elevation of my invention. Fig. 2 is a front elevation. Fig. 3 is a plan view, and Figs. 4 and 5 views of parts in detail.

This invention has for its object the sewing of boot and shoe soles to their uppers when the latter are turned wrong side out; and it relates to certain mechanisms whereby the movement of the needle through leather is similar to that given to an awl by the hand of a shoemaker in stitching soles and uppers together, and whereby the movements of the presser-foot and thread-carrier are accomplished, all as hereinafter fully explained.

In the drawing, A represents the driving-shaft, provided with the balance-wheel A¹, cam *a*, and bevel-pinions *a*¹ *a*². A² is a metal frame, in which all the parts are held, and which is pivoted at *a*² *a*³ in such manner that the frame can be raised or lowered on its pivots. B is an arm attached to cam *a*, and projecting diagonally downward. Said arm is provided with the curved slot B' and straight slot *b*.

C represents the needle-arm, which is connected with the arm B by screws *c* *c*¹, passing through the slots B' *b*. At the lower end of arm C is the needle D, which is provided at its ends with a hook. The upper end of arm C has an intermediate piece, C², between itself and the arm B, to which piece it is attached by screws *c*² *c*⁴, the latter of which passes through a transverse curved slot, C³, as shown in Fig. 4, by means of which the arm C may be adjusted to incline more or less from cam *a*.

In Fig. 1, D is the cast-off, which consists of a tongue of metal grooved in its under side, so as to cover the needle, and fitting closely over the barb or hook of the same. The cast-off is attached by its flange *d*' to the lower end of a bar, E, that slides in the recess in the upper surface of the arm C.

At the upper end of the bar E is a stud, H, which is connected by means of a spiral spring, H', with the standards F. These latter pro-

ject upward from the bar C, at right angles with the same.

Between the standards F is pivoted a block, through which passes loosely the rod *e*, the lower end of which is jointed to the bar E, while its upper end is jointed to the rod F.

A spiral spring, *g*', incloses the rod *e*, which spring bears on the lower side of the block, through which said rod passes, and on the upper side of the bar E a similar spring, *g*, incloses the rod F', passing from the point of the attachment of said rod with the rod *e* to the head *f* of a bolt, through which the rod F passes, and which is swiveled in the U-shaped plate *f*', that is secured to the frame A².

In Fig. 1, *h* represents a pin projecting upward from the lower end of the arm B, to the upper end of which pin is attached a spiral spring, *h*', which connects said pin with the upper end of the needle-arm C.

In Fig. 1, I' is a vertical plate, that is rigidly attached to the front side of the frame A². I is the presser-bar, which is slotted, and connected with the vertical plate I' by screws *i*, in such a manner as to have a limited vertical motion, sliding on said plate. J¹ is a pin projecting horizontally outward from the presser-bar I, near the upper end of the same. J² is a pin projecting horizontally outward from the plate I' below the pin J¹. *j* is a spiral spring, by which the pins J¹ and J² are connected. K are lugs extending horizontally from the presser-bar I, near the lower end of the same. K' is a curved plate, which is pivoted between said lugs. *k* is a bar, which forms the lower part of the plate K'. *k*' is a vertical frame, which is secured to the front side of the plate K' below the curved part thereof. J is a roller, mounted between lugs which extend outward from the plate I', near its lower end, against which roller K' is drawn by the spiral spring *l*. L is the thread-carrier, which is mounted vertically in the horizontal arms of the frame *k*'.

The thread-carrier is bent inward above and below the frame *k*', its upper arm, after passing through a curved slot, M, in one side of the inclined portion of the plate K', and then bending downward, being jointed to the lower extremity, *m*.

The lower arm of the thread-carrier is

formed at its inner end into a hook, m' , in which is made an orifice, n , for the thread to pass through.

N, Fig. 3, represents a bevel-pinion, which meshes with the pinion a^2 , and is located on one end of the shaft N' , which runs across frame A^2 at right angles to the shaft A, and has a cam, O, and disk O' on its opposite end.

P represents a vertical feed-bar, which is attached to the arms P^2 of the sliding carriage P^1 , and has a curved foot. The carriage P^1 is eccentrically connected with the disk O' by the rod R^2 , Fig. 3.

To bar P is attached an elbow-shaped arm, R, Fig. 3, which is journaled in standards R^1 , and rigidly attached to a bent lever, r , which bears on the periphery of the cam O.

S, Fig. 3, represents a bevel-pinion, which meshes with the pinion a^1 , and is on the shaft S' , which runs parallel with the shaft N' on the opposite end of the machine. Said shaft S' is provided on its end opposite the pinion S with a disk, T, which is eccentrically attached to an arm or lever, U. This latter is pivoted at u in the frame A^2 , and provided on the lower side of its outer end with the projection V, in which is a bolt, W, with a slotted head, in which bolt is pivoted the upper end of rod m , the same being slotted at the point of its attachment to the bolt W, and having a slight longitudinal play.

X, Fig. 1, represents a curved plate, which is pivoted at one end to one of the lugs K, and is provided with a curved slot, x , through which passes screw x' , which pivots the plate X to the lower end of the arm B.

Y represents a shorter plate, pivoted through slot y to the plate X, and provided at its inner end with an arm or bar, z , which projects under and bears against the arm C.

Operation.

The thread, which is suitably waxed, is wound on a spool or bobbin journaled on any convenient part of the frame A^2 , from whence it passes downward under a suitable tension device, as shown in dotted lines in Fig. 2, and through the orifice n in the hook m' .

When the shaft a is revolved, the eccentric a , rotating with it, imparts motion to the arm B. The arm B, being loose on the eccentric a , would hang vertically therefrom were it not connected with the arm C, which is supported in an inclined position by the pin z of the plate Y, the latter being upheld by the plate X. The arm B is therefore also sustained in an inclined position.

Following the movements of the different devices from the time when the eccentric a is at the highest point in its rotation, it will be seen that while the eccentric is moving downward and forward the arms B and C travel also downward and forward, or, in other words, obliquely, in the resultant of the motion of the eccentric as one arm, until the point of the needle reaches the projecting lip of leather that has been previously formed on

the flesh side of the sole, which lies beneath the presser-foot, for the purpose of being this lip it is essential that it should be brought sewed to its upper. Before the needle pierces down into a position nearly horizontal, in order that the whole orifice may be made in the lowest part of the lip. Therefore the bar E is so arranged as to strike the presser-bar I a little before the needle reaches the lip of the sole. The bar E is thereby brought to a stand, and the arm C is temporarily checked by the spring H, which connects it with the bar E.

The checking of the arm C turns the arm B aside from the oblique course it has hitherto held, causing it to move downward and to carry the upper extremity of the arm C downward with it, the lower extremity of the arm C still remaining stationary, or nearly so, the form of the slot B' admitting of the moving of the head of the arm C in the arc of a circle of which the lower end of said arm is at the center.

By the time the arm C attains a position nearly horizontal the upper ends of the slots b B' come against pins c c' , and, further movement of the arm C in a curvilinear direction being impossible, the arm C is driven forward. Prior to entering the lip, the needle is mostly covered by the sheath d . On entering the lip the needle emerges from beneath the sheath, leaving the latter behind, but held up to work by spring H.

After the point of the needle has passed through the leather to its utmost extent, the lever U is raised by the disk T, and with it the rod m , which is carried diagonally upward, and imparts a vibratory motion to the thread-carrier L, the upper end of which moves through slot M, which gives it a slight upward motion, and causes the hook m' , through which the thread passes, to swing over the point of the needle D in such manner as to enable the hook of the latter to catch the thread, which it does, and is withdrawn by the backward motion of arm C, drawing a loop of thread with it through the leather.

When the needle returns it draws the thread in a loop through the old loop held by the cast-off in the usual manner of forming the chain-stitch.

During the forward movement of the needle-arm C, the presser-bar I bears on the leather on the bed of the machine and holds the whole firmly, while the arm k presses the leather lip against the side of said bar I.

Just after the needle has cleared the leather lip in its upward and rearward movement the pin O'' of the disk O' reaches the front end of the slot in the arm R^2 in which said pin slides, and sets the arm R^2 in motion toward the presser-bar. The arm R^2 drives forward the carriage P^1 that bears the feed-bar P.

Simultaneously with the starting of the carriage P^1 , the eccentric O begins to raise the free end of the lever r , which lever, being pivoted in the lugs R^1 of the carriage P^1 , and connected near its front end with the feed-bar P,

first forces said feed-bar downward as the latter moves forward, thus insuring its taking firm hold of the leather; and as soon as the feed-bar has taken such hold and ceased to descend farther, although still continuing to move forward, the fulcrum of the lever r is transferred to the feed-bar, and as the lever still keeps on rising it elevates, by reason of its connection with the lugs R^1 , the whole frame A^2 , with all its belongings, of which latter the bar I' is one, which bears a screw, I'' , that passes through a slot in the presser-bar I' .

The screw-head is placed nearly or quite in contact with the lower side of the offset of the bar I , and when the screw rises with the frame A^2 it lifts the bar I off from the leather.

When the eccentric O begins to descend the weight of the frame A^2 draws the lever r downward, causing it to follow the eccentric until the frame resumes its former position supported upon the presser-bar.

As soon as the presser-bar rests once more on the leather the feed-bar is drawn backward by the reverse motion of the carriage P^1 .

The machine being pivoted, as above mentioned, at $a^3 a^3$, it readily adapts itself to any inequalities in the leather, and avoids any positive motion, which is usually a serious objection in sewing turned shoes, as any variation in the thickness of the sole interferes materially with the perfect operation of the machine.

It will be seen that the motion of the needle D is similar to that produced by hand, and is therefore productive of the best results.

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

1. The arm C , provided with the slot C^3 , the arm B , provided with the slots $b B'$, the intermediate piece C^1 , and the eccentric a , all arranged as specified.

2. The cast-off d and sliding arm E , operated by spring H' , rods $e F'$, and springs $g g'$, in combination with needle-arm C and needle D , substantially as described.

3. The presser-foot bar I , in combination with plate X , having slot x , and plate Y , having arm or bar z , and needle-arm C , arranged and operated substantially as described.

4. The pivoted curved plate K' , having the curved slot M , in combination with the thread-carrier L , connecting-rod m , and lever U , all arranged as described.

5. The feed-bar P , in combination with carriage P^1 , disk O' , cam O , lever r .

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

JOHN P. GREELY.

Witnesses:

B. GREELY,
CHARLES F. BROWN.