

W. HIRONS & J. D. MOORE.

Sewing-Machines.

No. 141,791.

Patented August 12, 1873.

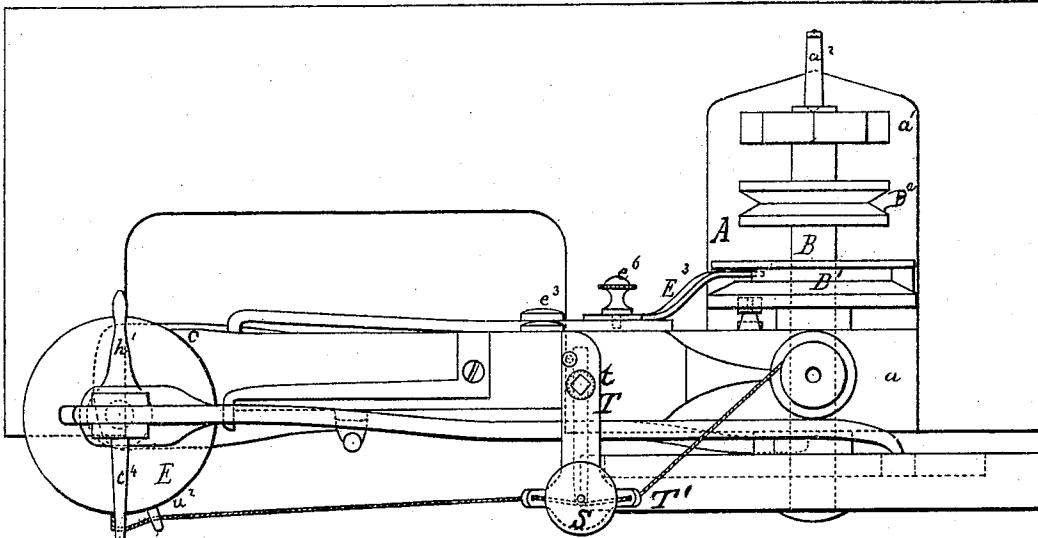


Fig. 1.

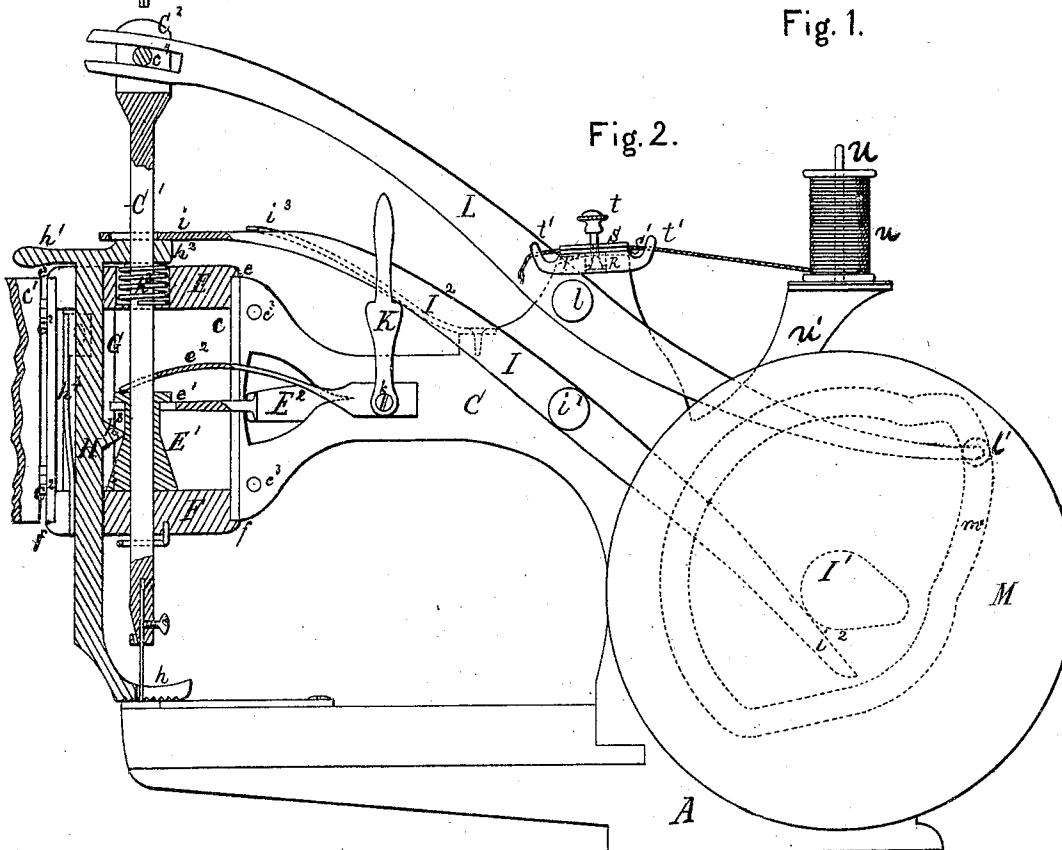


Fig. 2.

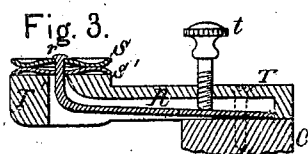


Fig. 3.

WITNESSES
Villette Anderson.
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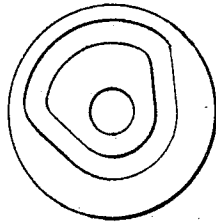


Fig. 5.

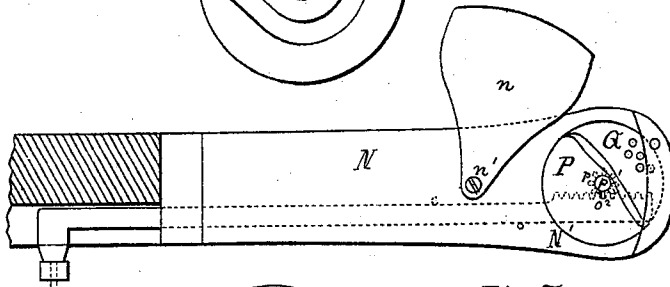


Fig. 6.

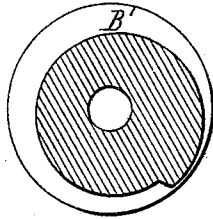


Fig. 7.

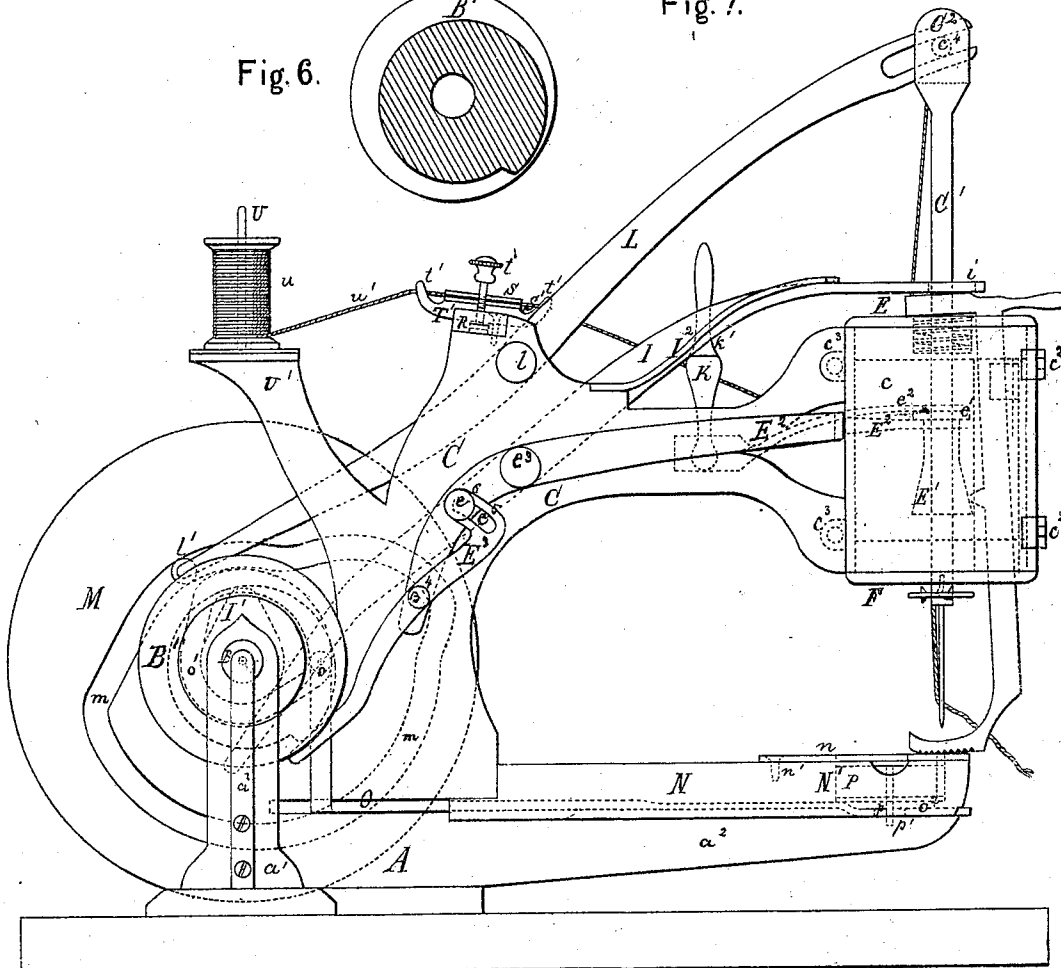
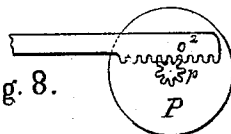


Fig. 4.

WITNESSES

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Fig. 8.



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UNITED STATES PATENT OFFICE.

WILLIAM HIRONS AND JAMES D. MOORE, OF GRINNELL, IOWA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **141,791**, dated August 12, 1873; application filed May 24, 1873.

To all whom it may concern:

Be it known that we, WILLIAM HIRONS and JAMES D. MOORE, of Grinnell, in the county of Poweshick and State of Iowa, have invented a new and valuable Improvement in Sewing-Machines; and we 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 drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of our improved sewing-machine by a plan view. Fig. 2 is a section of the front head exhibiting the feed-motion. Fig. 4 is a side elevation of the machine. Figs. 3, 5, 6, 7, 8 represent detailed parts of the sewing-machine.

Our invention relates to the feed and tension mechanisms of sewing-machines. A round needle-bar is arranged in connection with a revolving guide-cylinder and a feed-bar, constructed as hereinafter described, whereby the material is moved in any desired direction. The shuttle is moved in a projecting arm in order to sew sleeves, boot-legs, &c., or sewing patches in large pieces of clothing, which cannot well be turned around on a sewing-machine, but which could be done without difficulty by a revolving feed-bar.

In the drawings, A represents the foundation-plate of our sewing-machine, which supports the shaft B with two standards, *a* and *a'*, and which has the needle-arm C and the shuttle-arm united with it. The needle-arm C terminates in a vertical semi-cylindrical bearing, *c*, which is completed to a fully cylindrical bearing by a semi-cylindrical door, *c'*, hinged on one side to the stationary bearing on the needle-arm C by lugs *c''*, and fastened to the needle-arm at the opposite side with flanges *c''* and screws *c'''*. The said cylindrical bearing has perfectly parallel ends, which serve for end bearings for a revolving head, E, and bottom F, which are united by a standard, G, and are made immovable in a vertical direction by means of laps or face-bearings *e* and *f*. A round needle-bar, C¹, passes through the centers of the head E and bottom F, and it bears between the said head and bottom, a cone, E¹, with a flanged head, *e'*, on the top of which

a forked spring, *e''*, bears, which enters through a slot between the cylindrical door *c'* and the needle-arm C, and is fastened outside to the needle-arm C. The cone is elevated by the forked end of a lever, E², which bears on the under side of the flanged head *e'*, is pivoted to the needle-bar C¹ by a pin, *e'''*, and has a lever, E³, pivoted to its end by a pin, *e''''*, the said lever being adjustable by a concentric slot, *e'''''*, and a set-screw, *e''''''*, at the fore end, and having a smooth bearing at the other end, which is operated by a cam-groove in a pulley, B¹, on the shaft B. The head E and the bottom F have, near the standard G, two parallel slots, into which the feed-bar H is inserted, which extends down to the sewing-table, where it is provided with a serrated presser-foot, *h*. The upper end of the feed-bar H is connected with a horizontal handle, *h'*, and a radial arm, *h''*, encircling the bar C¹. Arm *h''* is elevated by a spring, *h'''*, located in a recess in the top E, while a more powerful spring, I², fastened to the needle-arm C, and provided with an angular lip, *i'*, bears on the forward arm of a lever, I, thereby forcing its slotted end *i* on the top of the arm *h''*, and pressing the bar H down at intervals, when the revolving cam I¹, which acts on the end *i'* of the lever I, permits. The lever I is pivoted to the needle-arm C by a pin, *i''*, and the cam I¹ is fastened to the shaft B. The feed-bar H is provided with a projection, *h''''*, which bears against the cone E¹, and, through its rising and falling, causes the lower part of the bar H to swing to and fro, in which motion the said bar is supported by the pressure of a spring, *h'''''*, fastened to the standard G and bearing on the back of the bar H. A stop-lever, K, pivoted to the needle-arm C by a pin, *k*, serves to lift the lever I, by aid of a step, *k'*, out of gear with the cam I¹, and thereby to stop the operation of the feed-bar H, which is then kept up above the sewing-plate by the spring *h'''*. The needle-bar C¹ has a forked head, C², with a pin, *c''*, which is operated by the forked head of the lever L. The said lever L is pivoted to the needle-arm C by a pin, *l*, and it has, at the lower end, a friction-roller, *l'*, which travels in the cam-groove *m* of the wheel M, thereby giving motion to the needle-bar C¹. In the place of a sewing-plate there is a shuttle-arm, con-

sisting of an elongation, a^2 , of the foundation-plate A, and a rounded cover, N, fastened to the same, which ends in a small circular casing, N', below the needle-bar. The cover N has a grooved bearing for the shuttle-bar O, which is provided with a vertical end, to which a roller, o, is fastened at the same central elevation as the shaft B, to receive a correct motion from the cam-groove o^1 in the pulley B¹. The front end of the bar O is provided with a rack, o^2 , by which it operates a pinion, p , on a vertical shaft, p' , to which also a semicircular cam, P, is attached, which fits into the circular casing N', and operates the crescent-shaped shuttle Q. A plate, n , pivoted to the arm N by a pin or screw, n' , serves to cover the cam P and the shuttle Q. The tension of the sewing-thread is effected by the central pressure of a spring, R, with a headed pivot-pin, r , on a couple of revolving elastic dished plates, S S', between the averted rims of which the thread is guided, and forced to pass in a diametrical direction by the elevated eyes t' of the double arm T' of the projecting spring-case T, which is fastened to the needle-arm C, and has a set-screw, t , fastened or screwed into its top, and by the pressure of which on the spring R the tension of the sewing-thread is regulated. The spool u revolves on a pin, U, fastened to the arm U', which juts out from the needle-arm C, and from there the thread w^1 passes through the rear eye t' between the tension-plates S S', through the front eye t' , through an eye, w^2 , on the outside of the semicylindrical door c^1 , through a hole in the end of the elongated pin c^4 , and from there down toward the needle-bar, in the usual manner. The shaft B is provided with a grooved pulley, B², so that it may be driven by a cord or belt from a treadle-wheel.

To operate the machine the lever K is turned back, causing the front end of the lever I to rise, whereby the bar H is raised through the spring h^3 . The fabric to be sewed is put on the plate n , and the lever K is moved down again. The movement of the needle-bar C¹ is the same as that of the needle-bar of any common sewing-machine. The feed-bar H presses on the fabric like a presser-foot while the needle is descending and rising, but during the latter motion the feed-bar is moved away from the needle by the rising of the forked head of

the lever E², by which the cone E¹ is raised, and the projection h^3 , and with it the bar H, pushed outward, carrying the fabric along the length of one stitch. After this the bar H remains stationary on the fabric, holding the same until the needle has come down again and is touching it, when it rises and moves toward the needle again, which is at the same time penetrating the fabric, and thereby holding it in place.

For filling the spools of the shuttle, they are placed between the center hole on the end of the shaft B and the dimpled end of a spring, a^2 , on the standard a^1 .

This machine may be used as a common sewing-machine by surrounding the shuttle-arm N with a folding table of the same elevation as the plate n .

The handle h^1 cannot be entirely passed around the needle-bar C¹, because the bar H and the standard G cannot pass the spring c^2 and the lever E²; but by reversing the handle to the other side of the said spring and lever, a complete circular seam may be sewn, nevertheless.

What we claim as new, and desire to secure by Letters Patent, is—

1. The feed-bar H, with the serrated presser-foot h , the handle h^1 , the encircling-arm h^2 , the projection h^3 , in combination with the cone E¹, with the flanged head e^1 , the levers E² I, and the springs h^3 , c^2 , I², and h^4 , substantially as described.

2. The combination, with the feeding-foot, of the lifting-lever E² and the pivoted adjustable end lever E³, having the slot e^5 and set-screw e^6 , substantially as specified.

3. The tension device fastened to the needle-arm C, consisting of the movable spring-case T, having the diametrical guide-eyes t' , spring R, set-screw t , and pressure-plates S S', arranged and operating substantially as shown and described.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

WILLIAM HIRONS.
JAMES D. MOORE.

Witnesses:

A. R. HILLYER,
JNO. MOWBRAY.