G. McKAY.

MACHINES FOR SEWING BOOTS AND SHOES.

No. 188,809. Patented March 27, 1877.

Fig. 1.

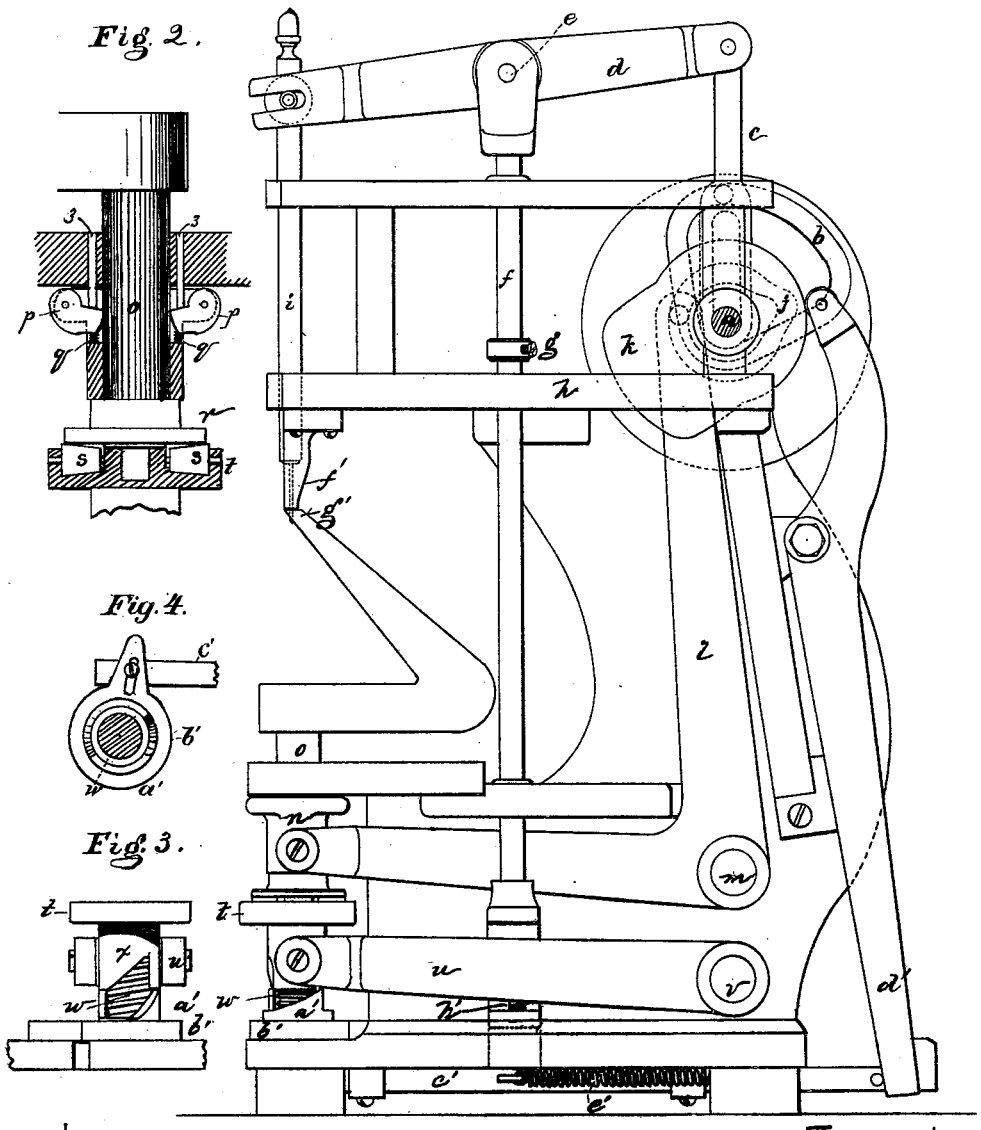

Fig. 2.

Fig. 4.

Fig. 3.

Witnesses.

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UNITED STATES PATENT OFFICE.

GORDON McKAY, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR SEWING BOOTS AND SHOES.

Specification forming part of Letters Patent No. **188,809**, dated March 27, 1877; application filed October 18, 1876.

To all whom it may concern:

Be it known that I, GORDON McKAY, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented an Improved Sewing-Machine, of which the following is a specification:

This invention relates to sewing-machines for sewing or uniting the soles to uppers in the manufacture of boots and shoes.

In the machine described in United States Patent No. 36,163, provision is made for lifting the presser from a variable base-line, which is the surface of the stock on which it rests when down, and then to permit it to descend upon the surface of the stock. The machine also describes mechanism for operating the needle to cause it to automatically vary its throw according to the thickness of the stock. The needle-lever is carried by an adjustable fulcrum bar or post, the position of which is determined by the thickness of the stock upon which the presser rests, an arm projecting from the fulcrum-post resting upon a lug or projection located by the position of the presser, the latter resting upon the work.

In the machine to be herein described, the needle, cast-off, whirl, &c., constituting the sewing parts, and the feed, are or may be constructed the same as described in such patent, and in Patent No. 45,422, to both of which reference may be had.

In this present invention the presser-foot is stationary instead of movable, as in such patents, and the horn is adapted to fall a determined distance from a variable base-line, represented by the inner portion of the shoe being sewed. The needle is always lifted a certain distance above the surface of the stock, the upward position of which is determined by the rigid presser, and the extreme downward throw of the needle is made variable according to the variation in the thickness of the stock, and so that the hook of the needle will be brought to a proper position with relation to the whirl in the horn, to be supplied with thread, notwithstanding the variations in the position of the horn by reason of the variations in the stock.

Figure 1 represents, in side elevation, sufficient of a well-known McKay sewing-machine to show how this invention may be embodied therewith; and Figs. 2, 3, and 4 are details of the devices for depressing the horn-shaft, and for locking it to resist the thrust of the needle.

The main shaft *a* has a disk provided with a cam-groove, *b*, to move the link *c*, connected with the needle-lever *d*, having its fulcrum, at *e*, on a movable fulcrum-post, *f*, the downward position of which is regulated by means of an adjustable collar, *g*, that meets the plate *h*, the collar resting upon the plate when the needle-bar is being lifted, to draw the needle from the upper side of the work, this insuring the lifting of the needle to a certain defined position above the top of the work, or the bottom of the fixed presser, thereby forming loops of equal length at each stitch, and by moving the collar the length of loop may be changed. The needle-bar *i* is connected with the lever *d*. A second cam-groove, *j*, in the face of a cam-disk, *k*, operates an elbow-lever, *l*, pivoted at *m*, the lever being suitably connected with the pawl-carriage *n*, which is a loose collar surrounding the horn-shaft *o*, and provided with pawls *p p*, that are held up in griping contact with the horn-shaft by springs *q*. The foot-plate *r*, fixed to the horn-shaft, serves the purpose of a base or foot, and bears upon a rest, *t*, preferably provided with rollers *s*, the rest being adapted to be held or fixed in position when the horn is to be locked, to hold the work between it and the rigid presser against the thrust of the needle. The rest *t*, free to be moved upon the horn-shaft, is connected with a fulcrum-post stop-lever, *u*, pivoted at *v*, the rest and stop-lever *u* being lifted by means of a spring, *w*, that bears against the cam-sleeve *x* of the rest. This spring *w* is of sufficient strength to overcome the weight of the horn and its appendages, and to lift it when the pawls are freed from the horn-shaft, in order to cause the upper end of the horn to press upward against the inner side of the shoe.

The upper end of the horn is pressed against the under or inner side of the work, and is locked in position by the cam projections on a cam, *a'*, in this instance formed upon a sleeve, *b'*, surrounding the horn-shaft, an arm projecting from the sleeve being connected, by link *c'*, with a lever, *d'*, operated by cam *k*, a spring, *e'*, moving the cam-sleeve and link *c'*

in the opposite direction. Prior to locking the horn it is held up by the spring *w*, causing the stock to be clamped between its upper end *g'* and the lower end of the stationary presser *f'*, the rest *t*, with the stop-lever *u*, being also held up by this spring, thereby insuring the proper relative positions of the end of the horn and the fulcrum-post stop-lever *u*. In this condition the horn is locked, and the cam *b* commences to move the needle-lever *d;* but the needle does not move until the adjusting-screw *h'*, or a part of the rising fulcrum-post, meets the fulcrum-post stop-lever *u*, at which time, the fulcrum-post being fixed, the needle-lever commences to descend. The position of the stop-lever *u* is, it is seen, determined by the position of the horn, and, consequently, the thickness of the stock.

After the needle penetrates the stock the cam portion *a'* of the cam-sleeve *b'* releases the rest and the horn from pressure, except that of the spring *w*. The movement of shaft *a* continuing, the fulcrum-post is caused to descend until the collar *g* is seated, and then the needle commences to rise. At this time the pawl-carriage, operated upon by the lever *l*, is moved down, the pawls *p* on the carriage engaging and carrying with it the horn, moving it down always a certain distance from the under side of the work, where it rested when the last stitch was made, this distance, in a practical working machine, being about one-fourth of one inch, more or less. During the time that the horn descends, or while it is relieved from pressure against the work, and before the needle fully completes its upstroke, the usual feeding devices (not shown) operate, feeding the stock and drawing up the loop simultaneously, as in the patents before referred to.

After the horn reaches its lowest position it is lifted by the spring, the pawl-carriage being also lifted at the same time by the lever; but the spring cannot lift the horn above the position from which it was taken by the pawl-carriage at its last descent until after the pawls are tripped by the adjustable tripping devices 3 3. The tripping devices will trip the pawls, if the stock is thinner than at the points where the needle last penetrated it, and then the horn-shaft, disengaged from the pawls, will be lifted by the spring *w* until the upper end of the horn bears against the work. The rollers *s* are to overcome friction between the plate *r* of the horn-shaft and the rest *t* when the horn is rotated in the usual way.

The cam for locking the horn in position may be constructed differently from the cam shown in the drawing, and it may be operated at the proper time from any moving part of the machine without departing from this invention.

The screw *h'* is to assist in adjusting the hook of the needle in proper relation to the whirl.

I claim—

1. In a sewing-machine, the combination, with a stationary presser and a horn, of mechanism adapted to automatically lower the horn from a variable base-line, the lower surface of the stock being sewed, substantially as described.

2. A horn and attached foot-plate, *r*, in combination with a rest, and mechanism to lock the horn and rest, and with a fulcrum-post stop-lever, all substantially as described.

3. In combination, a horn and mechanism to depress it from a variable base-line, corresponding with the under side of the stock, and a fulcrum-post stop-lever to determine the descent of the needle, substantially as described.

4. The needle-actuating lever and fulcrum-post, in combination with a collar to determine its downward throw, and a fulcrum-post stop-lever placed in position by the horn to determine its upward throw, substantially as described.

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

GORDON McKAY.

Witnesses:
G. W. GREGORY,
S. B. KIDDER.