2 Sheets—Sheet 1.

G. McKAY.

MACHINE FOR UNITING THE SOLES TO UPPERS OF BOOTS AND SHOES.

No. 191,874. Patented June 12, 1877.

Fig 1.

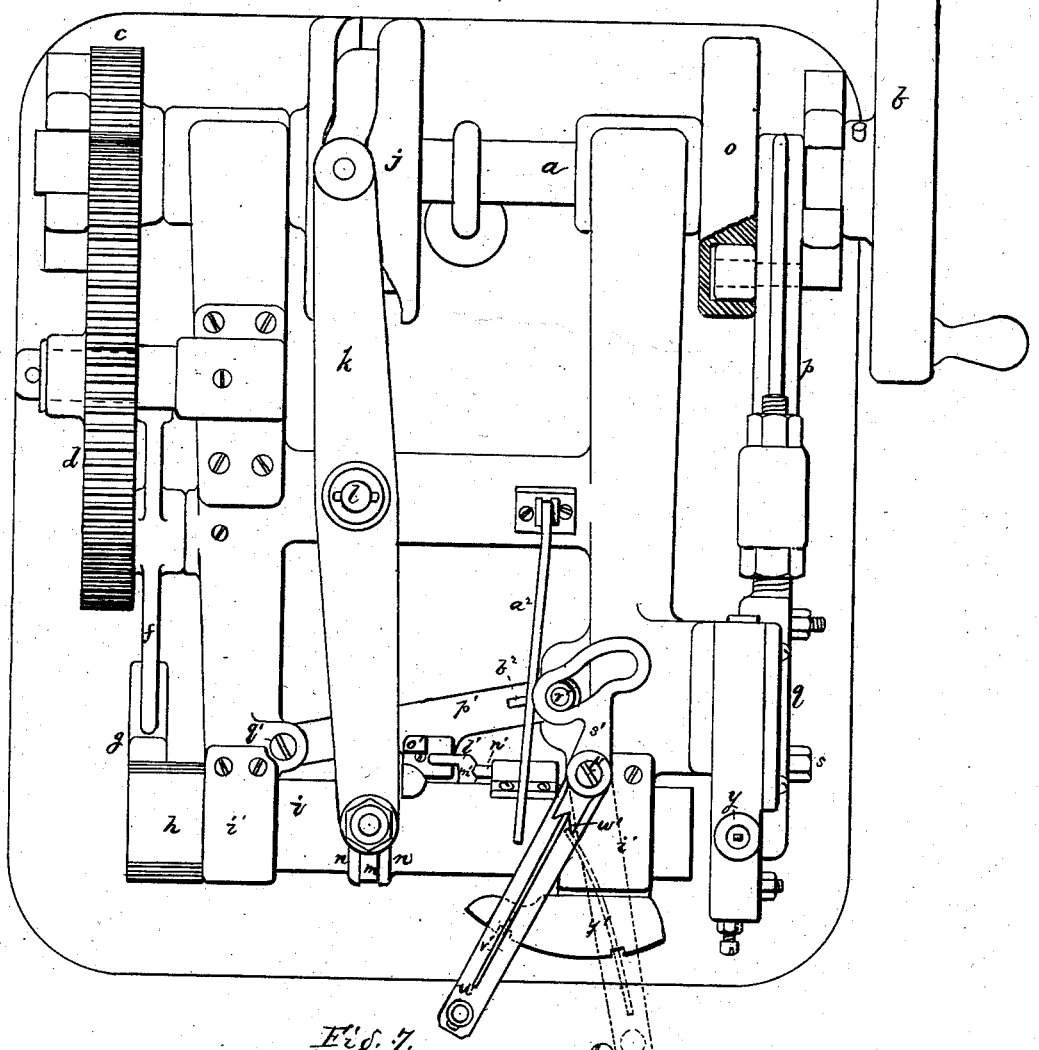
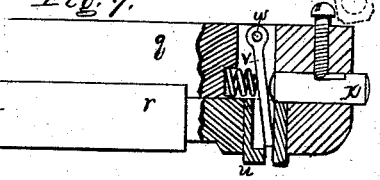


Fig. 7.



Witnesses.

L. H. Latimer.

W. J. Pratt.

Inventor.

Gordon McKay

per Crosby & Gregory

attys.

2 Sheets—Sheet 2.

G. McKAY.

MACHINE FOR UNITING THE SOLES TO UPPERS OF BOOTS AND SHOES.

No. 191,874. Patented June 12, 1877.

Fig. 2.

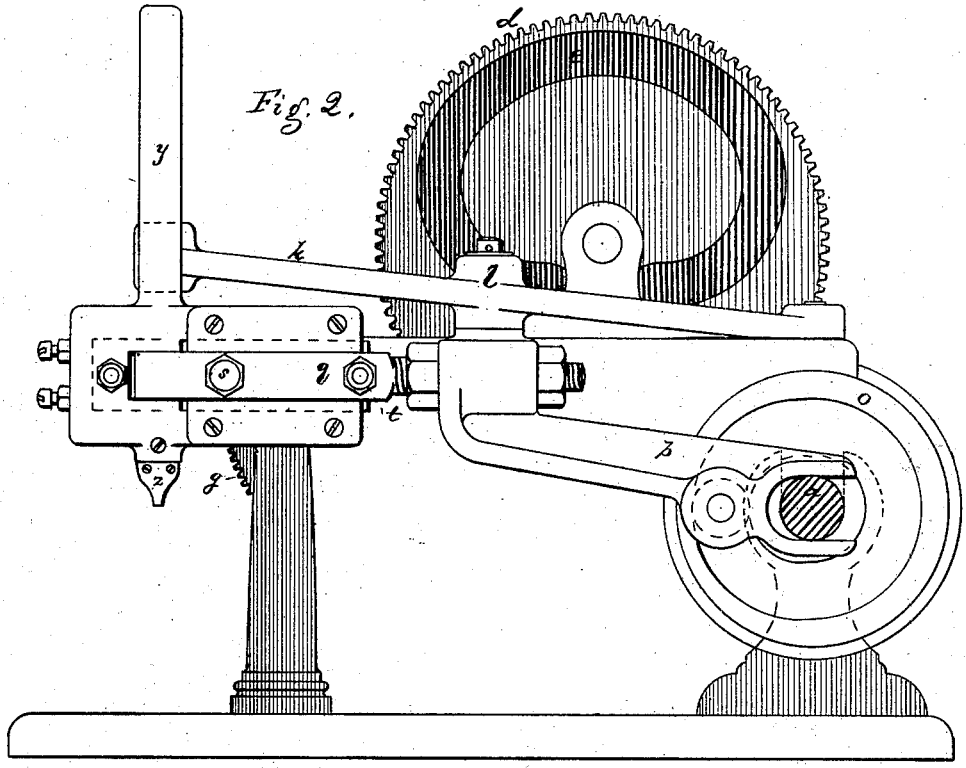


Fig. 6.

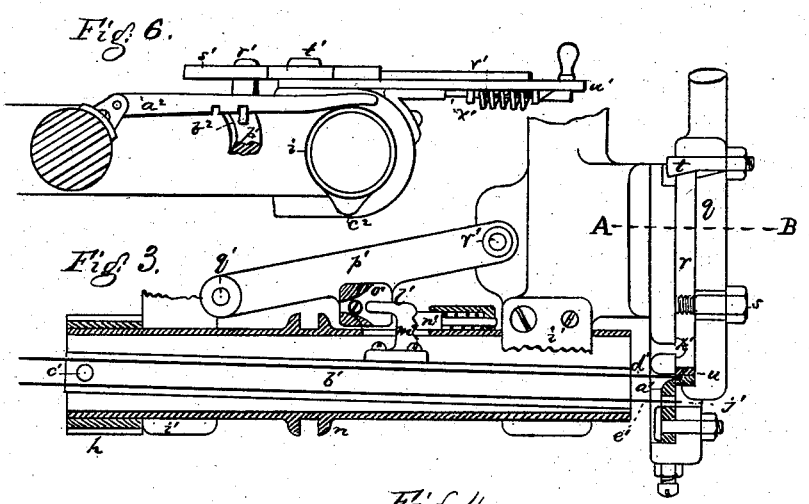


Fig. 3.

Fig. 5.

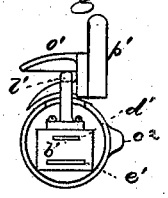
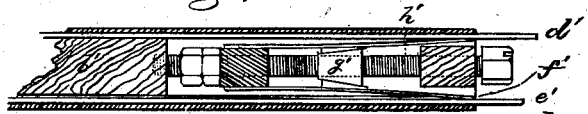


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

GORDON McKAY, OF CAMBRIDGE, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR UNITING THE SOLES TO UPPERS OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. **191,874**, dated June 12, 1877; application filed November 11, 1875.

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 Improvement in Machines for Uniting Soles to Uppers in Boots and Shoes, of which the following is a specification:

This invention relates to machines for uniting soles to uppers in boots and shoes, the sole-fastenings being preferably of metal and cut from strips; but strips of wood or other material might be used.

In this machine I propose to employ a shoe-support or horn and a shoe-feeding mechanism substantially as represented in United States Patents Nos. 122,985 and 140,400.

The nail-driver and its actuating mechanism may be of any well-known construction; and in this machine, as in Patent No. 158,107, the nailing apparatus is arranged on a swinging head, so that the nail-tube may accommodate itself to the varying thickness of the sole, and the horn will, preferably, be locked in position at the time the nail or peg is being driven, and be released when the feed takes place.

In this instance the semi-rotating and reciprocating carrier has pivoted to it a shifting strip-box or strip-retainer, having channels adapted to contain nail-strips of different widths, from which nails of different lengths may be cut, as required, for the sole or shank. The shifting strip-box is provided with friction devices to grasp and feed the nail-strips, and the shifting mechanism is so constructed that the shifting of the strip-box can take place only at the proper time, whereby the strip from which the nail is to be next cut will always be presented to the action of the cutters with the proper edge of the nail-strip, or that edge which should form the head of the nail, uppermost, the last nail cut from such strip having been cut when the other edge of the nail-strip was uppermost.

The nails cut are tapering, and the strip is turned after each nail is cut, and it is necessary to cut the nails in regular order, or else slugs or malformed nails would be formed.

The carrier for the strip-box is drawn away from the cutting mechanism while the cutters pinch the strip, but before severing the nail, to a distance greater than the width of the nail to be cut, to insure more than enough material for a nail at the next forward movement of the strip-box, and the end of the nail-strip, during the next forward movement, meets an adjustable gage, which determines the width or size of the nail in cross-section, and after the nail is cut the gage is removed from the path of the driver, and the nail is driven into the sole.

After the nail-strip strikes the gage it stops, and the friction devices carried by the strip-box and holding the strips then slide over the strip stopped by the gage during the remainder of the time that the strip-box moves forward.

After the nail is severed from the strip the strip-box moves farther back to draw the end of the strip away from the cutters, to permit the strip-box to be rotated.

Figure 1 is a top view of sufficient of a nailing-machine to illustrate this my invention; Fig. 2, a side elevation thereof; Fig. 3, a section of the semi-rotating and reciprocating carrier with shifting strip-box. Fig. 4 is a detail of the nail-strip holding and feeding mechanism in section; and Figs. 5, 6, and 7 are details, to be hereafter referred to.

The rotating shaft *a* of the machine derives motion from the pulley *b*, and carries a toothed wheel, *c*, that engages a toothed wheel, *d*, provided with a cam-groove, *e*, receiving a pin or roller from a pivoted lever, *f*, having a toothed sector, *g*, adapted to engage a hub, *h*, and connected with the carrier *i*, and provided on a portion of its periphery with teeth, the sector imparting to the carrier a semi-rotary motion at each rotation of the shaft *a*. On shaft *a* is a grooved cam-hub, *j*, adapted to receive a pin on and move a lever, *k*, pivoted at *l*, and provided, at its forward end, with a yoke, *m*, or equivalent, to grasp the carrier or fit between collars *n* thereon, the vibrations of the lever *k* reciprocating the carrier toward and from the cutting mechanism and driver.

A disk, *o*, with a face-groove, receives a pin or projection from an arm, *p*, forked at its end

to grasp the shaft *a*, and at the other end of this reciprocating arm, and adjustably connected therewith, is the bar *q*, having a plate, *r*, confined to it by means of a set-screw, *s*, and held, and at the same time pressed forward, by an adjusting wedge-screw, *t*, a shoulder on the end of the bar *q* receiving between it and the end of the plate *r* the movable cutter *u*, provided with a groove or space or nail-receiving chamber, into which the end of the nail-strip being used is projected or moved (see Fig. 3) when the strip is carried forward.

Referring to Fig. 7, the movable cutter-block *u* has in its groove a gage, *v*, to determine the distance of the end of the strip beyond the cutter. This gage is pivoted at *w*, and is retained in the groove by a spring, except when removed therefrom by means of a pin, *x*, kept pressed outward by the spring-pressed gage, and as the bar *p*, *q*, *r*, &c., moves forward the pin *x* meets a suitable stop, pushes the pin inward, moves the gage *v* out of the cutter-slot, and further movement of bar *q* presents the nail in line with the driver, which descends through the driver-guide *y*, and drives the nail from the groove in the cutter into the nail-tube or foot *z*, and into the sole.

The grooved cutter *u*, into which the nail-strip being used projects, first bears the end of the nail-strip sufficiently hard against the stationary part a^1 of the cutting mechanism to hold the strip as the strip-box moves back. Each nail-strip is held in a groove in the shifting strip-box b^1, pivoted at c^1 to the semi-rotating and reciprocating carrier *i*, each strip *d'* or *e'* being held or pressed by a spring, *f'*, one for each strip, the friction of the springs against the strips being governed by an adjustable wedge, *g'*, on a screw, *h'*, adapted to bear against wedge-blocks on the springs *f'*. As the carrier is moved away from the cutters the friction-spring moves over the strip held by the cutters for a distance greater than the width of the nail to be cut at the next forward motion of the carrier and strip-box, and then the nail is severed, and the carrier and strip-box move farther back to force the ends of the strips from the cutting mechanism, and to permit the strips to be turned with their other edges up.

The shifting strip-box has two grooves for nail-strips of two widths. (See Fig. 5.) The narrow strip *d'* rests in the smallest nail-passage, and the wide strip *e'* in the largest passage.

The carrier *i* rests in bearings *i'*, and has rotary-reciprocating and longitudinally-reciprocating motions therein, being rotated to present uppermost first one and then the other edge of the nail-strips carried by the shifting double strip-box or retainer pivoted in the carrier.

In the cutter-housings or head of the machine, and at each side of the cutting mechanism, are passages *j' k'*, in one of which the end of the nail-strip not being cut projects when the strip-box is moved forward, and two of these passages or spaces—one at each side of the cutters—are necessary, because the unused strip is sometimes at one and then at the other side of the cutters.

Connected to the strip-box is a hook, *l'*, with notches *m'* to receive a locking-pin, *n'*, carried by the carrier, the pin, as shown, being a spring-pressed pin. (See Fig. 3.) The shifter *o'* for the shifting strip-box b^1 is a forked block, mounted on the link *p'*, pivoted at *q'* to the frame, and provided at its opposite end with a roller-pin, *r'*, adapted to fit a cam-slot in a shipper-lever, *s'*, pivoted at *t'*. This shipper-lever is made in parts, as follows: The handle portion *u'* is pivoted at *t'* by the same pin that pivots the slotted portion of the shipper—a rather stiff flat spring, *v'*, connected with the handle *w'*, enters a notch, *w'*, in the outer part of the slotted part *s'* of the shipper, and a spring-catch, *x'*, carried by *u'* and under control of the handle *u'*, is adapted to enter either of two notches in a curved shipper-holding plate, *y'*. The position of the shifter *o'* is changed by this shipper, so as to place one or the other of its projecting inclined and curved horns or forks in such position with relation to the hook *l'* attached to the shifting strip-box b^1 that the hook, striking one or the other horn, will be pushed or pulled from one to the other side of the carrier *i*, so as to bring the narrow or the wide nail-strip passage in the shifting strip-box in line with the cutting mechanism, and the narrow or wide nail-strip will be thrown into or out of action, according to the position of this shifter *o'*, and either the wide or narrow strip may continue in action until the shifter is changed. In this instance, when the machine operates regularly, and the hook acts on the horn nearest the carrier, the wide strip is thrown to the center, or in line with the cutters, and when it acts on the other or more distant horn the narrow strip is pushed into operative position, and when shifted the shifting strip-box is held by the locking-pin *n'*.

Referring to Fig. 3, the horn farthest from the carrier has just been struck by the hook *l*, the narrow strip *d'* has been thrown in line with the cutters, and the carrier has moved forward, and has projected the end of the narrow nail-strip into the groove of the movable cutter, ready for the forward movement of the cutter, and the wide strip *e'* rests in the passage *j'*, and while the end of the narrow strip is held, but not cut-off, by the cutters, the carrier and strip-box are carried back more than the distance of the width of a nail, and during the completion of this backward movement of the carrier the nail is severed from the strip between the movable and fixed cutter, and the movement of the former beyond the fixed cutter places the nail in position to be re-

moved from the groove of the cutter by the usual nail-driver, the gage *v* being removed, as before stated; and when the carrier *i* completes its backward movement it is rotated to present the other edge of the strip uppermost, the cutters and nail-strip being so placed as to cut the nails of tapering form from head to point, and alternately with one and then the other edge uppermost, and that edge of the strip to form a proper head for the nail then to be cut and used is always uppermost.

With the shipper-lever as in Fig. 1, full lines, the narrow strip, in this present instance, will always be in operative position, and with the shipper-lever in the reverse position the wide strip will be in place.

A notched locking-lever, a^2, engages a projection, b^2, on the lever p', and locks the lever in either of its extreme positions of adjustment, and the lever p' cannot be moved by the shipper-lever until the locking-lever is elevated by a projection, c^2, on the lower side of the carrier *i*. (See Figs. 5 and 6.) This locking-lever releases the lever p' only when the hook l' for operating the shifting strip-box is at the front of the machine, or directly opposite to the position shown in Figs. 1, 3, and 5, and the movement of the shipper s' at this time only insures the correct order of presentation of the strip for the proper cutting of the nail from the strip with the head uppermost.

Should the shipper be moved when the hook is in the position shown in the drawing, the shifter o' would not be moved, for it is held by the locking-bar a^2; but the end w' of the shipper may be moved, as shown in dotted lines in Fig. 1, the spring v' permitting this without moving the slotted or cam part of the shipper, and when the proper time for the strip-box to be shifted arrives, (which is as the hook, during the rotation of the carrier, is at the front, or opposite to the position shown in the drawing,) then the locking-lever a^2 is released, and the spring v', acting on the slotted portion of the shipper, moves the shipper and lever p' and shifter o', so that the hook as it comes to the position in Figs. 3 and 5 is acted on and moved by the one or the other horn of the shifter o'.

The strip-box b^1 has two grooves or channels for nail-strips of different widths, and is pivoted back from its forward end, and it may be shifted by a shipping-lever during the action of the machine, when it is desired to use a long or short nail, and the strip-box, which moves on its pivotal pin, will bring either one or the other of the strip-passages at the strip-delivering ends of the strip-box directly in line with the cutting mechanism, and from the passage in the strip-box containing the nail next to be cut and used, the strip then to be used is projected directly between the cutters, each nail being cut and driven before another nail is cut.

The nail cut off by the cutters is held in a groove formed in the cutter *u* until the nail-driver, in its descent, displaces and drives the nail from such groove into the sole. The cutters are placed at an angle to an imaginary line drawn through the center of the strip being cut, to correspond with the taper or angle it is desired to give to the side or edge of the nail when cut.

I prefer to make the movable cutter *u* in two parts, so that the one resting against the bar *r*, and which is the actual cutting-edge, may be easily ground as it becomes dull, and as it is worn away by grinding the adjusting wedge-screw *t* keeps the bar up against the cutter firmly, and holds it in place.

This invention may be applied to any well-known class of nailing-machines.

I do not intend to limit myself to the exact devices shown, nor to the exact construction of the devices shown, and for the devices shown I may use any equivalents.

The carrier need not be a tube, as shown, as its only purpose is to carry or hold the pivot of the strip-box and the locking-pin for the hook of the strip-box; and it is evident that the carrier might be more or less open, or be otherwise shaped, so as to have a semi-rotary motion and a reciprocation, and in some cases the carrier might rotate and not reciprocate longitudinally, but the strip-box will be reciprocated in the carrier independently.

I claim—

1. The combination, with a semi-rotating carrier, of a shifting strip-box, substantially as described.

2. A semi-rotating and reciprocating carrier and a locking device, in combination with a shifting strip-carrier adapted to contain nail-strips of different widths, substantially as described.

3. A semi-rotating carrier and shifting strip-box, provided with two passages to contain nail-strips of different widths, and mechanism for shifting it, in combination with nail-cutting-mechanism and a nail-driver, adapted to cut a nail at will from either strip and drive it before another nail is cut from the strip.

4. A strip-box and friction devices to engage the strip, in combination with a gage to determine the forward position of the strip and the width of the nail to be cut, and with cutters adapted to hold the strip as the strip-box moves from the cutters, substantially as described.

5. A rotating carrier and a shifting strip-box, in combination with mechanism adapted to shift the strip-box to insure the presentation of the nail-strip to the cutters, to sever a nail from the strip with the head or enlarged part of the nail next to be driven uppermost, substantially as described.

6. A shifting nail-strip box and nail-cutting mechanism, combined with the head or cutter-housings, provided with passages for

the reception of the nail-strip not being acted upon by the cutter, substantially as described.

7. A nail-receiving groove or chamber adapted to receive the end of a nail-strip, in combination with cutters and a gage to determine the position of the strip and the width of the nail to be cut, 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.