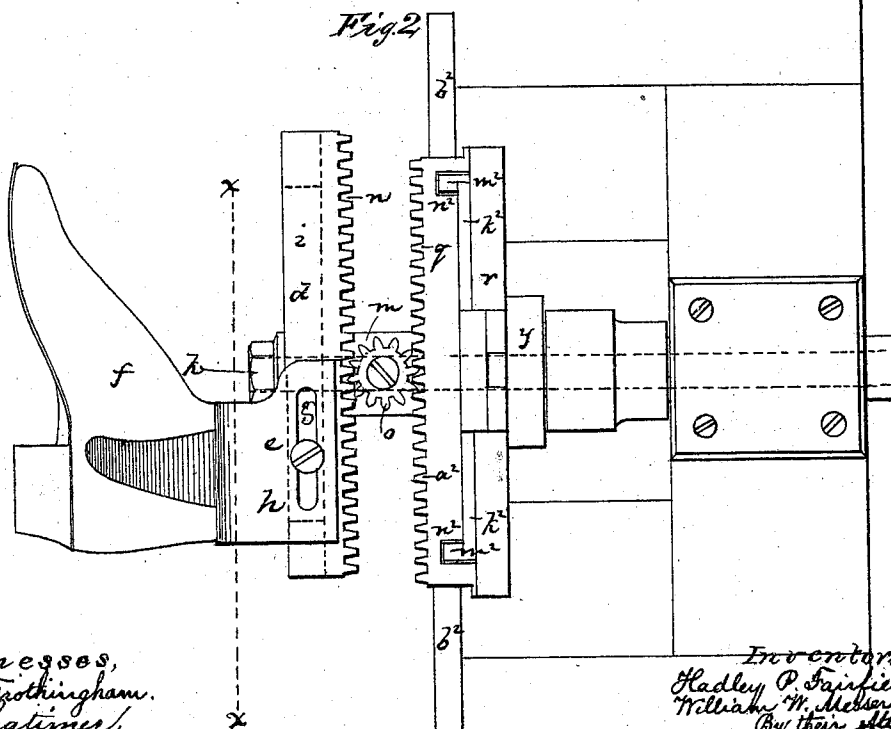
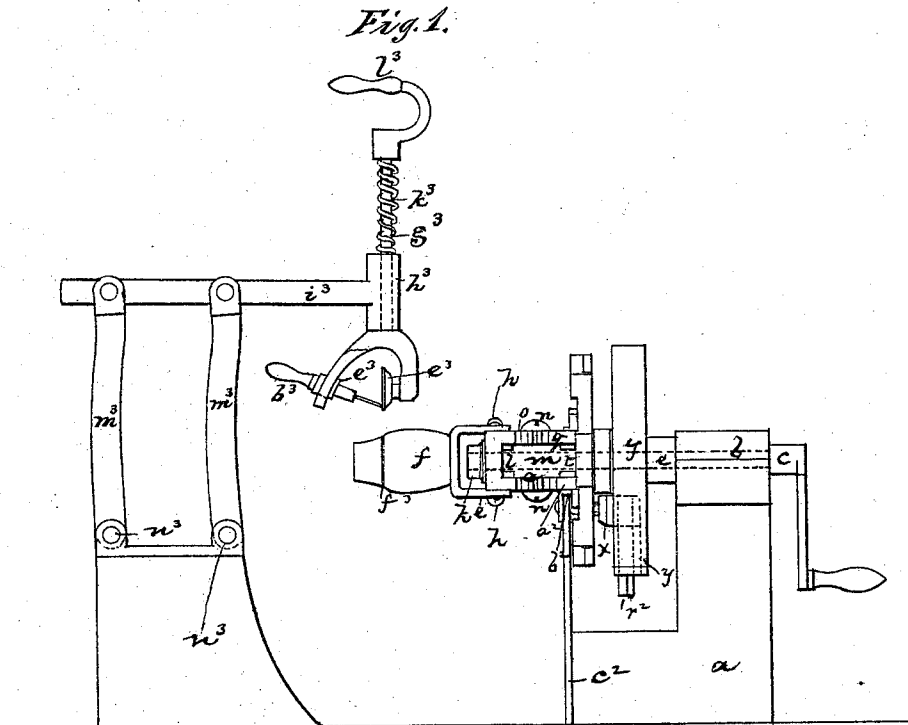


H. P. FAIRFIELD & W. W. MESSER, Jr.
Machinery for Finishing the Sole-Edges of Boots and Shoes.

No. 143,682.

Patented Oct. 14, 1873.



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Fig. 3.

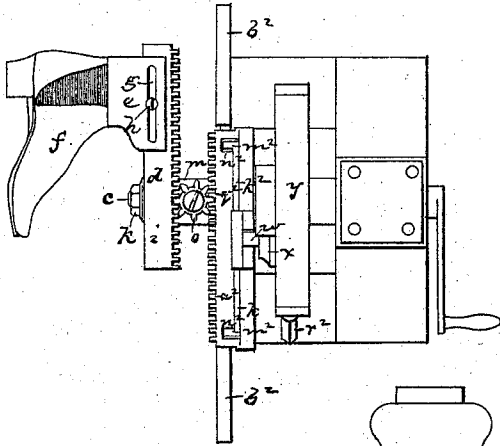


Fig. 4.

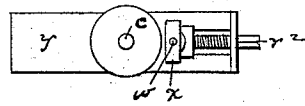


Fig. 5.

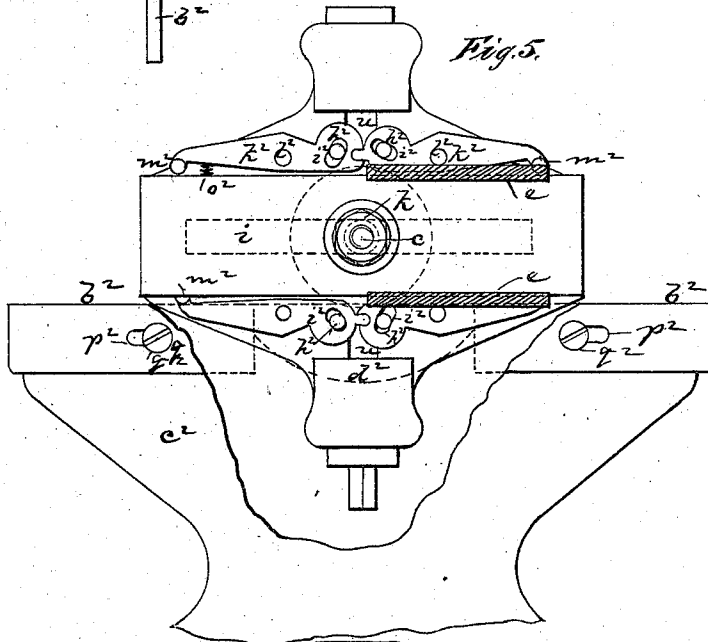
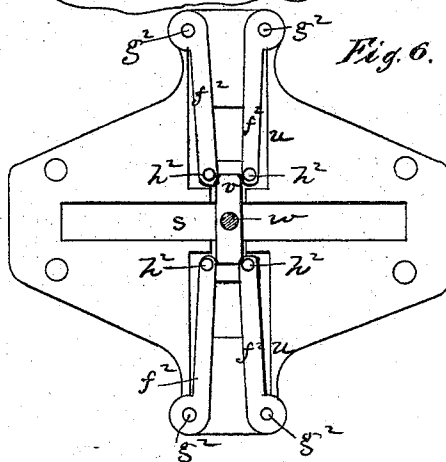


Fig. 6.



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UNITED STATES PATENT OFFICE.

HADLEY P. FAIRFIELD AND WILLIAM W. MESSER, JR., OF BOSTON, MASS.

IMPROVEMENT IN MACHINERY FOR FINISHING THE SOLE-EDGES OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. 143,682, dated October 14, 1873; application filed March 15, 1873.

To all whom it may concern:

Be it known that we, HADLEY P. FAIRFIELD and WILLIAM W. MESSER, Jr., both of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Machine for Trimming or Finishing the Edges of the Soles of Boots and Shoes; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

The invention has reference to the organization of a machine or mechanism for trimming the sole-edges of boots and shoes; the invention being also more or less applicable to burnishing such edges. The invention relates, first, to the mechanism for supporting and guiding the boot or shoe; and, secondly, to the arrangement of the trimming mechanism in relation to a shoe supporting and guiding mechanism. In our invention we fasten the shoe or last to an oblong plate, having gear-teeth meshing into and driven by gear-pinions, which engage with and are driven by gear-teeth on another plate, the pinions turning on pins projecting from a block, which alternately rotates with the shaft, and remains stationary as the shaft turns, the shaft passing through the block, and the two gear-plates sliding endwise upon this block as a guide. The second gear-plate has radial grooves extending from its center in diametric line, and moving in these grooves is a slide on the end of a crank-pin projecting from a bar fixed on the driving-shaft, this crank-pin being so arranged, with respect to other devices, that during one-half of the rotation of the shaft it moves the slotted plate horizontally, and during the other half-rotation imparts a half-rotation to the slotted plate, the plate and shaft then rotating as one. The horizontal movements of the plate impart the movement to the shoe to bring the whole length of edge first on one side of the shoe, and then on the opposite side, to the action of the trimming-tool over it, and the rotative movements of the plate present the curved edges at the toe and heel, successively, to the action of the trimming-tool, and also reverse the position of the shoe, or bring its opposite sides in succession uppermost, for the successive horizontal movements

of the shoe to carry the side edges under the tool. The invention consists, primarily, in this method of moving the shoe-holding plate, or in the mechanism by which the respective movements are imparted to the shoe.

The drawing represents a machine embodying the invention.

Figure 1 shows the mechanism in plan. Fig. 2 is a side elevation of it. Fig. 3 is a section on the line *x x*.

a denotes an upright, having at its top a box, *b*, that supports a horizontal driving-shaft, *c*. At the inner end of this shaft is a rack-plate, *d*, having fastened to it a holder, *e*, to which the boot *f* is jacked by any suitable jacking mechanism. This holder may be made adjustable by slots *g* and screws *h*. The shaft *c* extends through a slot, *i*, in the rack-plate *d*, a nut, *k*, securing the plate upon the shaft, and the nut and slot permitting the plate to slide freely upon the shaft. At its rear the plate *d* has a slot, *l*, into which extends one end of a block, *m*, mounted on the shaft *c*, the plate being guided by this slot and the block. The plate also has gear-racks *n*, into which mesh pinions *o*, turning on pins *p*, which are fast to the block, these pinions also meshing into gear-racks *q*, on the inner side of a plate, *r*, also mounted on the shaft *c*, and having a slot, *s*, through which the shaft extends, the plate *r* sliding upon the block *m*, and having a groove, *t*, into which one end of the block extends. The plate *r* has two radial slots, *u*, in diametric line, and in these slots travels a slide, *v*, on a crank-pin, *w*, extending from a block, *x*, which block is fitted to or projects from an arm, *y*, extending from the driving-shaft.

This crank-pin imparts two movements or kinds of movement to the slotted plate, namely, a rotative movement and a horizontal movement, imparting first a horizontal movement, next a semi-rotary movement, next another horizontal movement, and, finally, a completion of the rotative movement; and to produce these movements intermittently and in regular succession, certain stopping, guiding, and releasing mechanism is used, as follows: The gear projections *a*² of the plate *r* in sliding pass over two rails, *b*², at the top of a vertical plate, *c*², and between the inner ends of these rails is a recess, *d*², the mouth of which is formed by the

inner ends of these rails. The projections a^2 extend to equal distances from the center of the plate, and as soon as the rear end of the plate in sliding forward reaches the recess the plate will begin to rotate and will continue to rotate until the opposite end of the projections strikes the rail, which acts as a stop, and prevents further rotative movement of the plate, and the crank-pin slide v then enters the slot u below it, and imparts a sliding movement to the plate.

In order that the crank-pin slide may act both to turn the plate and to move it horizontally a mechanism is used, as follows: On opposite sides of each groove u are arms f^2 pivoted at the end of the slot, as seen at g^2 . From the inner ends of these arms pins h^2 extend through cam or eccentric slots i^2 in levers k^2 , which levers are pivoted, as seen at l^2 , and have at their outer ends projections m^2 extending from recesses n^2 . The outer ends of the levers are pressed up by springs o^2 , causing the slots i^2 to throw the arms f^2 inward. The inner sides of the arms f^2 , at the ends thereof, are beveled, and when the crank-slide, in moving from one slot, u , toward and into the opposite one, strikes the arms, they act as stops and prevent further movement of the slide in the slot, if the plate is in position to rotate; or, in other words, the power required to turn the plate is less than that required to drive the slide in between the arms. The plate being in position to turn the crank-pin slide rotates it until the projection a^2 comes into contact with the rail b^2 , and as the further rotation of the plate is then stopped the slide v will enter the slot and impart horizontal movement to the plate, the projection m^2 striking the rail b^2 and spreading the arms f^2 , the levers k^2 being jointed together so that either arm is moved with and by the movement of the other. The respective and intermittent horizontal rotary movements of the plate will be kept up so long as the shaft is turned.

By the arrangement shown the shaft may be rotated in either direction, either rail b^2 effecting the change of movement from rotary to horizontal.

For rotative movement only in one direction the machine need have but one rail.

To adjustably regulate the extent of end movement of the plate r , the rail or rails b^2 may be set in position by means of the slots p^2 and screws q^2 , the crank-pin being also made adjustable by means of a screw, r^2 , the position of the plate r being changed by adjustment of the block x . As the plate r is moved horizontally the gear-plate d is moved in the opposite direction, the shoe being in horizontal position, and being moved horizontally to bring its side edge to the action of the trimming-tool, and at the end of each horizontal movement the plate d and shoe turning with the plate r , bringing the heel or toe to the action of the tool, after which the plate d again slides in opposite direction to the plate r to bring the opposite edge of the sole to the ac-

tion of the tool, the plate d and shoe then again rotating with the plate r to bring the heel or toe, not already acted upon, to the action of the tool. By the employment of the two gear-plates the heel or toe is brought uppermost for the action of the tool when the heel or toe is in, or nearly in, line with the shaft c .

The mechanism might be used with only the one plate by placing the trimming-tool below instead of above the boot, or by otherwise arranging the jack mechanism; but the arrangement shown is preferable.

The trimming mechanism is arranged as follows: a^3 denotes the cutter, fixed in the end of a handle, b^3 , that extends through a holder, c^3 , sliding on a curved guide-bar, d^3 , the curve of this bar being struck from the point of the knife, which point is at the edge of a guide-roll, e^3 , that runs in the crease f^3 of the shoe for the action of the cutter. The bar d^3 and the arm that carries the roll e^3 both extend from a vertical spindle, g^3 , which passes through a sleeve, h^3 , at the end of a horizontal arm, i^3 . The spindle rotates freely in the sleeve, and is pressed down by hand to bring the cutter to its work, and up by a spring, k^3 , the manipulatory movements of the spindle being facilitated by a handle, l^3 . The arm i^3 is jointed to the tops of two parallel bars, m^3 , which are jointed at their bottom ends, as seen at n^3 . By means of these jointed bars the forward and back movements of the tool are readily effected, its vertical movement and laterally angular movements being effected by means of the spindle, and its angular and edge presentation and its vertical angle by its connection with the stock e^3 , and the movement of this stock upon the curved guide-bar, all the movements being requisite or desirable to hold the tool in conformity with the general irregular shape of the sole-edge, and the shape to be given to such edge in cross-section.

The arrangement of the two gear-plates, so that they have movements in opposite directions, effects a balance of the shoe in all positions, so that there is no tendency of the shoe to drop to a vertical position as soon as it begins to tip down, and for the same purpose the arm y is extended in both directions from the shaft c , the weight of all the rotating mechanism being about equally distributed upon both sides of the shaft.

We claim—

1. The intermittently-rotating and horizontally-moving slotted plate r , guide and stop rail or rails b^2 , and crank-pin slide v for imparting movements to the boot or shoe, substantially as described.

2. In combination with the plate r , rail or rails b^2 , and crank-pin slide v , the arms f^2 , and levers k^2 , arranged to operate substantially as described.

3. In combination with the plate r having rotative and horizontal movements, the plate d geared to and driven by the plate r , substantially as described.

4. The rails b^2 and crank-pin block x , made adjustable, substantially as and for the purpose described.

5. In combination with the trimming-cutter mounted as described, the guide-roll e^3 , arranged substantially as shown and described.

6. The trimming-tool and guide-roll attached to arms extending from the spindle g^3 , said

spindle having capability of vertical rotative and forward and back movement, substantially as shown and described.

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