2 Sheets—Sheet 1.

D. C. MATHEWS.

Burnishing-Machine for Boot and Shoe Soles.

No. 225,228. **Patented Mar. 9, 1880.**

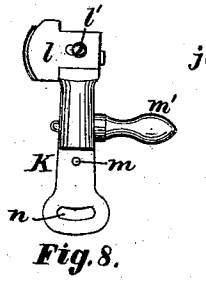


Fig. 8.

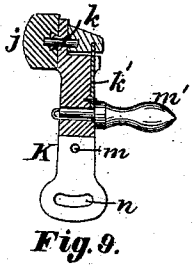


Fig. 9.

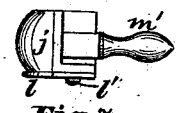


Fig. 7.

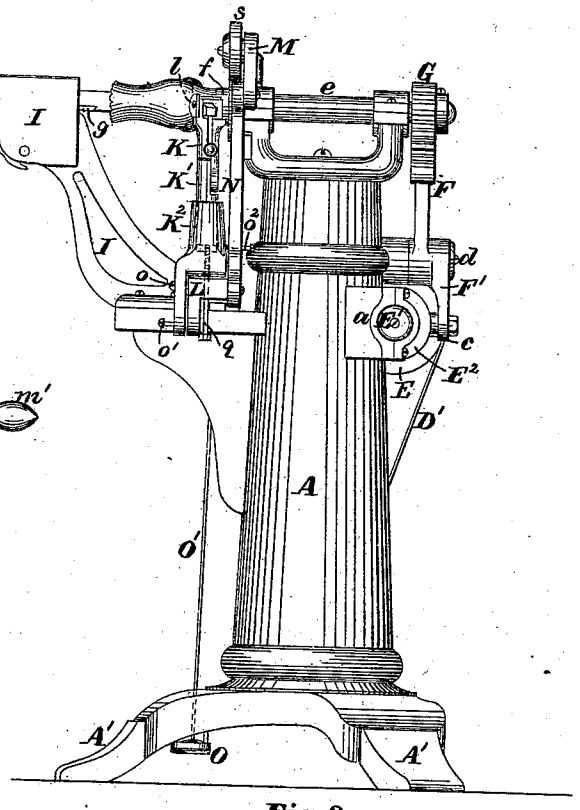


Fig. 2.

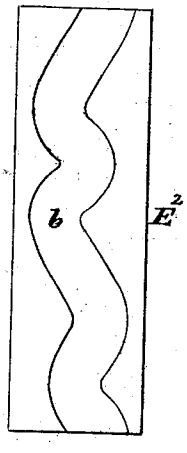


Fig. 10.

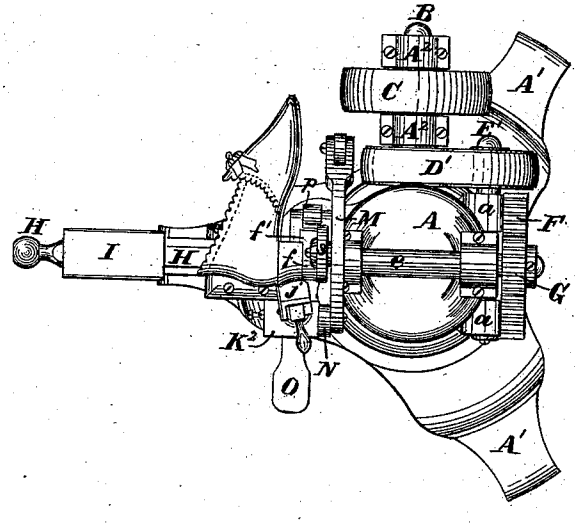


Fig. 1.

Witnesses.

E. A. Hemmenway.

Walter E. Lombard.

Inventor:

Don C. Mathews

by N. C. Lombard

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2 Sheets—Sheet 2.

D. C. MATHEWS.

Burnishing-Machine for Boot and Shoe Soles.

No. 225,228. **Patented Mar. 9, 1880.**

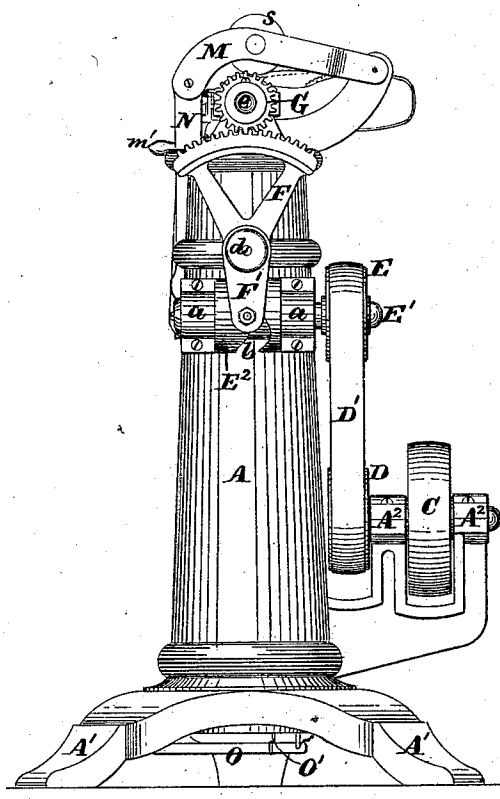


Fig. 4.

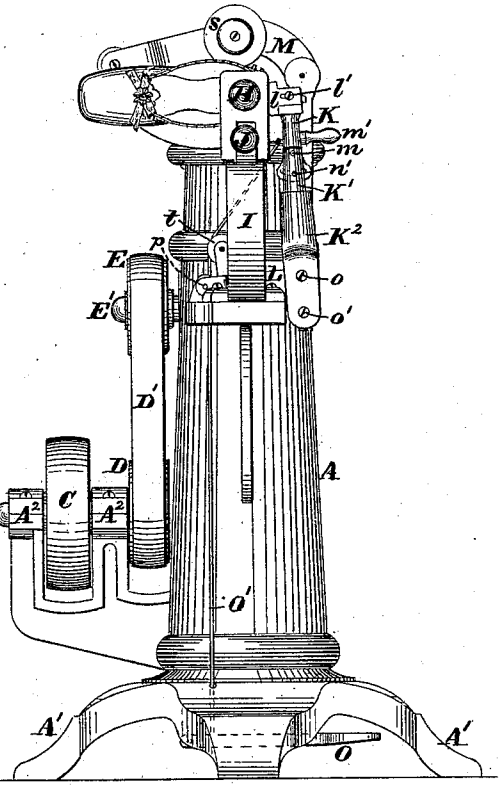


Fig. 3.

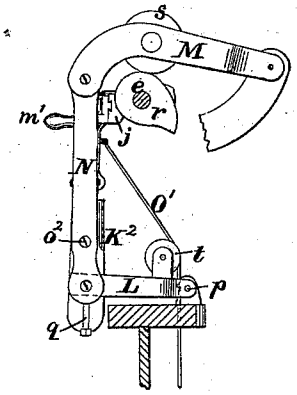


Fig. 5.

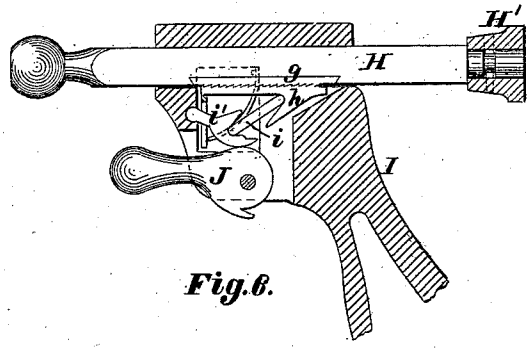


Fig. 6.

Witnesses:

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UNITED STATES PATENT OFFICE.

DON C. MATHEWS, OF LYNN, MASSACHUSETTS.

BURNISHING-MACHINE FOR BOOT AND SHOE SOLES.

SPECIFICATION forming part of Letters Patent No. 225,228, dated March 9, 1880.

Application filed November 28, 1879.

To all whom it may concern:

Be it known that I, DON C. MATHEWS, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Burnishing the Edges of Boot and Shoe Heels, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a machine for automatically burnishing the edges of boot and shoe heels; and it consists in certain novel arrangements and combinations of devices whereby the shoe is more readily and easily jacked, and the burnishing-tool is readily adjusted to the different styles and shapes of heels, and made effective in burnishing the heel-edge and the rand as well, the details of which devices will be best understood by reference to the description of the drawings, in which—

Figure 1 is a plan of a machine embodying my improvements. Fig. 2 is a front elevation. Fig. 3 is a side elevation looking at the end of the jacking device. Fig. 4 is an elevation of the side opposite to Fig. 3. Fig. 5 is a detail drawing illustrating the mechanism for raising and lowering the burnishing-tool to adjust it to the best working position on the different parts of the heel. Fig. 6 is a partial section through the jack-supporting bracket, and illustrating the mechanism for jacking the boot or shoe, drawn to an enlarged scale. Figs. 7, 8, and 9 are details illustrating the construction of the burnishing-tools and their application to the carrier, enlarged; and Fig. 10 is a development of the cylinder-cam for imparting motion to the heel of the boot or shoe in contact with the burnisher, also drawn to an enlarged scale.

A is a column supported by a suitable base or legs, A′, and upon which the operating parts of the machine are supported. B is the driving-shaft, mounted in bearings A^2, and having secured thereon the driving-pulley C, by means of which and a belt (not shown) power may be applied thereto, and the pulley D, from which the belt D′ leads to the pulley E, secured upon the end of the cam-shaft E′, mounted in bearings *a a* on the column A, and having secured thereon the cylinder-cam E^2, which has formed in its periphery a zigzag path, *b*, of varying throws, with which the anti-friction roll *c*, mounted on the end of the short arm F′ of the toothed segment F, engages, as shown.

The segment F is mounted upon a stud or journal, *d*, set in the side of the column A, and its teeth engage with corresponding teeth of the pinion G, secured to one end of the shaft *e*, which is mounted in suitable bearings on top of the column A, and has secured to its other end the heel-rest or bearing-plate *f*, for the tread-surface of the boot or shoe heel to bear against when the boot or shoe is jacked, said bearing-plate being provided with a shoulder, *f′*, to bear against the breast of the heel, while the opposite end of said plate is shaped to correspond to the desired shape of the heel-tread.

H is a jack rod or bar, made rectangular in cross-section and fitted to and adapted to be moved in a correspondingly-shaped bearing in the bracket I in a direction in axial line with the shaft *e*, and has secured upon its inner end the swiveling head H′, fitted to enter the boot or shoe and bear upon the heel portion of the inner sole and press the boot or shoe heel hard against the heel-plate *f*, to clamp the heel between the two surfaces, thereby compelling the heel to be revolved or vibrated with the shaft *e*.

To obtain the desired clamping-pressure of the bar H, it is provided upon its under side with a series of ratchet-shaped teeth, *g*, with which correspondingly-shaped teeth formed upon the upper side of the movable plate *h* engage as said plate is pressed upward and toward the shoe by the action of the toggle-links *i* and *i′* as they are straightened by a partial rotation of the cam-lever J into the position shown in Fig. 6.

The tool *j*, for burnishing the edge of the sole, has formed in its back face a dovetail groove to fit a correspondingly-shaped lip or tongue on the upper section, K, of the tool-carrier in such a manner that it may be readily removed from or applied to said carrier, said tool being secured from accidental displacement by the pin *k*, which passes through the carrier-head and enters a hole in the tool, and is held in position by the spring *k′*, as shown in Fig. 9.

A rand burnishing and setting tool, *l*, is also secured to the head of section K by means of the screw *l'*, which passes through a slot in said tool, and is screwed into the head of K in such a manner that the tool *l* shall fit close to and in contact with one end of the tool *j*, and be capable of adjustment to cause its working-edge to project a greater or less distance beyond the working-face of the tool *j*, and consequently to a greater or less distance into the rand of the boot or shoe.

The section K of the tool-carrier is pivoted at *m* to the section K', and is provided with a handle, *m'*, whereby it may be vibrated about said pivot to a limited extent, determined by the length of the curved slot *n*, formed in the lower end of K, and the pin *n'*, set in K', or about a vertical axis of motion rendered possible by fitting the lower end of K' to a cylindrical socket in the lower section, K^2, of the carrier, said motions being for the purpose of controlling the position of the burnishing-surfaces of the tools relative to the surface of the heel being acted upon.

The tool-carrier, composed of the three pieces, K, K', and K^2, is pivoted at *o* to the short link L, which, in turn, is pivoted to some fixed portion of the frame of the machine, as at *p*, Figs. 3 and 5.

The tool-carrier K K' K^2 may be adjusted, by means of its pivot-pin *o* and the set-screws *o'* o^2, so as to move the burnishing-tools toward or from the tread-surface of the heel to be burnished, in order that the tool *l* may enter the rand whatever may be the thickness of the heel.

The burnishing-tools *j* and *l* may be set in the desired normal position vertically by means of the set-screw *q*, set in the socket K^2, and acting upon the lower end of K' to raise or lower it, according as said screw is turned in one direction or the other.

In order that the burnishing-tools shall work with equal effect upon all parts of the heel-edge as said heel is rapidly vibrated with varying throws about the axis of the shaft *e*, it is necessary to automatically raise and lower the burnishing-tools during the operation of rubbing the heel-edge, on account of the peculiar shape of the heel—*i. e.*, one portion curved and nearly concentric with its axis of vibration, and other portions nearly straight and tangent to the curved portion.

To give this automatic movement to the tools, I place upon the shaft *e* a pattern-cam, *r*, of the desired shape appropriate to the particular heel to be finished, which cam, acting upon the truck *s* on the lever M, pivoted at one end to some portion of the frame and connected at its other end to the upper end of the link N, the opposite end of which is connected to the link L, raises the tool-carrier and the tools attached thereto, or allows them to be depressed by the united action of gravity and the downward pressure exerted by the treadle O and the cord O', leading therefrom over the grooved wheel *t*, and attached at its upper end to the upper section, K, of the tool-carrier.

The treadle O and the cord O' also serve the purpose of holding the tools firmly in contact with the heel-edge with a yielding pressure.

The cylinder-cam E^2 is designed to impart to the shoe clamped to the shaft *e* a series of rapid vibrations of varying lengths, in such a manner that the tools shall rub or act upon fractional portions of the heel-surface at each or nearly all of the vibrations of the heel, each succeeding vibration of the heel bringing a portion of the heel in contact with the tools that was not acted upon by the next preceding vibration, by which arrangement all parts of the heel-edge are successively subjected to short, quick, and often-repeated rubbing action in contact with the tools, whereby a fine finish is produced upon the heel-edge, very similar to that produced by the hand-tool in the hands of an expert operator.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of the shaft *e*, heel-rest *f*, jack-bar H, provided with ratchet-teeth *g* and swiveling head H', the toothed plate *h*, toggle-links *i* and *i'*, and the cam-lever J, all arranged and adapted to operate substantially as and for the purposes described.

2. The combination of the shaft *e*, heel-rest *f*, a clamping mechanism for securing the heel to said rest and compelling it to be moved with said shaft and rest, the pinion G, the segment F, provided with arm F', anti-friction roll *c*, and the cylinder-cam E^2, having formed therein a zigzag path, *b*, adapted to impart to said segment and the shaft *e*, with the shoe clamped thereto, a succession of rapid vibrations of varying length, substantially as described.

3. The tool-carrier composed of the three parts K, K', and K^2, constructed and united substantially as and for the purposes described.

4. The combination of the pivoted tool-carrier K K' K^2, the treadle O, cord O', and pulley *t*, all arranged and adapted to operate substantially as and for the purposes described.

5. In combination with the shaft *e*, heel-rest *f*, and a mechanism for clamping the heel to the rest, the burnishing-tools *j* and *l*, one or both, the carrier K K' K^2, links L and N, lever M, truck *s*, and cam *r*, all arranged and adapted to operate substantially as described.

Executed at Boston, Massachusetts, this 26th day of November, A. D. 1879.

DON C. MATHEWS.

Witnesses:
N. C. LOMBARD,
E. A. HEMMENWAY.