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UNITED STATES PATENT OFFICE.

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PLACE.

IMPROVEMENT IN MACHINES FOR TRIMMING AND BURNISHING SOLES.

Specification forming part of Letters Patent No. 117,287, dated July 25, 1871.

To all whom it may concern:

Be it known that I, SAMUEL H. HODGES, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Trimming and Burnishing-Machines for Boots and Shoes, of which the following is a specification:

The invention consists mainly in the combination, with a jack or holder for supporting the boot or shoe, of a trimming or burnishing-tool actuated by suitable mechanism and mounted on a flexible or jointed frame or arms, operating substantially in the manner hereinafter described, so that the trimming or burnishing-tool may, by means of said frame or arms, be brought to bear, at any desired point or angle, upon the edge or bottom of the sole or heel of the boot or shoe held in or by the jack. By the employment in this manner of a flexible or jointed tool-carrying frame the machine becomes not only a trimming but a burnishing apparatus, and it may be used in both operations, all that is needed being a change of the tool from a cutter to a burnisher, or vice versa. The invention further consists in minor features relating chiefly to a novel construction of the cutter itself, and to the construction and arrangement both of the jack and of the mechanism for operating and adjusting the same.

The manner in which my invention is or may be carried into effect will be readily understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of an apparatus made in accordance with my invention. Fig. 3 is a side view of the particular cutter, which, in this instance, I have represented as mounted on the flexible or jointed tool-carrying frame. Fig. 2 is a transverse vertical section of said cutter.

The flexible or jointed tool-carrying frame consists, in this instance, of two arms, A D, from which I am enabled to obtain all the movements needed to adapt the tool to bear upon any desired portion of the work. The lower end of the arm A is pivoted to standards B by the shaft C. Within the forked upper end of the arm A is pivoted the second arm D, which is also forked at this pivoted end. In the outer or free end of the arm D is mounted a shaft, E, capable of a rotary motion, upon which shaft the cutting or burnishing-tool is mounted. Motion is communicated to the

shaft E by means of a pulley, I, communicating by belting J with a pulley, K, mounted on the shaft connecting the forked ends of the two arms A D. The pulley K is connected by belting M with a pulley, L, on shaft C, and the latter is revolved by some suitable power or prime mover. In this way motion is readily communicated to the cutter or other tool mounted on the shaft E. It is manifest, however, that motion may be communicated to the tool in other ways, and that the movement of the tool need not necessarily be rotary, but may be reciprocatory. For instance, the tool may be mounted on a sliding carriage or holder held in ways or grooves formed on the free end of the arm D, and this holder may be connected by a rod with an eccentric on the shaft connecting the arms, so that when the shaft is rotated by the pulley K a reciprocating movement will be imparted to the tool-holder through the medium of the eccentric and connecting-rod. The details of construction of the flexible frame may also be varied, and it may be constructed to swing on a universal joint so as to give motion in all directions to the tool, all that is required being that the tool should have such freedom of motion as to permit it to be brought to bear upon any part of the shoe where its services are required. A handle, d, on the extremity of the upper part of the frame, enables the operator to guide the movements of the frame and tool. With the tool and tool-carrying frame, when thus arranged to operate, I combine a jack, holder, or other suitable support for the shoe or boot, by means of which the work may be properly presented to and sustained under the action of the trimming or burnishing-tool carried by the frame. Owing to the flexible or jointed arrangement of the frame and the freedom of motion which it allows the tool, the machine is adapted to receive a burnishing as well as a cutting instrument, and may be used equally well for either operation, thus uniting in itself the qualifications of both a trimming and burnishing apparatus. Any suitable cutting or burnishing-tool and any suitable jack or support for the shoe may be employed. I have, however, represented in the drawing a jack and jack-operating mechanism and a cutter, the construction and arrangement of which, in some respects, are peculiar, and these I shall therefore proceed to describe so that the manner in which they oper-

ate together in connection with the flexible frame may be understood; although I do not limit myself to the combination of the flexible frame with a jack and cutting-tool of such peculiar construction. The revolving cutter F on the end of the shaft E is composed of three sections, *f f f*, each of which is held, independently of the others, to a flange, F', by a screw, *i*, the said screws passing through their respective sections near the shaft E. The sections are provided with diagonal cutting-edges *f'*, and have spaces between them to let the chips or shavings through somewhat after the manner of a plane-iron. The flange F' is sleeved on the shaft E, the sleeve being provided with a clutch, *e*, which engages with a corresponding clutch on the shaft E. This arrangement allows the cutter-disk F to be removed from shaft E and an emery-wheel or other cutting or finishing instrument substituted. G represents a circular guard or shield, which is attached to arm E by means of the bent strap H, and projects over one side of the revolving cutter-disk F. N represents a stationary table supported by standard O, in which table slides a carriage, P. Near the front end of carriage P is pivoted a plate, R, to which is pivoted a smaller plate, S. T represents a disk which is hinged to the pivoted plate S. Said disk is constructed in two portions, the inner one of which is pivoted to the hinged portion and provided with the projecting pin U and concave rest V, on which the last is held during the operation. The disk T is connected to the carriage P by a cord, W. X represents a rubber or other spring, which engages with a projection, Y, on the carriage P, and, passing under the table N, holds the carriage P in the position shown. *a* represents a treadle, which is connected to table P by cord *b*, the latter passing through standard *c*, and when depressed draws the table P backward, which table is returned to its former position when the pressure is removed by the spring X. The hinged or jointed tool-carrying frame may be arranged in any suitable position, either as shown in the drawing, or above the operator, or on a bench in front, or in any other convenient locality. By the use of suitable tools the machine may be applied to finishing or operating upon any part of the edge or bottom of a boot or shoe. The boot-jack may be brought into position for work by means of a rack and pinion instead of the spring and treadle, as above described; but I prefer the last-named arrangement, which, in connection with the sliding-jack holding-carriage, may be used with a jack of any suitable construction. The lower end of the arm A is weighted, as shown in Fig. 1, to counterbalance, in a measure, the weight of the upper end of the same.

Power is imparted to the shaft C by any suitable means, and communicated to the shaft E by belts M J and pulleys L K I, thereby revolving the cutter. The boot or shoe attached to its last is placed (in case the jack shown in the drawing is used) on the pivoted portion of disk T, the heel of the last being engaged with the pin U and the toe bearing on the concave rest V, the sole of

the boot or shoe projecting outward in line with the cutter F, which revolves against the edge thereof and effects the desired finish, which is imparted to all parts of said edge by revolving the pivoted portion of disk T, while the upper of the boot or shoe is protected by the guard or flange G, which projects between the upper and sole and confines the operation of the cutter-disk strictly to the latter. When the work is placed on or removed from the disk T the latter is laid flat on the carriage P, being hinged, as above mentioned, and swinging freely, and when the operation is being performed the disk is raised to the position shown in Fig. 1, where it is held by the cord W. It will be readily seen that, by means of the swinging or jointed tool-carrying frame, the utmost facility of vertical and horizontal adjustment of the trimming or burnishing-tool is obtained, the same being raised or depressed and moved forward or backward at will, the operator grasping the handle *d* which projects from the arm D. The disk T can be adjusted by means of the plates S R so as to present itself diagonally to cutters F, or in a direct line with the same, and admits of a limited lateral play, while, by means of the sliding carriage P and treadle *a*, the work can be drawn backward to any desired extent, thus putting the whole machine perfectly under the control of the operator. The cutter F can be readily removed from shaft E and another of different form substituted for performing different operations. By means of the diagonal cutting-edges of sections *f* a shearing cut is produced on the work, which renders the operation easier. The weight K, which is attached to the lower end of arm A by screw K', can be caused, by means of said screw, to project further from said arm, thus more nearly counterbalancing the same. If desired, the arm D may be provided with a similar attachment.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a machine for trimming or burnishing, or both trimming and burnishing boots and shoes, with a jack or support for the shoe, of a flexible or jointed tool-carrying frame, operating substantially as shown and described, and a trimming, burnishing, or other suitable tool mounted thereon, and actuated substantially in the manner herein set forth.

2. The combination, in a trimming or burnishing-machine for boots and shoes, with the boot-jack or holder, of the sliding carriage, spring, and treadle or lever for adjusting the position of the same, substantially as shown and set forth.

3. The combination, with trimming or other tool, mechanism for imparting motion to the same, and the flexible or jointed tool-carrying frame, operating as described, of the boot-jack or support, and the adjustable or sliding carriage upon which the same is mounted, under the arrangement, substantially as herein shown and set forth.

4. The cutter herein shown and described, consisting of the cutting-sections adjustably connected with their supporting-flange, and combined

with the shaft from which they receive motion by means of a sleeve and clutch *e*, substantially as specified.

5. The shoe-holding disk T, hinged to the pivoted plates S R, substantially as herein shown and described.

In testimony whereof I have signed my name

to this specification in the presence of two subscribing witnesses.

SAML. H. HODGES.

Witnesses:

CARROLL D. WRIGHT,
CHARLES F. BROWN.