

(No Model.)

3 Sheets—Sheet 1.

H. A. WEBSTER.
BUFFING OR POLISHING MACHINE.

No. 576,418.

Patented Feb. 2, 1897.

FIG. 1.

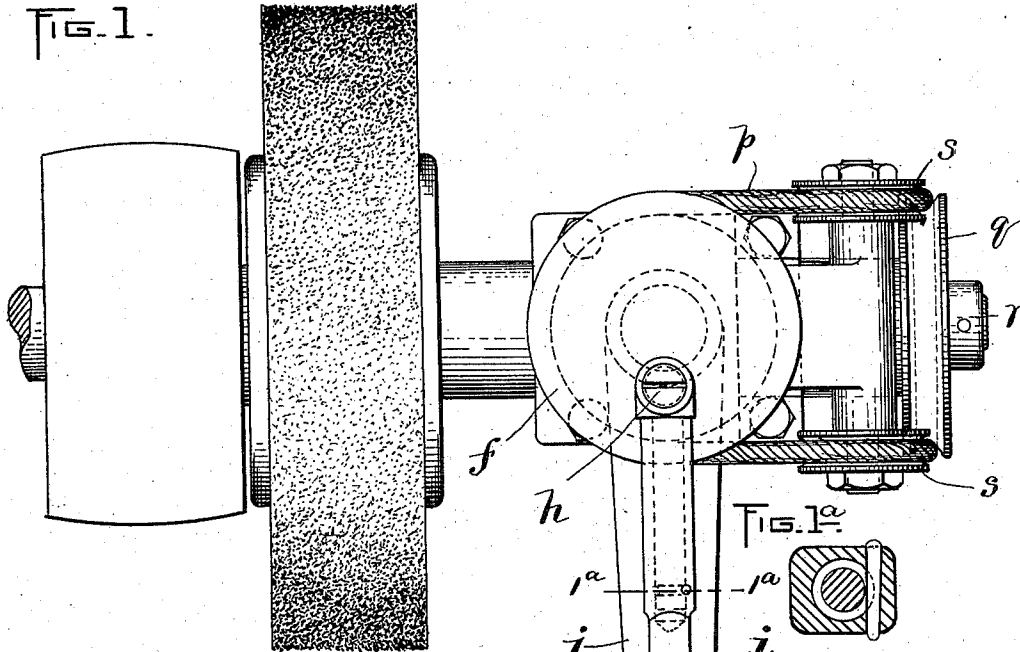


FIG. 1^b.

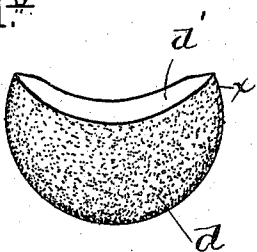
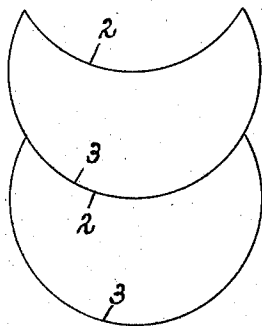


FIG. 1^c.



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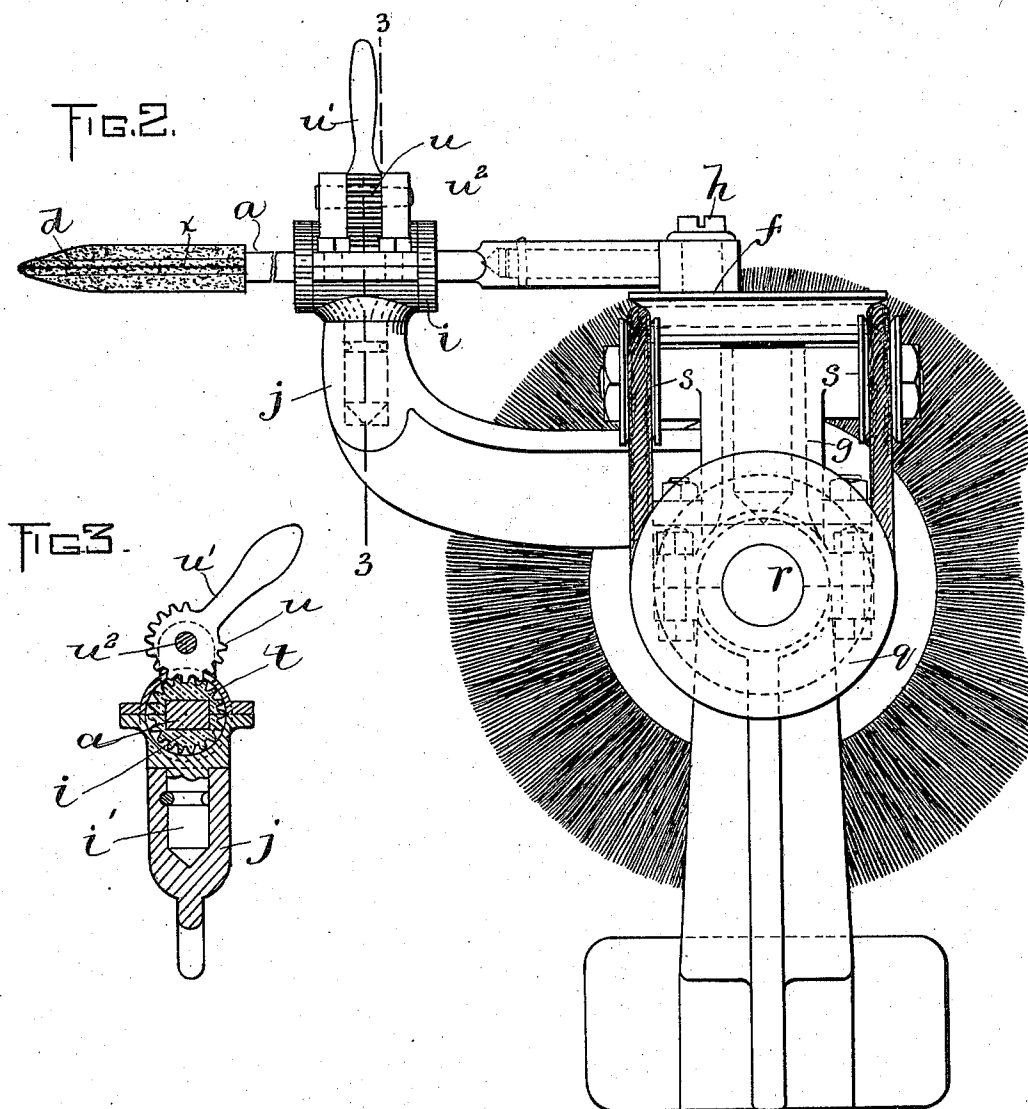
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(No Model.)

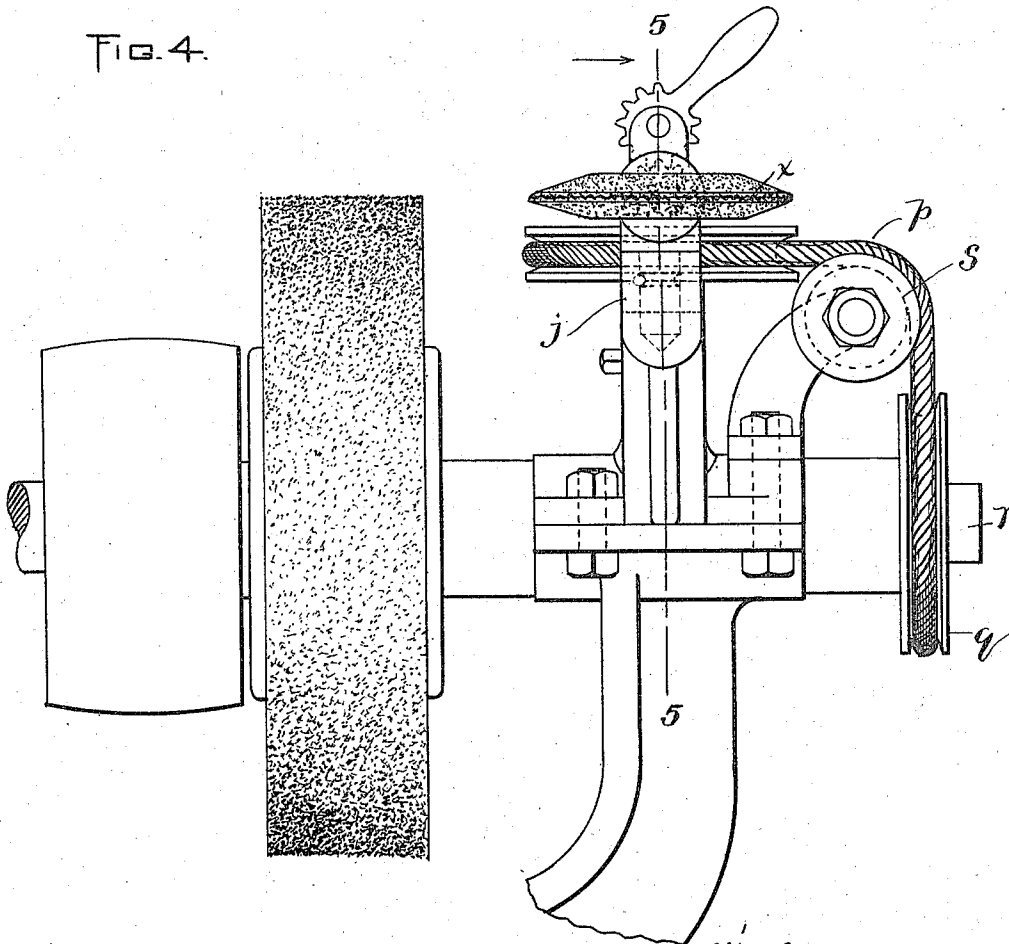
3 Sheets—Sheet 3.

H. A. WEBSTER.
BUFFING OR POLISHING MACHINE.

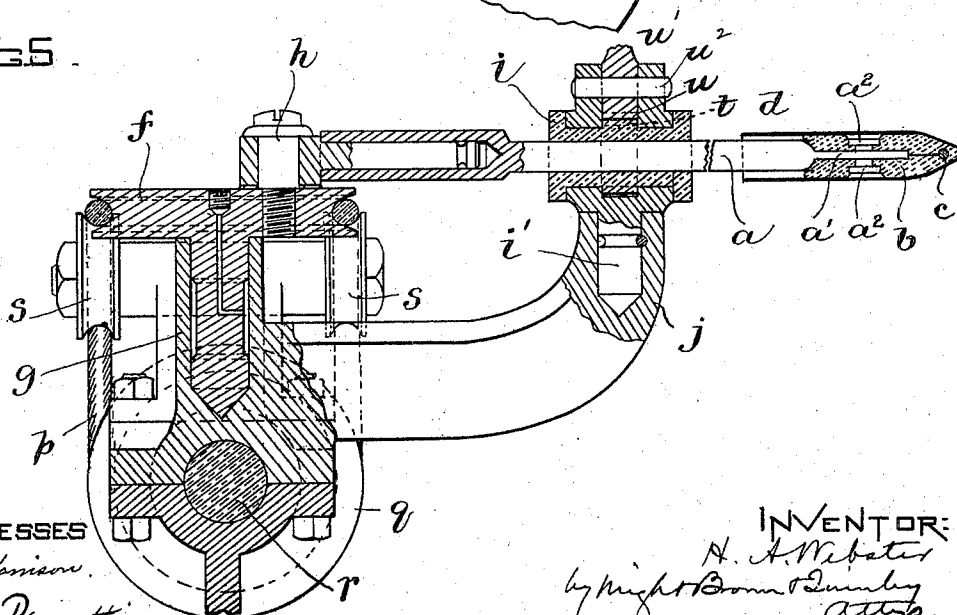
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FIG. 4.



FIGS.



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UNITED STATES PATENT OFFICE.

HAROLD A. WEBSTER, OF HAVERHILL, MASSACHUSETTS.

BUFFING OR POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 576,418, dated February 2, 1897.

Application filed November 20, 1896. Serial No. 612,826. (No model.)

To all whom it may concern:

Be it known that I, HAROLD A. WEBSTER, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Buffing or Polishing Machines, of which the following is a specification.

This invention relates particularly to machines for buffing or abrading surfaces, such as soles of boots and shoes, by means of a yielding-backed abrasive surface which has a movement in the plane in which it lies. A machine of this type is shown in Letters Patent of the United States No. 8,895, (reissue,) dated September 16, 1879, which machine comprises a yielding pad connected with one end of a spindle which rotates in a suitable bearing, the pad being provided with an abrasive cover which is arranged substantially at right angles to the axis of rotation and presents its entire acting face to the article to be buffed. An abrasive pad-cover rotating about an axis substantially at right angles to its acting face is open to the following objection, namely: the central part of the cover coinciding with the axis of rotation has practically no motion. Consequently the portion of the work that is pressed against said central part receives but little abrasion or action from the abrasive cover, while the marginal portion of said cover has a greater surface velocity than the portions between it and the center of the cover, so that there is a lack of uniformity in the finish imparted by the cover to the work, and the fibers raised by the abrasive cover on the surface of a boot or shoe sole, constituting what is called a "velvet bottom," are lacking in uniformity.

My invention has for its object to overcome the objections above recited; and it consists in a machine of the character specified, comprising a flexible pad having a substantially flat acting face and a suitable cover thereon and operating mechanism organized to give the pad an orbital movement in the plane of its acting face, said orbital movement causing all portions of the pad to move bodily around imaginary centers, so that all parts of the pad-cover act with practical uniformity upon the work presented to it.

The invention also consists in certain improvements in the construction and form of

a pad-cover, all of which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a top plan view of a buffing-machine embodying my invention. Fig. 1^a represents a section on the line 1^a 1^a of Fig. 1. Fig. 1^b represents a view of the pad-cover detached. Fig. 1^c represents a diagram illustrating the manner of cutting out the pieces forming the pad-cover. Fig. 2 represents an end elevation of the machine. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a front elevation of the machine. Fig. 5 represents a section on line 5 5 of Fig. 4.

The same letters and numerals of reference indicate the same parts in all the figures.

In the drawings, *a* represents an arm or carrier, to one end of which is secured a flexible pad *b*, said pad being preferably crescent-shaped and having a semicircular margin which projects outwardly from the arm and is free to yield in such directions as may be required to enable it to conform to the surface of the work presented to it.

The pad may be secured to the arm or carrier *a* in any suitable way. In Fig. 5 I show the pad centrally divided and disposed upon opposite sides of the flattened end *a'*, said end being comparatively thin. The parts of the pad above and below the end *a'* are secured to said end by means of flat-headed screws *a*².

A curved piece *c* of elastic wire may be inserted in the margin of the pad, as shown in Fig. 5, and by dotted lines in Fig. 1, to give an elastic support to said margin. I do not limit myself, however, to the construction of the pad nor to the manner of attaching it to the arm or carrier *a*, here shown and described, and may use any other suitable construction and attaching means.

The pad is arranged so that it has two acting faces, one at the bottom and the other at the top, and each acting face is arranged in a plane substantially parallel with the plane of the movement which is imparted to the pad, as hereinafter described.

d represents the pad-cover, which is made in the form of a pocket adapted to receive the pad *b*, the mouth *d'* of the cover being shorter than the greatest width or diameter of the

pad, so that when the cover is in place on the pad the contracted mouth of the cover will prevent the latter from slipping loosely off from the pad, the spring *c* tending to distend the pad within the cover.

The pad is preferably made of two crescent-shaped flat pieces of emery-cloth or other suitable abrasive material. The inner edge 2 of each side piece is preferably formed on the same curve as the outer edge 3, so that the pieces forming the cover can be economically cut, without waste, from a sheet of emery-cloth, as indicated in Fig. 1°. The outer or salient-curved edges 3 are suitably united, by stitches *x* or otherwise, the inner or reëntrant curved edges 2 being free and disconnected from each other and forming the edges of the mouth of the pocket.

In connection with the pad-cover and holder or carrier I employ means for giving the pad an orbital movement, so that the pad is moved or revolved bodily about a central point instead of rotating about such point, as heretofore. Said mechanism may be organized to move the pad in either an elliptical or a circular orbit. The mechanism here shown imparts an elliptical movement to the pad, and comprises a disk or pulley *f*, mounted to rotate in a fixed bearing *g* on the supporting-frame of the machine, a wrist-pin *h*, eccentrically mounted on the disk *f* and engaged with the rear end of a rotatable section *a*¹⁰ of the arm *a*, and a guide *i*, provided with a stud *i'*, which is mounted to oscillate freely in a fixed bearing *j* on the supporting-frame, the arm *a* being movable endwise in the guide *i*.

It will be seen that the rotation of the disk *f* causes the wrist-pin *h* to impart a revolving motion to the end of the arm with which it is engaged, the arm being thus caused to move endwise and oscillate in the guide *i*, which conforms to the oscillating movements of the arm. The result is the movement of the pad in the elliptical orbit *o*. (Represented in dotted lines in Fig. 1.)

The disk *f* is rotated by means of a belt *p*, driven by a pulley *q* on the main driving-shaft *r* of the machine, said pulley running over idle-pulleys *s s* and around the grooved periphery of the disk *f*.

To permit both sides of the pad-cover to be used, I provide means for giving a half-rotation to the arm *a* in order that either side of the cover may be brought into operative position without removing it from the pad, the two side pieces of the cover being therefore interchangeable. To this end I make the guide *i* rotatable in the bearing *j* and provide it with gear-teeth *t*, meshing with a gear-segment *u*, formed on a lever *u'*, which is pivoted at *u*² to fixed ears on the bearing *j*. A swinging movement of the lever *u'* will give a half-rotation to the guide *i*, which movement is imparted to the arm *a*, the orifice in the guide and the portion of the arm that

moves therein being polygonal in cross-section. By giving a pad of this description an orbital movement in the plane of its acting face I am enabled to produce results in buffing or forming a velvet finish on the bottom of shoe-soles similar to that produced by hand-work, in which the operator holds a piece of abrasive material in his hand and moves it about over the surface to be buffed. Hand-work for this purpose has always been recognized as superior to the work produced by a pad having a rotary movement in the plane of its acting face, the center of rotation being fixed; but owing to the necessary slowness attending hand-work this class of buffing is at the present time performed almost entirely by machines in which the abrasive pad-cover is rotated about a fixed center.

My improvement overcomes the objections of both of the methods heretofore in use, and enables shoe-soles to be finished in a manner equal to hand-work and as rapidly as by the mechanism heretofore used.

I claim—

1. A machine of the character specified comprising a flexible pad having two substantially flat supporting-faces, a cover formed to receive said pad, and having two similarly-shaped acting sides or faces, an arm supporting said pad, and mechanism for moving the arm to give the pad an orbital movement in the plane of its faces.

2. A machine of the character specified, comprising a flexible pad having a cover with two acting faces, an arm supporting said pad, means for moving the arm to give the pad an orbital movement in the plane of its acting face, and means for partly rotating the arm and pad to interchange the acting faces of the pad.

3. As an article of manufacture, a pad-cover composed of two crescent-shaped pieces of abrasive material united along their salient curves, their reëntrant curves forming the edges of a contracted mouth which is shorter than the greatest width or diameter of the cover.

4. An appliance of the character specified, comprising a flexible pad having a curved edge and a device for yieldingly expanding said edge, and a cover formed as a pocket to receive said pad and having a mouth of less than the greatest normal width or diameter of the pad.

5. As an article of manufacture an abrasive pad-cover composed of two similarly-shaped side pieces, collectively forming a pocket having a mouth between said side pieces.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of November, A. D. 1896.

HAROLD A. WEBSTER.

Witnesses:

C. F. BROWN,
A. D. HARRISON.