

H. A. WEBSTER.
BUFFING OR POLISHING DEVICE.

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UNITED STATES PATENT OFFICE.

HAROLD A. WEBSTER, OF HAVERHILL, ASSIGNOR TO THE GLOBE BUFFER COMPANY, OF BOSTON, MASSACHUSETTS.

BUFFING OR POLISHING DEVICE.

SPECIFICATION forming part of Letters Patent No. 550,062, dated November 19, 1895.

Application filed August 2, 1895. Serial No. 558,028. (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 Devices, of which the following is a specification.

This invention relates to appliances for performing operations analogous to abrading or buffing, or to polishing by friction exerted on the surface to be treated by means of a flexible band or cover which is yieldingly supported and to which a progressive movement is imparted by means such as a rotating shaft.

The invention has for its object to provide an appliance adapted to operate without liability of overheating or discoloring the work.

The invention consists in an appliance of the character specified comprising a rotary hub or shaft, a series of limp sections connected therewith in position to radiate therefrom when acted on by centrifugal force, said arms collectively constituting a normally limp or flabby cushion or pad which is inoperative when at rest and is adapted to be made operative by centrifugal force and to distend a flexible cover formed to surface said cushion, and clamping devices positively connected with the hub or shaft at the ends of said cushion and adapted to grasp the ends of the said flexible cover and thereby cause the cover to rotate with the hub or shaft without slipping on the cushion.

The invention also consists in certain improvements in the mechanical construction of an appliance organized as above indicated.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a portion of an organized machine having a buffing appliance embodying my invention. Fig. 2 represents a partial side elevation and a partial longitudinal section of the said appliance. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a section on line 4 4 of Fig. 2. Fig. 5 represents a view showing in perspective a portion of the hub, one of the slotted collars thereon, and a portion of one of the strip-holding rods, the latter being separated from the collar. Fig. 6 represents an end view showing the means for radially adjust-

ing the clamping-fingers. Fig. 7 represents a section on line 7 7 of Fig. 2.

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

In the drawings, *a* represents a face or cover, which may be composed of material adapted to exert a polishing frictional pressure or an abrading frictional pressure. In the former case the cover *a* would be of some suitable cloth, such as silesia, while in the latter case the cover would have an abrasive coating on its outer surface and might be composed of emery cloth. When the cover is constructed to polish, it is commonly used for such purposes as finishing the surfaces of heels and other parts of boots or shoes which have been treated with a suitable solution of wax. The acting face or cover *a*, yieldingly supported, as hereinafter described, and moved at a rapid rate by the rotation of its yielding support, will quickly raise a high polish upon the surface presented to it. When the acting face or cover *a* is adapted to abrade the surface presented to it, it is commonly used for such purposes as buffing or cleaning the bottoms of boot and shoe soles; but both the polishing and the buffing covers are of course adapted for other uses.

In carrying out my invention I provide as a support for the cover *a*, a rotary hub *b* and a series of limp sections *c*, radiating from said hub. Said sections may be strips of any suitable material—such as limp leather, cloth, or other thin limp material—and are preferably attached at their inner ends to the hub, their outer ends being free.

The sections *c* are limp, or, in other words, they have not sufficient inherent elasticity to hold them in position to exert any perceptible outward pressure on the cover, but require to be held in said position wholly by centrifugal force. Said sections, therefore, collectively constitute a cushion or pad which when at rest is insufficient to operatively support the cover, and is adapted to be maintained in an operative position by centrifugal force, said cushion or pad constantly exerting an outward pressure against the cover when the device is in rapid motion. Owing to the limp character of the sections *c* they permit the cover to yield freely and conform to the shape

of the surface of the article being acted on and to enter the various depressions that may exist in said surface, the sections exerting a uniform pressure on all parts of the distorted surface formed on the cover by the pressure of the work against it. Hence a comparatively large area of the surface of the work may be subjected to the action of the cover at one time without material variation of the pressure at different points and without liability of burning the said surface at any point by excessive pressure and friction. In other words, when the sole of a boot or shoe is pressed against the cover the centrifugally-controlled sections will yield and permit a considerable portion of the cover to be flattened and move in contact with the sole, the pressure being practically uniform at all parts of the flattened portion because of the lack of inherent elasticity of the sections, whereas if said sections were inherently elastic and self-supporting the pressure would be greater at the central part than at the margin of the flattened portion, on account of the effort of the sections to assume their normal position, and hence with constant danger of burning the work if the latter were pressed into the cover with sufficient force to cause a large area of contact between the work and cover. My invention avoids this difficulty and enables the work to be pressed as firmly against the cover and to flatten as large an area of the latter as the operator may desire without liability of burning the work.

I am aware that abrasive covers have been supported by elastic arms or projections radiating from a rotary hub or belt; but in every instance, so far as I am aware, the arms have had sufficient inherent elasticity to make them self-supporting, so that any pressure exerted by the work against the cover has to overcome the inherent elasticity of the arms before flattening any considerable portion of the cover. The resistance due to the inherent elasticity, added to that caused by centrifugal force when the device is rapidly rotated, is very liable to develop an injurious degree of heat, as already indicated. As examples, see Patents No. 369,513, dated September 6, 1887, and No. 401,215, dated April 9, 1889.

Another advantage resulting from my invention is that the cushion or pad is normally limp or flabby, so that the cover can be easily applied and removed, whereas inherently-elastic arms would resist the application and removal of the cover to a much greater extent, the cushion formed by the elastic arms being necessarily of such diameter that it closely fits the interior of the cover.

To prevent the cover *a* from slipping upon the cushion, I provide means for positively connecting the end portions of the cover with the hub or shaft. Said means preferably comprise, first, two collars *g g*, secured to the hub or shaft at the ends of the cushion, said collars being preferably made of yielding material, such as felt, and of a diameter which

is preferably slightly less than the diameter of the cushion formed by the strips or sections *c* when the cushion is distended by centrifugal force. Said means comprise, secondly, clamping-fingers *h*, which are radially adjustable and are arranged to bear upon the peripheries of the yielding collars *g*, said fingers being therefore adapted to sink into the collars when moved inwardly. The ends of the cover *a* are interposed between the collars *g* and fingers *h*, and the latter are then adjusted inwardly and caused to clamp the ends of the cover and thus connect the cover with the hub or shaft. The fingers *h* are formed upon radial shanks *h'*, which are provided with studs *h''*, entering cam-shaped slots *i* in rotary collars *i'*, which are supported as hereinafter described. When the collars *i'* are rotated in one direction, the fingers *h* are moved outwardly, and when the collars are rotated in the opposite direction, said fingers are moved inwardly.

The limp arms or sections *c* are preferably formed by folding strips of limp leather or other suitable material over the rods *j*, which are secured to the hub or shaft *b* and extend lengthwise thereof, said rods being separated from the periphery of the hub or shaft, so that the strips can pass between the rods and the hub or shaft, as shown in Fig. 3. The plies of the folded strips may be connected by stitches *k* at the outer edges of the rods *j*. Said rods are here shown as secured to the hub or shaft by means of a collar *m*, affixed to said hub and provided with slots *m'* in its periphery, which slots receive the reduced ends *j'* of the rods *j* and the sleeves *o*, which are internally screw-threaded and engaged with corresponding screw-threads formed on the hub *b*, said sleeves having flanges *o'*, which project over the collars *m* and cover the slots *m'* thereof, thus retaining the ends of the rods *j* in said slots. As here shown, the sleeves *o* are extended outwardly at *o''* and formed to support the collars *i*, said sleeves being secured by screws *p* to the driving-shaft *q*, upon which the hub *b* is mounted.

I do not limit myself to the described details of construction, and may variously modify the same without departing from the spirit of my invention.

Having thus explained the nature of my invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, what I claim, and desire to secure by Letters Patent, is—

1. A buffing or polishing appliance of the character specified, comprising a rotary hub or shaft, a series of limp sections in position to radiate therefrom when acted on by centrifugal force, said sections collectively constituting a normally limp cushion or pad adapted to be made operative by centrifugal force, and clamping devices positively connected with the hub or shaft at the ends of

said cushion and adapted to grasp the ends of a flexible cover placed on said cushion, whereby the cover is secured to and caused to rotate with the hub or shaft.

5 2. A buffing or polishing appliance comprising a rotary hub or shaft, a centrifugally maintained cushion thereon, collars secured to the hub or shaft at the ends of said cushion, and clamping fingers arranged to co-operate with said collars in grasping the ends of
10 a flexible cover placed on the cushion.

3. A buffing or polishing appliance comprising a rotary hub or shaft, a centrifugally maintained cushion thereon, collars secured to the
15 hub or shaft at the ends of said cushion, clamping fingers arranged to co-operate with said collars in grasping the ends of a flexible cover placed on the cushion, and collars rotatively connected with said hub or shaft and provided
20 with cams engaged with said clamping fingers.

4. A buffing or polishing appliance comprising a rotary hub or shaft, slotted collars affixed thereto, rods extending lengthwise of the hub and having their ends inserted in the

slots of said collars, flanged sleeves remov- 25
ably secured to the hub and formed to project over said collars to confine the rods therein, and limp strips or sections folded upon said rods and radiating from the hub.

5. A buffing or polishing appliance of the 30
character specified, comprising a rotary hub or shaft, a suitable yielding cushion, flanges or collars of yielding material such as felt secured to the hub at opposite ends of said cushion, clamping fingers arranged to bear 35
on the peripheries of said yielding collars, and means for adjusting said fingers, the fingers sinking into the yielding collars when adjusted inwardly.

In testimony whereof I have signed my 40
name to this specification, in the presence of two subscribing witnesses, this 30th day of July, A. D. 1895.

HAROLD A. WEBSTER.

Witnesses:

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