Jan. 3, 1956 F. H. J. BEEREN 2,728,928

SHOE POLISHING MACHINE

Filed Dec. 6, 1954 2 Sheets-Sheet 1

Fig-1

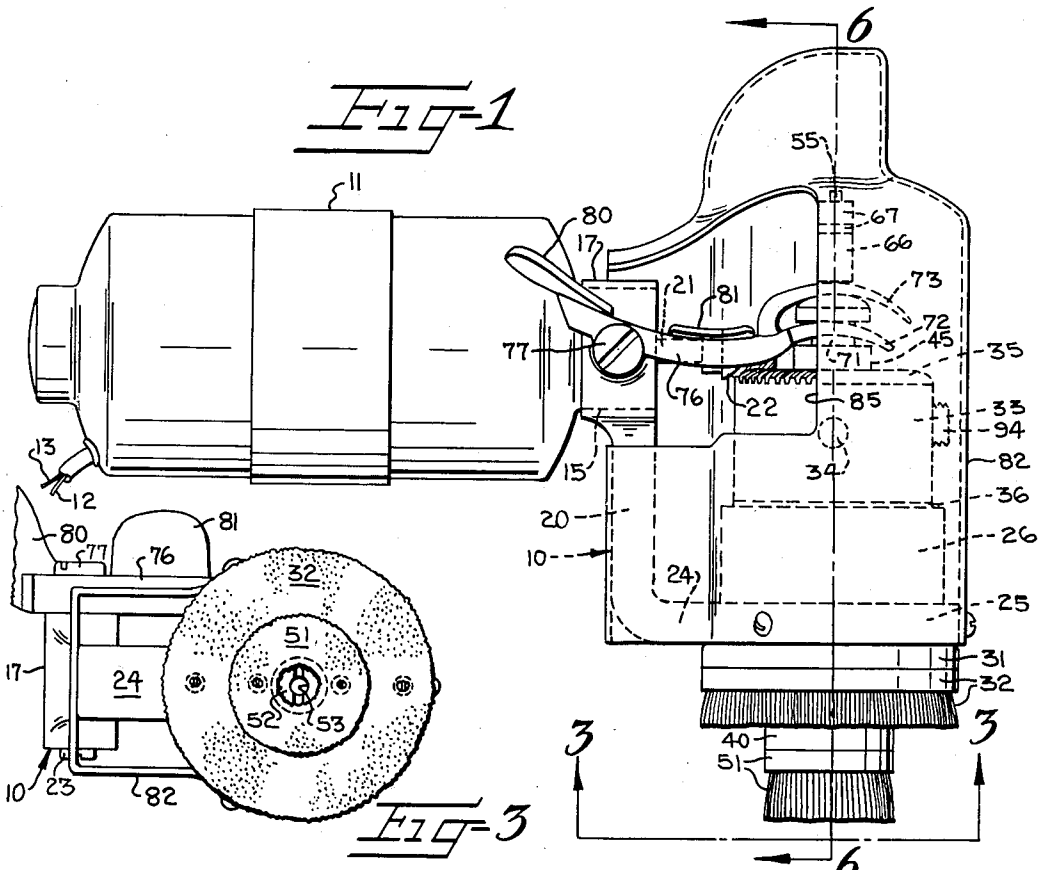

Fig-3

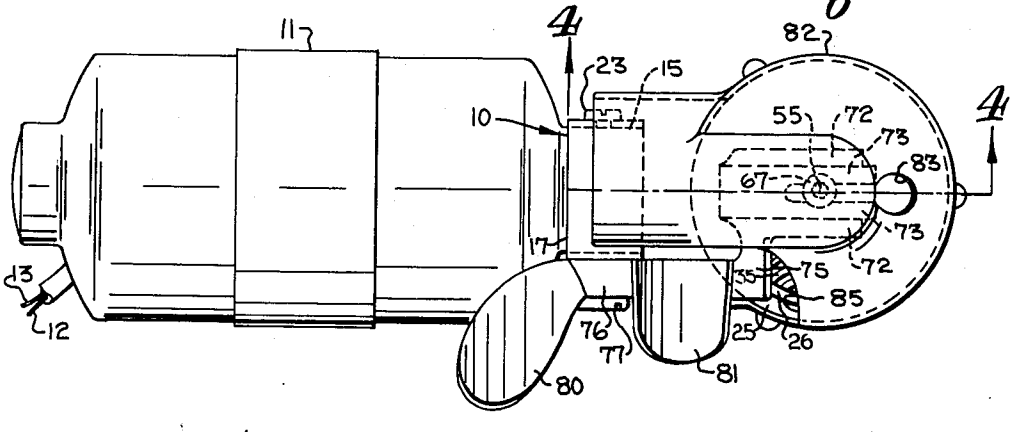

Fig-2

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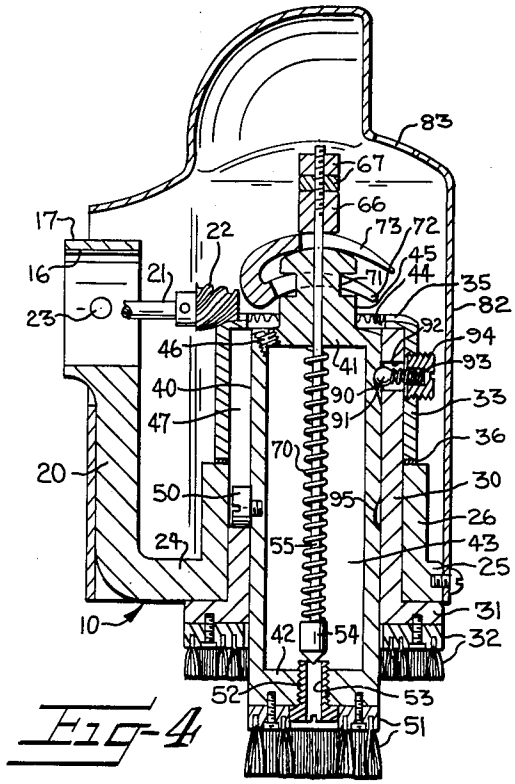

Fig-4

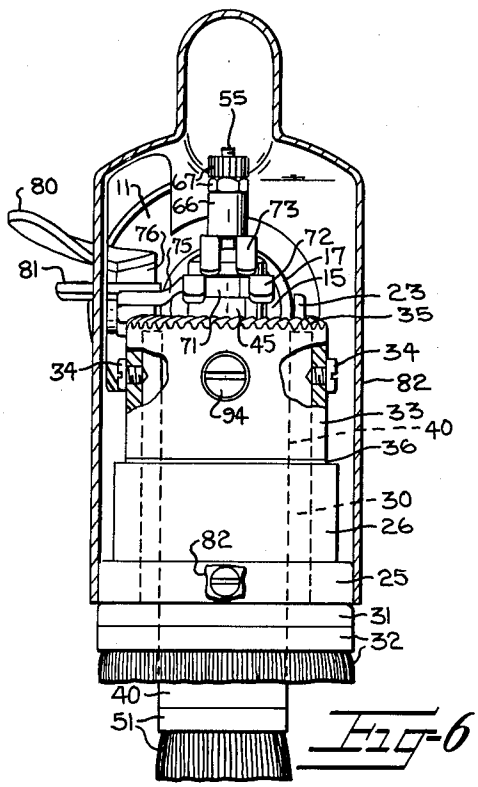

Fig-6

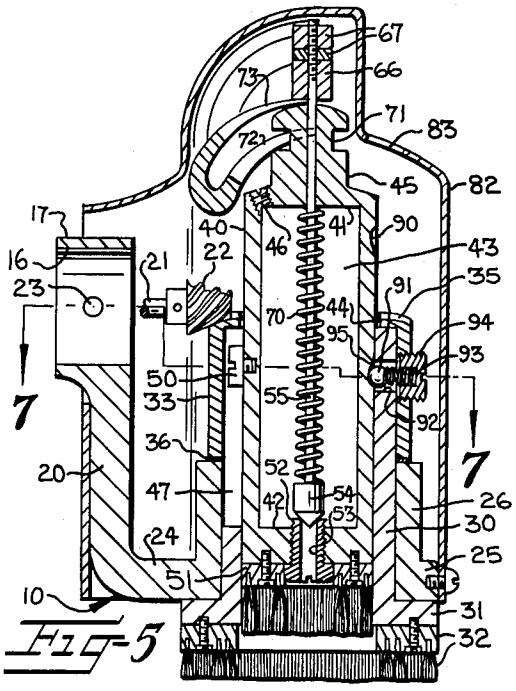

Fig-5

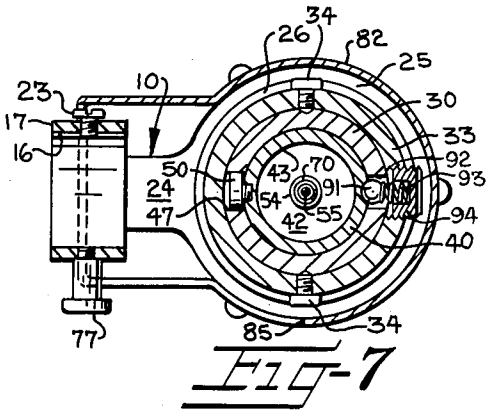

Fig-7

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SHOE POLISHING MACHINE

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7 Claims. (Cl. 15—29)

This invention relates to rotary polishing devices and it is an object of this invention to provide a portable shoe polishing machine comprising inner and outer rotary coaxial pads or brushes with means to automatically feed a polishing material to the inner brush, only whenever it is extended axially of the outer brush, and manually operable means being provided for extending and retracting the inner brush relative to the outer brush.

It is another object of this invention to provide a machine of the character described comprising a portable frame having inner and outer coaxially arranged resilient polishing members, such as brushes or polishing pads, rotatably mounted thereon and to both of which rotation is imparted. The inner polishing element is fixed to a hollow spindle forming a reservoir mounted for axial movement within and relative to a sleeve to which the outer annular polishing element is secured.

A novel manually operable cam mechanism is provided for extending and retracting the inner polishing element relative to the outer polishing element. This cam means also respectively opens and closes a discharge port or valve mechanism with respective extending and retracting operations of the inner polishing element to permit a polishing liquid or compound to pass from the reservoir to the inner polishing element when the inner polishing element is extended. Thus, when the inner polishing element with its reservoir is extended relative to the outer polishing element, it serves as an applicator for evenly spreading the polishing liquid or compound, by rotary motion, onto the surface to be polished. Thereafter, the inner polishing element is retracted relative to the outer polishing element and the outer polishing element then polishes the desired surface by a rotary motion without applying additional polishing fluid or compound to the surface.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the improved polisher showing the inner polishing element, pad or brush and a portion of the reservoir or spindle in extended position relative to the annular outer polishing element, pad or brush;

Figure 2 is a top plan view of the structure shown in Figure 1;

Figure 3 is a fragmentary inverted plan view looking upwardly substantially along line 3—3 in Figure 1, but omitting the electric motor;

Figure 4 is a vertical sectional view taken substantially along line 4—4 in Figure 2, also omitting the electric motor, but showing a portion of the shaft of the electric motor;

Figure 5 is a view similar to Figure 4, but showing the inner rotary polishing element in retracted position relative to the outer annular polishing element;

Figure 6 is a vertical sectional view taken substantially along line 6—6 in Figure 1, but showing the improved polisher mostly in elevation and showing the casing or housing for the operating parts thereof in section;

Figure 7 is a sectional plan view taken substantially along line 7—7 in Figure 5.

Referring more specifically to the drawings, the numeral 10 broadly designates a substantially L-shaped frame which is adapted to be secured to one end of an electric motor 11 which also serves as a handle for the improved polisher. The electric motor 11 has wires 12 and 13 extending therefrom which are adapted to be connected to a suitable source of electrical energy, not shown.

The electric motor 11 is preferably a relatively small, light-weight, fractional horsepower motor whose casing preferably has a circular projection 15 thereon which fits in a bore 16 provided in an enlarged upper portion 17 on the substantially vertical leg 20 of the frame 10. The motor shaft 21 extends forwardly through the projection 15 on the casing of the motor 11 and has a relatively small bevel gear 22 fixed thereon which is preferably, but not necessarily, of the helical type as best shown in Figures 4 and 5. The circular portion 15 on the front end of the casing of the motor 11 may be secured in the bore 16 by any suitable means such as a set screw 23.

The substantially horizontal portion of the substantially L-shaped frame 10 is indicated at 24 and has an enlarged substantially circular annular portion 25 on the outer end thereof provided with a reduced upwardly projecting bearing member 26 thereon which is preferably integral with the circular portion 25 on the horizontal portion 24 of the frame 10. An outer brush-supporting or outer polishing-element-supporting sleeve or outer rotary tubular member 30 is rotatably mounted in the tubular bearing member 26 and its lower end has an enlarged portion or flange 31 thereon to which an annular resilient outer polishing element, such as a pad or brush 32, is suitably secured.

The upper portion of the tubular member 30 extends substantially above the upper end of the bearing member 26 and has an inverted substantially cup-shaped member or cap 33 fixed thereon, as by screws 34 (Figures 6 and 7). The upper end of the inverted cup-shaped member 33 has a bevel gear 35 thereon which is shown as being formed integral with the upper wall of the inverted cup-shaped member 33. The bevel gear 35 is also preferably of the helical type and is engaged by the gear 22 fixed on motor shaft 21.

Although the lower edge of the circular wall of the cap 33 may rotatably and slidably contact the upper end of the bearing member 26, it is preferable that a suitable thrust washer or ring 36 is provided between the proximal surfaces of the cap 33 and the bushing or bearing member 26. The distance from the lower edge of the inverted cup-shaped member 33 to the upper surface of the flange 31 should be such that the flange 31 on the tubular member 30 may slidably and rotatably engage the lower surface of the annular portion 25 of the horizontal leg of the frame 10.

Mounted for rotation with the tubular member 30, and for axial movement therein, is an elongated hollow body, spindle, inner rotary element or reservoir 40 which is preferably, but not necessarily, circular in cross-section and which is closed at its upper and lower ends, as at 41, 42, to form a chamber 43 therein for containing a suitable polishing liquid, polishing compound or other polishing material, not shown.

It will be noted that the upper wall or gear 35 on the inverted cup-shaped member 33 has an axial opening 44 therein through which the reservoir 40 may pass freely and through which a reduced circular hub portion 45 on the upper end of the body or reservoir 40 extends when the body or reservoir 40 is extended, as shown in Figures 1, 4 and 6. The upper wall 41 of the reservoir 40 has

a suitable threaded plug or screw 46 therein which may be removed for replenishing the supply of polishing liquid or compound in the chamber 43 of the reservoir 40, when desired. The tubular member 30 has a longitudinally extending slot 47 therein in which an abutment or key 50 shown in the form of the head of a screw is positioned, said key 50 being fixed to the annular wall of the body 40 whereby the key 50 prevents relative rotational movement between the body 40 and the tubular member 30. Also, it will be observed in Figure 4 that the lower end of the groove 47 terminates in substantially spaced relation above the lower surface of the flange 31 on the tubular member 30 so the abutment 50 engages the lower end of the slot 47 to limit outward movement of the body 40 when it is extended as shown in Figures 1, 4 and 6.

The lower or free end of the body or reservoir 40 has an inner annular polishing pad or brush 51 suitably secured thereto. The brush 51 may be termed as a resilient inner polishing element or polish spreading element. The headed lower end of a nozzle 52 is encircled by the inner annular polish spreading element 51, the body of the nozzle 52 threadably penetrating the lower wall 41 of the reservoir or body 40 and being provided with an axially extending passageway or port 53 therein.

Although the passageway 53 is shown as being provided in the nozzle 52, it is to be distinctly understood that the nozzle 52 may be eliminated and the discharge passageway 53 may be formed in the lower wall 42 of the reservoir or body 40, without departing from the spirit of the invention. The upper end of the passageway 53 is adapted to, at times, be closed by a valve member 54 which is fixed to or integral with a shaft or rod 55 of substantially lesser diameter than the valve member 54. The rod 55 extends upwardly and loosely penetrates the upper wall 41 and the reduced portion 45 on the reservoir or body 40 and has a retaining member 66 loosely mounted thereon whose upper end bears against one of a pair of lock nuts 67 threadably mounted on the upper end of the rod 55. The rod 55 and its valve member 54 are urged downwardly or toward the discharge passageway 53 by a compression spring 70 which surrounds the rod 55. The upper end of the spring 70 bears against the lower surface of the top wall 41 of the reservoir or body 40 and the lower end of the spring 70 bears against the valve member 54.

The medial portion of the reduced portion 45 of the body 40 has an annular groove 71 therein which is engaged by a bifurcated lower or inner arcuate reservoir shifting cam 72. The upper end of the reduced portion 45 of the reservoir or body 40 is preferably rounded somewhat and is engaged by the lower or inner surface of a bifurcated arcuate outer cam or valve-controlling cam 73 whose bifurcations straddle the rod 55 and the upper surfaces of which engage the lower surface of the retaining member 66.

It will be noted that the cam 73 is relatively sharp at its free end and gradually increases in thickness toward its other end, said other end being formed downwardly and connected to or formed integral with the lower or inner arcuate bifurcated cam 72. It is thus seen that the bifurcated lower and upper arcuate cams 72, 73 are collectively substantially U-shaped in elevation. Connected to the lower and upper arcuate bifurcated cams 72, 73, at the junctures thereof is an outwardly projecting portion 75 whose outer end is formed integral with a hand-lever 76 which extends rearwardly and is pivotally connected to one side of the enlarged upper portion 15 of the vertical leg 20 of the frame 10, as at 77. The hand-lever 76 preferably has a pair of spaced curved finger seats or seat plates 80, 81 projecting outwardly from the upper surface thereof adjacent opposite sides of the pivot point 77 thereof.

The open lower end of a suitable hollow shield 82 is suitably secured to the enlarged end portion 25 on the forward portion of the leg or arm 24 of the L-shaped frame 10. The shield 82 is provided with an opening 83 in the upper portion thereof which is provided to permit access to the plug 46 for replenishing the supply of polishing liquid or compound in the chamber 43 of the reservoir 40. It will be observed in Figure 1 that one side wall and the rear of the shield 82 is cut away to provide an opening 85 therein through which the hand-lever 76 and the upper portion of the arm 20 of frame 10 extend.

It is thus seen that, upon moving the hand-lever 76 in a clockwise direction so that it occupies the position shown in Figure 1, the lower or inner arcuate bifurcated cam 72 rides in the annular groove 71 in the reduced upper portion 45 of the body 40 to thereby impart downward movement to the body 40 to extend the same relative to the tubular member 30 and the outer annular brush or polishing element 32. In so doing, it will be noted that the outer or upper arcuate bifurcated cam 73 rides against the curved surface of the reduced portion 45 of the body 40 and, since the spring 70 causes the lower end of the retainer 66 to bear against the upper or outer surface of the bifurcated upper arcuate cam 73, it is apparent that the upper cam 73 will cause the rod 55 and valve member 54 to move upwardly relative to the reservoir or body 40 to thereby open the valve 54 and to permit the polishing compound or liquid to pass through the passageway 53 in the nozzle 52. Assuming that the motor 11 is then running, it is apparent that the polishing liquid or compound will then flow onto the surface to be polished, such as a person's shoe, and the rotating brush or pad 51 will then evenly spread the polishing compound or liquid over the surface to be polished.

In order to maintain the inner brush or pad 51 in extended position without maintaining downward pressure on the forward finger seat 81 on the hand-lever 76, it will be noted that the portion of the annular wall of the body or reservoir 40 opposite from the key 50 has a relatively small recess 90 therein which is then engaged by a detent or spring-pressed ball 91 loosely disposed in a hole 92 provided therefor in the tubular member 30. The ball 91 is urged inwardly into the recess 90 or against the outer surface of the body 40 by a compression spring 93 which also fits in a recess provided therefor in the inner surface of a threaded plug or screw 94. The threaded plug or screw 94 threadably penetrates the annular wall of the inverted cup-shaped member 33.

After the desired amount of polishing material, compound or liquid has been applied to the surface to be polished, the operator then exerts pressure on the finger seat 80 to impart movement to the hand-lever 76 in a counterclockwise direction in Figure 1. It is apparent that this will return the parts to the position shown in Figure 5 and, since the relatively sharp end of the bifurcated upper cam 73 is then disposed between the rounded upper end of the reduced portion 45 of the body 40 and the retaining member 66, it is apparent that this permits the compression spring 70 to move the valve 54 to closed position to thereby prevent additional polishing compound or liquid from flowing through the passageway 53 in the nozzle 52.

The length of stroke imparted to the body or reservoir 40 by the hand lever 76 and the cam 72 thereon is such that the inner annular brush or pad 51 will then be entirely withdrawn or retracted relative to the outer annular brush or pad 32 and, since both of the brushes or pads 32, 51 rotate in unison, it is apparent that the surface to which the polishing material, liquid or compound had been applied may then be polished by the brush 32. In order to assist in maintaining the reservoir 40 and its inner annular brush 51 in the retracted position, substantially as shown in Figure 5, it will be observed that the wall of the reservoir or body 40 also has a relatively small shallow recess 95 therein spaced substantially below the recess 90

and which is also engageable by the detent 91 when the reservoir 40 and its brush 51 are in retracted position.

It is thus seen that I have provided a novel polishing machine particularly devised for polishing men's shoes and the like and comprising a driven inner brush or pad and an outer annular brush or pad arranged coaxially with respect to the inner brush or pad and wherein the inner brush or pad is connected to the lower end of a reservoir whose lower wall has an axially disposed discharge passageway therein which is automatically opened when the reservoir and its inner brush are in extended position. It is also seen that I have provided novel hand-operated cam means for retracting and extending the reservoir and the inner brush or pad relative to the outer brush or pad while rotation is imparted to both of the brushes or pads simultaneously.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A hand controlled portable polishing machine comprising an outer rotary member having a resilient polishing element thereon, an inner rotary member mounted for axial movement in the outer member and also having a resilient polishing element thereon, said inner member having a chamber therein for containing polishing liquid, said inner member also having a passageway therein for directing liquid from the chamber to the resilient element thereon, a valve controlling said passageway, means for imparting rotary motion to the outer and inner rotary members, manually operable means for shifting said inner rotary member between extended and retracted positions relative to the outer rotary member, and means automatically closing said valve when the inner rotary member is retracted and automatically opening said valve when the inner rotary member is extended.

2. A hand controlled portable polishing machine comprising an electric motor, a frame fixed to said motor, a tubular outer rotary member journaled in said frame and having a resilient polishing element thereon, an inner rotary member mounted for axial movement in and restrained from rotation relative to the outer member and also having a resilient polishing element thereon, said inner member having a chamber therein for containing polishing liquid, said inner member also having a passageway therein for directing liquid from the chamber to the resilient element thereon, a valve controlling said passageway, driving connections between the outer member and the motor for imparting rotary motion to the outer and inner rotary members, manually operable means for shifting said inner rotary member between extended and retracted positions relative to the outer rotary member, and means automatically closing said valve when the inner rotary member is retracted and automatically opening said valve when the inner rotary member is extended.

3. A structure according to claim 2 wherein the driving connections comprise a first bevel gear on said motor, a second annular bevel gear meshing with the first gear and being fixed to the end of the outer member remote from the corresponding polishing element and through which the inner member extends, said shifting means including a hand-lever pivoted on said frame, a peripheral groove in the end portion of said inner member adjacent said second gear, and a bifurcated portion on said hand-lever engaging said peripheral groove.

4. A structure according to claim 3 wherein said valve and the means opening and closing said valve comprise resilient means normally urging the valve to closed position, an extension on the valve loosely penetrating the end of the inner member adjacent said bifurcated portion on the hand-lever, an arcuate tapered cam fixed on the hand-lever and engaging the corresponding end of the inner member, a retaining member fixed on the valve extension and bearing against the outer surface of the cam whereby the cam displaces the retaining member relative to the inner member to open the valve when the inner member is extended and permits the retaining member to move toward the inner member when the inner member is retracted.

5. In a manually controlled and portable power driven polishing tool of the rotary type having a frame; the combination of a tubular member journaled in said frame and having a first polishing brush thereon, a reservoir for containing polishing liquid mounted for axial movement in said tubular member, means restraining said reservoir against rotational movement relative to said tubular member, means for driving the tubular member and the reservoir, a hand-lever pivoted on said frame, means responsive to movement of said lever in one direction for moving said reservoir from a retracted to an extended position relative to the tubular member, said reservoir also having a second polishing brush on its end adjacent the first polishing brush, a passageway in the lower end of said reservoir for directing liquid from the reservoir to the second brush, a valve normally closing said passageway when the reservoir is in retracted position, and means operable automatically upon movement of said reservoir from retracted to extended position for opening said valve.

6. A structure according to claim 5 wherein said reservoir has a reduced portion on its end opposite from the second brush, said reduced portion having an annular groove therein, a first arcuate bifurcated cam movable in said annular groove, a second arcuate bifurcated cam movable against the outer surface of said reduced portion of the reservoir, means connecting said cams to said hand-lever, a shaft connected to said valve and loosely extending through the reduced portion of the reservoir and having a retaining member thereon engageable with the outer surface of the second cam, spring means normally urging the valve toward closed position, and said outer cam being of gradually increasing thickness from its free end toward the hand-lever whereby, upon moving said hand-lever in one direction, the reservoir is moved from a retracted to extended position through engagement of the first cam with the annular groove in the reduced portion of the reservoir, and whereby the second cam then increases the displacement between the retaining member and the free end of the reduced portion of the reservoir to move the valve away from the passageway in the lower end of the reservoir to permit the polishing liquid to escape from the reservoir.

7. A hand controlled portable polishing machine comprising an outer rotary member having a resilient polishing element thereon, an inner rotary member mounted for axial movement in the outer member and also having a resilient polishing element thereon, said inner member having a chamber therein for containing polishing liquid, said inner member also having a passageway therein for directing liquid from the chamber to the resilient element thereon, a valve controlling said passageway, means for imparting rotary motion to the outer and inner rotary members, manually operable means for shifting said inner rotary member between extended and retracted positions relative to the outer rotary member, means automatically closing said valve when the inner rotary member is retracted and automatically opening said valve when the inner rotary member is extended, said inner member having a pair of longitudinally spaced recesses therein, and a detent carried by the outer rotary member and being alternately engageable with said recesses for respectively retaining the inner rotary member in retracted and extended positions.

No references cited.