

March 17, 1970

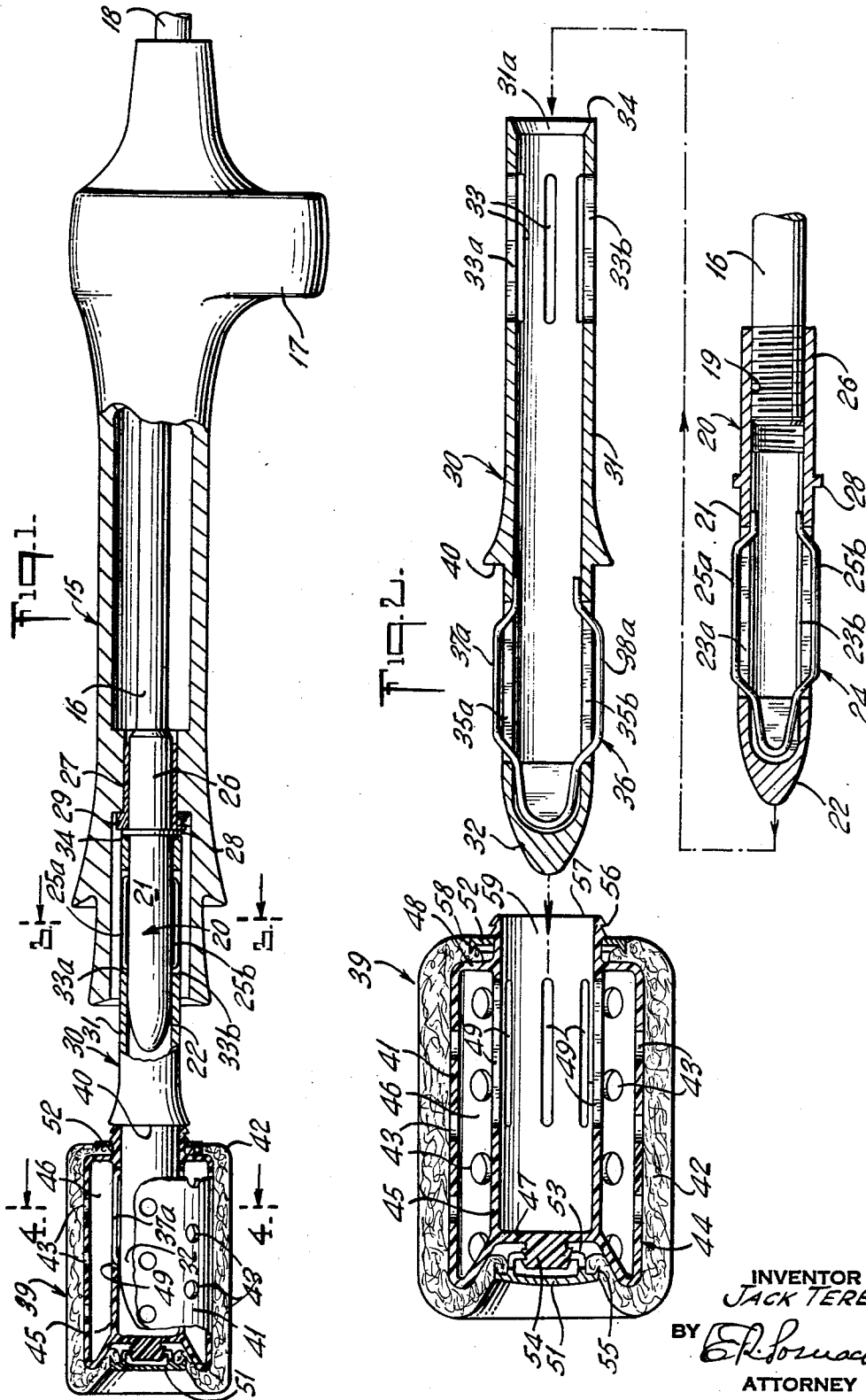
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ROTARY TOOL DEVICE WITH COACTIVE LIQUID DISPENSING MEANS

Filed Jan. 30, 1967

2 Sheets-Sheet 1



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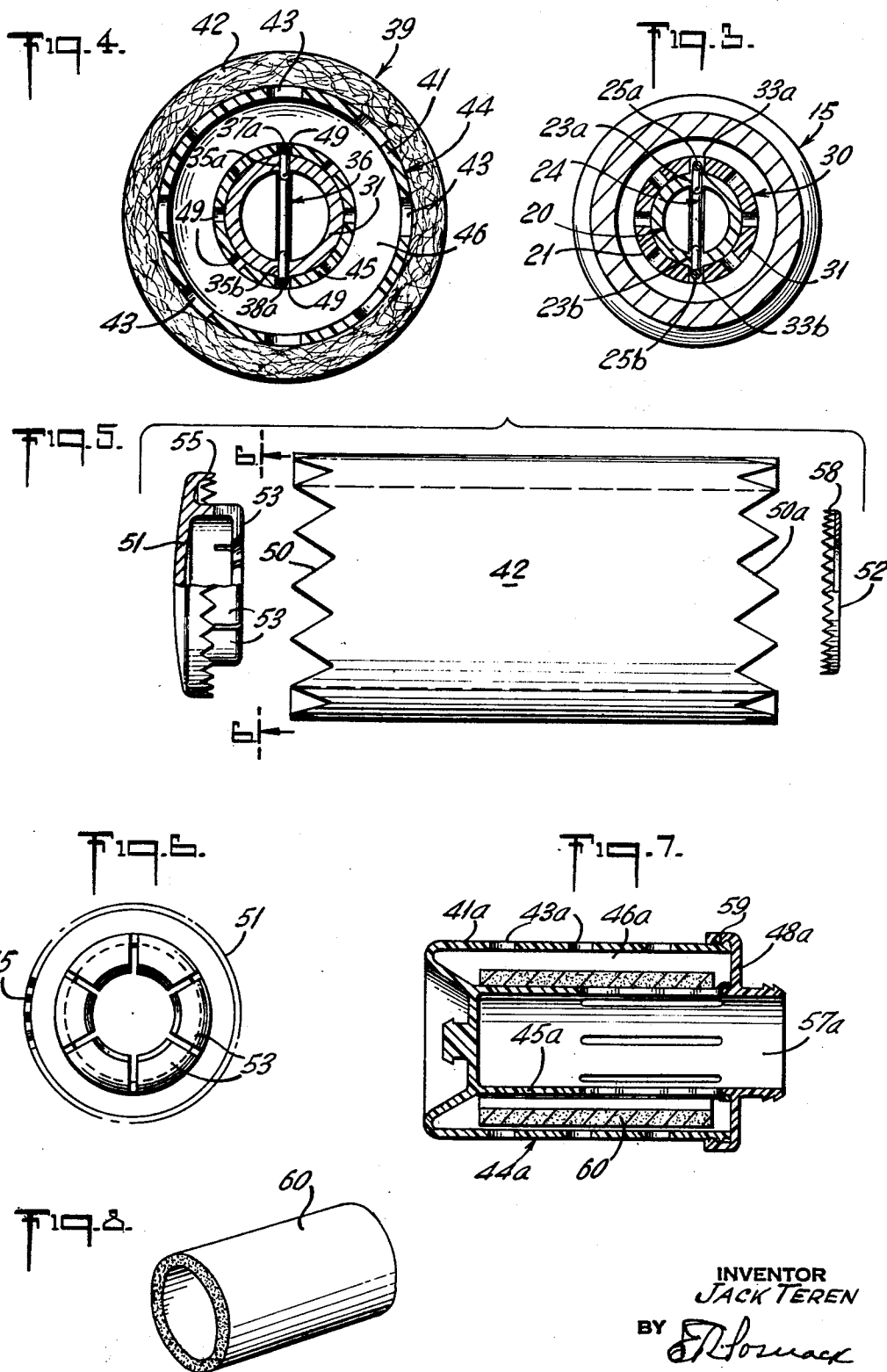
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2 Sheets-Sheet 2



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**ROTARY TOOL DEVICE WITH COACTIVE
LIQUID DISPENSING MEANS**Jack Teren, 2195 N. Central Road,
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10 Claims

ABSTRACT OF THE DISCLOSURE

A rotary tool device with coactive liquid dispensing means. The device comprises a hand-held casing supporting a rotatable mandrel upon which is mounted the tool. The latter has a hollow jacketed holder with an outer abrading or other working wall, like a scouring pad, said holder having an inside annular jacket containing a selected liquid, like soap water, which is ejected into said working wall through suitable openings by centrifugal action caused by the rotation of the tool.

BACKGROUND OF THE INVENTION**Field of the invention**

This invention relates to rotary tool devices with coactive liquid dispensing means, and is particularly, though not exclusively, directed to scouring pads and other abrading tools adapted to operate with the aid of a liquid medium.

The prior art

Abrasive cleaners, such as scouring pads, brushes and the like for the cleaning of household utensils, generally require the use of soap and water or detergents. The nature or quantity of the deposits to be removed from the worked-upon surfaces of such appliances as pots and pans often requires prolonged and considerable manual effort both in the application of the needed force as well as in the repeated application upon the pad or brush of moisture and soap. Fountain brushes and scouring pads with embedded soap have been employed in attempts to reduce the time and effort required for such cleansing and scouring operations, but these have been successful only to limited extents. Relying upon gravity to feed the brush bristles has proved to be unsatisfactory because of the inadequate feeding rates of the liquid and the need to apply manual effort both for scrubbing and flow-inducing operations. Relying upon a cake of soap in a scouring pad has failed to reduce the effort required in the use of the pad and in the need for frequent applications of water and soap to the surface of the pad.

SUMMARY OF THE INVENTION

The present invention employs rotary means, in the form of a suitable tool operated by a flexible shaft connected to a remotely positioned electric motor, both for performing the required scouring or abrading steps and also for effectively supplying to the working surface of the tool a selected liquid such as a solution of soap water, a detergent etc. The arrangement is such as to obviate the disadvantages above mentioned.

Briefly, the tool member comprises a casing adapted for manual grasping containing therein a rotatable spindle connected at the rear end to the flexible shaft and at the front end to a mandrel in releasable engagement with the tool member—the herein-described scouring pad member being one such tool member. Said member comprises a hollow jacketed holder component with a central chamber into which the forward end of said mandrel is slidably fitted. To the outer surface of said holder component is secured a scouring pad, said component having

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an annular jacket or chamber in spaced relation to the axis and adapted to contain therein either a selected liquid alone, or water and an open-ended cylindrical cake of soap loosely mounted over the inner cylindrical wall defining said central chamber. The outer cylindrical wall of said annular jacket has a plurality of apertures through which the liquid in the annular jacket is centrifugally ejected upon the operative rotation of the tool—the ejected liquid soaking the scouring pad and coacting therewith in its cleaning operation. The said holder component is preferably made of flexible plastic material, thereby enabling it and the pad mounted thereover to be deformed under pressure so that corners and intricate surfaces could be reached.

Referring to the drawings,

FIG. 1 is a side elevation, with parts broken away and in section for clarity, of the assembly of components of an embodiment of the rotary tool device of this invention.

FIG. 2 is a somewhat enlarged exploded sectional view of the components of FIG. 1.

FIG. 3 is an enlarged section of FIG. 1 taken along line 3—3.

FIG. 4 is an enlarged section of FIG. 1, taken along line 4—4.

FIG. 5 is a side elevation of the scouring pad member and end views, partly in section, of the opposite retaining discs for securing said pad member in place, the pad member and discs being shown in disassembled relation.

FIG. 6 is an elevational view of one of the retaining discs shown in FIG. 5, looking in the direction of arrows 6—6.

FIG. 7 is a sectional elevation of a modified form of jacketed holder component of my invention.

FIG. 8 is a perspective view of a cylindrical soap piece adapted for use with the member shown in FIG. 7.

DESCRIPTION OF PREFERRED EMBODIMENT

In the particular form of my invention illustrated in the drawings, a casing 15, adapted for manual gripping contains a spindle 16 operatively connected to a transmission mechanism disposed within the rear housing portion 17 and the flexible shaft 18 driven by a remotely positioned motor, the transmission mechanism and motor not being shown since they are well known to those skilled in the art, a detailed description thereof not being necessary for an understanding of this invention. Suffice it to say for the purpose of this specification that there are no electrical connections or circuits within said casing 15 and no rigid connection between the spindle 16 and the motor, so that the casing is free of the danger of short-circuiting through water seepage and can be freely manipulated during the operative use of the device.

The forward end of said spindle 16 has affixed thereto by threading 19, the elongated driving head 20 comprising a cylindrical shell 21 with a solid, preferably conoidal front wall 22, said shell having a pair of parallel diametrically opposite slots 23a and 23b. A spring 24 is positioned within said shell 21 with the opposite protruding portions 25a and 25b thereof extending through said slots 23a and 23b, respectively, the said spring having a forward U-shaped portion in engagement with the inner surface of said wall 22. The rear portion 26 of said driving head 20 extends through and is in rotatable engagement with the bushing 27 affixed within the said casing 15, the said head 20 having a collar 28 in engagement with the forward flange 29 of said bushing.

Adapted for operative engagement with said driving head 20 is the mandrel 30 shaped substantially like said head and adapted to releasably support a suitable tool, such as a scouring pad or other cleaning or abrading element

in a manner to be hereinafter set forth. Said mandrel 30 comprises a cylindrical shell 31 with a rear entrance aperture 31a and a preferably solid, conoidal front wall 32, said shell having a plurality of parallel circumferentially spaced slots 33, these being proportioned and positioned to receive therein said protruding portions 25a and 25b of said spring 24. In the embodiment illustrated there are an even number of slots in paired diametral arrangement—like the paired slots 33a and 33b—so that during the operative assembling of said driving head 20 and mandrel 30, a slight rotational manipulation of said mandrel will cause the said protruding spring portions 25a and 25b to snap into the adjacent diametrically opposite slots. In the form of my invention shown, the shell 21 of said head 20 is proportioned for a slide fit within the shell 31 of the mandrel 30, so that the front wall or nose 22 of the driving head can readily enter the opening 31a when the mandrel 30 is slid over the driving head 20, the arrangement being such that when the rear terminal 34 engages the said collar 28 of the head, the spring 24 will be in position for interlocking engagement with coactively positioned slots 33.

The forward end of said mandrel 30 is provided with a pair of parallel diametrically opposite slots 35a and 35b, there being a spring 36 in the mandrel substantially like the said spring 24, spring 36 having the two diametrically opposite protruding portions 37a and 38a extending through the said slots 35a and 35b, respectively. Said protruding spring portions 37a and 38a are proportioned and positioned for locking engagement with the rotating tool member 39 when the annular shoulder 40 is brought into abutting engagement with member 39, in a manner to be hereinafter described.

The tool member 39 has an annular working wall 41 provided with suitable abrading, cutting or scouring means—such means being at times herein referred to as “working means”—the particular embodiment illustrated showing the working means as a scouring pad member 42 with a working surface. The said pad is adapted to receive within the body thereof a liquid detergent, water or water and soap, the arrangement being such that upon an operative rotation of member 39 the liquid contained in the device will be centrifugally ejected through peripheral apertures 43 in said wall 41, saturating the enveloping scouring pad element during the operative scouring action thereof.

The said annular wall 41 is an integral part of the hollow jacketed holder component 44 of the tool member 39. Said component 44 is preferably of flexible plastic material and comprises an inner annular wall 45 concentric with said annular wall 41, said walls 41 and 45 being in spaced relation and forming therebetween the annular chamber or jacket 46, the said walls 41 and 45 together with the respective front and rear end annular walls 47 and 48 fully enclosing said jacket. The said inner wall 45 contains a plurality of parallel circumferentially spaced slots 49 proportioned and positioned to receive in diametrically opposite slots, in the manner aforesaid, the protruding portions 37a and 38a of said mandrel spring 36 for releasable interlocking engagement. The illustrated pad element 42 has its opposite ends notched to provide terminal tongues 50 and 50a which can be tucked in against said respective front and rear end walls 47 and 48 when said element is operatively positioned over said annular wall 41. In this embodiment opposite retaining discs 51 and 52 are employed. Disc 51 has a segmented annular retaining wall 53 in frictional engagement with the forwardly extending boss 54 of member 44 and a separate peripheral gripping edge 55 in engagement with the adjacent tucked-in tongues 50. Said disc 52 is centrally apertured for frictional engagement with the outer surface 56 of the rearwardly extending portion 57 of said inner wall 47, said disc also having a peripheral gripping edge 58 in engagement with the adjacent tucked-in tongues 50a.

The inside diameter of said inner wall 45 is proportioned to permit the forward portion of said mandrel 30 to be slidably inserted within the central chamber 59 defined by said inner wall 45, whereby the said tool member 39, or any similar member, may readily be detachably secured to said mandrel.

The annular jacket or chamber 46 is adapted to contain therein a selected liquid, such as a detergent, saponified water, or just plain water. Whatever the liquid, the operative rotation of member 39 will cause the liquid to be centrifugally ejected outwardly through the said apertures 43 in the annular wall 41 due to the fact that the said annular chamber is spaced outwardly from the axis of rotation whereby the mass of liquid contained therein is subject to centrifugal action. The action is such that the liquid will coact with the mechanical abrading or other action of the tool to lubricate the worked-upon surface or dissolve or chemically act upon deposits on said surface that it is desired to remove.

In the illustrated form of this invention, the ejected liquid will saturate the scouring pad material 42 and maintain it in such condition as long as there is liquid within chamber 46 to be centrifugally ejected. The flexibility of the jacketed member 44 will enable it to be deformed under pressure, thereby enabling the tool with the pad 42 to reach corners and intricately shaped surfaces.

In the embodiment of my invention wherein the jacketed holding member 44 is of one piece, the selected liquid can be introduced into chamber 46 by immersing the member within a mass of the liquid, or the entire tool 39 together with the pad 42 can be placed under a sink faucet when it is desired to introduce water, the continued application of faucet water causing surplus water from the saturated material to enter the chamber 46 through said apertures 43.

In FIGS. 7 and 8, the jacketed member 44a is substantially like member 44 above described, except that the rear wall 48a is part of a flanged cap 59 that is removably secured to the rear of the outer annular wall 41a, said cap carrying said rear extension member 57a. This arrangement enables detergents or other selected liquids to be introduced into the annular chamber 46a directly, and provides for refillings. It also enables a hollow open-ended cylindrical cake of soap 60 to be inserted within the chamber 46a. In this arrangement it is preferred that the inside diameter of said cylindrical soap piece 60 be greater than the outside diameter of the inner wall 45a, and the outside diameter of said soap piece be less than the inside diameter of said outer wall 41a. This arrangement leaves space for the water within the chamber 46a to engage both the inner and outer surfaces of the soap when it is operatively disposed over said inner annular wall 45a, thereby more rapidly to produce a soap solution. Furthermore, the operative rotation of member 44a will cause the eccentrically mounted cylindrical soap piece 60 to act as an eccentric pump rotor or impeller continuously exerting a sweeping force in the direction of rotation against the liquid in advance thereof, thereby accelerating the operative discharge of the liquid through said apertures 43a. It is within the contemplation of this invention not to limit member 60 to a piece of soap, since a similar member made of other material and operatively mounted on annular wall 45a can serve the sole purpose of an impeller.

In the above description the working means on the outer annular wall of the tool member has been referred to as a scouring pad member only by way of example, it being understood that other forms of working means, both as separable components or as integral portions of the outer annular wall of the tool member, may be employed within the contemplation of this invention.

I claim:

1. A rotary device with coacting liquid dispensing means, comprising a casing adapted for manual grasping,

rotatable means supported by said casing and a tool member connected to said rotatable means, said tool member having an outer annular wall and a jacketed portion supporting said wall, said annular wall having working means thereon, said jacketed portion having an internal annular jacket spaced from the axis of said rotatable means and adapted to receive a selected liquid therein, and apertured portions communicating between said jacket and said outer annular wall of said tool, whereby upon an operative rotation of said tool liquid contained within said annular jacket will be ejected through said apertured portions into engagement with said working means, said working means comprising a pad member of porous, abrasive material detachably mounted over said outer annular wall, said apertured portions being disposed within said outer annular wall, whereby liquid operatively ejected through said apertured portions will be absorbed by said pad member, said tool member having end walls at the opposite ends of said outer annular wall, said end walls and said annular wall enclosing said annular jacket, said pad member having oppositely disposed end extensions detachably secured to said end walls.

2. In a rotary device with coating liquid dispensing means, the combination according to claim 1, said end walls having respective forwardly and rearwardly protruding portions, and front and rear retaining discs operatively supported by said respective protruding portions, said discs having peripheral gripping edges in frictional engagement with the said respective end extensions of said pad member.

3. In a rotary device with coating liquid dispensing means, the combination according to claim 1, said tool member and its said pad member being made of flexible material adapted to be deformed under pressure operatively applied against said pad member.

4. In a rotary device with coating liquid dispensing means, the combination according to claim 1, one of said walls being detachably secured to said outer annular wall, whereby access can be had to said internal jacket.

5. A rotary device with coating liquid dispensing means, comprising a casing adapted for manual grasping, rotatable means supported by said casing and a tool member connected to said rotatable means, said tool member having an outer annular wall and a jacketed portion supporting said wall, said annular wall having working means thereon, said jacketed portion having an internal annular jacket spaced from the axis of said rotatable means and adapted to receive a selected liquid therein, and apertured portions communicating between said jacket and said outer annular wall of said tool, whereby upon an operative rotation of said tool liquid contained within said annular jacket will be ejected through said apertured portions into engagement with said working means, said tool member having an inner annular wall concentric with said outer annular wall, both of said walls defining therebetween said annular jacket, said inner annular wall defining a central chamber, said rotatable means having a mandrel extending forwardly from said casing into said central chamber, said inner annular wall and said mandrel being in detachable engagement, said rotatable means also having a spindle with a forwardly disposed driving head and spring means protruding outwardly from said head, said mandrel being hollow and open-ended at the rear and proportioned to accommodate therein said driving head, the rear of said mandrel having recessed portions for detachable engagement with said spring means.

6. In a rotary device with coating liquid dispensing means, the combination according to claim 5, said driving head being hollow, said spring means being supportably positioned within the body of said driving head, said head having apertured portions through which the protruding portion of said spring means extend, the forward portion of said mandrel having spring means supportably positioned within the body of said mandrel, said inner annular wall of said tool member having apertured por-

tions in detachable engagement with said latter spring means.

7. A rotary device with coating liquid dispensing means, comprising a casing adapted for manual grasping, rotatable means supported by said casing and a tool member connected to said rotatable means, said tool member having an outer annular wall and a jacketed portion supporting said wall, said annular wall having working means thereon, said jacketed portion having an internal annular jacket spaced from the axis of said rotatable means and adapted to receive a selected liquid therein, and apertured portions communicating between said jacket and said outer annular wall of said tool, whereby upon an operative rotation of said tool liquid contained within said annular jacket will be ejected through said apertured portions into engagement with said working means, said tool member having an inner annular wall concentric with said outer annular wall, both of said walls defining therebetween said annular jacket, said inner annular wall defining a central chamber, said rotatable means having a mandrel extending forwardly from said casing into said central chamber, said inner annular wall and said mandrel being in detachable engagement, the forward portion of said mandrel having spring means protruding outwardly therefrom, said inner annular wall having recessed means in detachable engagement with said spring means.

8. A rotary device with coating liquid dispensing means, comprising a casing adapted for manual grasping, rotatable means supported by said casing and a tool member connected to said rotatable means, said tool member having an outer annular wall and a jacketed portion supporting said wall, said annular wall having working means thereon, said jacketed portion having an internal annular jacket spaced from the axis of said rotatable means and adapted to receive a selected liquid therein, and apertured portions communicating between said jacket and said outer annular wall of said tool, whereby upon an operative rotation of said tool liquid contained within said annular jacket will be ejected through said apertured portions into engagement with said working means, said tool member having an inner annular wall spaced from said outer annular wall, both of said walls defining therebetween said annular jacket, said apertured portions being disposed within said outer annular wall, and an impeller member within said jacket and mounted on said inner annular wall.

9. In a rotary device with coating liquid dispensing means, the combination according to claim 8, said impeller member being of open-ended cylindrical configuration with an outside diameter less than the inside diameter of said outer annular wall and an inside diameter greater than the outside diameter of said inner annular wall, whereby said impeller member will operatively revolve about said inner annular wall during the operative rotation of said tool member.

10. In a rotary device with coating liquid dispensing means, the combination according to claim 9, said impeller member being made of soap, whereby liquid operatively disposed within said jacket will be engageable with the inner and outer surfaces of said cylindrical soap piece.

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