

- [54] **POWER AERATED DOUCHE**
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415/116
- [51] Int. Cl. .... **A61m 1/00**
- [58] Field of Search ..... 128/230, 229, 66,  
128/251, 65, 67, 62; 251/4, 5; 415/116;  
239/303-308, 124, 127; 32/33

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[57] **ABSTRACT**

This specification discloses an electrically driven feminine hygiene appliance including a cover which also functions as a reservoir for a quantity of douching liquid, pumping apparatus for pressurizing air and the douching liquid, an electric motor for driving the pumping apparatus, a tube for conducting the pressurized liquid and air to a nozzle having lateral discharge ports, and a valve controlling the passage of the air and liquid to the nozzle. The invention delivers a mixture of air and douching liquid under a desired pressure to the discharge nozzle in the form of an aerated liquid.

**5 Claims, 14 Drawing Figures**

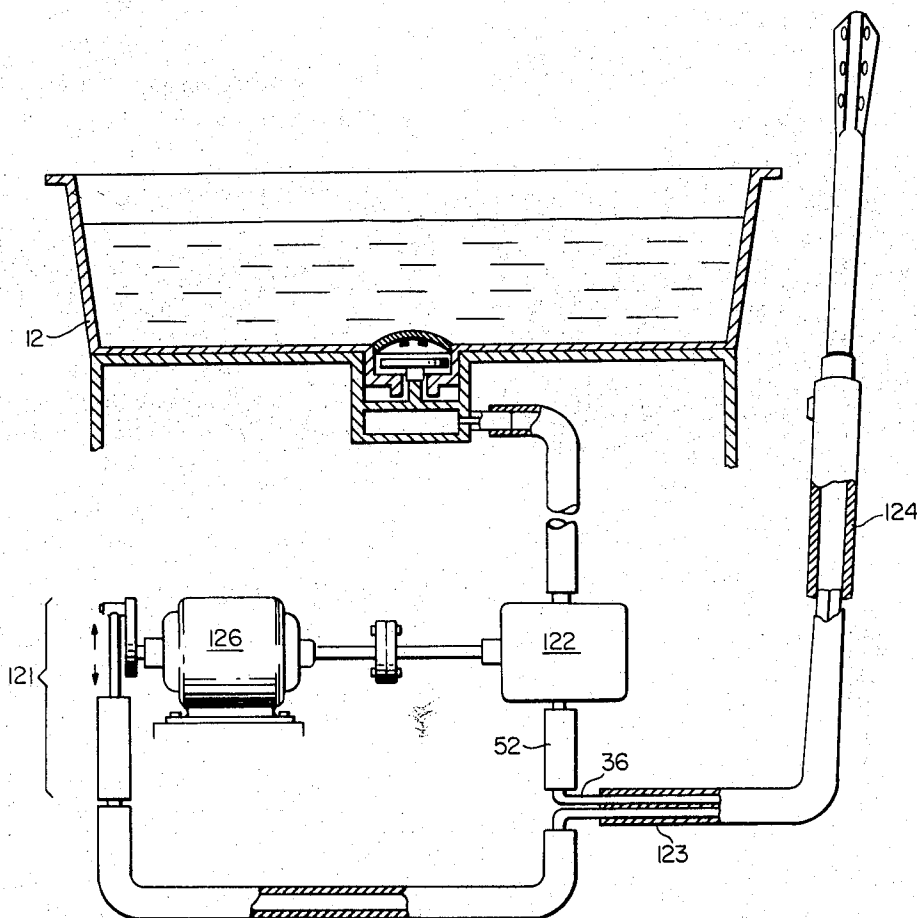


Fig. 1

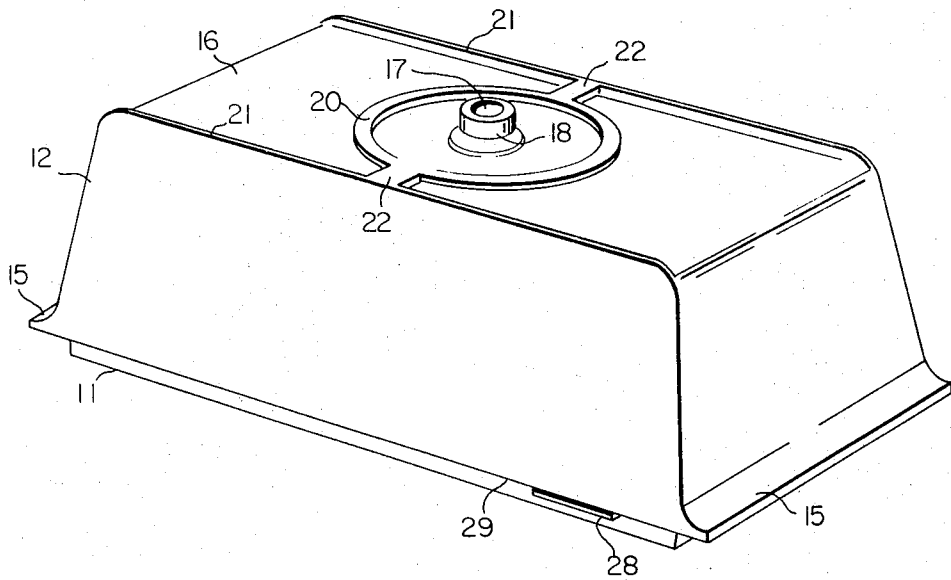
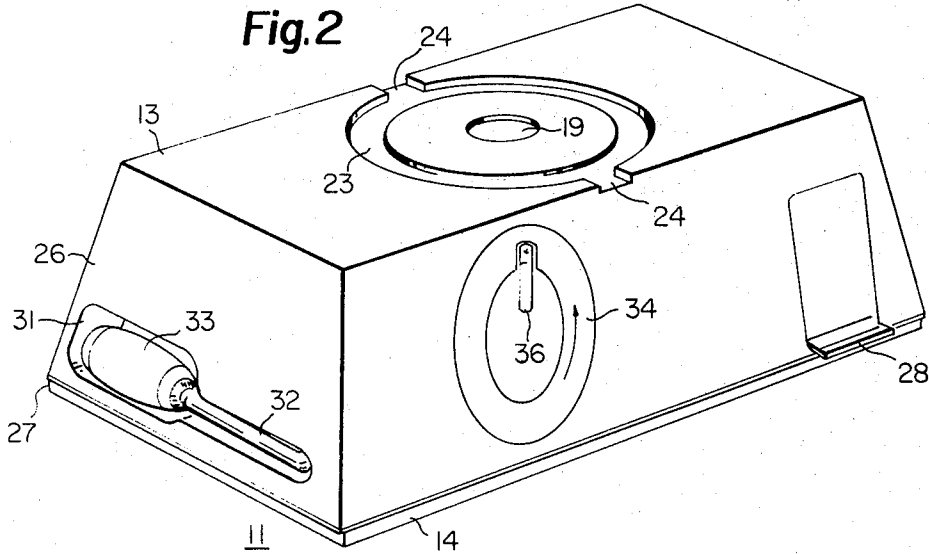


Fig. 2



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Fig. 3

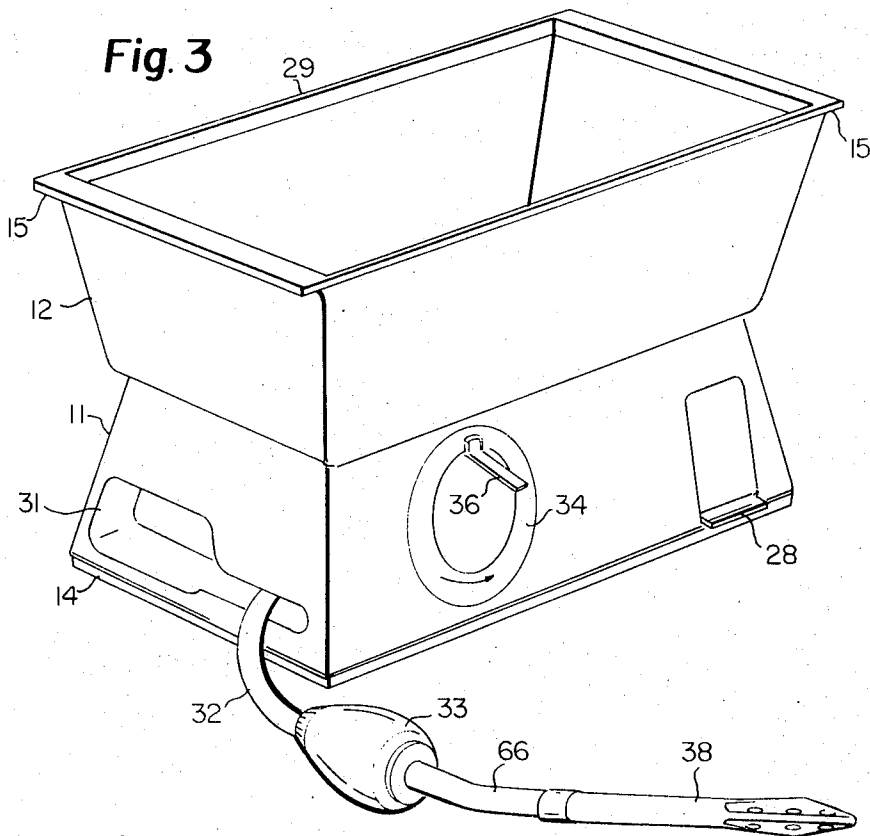
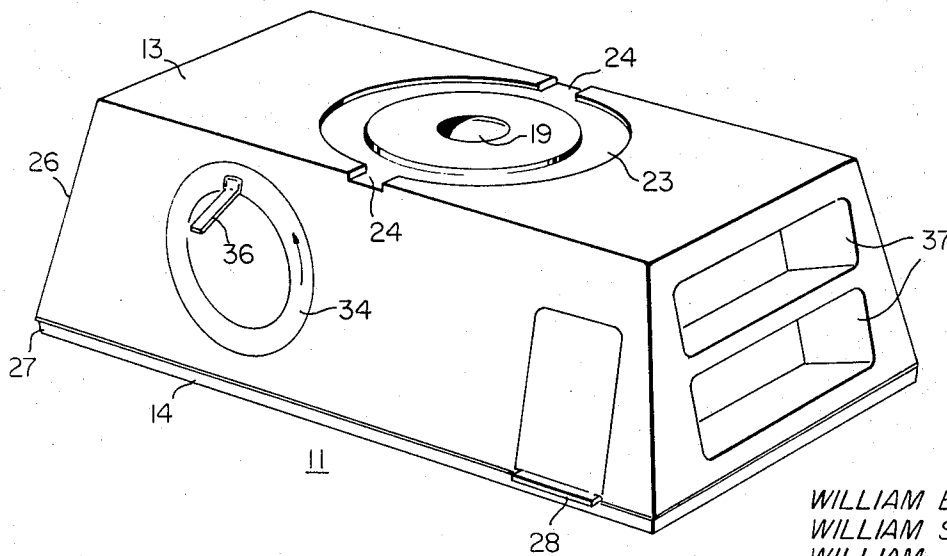


Fig. 4

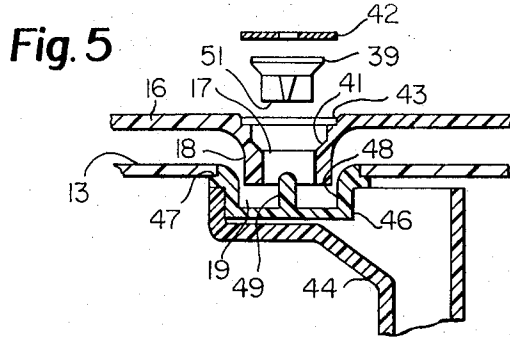


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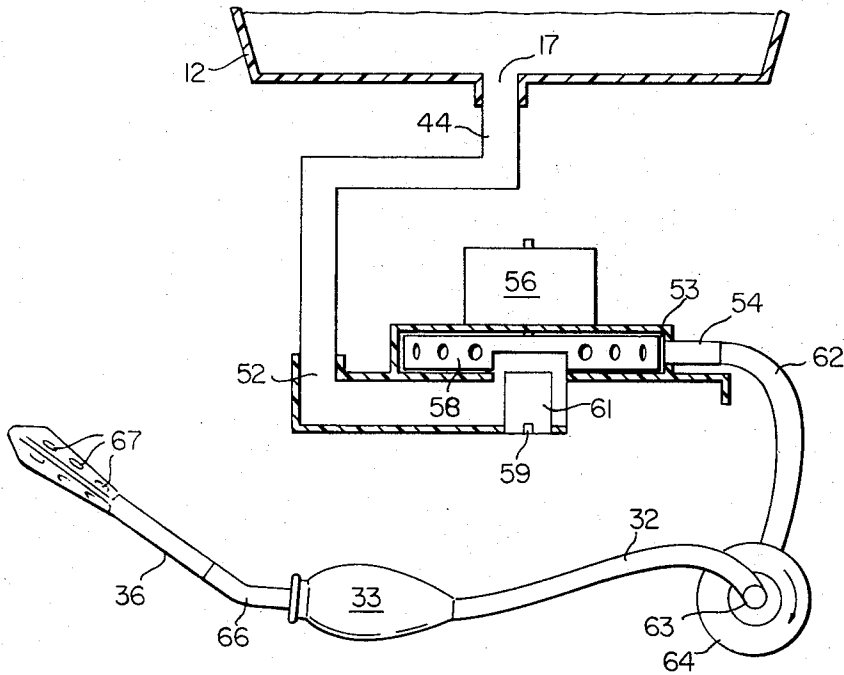
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**Fig. 6**



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Fig. 7

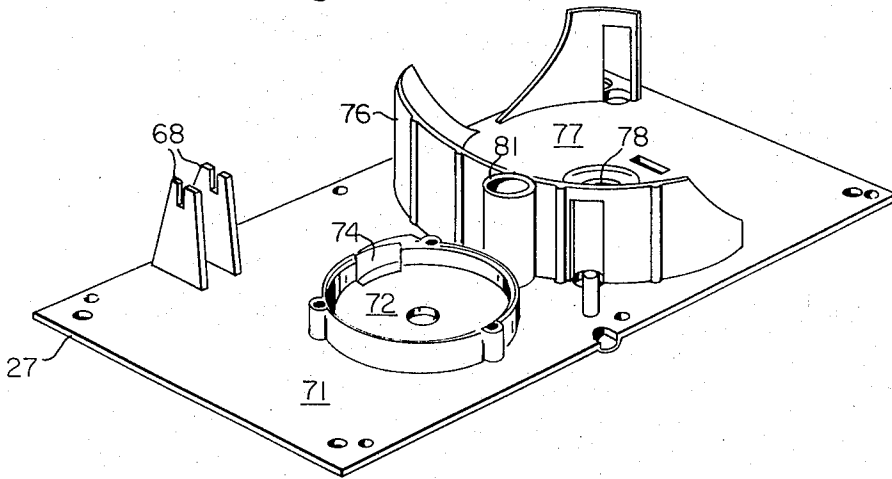
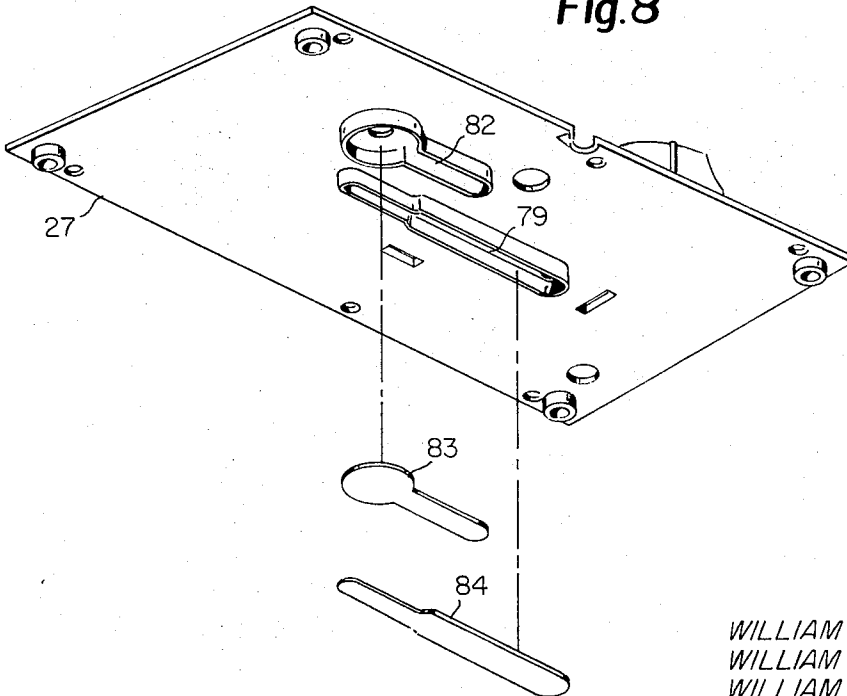


Fig. 8



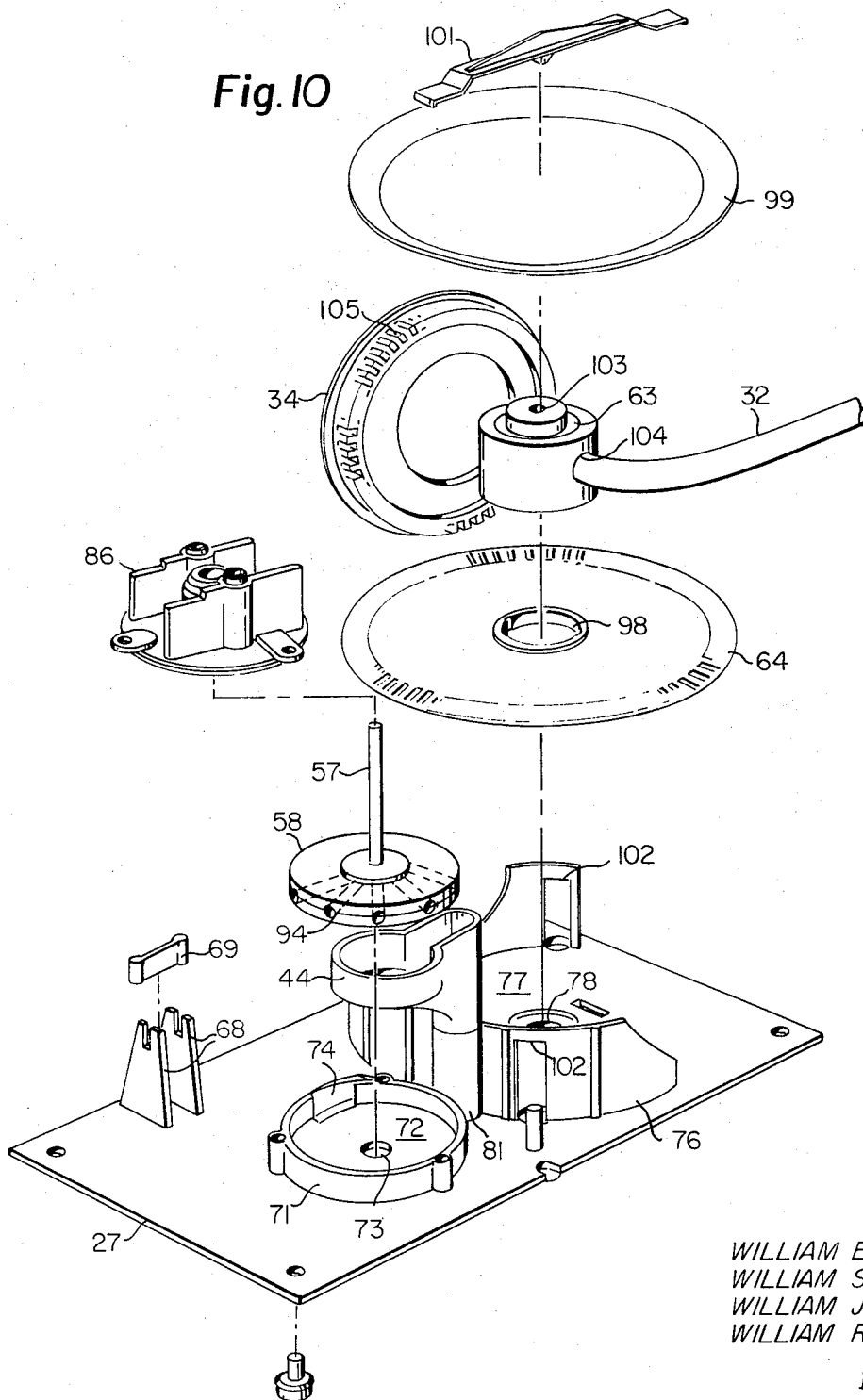
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Fig. 10



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Fig. 9

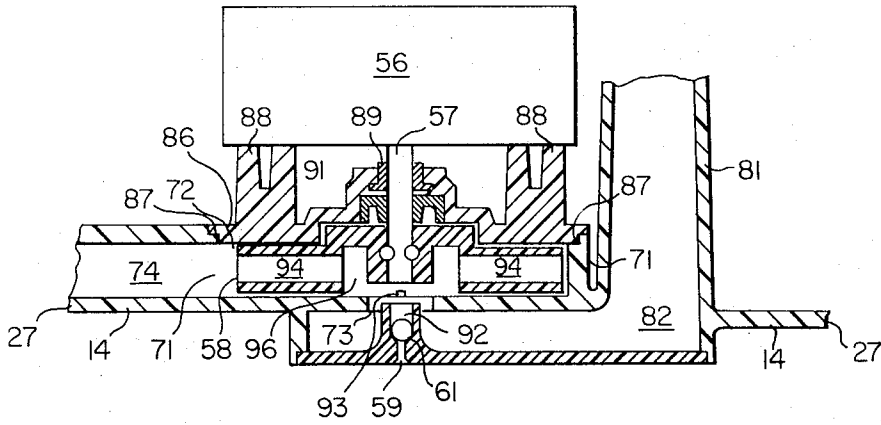


Fig. 11

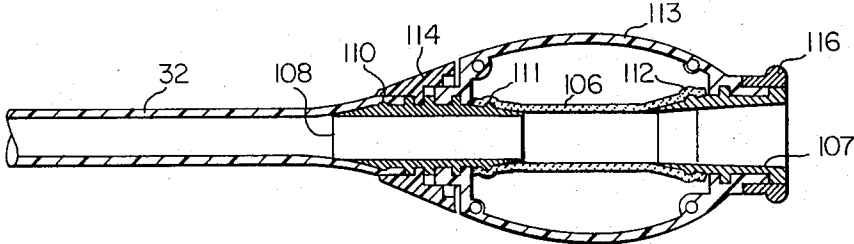
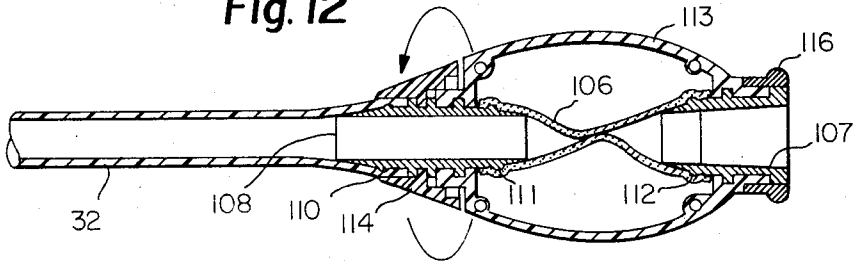


Fig. 12



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Fig. 13

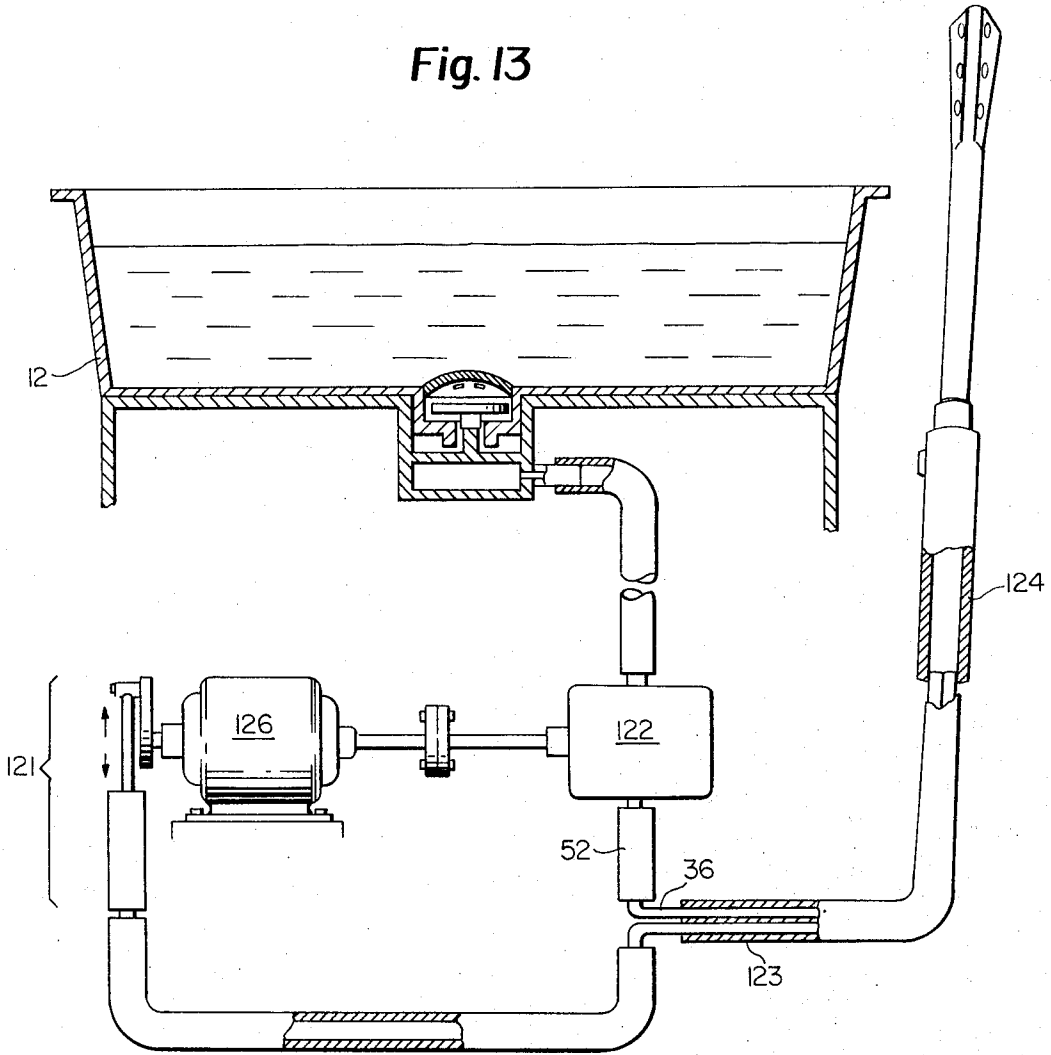
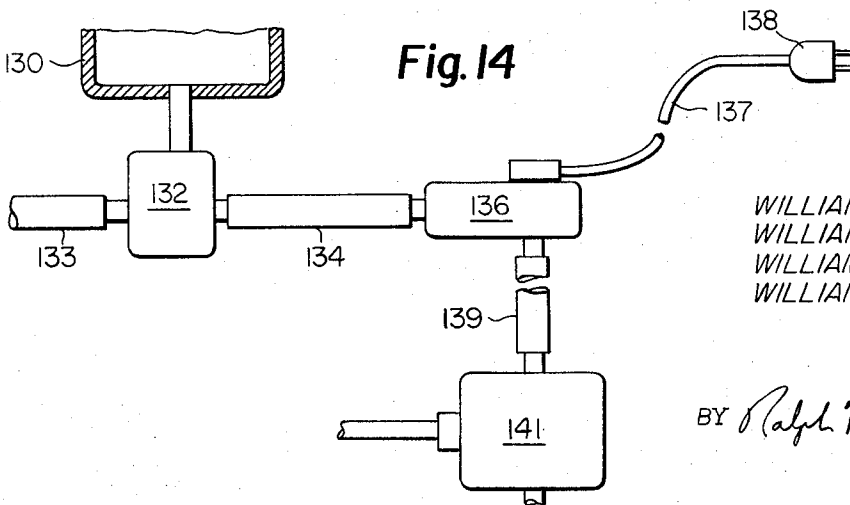


Fig. 14



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## POWER AERATED DOUCHE

This application is a continuation in part of application Ser. No. 132,769, filed Apr. 9, 1971.

## BACKGROUND OF THE INVENTION

At the present time, douches are widely used which deliver a stream of water or douching solution under pressure to a discharge nozzle that is inserted in the vagina. As a general rule, the pressure is produced by gravity acting on a douche solution in a reservoir suspended at a required height in the bathroom. This practice is objectionable for the following basic reasons:

In the first place, the storage of the equipment when not in use is awkward and inconvenient. This problem is ordinarily solved by hanging the apparatus, which usually includes a rubber water bag with a hose attached, in a position where it may be seen. As the equipment is generally unsightly, storage in this manner is not entirely satisfactory. The inconvenience of storing the apparatus may actually discourage many from enjoying the benefits of douching.

Another undesirable factor is the inconvenience attending the use of the conventional douching equipment. In many instances, there is no suitable point from which to hang the reservoir in convenient relation to a toilet bowl, tub or shower and difficulty is encountered in controlling the flow of douching liquid out of the discharge nozzle. Moreover, the pressure generated by gravity decreases as the liquid level drops in the reservoir, so that the optimum pressure for douching is not maintained throughout the process.

Many of the nozzles now used eject a stream of the douching liquid out of the end of the nozzle. Such action may have a deleterious effect on the tissues of the vagina, or may result in matter being driven into the cervix or Fallopian tubes with undesirable results. This risk is greater where the nozzle delivers a stream of ordinary liquid under pressure.

The present invention is founded on the belief that a gentler, safer and more effective douche is provided by an aerated liquid which is an intimate mixture of liquid with air in the form of many small bubbles. In addition, the mixture is discharged through lateral ports in the nozzle to reduce or eliminate the possibility of forcing material into the cervix. While it has been proposed in the prior art to eject the solution in the form of a spray, the latter will not at the same time provide the same gentle effect and a thorough cleansing and laving action.

## OBJECTS OF THE INVENTION

The invention has the following objects:

1. To provide a douch appliance that when not in use may be stored in a compact manner presenting an attractive appearance.

2. To provide a douche appliance including a cover, which in another position, functions as a reservoir for the douche solution.

3. To provide a douche appliance which delivers an aerated liquid under pressure to a discharge nozzle.

Various other and more detailed objects and advantages of the invention are achieved in a practical embodiment of the invention and will become apparent from the following description of the invention.

## SUMMARY OF THE INVENTION

The invention is embodied in an illustrative douche appliance comprising a base which houses a motor and motor driven apparatus for pumping air and a douching liquid, and means for storing a hose, valve handle and nozzle. A cover which fits over the base may be inverted in which position it acts as a reservoir for the douche liquid. The bottom of the reservoir carries a valve which is opened when the reservoir is inverted and placed on the top of the base. This valve when open, communicates with a conduit leading to the pumping apparatus. Conduits are provided to conduct air and water under pressure from the pumping apparatus to a discharge nozzle which is provided with a control valve. The air and liquid are discharged from the nozzle in the form of an aerated solution which provides a gentle, effective and comfortable douching action.

For a full and complete understanding of the invention reference may be had to the following more detailed description and the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the preferred embodiment of the invention in its compact and covered aspect of nonuse;

FIG. 2 is a perspective view of the preferred embodiment with the cover removed to reveal the base portion with recess for storage of a flexible hose;

FIG. 3 is a perspective view of the preferred embodiment with the cover inverted and in position to function as a reservoir for a douching liquid;

FIG. 4 is a perspective view of the base portion of the preferred embodiment turned to reveal storage spaces for discharge nozzles or the like in an end portion thereof;

FIG. 5 is a partially exploded cross-section view of fluid passage connecting the reservoir and the base portion of the preferred embodiment in their operating position;

FIG. 6 is a functional schematic diagram depicting the interrelation of the various parts of the preferred embodiment;

FIG. 7 is a perspective top view of a bottom portion of the base unit of the preferred embodiment;

FIG. 8 is a partially exploded perspective bottom view of the portion of the base unit depicted in FIG. 7;

FIG. 9 is a cross-sectional view of a pump assembly included in the base unit of the preferred embodiment;

FIG. 10 is an exploded top perspective view of a portion of the base unit of the preferred embodiment;

FIGS. 11 and 12 are cross-sectional views of a flow control valve and handle included in the preferred embodiment;

FIG. 13 is a diagrammatic view of a variation of the invention in which air and liquid are pressurized and conducted separately to a mixing chamber associated with the flow control valve;

FIG. 14 is a diagrammatic view of a modification of the invention.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

FIGS. 1 through 4 depict various external features of the preferred form of a power aerated douche embodying the invention and comprising a base unit 11 and a

cover 12 which when inverted functions as a liquid reservoir in the manner illustrated in FIG. 3. Base 11 is rectangular in its horizontal cross-section, with its top surface 13 being smaller than its bottom surface 14. The side surface of base 11 are thus trapezoidal and the sides slope inward from the bottom to the top. The inside walls of cover or reservoir 12 slope outward from the bottom to the opening at the top in a manner complementary to the sides of base 11, so that the cover 12 may be easily placed over the base 11 when appliance is not in use. Outwardly projecting handles 15 are provided at the ends of reservoir 12 to afford convenient places to grip the part when it is to be lifted from its position covering base 11 in order to use the appliance. Handles 15 also enable the user to firmly hold the reservoir when it contains liquid and might otherwise be rather awkward due to the weight or sloshing of the contents.

The bottom of reservoir 12 is provided with an outlet port 17 which extends outwardly of the surface 16 in the form of a short hollow cylindrical conduit 18 which is adapted to mate with a downspout opening 19 in the top of base 11 to form a liquid tight seal in the manner more fully described below with reference to FIG. 5. In order to aid the user of the appliance to position the reservoir 12 full of liquid easily and accurately over downspout opening 19, the bottom surface 16 of reservoir 12 is provided with a system of ribs to act as locators and also to strengthen the reservoir. In the preferred embodiment, the locators include a circular rib 20 centered about the outlet conduit 18, a pair of longitudinal ribs 21 at the edges of bottom surface 16, and a pair of transverse ribs 22 extending between circular rib 20 and longitudinal ribs 21 along a line passing through the center outlet port 17. The ribs 20 and 22 are adapted to mate with a set of complementary channels 23 and 24 formed in the top surface 13 of base 11 while longitudinal ribs 21 are spaced to fit over the edges of surface 13. The combination of ribs and channels allows reservoir 12 to drop into its operating position on base 11 when the two portions of the appliance are rotationally and translationally oriented in the manner required.

The base 11, which is depicted in two different views in FIGS. 2 and 4, comprises a housing formed by an upper section 26 having an exterior form generally complementary to the inside of reservoir 12 and a bottom section 27. A more detailed view of bottom section 27 may be had by referring to FIGS. 7, 8 and 10. Base 11 houses apparatus for pressurizing air and a liquid to be aerated, together with means for storing a length of flexible hose or tubing in a coiled condition, and the valves and conduits required to conduct air, liquid and aerated liquid from one part to another of the device. In the preferred embodiment, the pressurizing apparatus is driven by an electric motor supplied with power controlled by a switch operated by a lever 28 which projects outwardly of the housing near the bottom of base 11. Lever 28 is placed so that it will be depressed by the edge 29 of reservoir 12, when reservoir 12 is inverted and placed over base 11 to cover the appliance when it is not in use. Thus, if the user forgets to turn off the appliance prior to returning it to its aspect of non-use, the act of replacing reservoir 12 in position as a cover will cause the power to be shut off.

FIGS. 2 and 3 show one end of the housing of base 11 having a slot or opening 31 through which a flexible

tube 32 may be withdrawn from and retracted to a storage space within. One end of slot 32 is enlarged with respect to the other to permit storage of a bulbous valve-handle 33 attached to the free end of hose 32. The hose storage apparatus of the preferred embodiment comprises a rotatable reel having a hub to which the other end of hose 32 is attached. The reel mechanism is illustrated in and described below with reference to FIG. 10. The housing of base 11 carries an exterior rotatable dial 34 which, when turned, causes the interior reel to turn and translate its rotational movement into an axial movement of tube 32 into or out of its storage place. A retractable handle 36 is provided which the user may grasp to turn or crank the dial 34. Handle 36 is preferably spring loaded to retract when not in use so that it will not interfere with the placement of reservoir 12 in its inverted cover position. FIG. 4 shows the housing of base 11 turned to reveal two box-like openings 37 which are provided for convenient storage of discharge nozzle 38 (See FIG. 3) not in use.

FIG. 5 shows a detailed partially exploded cross-sectional view of the outlet port 17 of reservoir 12 and downspout opening 19 of base 11 which are positioned together when the reservoir is in its operating position on top of base 11 to form a passage for liquid to flow from the reservoir into the liquid conduits inside the housing of base 11. Outlet port 17 includes a check valve 39 which seals against valve seal 41 when reservoir 12 contains a supply of liquid, as when the user is carrying the reservoir from a sink to the location of base 11. Valve 39 is prevented from dropping out of port 17 when reservoir 12 is inverted, by a valve retainer 42 which is fastened in a retainer seat 43 in the bottom 16. Retainer 42 may be a cross-shaped member as shown, or may be otherwise adapted to prevent valve 39 from coming out of its place while presenting a minimal obstruction to the flow of liquid through port 17. Retainer 42 also serves the useful function of a strainer to prevent entry into the connecting liquid conduits of foreign objects which may be present in the reservoir 12.

Immediately underneath downspout opening 19 in top surface 13 of base 11 is a downspout 44 adapted to conduct liquid from opening 19 to a connecting conduit which runs to the liquid pumping apparatus to be described subsequently. A perspective view of downspout 44 is included in FIG. 10. Downspout 44 includes a downspout cover 46 having a seat 47 adapted to engage and support the edge of surface 13 surrounding opening 19. A portion of downspout cover 46 forms a seal surface 48 generally complementary to the outer surface of outlet conduit 18 of reservoir 12. Surface 48 is slightly tapered inwardly and downwardly so as to engage the sides of conduit 18, forming a liquid-tight seal when reservoir 12 is properly positioned for operation of the appliance. Downspout cover 46 also includes an upwardly projecting member 49 adapted to engage a downwardly projecting portion 51 of valve 39 to raise the valve and open outlet port 17 when the reservoir 12 is positioned for operation. Downwardly projecting portion 51 of valve 39 may also serve to guide the movement of valve 39 in port 17 along the desired line. The portion of downspout cover 46 surrounding member 49 includes openings (not shown) to permit the flow of liquid through cover 46 and into downspout 44.

The functional schematic diagram of FIG. 6 shows the reservoir 12 with outlet port 17 connecting to downspout 44 which communicates with a pump inlet channel 52 for conducting liquid flowing from the reservoir 12 to the pump chamber 53. The pump illustrated is of the centrifugal type and is adapted to mix air and liquid in the chamber 53 so that an aerated liquid is delivered at the pump outlet 54. An electric motor 56 turns a shaft 57 on which is mounted the pump impeller 58. Air to be mixed with the liquid in pump chamber 53 is introduced into the central region of the chamber through an air inlet 59 which includes a check valve 61 for preventing liquid from flowing out of the chamber 53. The aerated liquid is expelled from chamber 53 through an outlet conduit 62 which communicates with a hollow rotatable hub 63 of a hose reel 64. Hose 32 communicates with the hollow interior of hub 63 to conduct the aerated liquid to valve handle 33 which includes a flow control valve. An adapter 66 connects valve handle 33 to discharge nozzle 38 which has a plurality of lateral discharge ports 67.

For economy of manufacture as well as for ruggedness of the appliance, a number of elements of the hose storage apparatus, pump means and related liquid conduits are integrated with the bottom section 27 of base 11, which is shown in top and bottom perspective views in FIGS. 7 and 8, respectively. The top side of bottom section 27 which, like most other parts of the structure, may be of a molded plastic such as "Cyclocac," includes a pair of spaced apart upright members 68 adapted to hold the body of the switch operated by exterior lever 28 shown in FIG. 2. The top edges of members 68 are notched to receive and firmly hold a switch retainer 69, shown in FIG. 10, adapted to lock the switch body in position.

Bottom section 27 also includes a circular wall 71 which defines the sides of a chamber 72 of a centrifugal type pump for combining and pressurizing air and liquid to produce a flow of aerated liquid in accordance with the principles of the invention. A pump inlet in the form of a central circular opening 72 in the bottom of chamber 72 is provided, through which air and liquid are introduced into the pump in the manner described more fully below in connection with FIG. 9. An outlet for aerated and pressurized liquid is provided by an opening 74 in wall 71 at the periphery of the chamber 72.

Bottom section 27 further includes a wall 76 enclosing the major portion of a circular base storage chamber 77 which opens toward the end of section 27 corresponding to the location of slot 31 in the upper section 26 of base 11. A hub inlet opening 78 is provided at the bottom center of storage chamber 77. Opening 78 communicates with pump outlet 74 through outlet conduit 79, shown in FIG. 8, which is integral with bottom section 27 on the underside thereof.

A vertical hollow conduit 81 formed as a further integral part of bottom section 27 is adapted at its top end to connect with the bottom of downspout 44 to form a functional continuation thereof. Conduit 81 communicates at its lower portion with pump inlet channel 52, shown in FIGS. 8 and 9, which is integrally formed with bottom section 27 on the underside thereof. Thus, liquid flows from the reservoir 12 through downspout 44, conduit 81 and inlet channel 82 to pump chamber 72 where it is mixed with air, pressurized to form an aerated liquid and expelled through outlet conduit 79 to

hub inlet opening 78 in the center of hose storage chamber 77. Pump inlet channel 82 and outlet channel 79 may conveniently be formed by molding open troughs in bottom section 27, and assembling with trough covers 83 and 84, shown exploded in FIG. 8, to form enclosed, liquid-tight passages as required.

FIG. 9 is a detailed cross-sectional view of the entire pump assembly with the pump outlet 74 rotated from its actual position for the purpose of clarity in the illustration. The pump comprises a circular chamber 72 defined by wall 71 and having a central inlet 73 in its bottom and a peripheral outlet 74 in wall 71. An impeller 58 is rotatably mounted on a shaft 57 in chamber 72. The top of the pump chamber is closed by a pump cover 86 which seals against an offset portion or seat 87 in the top edge of wall 71. Pump cover 86 includes upright portions 88 which function as motor mounts for the electric motor 56, and also carries a bearing 89 and a "U" seal 91 of "Neoprene" or the like which prevents liquid from flowing out of chamber 72 around shaft 57. Preferably, shaft 57 is of metal coated with "Teflon" or the like to act as an additional insulative barrier between the electric power supplied to the motor 56 and the liquid in the chamber 72.

Inlet trough cover 83 includes an air inlet opening 59 which communicates with a valve chamber 92 having an open top end and containing a ball valve 61 held in chamber 92 by a ball retainer 93. The open end of chamber 92 projects upwardly in the center of pump inlet opening 73 which communicates with pump chamber 72. When the appliance is in use, liquid flows downward through conduit 81, through inlet channel 82, around air valve chamber 92 through opening 73 into the pump chamber 72. At the same time, air flows into the pump chamber 72 through opening 59 and chamber 92. Air may be pulled into the pump chamber 72 by Venturi action of the liquid flowing around the upwardly projecting chamber 92 or, alternatively, the relative sizes of the inlet opening 73 and opening 59 may be adjusted so that the flow of liquid is restricted to the point where the low pressure in the center of the pump chamber 72 causes air to flow through check valve 61.

Impeller 58, which appears in perspective in FIG. 10, is of the closed type and has a plurality of radial channels 94 communicating between a central opening 96 and its outer edge. The impeller 58 may be formed of two circular molded sections fastened together by means of mating holes and prongs. Shaft 57 may have a flattened end portion 97 molded into the top section of impeller 58.

The hose storage apparatus in the preferred embodiment may be understood from FIG. 10 which depicts a hose storage reel comprising a flat circular gear plate 64 having a central opening 98 adapted to fit in non-rotatable relation around reel hub 63. Hub 63, when assembled, extends through opening 98, in gear plate 64 and down into hub inlet hole 78 in bottom section 27 of base 11. A liquid-tight rotatable joint is formed between the bottom of hub 63 and a recessed flat surface surrounding opening 78 by a "U" cup packing seal. Thus, hub 63 may rotate with gear plate 64 while providing a liquid-tight link between hose 32 and pump outlet channel 79. The seal is maintained by pressure applied to the top of hub 63 by a reel cover 99 which is held down under tension by a flexed reel retainer 101 the ends of which are inserted into retainer slots 102 in

wall 76. The axial alignment of hub 63 and cover 99 is maintained by a small bump or detent (not shown) on the underside of cover 99 which fits into a corresponding depression 103 in the top of hub 63.

Gear plate 64 is engaged by a geared wheel 104 which is part of dial 34 shown in FIGS. 2, 3 and 4. Thus when dial 34 is turned, gear plate 64 and hub 63 are rotated to retract or recoil hose 32, as the case may be. Hose 34 is attached to hub 63 by inserting one end through hub opening 104, and then inserting into the end of the hose, from inside the hub, a hollow conically flared hose keeper (not shown) to wedge the wall of hose 32 against the edge of opening 104.

FIGS. 11 and 12 depict the flow control valve employed in the preferred embodiment, in both the open and the closed conditions. The valve comprises a short section 106 of flexible tubing, such as surgical tubing, extending between a nose piece 107 and a splice piece 108. The splice 108 is a rigid hollow piece adapted to link hose 32 with tube section 106. The end of hose 32 is forced over a tapered end of splice 108 and over an annular ridge 110 thereon. Tube section 106 is forced over the other end of the splice, which has an annular ridge 111 to assure a firm hold and good seal. The other end of tube 106 is forced over the tapered end of nose 107, which has a similar annular ridge 112. The splice 108 and the nose 107 are rotatably mounted in a two-piece handle 113 which maintains their axial alignment. Finally, a knob 114 is forced up over the portion of hose 32 on splice 108, and over the hose-end portion of the handle 113, and a retainer 116 is forced over the nozzle-end portion of handle 113. The knob 114 and retainer 116 served to hold together the two halves of handle 113. In addition, knob 114 provides a convenient place to grasp splice 108 to rotate it with respect to nose 107, thereby twisting tube section 106 as shown in FIG. 12 to close the valve.

FIG. 13 is a schematic diagram of an embodiment of the invention comprising a separate pump 121 for pressurizing air and another pump 122 for pressurizing liquid received from the reservoir 12. Air and liquid under pressure are conducted separately by a two-channel conduit 123 to a mixing chamber 124 associated with the valve handle at the end of the discharge hose. Both pumps 121 and 122 are driven by a single electric motor 126.

#### THE MODIFICATION

A somewhat modified embodiment of the invention is illustrated in FIG. 14. In this form, the use of a reservoir 12 is not required. A supply of chemicals either in liquid or comminuted solid form is shown at 130.

It is drawn by a Venturi shown at 131 to a volume and pressure control represented at 132. Water from a house main 133 is under pressure and renders Venturi 131 effective. From the volume and control station 132, the solution passes through a tube 134 to an electric heating unit 136. A cord 137 extends from the latter and has a conventional plug 138 on its free end.

From the heating unit 136, a tube 139 conducts the

heated solution to a liquid pump 171. From the latter the solution is delivered under pressure to a handle similar to the valve handle of FIGS. 11 and 12.

Although the invention is described herein with particular reference to a specific illustrative embodiment, many variations and modifications are possible and may be made by persons skilled in the art without departing from the scope and spirit of the invention as defined by the following claims.

What is claimed is:

1. Apparatus for providing an aerated discharge of a liquid such as water, a douching preparation, or the like, especially for cleansing vaginal and surrounding areas by impingement thereagainst, comprising a base assembly and a cover assembly;

the base assembly comprising in combination, a housing containing a centrifugal pump for producing a flow of aerated liquid, the pump having a substantially circular chamber with inlet means, in its central region, for air and a liquid to be aerated and an outlet for aerated liquid in its peripheral region, a flexible discharge tube communicating at one end to the pump outlet and having a liquid flow control valve at the other end and a syringe nozzle connected to the end of said flow control valve, reel means for retractably storing the discharge tube inside the housing in a coiled condition, and liquid conducting means adapted to receive liquid from a reservoir and conduct it to the pump inlet; and

the cover assembly comprising an open container adapted in a first position to function as a liquid reservoir and in a second position to function as a cover for the base assembly, and liquid outlet means for allowing liquid to flow from the reservoir in the first position to the liquid conducting means in the base assembly.

2. Apparatus as claimed in claim 1 wherein the pump further comprises a circular impeller rotatably mounted in the chamber with a central opening and a plurality of closed channels extending between the opening and the periphery of the impeller for conducting liquid and air from the region of inlet means to the peripheral region of the chamber.

3. Apparatus as claimed in claim 1 wherein the base assembly further includes at least one external niche for storing a discharge nozzle.

4. Apparatus as claimed in claim 1 wherein the base assembly further includes an external rotatable dial adapted to engage and communicate rotational motion to the reel means for retracting or extending the discharge tube.

5. Apparatus as claimed in claim 1 wherein the pump inlet means comprises a central air inlet including a fluid flow actuatable valve adapted to allow air to flow into the pump chamber and to prevent liquid from out of the chamber through the air inlet, and an annular liquid inlet surrounding the air inlet whereby air is drawn into the chamber through the air inlet when liquid flows thereinto through the liquid inlet.

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