

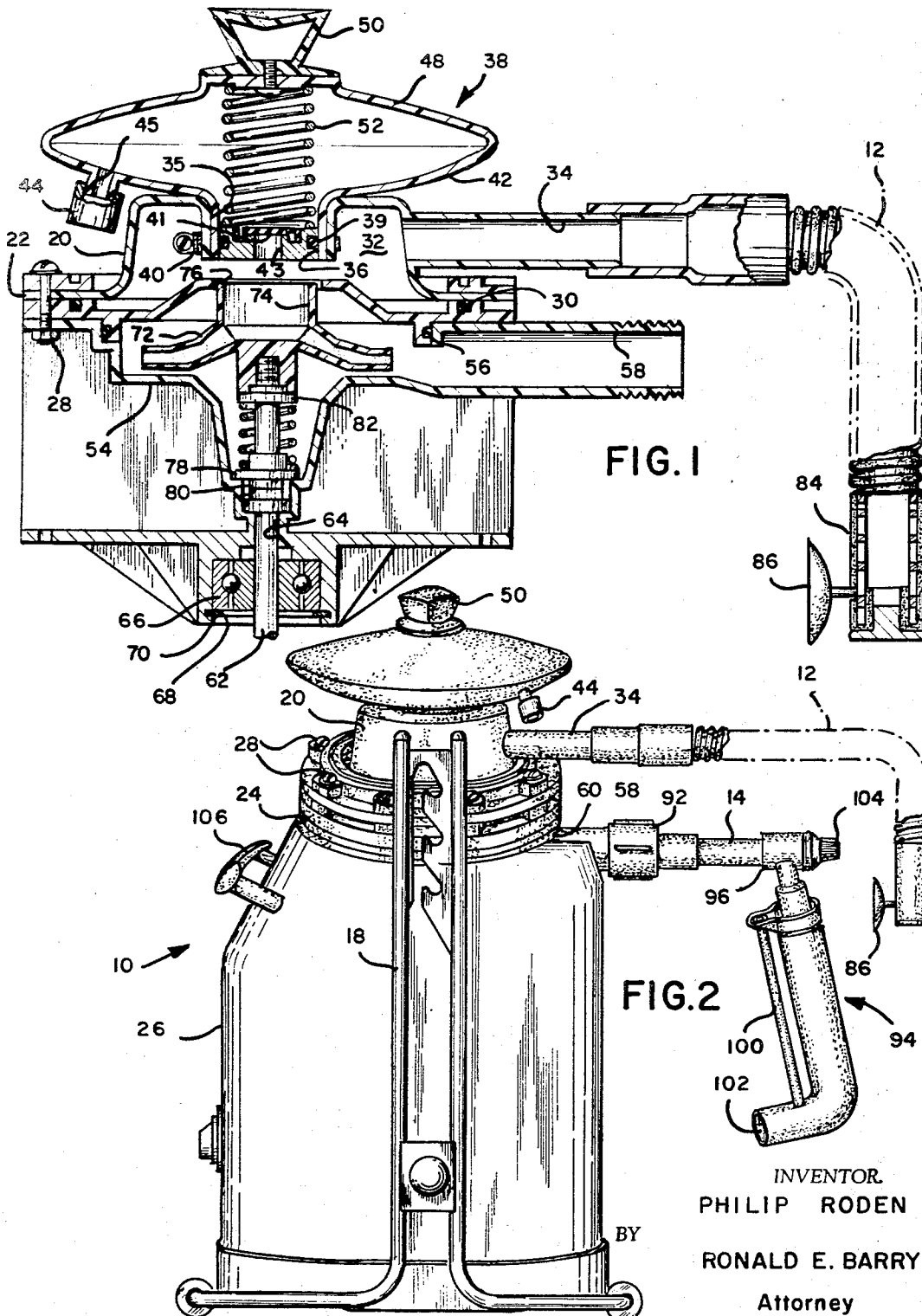
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HYDROTHERAPY APPARATUS

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HYDROTHERAPY APPARATUS

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This invention relates to portable water-circulating devices which are used for therapeutic treatment of the anatomy.

This application is an improvement on my co-pending application Serial No. 315,186, filed October 10, 1963 and now Patent No. 3,286,712.

In my co-pending application, a hydrotherapeutic device was disclosed which was a portable, self-supporting unit that could be positioned in a vertical relation adjacent to a body of water such as a bathtub. This device proved satisfactory in operation in that it provided the flexibility desired for a unit of this type since it could be positioned at any convenient location adjacent to the bathtub. This device had one objectionable feature, i.e., the necessary inconvenience of removing the inlet hose and pouring water into the chamber in order to prime the apparatus prior to using.

One of the primary objects of this invention is to provide an improved hydrotherapy unit that can be quickly and easily set up by the user at any desired position adjacent the bathtub.

Another object of this invention is to provide a home hydrotherapy unit that can be quickly and easily primed, drained and cleaned.

Another object of this invention is to provide a device that can be easily assembled and disassembled by an unskilled individual.

Another object of this invention is to provide a device that can be easily primed from the top without any possibility of wetting the electrical components of the device.

A further object of this invention is to provide a home hydrotherapy device that is free of electrical hazards.

Still another object of this invention is to provide a home hydrotherapy device that can be easily handled and stored when not in use.

A still further object of this invention is to provide a low-cost, light weight, home hydrotherapy unit that can be quickly and easily moved to any position in a tub and adjusted to direct a flow of aerated water at any height or angle.

These objects are accomplished by using a vertical type hydrotherapy unit which has a housing made out of an electrically non-conductive material that is light in weight and of sufficient strength to be a self-supporting unit. A cover is secured to the top of the housing to form a water reservoir above the pump. The top of the cover contains a bellows type priming device that is used to pump water from the tub to the unit by simply applying a slight up and down force to the bellows. The driver motor for the pump is mounted within the housing so that it is protected from any water that might be splashed from the tub onto the unit. All of the parts that contact water are electrically non-conductive thereby eliminating the electrical hazard normally present in electrical devices used in water. Water is drawn from and discharged to the tub through flexible hoses with an aspirator provided on the end of the discharge hose to aerate the water as it leaves the hose. One significant advantage of this arrangement is that the aerated water can be applied directly on the part of the anatomy that requires treatment. This will be more readily appreciated when it is realized that almost all units presently on the market are stationary and only develop a whirlpool effect in the tub. The direct application of aerated water to the anatomy has proven more

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beneficial than the whirlpool devices. Other objects and advantages will become more readily apparent from the following detailed specification when read in connection with the accompanying drawings, in which:

FIG. 1 is a side view in section showing the vertical relation of the pump motor and bellows.

FIG. 2 is a perspective view of the entire unit.

Referring more specifically to the drawings, a hydrotherapy unit 10 is shown having an inlet hose 12 and a discharge hose 14 both of which can be placed into a tub or other body of water. The hoses are both made of an electrically non-conductive material such as spirally wound, flexible polyethylene plastic material. Suction cup 86 is provided on the end of the inlet hose so that it may be attached at any location within the tub. The outlet hose may be attached to the tub by suction cups or it may be mounted on a rigid tube with its lower end extending into the tub. Since the only parts of the unit that extend into the tub are the ends of the inlet and discharge hoses, the versatility of the unit is greatly enhanced due to the small tub space required for the hoses. The end of the discharge hose can be placed at any position and at any required elevation. The unit is mounted on a stand 18 that can be placed at any convenient position along the side of the tub.

The unit includes a cover 20 having a flange 22 which is secured to a flange 24 on the top of housing 26 by a number of screws 28. A rubber O-ring 30 is positioned between the flanges to seal chamber 32 formed between the cover and housing. The top of the cover includes an inlet passage 34 and is recessed at 35 to receive an inlet stem 36 of a priming device 38. A check valve assembly 37 is sealed in the inlet stem by O-ring 39 and has a flapper valve 41 positioned to allow one way air flow through passage 43. A clamping ring 40 is used to secure the priming device within the recess in the cover.

The priming device is molded as a single unit from a flexible plastic material and includes a plate shaped bottom section 42 having an exhaust stem outlet 45 in which is located a one way valve 44 to control the expulsion of air from the cover. The top section 48 of the priming device is also plate shaped, with a plastic knob 50 connected to the top to allow easy manual reciprocation of the top section thus forming a bellows. The top and bottom sections can be molded from a flexible electrically non-conductive material such as polyethylene plastic to form the bellows. A spring 52 is located between the top and bottom sections to provide an outward bias between the pieces. When the top piece is pushed down air will be expelled from outlet valve, and when released the spring will push the top section up drawing air through check valve assembly 37 and creating a vacuum in chamber 32. As the top is continually pumped up and down water will be drawn up inlet hose 12 until the chamber is filled.

A pump housing 54 is secured to the inside surface of the top of the base by any conventional means and is sealed by O-ring 56. Outlet passage 58 of the pump housing projects through an opening 60 in the side wall of the housing for discharging water from the housing. An electric motor (not shown) is secured to the pump housing with the armature shaft 62 of the motor extending into the pump housing through drive passage 64. A ball bearing 66 is secured to the shaft and is held in the drive passage by snap ring 68 which is seated in groove 70. The centrifugal impeller 72 of the pump is secured to the end of the shaft with the impeller inlet 74 extending upward into aperture 76 in the top of the pump housing. The pump housing and impeller are both molded from an electrically non-conductive material such as Delrin.

The drive passage is sealed by means of a mechanical seal formed between a rubber lined ceramic ring 78 posi-

tioned in groove 80 and a spring biased seal ring 82 positioned on the shaft. The spring biased seal is seated on the ceramic ring by screwing the centrifugal impeller onto the end of the shaft. Once the impeller has been tightly secured to the shaft, the spring seal ring will be compressed so that it bears against the ceramic ring. The seal ring will rotate with the impeller while the ceramic ring remains stationary in the pump housing. The spring bias force applied to the contacting surface of the seal ring and ceramic ring provides a mechanical seal between the two rings which prevents water from running down the armature shaft.

A filtering screen assembly 84 is connected to the inlet of the inlet hose to prevent any large objects from entering the unit. Suction cup 86 is mounted on the side of the screen assembly for securing the inlet at any position in the side of the tub. It should be apparent that due to the relative positions of the chamber 32 and the inlet base, a siphoning effect will result each time the unit is turned off by the head of water in the inlet hose. This would necessitate a priming action each time the unit is turned off which is undesirable when the unit is turned off only momentarily. The check valve assembly prevents any flow of water from chamber 32 when the unit is turned off.

The outlet hose is connected to the outlet of the pump housing by a connecting nipple 92. An aspirator assembly 94 is mounted on the end of the outlet hose and is pivoted on bracket 96 so that it can be moved to any position in the tub and has suction cups 98 secured to the assembly. The aspirator functions in the same manner and is used in the same way as in my co-pending application.

In operation the inlet end of the inlet hose 12 is secured to the side of the tub below the level of the water in the tub. The aspirator unit is then secured to the side of the tub in the area of the anatomy which is to be treated, the only limitation being that the air holes in the aspirator housing must be located above the level of the water in the tub. Knob 50 is then reciprocated to pump water into chamber 32. Once the chamber is filled the unit can be turned on. When the electric motor is switched on, the water in chamber 32 will be drawn into the pump housing and discharged into the aspirator. The water that discharges from nozzle assembly 94 will be aerated by air which is drawn through vent 100 by the venturi effect at opening 102. The rate of water flow can be adjusted by turning button 104 which is connected to butterfly valve in tube 14.

When the unit is turned off, any water remaining in the pump housing can be drained by picking up the unit with handle 106 at an angle to pour the water from the pump housing through the discharge hose. The hoses can be separated from their respective nipples, and stored separately if desired.

Although only one embodiment of the present invention has been shown and described, it should be apparent that various changes and modifications can be made therein without departing from the scope of the appended claims.

What is claimed is:

1. A portable hydrotherapy unit comprising
 - a housing,
 - a motor driven pump positioned within said housing and having an inlet and an outlet, said inlet project-

ing upward through the top of said housing and said outlet projecting outward through the side of said housing,

- a cover secured to the top of said housing and defining a chamber above said pump inlet, an inlet through said cover to said chamber,
- manually operable priming means secured to said cover for drawing a vacuum in said chamber, whereby water will be drawn through said cover inlet to said chamber.

2. A portable hydrotherapy unit according to claim 1 wherein said priming means

includes flexible plate-like top and bottom members connected at their outer peripheries to form a chamber between said members,

passage means connecting said priming chamber to the chamber in the cover,

and a one way exhaust valve connected to the priming means allowing for the discharge of air from said priming chamber on movement of said member towards each other.

3. A portable hydrotherapy unit according to claim 2 wherein said priming means includes

a spring means for biasing said members apart.

4. A portable hydrotherapy unit according to claim 3 including an inlet hose having one end connected to said cover inlet and the other end is connected to a body of water,

and an outer hose having one end connected to the pump outlet and the other end connected to the body of water.

5. A portable hydrotherapy unit comprising a housing

a pump, a motor operatively connected to said pump, said pump and motor being positioned within said housing in a vertical relation,

said pump having an inlet projecting vertically upward in said housing and an outlet projecting horizontally through the side wall of said housing,

a cover secured to the top of said housing and defining a chamber above said pump inlet, an inlet in said cover connected to a body of water, manually operable priming means secured to said cover for drawing a vacuum in said chamber,

whereby water will be drawn through said cover inlet into the said chamber in position to prime said pump upon energization of said motor.

6. A portable hydrotherapy unit according to claim 5 wherein said manually operable priming means comprises

air bellows having a one-way air outlet which exhausts to atmosphere and an inlet connected to the chamber whereby on reciprocation of said bellows air will be drawn from the chamber and discharged to atmosphere.

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