Sept. 26, 1961 S. ROSOFF 3,001,208

HYDRO-THERAPY EQUIPMENT

Filed Oct. 29, 1957 2 Sheets-Sheet 1

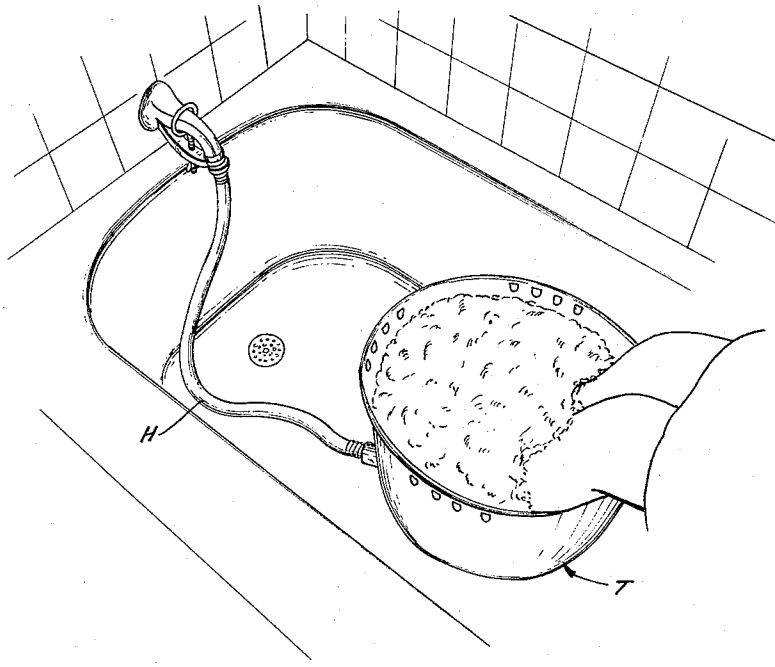


FIG. 1

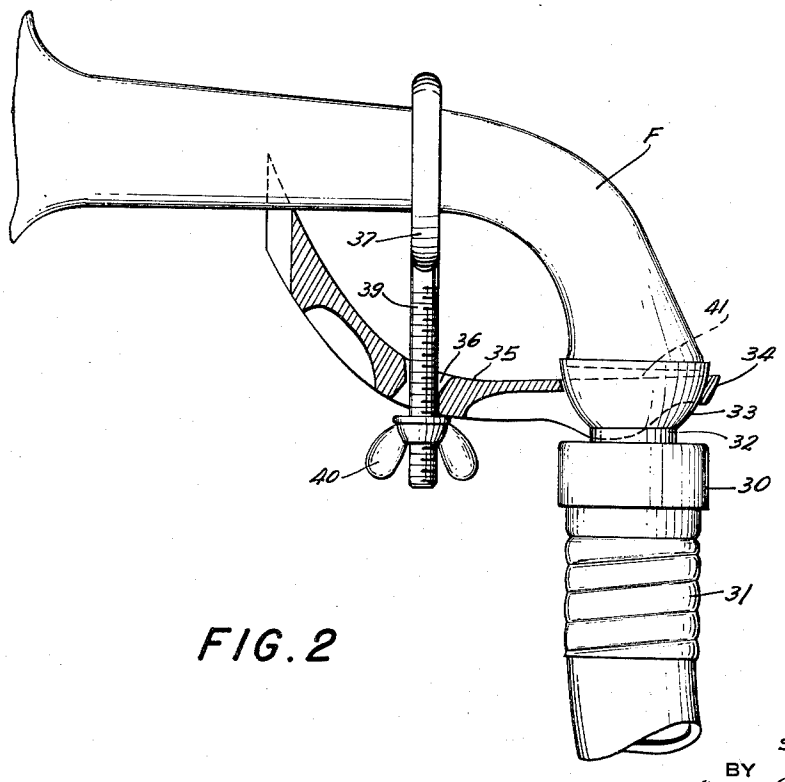


FIG. 2

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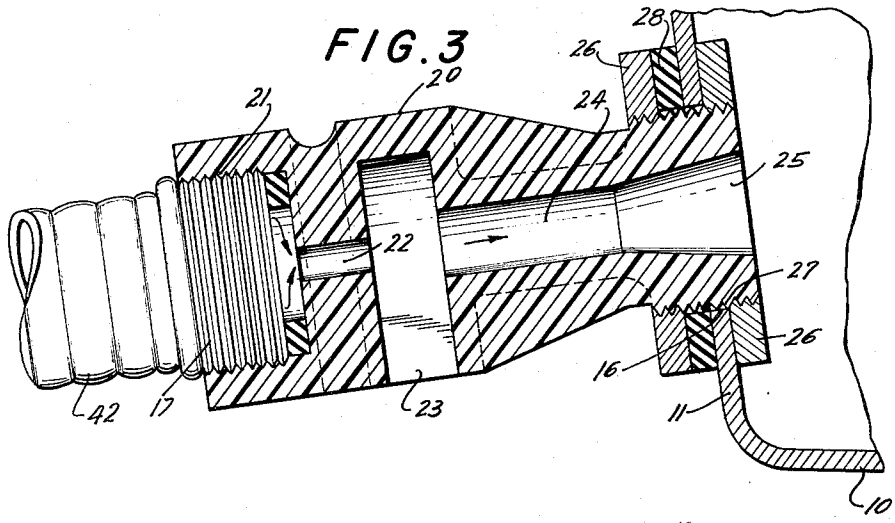
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FIG. 3



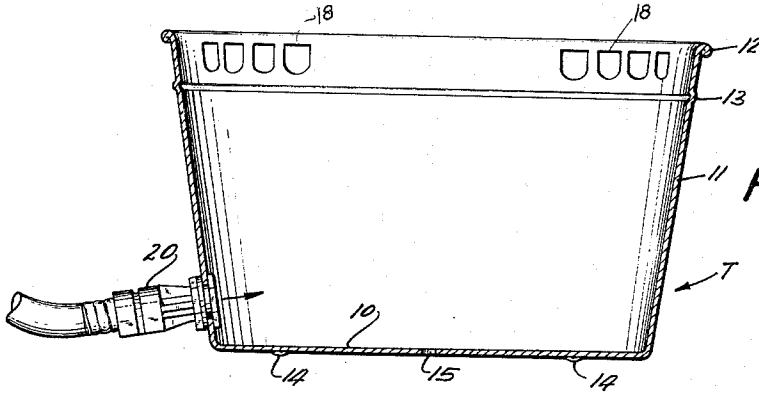


FIG. 4

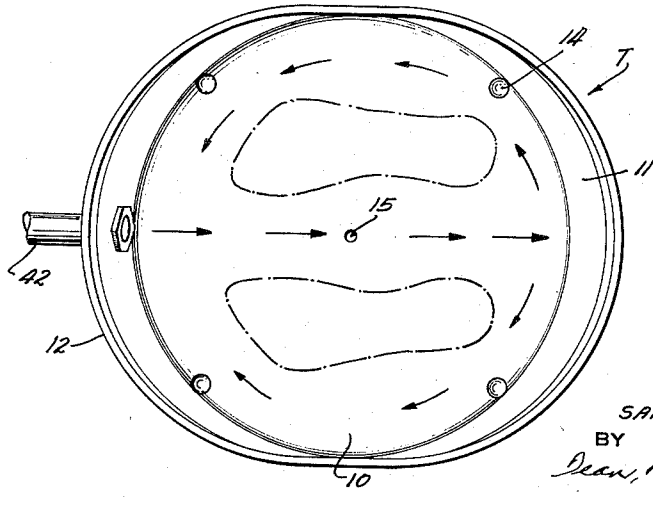


FIG. 5

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HYDRO-THERAPY EQUIPMENT

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2 Claims. (Cl. 4—182)

The present invention is concerned with hydrotherapy units, more especially adapted for treatment of the limbs or extremities in the patient's or user's home.

It is among the objects of the invention to provide a portable hydrotherapy unit of the above type which is of relatively small weight and small bulk and may be used in the ordinary bath tub or sink, which effects a thoroughly aerated hydraulic stream circulating about the legs or arms, feet or hands being treated, by mere connection with a suitable hose to the faucet of the tub or sink, with the complete avoidance of any moving parts, which requires no plumbing connection or installation or connection, but which may instantly be placed into use by resting the unit in the bath tub and connecting a rubber hose from the faucet of the bath tub to the inlet of the tank, which is thoroughly safe and substantially infallible in operation, with the omission of an electric motor, and the avoidance of the danger of electric shock or even electrocution.

This application is a continuation-in-part of my copending application Serial No. 432,352, filed May 26, 1954, and now abandoned.

In the accompanying drawings in which is shown one of various possible embodiments of the several features of the invention,

FIG. 1 is a perspective view showing the device in use,

FIG. 2 is a side elevation, partly in section, showing the inlet of the hose connected to the faucet of a bath tub,

FIG. 3 is a transverse sectional view on a larger scale showing the aerator inlet as mounted in the tank, and its connection to the supply hose,

FIG. 4 is a longitudinal cross-section of the tank, and

FIG. 5 is a plan view of the tank showing diagrammatically the mode of circulation of the water therein.

Referring now to the drawings, the unit in its preferred home use embodiment, comprises a tank T, which may be of any suitable material but is preferably of drawn sheet aluminum. The tank may have a circular floor 10 and a wall 11 rising therefrom, which preferably has a rounded rim 12 and may also have a peripheral bead 13, one to two inches below the bead for enhanced stiffness of the structure.

The tank desirably has a plurality of sets of finger apertures 18 between the bead 13 and the rolled over rim 12, for convenience in handling, and has overflow ports sufficiently high to assure submerging the feet and ankles in use. The bottom of the tank is preferably drawn with three or more, illustratively four, preferably equidistant, downward protuberances or teats 14, upon which the tank rests with its floor thus slightly spaced from the bottom of the bath tub. The floor preferably has a small aperture 15 therethrough, illustratively at the center, which may be in the order of ¼ inch in diameter, and serves to drain water at much smaller rate than the rate at which the aerated water is admitted to the tank in use, but which will automatically drain the tank in a few minutes after use, so that the empty tank may readily be removed from the tub. While the tank may be of any dimensions suitable for use, one illustrative commercial embodiment involves a floor 14 inches in diameter, a side wall 10 inches high and the side wall flares slightly at diametrically opposite regions to oval shape at the top, 17 inches at its maximum dimension and 14 inches at its minimum dimension at right angles thereto.

The tank has mounted in its wall 11, an aerator by which the discharge from the faucet of the bath tub is converted into a high velocity stream. The aerator which per se is not the invention of applicant, may be a unit 20 of plastic or metal which has a tapped inlet 21 adapted to mount the outlet nipple 17 of the supply hose H, an axial inlet bore 22 which may be of diameter in the order of ⅛ inch, and thus has a cross section in the order of but a very small fraction of that of the bore of the hose, for a great multiplication in the linear speed of flow of the stream of greatly reduced diameter that passes therethrough. Beyond the reduced axial inlet bore 22, the aerator has one or more lateral air inlet ports 23, in the embodiment shown, a single wide air opening 23, so that the rapidly flowing stream of water draws in air liberally, as the rapid water stream passes from reduced bore 22 to the water discharge bore 24 of the aerator. Said discharge bore is of diameter in the order of twice that of the water inlet bore 22 and in the order of that of the air inlet port. The thus aerated stream passes axially outward through discharge nozzle 25 into the tank 10.

The aerator 20 is preferably removably affixed in the aperture 16 in the side wall of the tank slightly above the floor 10 of the tank. When the tank is oval, as preferred and shown, the aerator is desirably mounted at the region below that of maximum diameter of the tank. For thus affixing the aerator, a nut 26 may be threaded upon the nozzle 25 which is formed as a nipple exteriorly threaded at 27, and a resilient washer 28 intervenes between the nut 26 and the exterior of the wall 11 of the tank with the nozzle extending inward through aperture 16. A second nut 26 is threaded on the extremity of the nipple at the inside of the tank and thus extends substantially flush with the discharge end of the aerator at the extremity of nozzle 25. The aerator is thus securely, yet removably clamped between nuts 26 and 26 upon nipple thread 27 at the outside and inside respectively of the tank, and washer 28 affords a watertight seal. Thus there are no parts protruding into the tank, likely to injure the user.

For supplying the tank with water through the aerator 20, a length of conventional rubber hose H may be used, which is preferably supplied as a part of the equipment. The inlet end of the hose has a conventional snap coupling 30 crimped thereto at 31, into the conventional slide ring of which may be snapped the plug member 32 which has an axially bored rounded head 33 that may desirably rest in a cradle 34 in a fishtail member 35 through a central aperture 36 of which extends a mounting loop 37, to be passed at its looped-end over the bath tub faucet F. The threaded stem 39 of the loop has a wing nut 40 thereon, by the tightening of which the fishtail is caused securely to engage the faucet and to hold the inlet end of the hose in position to deliver the outflow from the faucet. To guard against leakage, a rubber washer 41 rests in a corresponding socket in the head of the plug member 32 of the snap connector, to engage against the rim of the faucet and guard against substantial leakage. The outlet nipple 17 of the hose H may be crimped to the hose end, as at 42.

The hose H is readily connected by threading its outlet nipple 17 into the outwardly protruding inlet end of the aerator 20. The fishtail adaptor is applied to the faucet of the bath tub, the plug member 32 of the snap coupling resting in the cradle 34 of the fishtail adaptor for mounting the inlet end of the hose H.

The bath tub faucet is turned on to the desired temperature and pressure and the stream of water through the hose H will be greatly accelerated as it travels through the reduced bore 22 of the aerator and will entrain much air admitted through the exposed port 23 by the injec-

tion action of the rapidly moving water stream. The thus richly aerated water stream is accordingly hurled forcefully across the tank to the opposite wall, whence the stream will be reflected and directed about and along the lateral wall of the tank slightly upwardly by reason of the slight taper of the tank at opposite regions, so that the feet, hands, legs or arms introduced into the tank at opposite sides of the aerator will be massaged by the rapidly moving aerated stream, the high air content cushioning the otherwise deleterious action of the forceful stream of water. As best indicated in FIG. 5 of the drawings, the stream of aerated water thus passes about and between the feet, hands, legs or arms, as the case may be, and effects a beneficial massage that promotes the circulation of the blood. This is particularly helpful where blood circulation is poor, as is frequently the case with the aging or those afflicted with arthritis, rheumatism, nervous tension, diabetes, arteriosclerosis, paralysis, muscle spasm, or fatigued extremities.

By the present invention, results are obtained in every way comparable with the treatment by elaborate electrically driven machines used in the offices of podiatrists and physicians, and of cost in the order of ten times that of the equipment of the present invention, all with the avoidance of grave hazards of an electric motor drive for hydro-therapy and with the facility of use by the ordinary layman in the home without the need for an attendant.

In practice, the user would be seated on the edge of the bath tub, as best shown in FIG. 1, with the feet in the tank during treatment. The temperature of the water may be readily adjusted, and may be progressively increased by manipulation of the faucets of the bath tub. By reason of the fact that the water stream is powerfully aerated, water of higher temperature may be safely used for the treatment than otherwise.

During treatment, water will escape through the little aperture 15 in the floor of the tank at only a negligible fraction of the rate at which it is supplied from the faucet, but after the treatment, when the water from the faucet is shut off, the tank will slowly drain through the aperture 15, emptying in a few minutes and may then readily be removed from the tub without particular effort or likelihood of spillage.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope of the claims, it is intended that all matter contained in the above description, or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A portable hydro-therapy unit comprising a tank having a floor and a wall rising therefrom, said tank having a water-flow inlet comprising an aerator affixed in a corresponding aperture in the side wall of the tank near the floor, extending at its inner end but slightly into the tank and protruding outwardly from the tank and discharging substantially horizontally into the tank, said aerator being an integral one-piece structure of type having facilities at its inlet for mounting the outlet end of a hose, the inlet of which is adapted to be connected to the faucet of the bath tub in which the tank is used, said aerator being of the type having a water inlet bore and a water discharge bore, the discharge bore being in the order of twice the diameter of the inlet bore, and an air inlet port larger than the water inlet bore and communicating with the discharge bore beyond the water inlet bore, the lateral air inlet port being in the order of the cross-sectional area of the water discharge bore, whereby the device in use will propel a forceful generally horizontal, thoroughly aerated stream of water to impinge against the wall of the tank at point opposed to the aerator with resultant reflection and direction of the aerated stream against and about the feet, hands, legs or arms of the user, as the case may be, rested upon the bottom of the tank.

2. A portable hydro-therapy unit comprising a tank adapted for home use in a conventional bath tube, said tank having a floor and a side wall, an aerator consisting of an integral one-piece structure, means affixing the aerator at a corresponding aperture in the side wall and near the floor of the tank, said aerator extending at its inner end but slightly into the tank and the major portion thereof protruding outwardly from the tank, said aerator having an inlet connection for a water hose to be supplied from the faucet of the bath tub in which the tank is used, said aerator protruding outwardly from the tank and having a water inlet bore, a water discharge bore, the discharge bore being in the order of twice the diameter of the water inlet bore, and an air inlet port of diameter of the order of that of the water discharge bore and communicating with the discharge bore beyond the water inlet bore, thereby to inject into the tank a high speed thoroughly aerated stream of water directed against the opposite side of the wall of the tank, for hydro-massage of the limbs or extremities resting on the bottom of the tank.

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