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L. F. HOTZ

3,325,829

BATH WATER CIRCULATOR AND AERATOR

Filed Aug. 10, 1964

FIG. 2

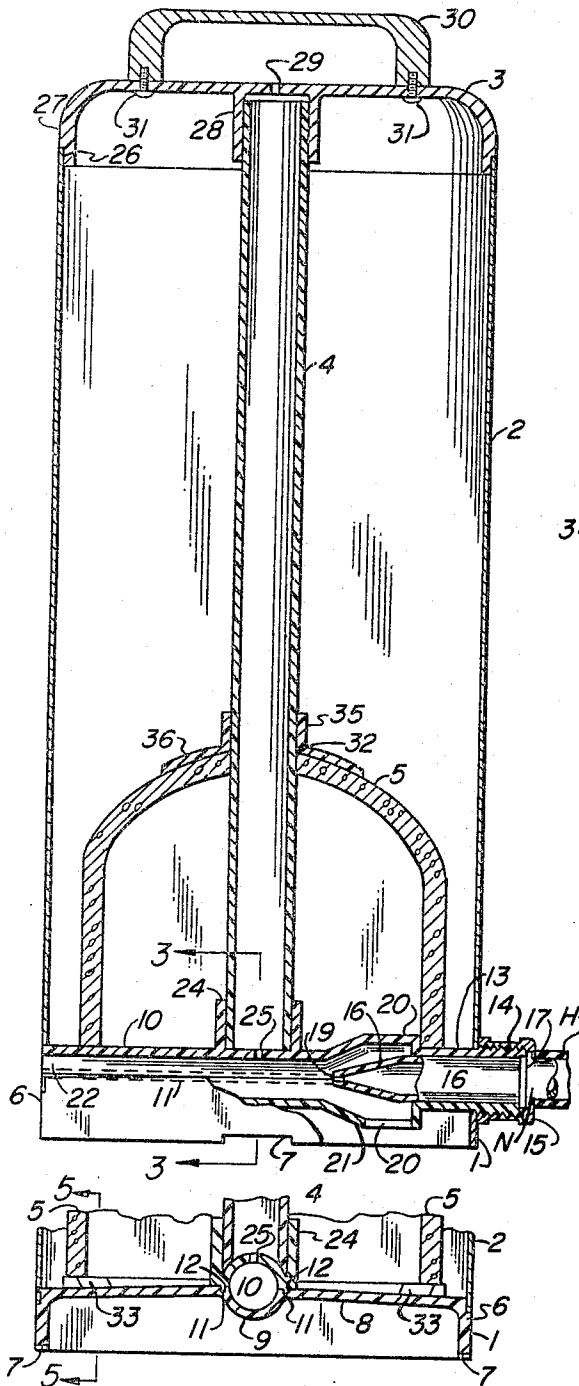


FIG. 3

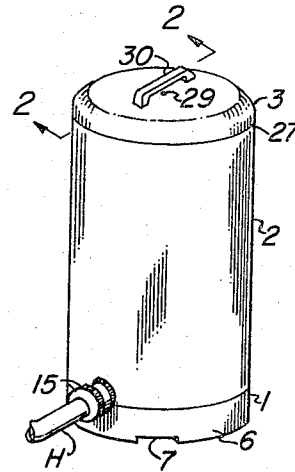


FIG. 1

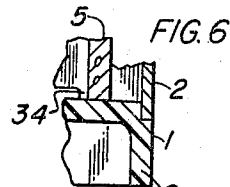


FIG. 6

FIG. 5

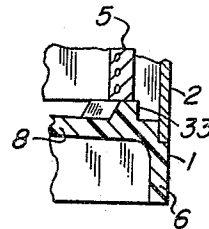
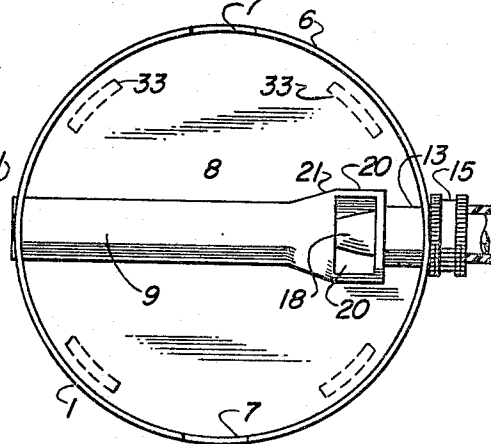


FIG. 4



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BATH WATER CIRCULATOR AND AERATOR

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5 Claims. (Cl. 4-180)

This invention relates to therapeutic apparatus and more particularly to bathwater aerator and circulator constituting an improvement over the device shown and described in my co-pending application, Ser. No. 286,239, filed June 7, 1963 now Patent No. 3,204,254 dated Sept. 7, 1965.

The principal objects of this invention are: to provide a device effective for the same general purpose as the device constituting the subject matter of my said prior application but which is more simple in construction, of better appearance and which is more effective for its intended purpose.

With the foregoing objects in view, together with such additional objects and advantages as may subsequently appear, the invention resides in the parts, and in the construction, combination and arrangement of parts described, by way of example, in the following specification of a presently preferred embodiment of the invention, reference being had to the accompanying drawings which form a part of said specification and in which drawings:

FIG. 1 is a reduced scale, perspective view of a device constituting a presently preferred embodiment of this invention,

FIG. 2 is a greatly enlarged medial sectional view taken on the line 2-2 of FIG. 1,

FIG. 3 is a fragmentary medial sectional view on the line 3-3 of FIG. 2,

FIG. 4 is a bottom plan view on the scale of FIGS. 2 and 3,

FIG. 5 is a further enlarged fragmentary sectional view taken on the line 5-5 of FIG. 3 showing a detail of the weight support means of the device, and

FIG. 6 is a view similar to FIG. 5 but showing a modified form of support of the hold-down weight of the device.

Referring to the drawings, the illustrated embodiment of the device comprises a generally circular base component 1, a jacket component 2, a top component 3, an air tube 4, and a weight 5. The base 1 comprises a circular peripheral wall 6 having the lower edge thereof notched as at 7 to provide clearances for the entry of water as will presently be explained. The upper edge of the wall 6 is peripherally recessed as at 8 to provide a shoulder to receive the lower end of the tubular sheet metal or sheet plastic jacket component 2 as best shown in FIG. 3. The upper edge of the wall 6 supports a generally horizontally extending, integrally formed web portion 8 having a diametrically extending groove 9 formed in the upper surface thereof and of varying diametral dimension for purposes hereinafter to be explained and which groove combines with a closure member 10 having, so far as the groove 9 is concerned, a mirror image relationship thereto and combining, as will be later explained, to form a jet pump means. Preferably, the groove portion of the base and the closure member are formed of a suitable rigid plastic and are located in juxtaposed relationship by adhesive means, it being noted that narrow channels 11 extend parallel to the groove closely adjacent to the side thereof and which are engaged by complementary tongues 12 depending from the closure member 10.

The grooved portion 9 and the closure member 10 combine to form a tubular, water circulation inducing and air entraining means extending diametrically across the device and comprising an inlet portion 13 having an exteriorly threaded portion 14 projecting radially from

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the side of the wall 6 and to which the end of a hose H having its other end connected to a source of water supply (probably a bathtub spout) is attached by a nut 15 carried by a nipple N inserted in the hose. Disposed in the inlet portion 13 is a jet nozzle 16 having a flanged end portion 17 seated on a shoulder within the threaded portion 14 and a tapered portion 18 at its other end terminating in a greatly reduced diameter jet orifice 19. Radially opposite the beginning of the tapered portion 18 of the jet nozzle, the opposing faces of the base and closure elements, forming the tubular means above referred to increase in diameter as at 20, thence taper convergently as at 21 to a point radially opposite the jet nozzle orifice 19 and thence continue in a straight delivery tube portion 22 to the side of the base member 1 diametrically opposite the inlet 13. The enlarged diameter portion 20 is provided with an opening 20' therein preferably in the side thereof formed by the base member 1.

In use, the device is immersed in the water in a tub or other receptacle employed for the treatment at least sufficiently to immerse the jet pump means and the water for actuating the jet pump means is delivered through the hose H under tap pressure. The high velocity of water through the jet nozzle orifice 19 draws water from the hollow interior of the base member through the opening 20' and discharges it out of the discharge portion 22, the notches 7 in the bottom of the base member permitting the entry of the water in which the device is immersed to be supplied to this Venturi type of action. This promotes a circulation of water in the tub and the temperature of the water in the tub can be gradually raised or lowered or maintained in equilibrium by regulation of the temperature of water supplied to the device.

The closure element 9 on the upper, outer face thereof at the axial line of the jacket 2 is provided with a tubular socket 24 in which the lower end of the air tube 4 is secured in any suitable manner as, for example, by adhesive means and the wall of the closure member 9 within the socket is provided with a small hole 25 affording communication between the air tube and the interior of the delivery portion 22 of the transverse water conduit means. The upper end of the jacket 2 is engaged by a shoulder portion 26 in the lower end of the skirt portion 27 of the top 3 and the under face of the top member 3 carries an axially disposed socket portion 28 into which the upper end of the air tube 4 is similarly adhesively secured, there being a small air hole 29 in the top surface of the top member 3 affording communication of the interior of the air tube with atmosphere. A handle 30 for carrying the device may be attached to the top member 3 by any suitable manner as by screws 31.

To hold the device steady in a receptacle, a weight may be employed as for example, the inverted bowl-shaped ceramic member 5 having a hole 32 through which the air tube 4 extends. The lower edge of the weight may rest on bosses 33 formed on the web portion 8 of the base 6 or, alternatively, the lower edge of the weight may have projections 34 which (see FIG. 6) may rest directly on the upper surface of the web portion 8. A collar 35 surrounding the air tube 4 and adhesively secured thereto may have a flange 36 thereon which engages the upper end of the weight to hold the weight securely against endwise movement on the air tube.

The action of the device in inducing circulation of the water within a therapeutic bath has previously been described, it being noted that by reason of the very small diameter of the jet nozzle 19 that a very high velocity of water circulation can be induced while not adding excessively to the total volume of bathwater. Moreover, there are no moving parts and since the entire circulation of the water is confined to the lower end of the device

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as distinguished from the device of my said co-pending application, there is less danger of the device being tipped over and being otherwise displaced. Moreover, since all of the jet action takes place below the level of the water in the tub or other receptacle and since no lifting of water is required, a lesser amount of force is required for a given magnitude of water circulation. The capacity of the jet pump means is inhibited by the fact that the rate of flow through the slots 7 is less than the delivery capacity of the jet pump means. This results in the creation of a vacuum in the underside of the base which tends to hold the device on the bottom of the bath receptacle against the reaction force of the delivery from the jet pump means against the bathwater. Not only is there a high degree of water circulation achieved but the rapidity with which the water passes the air orifice 25 entrains air in the water drawn down through the air tube and the entry 29 at the upper end thereof so that not only is the water rapidly and efficiently circulated but also, a very considerable amount of air is entrained therein which, of course, gives a soothing effect to the persons being treated.

While in the foregoing specification, there has been disclosed a presently preferred embodiment of the invention, it is not to be deemed therefrom that the invention is limited to the precise details of construction thus disclosed by way of example, and it will be understood that the invention includes, as well, all such changes and modifications in the parts, and in the construction, combination and arrangement of parts as shall come within the purview of the appended claims.

I claim:

1. A bath water circulator and aerator comprising in combination, a base carrying a generally horizontal jet pump means and disposed at a level from the bottom surface of said base at which said jet pump means will be wholly submerged beneath the surface of the bath water to be circulated and aerated; said jet pump means comprising a first inlet means having means affording the connection thereof to a source of water under pressure and terminating within said jet pump means in a jet orifice arranged to discharge water received from the pressure source into said jet pump means, a second inlet means

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disposed upstream of said jet orifice and affording communication between the bath water to be circulated and aerated and the interior of said jet pump means, an outlet having communication with both of said inlet means, and an air inlet means extending from a point above the surface of the bath water to the interior of said jet pump means at a point downstream of said jet orifice.

2. A bath water circulator and aerator as claimed in claim 1 in which said base supports said submerged jet pump means in a horizontal plane spaced from the bottom of the bath water containing means, in which said second inlet means is disposed at the lower side of said jet pump means, and in which said bottom surface of said base includes at least one portion spaced upwardly from the plane of the bottom of surface of said base sufficiently to allow bath water to enter said second inlet means.

3. A bath water circulator and aerator as claimed in claim 1 in which said base carries a weight member to hold said base immersed and in which said air inlet means includes a vertical hollow member serving additionally as means to hold said weight member in fixed position on said base.

4. A bath water circulator and aerator as claimed in claim 1 in which said air inlet means includes a vertically extending tube having one end in communication with the interior of said jet pump means, in which the opposite end of said tube carries a top member having a handle and further having an opening affording communication of said tube with atmosphere.

5. A bath water circulator and aerator as claimed in claim 3 in which said tube extends through said weight member and carries means engaging said weight member effective to hold said weight member seated on said base.

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