United States Patent

[11] 3,628,529

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[21] Appl. No. **887,108**
[22] Filed **Dec. 22, 1969**
[45] Patented **Dec. 21, 1971**

[54] **HYDROMASSAGE ASSEMBLY**
7 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **128/66, 4/180**
[51] **Int. Cl.** **A61h 9/00**
[50] **Field of Search** 128/66, 369; 4/178, 180, 172, 172.15

[56] **References Cited**
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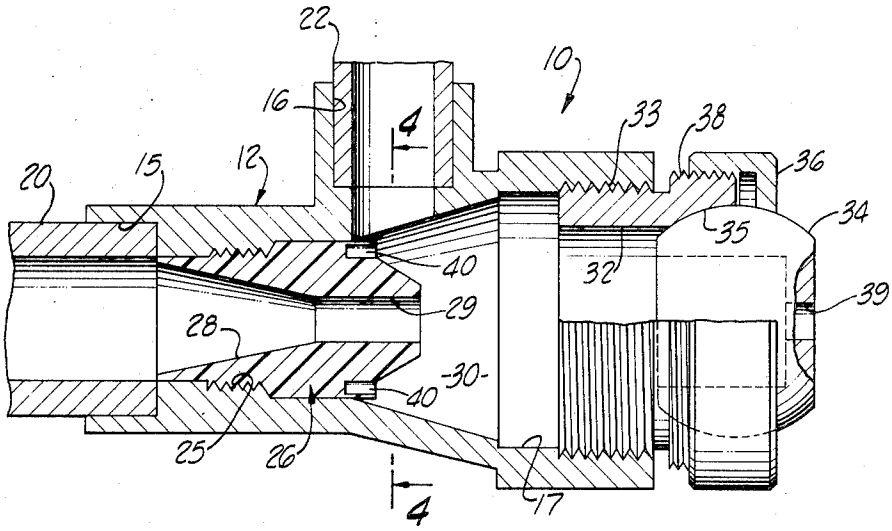
ABSTRACT: A hydromassage assembly adapted to be permanently embedded in the sidewall of a pool of water and including a detachable aspirator nozzle of nonmetallic material accessible for assembly and disassembly through the discharge port of the embedded assembly. The assembly is highly resistant to erosion from the action of rapidly flowing water and incapable of reacting to form metallic oxides and the like discoloring agents commonly deposited from the water onto the walls of pools and associated equipment.



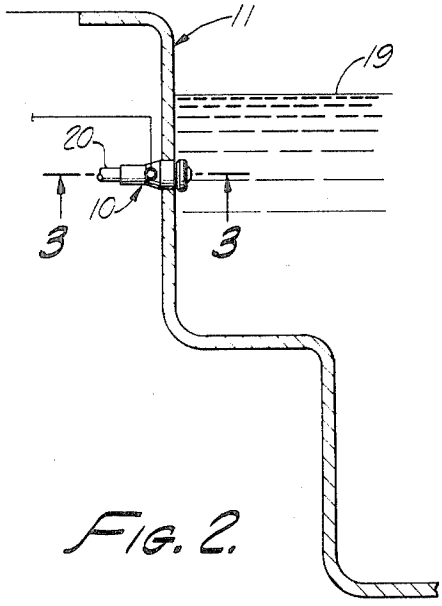


FIG. 2.

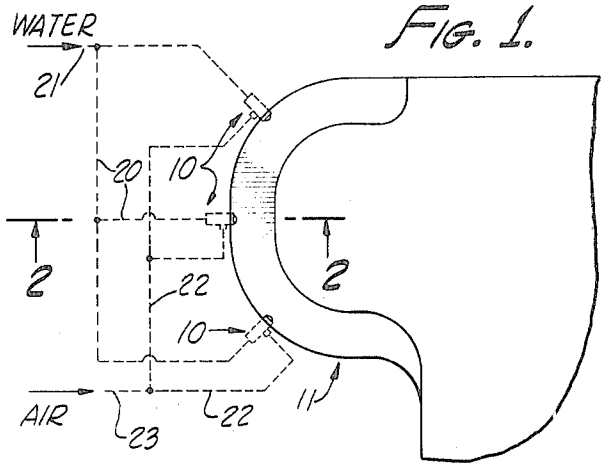


FIG. 1.

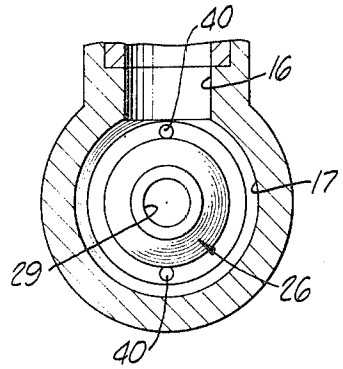


FIG. 4.

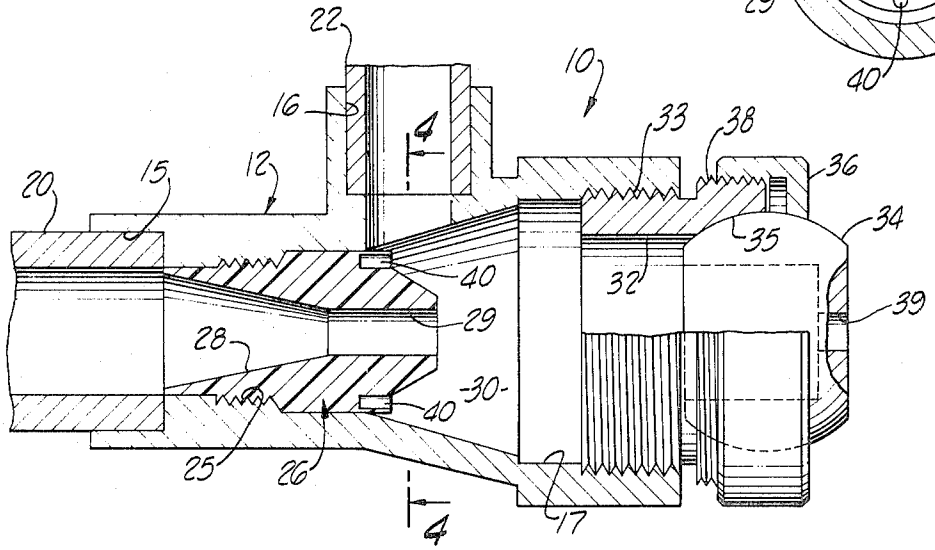


FIG. 3.

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HYDROMASSAGE ASSEMBLY

The present invention relates to hydromessage devices and more particularly to an improved hydromessage assembly provided with a readily detachable aspirator incapable of forming metallic oxide and highly resistant to erosion by rapidly flowing water.

A water variety of hydromessage devices have been proposed heretofore so constructed as to deliver a rapidly flowing stream of water past an inlet for air for the purpose of entraining the air for admixture with the water and use for therapeutic purposes. There are two particularly serious problems associated with the use of these devices as previously constructed. For example, the venturilike device commonly employed to increase the velocity of the water past the air inlet is subject to rapid erosion and wear; and secondly, the water-borne impurities and cleaning agents commonly present therein react with the eroded particles to form metallic oxides. These oxides have a strong affinity for and become attached to the sidewalls of the pool into which the water is discharged. The patterns of such deposits are oftentimes irregular and nonuniform and form highly tenacious and deep-seated strains on tile, ceramic and enamelled surfaces. Additionally, the eroded surfaces of the water restrictor passes detract serious from the operating efficiency and effectiveness of the hydromessage equipment. Usually, the plumbing fixtures embodying these passages are permanently installed in the sidewalls of swimming pools, hydrotherapy basins and the like. For these reasons, the servicing and replacement of such fixtures is extremely costly and oftentimes impractical.

The primary purpose of the present invention is to avoid the foregoing and other shortcomings of prior hydromessage assemblies by providing an inexpensive generally T-shaped main housing adapted to be permanently embedded in the wall of a swimming pool, a hydrotherapy pool or the like installation. Suitably detachably mounted between the opposite ends of the T-shaped head portion of this main body is a nonmetallic aspirator nozzle highly resistant to erosion by rapidly flowing water and readily assembled into and disassembled from its normal operating position through the discharge end of the permanently installed main housing. The discharge end of the aspirator nozzle extends across and in close proximity to an atmospheric air inlet with the result that the rapidly flowing stream of water issuing from the nozzle is highly effective in aspirating air into the device and to mix it with the water discharging into the hydrotherapy pool. The outer end of the aspirator nozzle is appropriately shaped to seat an operating tool useful in installing and removing the nozzle from the main housing through the discharge end thereof and without need for disconnecting the air or water pipes or interfering in any way with the installed embedded condition of the main body of the assembly.

Accordingly it is a primary object of the present invention to provide a hydromessage assembly the main body of which is adapted to be permanently installed and embedded in the wall of a water pool and featuring a readily installed and removed nonmetallic aspirator nozzle highly resistant to erosion.

Another object of the invention is the provision of a hydrotherapy pool having a hydromessage device embedded in the wall thereof with its discharge end opening into the pool and equipped with a nonmetallic aspirator nozzle readily accessible for servicing and replacement through the discharge end of the assembly.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the invention is illustrated:

FIG. 1 is a fragmentary top plan view of a typical pool having a plurality of the invention hydromessage devices installed in the wall thereof;

FIG. 2 is a vertical sectional view on an enlarged scale taken along line 2—2 on FIG. 1;

FIG. 3 is a cross-sectional view on an enlarged scale of the device per se taken along line 3—3 on FIG. 2; and

FIG. 4 is a fragmentary view taken along line 4—4 on FIG. 3.

Referring to the drawing, there is shown one preferred embodiment of the invention hydromessage device, designated generally 10, permanently embedded in masonary or other wall-forming material of a hydrotherapy pool 11. Assembly 10 is preferably molded from high-strength thermoplastic material and includes a T-shaped hollow main housing 12 having a water inlet 15, and air inlet 16 and a combined water and air outlet 17. Main housing 12 may be molded in one piece from high-density polyvinyl chloride or other suitable high-strength thermoplastic composition well known to those skilled in the plastic art.

It is commonplace to install one or more of the devices 10 in each pool with the discharge 17 opening through the sidewall of the installation either at the same or different levels below the water surface indicated at 19 in FIG. 2. The water inlets 15 of the several devices are interconnected by a plastic tubing 20 supplied with pressurized water from conduit 21. Likewise, the air inlets 16 are interconnected by a plastic conduit 22 having an air supply duct 23 in communication with the atmosphere.

The interior of main housing 12 intermediate water inlet 15 and air inlet 16 is provided with a threaded passage 25 detachably seated an aspirator nozzle 26 formed of nonmetallic material and preferably molded from thermoplastic material. The aspirator nozzle 26 has a converging inlet passage 28 opening into a throat 29 discharging across the inner end of air inlet 16 and coaxially into the air and water outlet passage 17.

It will be readily apparent that the velocity of the pressurized water flowing through the aspirator nozzle is greatly increased as it approaches and reaches throat 29. Accordingly, this high-velocity stream issuing from the aspirator nozzle is highly effective in entraining a flow of air through air supply conduits 22 and 23 into chamber 30. The resulting highly energized body of water and air in chamber 30 discharges into the water in pool 11 in a highly agitated condition and with considerable velocity. The entry of this water into the pool usually takes place through any suitable adjustable nozzle.

The adjustable nozzle construction illustrated in FIG. 3 comprises a tubular socket fitting 32 having a threaded connection 33 with the interior of the outlet passage 17. An outlet nozzle 34 is held adjustably socketed in seat 35 by means of a bushing 36 having its threaded interior mating with threads 38. The outlet opening 39 of nozzle 34 can be readily oriented to direct the water and air stream in a wide variety of directions as will be readily apparent from the foregoing description of its construction and mode of assembly to fitting 32.

It will be understood that aspirator 26 may be formed with a venturi passage of different size thereby enabling the user to obtain a desired rate of flow by installing an appropriate size aspirator. The outer or forward end of the aspirator is preferably provided with suitable tool engaging sockets 40, 40 for seating a spanner wrench or the like while assembling and disassembling the aspirator. Such wrenches are readily engaged in socket 40 after detaching the clamping ring 36 and nozzle fitting 34. It will therefore be apparent that a worn or unserviceable aspirator nozzle 26 may be replaced with a new one or one of a different size merely by detaching the adjustable nozzle fitting from the discharge end. Although the aspirator 26 has been shown wit threads 25 for holding in its assembled position, it will be understood that any other suitable means may be employed for holding this fitting detachably in its assembled position.

While the particular hydromessage assembly herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention, and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

I claim:

1. A hydromessage assembly for delivering a highly energized stream of water and air into a body of water below the surface thereof, said assembly comprising a T-shaped molded main body having an open-ended T-head and an open ended T-stem opening into the midportion of said T-head, a nonmetallic aspirator nozzle having a rearwardly flaring water inlet passage opening into a relatively small diameter coaxial discharge passage, means detachably supporting said aspirator nozzle coaxially of said T-head with the discharge end thereof positioned to discharge past the inner end of said T-stem, the outer end of said T-stem being connectable to a supply of air at atmospheric pressure and the end of said T-head adjacent the flaring inlet end of said aspirator nozzle being connectable to a supply of pressurized water, the flow of pressurized water through said nozzle being effective to aspirate a flow of atmospheric air into the outlet end of said T-head for turbulent admixture with the stream of water issuing from said nozzle, and said aspirator nozzle being connectable to and removable from said T-head through the water and air discharge end thereof.

2. A hydromessage assembly as defined in claim 1 characterized in that said aspirator nozzle is formed from thermoplastic material highly resistive to erosion and wear by rapidly flowing water passing therethrough.

3. A hydromessage assembly as defined in claim 2 characterized in that the exterior of the discharge end of said aspirator nozzle is generally conical with the smaller end thereof merging with the sidewall of the water flow passage extending longitudinally of said nozzle.

4. A hydromessage assembly as defined in claim 1 characterized in that said T-shaped main body and said aspirator nozzle comprise molded thermoplastic material.

5. A hydromessage assembly as defined in claim 1 characterized in that said aspirator nozzle and the interior of said T-head having mating threads cooperating to hold said aspirator nozzle detachably assembled between the inlet and outlet ends of said T-head.

6. In combination with the sidewall of a masonry pool for water employed for the hydrotherapy treatment of patients, a hydromassage assembly embedded in said sidewall of only the discharge end thereof opening into the water pool below the water surface, said assembly having a unitary hollow main body having aligned inlet and outlet openings, means for supplying pressurized water to said inlet, an air aspirator nozzle detachably mounted coaxially of and between said inlet and outlet openings, the discharge end portion of said aspirator nozzle being shaped to seat a tool insertable into said main body from within said water pool and usable to assemble and disassemble said aspirator nozzle to and from said main body while said main body remains installed in the sidewall of said pool, and means to supply air at atmospheric pressure into said hollow main body in an area embracing the discharge end portion of said aspirator nozzle whereby the rapid flow of water through said nozzle aspirates a flow of air about the discharge end thereof for turbulent admixture with the stream of water issuing from said nozzle.

7. The combination defined in claim 6 characterized in that hollow main body and said aspirator nozzle are molded thermoplastic.

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