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(54) **Massage unit.**

(57) A unit for use in a tub (10) or spa to provide a dry hydro-massage of the neck and shoulders. The unit (12) mounts to the tub edge (14) and includes a diaphragm (36) which sealingly covers a discharge jet (26) such that the fluid will flex the diaphragm into massaging relationship with the user's body. The water is exhausted into the tub through a secondary port (46) below the water line such that dry hydro-therapy is provided by the unit. The inflation of the diaphragm is controlled by pressure regulating ports (42) formed within a housing (16) of the unit to control the exhaust of fluid from the jet chamber. In one embodiment, the ports are variable to vary the inflation pressure of the diaphragm. With the unit mounted to the tub the user may remain seated within the spa while the unit provides a dry hydro-massage of the neck and upper back normally positioned above the water line. To provide increased freedom of application of the hydro-massage, the unit may be incorporated into a telescopingly adjustable assembly associated with the tub wall or a hand-held assembly.

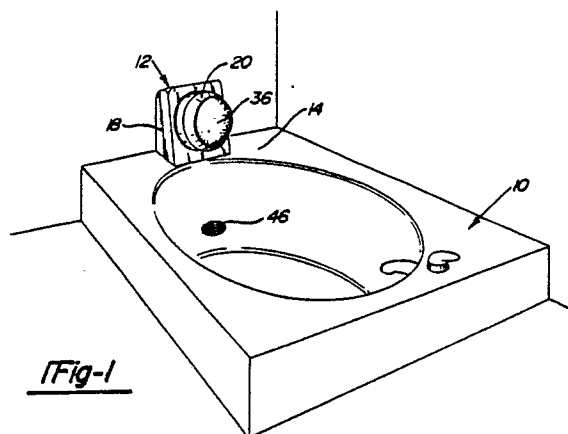


Fig-1

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DRY HYDRO-MASSAGE UNIT

Background Of The Invention

I. Field of the Invention

This invention relates to a hydro-massage unit for a tub, whirlpool spa or the like and, in particular, to a dry hydro-massage unit which includes means for regulating the inflation pressure of the resilient diaphragm to provide a dry, warm impact massage of upper body portions while the user is situated within the tub. The unit may be incorporated into a telescoping or hand-held assembly for specific application.

II. Description of the Prior Art

Hydrotherapy jet discharges for whirlpool tubs and spas have been developed to provide a turbulent mix of water and air for impacting against a user's body in the spa. These discharges have been refined to provide efficient flow with maximum therapeutic benefit. Discharge jets which are selectively directionally adjustable by the user and jets which travel along a closed path are well known embodiments for increasing the benefits of the spa. However, these discharge jets must be positioned below the water line within the spa to minimize splash. As a result, the therapeutic benefits are limited to the body parts below the water line or the user must slouch down in an attempt to apply the massaging effect to the shoulders.

Closed dry hydro-massage systems have been developed for specific devices such as water beds. These systems circulate the water from a closed reservoir against a membrane which engages the user. The membrane may form the back of a car seat or the upper surface of a waterbed mattress. However, such systems have not been employed in spas to provide hydromassage of selected body parts. Moreover, the massage is dependent solely on the impact action of the water jet against the flexible membrane since no means are provided for maintaining inflation of the membrane.

Summary Of The Present Invention

The present invention overcomes the disadvantages of the prior known hydro-massage systems by providing a dry hydro-massage unit for a spa which includes pressure regulating means to main-

tain inflation of a flexible diaphragm to provide a comfortable resilient surface for the user while massaging the user's neck and shoulders normally disposed above the water line.

The dry hydro-massage unit according to the present invention generally comprises a housing associated with a tub or spa wall and having air and water supply means to supply the turbulent mixture to the discharge head. The discharge head is sealingly positioned behind a flexible diaphragm such that the discharge is directed against the diaphragm. The housing is provided with an air vent at the top to allow air to escape and a water exhaust at the bottom of the housing. The water exhaust fluidly communicates with the tub to permit escape of the water back into the spa. The jet discharges into a regulated chamber formed partially by the flexible diaphragm and by an interior wall having a plurality of ports. The size and number of ports are selected to regulate the pressure within the chamber to ensure inflation of the diaphragm according to the discharge capacity of the discharge jet. In an alternative embodiment, a rotatable plate may be mounted to the interior wall to vary the size of the ports and, as a result, the inflation pressure of the diaphragm. The discharge head forces the air/water mixture against the diaphragm and the water is exhausted into the spa through a port below the water line. In this manner, a dry hydro-massage is provided to parts of the user's body disposed above the water line. For added convenience, the jet housing may form a part of a hand-held unit or may be telescopically adjustable between a position above the rim of the spa tub and the water line.

The present invention has the advantage of providing the therapeutic benefits of a hydro-massage to the neck and head are without the water splash of past known spa jets. As a result, water splash against the face and eyes is eliminated permitting the user to quietly enjoy the dry hydro-massage. The invention has the added benefit of keeping the user's hair and face dry thus allowing users with styled hairdos and makeup to enjoy the massaging benefits of the spa without ruining the hairdo or makeup. Additionally, the user is provided with a warm and resilient surface against which to lean as a result of inflation of the diaphragm. Without regulation of the fluid exhaust from the discharge chamber inflation of the diaphragm could not be maintained. Furthermore, the inflated massage pillow provides greater heat transfer over a wider area while the impact massage is specifically directed. The impact power of the jet can be varied by pump pressure, restricting the mixture of air and

the exhaust of fluid.

Other objects, features, and advantages of the invention will be apparent from the following detailed description taken in connection with the accompanying drawings.

Brief Description Of The Drawing

The present invention will be more fully understood by reference to the following detailed description of a preferred embodiment of the present invention when read in conjunction with the accompanying drawing, in which like reference to like parts throughout the views and in which:

FIGURE 1 is an elevated perspective of a tub having the dry hydro-massage unit embodying the present invention mounted thereto;

FIGURE 2 is a cross-sectional perspective of the dry hydro-massage unit mounted to the tub;

FIGURE 3 is a front plan view partially in cross-section taken along lines 3-3 of Fig. 2;

FIGURE 4 is a perspective view of the dry hydro-massage unit incorporated into a telescopically adjustable assembly associated with a spa tub;

FIGURE 5 is an exploded perspective of the telescopically adjustable dry hydro-massage unit;

FIGURE 6 is a cross-sectional view of the telescopically adjustable dry hydro-massage unit;

FIGURE 7 is an elevated perspective of a spa tub having the dry hydro-massage unit incorporated into a hand-held unit;

FIGURE 8 is a front plan view partially in cross-section of the hand-held dry hydro-massage unit; and

FIGURE 9 is a side plan view partially in cross-section of the hand-held dry hydro-massage unit.

Detailed Description Of A Preferred Embodiment Of The Present Invention

Referring first to Figures 1 and 2, there is shown a tub 10 to which a dry hydro-massage unit 12 embodying the present invention is mounted. The dry hydro-massage unit 12 may be mounted to any type receptacle adapted to receive a user including a whirlpool spa or a bathtub. In a preferred embodiment, the unit 12 is mounted to a top rim 14 of the tub 10 such that a user positioned in the tub 10 can lean against the dry hydro-massage unit 12 for the selective massage of body parts normally situated above the water line. The dry

hydro-massage unit 12 provides the massaging effect of hydro-massage devices while eliminating the splash and spray of known units. As will be hereinafter described, the dry hydro-massage unit 12 may be combined with a hand-held assembly or a telescopically adjustable assembly for greater freedom of placement.

Referring now to Figures 1 through 3, the dry hydro-massage unit 12 of the present invention includes a housing 16 mounted to the tub rim 14. In a preferred embodiment, the housing 16 consists of a main body 18 to which is attached a bezel 20 forming a front opening 22 for the housing 16. Mounted within the housing 16 is a hydro-massage jet assembly 24 which includes a discharge jet 26. The jet assembly 24 is mounted within the housing 16 using a mounting bracket 28 which engages flanges 30 formed as part of the body 18 of the housing 16. Air and water are supplied to the jet assembly 24 through air line 32 and water line 34. The jet assembly 24 mixes the air and water using a venturi jet nozzle to produce the soothing massaging fluid discharged through the jet 26. The hydro-massage jet assembly 24 is positioned within the housing 16 such that the massaging fluid is directed through the front opening 22 of the housing 16.

To prevent the massaging fluid from being discharged against the user and therefore create the dry hydro-massage effect, a diaphragm 36 is sealingly mounted to the front opening 22 such that the massaging fluid is discharged against the diaphragm 36. Although discharging the massaging fluid to massagingly flex the diaphragm 36 will produce some soothing relief, the rigid structure of the housing 16 makes it uncomfortable for the user to relaxingly lean against the unit 12. Accordingly, in order to inflate the diaphragm 36 to form a pillow-like surface, a restrictive flow interior wall 38 is positioned within the housing 16. Together with the diaphragm 36, the interior wall 38 forms a pressure chamber 40 into which the massaging fluid is discharged. The wall 38 includes a plurality of circumferentially spaced ports 42 to restrict outlet flow from the chamber 40. The size and number of ports 42 are selected to create a predetermined fluid pressure within the chamber 40 such that the diaphragm 36 will be inflated to a desirable level according to the discharge flow of the hydro-massage jet assembly 24. Thus, as massaging fluid is discharged by jet assembly 24, the flow ports 42 of the interior wall 38 restrict the outlet flow of fluid from the chamber 40 creating a fluid pressure to inflate the diaphragm 36 to form a comfortable pillow. Fluid is exhausted from the housing 16 through an outlet line 44 which communicates with the tub basin through exhaust port 46. As a result, the massaging effects of the fluid can be felt by the

user through the flexible diaphragm 36 while the spray of the water is eliminated. The discharged fluid is returned to the tub 10 below the water line. In addition, the body 18 of the housing 16 is provided with an air vent 48 to vent any air trapped within the housing 16.

The dry hydro-massage unit 12 may be incorporated into a telescopingly adjustable unit as shown in Figures 4 through 6 or a hand-held assembly as shown in Figures 7 through 9. These alternate embodiments provide added flexibility yet incorporate the basic dry hydro-massage unit 12 described hereinbefore.

The telescopingly adjustable unit 30 is incorporated into the peripheral wall 114 of the tub 110 to provide the soothing massage of hydro-therapy jets without fluid discharge to body portions normally situated above the rim of the tub 110. In a preferred embodiment, the telescopingly adjustable unit 130 is mounted within an opening 132 formed in the peripheral wall 114 of the tub 110. An enclosure plate or wall 134 is mounted substantially flush with the wall 114 over the opening 132 to form a chamber 136 open to the top of the tub 110. The dry hydro-massage unit 130 is telescopingly adjustably disposed within this chamber 136. The enclosure wall 134 includes a U-shaped slot 138 which guidingly receives the discharge head of the unit 130. An exhaust port 140 formed near the bottom of the tub 110 provides fluid communication between the interior chamber 136 and the interior basin of the tub 110. As best shown in Fig. 6, the dry hydro-massaging unit 130 includes a hydro-massage jet assembly 142 which supplies the therapeutic turbulent mixture of air and water. As with the other embodiments, the jet assembly 142 is sealingly enclosed by a diaphragm 154 causing the therapeutic fluid to be discharged against the diaphragm 154. Fluid flow through the peripheral passageways 176 is restricted in order to maintain the diaphragm 154 in an inflated state.

The hydro-massage assembly 142 is telescopingly mounted within the interior chamber 136 for selective adjustment of the diaphragm covered discharge jet 144 between a first position substantially at or below the water line 118 through a second position above the top rim 124 of the tub 110. The assembly 142 is guided by a pair of tracks 162 opposingly mounted to the interior side of the enclosure wall 134 on opposite sides of the slot 138. The tracks 162 slidingly receive side portions 164 of the housing 156 which can include locking means 166 to positionally maintain the assembly 142. In a preferred embodiment, the locking means 166 includes a spring-biased pins 168 which cooperate with the tracks 162 to bias the assembly 142 away from the enclosure wall 134. The back of the side portions 164 are provided with

an integral pin 170 which cooperates with a series of apertures 172 to positionally maintain the the assembly 142 in a plurality of positions. The jet assembly 142 is telescopingly adjusted within the chamber 136 by pulling the assembly 142 forwardly to remove the pins 170 from the apertures 172.

The hand-held unit 212 is designed to be easily manipulated by a user 214 in order to apply a therapeutic hydro-massage to specific body parts such as the neck and shoulders. The unit 212 generally comprises a housing 216 having a handle 218 to facilitate manipulation and a flexible hose 220 which connects the housing 216 to the air and water supplies. The housing 216 has a front opening 228 within which a hydro-massage jet assembly 230 is disposed. The jet assembly 230 includes a discharge nozzle 234 which directs a massaging fluid out of the housing 216 against a flexible diaphragm 242 sealingly positioned over the opening 228. With the diaphragm 242 attached to the housing 216, the massaging fluid is prevented from being discharged from the housing 216 except through the hose 220. The position of the diaphragm 242 relative to the jet assembly 230 ensures that the massaging fluid is discharged against the diaphragm 242 and as a result the diaphragm 242 will be massagingly flexed by the discharge fluid. Once discharged against the diaphragm 242, the fluid flows into the housing 216 and hose 220 through the restricted flow peripheral passageways 248. The resulting increased pressure behind the diaphragm 242 will inflate the diaphragm 242 to form a more suitable massaging surface to be placed against the user's body.

Thus, the present invention will provide a soothing dry hydro-massage of a user by eliminating the spray of the massaging jet. As a result, the hydro-massage unit can be mounted above the water line to provide soothing relief of the neck and shoulders, body parts normally positioned above the water line of a spa.

Claims

1. A dry hydro-massaging unit for mounting to a spa tub, the dry hydro-massage unit providing selective massage of a user positioned within the tub, said dry hydro-massaging unit comprising:
 - a housing mounted to the tub, said housing including a front opening;
 - a diaphragm sealingly covering said front opening of said housing to form a pressure chamber within said housing;
 - a hydro-massage jet assembly having a discharge jet mounted within said housing, said discharge jet positioned to discharge a massaging fluid into said

pressure chamber of said housing and against said diaphragm whereby said massaging fluid from said discharge jet massagingly flexes said diaphragm; means connected to said hydro-massage jet assembly for supplying said massaging fluid to said discharge jet; and means for restricting the exhaust of fluid from said pressure chamber of said housing thereby maintaining inflation of said diaphragm.

2. The unit as defined in claim 1 wherein said means for restricting the exhaust of fluid from said pressure chamber includes an interior wall within said housing, said interior wall having at least one regulating port through which fluid from said pressure chamber flows into the remainder of said housing.

3. The unit as defined in claim 2 wherein said interior wall is an annular wall circumferentially mounted about said hydro-massage jet assembly within said housing, said annular wall including a plurality of circumferentially spaced ports, the number and diameter of said ports determining the fluid pressure within said chamber.

4. The unit as defined in claim 3 and further comprising means for selectively adjusting the diameter of said ports to selectively regulate fluid flow through said ports and the fluid pressure within pressure chamber.

5. The unit as defined in claim 2 wherein fluid from said housing is exhausted into the tub through fluid venting means.

6. The unit as defined in claim 1 wherein said housing includes air venting means.

7. The unit as defined in claim 1 wherein said housing is movably mounted within the peripheral wall of the spa tub such that said diaphragm covered housing is selectively movable between a first position below the top rim of the spa tub and a second position above the top rim of the spa tub.

8. The unit as defined in claim 1 wherein said housing forms part of a hand-held assembly, said hand-held assembly manually manipulable such that said diaphragm covered discharge jet may be selectively positioned against specific portions of the user's body.

9. The unit as defined in claim 8 wherein said means for supplying said massaging fluid to said discharge jet includes at least one hose connected to said hand-held assembly.

10. A dry hydro-massaging unit for mounting to a spa tub, the hydro-massage unit providing selective massage of a user positioned with the tub, said dry hydro-massaging unit comprising:
a housing mounted proximate the tub for selective engagement by the user positioned in the tub, said housing including a front opening;
a flexible diaphragm sealingly covering said front opening of said housing, said diaphragm enclosing

a pressure chamber within said housing;
a hydro-massage jet assembly having a discharge jet mounted within said housing, said discharge jet positioned to discharge a massaging fluid into said pressure chamber of said housing and against said diaphragm whereby said massaging fluid from said discharge jet massagingly flexes said diaphragm while fluid flow past said diaphragm is prevented;
means fluidly connected to said hydro-massage jet assembly for supplying a massaging fluid to said jet for discharge against said diaphragm; and
an interior wall within said housing proximate said hydro-massage jet assembly forming said pressure chamber within said housing, said interior wall including restrictive port means for regulating the exhaust of said massaging fluid thereby maintaining a predetermined fluid pressure within said chamber to inflate said diaphragm.

11. The unit as defined in claim 10 wherein said interior wall is an annular wall circumferentially mounted about said hydro-massage jet assembly within said housing, said annular wall including a plurality of circumferentially spaced ports forming said restrictive port means, the number and diameter of said ports determining the fluid pressure within said chamber to inflate said diaphragm.

12. The unit as defined in claim 11 and further comprising means for selectively restricting the exhaust of said massaging fluid from said pressure chamber through said ports.

13. The unit as defined in claim 12 wherein said means for selectively restricting includes a rotatable shutter member sealingly mounted adjacent said interior wall, said shutter member selectively adjusting the diameter of said ports upon rotation thereof relative to said interior wall.

14. The unit as defined in claim 1 wherein said housing is movably mounted within the peripheral wall of the spa tub such that said diaphragm covered housing is selectively movable between a first position below the top rim of the spa tub and a second position above the top rim of the spa tub.

15. The unit as defined in claim 1 wherein said housing forms part of a hand-held assembly, said hand-held assembly manually manipulable such that said diaphragm covered discharge jet may be selectively positioned against specific portions of the user's body.

16. A dry hydro-massaging unit for mounting in a peripheral wall of a spa tub having a top rim, said dry hydro-massaging unit comprising:
a hydro-massage jet assembly having a discharge jet, said hydro-massage jet assembly movable mounted within the peripheral wall of the spa tub;
means connected to said hydro-massage jet assembly for supplying a massaging fluid to said discharge jet; and
a diaphragm sealingly covering said discharge jet

whereby said massaging fluid from said discharge jet massagingly flexes said diaphragm; said hydro-massage jet assembly movable within the peripheral wall of the spa tub such that said diaphragm covered discharge jet is selectively movable between a first position below the top rim of the spa tub and second position above the top rim of the spa tub.

17. The dry hydro-massage unit as defined in claim 16 wherein the peripheral wall of the spa tub includes an opening for receiving said hydro-massage jet assembly, said unit further comprising an enclosure wall covering the opening in the tub wall and forming an interior chamber open to the top of the tub, said hydro-massage jet assembly slidably disposed within said chamber, said enclosure wall having an elongated slot and mounted substantially flush with the peripheral wall of the spa tub.

18. The dry hydro-massaging unit as defined in claim 17 and further comprising guide tracks mounted to said enclosure wall on opposite sides of said elongated slot, said guide tracks movably receiving said hydro-massage jet assembly.

19. The dry hydro-massaging unit as defined in claim 18 wherein said hydro-massage jet assembly includes lock means engageable with said guide tracks to selectively position said jet assembly along said guide tracks and selectively lock said jet assembly between said first and second positions.

20. The unit as defined in claim 16 and further comprising means for restricting outlet flow of discharged fluid from said housing thereby increasing the fluid pressure within said housing to expand said diaphragm, said discharge jet discharging fluid into the pressurized fluid environment.

21. A hand held dry hydro-massage unit for applying dry hydro-massage to specific portions of a user's body, said unit associated with a spa tub having a water and an air supply, said dry hydro-massage unit comprising:

a housing having a front opening;

a hydro-massage jet assembly having a discharge nozzle mounted within said housing, said hydro-massage jet assembly supplying a massaging fluid through said discharge nozzle;

means fluidly connecting said hydro-massage jet assembly to the water and air supply of the tub for the supply of water and air to said assembly; and a diaphragm sealingly covering said opening of said housing whereby said massaging fluid from said discharge nozzle massagingly flexes said diaphragm;

said dry hydro-massage unit manually manipulable such that said diaphragm covered discharge nozzle may be selectively positioned against specific portions of the user's body.

22. The unit as defined in claim 21 wherein said housing includes an integral handle for manipulating said unit.

23. The unit as defined in claim 22 wherein said means for supplying water and air to said jet assembly includes a water supply line and an air supply line, said supply lines extending between the water and air supplies in the spa tub to said hydro-massage jet assembly for discharge through said discharge jet.

24. The unit as defined in claim 21 and further comprising means for restricting outlet flow of discharged fluid from said housing thereby increasing the fluid pressure within said housing to expand said diaphragm, said discharge jet discharging fluid into the pressurized fluid environment.

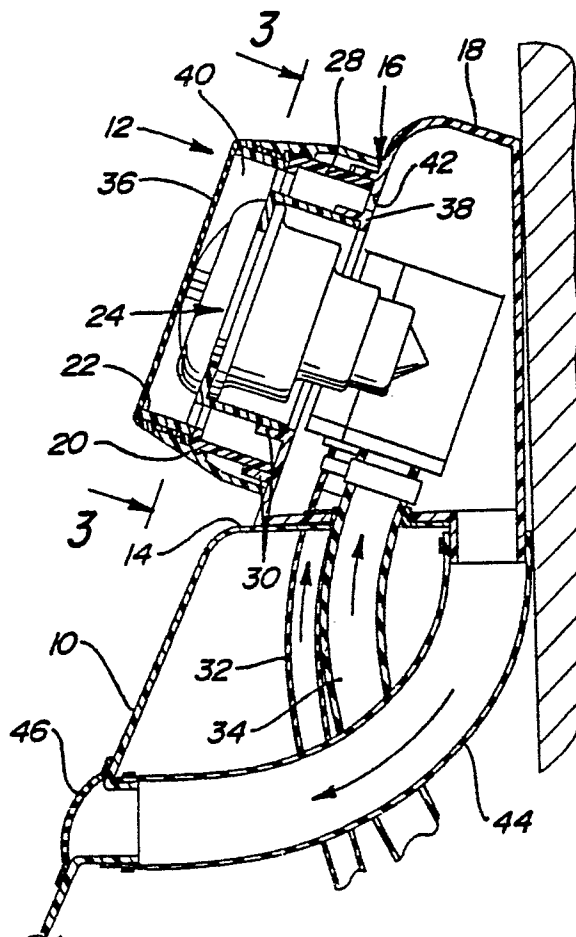
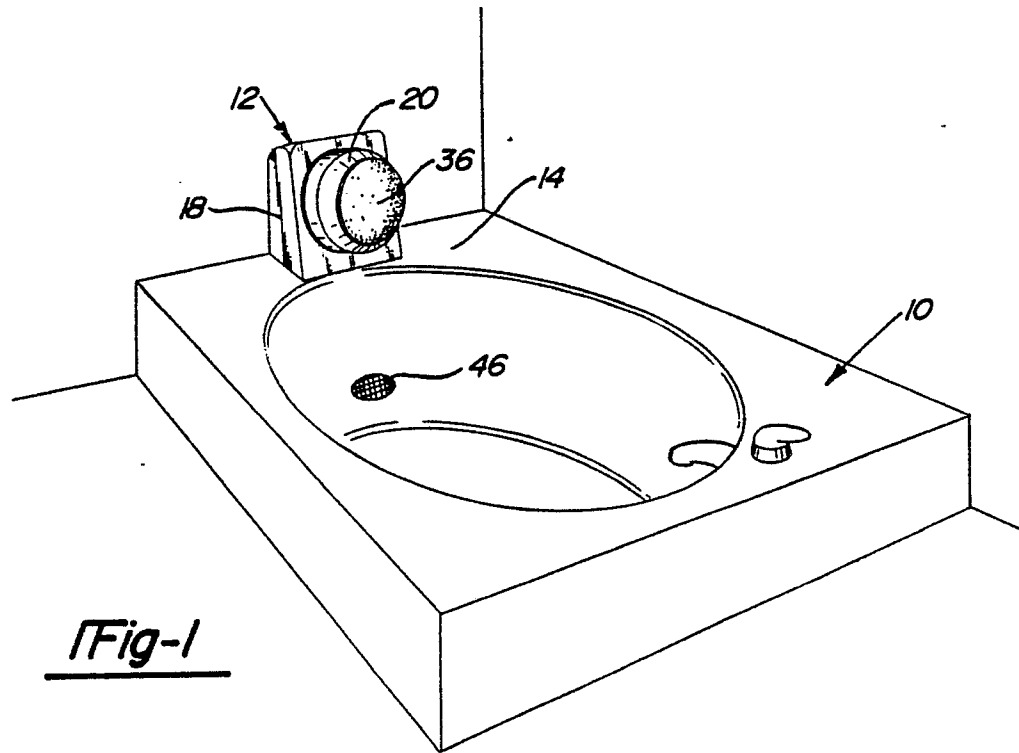
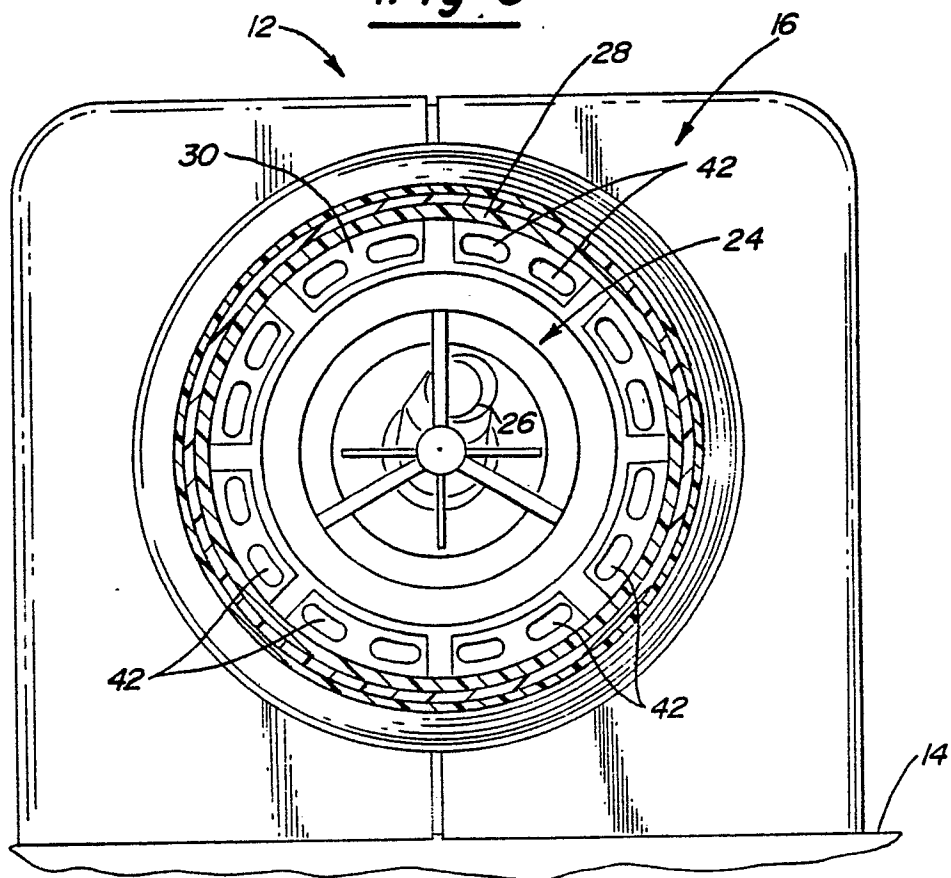
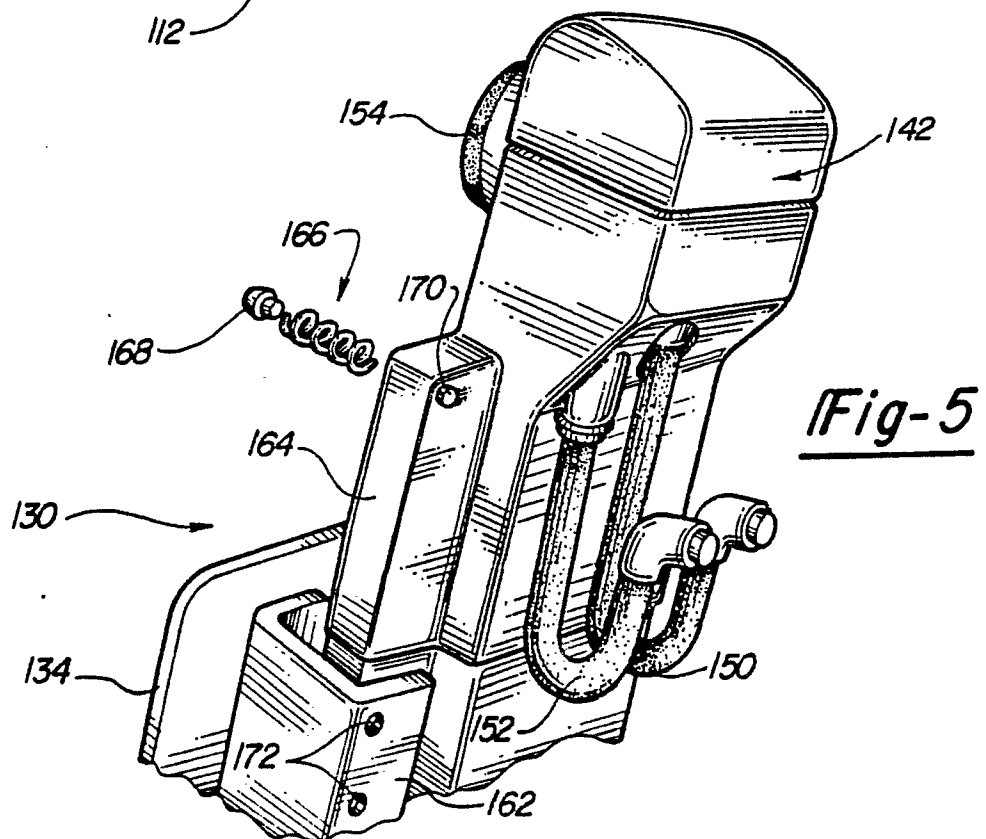
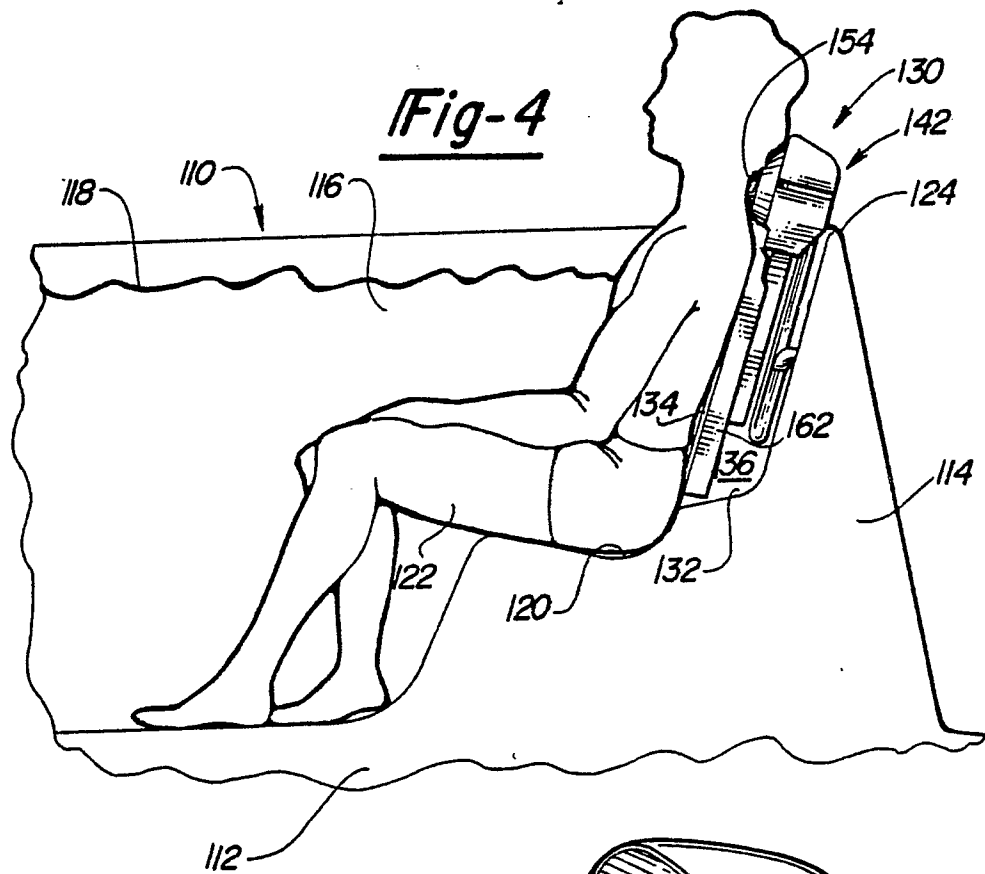
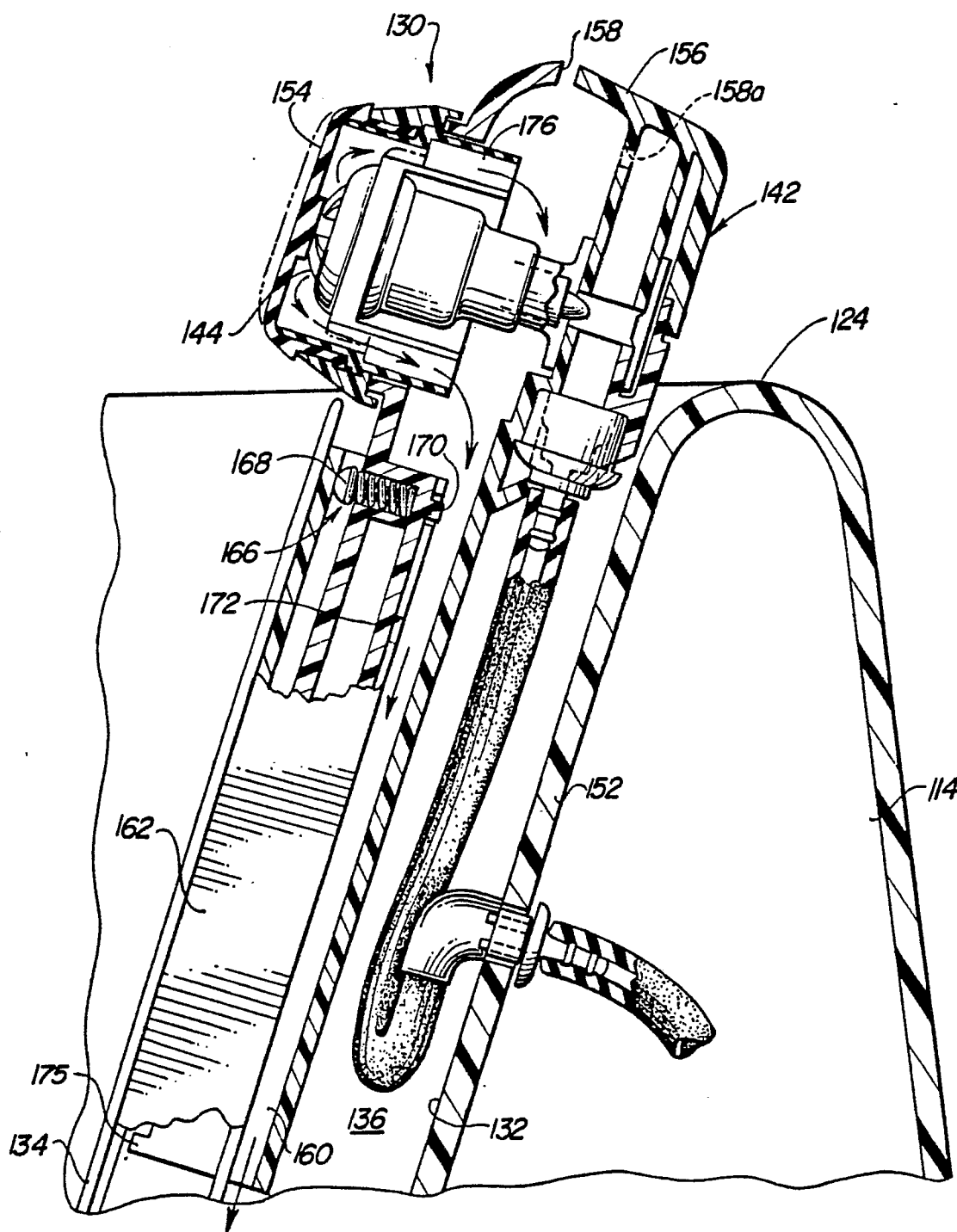


Fig-3





Fig-6

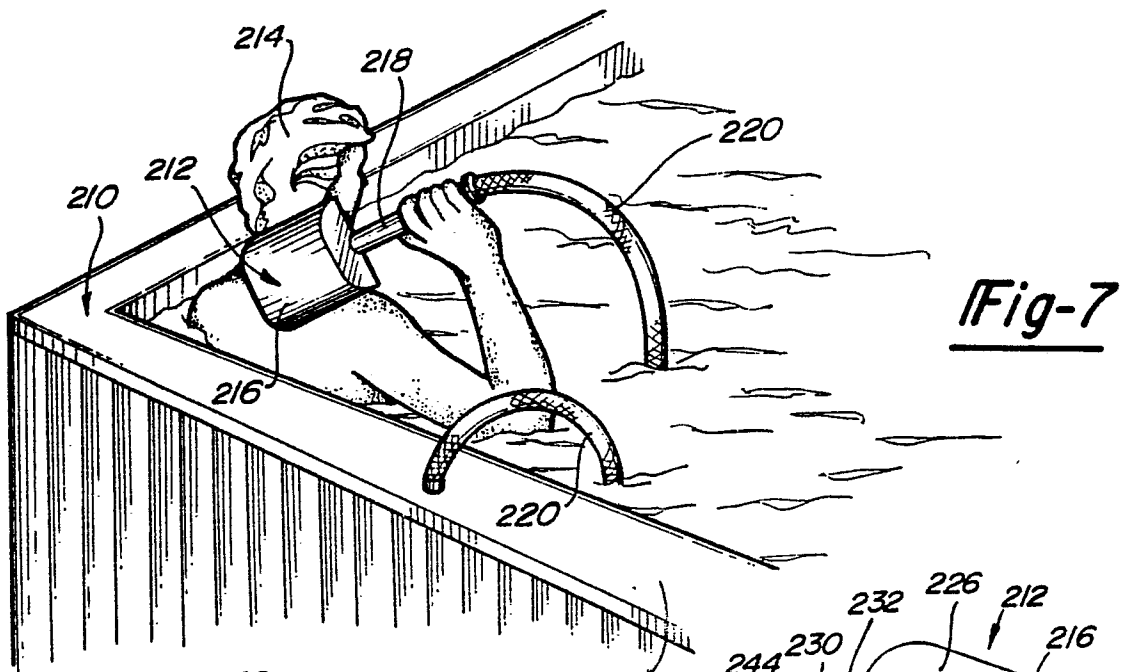


Fig-7

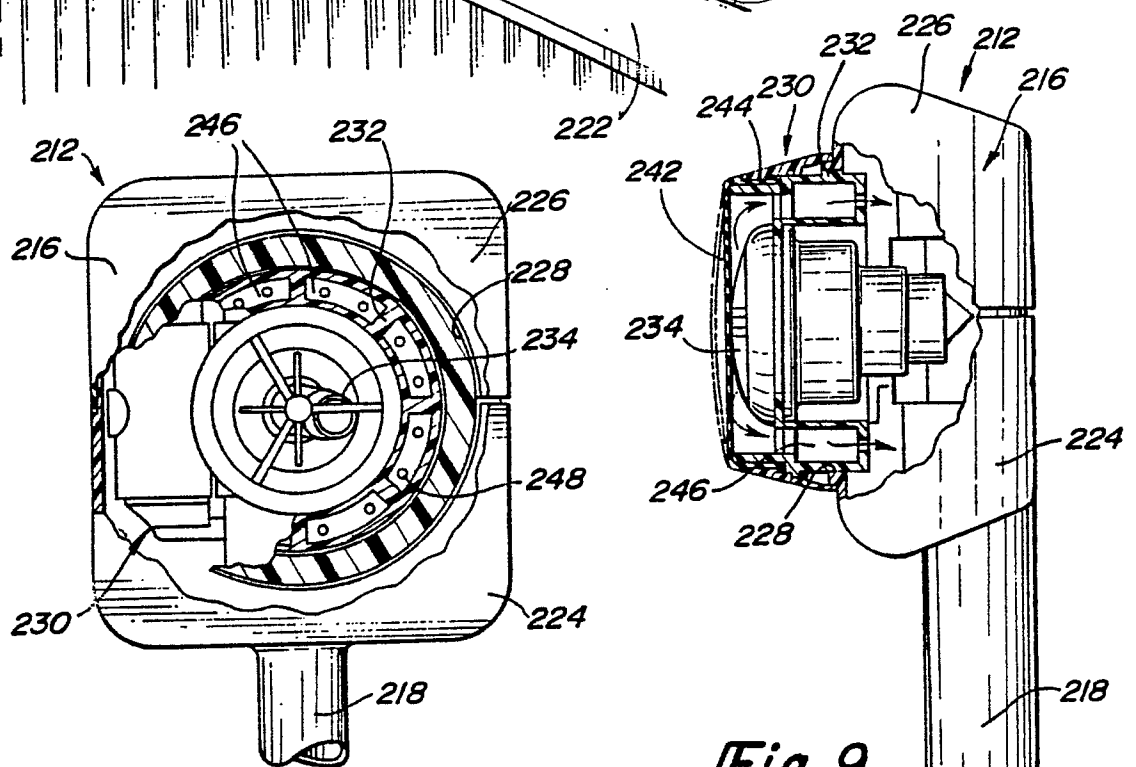


Fig-8

Fig-9