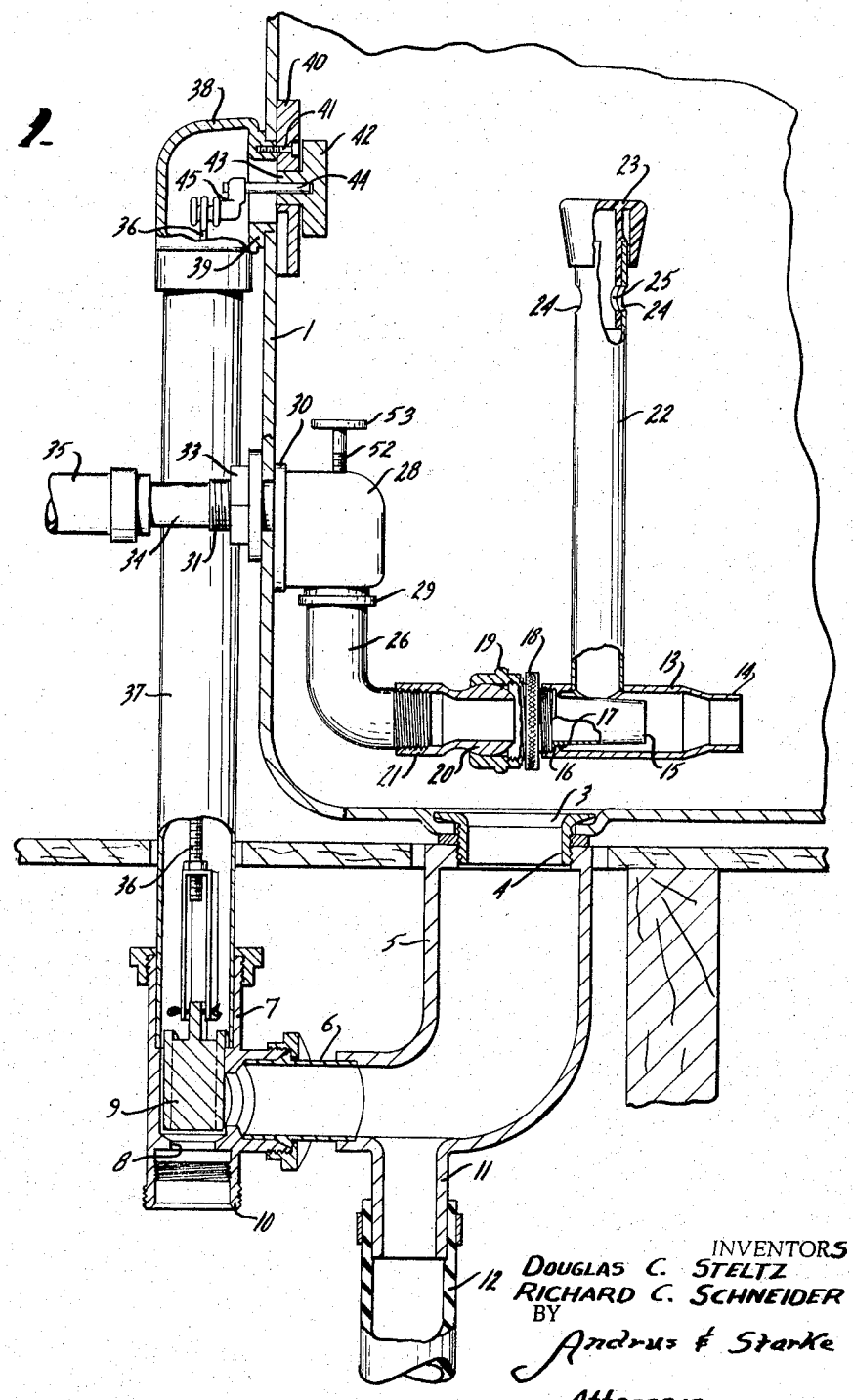
Sept. 12, 1967 D. C. STELTZ ETAL 3,340,870

HYDROTHERAPEUTIC BATHTUB APPARATUS WITH INLET BELOW THE OVERFLOW OPENING

Filed Sept. 22, 1964 2 Sheets-Sheet 1

Fig. 1.



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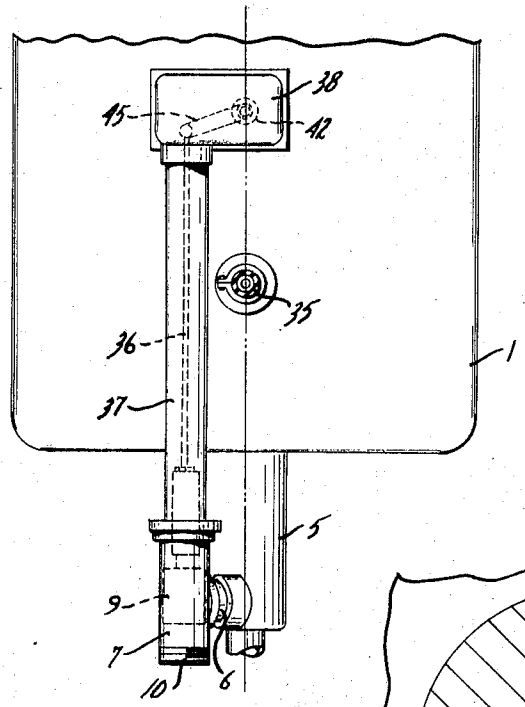


Fig. 2.

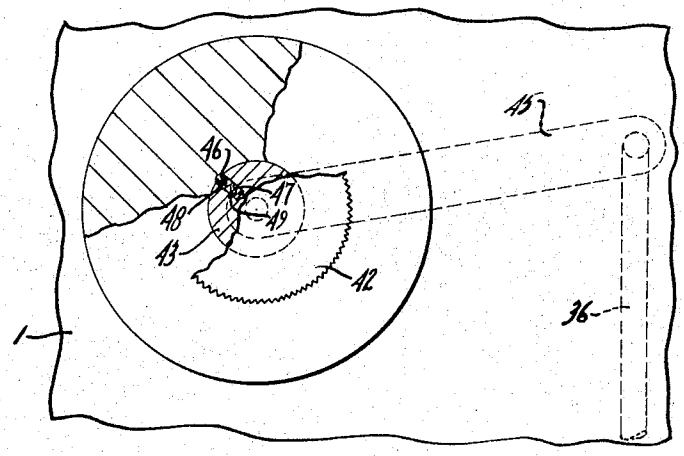


Fig. 4

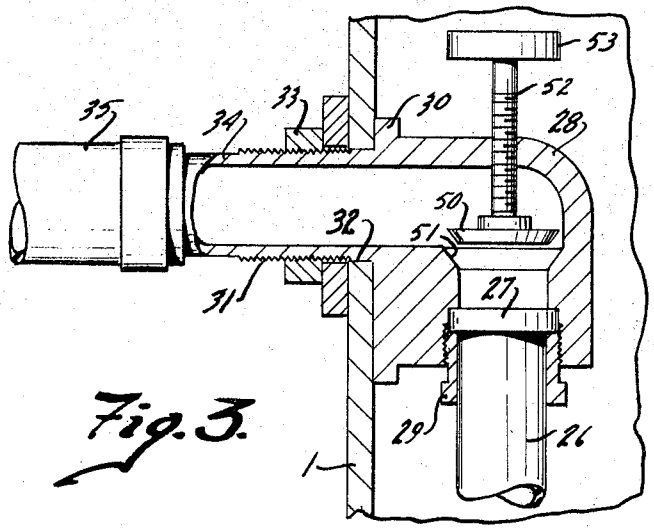


Fig. 3.

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HYDROTHERAPEUTIC BATHTUB APPARATUS WITH INLET BELOW THE OVERFLOW OPENING

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ABSTRACT OF THE DISCLOSURE

This invention relates to a hydortherapeutic unit which is permanently installed with a bathtub or tank. The pump and motor of the therapeutic unit are mounted outside of the tub, and water is supplied to the nozzle assembly located within the tub through an inlet opening provided in the end wall of the tub beneath the waste valve control opening. Water is ejected under high pressure from the nozzle assembly within the body of water in the tub and is recirculated to the pump through a return line which communiactes with the drain opening in the bottom of the tub.

This invention relates to a hydrotherapeutic apparatus to be installed in a bathtub or other water tank.

The conventional hydrotherapeutic unit which is used for the treatment of sore muscles, rheumatic conditions or the like, includes a motor driven pump and the outlet of the pump is connected to a nozzle assembly which is located within the tub or tank beneath the water level. Water is ejected under high pressure through the nozzle assembly and is directed against the portion of the body undergoing treatment. An air inlet pipe is normally associated with the nozzle assembly and the water being ejected through the nozzle creates an aspirating effect which draws air into the nozzle assembly and provides an aerated high pressure stream of water.

In one common type of hydrotherapeutic unit the entire unit, including the motor and pump, is located in the tub or tank in contact with the water. With units of this type the electrical connections to the motor have to be positively insulated to prevent shorting, and in many cases people are reluctant to use a unit of this type, knowing the inherent danger involved in operating an electrical device in water.

In another common type of hydrotherapeutic unit, the motor and pump are located outside of the tank while the nozzle assembly is located within the tank or tub and is connected to the pump by long hoses. A unit of this type, when used with a household bathtub, requires assembly and disassembly at the start and completion of each period of use. Furthermore, the entire unit including the long hoses, pump and motor must be handled and stored during periods of non-use.

The present invention is directed to a hydrotherapeutic unit which is permanently installed with a standard bathtub or other water tank. According to the invention the pump and motor are mounted outside of the tub, and water is supplied to the nozzle assembly located in the tub through an inlet opening provided in the end wall of the tub beneath the waste level control opening. Water is ejected under high pressure from the nozzle assembly within the body of water in the tub and is recirculated to the pump through a return line which communicates with the drain opening in the bottom of the tub.

The hydrotherapeutic apparatus of the invention can be used with household bathtubs, tanks, pools, or the like. It is particularly adapted to be installed with bathtubs in new building construction, but can also be installed with existing tubs.

As the pump and motor are located outside of the tub, the inherent danger of a possible electrical short is eliminated and this provides a distinct advantage over units in which the pump and motor are submerged in the water in the tub.

Other objects and advantages will appear in the course of the following description.

The drawings illustrate the best mode presently contemplated of carrying out the invention.

In the drawings:

FIGURE 1 is a vertical section of the hydrotherapeutic unit as installed in a standard bathtub.

FIG. 2 is an end view of the bathtub.

FIG. 3 is an enlarged vertical section showing the water inlet conduit extending through the tub; and

FIG. 4 is an enlarged fragmentary elevational view with parts broken away in section showing the waste control knob and connection to the waste valve rod.

The drawings illustrate a hydrotherapeutic unit installed with a standard bathtub **1**. The hydrotherapeutic unit, in general, includes a nozzle assembly **2** which is located within the tub **1** and water is supplied to the nozzle assembly by a motor-pump unit, not shown, which is mounted outside of the tub in any convenient location. For example, the motor-pump unit can be mounted on the partition wall studs, or mounted on the floor joists beneath the tub.

As best shown in FIG. 1, the bathtub **1** is provided with a standard drain opening **3**. A drain fitting **4** is secured within the opening **3** and the lower end of fitting **4** is connected to the upper end of an elbow **5** while the opposite end of the elbow is connected by pipe **6** to a standard waste fitting **7**. Waste fitting **7** defines a valve seat **8** which is adapted to be closed off by a conventional gate valve **9**. The lower end **10** of fitting **7** is threaded and is adapted to be connected to a drainage pipe.

The elbow **5** is also provided with a nipple **11** and a hose or conduit **12** is clamped, or otherwise secured, to nipple **11**. The hose **12** is connected to the suction or inlet side of a conventional motor driven pump and when the unit is in operation, and the valve **9** is closed, water will be drawn from the tub through the drain fitting **4** and flow through hose **12** to the pump.

The nozzle assembly **2**, which is located within the tub **1**, is similar to that disclosed in the copending application, Ser. No. 386,921, filed Aug. 3, 1964, of the same inventors. Generally, the nozzle assembly includes a tubular body **13** which is provided with an outlet **14** of reduced diameter. A tapered nozzle **15** is located within the body and is provided with an outwardly extending flange **16** which bears against a shoulder **17** formed in the body **13**. The flange **16** is maintained in tight bearing engagement with shoulder **17** by an adapter **18** which is threaded into the end of the body **13**.

To provide universal movement for the nozzle, a socket member **19** is threaded onto the adapter and defines a generally spherical surface or socket which receives the ball portion **20** of a water inlet pipe **21**. With this ball and socket type of connection, the body **13** of the nozzle can be moved in all directions with respect to the pipe **21**.

Air is drawn into the high pressure liquid stream through a standpipe **22** which communicates with the body **13**. The upper open end of standpipe **22** extends above the level of water in tub **1** and is enclosed by a rotatable cap **23**. A series of air inlet openings **24** are provided in the pipe **22** and the cap **23** is provided with a similar number of openings **25**. By rotating cap **23**, the openings **25** can be brought into partial or full alignment with openings **24** to thereby control the air flow into the standpipe **22**.

During operation, the nozzle assembly itself is located beneath water level and the upper end of the standpipe

will project upwardly of the water level so that air can be drawn in through the openings **24** and **25** by the aspirating effect of the water being discharged through the tapered nozzle **15**. Air being drawn through the standpipe will be mixed with the water stream to provide an aerated high pressure stream of water which is discharged from the outlet **14**.

Pipe **21** is connected to an elbow **26** and the upper end of the elbow is provided with a flange **27** which is located within an opening in a fitting **28**. A nut **29** is threaded within the opening in the fitting **28**, and the upper end of the nut bears against the flange **27** to prevent the elbow from being displaced from the fitting. This connection, however, permits the elbow **26**, as well as the nozzle assembly **2**, to be pivoted about the axis of the nut **29** so that the entire nozzle assembly and elbow **26** can be pivoted to a position close to the end wall of the tub when the hydrotherapeutic unit is not in operation.

The fitting **28** is also provided with a flange **30** which bears against the inner surface of the tub **1**, and fitting **28** is also formed with a threaded portion **31** which projects outwardly through an opening **32** formed in the end wall of the tub. The fitting **28** is secured to the tub wall by a nut **33** which is threaded on the end **31** and bears against a disc located against the outer wall of the tub. By threading down the nut **33**, the flange **30** of the fitting **28** is drawn tightly against the inner wall of the tub.

The end **34** of fitting **28** has a reduced diameter over that of the threaded portion **31** and a hose or conduit **35** is clamped to the end **34** and is connected to the outlet or discharge side of the pump.

Conduits **12** and **35** are preferably formed of non-metallic, electrically insulating materials so that there is no metal-to-metal connection between the motor-pump unit and the nozzle assembly **2**.

With this construction, water under high pressure is discharged from the pump and passes through the hose **35** and fitting **28** to the nozzle assembly **2** where it is discharged as a high pressure aerated stream into the body of water located within the tub. The water is continuously withdrawn from the tub through drain fitting **4** and is recirculated through hose **12** to the pump.

In order to provide a uniform discharge of high pressured water for all areas of the tub, it is important that the nozzle assembly **2** be mounted along the longitudinal center line of the tub **1**, as shown in the drawings. To mount the nozzle assembly along the center line, it is necessary to alter the normal construction of the waste valve control. The waste valve **9** is secured to the lower end of the vertical rod **36** which extends upwardly within a tube **37**, depending from the lower end of a housing **38**. The housing **38** bears against the outer surface of the tub wall and is provided with a pair of bosses **39** which extend through the waste control opening in the end wall of the tub. A ring **40** is positioned against the inner wall of the tub, and a series of screws **41** extend through the ring and are threaded within the bosses **39** to firmly position the ring and housing **38** in relation to the bathtub.

A knurled hand knob **42** is provided with an inner section **43** of reduced diameter which is rotatably mounted within the central opening in the ring **40**. A shaft **44** is threaded within an opening in the inner section **43** of knob **42** and is pivotally connected to one end of a link **45**. The other end of link **43** is connected to the upper end of the valve rod **36**. With this construction, rotation of the hand knob **42** will pivot the link **45** to thereby move the rod **36** in a generally vertical path of movement. Link **45** provides an offset so that the valve control rod **36** will extend downwardly at a location spaced from the longitudinal center line of the tub and thus will not interfere with the connections to the nozzle assembly **2**.

To maintain the valve in the open position, a ball or detent **46** is mounted within a recess **47** formed in the inner section **43** of knob **42** and is adapted to engage a socket **48** in the inner wall of ring **40**. The ball **46** is urged outwardly by a coil spring **49** which is located within the recess **47**. The socket **48** is positioned so that when the knob **42** is rotated, the ball **46** will engage the socket **48** when the valve is in the open position and the engagement will prevent the valve from falling by gravity to the closed position.

To control the flow of water through the nozzle assembly, a valve **50** is located within the fitting **28** and is adapted to seat on a valve seat **51**. The valve **50** is connected to the inner end of a stem **52** which is threaded within an opening in the fitting. A knob **53** is secured to the end of stem **52** and by turning the knob the valve **50** can be opened and closed to regulate the flow of water to the nozzle assembly. The valve **50** permits the user of the unit to adjust the pressure of the discharged water stream to his liking and also enables the pressure to be reduced during cleaning when the tub is empty so that splashing will be minimized.

As both the pump and the motor are located outside of the tub, the present unit eliminates the inherent danger which is present with a device in which the pump and motor are located within the water in the bathtub. The pump motor can be actuated by a switch located a substantial distance from the tub, or, alternately a low voltage circuit can be used in which case the switch can be located adjacent the tub.

The water is supplied to the nozzle assembly through opening **32** formed in the end wall of the tub beneath the normal waste valve control opening, and because of this, the unit is particularly adaptable for installation in new construction, in which case the tub would be preformed with the opening **32**. In the case of existing tubs, the opening **32** has to be drilled in the end wall of the tub.

As it is important that the nozzle assembly be located along the longitudinal center line of the tub to provide proper water flow, provision is made for altering the position of the waste valve control rod so that the actuating lever is along the longitudinal center line of the tub, while the rod itself is offset from the center line where it will not interfere with the water supply to the nozzle assembly.

The nozzle assembly itself is provided with two separate types of movement. The nozzle assembly is connected through a ball and socket joint to the elbow **26**, the elbow, in turn, is mounted by a swivel connection to the fitting **28**. This construction enables the nozzle assembly to be moved universally to direct the water in all directions against the portion of the body to be treated. In addition, the swivel connection with the fitting **28** enables the entire nozzle assembly **2** and the elbow **26** to be swung against the end wall of the tub **1** when the unit is not in use so that the nozzle assembly will not interfere with normal use of the bathtub.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

We claim:

1. A hydrotherapeutic unit, comprising a bathtub having a drain opening in the bottom surface thereof and having a waste valve control opening in the end wall of the tub in alignment with the longitudinal center line of the tub, said tub having a second opening in the end wall disposed along the longitudinal center line of the tub and located beneath said waste control opening, supply conduit means extending within the second opening in said tub for supplying liquid from a pump to the tub, a nozzle assembly located within the tub and connected to said supply conduit means, return conduit means communicating with the drain opening in the tub for returning water from the tub to the inlet of the pump, drain

conduit means communicating with said return conduit means, valve means disposed in said drain conduit means for selectively opening and closing said drain conduit means, a control member connected to said valve means and extending upwardly along the outer surface of the bathtub, said control member being spaced laterally from the longitudinal center line of the bathtub, and an actuating member extending through said waste valve control opening and connected to said control member.

2. A hydrotherapeutic unit, comprising a bathtub having a drain opening in the bottom surface thereof and having a waste valve control opening in the end wall of the tub in alignment with the longitudinal center line of the tub, said tub also having a second opening in the end wall disposed along the longitudinal center line of the tub and located beneath said waste control opening, a liquid inlet conduit extending within the second opening and adapted to supply liquid from the outlet of a pump to the tub, a nozzle assembly located within the tub and connected to the inlet conduit, a return conduit communicating with the drain opening in the tub and adapted to return water from the tub to the inlet of the pump, a drain conduit communicating with the return conduit means, a valve disposed in the drain conduit for selectively opening and closing said drain conduit, said valve being offset from a plane passing through the longitudinal center line of the tub, a control member connected to the valve and extending vertically along the outer surface of the tub, and actuating means extending through the waste control opening in the tub and connected to the upper end of said control member.

3. The structure of claim 2 in which said actuating means includes a manually operable actuating member disposed in the tub and extending through the waste control opening and a link extends laterally from the inner end of said actuating member and is connected to the upper end of the control member.

4. The structure of claim 2, in which said supply conduit means and said return conduit means are formed at least in part of electrically insulating material to prevent an electrical conductive connection between said pumping means and said nozzle assembly.

5. A hydrotherapeutic unit, comprising a bathtub having a drain opening in the bottom surface thereof and having a waste valve control opening in the end wall of the tub, said tub having a second opening in the end

wall located at a level beneath the said waste control opening, supply conduit means extending within the second opening in said tub for supplying liquid from a pump to the tub, a nozzle assembly located within the tub and connected to said supply conduit means, return conduit means communicating with the drain opening in the tub for returning water from the tub to the inlet side of the pump, drain means communicating with one of said conduit means, valve means disposed in said drain means for selectively opening and closing said drain means, a control member connected to said valve means and extending upwardly along the outer surface of the end wall of the tub and disposed in a generally vertical plane offset from a vertical plane extending through said second opening and an actuating member extending through said waste valve control opening and connected to said control member.

6. The unit of claim 5, and including an elbow disposed within the tub, said elbow having a generally vertical portion extending downwardly along said end wall and connected to said supply conduit means, and said elbow having a generally horizontal portion connected to said vertical portion, said nozzle assembly being connected to said horizontal portion.

7. The structure of claim 6 in which the elbow is pivotally connected to said supply conduit means whereby the elbow and said nozzle assembly can be swivelled in a horizontal plane within the tub.

8. The structure of claim 6 in which the nozzle assembly is connected to said elbow through a universal joint to permit the nozzle to move universally with respect to the elbow.

9. The structure of claim 5, and including valve means disposed in said supply conduit means for regulating the flow of water through said supply conduit means.

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