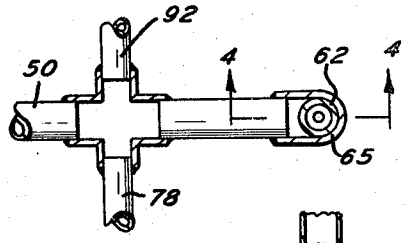
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WHIRLPOOL BATH

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FIG. 3



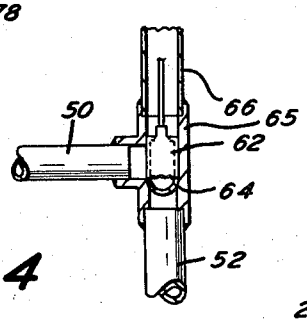
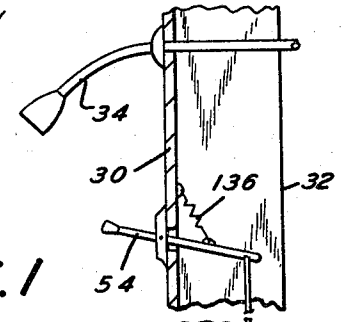
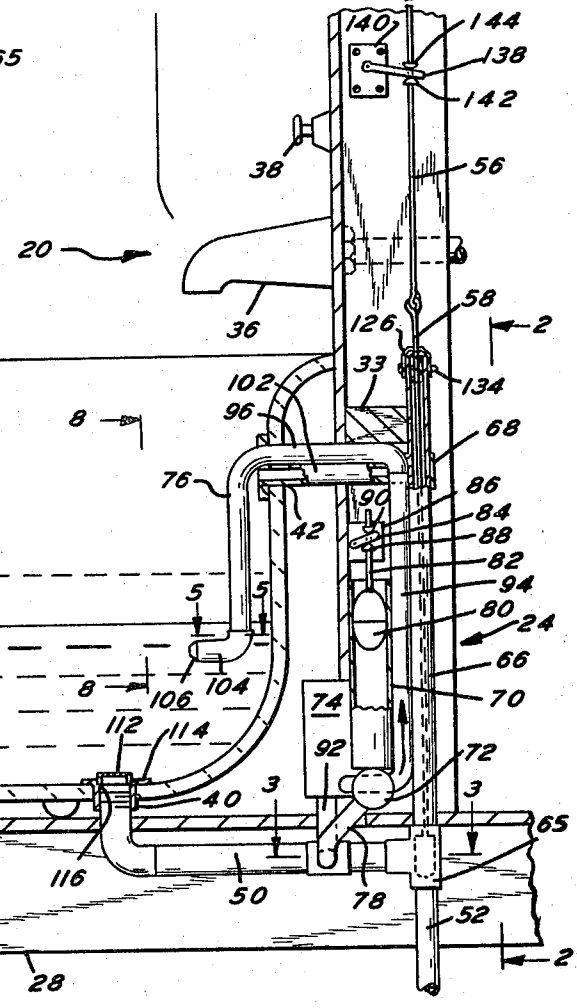


FIG. 4

FIG. 1





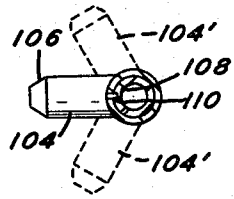


FIG. 5

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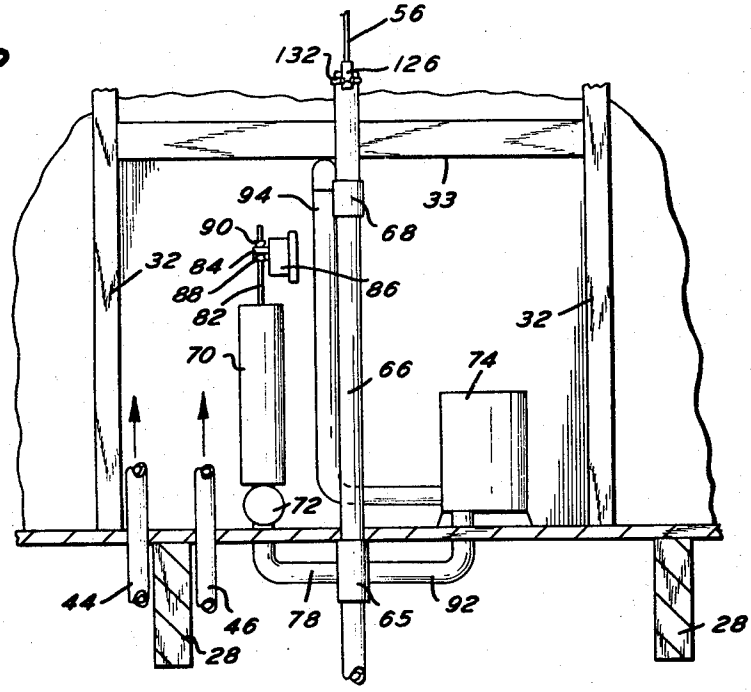
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WHIRLPOOL BATH

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FIG. 2



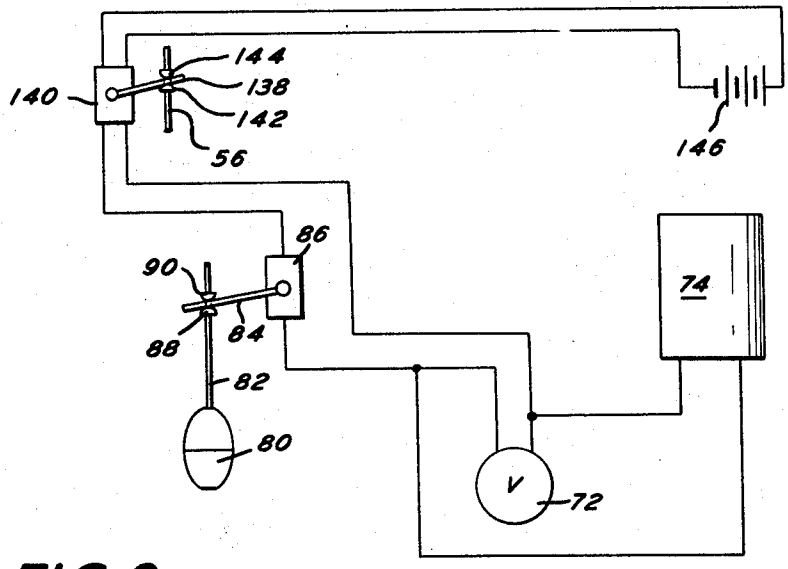


FIG. 9

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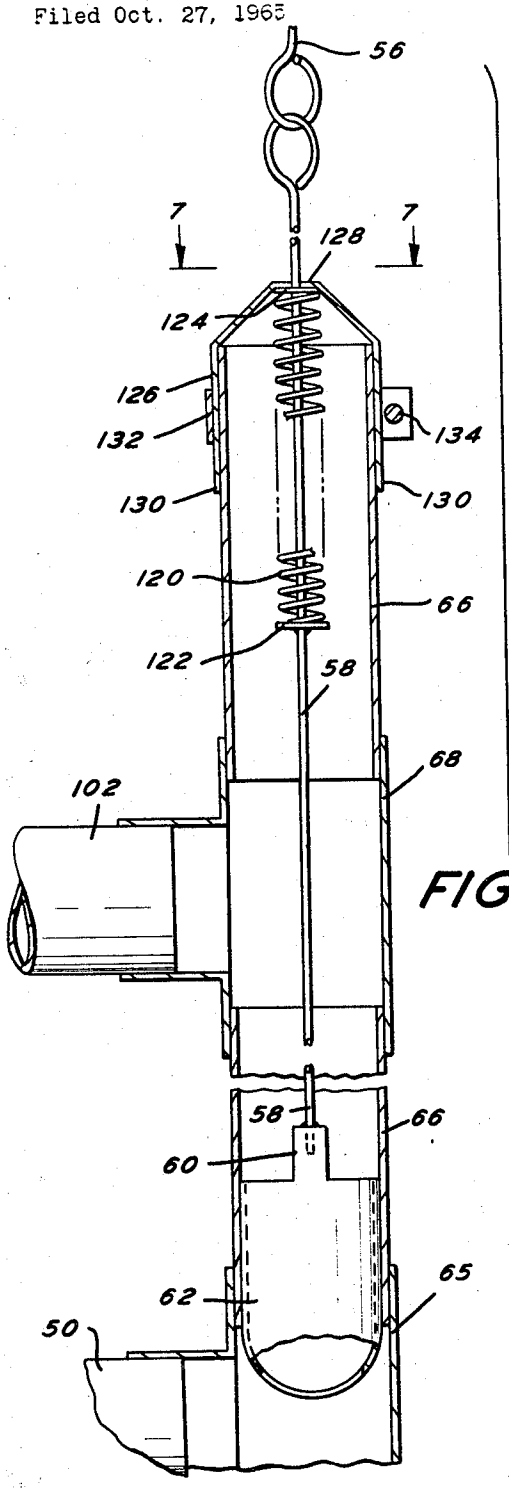


FIG. 6

FIG. 7

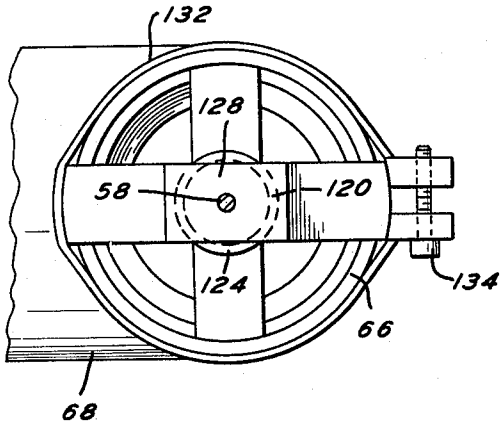
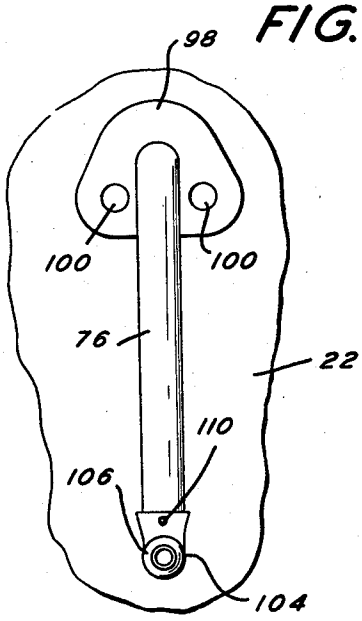


FIG. 8



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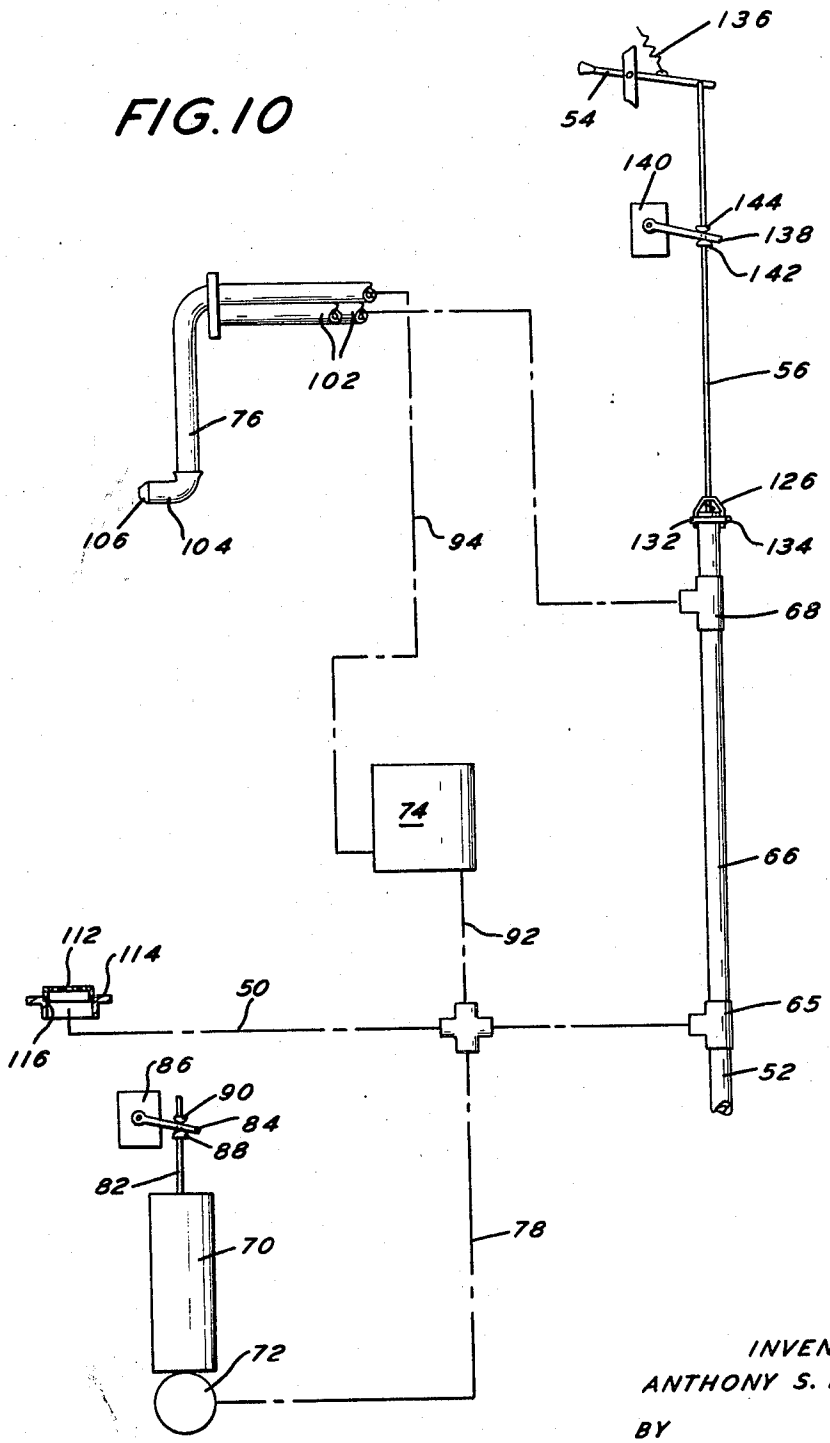
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WHIRLPOOL BATH

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FIG. 10



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WHIRLPOOL BATH

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12 Claims. (Cl. 4—178)

ABSTRACT OF THE DISCLOSURE

A whirlpool bath comprising a bathtub, a drain in the bottom of the bathtub, conduit means connecting the drain with a pump, and a nozzle connected with the pump for discharging water under pressure into the bathtub. The nozzle is positioned below the level of the water when the whirlpool bath is in operation. The motor is controlled by a switch which is actuated by the level of water in the bathtub, and the liquid level control for the switch is set to close the switch when the level of water within the bath tub is above the position of the nozzle.

This invention relates to a whirlpool bath, and more particularly, to a system adapted for use with a household bathtub to convert the same into a whirlpool bath.

The use of therapeutic or whirlpool baths and the advantages of the same on the body of a person undergoing treatment are now well known. There are now many devices being marketed which will administer the hydromassage of a whirlpool bath treatment to persons suffering from various muscular or other disorders. These commercially available devices are quite costly and also take up a large amount of space. This is because the commercially available devices include their own large stainless steel tubs and a self-contained pump for recirculating the water under pressure. For these reasons, whirlpool baths are not generally used in the home.

A number of devices have been suggested for use in a bathtub within the home for converting the bath tub into a whirlpool bath. For the most part, these devices comprise self-contained pumps and nozzles which are inserted directly into the bathtub. These devices also suffer from a number of shortcomings. The most important of these shortcomings is the fact that the devices consume a large amount of space relative to the overall size of the bath tub. Thus their usefulness is severely curtailed. Furthermore, the user of the device must turn on an electric switch by directly contacting the switch, which presents the inherent danger of electric shock, since the user may be wet when the device is turned on.

The system of this invention is specifically adapted for converting a household bath tub into a whirlpool bath. However, using the system of this invention, the bath tub may still be used for its intended purpose of being a bathing tank. One of the specific advantages of the system of this invention is that there is no direct contact with any electrical switch by the user of the bath tub. Thus there is no fear of any possible injury from electric shock when using the system of this invention.

It is therefore an object of this invention to provide a novel whirlpool bath.

It is another object of this invention to provide a system for converting a household bathtub to a whirlpool bath.

It is a further object of this invention to provide a whirlpool bath that is entirely safe to the user.

It is a further object of this invention to provide a whirlpool bath which is controlled by the level of water within the bathtub.

It is a further object of this invention to provide a whirlpool bath which can be selectively used as a conventional bathtub or as a hydrotherapy bath.

It is a further object of this invention to provide a whirlpool bath in which the temperature of the water can be maintained without any external heating elements.

These and other objects of this invention are accomplished by providing a whirlpool bath comprising a bath tub, a drain in the bottom of said bath tub, conduit means connected with said drain, means for closing said conduit means, said conduit means being connected with second conduit means, a pump on said second conduit means, a discharge nozzle associated with said pump, said nozzle adapted to discharge water into said bath tub, and switch means for causing the start of operation of said pump, said switch means being controlled by the level of water in said bathtub.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a side sectional view of the whirlpool bath of this invention;

FIG. 2 is a sectional view taken along the line **2—2** of FIG. 1;

FIG. 3 is a sectional view taken along the line **3—3** of FIG. 1;

FIG. 4 is a sectional view taken along the line **4—4** in FIG. 3;

FIG. 5 is a sectional view taken along the line **5—5** of FIG. 1;

FIG. 6 is an enlarged sectional view of the overflow drain of the whirlpool bath of FIG. 1;

FIG. 7 is an enlarged sectional view taken along the line **7—7** of FIG. 6;

FIG. 8 is a front elevational view of the discharge nozzle of the whirlpool bath of this invention, and taken in the direction of line **8—8** of FIG. 1;

FIG. 9 is a wiring diagram for the whirlpool bath of this invention; and

FIG. 10 is a piping diagram for the whirlpool bath of this invention.

Referring now in greater detail to the various figures of the drawings wherein similar reference characters refer to similar parts, a whirlpool bath embodying the present invention is generally shown at **20** in FIG. 1. Device **20** basically comprises a bathtub **22** and a pumping system generally shown at **24** in FIG. 1.

Bathtub **22** is of the conventional household type and rests on floor **26**. Floor **26** is in turn supported by joists **28**. A wall **30** conceals the piping for the bathtub **22**. Wall **30** is supported by vertical studs **32** and horizontal stud **33**.

The piping usually found with a household bathtub is also used with the whirlpool bath of this invention. Thus, there is a shower nozzle **34**, a bath nozzle **36**, hot and cold water faucets **38** (one shown) and an emptying drain **40**. An overflow drain **42** is placed near the top of tub **22**. A hot water pipe **44** and a cold water pipe **46** (FIG. 2) are positioned behind wall **30**.

In normal usage, the water **48** in bathtub **22** will be exhausted through drain **40**. This water will pass through discharge conduit **50** and into pipe **52** which carries the discharged water to the house sewage system. When it is desired to fill the bathtub for taking a bath, the discharge conduit **50** is sealed. This is accomplished by pivoting lever **54** (FIG. 1) upwardly. This in turn causes a downward movement of rod **56** which is pivotally secured to the back end of lever **54**. Rod **56** is linked to a second rod **58**. Longitudinal movement of rod **56** will therefore cause a similar longitudinal movement in rod **58**. It is to be understood that rods **56** and **58** can be a single rod without departing from the scope of this in-

vention. Rod 58 is threadedly secured in the yoke 60 of stopper 62 (FIG. 6). To provide a more permanent securement, the rod 58 can additionally be soldered to yoke 60. As seen in FIG. 4, when rods 56 and 58 are moved downwardly, stopper 62 rests in a seat 64 of T-coupling 65. In this position, stopper 62 seals discharge conduit 50 and prevents the water in conduit 50 from entering pipe 52. As is apparent from FIG. 6, any of the water entering overflow pipe 66 through overflow coupling 68 will pass through stopper 62 which is hollow. Thus, the stopper 62 will seal the discharge conduit but will freely permit any overflow water to pass into emptying pipe 52.

To the extent that the bathtub and its piping are described above, they are exemplary of the systems now in current usage in most households. The whirlpool bath system of this invention is adapted to be connected directly into the plumbing now in current usage. Additionally, the whirlpool bath system of this invention is sufficiently compact in size to fit into the plumbing space behind substantially all of the bathtubs now in current usage. This space is readily accessible through a removable door concealing the bathtub plumbing. For this reason, it is possible to use the whirlpool bath system of this invention on existing bathtubs or to install it during the construction of a bathroom having a bathtub.

As best seen in FIGS. 1 and 2, the whirlpool bath system of this invention comprises a float chamber 70, a solenoid valve 72 at the entrance to the float chamber, a combined motor and centrifugal pump 74 and a discharge pipe 76. Float chamber 70 is a hollow vertically extending cylinder. Water enters float chamber 70 through pipe 78 and solenoid valve 72. As seen in FIGS. 1 and 3, pipe 78 is coupled to discharge conduit 50.

A float ball 80 which can be brass, plastic or rubber, is positioned in float chamber 72. A rod 82 is threadedly connected in the top of float ball 80. Rod 82 passes through a hole in toggle 84 which in turn is connected through a plastic rod to waterproof switch 86. A collar 88 is positioned below toggle 84 and a collar 90 is positioned above toggle 84. These collars can be held on rod 82 by any suitable means, such as set screws. Thus, rod 82 is freely slidable in toggle 84, but the sliding movement is limited by collars 88 and 90.

Motor and pump 74 is also coupled to discharge conduit 50 by pipe 92. The motor and centrifugal pump combination is the same as that generally used for pumping water in a whirlpool bath. If desired, the motor and pump can be separate from each other and need not be combined in a single housing. Any of the motor and pump combinations now used in whirlpool baths are adapted to be used with the system of this invention.

The outlet side of pump 74 is connected to pipe 94. Pipe 94 is in turn connected to discharge pipe 76. The top 96 of discharge pipe 76 is horizotal and passes through the area of overflow drain 42. In order to accommodate the system of this invention, the usual perforate plate covering the overflow drain is replaced by an imperforate plate 98 (FIG. 8). Plate 98 has one opening therethrough for the reception of nozzle 76. Below this opening there are a pair of aligned openings 100. A pipe 102 connects each opening 100 with overflow pipe 66. Thus, if the level of the water within the bathtub should ever reach the level of pipes 102, the excess water will pass through pipes 102 into overflow pipe 66. Thereafter, this water will pass downwardly through the hollow center of stopper 62 and into emptying pipe 52. Since the overflow pipes 102 are below the horizontal portion 96 of the discharge nozzle, there is no fear of the water leaking into the area of the discharge pipe and behind the tub.

A discharge nozzle 104 is fitted on the bottom of pipe 76. Nozzle 104 is basically L-shaped and includes a constricted end 106. Having this constriction increases the velocity of the water emanating from the nozzle. As seen in FIG. 5, nozzle 104 is rotatably mounted on pipe 76 and is pivotable to the positions shown at 104'. This mounting is accomplished by providing a slot 108 near the bottom of pipe 76. A set screw 110 passes through the vertical portion of nozzle 104 and extends into slot 108. Thus, the rotational movement of nozzle 104 is limited by the abutment of set screw 110 against the walls of slot 108. The combination of the set screw and slot also serves the function of retaining the nozzle in place on the bottom of pipe 76. Suitable means such as an O-ring can be used to prevent any leakage at the joint between nozzle 104 and pipe 76.

A perforated plate 112 is placed over the outlet drain 40 of the bathtub. This perforated plate has an annular dependent perforated flange 114 projecting downwardly. The plate 112 is positioned in the outlet drain and rests on a shoulder 116 in the outlet. As seen in FIG. 1, the top surface of perforated plate 112 is raised above the bottom of the bathtub. The purpose for this is to prevent the inadvertent stoppage of water flow from the bathtub when the pump 74 is operating. Thus, if the user of the whirpool bath should inadvertently place his foot over the plate 112, liquid would still leave the bathtub through the holes in perforated flange 114. In this way, there is no danger of destroying the pump 74 because of lack of water reaching the pump when it is recirculating water from the tub.

When it is desired to use the bathtub either as a whirlpool bath or in a conventional manner, lever 54 is raised to the position shown in FIG. 1. This in turn forces stopper 62 downwardly to the position shown in FIG. 4. In order to make certain that the stopper 62 does not vibrate during the use of the bathtub as a whirlpool bath spring 120 (FIG. 6) is provided. Spring 120 is a compression spring and is telescoped over rod 58. Its lower end abuts washer 122 which is welded or soldered to rod 58. The top of spring 120 abuts washer 124 which in turn abuts bracket 126. Rod 58 passes through washer 124 and a central opening in bracket 126. Bracket 126 includes a horizontal top portion 128 and vertical dependent legs 130 which abut the outer wall of pipe 66. Legs 130 are releasably secured to pipe 66 by a clamp 132 which is tightened by screw 134. The clamp 132 functions in the same manner as a conventional hose clamp.

The purpose of clamp 132 is to adjust the compression of spring 120. Thus the positioning of the lower end of spring 120 is fixed by the position of washer 122 which is not adjustable. Therefore any adjustment in the amount of compression is accomplished by the pressure applied against the top of the spring. By loosening clamp 132, spring 120 is permitted to expand. When the desired compression of the spring is reached the clamp 132 is tightened and the spring will be held rigidly in place. The desired compression will be achieved when a point is reached whereby stopper 62 will not vibrate when the pump is functioning while at the same time the compression is sufficiently light to permit lever 54 to be returned to a downward position, that is, a position which has the outside portion lower than that which is shown in FIG. 1. Thus, in the downward position the stopper 62 will be at the position shown in FIG. 6. In order to aid in maintaining the lever 54 in a downward position, a tension spring 136 connects lever 54 with wall 30. When the lever 54 is raised, an over-the-center point will be reached whereby spring 136 will not cause the return of the lever.

Rod 56 passes through a toggle 138 which is connected through a plastic rod to waterproof switch 140. Switch 140 can be the same type as switch 86. A collar 142 is secured to rod 56 below toggle 138 and a collar 144 is secured to rod 56 above toggle 138.

It is thus seen that when lever 54 is raised, toggle 138 will be lowered by collar 144. The lowering of toggle 138 in turn closes switch 140. Referring now to FIG. 9, it is seen that switch 140 is connected to a voltage source 146 such as a household receptacle. After lever 54 has been raised, thereby closing switch 140 and sealing discharge conduit 50, water faucets 38 are turned on. This

will cause the filling of tub **22** with water, since the water can no longer leave through discharge conduit **50**. Simultaneously with the filling of tub **22**, the water level in float chamber **70** will also rise. This is because float chamber **70** is connected to discharge conduit **50** through pipe **78**. Solenoid valve **72** is normally open and therefore will permit the water to enter float chamber **70**. It should also be noted that pump **74** is connected to the discharge conduit **50** through pipe **92**. However, since the pump is not in operation at this time, the water will not pass through the pump.

The tub is filled until the desired height is reached. If the height is at a relatively low level, the tub can be used in its conventional manner. However, if it is desired to use the tub as a whirlpool bath, water is added to the tub until float ball **80** is caused to rise. As the float ball **80** continues to rise, collar **88** will abut toggle **84** and raise it to the upper position shown in FIG. 1. At this time, toggle **84** will close switch **86**.

Referring again to FIG. 9, it is seen that the closing of switch **86** will complete a circuit from the voltage source, through switch **140**, through solenoid valve **72**, and back through switch **86**. With the solenoid valve closed, water will no longer rise in float chamber **70**. Simultaneously with the closing of solenoid valve **72**, a new circuit is completed which passes through voltage source **146**, switch **140**, switch **86** and pump and motor **74**. Thus, at this time pump and motor **74** will be actuated.

Referring now to the piping diagram of FIG. 10, it is seen that the water leaving through discharge pipe **50** is prevented from entering float chamber **70** since solenoid valve **72** is closed. Likewise, the water cannot be discharged through pipe **52** since stopper **62** seals this pipe. Therefore, the water in discharge conduit **50** will automatically enter pipe **92** and thus enter pump **74**. The pump in turn forces the water through pipe **94** and out through the discharge pipe **76**. The water will be finally discharged through nozzle **104**.

Since water seeks its own level and since pump **74** is below the level of the water in tub **22**, the recirculation of the water is automatically maintained. Having the raised perforated plate **112** prevents the inadvertent stoppage of the water supply to the pump, which could damage the pump if the supply were cut off. Having stopper **62** maintained in place by the force of spring **120** prevents any vibration to the stopper. The purpose of preventing the vibration is to prevent the drawing of any air through the stopper into the pump which would hamper the operation of the pump. This is because there is a small amount of air maintained between stopper **62** and the trap on the pipe **52**.

As previously pointed out, nozzle **104** is rotatable around pipe **76** as an axis, as seen in FIG. 5. Thus, if it is desired to have the motion of the water going to either the left or right side of the body when a person is using the tub, this can easily be accomplished by changing the angle of nozzle **104**.

When it is desired to empty the tub and to turn off the whirlpool system, lever **54** is pivoted downwardly from the position shown in FIG. 1. This in turn will permit the water in the tub to drain through pipe **52**. Simultaneously with the lowering of the lever, collar **142** on rod **56** will cause the raising of toggle **138**. This will immediately open switch **140** which will in turn terminate the source of current to pump **74**, thereby ceasing the operation of the pump. With switch **140** open, solenoid valve **72** will no longer be energized and will thus return to its normal open position. With the solenoid valve open, the water within float chamber **70** will be drained. As this water is drained, float ball **80** will drop and eventually collar **90** will force toggle **84** downward. The float ball **80** normally is suspended from rod **82** by the toggle **84**. Collar **90** maintains the rod in place. When it is desired to use the whirlpool bath again, the same procedure as that described above is followed.

One of the safety features of the device of this invention is that the user will never come into direct contact with any electrical switches. Thus, the entire operation is controlled by lever **54**. Although lever **54** indirectly causes the closing of switch **140**, it is electrically isolated from the switch by a plastic rod which is connected to toggle **138**. The entire switch **140** is waterproof.

Another safety feature of the device of this invention is that nozzle **104** is always below the surface of the water. Thus, since the pump is controlled by float **80**, and float **80** is in turn controlled by the level of the water, the pump cannot operate until a certain predetermined level within the tub is reached. If the pump were permitted to operate independently of the water level, there is always the danger that it can be turned on at a time when nozzle **104** is above the level of the water. This in turn would cause a rapid discharge of water from the nozzle and a possible splashing of water throughout the room.

The level at which the whirlpool system will be turned on can be regulated through float ball **80**. Thus, float ball **80** is threadedly secured on rod **82**. By lowering the float ball the whirlpool apparatus will be turned on at a lower level within the tub. Likewise, the raising of the float ball will raise the level within the tub. In this way, the maximum water level for using the tub in a conventional manner, without the whirlpool apparatus in operation, can easily be set.

Another feature of the system of this invention is that the overflow drain **42** is still usable even with the system in operation. Thus, if the water should ever reach too great a height, the excess water will be carried off through pipes **102** into drain pipe **66**. Having this feature permits the maintenance of a desired water temperature. Thus, when during the use of the whirlpool bath the temperature of the water becomes lower, it is possible to add more hot water through nozzle **36**. In fact, it is possible to continuously add hot water through the nozzle, with any excess water being immediately carried away through pipes **102**.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims, the invention may be practiced otherwise than as specifically described.

What is claimed as the invention is:

1. A whirlpool bath comprising a bathtub, a drain in the bottom of said bathtub, first conduit means connected with said drain, means for closing said first conduit means, said first conduit means being connected with second conduit means, a pump on said second conduit means, said pump having an inlet and outlet side, a discharge nozzle in liquid communication with the outlet side of said pump, said nozzle adapted to discharge water into said bathtub, switch means for causing the start of operation of said pump, said switch means being controlled by the level of water in said bathtub, which level is above the position of said nozzle within said tub, and a float chamber, said float chamber having a float ball therein and being in liquid communication with said first conduit means, whereby the level of liquid in said float chamber will be the same as the level in said bathtub, and said switch means will be controlled by the liquid level within said float chamber and actuated by said float ball.

2. The whirlpool bath of claim **1** and further including valve means in liquid communication with said float chamber, said valve means being openable and closable by circuitry including said switch means.

3. The invention of claim **1** and further including means covering said drain, said covering means comprising a perforated disc having a perforated dependent flange projecting downwardly therefrom, said flange being positioned in said drain, and said disc being positioned above the bottom of said bathtub whereby water leaving said bathtub passes through both said perforated disc and said perforated flange.

4. The whirlpool bath of claim 1 wherein said nozzle is pivotally mounted within said tub.

5. The whirlpool bath of claim 1 wherein said nozzle is positioned on a pipe which passes through an overflow drain on said tub, and conduit means positioned in said overflow drain below said pipe, said conduit means in said overflow drain being adapted to carry excess water from said tub into an emptying pipe.

6. The whirlpool bath of claim 1 and further including lever means, said lever means adapted to control stopper means for said bathtub, said stopper means serving to seal said first conduit means connected with said drain, said lever means being adapted to cause the closing of second switch means which are in circuit with said switch means for causing the start of operation of said pump.

7. The whirlpool bath of claim 6 wherein said lever means is pivotally connected to said stopper means by at least one rod whereby movement of said lever means causes a consequent movement of said rod and stopper means.

8. The whirlpool bath of claim 7 wherein said rod contains means for opening and closing said second switch means.

9. The whirlpool bath of claim 6 and further including spring means associated with said rod.

10. The whirlpool bath of claim 9 wherein said spring means comprises a compression coil spring, with the compression on said spring being adjustable.

11. In a whirlpool bath comprising a bathtub, pump means for circulating water, and a nozzle for discharging pumped water into said tub, said nozzle being positioned below a predetermined level of water within said bathtub when it is discharging water, a control system comprising first switch means and second switch means in circuit with said first switch means, said second switch means being actuatable by the level of water within said tub, said pump being in circuit with said first switch means and said second switch means, whereby said pump will be actuated when said predetermined level of water within the tub is reached, said second switch means being associated with a float chamber, said float chamber including a float ball adapted to actuate said second switch means when said predetermined level is reached, said predetermined level being adjustable within said float chamber.

12. The whirlpool bath of claim 11 and further including valve means associated with said float chamber, said valve means being in circuit with said second switch means, said valve means being closed when said second switch means is closed, whereby no further water will enter said float chamber when said valve means is closed.

References Cited

UNITED STATES PATENTS

1,691,577	11/1928	Lang	4—172
2,739,939	3/1956	Leslie	4—100
2,832,370	4/1958	Hill	137—433
3,271,790	9/1966	Schneider et al.	128—66
3,288,134	11/1966	Reich	128—66
3,319,266	5/1967	Schneider et al.	128—66

FOREIGN PATENTS

320,752	10/1929	Great Britain.
477,661	1/1938	Great Britain.

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