April 1, 1969 O. T. CHENEY 3,435,466

POWER LIFT BATHTUB SEAT

Filed May 29, 1967 Sheet 1 of 2

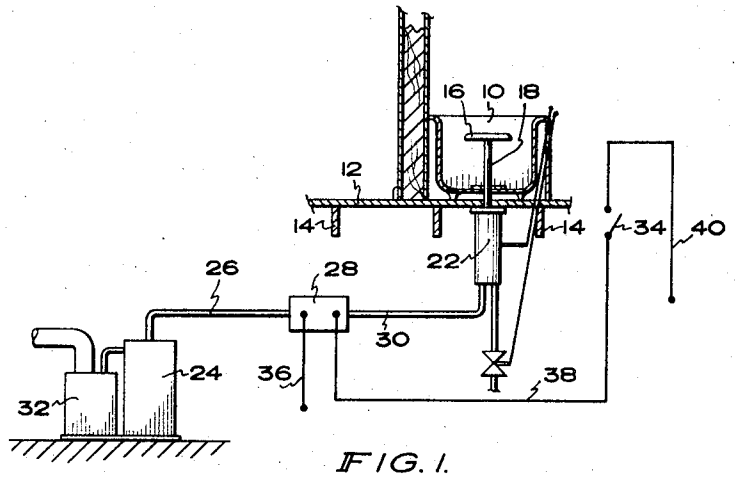


FIG. 1.

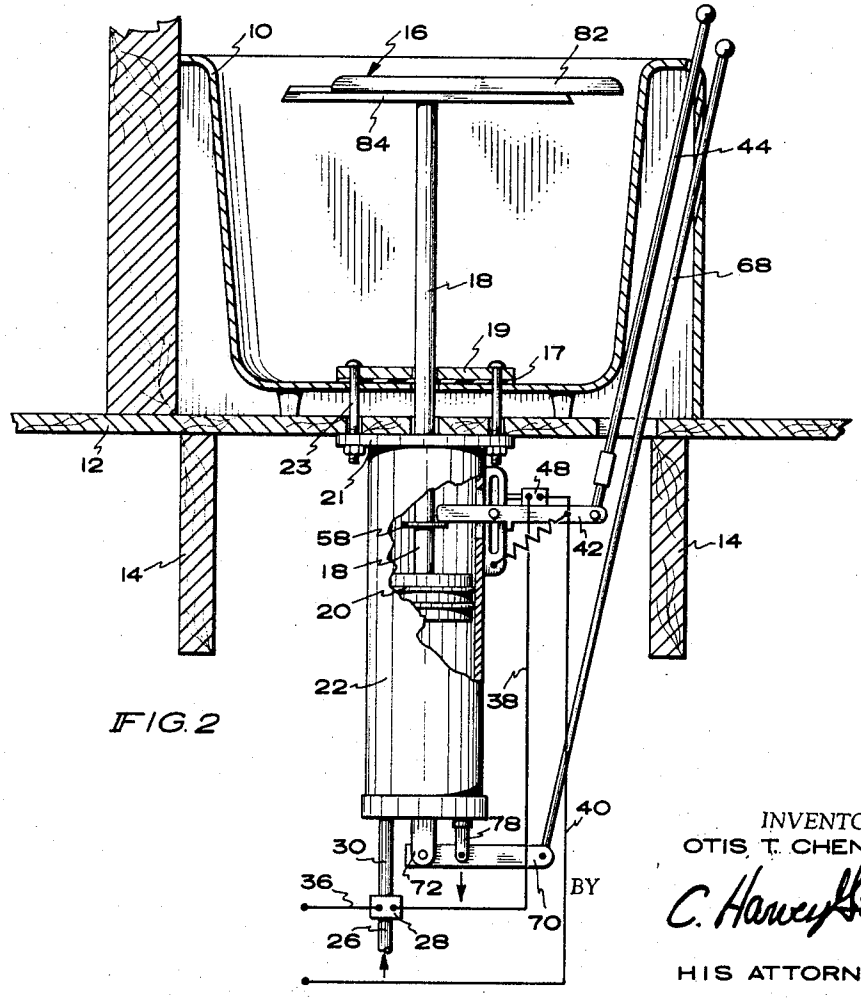


FIG. 2

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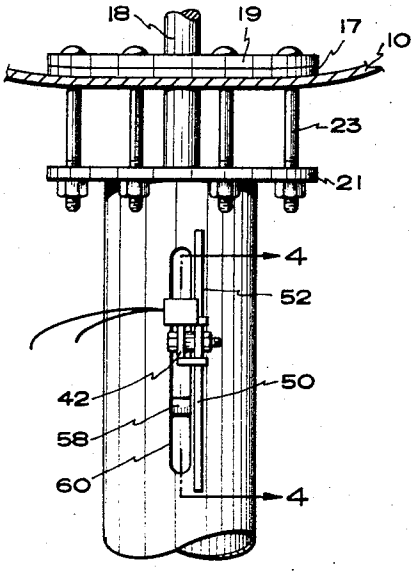


FIG. 3

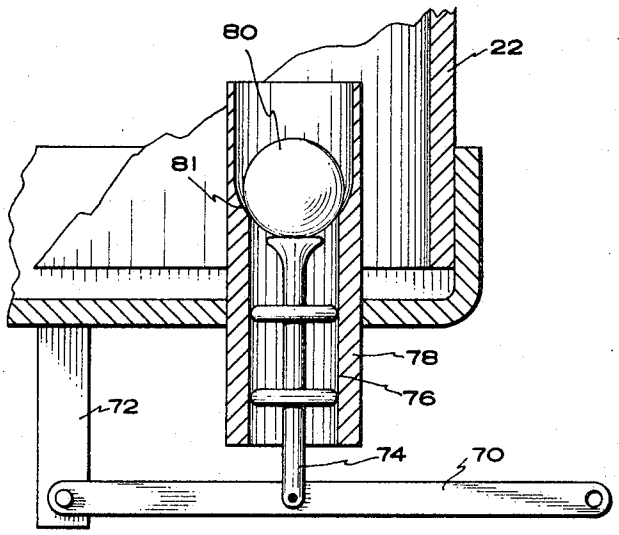


FIG. 5

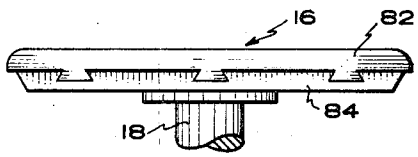


FIG. 6

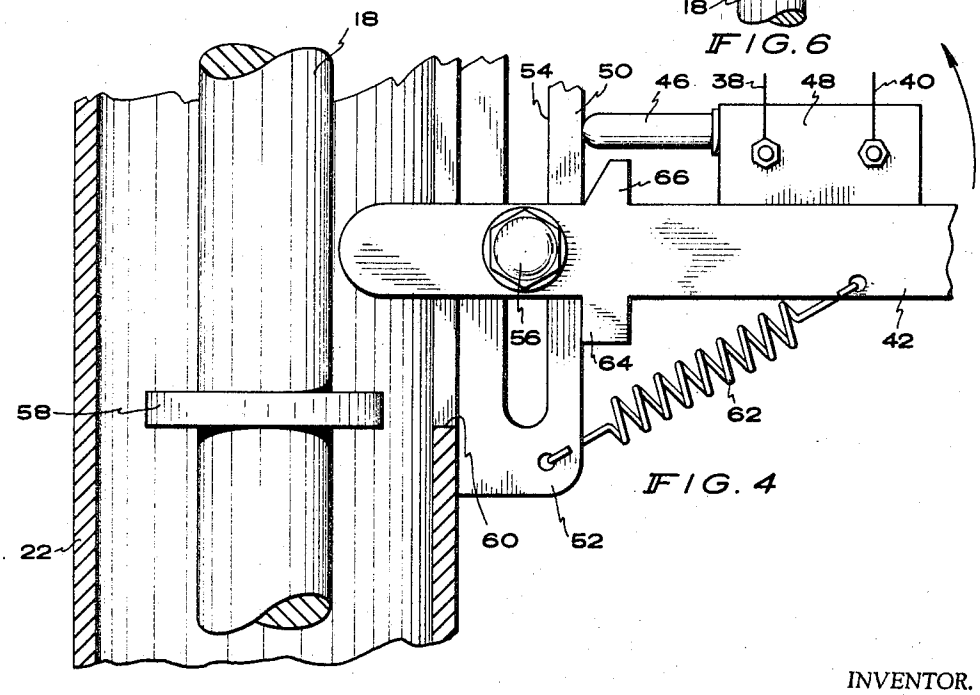


FIG. 4

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POWER LIFT BATHTUB SEAT

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U.S. Cl. 4—185 9 Claims

ABSTRACT OF THE DISCLOSURE

A power lift bathtub seat comprising a seat mounted on a vertical shaft, passed through the bottom of the tub, which is connected to a piston slidably mounted in a cylinder in communication with a source of pressurized fluid. Valve means are interposed between the cylinder and the fluid source having an activation lever which causes the valve to open when held in a predetermined position and which is rotated to cause the valve to close when the piston reaches a predetermined elevation in the cylinder. The seat can be fitted with a slidable section which moves towards the rim of the bathtub for easy mounting.

This invention relates to a bathtub seat, and in particular, to a power lift bathtub seat.

Bathtub bathing for persons suffering from physical disabilities often presents a substantial problem since the bather often requires assistance in climbing into and out of the tub. It is often difficult to obtain adequate assistance for this purpose due to the nature of the physical strain involved in lifting the bather over the tub rim and then lowering them into a sitting position on the tub bottom. After the bath the reverse procedure of lifting the individual from the tub presents a still further problem.

Accordingly, it is a principal object of this invention to provide a power elevatable seat for bathtubs which is adapted to be used by convalescents and other persons suffering from physical disabilities for lowering themselves into and out of a bathtub without requiring assistance from another person. A further object of this invention is to provide a bathtub seat which moves to a predetermined elevation above the bottom of the tub whereupon its motion is automatically stopped.

Briefly, the invention comprises a bathtub seat mounted on one end of a vertically extending shaft which passes through the bottom of a bathtub. The shaft is connected to a piston wtihin a cylinder, fixedly attached to the bottom of said tub, which is in communication with a source of pressurized fluid. Valve means are interposed between the cylinder and the fluid source for controlling the flow of fiuid to said cylinder and activation means are provided for opening said valve means when said seat is to be raised and for automatically closing said valve means when said seat is at a predetermined elevation. The cylinder is also provided with means for exhausting the fluid therein to allow the bathtub seat to be lowered into the tub. In the preferred embodiment of this invention the seat is an adjustable one which can be moved towards the outside rim of the tub thereby allowing it to be more easily mounted.

So that the invention may be more readily understood and carried into effect, reference is made to the accompanying drawings, which are offered by way of example only and are hot to be taken as limiting the invention, the scope of which is defined by the appended claims, which obviously embrace equivalent structures and processes.

In the drawings:

FIG. 1 is a diagrammatic representation of the bathtub seat of this invention mounted in a bathtub, shown in section, and the associated components used to raise and lower the seat.

FIG. 2 is a sectional view of a bathtube with the power elevatable bathtub seat of this invention positioned within the tub. For purpose of clarity the cylinder used to raise and lower the seat is shown partially broken away.

FIG. 3 is a side view of the lifting cylinder with associated control means.

FIG. 4 is a sectional view of FIG. 3 taken along the plane of line 4—4.

FIG. 5 is a sectional view of one type of exhaust valve that can be used to exhaust the cylinder.

FIG. 6 is a plan elevation view of one type of adjustable bathtub seat that can be used in this invention.

Referring now more particularly to the drawings, in FIG. 1 there is shown bathtub 10 mounted in a conventional fashion on floor 12 which is supported with floor joists 14. Bathtub seat 16, supported on shaft 18, is positioned in tub 10 to support an individual taking a bath within said tub. Said shaft 18 is connected to hydraulic piston 20 mounted in cylinder 22. Said cylinder is secured at its top end 21 with bolts 23 to a mounting plate 19 positioned in the bottom of tub 10. To prevent water leakage a gasket 17 is positioned between the tub bottom and plate 19. The cylinder is adapted to be pressurized with fluid which is passed from a fluid source, such as compressed air reservoir 24, along line 26, through valve 28, and along line 30 to said cylinder 22. The air within reservoir 24 is pressurized with air compressor 32 which is controlled with a conventional pressure regulator device. While the use of a compressed air system is specifically shown in FIG. 1, it is to be noted that cylinder 22 can be pressurized with any gaseous or liquid fluid under pressure such as water, nitrogen, and the like.

The control means for raising and lowering the bathtub seat of this invention are shown in detail in FIGURES 2 through 5. As indicated, when valve 28 is opened, pressurized fluid passes through line 30 into cylinder 22 and thereby urges piston 20 to move upwardly in said cylinder. This, of course, lifts shaft 18 with connected seat 16 upwardly in the tub. Valve 28 is preferably a solenoid type which is opened when switch 34 is closed, thereby allowing current to flow from its source along line 36, through solenoid 28, along line 38, through closed switch 34, and along line 40 back to its source. When lever 42 is pulled upwardly with adjustable pull rod 44 (rotated counterclockwise in FIG. 2), spring loaded pressure switch 46 is urged inwardly into switch housing 48 thereby closing switch 34 in a conventional fashion. During this operation the end of pressure switch 46 which protrudes from switch housing 48 rides on end face 50 of bracket 52.

Bracket 52, fixedly connected to the outside of cylinder 22, is provided with elongated slot 54 for adjustably mounting lever 42 to said cylinder 22. Lever 42 is pivotally mounted to bracket 52 with bolt 56 which is sized to pass through said elongated slot 54 and be secured therein at any predetermined position. While it is preferred to journal lever 42 to bracket 52, it is to be noted that the lever can be mounted on any member positioned proximate said cylinder 22. Stop ring 58 is connected to shaft 18 and as piston 20 moves upwardly in cylinder 22 said stop ring contacts the end of lever 42 which protrudes through slot 60 and urges said lever to rotate (in a clockwise direction in FIG. 2) until pressure button 46 moves outwardly from switch housing 48 a sufficient distance to open switch 34 thereby closing solenoid valve 28. Accordingly, the level at which seat 16 stops can be varied by adjusting the elevation of lever 42 in slot 54. Lever 42 is held so that switch 34 is in a normally open position, except when rod 44 is pulled upward, with a conventional biasing means such as spring 62 connected at one end to

bracket **52** and at its other end to lever **42**. In addition, the lever is held in a predetermined plane when switch **34** is in an open position with stop **64** attached to lever **42**. When pull rod **44** is moved upwardly to close switch **34** said lever is held in a second predetermined plane with stop **66**, also secured to lever **42**.

When it is desired to lower seat **16** into tub **10** pull rod **68** is urged upwardly which causes lever **70**, mounted at one end to bracket **72** secured to the base of cylinder **22**, to rotate about its pivot point. When this occurs, plunger **74**, also pivotly mounted to lever **70**, is urged upwardly into exhaust port **76** in ball valve **78**. The end of said plunger contacts ball **80** and lifts it away from valve seat **81** to thereby allow fluid to pass from cylinder **22** into port **76** thereby enabling piston **20** to move downwardly in cylinder **22**.

One preferred bathtub seat of this invention is shown in FIG. 6. As illustrated, the seat comprises a slidable top seat section **82**, having a substantially plane top surface, which is mounted on a base **84** secured in a conventional fashion to shaft **18**. It is also within the scope of this invention to rotatably mount said base **84** to shaft **18** so that maximum seat movement can be obtained. Since section **82** is slidably connected to base **84**, e.g., through the use of angled grooves as illustrated in said FIG. 6, it can be moved towards the rim of the bathtub thereby enabling it to be mounted more easily.

To operate the bathtub seat of this invention, pull rod **44** is urged upwardly and held in this position until seat **16** moves to its preset loading elevation (at which time push rod **44** is urged downwardly when lever **42** contacts stop ring **58**). The slidable section **82** of said seat is then slid outwardly towards the outside rim of bathtub **10** to a position where the person intending to use the tub can easily mount the seat. The person on the seat then places his legs into the bathtub. At this time, the slidable section of seat **16** is also slid back towards the center portion of the tub or it may be left in its loading position and as the seat is lowered into the tub it is urged to its center position as it moves along the side edge of the tub. The seat is lowered by lifting pull rod **68** which allows the pressurized fluid within cylinder **22** to escape through exhaust valve **78**. When the person has completed his bath, he is elevated out of the tub by merely pulling rod **44** which opens solenoid valve **28** thereby allowing pressurized fluid to pass into cylinder **22**.

Whereas there is here illustrated and specifically described a certain preferred construction which is presently regarded as the best mode of carrying out the invention, it should be understood that various changes may be made and other construction adopted without departing from the inventive subject matter particularly pointed out and claimed.

I claim:

1. A power bathtub seat comprising a seat mounted proximate one end of a vertically extending member

passed through the bottom of a bathtub and connected proximate its other end to a piston slidably mounted within a cylinder which is attached to said bathtub; a source of pressurized fluid in communication with said cylinder; first valve means interposed between said cylinder and said source of pressurized fluid for controlling the flow of fluid to said cylinder; valve activation means connected to said cylinder for controlling said first valve means which comprises a lever rotatably mounted proximate said cylinder, means connected to said lever for opening said first valve means when said lever is in a predetermined position, means for manually rotating said lever to said predetermined position, and means connected to said vertically extending member for rotating said lever to a second predetermined position to close said first valve means when said vertically extending member is at a predetermined elevation; discharge means in communication with said cylinder for discharging pressurized fluid from said cylinder; and second valve means interposed in said discharge means for controlling the flow of fluid therethrough.

2. The power bathtub seat of claim **1** wherein said first valve is a solenoid valve.

3. The power bathtub seat of claim **2** wherein said means connected to said lever for opening said solenoid valve is an electrical switch which completes an electrical circuit to activate said valve when said lever is rotated to said predetermined position.

4. The power bathtub seat of claim **3** wherein said means for manually rotating said lever is a pull rod connected to said lever and positioned in a location which is easily accessible to a person using said bathtub.

5. The power bathtub seat of claim **4** wherein means are connected to said second valve means for manually controlling said second valve means.

6. The power bathtub seat of claim **5** wherein said lever is adjustably mounted on said cylinder.

7. The power bathtub seat of claim **1** wherein said source of pressurized fluid is a source of pressurized air.

8. The power bathtub seat of claim **1** wherein said source of pressurized fluid is a source of pressurized water.

9. The power bathtub seat of claim **1** wherein said seat is provided with a slidable top portion which is adapted to slide towards the rim of said bathtub to facilitate loading of said seat.

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