March 5, 1968 C. R. BERTHELSEN ET AL 3,371,357

BATH LIFT

Filed May 10, 1965 2 Sheets-Sheet 1

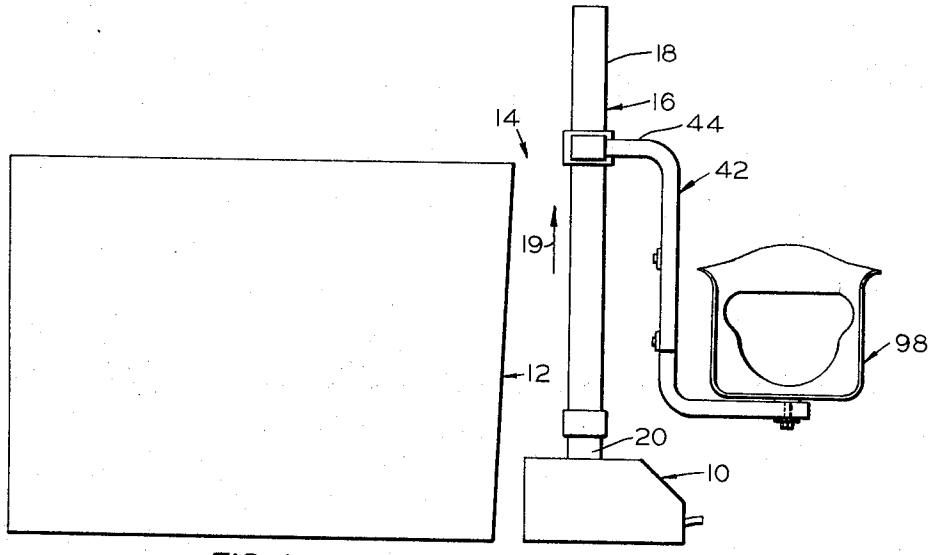


FIG. 1

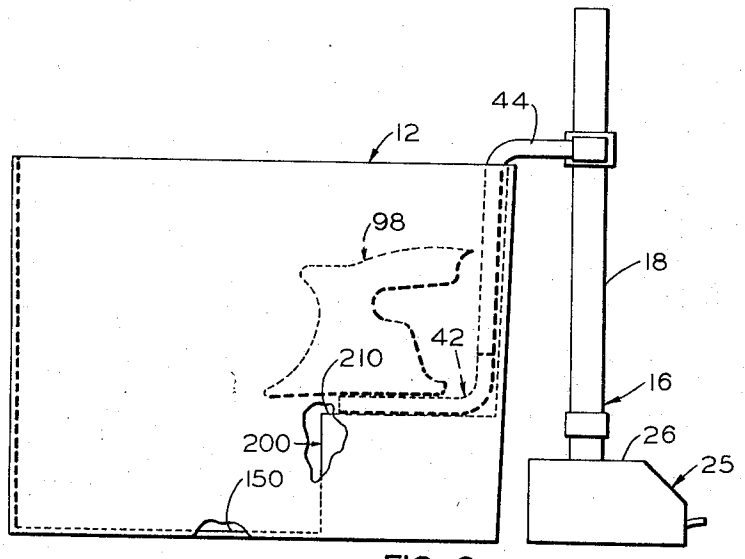


FIG. 2

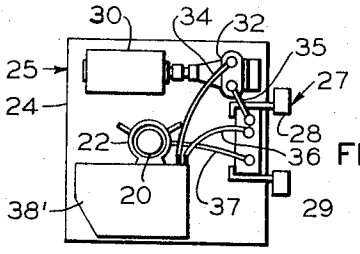


FIG. 3

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March 5, 1968 C. R. BERTHELSEN ET AL 3,371,357

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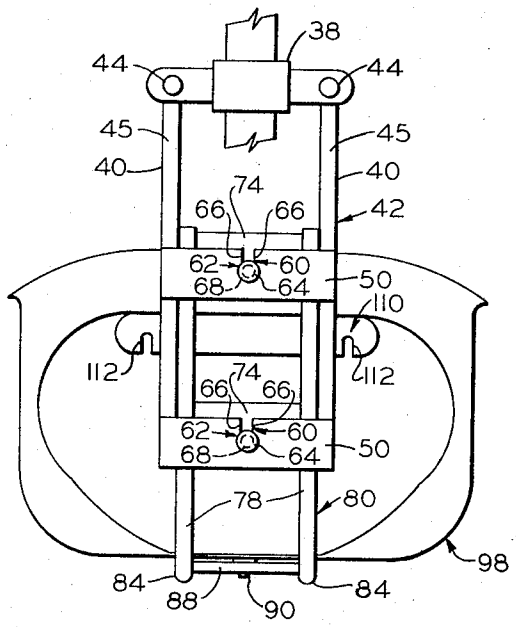


FIG 4

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BATH LIFT

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3 Claims. (Cl. 5—83)

This invention relates to lifts for lowering an invalid patient into a tub or therapy tank. More particularly it is an object of the invention to provide such lifts with greater efficiency.

In nursing homes and hospitals it has been necessary to raise the bottom of a bath tub up above the floor on a pedestal usually a foot high. This is a convenience for an attendant so that the attendant does not have to bend over as far in bathing the patient. An invalid patient often cannot climb into a rised tub by himself, and for this reason, bath lifts have been proposed heretofore.

Such bath lifts have been of many types, some of them requiring the lifting of the patient by the operator just in order to the lift the patient into the lift itself, whereby to a great extent, the benefit that could be gained from a lift, is lost.

It is, therefore, an object of the invention to provide a bath lift into which a patient can be received from a wheel chair with only horizontal shifting of the patient and without the necessity of the lifting of the patient manually by the attendant.

Many tubs are mounted in one corner of a room and have faucet fixtures at the end of the tub adjacent the corner. There has been a considerable problem to devise a lift which is supported by means anchored to the floor outside of the tub, and yet, is adapted to place the patient in a position in which the patient is facing the faucet and water controls without danger of injury as would be possible, if the patient's back were to the controls. We have solved this problem by providing a lift having a chair portion not only swingably mounted on a supporting post by means of arms, but also with the seat swivelly mounted with respect to the arms themselves, whereby regardless of whether a tub is in a corner with its fixtures to the right, or in a corner with its fixtures to the left, the lift will nevertheless be capable of lifting a patient into the tub facing in the proper direction.

A further object of this invention is to provide the feature of the said chair swivelling in a horizontal plane for the advantage that an invalid patient, while in the tub, will find possibilities of body movement more easy because, as his shoulders and arms move in the process of bathing, the seat itself can swivel to make his movement easier. The swivelling of the seat avoids the necessity for the patient to twist his body as extensively in order to reach his legs and also makes it unnecessary for the patient to shift his buttocks by twisting against a seat as is necessary for a patient sitting in a fixed seat.

Heretofore different ways of lifting patients have been proposed.

Heretofore many ways of powering lifts have been proposed, among them, the use of water pressure in hydraulic cylinder lifting devices, these having a disadvantage in mass distribution because of the highly varying water pressures in different areas and the seasonal variances of water pressure in the same area.

Some of these prior art systems have exhausted the

water from the hydraulic cylinder in lowering the patient back into the tub in which the patient is to bathe, whereby sanitary conditions cannot be maintained.

It is, therefore, an object to provide a hydraulic controlled lift utilizing hydraulic fluid having its own reservoir, whereby sanitary conditions are enhanced and whereby constant dependability is available.

A further advantage of our hydraulic lift lies in the greater safety it provides. For example, with a water lift, the position of the lift can change do to leakage in its cylinder as a result of the impracticality of making water cylinders with as close a tolerance as a hydraulic cylinder using hydraulic fluid.

A further object is to provide a hydraulic lift having the advantage that the attendant operating the lift is always close by the patient to offer assistance and assurance, rather than being at some distance away where more distant controls may be positioned.

An important object is to provide a lift which can be controlled by the feet of the operator, leaving the operator's hands free to assist the patient. Many patients do not have the sense of balance or the muscular control or the strength that is needed to be able to confidently and safely hold themselves in a lift seat, and for them the possibility of an attendant's assisting hands being free because of foot-pedal controls, is extremely important and assuring.

A further object of the invention is to provide a lift having a seat which is adapted to swivel so that the lift can be mounted on any side of a tub and still will operate with the seat facing the desired direction, eliminating the prior art problem of a lift that must be mounted on only one side of a tub and would not work at the ends of the tub, making installation practical only when the prior art lifts were installed simultaneously with the tub so as to be part of the original planning.

Other and further objects and advantages of the present invention will be apparent from the following detailed description, drawings and claims, the scope of the invention not being limited to the drawings theselves as the drawings are only for the purpose of illustrating a way in which the principles of this invention can be applied.

Other embodiments of the invention utilizing the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

FIGURE 1 is a side elevation of the bath lift of this invention shown alongside a therapy tank or tub, the lift being shown with its seat portion disposed with its front side facing the viewer and supported on lift arms arranged in a preliminary position in which they are disposed upon receiving a patient thereon preliminary to placing the patient in the tank.

FIGURE 2 is a side elevation of the lift and the tank of FIGURE 1, but showing the lift arms and chair in positions inside the tank.

FIGURE 3 is a top plan view of a pumping assembly of the invention together with the base portion of a pumping assembly housing, an upper portion of the pumping assembly housing not being shown.

FIGURE 4 is a rear elevation of the chair and of the lift arm and of means interconnecting the chair and lift

arm, a broken-away segment of the hydraulic cylinder means of the invention being shown. The chair in FIGURE 4 is facing away from the viewer.

The bath lift of this invention is generally indicated at **10** and can be used to lift a patient into a conventional bath tub or into a therapy tank or tub generally indicated at **12**.

The therapy tank and bath lift **10** together form a bath assembly generally indicated at **14**.

The bath lift **10** has a vertically extending elongated hydraulic cylinder means **16** having an upper outer portion **18** of larger diameter which is adapted to move vertically upward in the direction of the arrow **19**, or if desired, downward, on a lower elongated portion **20** of the hydraulic cylinder assembly, which latter is vertically disposed and is anchored by means of a receiver **22** to the base portion **24** of a foot pedal-operated motorized pump assembly generally indicated at **25**, which latter has an upper housing portion **26** having foot pedal control lever means generally indicated at **27** protruding through the housing **26** thereof, the lever means **27** comprising a foot pedal **28** and foot pedal **29**, which when depressed cause upward and downward movements of the upper section **18** of the hydraulic cylinder means **16**.

The motorized pump assembly generally indicated at **25** is not shown in complete detail inasmuch as the operation of pumps by motors and the control thereof by foot pedals is well known in many fields, however, for some explanation, a reversible electric motor is shown at **30** as attached to a pump **32** and means not shown connect the pedals **28** and **29** to the motor **30** electrically in a manner for causing the motor to rotate in one direction or the other in order to cause the pump **32** either to pump fluid into the hydraulic cylinder section **22** through the hose **34** or withdraw fluid therefrom through the hose **35** for causing the upper hydraulic cylinder section **18** to move upwardly or downwardly, respectively.

The upper hydraulic cylinder section **18** is provided with an anchor collar **38** fixed thereto and having upper ends of two arms **40** of a lift arm means generally indicated at **42** anchored thereto.

The lift arms **40** have first portions **44** extending laterally from the hydraulic cylinder assembly **16** and have second portions **45** each connected to one of the first portions **44** and extending downwardly therefrom in a vertical direction.

A pair of lift bars **50** are attached to the hydraulic cylinder assembly side of the lift arms **42**, the lift bars **50** being vertically spaced and each having a notch **60** therein receiving a stud **62** having a head **64** of a size or diameter larger than the distance from one vertical wall **66** to the opposite vertical wall **66** of a notch, each stud **62** also having a shank portion **68** of the size for slidable but snug reception between respective walls **66**, whereby when the studs are disposed in the notches **60**, the studs cannot be removed from the notches except by a vertical upward movement with respect thereto.

The studs **62** are each mounted on a stud carrier **74** and the stud carriers **74** are disposed across and attached to forward sides of a pair of horizontally spaced standards **78** of a lift frame generally indicated at **80**. The standards **78** are vertically disposed and are of a spacing for snugly fitting between the second or vertical sections **45** of the lift arm assembly **42**, whereby the standards engage forward sides of the lifting bars **50** at times when the studs **62** are in place in the notches **60**.

The lift frame **80** further has first and second or right and left horizontally extending portions **84** attached to and having a pivot bar **88** attached to and interconnecting the horizontally extending portions **84**, whereby the pivot bar **88** receives a swivel pin **90** in a rotatable manner, the upper end of the swivel pin **90** being fixed to a seat **98**, which latter is thereby swivelly mounted on the lift frame **80**.

Attached to the forward side of the standards **78** is a notched bar **110** having downwardly opening notches **112** which are adapted to enage suitable means not shown in a dolly or wheel chair assembly to which the seat **98** can be attached by simply lowering the seat with the lift of this invention until the notches **112** have received suitable means on the dolly and then further lowering the lifting arm assembly **42** until the notches **60** have released the studs **62**, whereupon the seat **98** is thereby freed to be moved on the dolly assembly.

In operation, it will be seen that a reverse of the above motion will remove the seat **98** from the dolly, not shown, whereupon the seat will be in the position shown in FIGURE 1. Upward movement of the lift arm assembly **42** will then raise the seat above a therapy tank **12** earlier described. A subsequent lowering of the lift arm assembly will place the seat in the therapy tank **12** in a position for the comfortable seating of the patient with his knees bent and sitting in a normal sitting position with his feet resting on the floor **150** of the tank **12**.

Thereupon, the tank **12** can be filled with water to any desired level for affording the patient a delightful bath of a nature unavailable in many places where no adequate facilities are available for the handling of an invalid patient.

The therapy tank **12** will be seen in FIGURE 2 to have a seat portion **200** built into it and an upper surface **210** of the seat portion **200** is horizontally disposed, whereby it can be used as a seat by a patient who is not using the seat **98**.

However, the same upper surface **210** serves as a surface on which to rest the underside of the lift arm assembly **42** for the proper emplacement of a patient in the therapy tank **12**.

This invention is believed to fulfill the objectives above set forth.

From the foregoing description, it is thought to be obvious that a bath lift constructed in accordance with our invention is particularly well adapted for use, by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that our invention can be changed and modified without departing from the principles and spirit thereof, and for this reason, we do not wish to be understood as limiting ourselves to the precise arrangement and formation of the several parts herein shown in carrying out our invention in practice, except as claimed.

We claim:

1. A bath lift having a vertically extending elongated hydraulic cylinder means, means for anchoring the base of said hydraulic cylinder to a supporting surface, a motorized pump assembly, means hydraulically operably interconnecting said pump assembly and said hydraulic cylinder means, lift arm means attached to said hydraulic cylinder means so as to be movable thereby upwardly and downwardly, said lift arm means having a first portion extending laterally from said hydraulic cylinder means and having a second portion connected to said first portion and extending downwardly therefrom, a seat, means mounting said seat on the lower end of said lift arm means comprising mutually engageable and releasable interlocking means having first portions mounted on said lift arm means and having second portions, a lift frame, the second interlocking means being connected to said lift frame, said lift frame having a portion extending beneath said seat, and means attaching said seat rotatably to said lift frame for the rotation of said seat on said lift frame about a vertical axis, said seat rotatable attaching means being separate and distinct from said mutually engageable and releasable interlocking means for independent action so that said mutually interlocking means can be engaged and released without interfering with said rotating means, whereby at times when said interlocking means are interlocked said lift frame and seat can be lifted by said lift arms, and whereby at times when said mutually interlocking portions are not interlocked, said seat and its

lift frame are disposed free of said lift arms and are adapted to be supported by other means.

2. The combination of claim 1 in which said lift frame comprises generally horizontally extending portions and generally vertically extending portions, the latter being connected to said generally horizontally extending portions, the second interlocking means being connected to said generally vertically extending portions.

3. The combination of claim 1 in which said first and second mutually interlocking portions comprise a stud having a shank and a head and a notched bar having a notch in its upper side adapted to snugly receive the shank portion of the stud.

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