United States Patent [19]

Feyerherm

[11] **3,918,108**

[45] **Nov. 11, 1975**

[54] **PORTABLE BATH LIFT**

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[21] Appl. No.: **394,551**

[52] **U.S. Cl.** ..... **4/185 L;** 4/251; 5/86; 248/226 R; 248/415; 297/DIG. 4

[51] **Int. Cl.²** **A47K 3/12;** A61G 7/02

[58] **Field of Search** ..... 4/185 L, 251; 5/81 R, 81 B, 86; 248/124, 226 R, 415; 297/DIG. 4

[56] **References Cited**

UNITED STATES PATENTS

2,664,142	12/1953	Scheurman et al.	248/124
2,680,855	6/1954	Robinson	4/185 L
3,104,399	9/1963	Dalton	4/185 L
3,286,970	11/1966	Nolan	4/185 L
3,289,217	12/1966	Glover	4/185 L
3,623,169	11/1971	James	5/86
3,714,672	2/1973	Condon	4/185 L
3,732,584	5/1973	James	5/86

FOREIGN PATENTS OR APPLICATIONS

709,113	5/1965	Canada	4/185 L

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Attorney, Agent, or Firm—Klarquist, Sparkman, Campbell, Leigh, Hall & Whinston

[57] **ABSTRACT**

A bath lift for assisting invalid persons into and out of a bathtub employs a portable hydraulic jack clamped to a rim portion of the bathtub and supported on a floor surface by a nonslip base. An open center seat is attached to the extensible portion of the jack by a suspension member. A leg support-stop attached to the seat is rotatable from a position which allows safe seating of the invalid to a position which supports the legs of the invalid while the invalid is being placed into the tub. The components are adapted for easy disassembly and reassembly.

10 Claims, 5 Drawing Figures

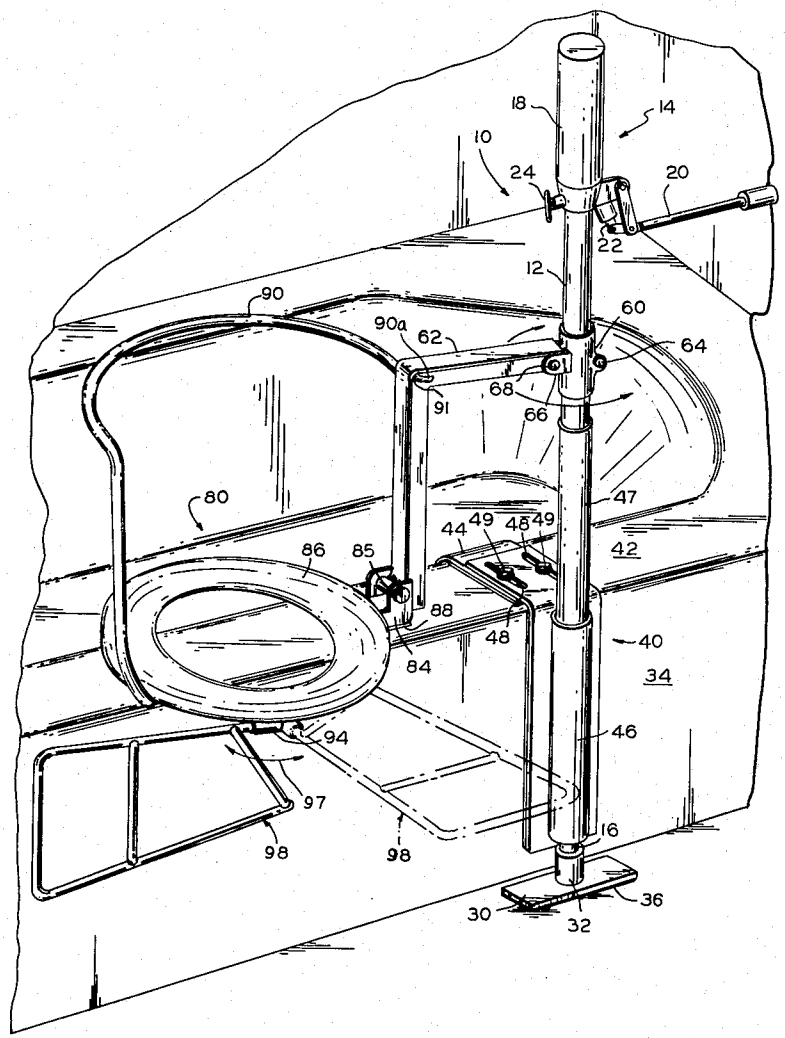
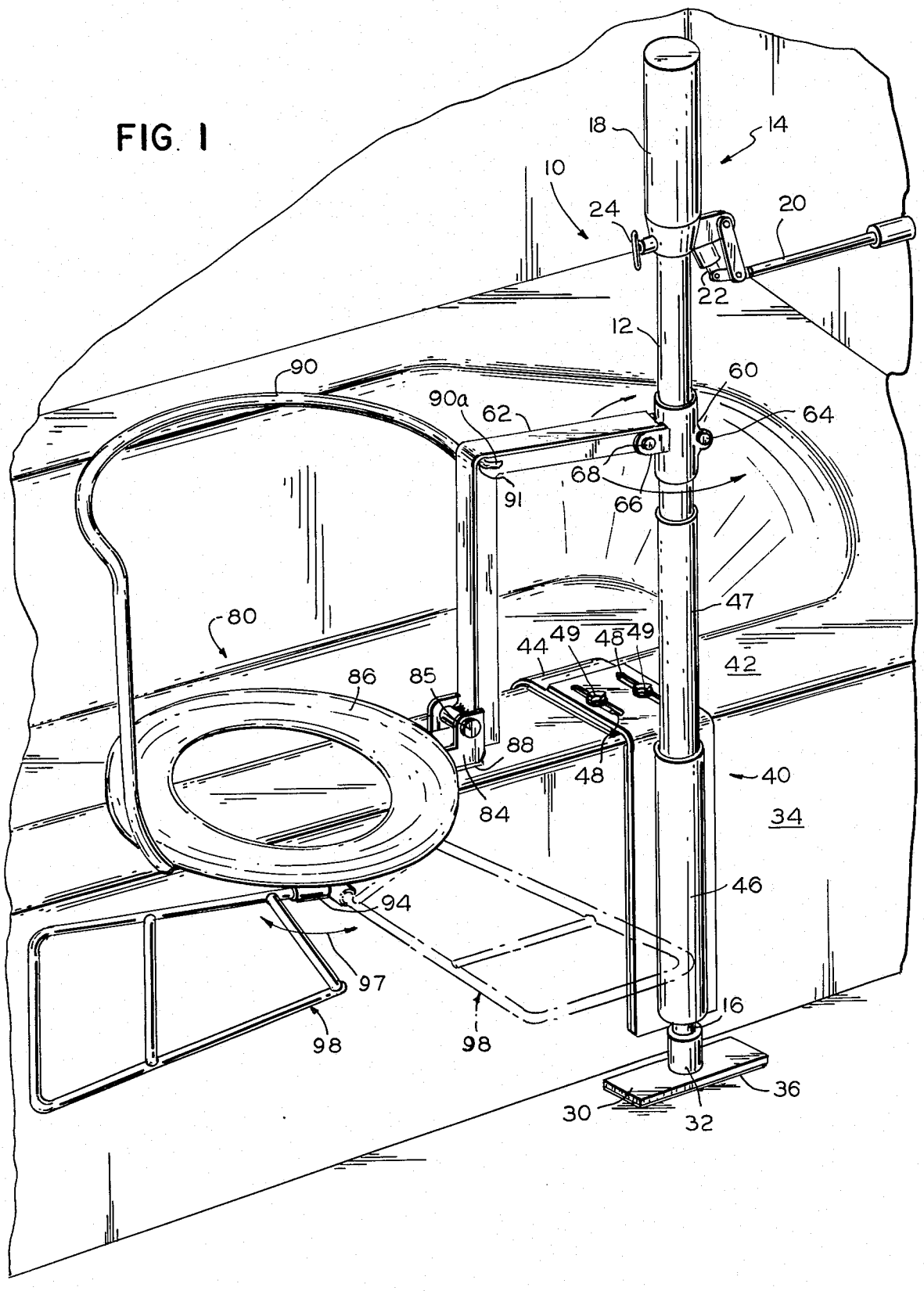


FIG. 1


18
14
10
24
20
22
12
90
60
90a
62
64
68
91
66
47
80
44
49
48
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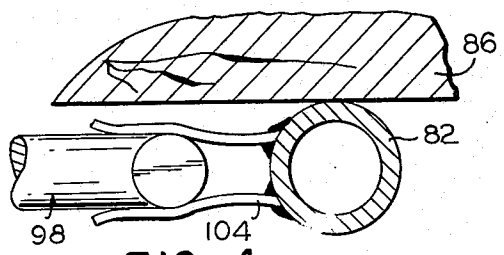


FIG. 4

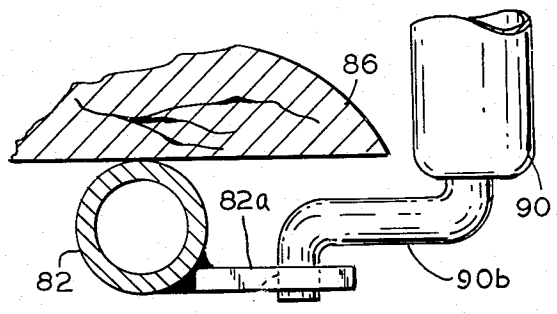


FIG. 5

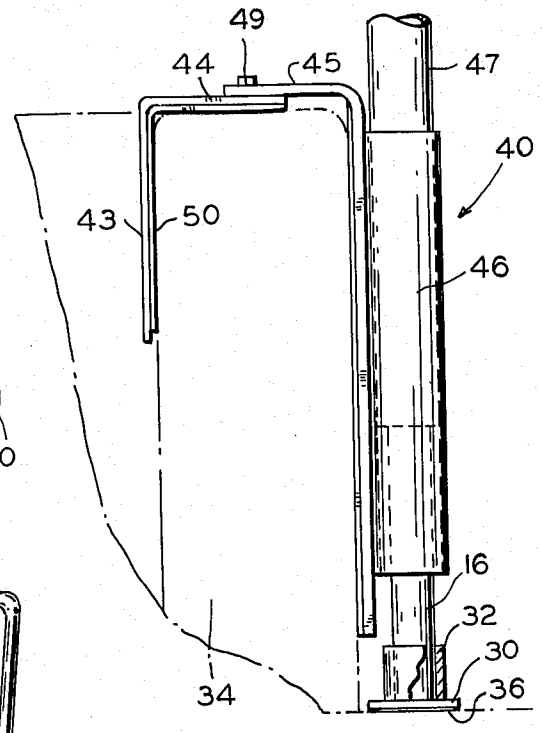
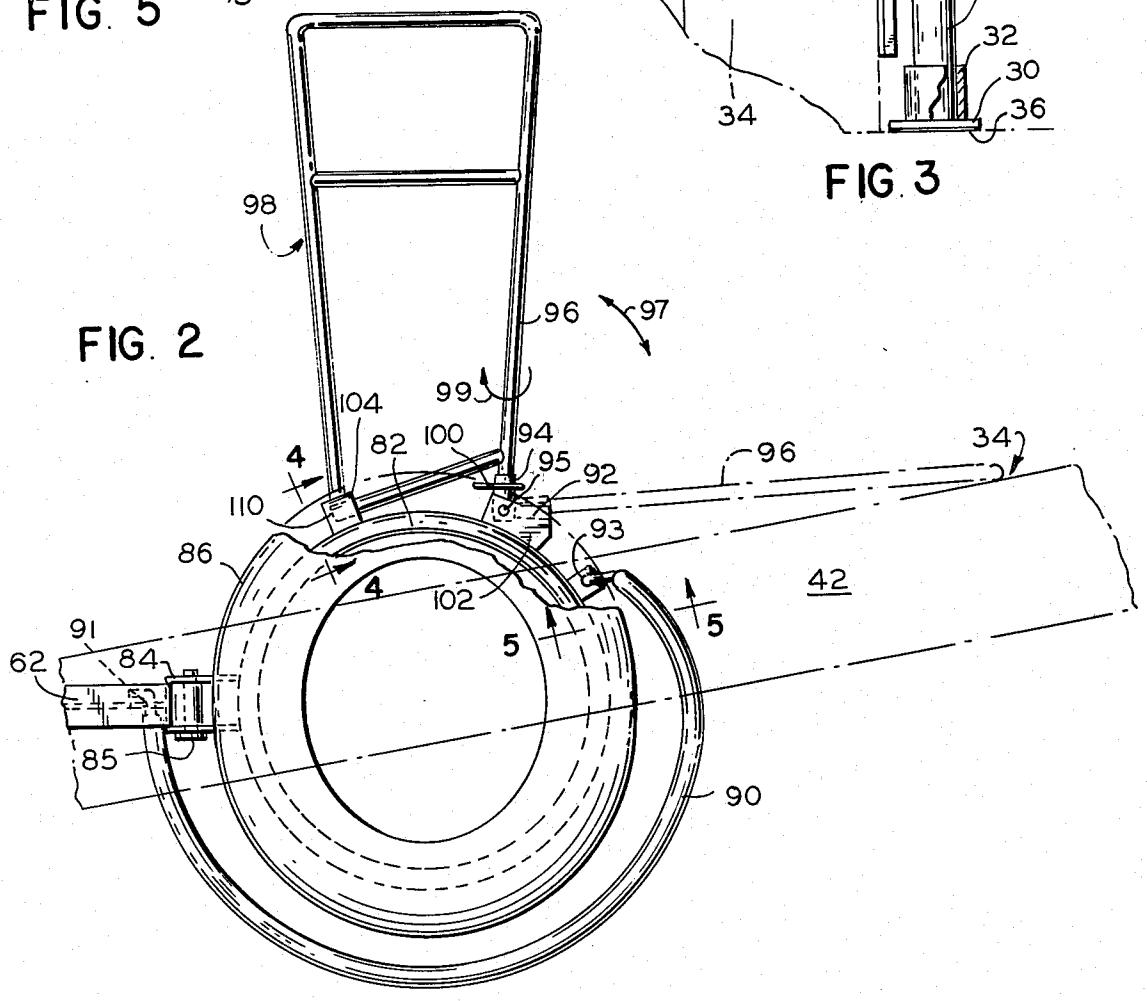


FIG. 3

FIG. 2



PORTABLE BATH LIFT

Background of the Invention

The present invention relates to a portable apparatus for lifting a handicapped or invalid person into and out of a bathtub or therapy pool.

Prior apparatus for performing this function have typically employed hydraulic jacks mounted permanently or semipermanently to a wall, floor or to a custom made frame. Examples of such lifts are shown in U.S. Pat. Nos. **2,664,142** to Scheurman et al., **3,091,778** to Gross, **2,604,636** to Nielsen, **3,078,473** to Daniels and **3,714,672** to Condon.

As indicated, most of the prior art devices are not portable and require either permanent installation to a supporting wall or floor or special supporting framework within or on the tub, with such framework adapted to fit only one size and shape of tub. Such prior devices are not easily disassembled and could not be used, for example, by an invalid while traveling since they are too heavy and cumbersome to be transported and/or assembled by one person. Also they can not be easily moved out of the way so others can use the tub.

Still another prior bath lift, shown in U.S. Pat. No. **3,289,217**, is clamped directly to the tub and employs a screw jack. However, the jack mechanism is submerged in the bath water, thus taking up room in the tub and subjecting the mechanism to fouling through water contact.

A common disadvantage of most such prior art devices is the lack of safety means to prevent inadvertent swinging movement of the seat during loading and unloading of the person. Also such prior lifts usually do not provide means for supporting the invalid's legs which makes it necessary for an attendant to lift and carry the invalid's legs as he is placed into the tub. Often this requires as much effort and danger of mishap as simply having the attendant manually lift the invalid into the tub.

Objects of the Invention

Accordingly, an object of the present invention is to provide a portable bath lift.

Another object of the invention is to provide a portable hydraulic bath lift which does not require any permanent mounting to a floor or wall so as to be usuable by a handicapped person when away from home or otherwise whenever permanent installation would not be permitted or convenient.

A further object of the invention is to provide a bath lift which is readily adjustable to fit bathtubs of various sizes and shapes.

A still further object is to provide a bath lift which may be quickly, easily and completely disassembled for transport in compact form and reassembled for use.

Another object is to provide a bath lift which does not require any special cumbersome supporting framework or installation.

A further object is to provide an improved bath lift with means operable to hold the lift seat in a loading position to minimize any danger of injury to the invalid person.

Another object is to provide means to support the invalid's legs after loading so that they will clear the rim of the bathtub.

Further objects of the present invention will be apparent from the remainder of this specification.

Summary of the Invention

The bathtub lift of the present invention is portable, lightweight and readily disassembled for compact carrying, for example, in the trunk of an automobile. The lifting component of the apparatus is a columnar hydraulic jack which can be operated either by the invalid or by an assistant. The jack is rotatably supported on a separate non-slip base positioned alongside the bathtub. An adjustable clamp means clamps the jack to the side of the tub and is slidably and rotatably mounted concentrically on the jack cylinder.

A removable seat suspension means cantilevered from the jack suspends a seat means from an extensible portion of the jack. Operation of the hydraulic jack raises and lowers the seat relative to the tub.

Attached to the seat means is a combination leg support-seat stop adapted to move between two fixed positions, one to hold the seat in loading position and the other to to support the invalid's legs after loading.

By selective use of the jack a seated invalid can be easily placed in and removed from a tub. When not required, the lift may be rotated to a position out of the way so noninvalids may use the tub. The lift employs tubualr construction to render it light weight and easily transportable. When it is desired to remove the lift, its complete disassembly can be accomplished in a matter of minutes.

Brief Description of the Drawings

FIG. **1** is a perspective view of the bath lift of the present invention shown in an operative position in conjunction with a bathtub;

FIG. **2** is a top view of the seat portion of the lift of FIG. **1** with portions broken away for clarity and with a rim portion of the tub shown in phanton lines;

FIG. **3** is a fragmentary side view of a lower portion of the lift of FIG. **1** showing a portion of the tub in phantom and a base portion of the lift in section;

FIG. **4** is a partial sectional view taken along the line **4–4** of FIG. **2**; and

FIG. **5** is a partial sectional view taken along the line **5–5** of FIG. **2.**

Detailed Description

Referring to FIG. **1** the bath lift of the present invention is illustrated in conjunction with a typical bathbub. The lift includes a conventional columnar hydraulic jack **10** having an extensible portion **12** which is raised and lowered by hydraulic means **14** relative to a stationary shaft portion **16.** The hydraulic means **14** includes a hydraulic pump consisting of a reservoir **18,** pump handle **20,** piston **22** and release valve **24.** A columnar jack suitable for use in the present invention is Type **77715** manufatured by Norco Design Products. It is suggested that the jack have a capacity of at least one and one half tons to prevent bending strains in its present application from affecting operation.

In operation, valve **24** is closed and pump handle **20** reciprocated to cause extensible jack portion **12** to move upwardly relative to shaft portion **16.** The process is reversed, as desired, by opening valve **24** to lower extensible portion **12** on shaft portion **16.**

Stationary shaft portion **16** is circular in cross section and extends slightly below the cylindrical extensible portion **12** when the jack is in its fully retracted position. As shown best in FIG. **3,** a floor-engaging base **30**

for supporting the jack has an upwardly opening receptacle 32 which slidably receives the stationary shaft portion 16 of the jack therein. Affixed to the underside of base 30 is a layer 36 of resilient high friction material to restrain the base from sliding on the floor. When shaft portion 16 is inserted in receptacle 32, base 30 not only supports the jack assembly on the floor next to the tub 34, but also permits rotation of the jack in the receptacle, the importance of which will become apparent shortly.

Referring to FIGS. 1 and 3, a clamp means 40 secures the jack to a rim 42 of tub 34. The clamp means comprises a U-shaped bracket 44 and a sleeve 46 fastened to one leg of the U-shaped bracket. The sleeve surrounds and is slidable relative to the extensible jack portion 12 over a wear resistant jacket 47. Thus, the clamp means is adjustable for different tub heights but remains stationary relative to tub rim 42 during movement of extensible portion 12. U-shaped bracket 44 is composed of two overlapping leg sections 43, 45 which are attached together by bolts 49 extending through adjusting slots 48. In this manner, the U-shaped bracket may be narrowed or widened as necessary to adapt to the rim width of a particular tub.

As best seen in FIG. 3, the inside surfaces of U-shaped bracket 44 are lined with a layer of resilient high friction material 50. Once the jack has been placed in the base 30 and secured by clamp means 40 to tub rim 42, the base and the clamp act together against the floor and tub rim, respectively, to resist lateral displacement of the jack assembly from its present vertical position.

A collar 60 (FIG. 1) fixed to extensible jack portion 12 supports one end of an L-shaped seat suspension means 62. A pair of ears 66 on collar 60 have aligned openings therethrough to receive a pin 68 which releasably secures the suspension means to the extensible jack portion 12. The jack-confronting end of suspension means 62 has a corresponding pin opening for the same purpose. The suspension means may be made of high strength metal or plastic stock of T-shaped cross section to provide a high strength-to-weight ratio. The upper lag portion of suspension means 62 is maintained horizontal due to the action of securing pin 68 and the T-shaped end pressing against collar 60.

The vertically positioned leg of suspension means 62 supports a seat means 80. As seen in FIG. 2, the seat means 80 comprises a tubular seat ring 82 having a connecting bracket 84 at one side thereof pinned to the supension means 62 by pin 85. An abutment portion of bracket 84 rides flush against a lower end of suspension means 62 to maintain the seat ring horizontal. The bottom of bracket 84 is surfaced with a resilient high friction pad 88 for engaging the tub rim 42 when the seat is in its loading position of FIG. 1. Seat ring 82 supports an open centered, contour seat 86 which is secured thereto by screws (not shown). In the loading position of FIG. 1, seat ring 82 rests on tub rim 42, primarily on friction pad 88. This reduces the tendency of the seat to swing during seating of an invalid person.

A curved back support railing 90 of lightweight tubular construction is removably attached to suspension member 62 and to seat ring 82. For this purpose the opposite ends of the railing are provided with angular extensions 90*a*, 90*b* of reduced diameter as shown in FIGS. 1 and 5 which hook into holes 91, 93 provided at the angle of suspension member 62 and through a tab portion 82a of seat ring 82, respecitvely to securely attach the railing without the use of fasteners.

Referring to FIGS. 1 and 2, and open ended pivot tube 94 is pivoted to a pair of flanges 92 on seat ring 82 by a pin 93 for horizontal swinging movement. Pivot tube 94 receives a leg 96 of a generally rectangular combination leg support-seat stop 98 of open frame construction. A spring pin 100 passes through upper and lower slots cut through the pivot tube and rides in an annular recess (not shown) of leg 96 to hold the leg in the pivot tube while enabling rotation of the leg in such tube. With leg 96 in pivot tube 94, leg support-stop 98 can be swung about the axis of pin 95 and rotated in the pivot tube as indicated by arrows 97 and 99.

As shown in FIGS. 2 and 4, resilient spring clips 102 and 104 are attached to seat ring 82. These clips serve to hold leg support-stop 98 selectively in either of two positions. In a first position, shown in solid lines in FIG. 1 and phantom lines in FIG. 2, clip 102 engages leg 96 and the leg support-stop 98 in contacting and substantially parallel to tub 34. This arrangement restrains the seat means making it safer for an invalid person attempting to sit down. Further, in this first position the leg support-stop 98 is out of the way during loading.

In a second position shown in solid lines in FIG. 2, the leg support-stop is substantially parallel to the floor. In this second position an invalid's legs can be supported on the open tubular frame. Corner 110 of the leg support-stop is received in clip 104 to secure the support-stop in this position. The support-stop is moved between the first and the second positions by rotating the leg support-stop about pin 95 and the axis of leg 96.

Operation

To utilize the lift, the seat is first moved to a loading position resting on tub rim 42. The leg supportstop 98 is positioned as shown in solid lines in FIG. 1. The invalid is then seated on contour seat 86 and the leg support-stop is moved to its leg supporting position shown in phantom in FIG. 1.

When the invalid's legs are resting on the support, jack 10 is operated with valve 24 in its closed position. Extensible portion 12 of the jack moves vertically upward relative to the floor thereby raising the seat means 80 off the tub rim. When the seat and leg support-stop are clear of the tub rim, the suspension means 62 is utilized by an attendant to rotate the seat with the jack about the base 30 until it overlies the tub. The valve 24 is then partially opened to cause gradual lowering of the seat into the water.

To remove the invalid person from the tub, the above described steps are reversed to again position the seat on tub rim 42 for unloading.

In the event that the person using the lift does not require assistance with his legs, the leg support-stop 98 can be removed, simply by pulling the spring pin 100 and pulling leg 96 from the pivot tube. Alternately, the present lift can be easily adapted for use by an amputee by permanently removing the leg support-stop and employing a second clamp on the tub rim capable of restraining the seat in the loading position. This additional clamp is similar in construction to clamp 40 except that it has no sleeve attached to either leg. The adjusting bolts of this second clamp engage the seat ring to restrain the seat in the loading position until is is lifted clear of the tub rim.

If a non-invalid desires to use the tub, the seat means may be rotated out of the way without any necessity for disassembling the lift or removing the clamp means **40.** When it is desired to disassemble the lift, this may be accomplished in a matter of a few minutes. The pins **68** and **85** are removed from the suspension means separating it from the seat and from the jack. Back rail **90** is lifted free of the seat ring and out of holes **91** and **93** and jack **10** is lifted out of the base **30** clear of sleeve **46.** Finally clamp means **40** is removed from the tub rim by loosing bolts **49.** Due to the tubular construction employed, the lift is lightweight and may be easily transported.

While I have shown and described a preferred embodiment of my invention, it will be apparent to those skilled in the art that many changes and modifications may be made without departing from my invention in its broader aspects as defined by the following claims.

I claim:

1. A portable bath lift for assisting a person in and out of a bathtub comprising:

a columnar jack means having a vertically extensible portion and a lower non-extensible portion for positioning in a vertical disposition alongside said tub,

a floor-engaging base adapted to removable receive and support in a vertical disposition said lower non-extensible portion of said jack means,

at least said vertically extensible portion of said jack means being rotatable about its vertical axis relative to said base,

detachable clamp means carried by said jack means and being vertically adjustable along said jack means for connecting said jack means to rim portion of said bathtub and free to rotate relative to at least said vertically extensible portion of said jack means so that said clamp means when operative remains stationary on said rim portion when said extensible jack portion rotates annd extends,

seat suspension means removably attached to and carried by said vertically extensible jack portion for vertical and rotational movement therewith, said suspension means being generally L-shaped and including a first leg portion extending generally horizontally outwardly from said extensible jack portion and a second generally vertical leg portion extending downwardly from the outer end of said first leg portion,

seat means, including an annular seat ring removably connected to a lower end of said vertical leg portion of said suspension means and supported by said suspension means in a horizontal disposition and an open-centered seat supported on said seat ring, said seat means further including a removable railing member having one end detachably connected to said seat ring and its other end detachably connected to said suspension means and defining a back rest and side support for a person seated on said open-centered seat,

said vertically extensible portion of said jack means when rotated about its vertical axis being operable to swing said suspension means and said seat means from a loading position along the rim portion of a bathtub to a position overlying the interior of said bathtub while said jack means remains stabilized in a vertical disposition alongside said bathtub by said base and clamp means.

2. The lift of claim **1** further including a leg supportstop removably attached to said seat ring and movable between a generally vertical stop disposition for engaging a side of said tub to restrain movement of said seat means during loading and a generally horizontal leg support disposition for supporting the legs of said person.

3. The lift of claim **2** wherein said L-shaped suspension means is hingedly attached to said extensible portion of said jack means and to said seat ring by removable pin means to thereby facilitate rapid assembly and disassembly of said lift.

4. The lift of claim **3** wherein said clamp means includes a U-shaped bracket having a hollow cylindrical sleeve attached along one leg for slidably receiving said jack therein, and means for adjusting the width of the bracket opening

5. The lift of claim **1** wherein said clamp means includes a U-shaped bracket having a sleeve means attached along one leg of said bracket for slidably and rotatably receiving said jack therein, and means for adjusting the width of the bracket opening.

6. The lift of claim **5** wherein the underside of said base and the inside surfaces of said U-shaped bracket are lined with a resilient high friction material, said base and said clamp acting together against a floor surface and tub rim respectively to resist displacement of said jack from a present vertical position.

7. The lift of claim **1** wherein said L-shaped suspension means is hingedly attached to said extensible portion of said jack means and to said seat ring by removable pin means to thereby facilitate rapid assembly and disassembly of said lift.

8. The lift of claim **1** wherein said seat ring is connected to the lower end of said vertical leg portion by a connecting bracket member having a bottom portion surfaced with a resilient high friction pad for engaging the rim portion of a bathtub to resist swinging movement of said seat means when in its loading position.

9. A portable bath lift for assisting a person in and out of a bathtub comprising:

a columnar jack means having a vertically extensible portion and a lower non-extensible portion for positioning in a vertical disposition alongside said bathtub,

a floor-engaging base adapted to receive and support in a vertical disposition said lower non-extensible portion of said jack means,

detachable clamp means carried by said jack means and being vertically adjustable along said jack means for connecting said jack means to a rim portion of said bathtub,

seat means for supporting said person,

seat suspension means removably attached to and carried by said vertically extensible jack portion for vertical movement therewith,

at least said vertically extensible portion of said jack means being rotatable about its vertical axis relative to said base to permit said means to be moved from a loading position to a position overlying said bathtub while said jack means remains stabilized in a vertical disposition by said base and clamp means,

and a leg support stop removably attached to said seat means and movable between a generally vertical stop disposition for engaging a side of said bathtub to restrain movement of said seat means during loading and a generally horizontal leg support disposition for supporting the legs of said person.

10. The lift of claim **9** wherein said leg supportstop includes an open tubular frame structure.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 3,918,108

DATED : November 11, 1975

INVENTOR(S) : Raymond M. Feyerherm

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 1, line 48, "whenever" should be --wherever--; column 2, line 25, "tubualr" should be --tubular--; column 2, line 47, "bathbub" should be --bathtub--; column 2, line 56, "manufatured" should be --manufactured--; column 3, line 31, "present" should be --preset--; column 4, line 1, "respecitvely" should be --respectively--; column 4, line 3, "and" (second occurrence) should be --an--; column 4, line 21, "in" should be --is--; column 4, line 67, "is" (first occurrence) should be --it--; claim 1, column 5, line 26, "removable" should be --removably--; claim 1, column 5, line 34, between "to" and "rim" insert --a--; claim 1, column 5, line 39, "annd" should be --and--; column 6, line 26, claim 6, "present" should be --preset--; claim 9, column 6, line 55, between "said" and "means" insert --seat--.

Signed and Sealed this

seventeenth Day of *February 1976*

[SEAL]

Attest:

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Attesting Officer

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Commissioner of Patents and Trademarks