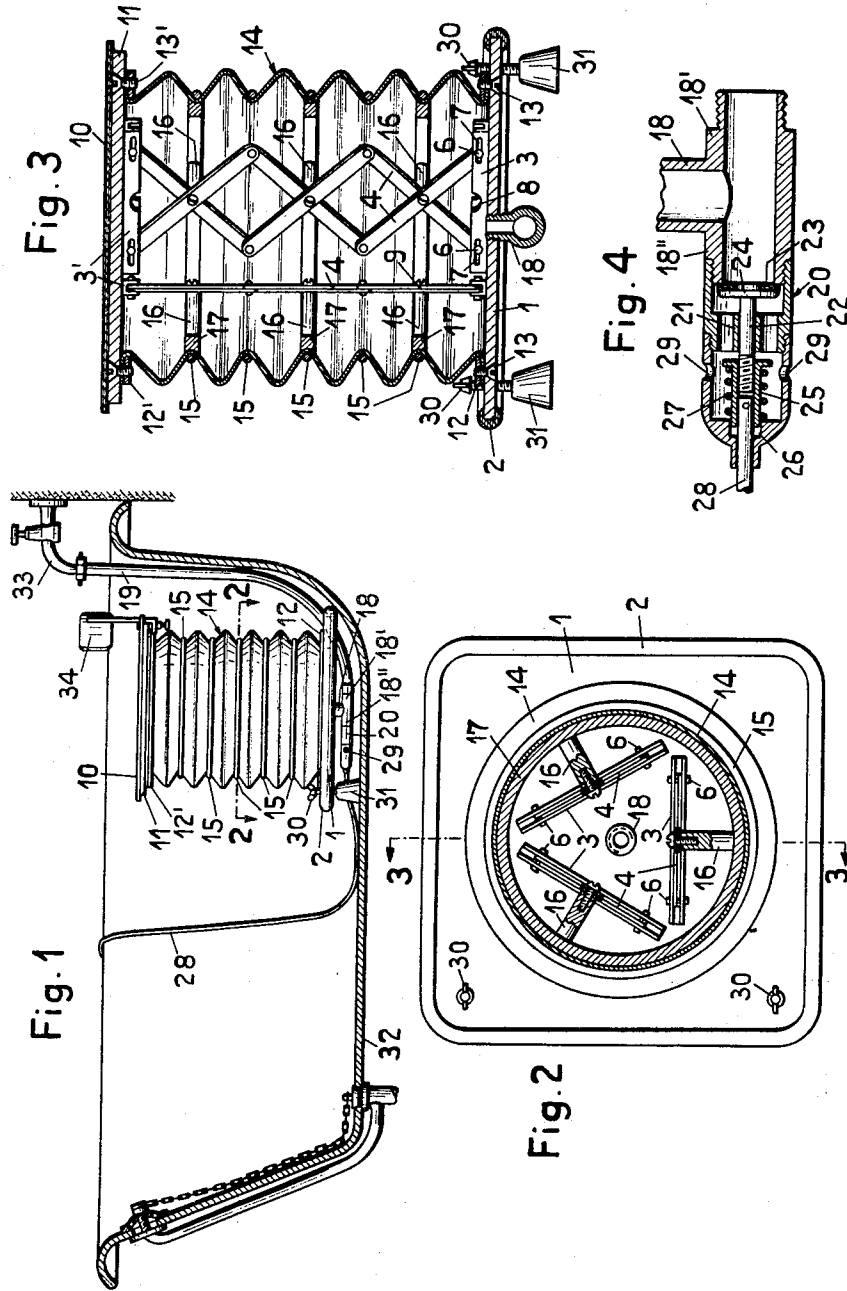


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TRANSPORTING DEVICES FOR INVALIDS FOR  
USE IN BATHTUBS AND LIKE RECEPTACLES  
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**TRANSPORTING DEVICES FOR INVALIDS FOR USE IN BATHTUBS AND LIKE RECEPTACLES**

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6 Claims. (Cl. 4—185)

This invention relates to transporting devices for invalids for use in bathtubs and like receptacles.

Physically disabled, e. g. totally or partially paralyzed patients, are frequently unable to get into a bathtub and out again unaided, but must be lifted into and out of the tub by attendants. This work is extremely strenuous for said attendants, and requires great effort and strength. Moreover, such work is not without danger, for accidents may easily be caused by patient's slipping. To lift a patient into and to take him out of the bathtub is also generally more or less painful for the patient.

It is, therefore, one of the objects of the present invention to provide means considerably facilitating the moving of the patient into and out of a bathtub or like receptacle and rendering such movements painless for the patient.

It is another object of the invention to provide means ensuring safe operation of a transporting device for the patient to thereby place him into a bathtub at any desired height therein.

The present invention further contemplates a bathing device for physically disabled persons, wherein portable lifting means is removably installed in a bathtub, said lifting means comprising a base resting on the bottom of the bathtub, a seat associated with said base for movement in vertical direction into and out of said bathtub, guiding or bracing means for said lifting means, and means automatically controlling said lifting means.

It is a further object of the present invention to provide means conducive to a simple construction for lowering a patient into a bathtub and for lifting him out of the same, whereby water supplied through the faucet of the bathtub is employed to bring about movement of the transporting device relative to the rim of the bathtub.

Still another object of the present invention is the provision of means rendering possible to combine a jack or lifting device with a bathtub and for removal of said device from the latter.

The above and other objects and features will become apparent from the following detailed description, reference being had to the accompanying drawing in which:

Fig. 1 is a vertical and longitudinal section of a bathtub with a bathing device made according to the invention;

Fig. 2 is a section taken along line 2—2 of Fig. 1;

Fig. 3 is a section taken along line 3—3 of Fig. 2 drawn to an enlarged scale;

Fig. 4 is a section of the inlet nozzle (on an enlarged scale) of the lifting device together with automatically controlled outlet means.

The bathtub, as illustrated, may be readily changed to a bathtub with bathing device for physically disabled persons, which comprises a base 1 whose edge is covered with a rubber binding 2. This base 1 supports three U-shaped guide rails attached along the sides of an equilateral triangle, each rail forming guide means for the two free lower ends of a scissors linkage 4, of the type known as lazy tongs.

Through each of these free lower ends of the lazy

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tongs 4, a belt 6 projecting with its two ends through the respective rail extends parallel to the pivots of said linkage and slides in slot 7 provided in opposite sides of the U-shaped guide rails 3. In the center of each of the U-shaped guide rails 3 a cut-out 8 is provided which upon collapse of the lazy tongs 4 will receive its lowermost center pivot 9 therein; so that the lazy tongs may collapse as compactly as possible.

The free upper ends of the three lazy tongs 4 are guided in exactly the same manner by three similar U-shaped guide rails 3' attached to the under-face of a seat 11 provided with a suitable covering 10 of rubber, canvas or the like. To the base 1, by means of washers 12 and screw bolts 13, the lower end of a bellows 14 of rubber or like material is tightly attached, which bellows surrounds the guide rails 3 and 3' and the three lazy tongs 4, the upper end of which bellows is tightly attached in exactly the same way by means of washers 12' and screw bolts 13' to the under-face of the seat 11.

The pleats of the bellows 14 are provided with suitable annular elements 15 to prevent buckling of the pleats or folds. The central pivots 9 of the lazy tongs 4 are connected to rods 16 which are directed toward the periphery of said bellows. Connecting said three rods 16 at the respective level is a ring member 17 which is concave on the outer surface to receive therein a respective fold of the bellows 14, said fold being retained on said ring member 17 by means of annular element 15 extending on the outside of said fold 14.

The base 1 is provided with a central inlet opening 18 to which a branch pipe 18' of a T-shaped tube is connected, one end of the latter being provided with threads for connecting a hose 19 thereto, the other end being threadedly connected to a valve block 20 through flange piece 18''. In a sleeve bearing 21 of said block 20 there slides a valve stem 22 carrying at one end thereof a valve plate 24 with rubber or leather gasket 23 for operating (closing or opening) the passageway of said flange piece 18''.

The other end of valve stem 22 is threadedly connected with a sleeve 25 which is slidable with one end in a bearing recess 26 provided in the end cover of the valve block 20. The sleeve 25 is surrounded by a compression spring 27 which forces said sleeve 25 toward valve plate 24 to thereby press the latter against the passageway of the flange piece 18''. The sleeve 25 is further provided with a flexible control member or pull string 28 passing through an opening in the cover of the block 20. The block 20 is further provided with outlet slots or perforations 29.

In its front portion, the base 1 has two threaded holes through each of which extends a bolt with a wing screw 30, engaging the respective lower end of a rubber support or foot 31 resting in the bathtub 32.

This bathing or lifting device for physically disabled persons is placed in said bathtub 32 so that the rear edge of the base 1 with rubber binding 2 engages the upwardly extending curvature of the bottom of the tub at the head end, and the rubber feet 31 are raised by means of wing screws 30 so that the base 1 extends in horizontal direction. The water hose 19 is then connected to the faucet 33 of a water supply line.

Upon opening the faucet water is admitted through inlet 18 by means of branch piece 18' of the T-tube whereby water fills up the interior of the bellows 14. The seat 11 is thereby raised at least approximately to the level of the upper rim of the bathtub 32. When the bathtub has been filled to predetermined level the patient will sit down on the seat 11 and the faucet or tap 33 is closed.

By operating the pull 28, the valve plate 24 is shifted and moved off the opening of branch or flange piece 18'' of the T-tube. Owing to the load on the seat 11, the

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water in the bellows 14 is now forced out through the opened valve and the outlet openings 29 into the bathtub. During this occurrence the seat 11 occupied by the patient sinks gradually to just above the bottom of the bathtub 32.

When the bather is to be lifted and removed from the bathtub 32, the pull 28 is released so that the compression spring 27 acts to close the valve 24 again, and the faucet 33 to which the hose 19 is connected is opened. The bellows 14 is refilled with water and the seat 11 occupied by the bather is again raised to at least approximately the upper rim of the bathtub, so that he can readily be lifted away from the bathtub.

The cross-sectional area of the bellows 14 is so chosen that the pressure commonly prevailing in an ordinary water-supply line is sufficient to lift the seat 11 under the weight of the bather. The three lazy tongs do not serve as lifting means, but will solely guide and brace the seat 11. Instead of three lazy tongs 4, two or four of the same could be provided. The valve acting at the opening of flange piece 18" of the T-tube includes the valve plate 24 with gasket 23, the valve stem 22, the sleeve 25 and the compression spring 27 and acts as a safety valve which opens automatically if the pressure in the bellows 14 should become too great or excessive.

The base 1, the seat 11, the guide rails 3 and the lazy tongs 4 consist of corrosion-proof materials, preferably light metal. The seat 11 may be provided with a removable backrest 34, if desired.

It is well understood that instead of the bathing or lifting device herein referred to any suitable, preferably hydraulically or fluid operated jack or similar devices may be used to bring about movement of the effective surface of the latter relative to the rim of the bathtub, which may be readily and preferably operated from a water supply through the faucet of the tub and which may be easily and readily combined with ordinary bathtubs now in use and for ready removal of said device from the latter.

It is, of course, understood that the jack or lifting device may be provided with a reclining surface rather than with a seat so that the patient may be transported into the bathtub in a reclining position instead of a sitting position.

While a preferred embodiment of the invention has been shown and herein described, it will be understood that the same is capable of modifications without departure from the general scope and spirit of the invention as defined in the claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. In combination, lifting means provided with a base for contact with the bottom of a bathtub and for removal therefrom, said lifting means including a seat and a bellows, pipe means extending from said bellows for connection with a water supply source, and vertically and horizontally extending bracing means, respectively, and positioned within said bellows, said vertically extending bracing means operatively connecting said seat with said base, said horizontally extending bracing means operatively connecting said vertically extending bracing means with said bellows, whereby tipping and tilting of said seat relative to said base is prevented, when said seat is in lifted position with respect to said base.

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2. In combination, lifting means provided with a base for contact with the bottom of a bathtub and for removal therefrom, said lifting means including a seat and a bellows, pipe means extending from said bellows for connection with a water supply source, valve means connected to said pipe means for selectively permitting passage of water through said pipe means, substantially vertically extending lazy tong means operatively connecting said base with said seat within said bellows, and substantially horizontally extending bracing means in contact with said bellows and including rods connected with said lazy tong means.

3. Lifting means according to claim 2, said horizontally extending bracing means being ring means within said bellows and operatively connected with said rods, which extend radially from said ring means.

4. Lifting means comprising, in combination, a base for contact with the bottom of a bathtub and for removal therefrom, a seat, a bellows interconnecting said seat with said base, pipe means extending from said bellows for connection with a supply source to operate said bellows, a plurality of vertically extending lazy tong means disposed within said bellows and between said seat and said base, a plurality of rods extending within said bellows in radial direction to the latter and operatively connected with said lazy tong means, respectively, and horizontally extending ring means within said bellows and in contact therewith, said rods operatively engaging said ring means, whereby upon raising said seat said lazy tong means are extended and carry said rods and said ring means for bracing said bellows against tipping and tilting.

5. Lifting means in accordance with claim 4, including horizontally extending annular means disposed exteriorly of said bellows and in contact therewith, said ring means and said annular means conforming in contour to each other, to thereby prevent displacement of said ring means relative to said bellows.

6. In combination, a bathtub, portable bellows lifting means for resting on the bottom of said bathtub and for removal therefrom, a seat operatively connected with said lifting means for holding a user, means connected to said lifting means to level said seat, pipe means connecting said lifting means with a fluid supply source, valve means for regulating the fluid supply to said lifting means, control means for said valve means and disposed in said bathtub for manipulation by said user, to thereby permit said user to discharge fluid from said lifting means for lowering said seat, and bracing means within the inner space of said bellows lifting means and stabilizing the latter against movement in longitudinal and transverse direction upon lifting said seat.

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