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(54) **BATH LIFT**

BADELIFT

APPAREIL DE LEVAGE POUR BAIGNOIRE

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EP 0 612 236 B1

Description

This invention relates to improvements in bath lifts and in particular to bath lifts for assisting ingress and egress from a bath.

Many elderly and disabled persons require assistance in bathing and various lifts and hoists have been developed to help a person to get into and get out of a bath. These hoists and lifts include supporting frameworks which may be located outside or inside the bath and which support seats which may be lowered from an entry position, where the seat is at least level with the rim of the bath, to a bathing position, where the seat is located as close as possible to the floor of the bath. A number of the lifts currently available are manually operated by, for example, turning a handle, though the operation of such lifts can prove tiring for many persons, particularly when they are in a seated position. Other lifts are provided with hydraulic lift arrangements operated by motor driven pumps, however these tend to be relatively expensive and complex. A number of lifts, such as the Tubmate Bath Lift available from Asgo Ltd, are powered by water pressure, available from the domestic cold water supply. The Tubmate Bath Lift includes a frame which is attached to the bath floor by means of four large suction pads and which includes a vertical mast on which the seat is mounted. However, the Tubmate Lift is relatively heavy and can prove awkward to remove to permit an able bodied person to use the bath, and installation requires the services of a plumber.

Water pressure is also used to lift the bather in the Tamplin Lifting Bath Cushion, available from Davis Tamplin, which is simply a cushion which may be filled to lift the bather from the floor of the bath, though the cushion only rises to within 80 mm of the bath rim and thus does not assist in entry and exit from the bath.

EP-A-0347652 discloses a bath lift including a frame having a portion for engaging the bath floor and a seat, with a scissors type frame therebetween. The seat is lifted by inflation of a flexible element with pressurised fluid, a valve controlling the flow fluid to the element.

It is one of the objects of the present invention to provide a bath lift which is of lightweight construction and thus can be removed from and fitted to a bath without difficulty.

It is a further object of the present invention to provide a bath lift which may operate using water pressure supplied from a domestic water supply system and which may be readily connected to the system.

It is a still further object of the present invention to provide a bath lift which facilitates ingress and egress from a bath.

These objects are achieved by providing bath lift apparatus according to claim 1.

The frame configuration permits the second part of the lower frame portion to extend into the sloping rear portion of the bath. This allows the arc described by the pivoting upper stabilising frame portion to be relatively large to minimize longitudinal translation of the seat during raising and lowering without compromising the space available in the bath.

In use, the frame configuration acts to stabilize the seat against unwanted movement as the seat is raised and lowered. The apparatus is conveniently arranged to allow the lifting means to be connected permanently or temporarily to a domestic cold water supply system or to a hand or foot pump system. Preferably, means are provided for releasably connecting the apparatus to an adjacent cold water tap. The water pressure may thus be used to inflate the lifting means and raise the seat, conveniently to a height level with the top of the bath. The bather may then slide over the rim of the bath onto the seat and operate the control means to deflate the lifting means, which conveniently drains into an adjacent wash hand basin or w.c. The water draining from the lifting means thus does not cool the bath water. With the seat in the lowered position the bather may remain on the seat. To leave the bath the bather operates the control means to inflate the lifting means and lift the seat to the raised position, from where the bather may slide from the seat over the rim of the bath.

Preferably, the lifting means is in the form of a collapsible, inextensible fluid actuated piston.

The fluid piston may itself be formed of inextensible material or may be located within a non-extensible outer jacket. The piston may be contained within a retaining system of collapsible rings, a coiled spring or a similar device formed of segments of rigid material.

The use of a collapsible, inextensible piston allows the piston to be located between the seat and the lower frame portion, directly beneath the seat, while allowing the seat to be lowered to a position only a short distance above the floor of the bath. This allows the user to bathe without having to use a significant extra volume of water and provides a very compact arrangement. The piston may include reinforcing hoops and preferably the hoops are concentric and have stepped diameters such that, in the collapsed configuration, the hoops fit within one another.

Preferably, a secondary stabilizing frame is provided between the seat and the forward part of the lower frame portion and is arranged to maintain the seat horizontal as it is raised and lowered. The secondary stabilizing frame may be in the form of a "Y" having a first frame member pivotally connected between the seat and lower frame portion and a second frame member having one end pivotally connected to an intermediate portion of the first frame member and the other end pivotally connected to the seat. The upper end of the first frame member is preferably slidably mounted in a horizontal track extending along a side of the seat. Most preferably, a secondary stabilizing frame is provided on each side of the apparatus. Alternatively, a secondary stabilising frame may be provided between the rear of the first stabilizing frame and the seat and serves to

maintain the seat horizontal as it is raised and lowered. Further, the seat is preferably slidably mounted on a seat frame pivotally mounted to the front of the upper portion of the frame and the secondary stabilising frame is arranged to hold the seat to follow a vertical path as the upper portion of the frame pivots on the lower portion of the frame with minimal forwards and rearwards motion, which some user's can find disconcerting.

The control means may include valves for controlling fluid flow to and from the lifting means. The valves may be operated by conventional taps or using a suitable lever or other control. The valve operators are conveniently located in a module arranged for mounting on the rim of the bath within easy reach of the bather.

Preferably, the apparatus includes a valve for closing the supply of pressurized water to the lifting means when the seat reaches a predetermined but adjustable fully raised position.

Side flaps may be pivotably attached to the seat, which flaps extend over the bath rim when the seat is raised and then pivot upwardly as the seat is lowered to hold the user on the seat and to prevent the user's fingers from being caught between the seat and frame portions.

These and other aspects of the present invention will now be described, by way of example, with reference to the accompanying drawings, in which;

Figure 1 is a part-sectional side view of a bath lift apparatus in accordance with a preferred embodiment of the present invention, shown fitted in a bathroom;

Figure 2 is a plan view of the bath lift apparatus and bath of Figure 1;

Figure 3 is a diagrammatic representation of the means for lowering and raising the apparatus of Figure 1;

Figures 4, 5 and 6 are side views of frame elements of the bath lift apparatus of Figure 1 shown in the fully raised, partially raised, and fully lowered positions, respectively;

Figure 7 is a side view of a bath lift apparatus in accordance with a further embodiment of the present invention, shown in the lowered position;

Figure 8 is a side view of the bath lift apparatus of Figure 7, in the raised position and showing a secondary stabilising frame; and

Figure 9 is a front view of the bath lift apparatus of Figure 7 with side flaps also shown.

Reference is first made Figure 1 of the drawings which shows, partially cut away, a bath 10 provided with a bath lift 12 in accordance with a preferred embodiment of the present invention. The bath lift 12 sits towards the sloping end of the bath, normally at the opposite end from the taps and drain, and is used to assist in ingress and egress of an elderly or disabled person from the bath. The lift 12 includes a seat 14 and this is shown in the raised position in Figure 1, in which the seat 14 is substantially level with the rim 16 of the bath. As will be described, the lift 12 may be operated to lower the seat 14 to a position adjacent the bath floor 18 and to lift the seat 14, and the bather, back to the raised position, facilitating exit from the bath.

The lift 12 includes a frame 20 having a lower portion 22 which sits on the bath floor 18 and an upper portion 24 to which the seat 14 is pivotally mounted. A collapsible inextensible fluid piston in the form of a water jacket 26 is located between the lower frame portion 22 and the seat 14. As will be described, the water jacket 26 may be inflated using tap water, to lift the seat.

In the embodiment illustrated, the water jacket 26 is connected to the cold water tap 28 of an adjacent wash hand basin 30. By means of a control 32, which includes appropriate valves, as will be described, the bather may allow water to flow through an inlet conduit 34 to the water jacket 26. As the jacket 26 reaches full inflation and the seat 14 reaches the fully raised position, the flow of water from the tap 28 is automatically cut off. To deflate the water jacket 26, the control 32 is operated to allow water to drain from the jacket 26 through a drain conduit 36 into the wash hand basin 30.

The water jacket supply system is illustrated diagrammatically in Figure 3 of the drawings and this illustrates the automatic shut-off. The Figure shows the jacket 26 fully inflated with the seat 14 in the raised position. Three valves are shown, an inlet valve 38, a drain valve 40 and a shut-off valve 42. The inlet and drain valves 38, 40 are located in the control 32 on the respective conduit 34, 36 and the shut-off valve 42 is located on the inlet conduit 34. Both conduits 38 communicate with the water jacket 26 via a single conduit 46 which is connected through a suitable T-joint 48 to the conduits 34, 36.

To raise the seat 14 and inflate the water jacket 26 the inlet valve 38 is opened while the drain valve 40 is closed. The shut-off valve 42 is opened and closed by means of a lever 49 which is normally biased to the open position by a spring 50. However, when the water jacket 26 is inflated and the seat 14 is raised a limit connection 52 which extends between the seat 14 and the end of the lever 49 closes the valve 42.

To deflate the water jacket 26 and thus lower the seat 14, the inlet valve 38 is closed while the drain valve 40 is opened. Thus, water may flow through the drain conduit 36. As the seat 14 moves downwardly, under the weight of the bather, the spring 50 returns the shut-off valve operating lever 49 to its normal position and opens the shut-off valve 42.

The inlet and drain valves 38, 40 are provided in a module 41 adapted to be fitted over the rim of the bath within easy reach of the operator. The valves 38, 40 may be operated by conventional taps or by means of a lever as shown.

The lift is also provided with a pressure regulator (not shown) which allows the release of water from the

system if the water pressure rises above a predetermined safe level.

The configuration of the frame 20 of the lift will now be described. The upper and lower frame portions 22, 24 are pivotally connected towards the back of the lift while the seat 14 is pivotally connected to the upper frame portion 24 towards the front of the lift. A further, stabilising frame 54 is provided between the seat 14 and the lower frame portion 22 and is arranged to maintain the seat 14 horizontal as it is raised and lowered, as will be described.

Reference is now also made to Figures 4 through 6 of the drawings which illustrate the various frame portions and the seat. The frame portions are of similar configuration on both sides of the lift and will be described with reference to only one side of the lift. It may be seen that the stabilising frame 54 is in the form of a "Y" and has a first frame member 56 pivotally connected between the seat 14 and the front end of the lower frame portion 22. The frame 54 further includes a second frame member 58 having its lower end pivotally connected to an intermediate portion of the first frame member 56 and its other end is pivotally connected to the front end of the seat 14. To maintain the seat 14 parallel as it is raised and lowered, the upper end of the first frame member 56 is mounted on a horizontal slide track 60 provided in a side portion of the seat 14.

The lower frame portion 22 extends upwardly and rearwardly from a planar floor engaging part 62 to the pivotal connection between the frame portions 22, 24. The rear part of the lower frame portion 22 may thus extend into the sloping rear portion of the bath. This allows the upper frame portion 24 to be relatively long such that the arc described by the pivoting upper frame portion 24 is relatively large and thus minimises longitudinal translation of the seat 14 during raising and lowering, without comprising the space available in the bath. In practice, it has been found that the translation is typically no more than 2.5 cm (1 inch), which is practically unnoticed by the bather. It will also be noted that the bath floor engaging part 62 of the lower frame portion fits within the upper frame portion (see Figure 6) to permit the seat to be lowered almost to the bath floor.

The jacket 26 is formed of inextensible material, such as fibre reinforced PVC and for additional strength, as well as to minimise lateral sagging or distortion in states other than the completely full state, may be contained within a retaining system formed of a plurality of collapsible rings. At its lower end, the jacket 26 is mounted on a part of the lower frame portion 22 which extends between the frame side members and the upper end of the jacket is connected to the base of the seat 14.

Figure 1 illustrates the lift 12 with the seat 14 provided with a back rest 64. If the bather wishes to lie in the bath, with the bath lift 12 in the lower position, the back rest 64 may be removed. For the comfort of the bather, a back support 66 (Figure 2) in the form of a sloping plate is provided between the rear ends of the side members of the upper portion 24. In the reclined position the bather may find it easier to wash their upper body and also their perineum.

Suction pads 70 are provided on the inclined portions of the side members of the lower frame portion 22 for attaching to the sloping end of the bath 10. This provides additional stability for the lift 12 while not substantially increasing the difficulty of removing the lift 12 from the bath 10 when the bath 10 is to be used by an able bodied person.

Figure 2 shows a seat extension 72 which is removably mounted to the seat 14 to facilitate sliding on to and from the seat 14 over the rim 16 over the bath. Alternatively, the extension 72 may be mounted to the bath and remain in place as the seat 14 is lowered.

The bath lift 12 may be manufactured in any suitable, water resistant materials, the frames 20,24 and at least the frame of the seat 14 being manufactured from a lightweight, rigid material such as a rigid plastic, while the stabilising frame 54 may be manufactured in stainless steel. The seat 14, back support 66 and seat extension 72 may be provided with padding for greater comfort.

As will be clear from the above description, the bath lift 12 allows an elderly or disabled person to raise and lower themselves from the bath with minimal effort. The lift configuration allows the lift to be of compact and lightweight construction so that it may be easily removed from the bath, while providing stability when in use. Also, the bath lift configuration allows the seat to be lowered to within around 5 cm (2 inches) of the bath floor such that it is not necessary to fill the bath very much higher than is normally required.

Reference is now made to Figures 7, 8 and 9 of the drawings which shows a bath lift 80 in accordance with a further embodiment of the present invention. The bath lift 80 operates in a similar manner to the first embodiment described above and therefore only different features will be described in any detail. The lift includes a frame 82 having pivotally connected lower and upper portions 84, 86, both portions being of similar form to simplify manufacture. The portions 84, 86 in this example are of welded stainless steel tubing, but for lightness in weight they would preferably be made in rigid moulded plastic.

The water jacket 88 is formed of a flexible jacket provided with a plurality of strengthening hoops 90. In this example the hoops 90 are rectangular and vary in diameter from a minimum at the middle of the jacket to a maximum at the seat 92 and the lower portion of the frame 84, to provide a water jacket in the form of two truncated square pyramids. The hoops are sized such that, when the water jacket is deflated, the hoops fit within one another thus limiting the height occupied by the deflated jacket as best seen in Figure 7: and are at distance from each other to restrict lateral sway and sagging when not inflated fully. A convenient distance

would be 2.5 cm or less.

The seat 92 is slidably mounted on a seat frame 94 which is itself pivotally mounted to the front of the upper portion of the frame 86. A secondary stabilising frame 96 (Figure 8) is provided on the side of the lift and connects the seat and seat frame 92, 94 with the frame 82. The frame 96 includes three pivotally interconnected links 98, 100, 102. The link 98 is pivotally connected to the upper portion of the frame 86 at a bracket 104 but also includes a slot 106 which engages a pin 108 mounted to the lower portion of the frame 84. The other end of the link 98 is also slotted at 110 and receives a pin 112 extending from the side of the seat frame 94. The end of the link 98 is pivotally connected to the link 100 which is in turn pivotally connected to the link 102, the other end of the link 102 being pivotally connected to the seat 92. The link 102 is also pivotally connected to the seat frame 94, and a second link 103 provides a pivotal connection between the rear of the seat and seat frame 92, 94.

The links are configured to move the seat in the horizontal plane to describe a substantially vertical path as the seat is raised and lowered on the upper portion of the frame 86, which describes an arc as it is raised and lowered. In use, the seat 92 is initially moved rearwards on the seat frame 94 as the seat is raised from the lowered position until the forward end of the upper portion of the frame 86 is raised above the pivot point between the frame portions 84, 86, after which the seat 92 is moved forwards on the seat frame 94.

Figure 9 illustrates the seat 92 provided with a pair of hinged side flaps 114, 116 which lie between the seat and the respective bath rim 117 when the seat is raised and are then pivoted to the positions 114a, 116a shown in broken outline in the figure as the seat is lowered. The flaps 114, 116 assist the user in moving onto and from the seat and also assist in maintaining the user on the seat as it is lowered. The flaps 114, 116 also prevent the user from holding onto the sides of the seat and to minimise the risk of their fingers being caught in the frame.

It will be obvious to those of skill in the art that the above described embodiment is merely exemplary of the present invention, and that various modifications and improvements may be made to the illustrated embodiment without departing from the scope of the invention; if the rim mounted module containing the control valves 38, 40 is inconvenient for a particular bather, the module may be provided with suction pads for mounting on a side wall of the bath or on a wall of the bathroom; and rather than using the cold water supply pressure to raise the seat, a hand, foot or powered pump system may be provided.

Claims

1. Bath lift apparatus (12) for assisting ingress and egress from a bath, the apparatus comprising:

   a frame (20) having a lower frame portion (22) for engaging the bath floor and an upper frame portion (24);

   a seat (14) pivotally mounted to the upper frame portion (24);

   fluid actuated lifting means (26) located between the lower frame portion and the seat;

   conduit means (34) for connecting the lifting means to a pressurised fluid source (28); and

   control means (32) for controlling the supply of pressurised fluid to the lifting means to permit inflation thereof to lift the seat and to permit deflation thereof to lower the seat;

   characterised in that the lower frame portion (22) includes a bath floor engaging first part (62) rigidly connected to a second part extending upwardly and rearwardly therefrom to a pivotal connection with the upper frame portion (24) which extends forwardly from said connection, the seat (14) being pivotally mounted to a front part of the upper frame portion.

2. Bath lift apparatus as claimed in claim 1, wherein the lifting means is in the form of a collapsible, inextensible fluid actuated piston (26).

3. Bath lift apparatus as claimed in claim 2, wherein the piston includes reinforcing hoops (90).

4. Bath lift apparatus as claimed in claim 3, wherein the hoops (90) are concentric and have stepped diameters such that, in the collapsed configuration, the hoops fit within one another.

5. Bath lift apparatus as claimed in any one of the preceding claims, wherein the conduit means (34) is arranged for temporary connection to an adjacent cold water tap (28).

6. Bath lift apparatus as claimed in any of claims 1 to 4, wherein the conduit means is arranged for connection to pump means.

7. Bath lift apparatus as claimed in any one of the preceding claims, wherein the conduit means (36) is arranged to drain into an adjacent wash hand basin (30) or w.c. on deflation of the lifting means (26).

8. Bath lift apparatus as claimed in any one of the preceding claims, further including a secondary frame (54) arranged to maintain the seat (14) horizontal as it is raised and lowered.

9. Bath lift apparatus as claimed in claim 8, wherein the secondary frame (54) is provided between the seat (14) and the forward part of the lower frame portion (22).

10. Bath lift apparatus as claimed in claim 8, wherein the secondary frame (96) is provided between the rear part of the first frame and the seat.

11. Bath lift apparatus as claimed in claim 10, wherein the seat (92) is slidably mounted on a seat frame (94) itself pivotally mounted to the front of the upper portion of the frame (86) and the secondary frame (96) is arranged to hold the seat (92) to follow a substantially vertical path as the upper portion of the frame (96) pivots on the lower portion of the frame.

12. Bath lift apparatus as claimed in any one of the preceding claims, wherein the control means (32) includes valves (38, 40) for controlling flow to and from the lifting means (26).

13. Bath lift apparatus as claimed in claim 12, wherein valve operators are located in a module (41) arranged for mounting on the rim of the bath.

14. Bath lift apparatus as claimed in any one of the preceding claims, including a valve (42) for closing the supply of fluid to the lifting means (26) when the seat (14) reaches a predetermined fully raised position.

15. Bath lift apparatus as claimed in any one of the preceding claims including side flaps (114, 116) pivotably attached to the seat (92), which flaps (114, 116) extend over the bath rim (117) when the seat (92) is raised and then pivot upwardly as the seat (92) is lowered to hold the user on the seat and prevent the user's fingers from being caught between the seat (92) and frame portions.

Patentansprüche

1. Badewannenlift-Vorrichtung (12) zur Unterstützung des Einsteigens und Aussteigens aus einer Badewanne, wobei die Vorrichtung folgende Komponenten umfaßt:

   ein Gestell (20), das einen unteren Gestellabschnitt (22) zum Halt am Boden der Badewanne und einen oberen Gestellabschnitt (24) hat;
   einen Sitz (14), der schwenkbar am oberen Gestellabschnitt (24) angebracht ist;
   ein fluid-betätigtes Hebemittel (26), das sich zwischen dem unteren Gestellabschnitt und dem Sitz befindet;
   ein Rohrleitungsmittel (34) zur Verbindung des Hebemittels mit der unter Druck stehenden Fluid-Quelle (28); und
   Steuerungsmittel (32) zur Regulierung der Zufuhr der Druckflüssigkeit zum Hebemittel, um dessen Aufpumpen zum Anheben des Sitzes zu ermöglichen und um das Ablassen von dessen Druck zum Absenken des Sitzes zu ermöglichen;

   dadurch gekennzeichnet, daß der untere Gestellabschnitt (22) ein erstes, mit dem Boden der Badewanne zum Eingriff kommendes Teil (62) einschließt, das starr mit einem zweiten Teil verbunden ist, das von diesem nach oben und hinten zu einer Schwenkverbindung mit dem oberen Gestellabschnitt (24) verläuft, der sich von der Verbindung nach vorn erstreckt, wobei der Sitz (14) schwenkbar an einem vorderen Teil des oberen Gestellabschnitts befestigt ist.

2. Badewannenlift-Vorrichtung nach Anspruch 1, bei der das Hebemittel die Form eines zusammenschiebbaren, undehnbaren, fluid-betätigten Kolbens (26) hat.

3. Badewannenlift-Vorrichtung nach Anspruch 2, bei welcher der Kolben verstärkende Reifen (90) einschließt.

4. Badewannenlift-Vorrichtung nach Anspruch 3, bei welcher die Reifen (90) konzentrisch sind und einen abgestuften Durchmesser haben, derartig, daß die Reifen in der zusammengeschobenen Konfiguration ineinander passen.

5. Badewannenlift-Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das Rohrleitungsmittel (34) für die zeitweilige Verbindung mit einem danebenliegenden Kaltwasserhahn (28) vorgesehen ist.

6. Badewannenlift-Vorrichtung nach einem der Ansprüche 1 bis 4, bei der das Rohrleitungsmittel für die Verbindung mit einem Pumpenmittel vorgesehen ist.

7. Badewannenlift-Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das Rohrleitungsmittel (36) dafür vorgesehen ist, sich beim Ablassen des Drucks des Hebemittels (26) in ein danebenliegendes Handwaschbecken (30) oder WC zu entleeren.

8. Badewannenlift-Vorrichtung nach einem der vorhergehenden Ansprüche, die außerdem ein zweites Gestell (54) einschließt, das dafür vorgesehen ist, den Sitz (14) beim Anheben und Absenken waagerecht zu halten.

9. Badewannenlift-Vorrichtung nach Anspruch 8, bei der das zweite Gestell (54) zwischen dem Sitz (14) und dem vorderen Teil des unteren Gestellab-

schnitts (22) angeordnet ist.

10. Badewannenlift-Vorrichtung nach Anspruch 8, bei der das zweite Gestell (96) zwischen dem hinteren Teil des ersten Gestells und dem Sitz angeordnet ist.

11. Badewannenlift-Vorrichtung nach Anspruch 10, bei welcher der Sitz (92) gleitfähig auf einem Sitzrahmen (94) angebracht ist, der selbst schwenkbar an der Vorderseite des oberen Abschnitts des Gestells (86) angebracht ist, und das zweite Gestell (96) so angeordnet ist, daß es den Sitz (92) so hält, daß dieser einer im wesentlichen senkrechten Bahn folgt, wenn der obere Abschnitt des Gestells (96) auf dem unteren Abschnitt des Gestells geschwenkt wird.

12. Badewannenlift-Vorrichtung nach einem der vorhergehenden Ansprüche, bei der das Steuerungsmittel (32) Ventile (38, 40) zur Steuerung des Stromes zu und von dem Hebemittel (26) einschließt.

13. Badewannenlift-Vorrichtung nach Anspruch 12, bei der sich Ventil-Betätigungselemente in einem Modul (41) befinden, das so aufgebaut ist, daß es auf dem Rand der Badewanne angebracht werden kann.

14. Badewannenlift-Vorrichtung nach einem der vorhergehenden Ansprüche, die ein Ventil (42) zum Schließen der Zufuhr des Fluids zum Hebemittel (26) einschließt, wenn der Sitz (14) eine festgelegte, voll ausgezogene Position erreicht hat.

15. Badewannenlift-Vorrichtung nach einem der vorhergehenden Ansprüche, die seitliche Klappen (114, 116) einschließt, die schwenkbar am Sitz (92) befestigt sind, wobei die Klappen (114, 116) über den Rand (117) der Badewanne reichen, wenn der Sitz (92) angehoben ist, und dann nach oben schwenken, wenn der Sitz (92) abgesenkt wird, um den Benutzer auf dem Sitz zu halten und zu verhindern, daß die Finger des Benutzers zwischen dem Sitz (92) und den Abschnitten des Gestells eingeklemmt werden.

Revendications

1. Appareil de levage pour baignoire (12) destiné à faciliter l'entrée dans la baignoire et la sortie de celle-ci, l'appareil comprenant:

un cadre (20) comportant une partie inférieure de cadre (22) destinée à s'engager dans le fond de la baignoire et une partie supérieure de cadre (24);

un siège (14), monté par pivotement sur la partie supérieure du cadre (24);

un moyen de levage actionné par un fluide (26) agencé entre la partie inférieure du cadre et le siège;

un moyen de conduite (34) pour connecter le moyen de levage à une source de fluide sous pression (28); et

un moyen de commande (32) pour commander l'amenée de fluide sous pression vers le moyen de levage, afin de permettre son gonflement pour relever le siège et son dégonflement pour abaisser le siège;

caractérisé en ce que la partie inférieure du cadre (22) englobe une première partie s'engageant dans le fond de la baignoire (62), connectée rigidement à une deuxième partie s'étendant vers le haut et vers l'arrière de celle-ci, vers une connexion pivotante avec la partie supérieure du cadre (24) s'étendant vers l'avant de ladite connexion, le siège (14) étant monté par pivotement sur une partie avant de la partie supérieure du cadre.

2. Appareil de levage pour baignoire selon la revendication 1, dans lequel le moyen de levage a la forme d'un piston repliable, inextensible, actionné par un fluide (26).

3. Appareil de levage pour baignoire selon la revendication 2, dans lequel le piston englobe des cerceaux de renforcement (90).

4. Appareil de levage pour baignoire selon la revendication 3, dans lequel les cerceaux (90) sont concentriques et ont des diamètres étagés, de sorte que dans la configuration repliée, les cerceaux s'adaptent les uns dans les autres.

5. Appareil de levage pour baignoire selon l'une quelconque des revendications précédentes, dans lequel le moyen de conduite (34) est destiné à être connecté temporairement à un robinet d'eau froide adjacent (28).

6. Appareil de levage pour baignoire selon l'une quelconque des revendications 1 à 4, dans lequel le moyen de conduite est destiné à être connecté à un moyen de pompe.

7. Appareil de levage pour baignoire selon l'une quelconque des revendications précédentes, dans lequel le moyen de conduite (36) est destiné à être évacué dans un lavabo adjacent (30) ou une cuvette de WC lors du dégonflement du moyen de levage (26).

8. Appareil de levage pour baignoire selon l'une quel-

conque des revendications précédentes, englobant en outre un cadre secondaire (54), destiné à maintenir le siège (14) dans une position horizontale lors de son relèvement et de son abaissement.

9. Appareil de levage pour baignoire selon la revendication 8, dans lequel le cadre secondaire (54) est agencé entre le siège (14) et la partie avant de la partie inférieure du cadre (22).

10. Appareil de levage pour baignoire selon la revendication 8, dans lequel le cadre secondaire (96) est agencé entre la partie arrière du premier cadre et le siège.

11. Appareil de levage pour baignoire selon la revendication 10, dans lequel le siège (92) est monté par glissement sur un cadre du siège (94), monté par pivotement sur l'avant de la partie supérieure du cadre (86), le cadre secondaire (96) étant destiné à entraîner le siège (92) à suivre une voie pratiquement verticale lors du pivotement de la partie supérieure du cadre (96) sur la partie inférieure du cadre.

12. Appareil de levage pour baignoire selon l'une quelconque des revendications précédentes, dans lequel le moyen de commande (32) englobe des soupapes (38, 40) destinées à assurer la commande de l'écoulement vers le moyen de levage (26) et à partir de celui-ci.

13. Appareil de levage pour baignoire selon la revendication 12, dans lequel des moyens d'actionnement des soupapes sont agencés dans un module (41), destiné à être monté sur le rebord de la baignoire.

14. Appareil de levage pour baignoire selon l'une quelconque des revendications précédentes, englobant une soupape (42) pour fermer l'alimentation de fluide vers le moyen de levage (26) lorsque le siège (14) atteint une position relevée complète prédéterminée.

15. Appareil de levage pour baignoire selon l'une quelconque des revendications précédentes, englobant des volets latéraux (114, 116) fixés par pivotement au siège (92), ces volets (114, 116) s'étendant au-dessus du rebord de la baignoire (117) lorsque le siège (92) est relevé avant de pivoter vers le haut lorsque le siège (92) et abaissé pour retenir l'utilisateur sur le siège et empêcher que les doigts de l'utilisateur ne soient coincés entre le siège (92) et les parties du cadre.

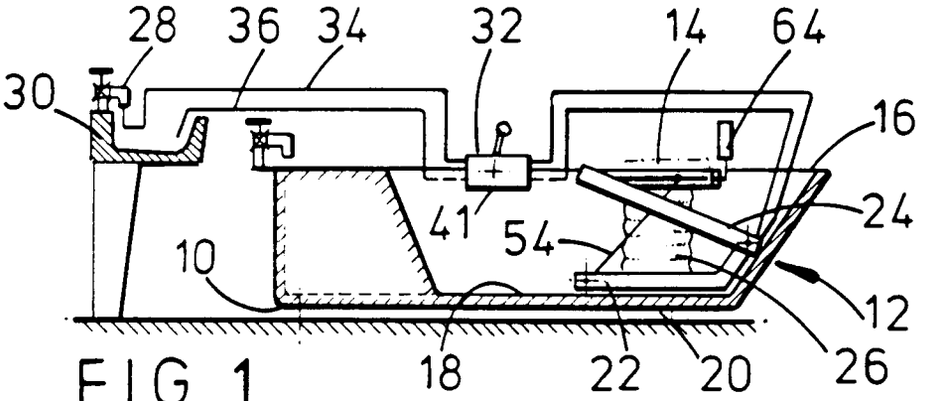


FIG. 1

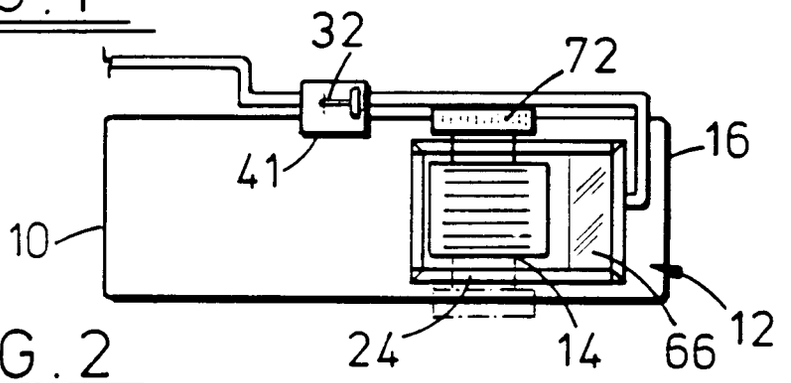


FIG. 2

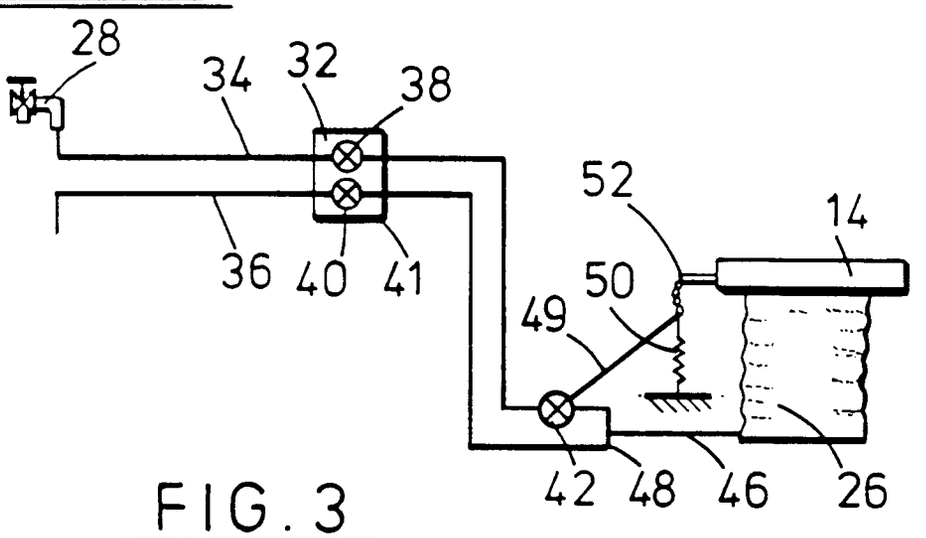


FIG. 3

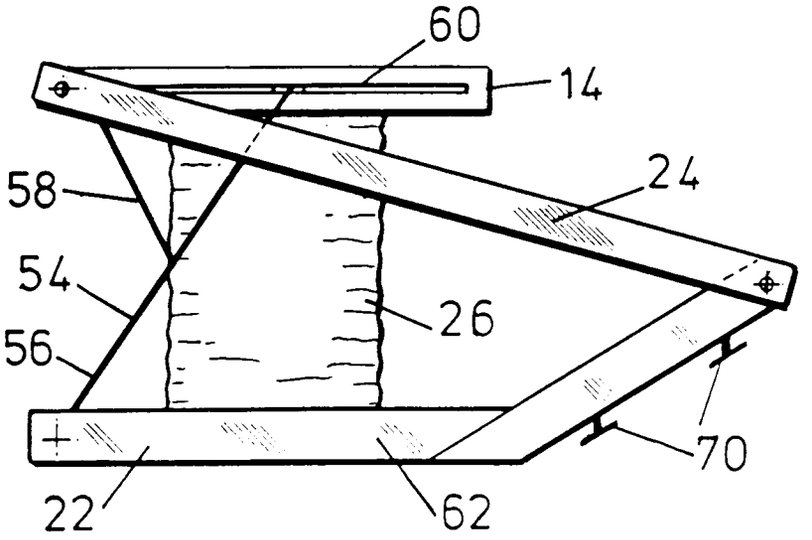


FIG. 4

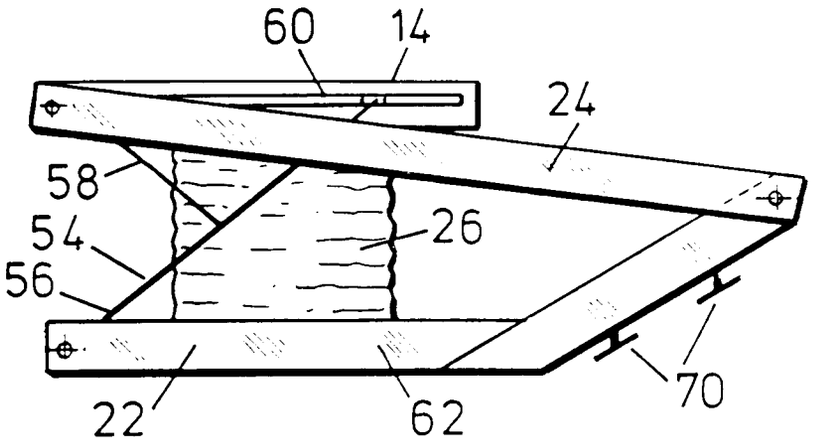


FIG. 5

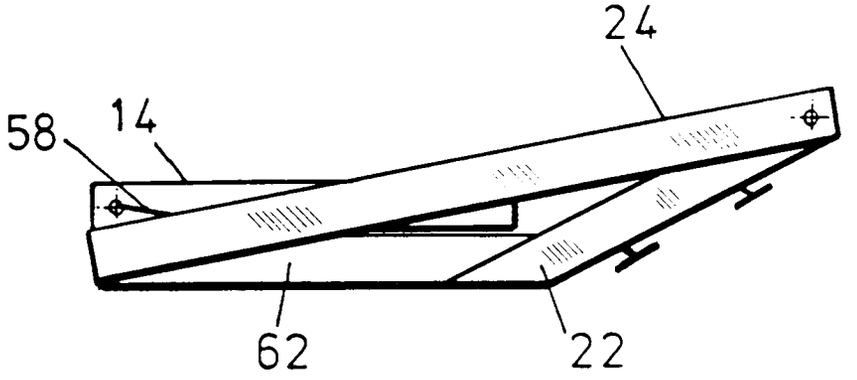


FIG. 6

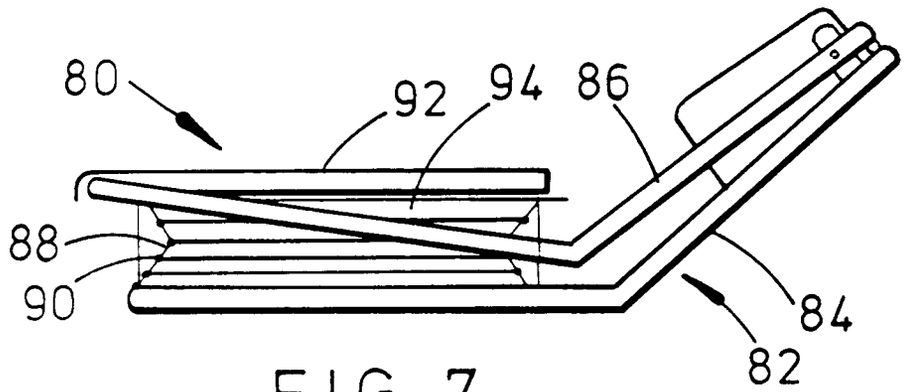


FIG. 7

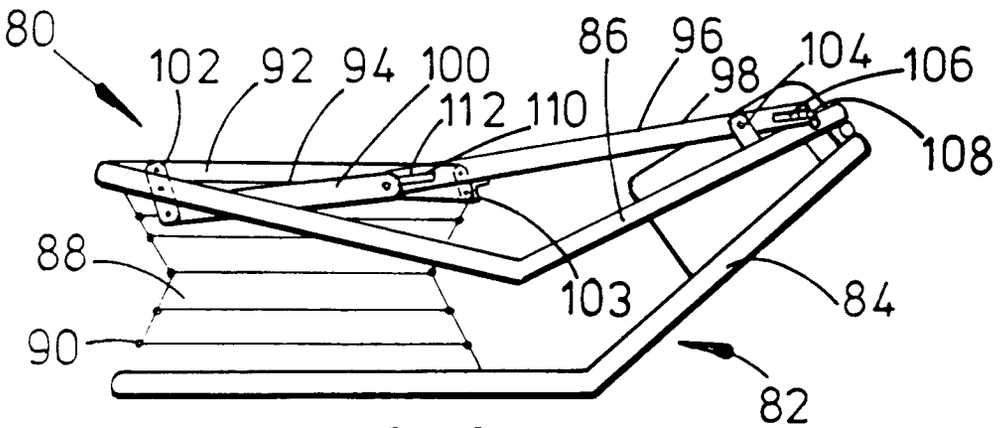


FIG. 8

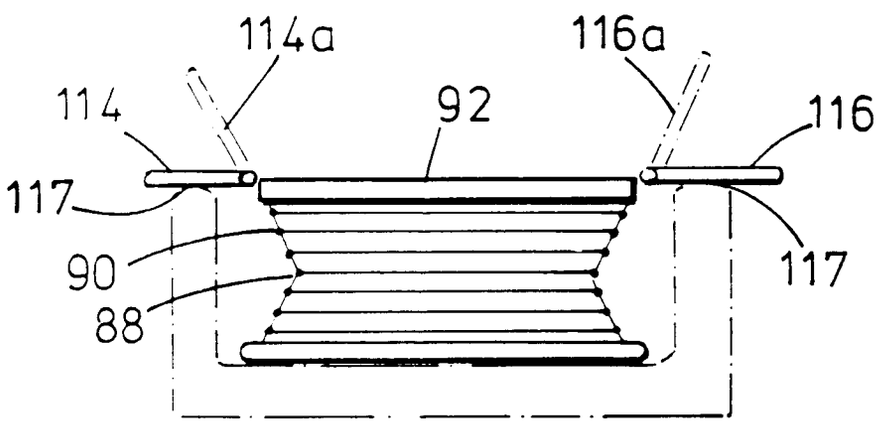


FIG. 9