



(11) **EP 2 898 868 B9**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:
Corrected version no 1 (W1 B1)
Corrections, see
Description Paragraph(s) 9

(51) Int Cl.:
A61G 7/10 (2006.01)

(48) Corrigendum issued on:
15.03.2017 Bulletin 2017/11

(45) Date of publication and mention
of the grant of the patent:
19.10.2016 Bulletin 2016/42

(21) Application number: **15160037.6**

(22) Date of filing: **11.02.2011**

(54) **Bath lift device**
Badhebevorrichtung
Dispositif élévateur pour une baignoire

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR

(30) Priority: **11.02.2010 EP 10153361**

(43) Date of publication of application:
29.07.2015 Bulletin 2015/31

(62) Document number(s) of the earlier application(s) in
accordance with Art. 76 EPC:
11707485.6 / 2 533 746

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(56) References cited:
EP-A1- 1 057 467 WO-A1-91/11133
WO-A2-2005/065621 GB-A- 2 344 047

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a bath lift device for raising and lowering persons into or out of a bathtub, said device including a chassis adapted to rest, in use, on a floor of the bathtub and a slideably supported seat adapted to be moveable between a raised position, in which the seat is correctly positioned to permit a person standing outside the bathtub to sit inside said seat, and a lowered position, in which said seat is positioned at the bottom of the bathtub.

BACKGROUND OF THE INVENTION

[0002] Bath lift devices have been widely used for aged or disabled people as a convenient means for entering or leaving a bathtub. Generally, a conventional bath lift device comprises two main parts, a fixed part resting, in use, on a floor of the bathtub and a moveable part including the seat.

[0003] However, in these conventional bath lift devices, these two parts are not independent. Thus, it is not possible to separate the moveable part from the fixed part without doing some dismantling operations. Therefore, when one wants to clean the floor of the bathtub, one needs to take the bath lift device as a whole out of the bathtub. Considering that the conventional bath lift devices are often made in heavy material, this operation can only be done by a strong person.

[0004] One solution to this problem consists in rendering independent the moveable part from the fixed part. Thus, in this solution, one needs only to take the moveable part out of the bathtub if one wants to have easy access to the floor. Such a solution can be found for instance in the international patent application WO 2005/065621. The bath lift device, revealed by this prior art, uses a pair of guide pillars extending from the chassis onto which is slideably mountable a seat having a backrest from the rear of which extend a pair of guide collars dimensioned to be received on the guide pillars. Thus, the seat can be raised relative to the chassis till the guide collars are disconnected from the guide pillars. However, in this solution, the friction between the guide pillars and the guide collars interferes with the raising or lowering movement of the seat. Moreover, this two-points connection between the seat and the chassis is insufficient to provide a stable position of the seat. Indeed, this connection allows the seat to slightly tilt backwards and forwards or slightly pivot on the left and on the right with regard to its initial position. This results in an uncomfortable sitting position for the user. Finally, with this two-points connection, there is a higher risk that a breaking of the guide pillars or of the guide collars occurs when an heavy person sits inside the seat.

[0005] An other solution to this problem, revealed by the European patent application EP 1 057 467, consists

in a bath aid formed by a seat arrangement, comprising a seat, a backrest and a seat frame supporting the seat, and a single vertical guiding rail extending rearward to the backrest. The seat arrangement is lowered and raised by a hoist, supported at its lower end by a lateral extension part of the guiding rail. Two guiding rollers are pivotally mounted on the seat frame, one roller being supported on the side of the guiding rail facing the seat arrangement and the other roller being supported on the side of the guiding rail facing away from the seat arrangement. The guiding rail is part of an inverted U-shaped framework fixed to the bath.

[0006] In this solution, the sitting arrangement and the guiding rail are only connected at two vertically shifted points. Therefore, the sitting position is not stable due to the possibility for the seat to tilt laterally. Moreover, the probability that the single guiding rail breaks during use is very high. Finally, to install the seat arrangement on the guiding rail or to separate the seat arrangement from the guiding rail, a pivotable latch connecting the rollers to the seat frame must be opened so as to permit the sliding downward or upward displacement of the seat arrangement. This implies that a dismantling operation must be made, rendering these operations rather complex to do.

[0007] The aim of the present invention is therefore to provide a bath lift device in which the fixed part and the moveable part can be easily separated or connected together, in which the moveable part can be easily raised or lowered relative to the fixed part, in which the sitting position of the user is stable and in which the probability of a break of the elements constituting the bath lift device is low.

[0008] A further aim of the present invention is also to provide a bath lift device easy and cheap to manufacture and lightweight.

SUMMARY OF THE INVENTION

[0009] In this view the present invention is concerned with a bath lift device for raising and lowering persons into or out of a bathtub comprising two independent parts that can be easily separated; without doing some dismantling operations:

- a fixed part including a chassis adapted to rest, in use, on a floor of the bathtub, said chassis comprising two tubular upright elements parallel to each other, extending, in use, in a close to vertical direction,
- a moveable part including a seat frame supporting a seat plate and a backrest, said seat frame being moveable upward and downward relative to the chassis via a lifting means and being slideably mounted onto said two upright elements,

characterized in that said two upright elements (11) are joined by a lateral element (12), said lateral element (12) consisting in a curved tubular element (31) connected at

its ends (32) to the two upper ends of the upright elements (11), said tubular element (31) being shaped so as to define an upper open area (33) permitting the sliding upward displacement of the moveable part (20).

[0010] Important features of the device are defined in the dependent claims 2 to 20.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Other features and advantages of the present invention will appear more clearly from the detailed description of embodiments of the invention which are presented solely by way of a non-restricted example and illustrated by the attached drawings in which:

Figure 1 is a side view of a first embodiment of a bath lift device according to the invention;

Figure 2 is a perspective view of the fixed part of the bath lift device of Figure 1;

Figure 3 is a perspective view of the moveable part of the bath lift device of Figure 1, in which the seat plate is disconnected from the seat frame;

Figure 4 is a perspective view of the lateral element used in the bath lift device of Figure 1;

Figure 5 is a perspective view in detail of a suction cup used in the bath lift device of Figure 1.

Figure 6 is a perspective bottom view of a clamping ring used in the bath lift device of Figure 1.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0012] In reference to Figures 1 to 3, a bath lift device according to the present invention is shown.

[0013] The bath lift device 1 of the present invention mainly includes a fixed part 10 including a chassis 11-14 adapted to rest, in use, on a floor of the bathtub and a moveable part 20 including a seat frame 21 supporting a seat plate 22 and a backrest 23, said seat frame 21 being moveable upward and downward relative to the chassis 11-14 via a lifting means 24.

[0014] In reference to Figure 2, one can see that the chassis 11-14 comprises two tubular upright elements 11 parallel to each other and extending, in use, in an approximately vertical direction. Said upright elements 11 are connected to their lower ends to a U-shaped element 14 via two connecting elements 13, said U-shaped element 14 extending, in use, in an approximately horizontal direction. To prevent a tilt back of the chassis 11-14, each connecting element 13 is advantageously connected to said U-shaped element 14 so as to be positioned between an end section 14' of said U-shaped element 14 and the rest of said U-shaped element 14. Of course, in an alternative embodiment of the present invention, each connecting element 13 could be connected at one end of said U-shaped element 14, an additional tubular element being connected to said connecting element 13 so as to form the end section 14' of Figure 2.

To improve the stability of the chassis 11-14, said connecting elements 13 are joined by a lateral rod 13' extending between the two lateral flanges of the U-shaped element 14. To improve the stability of the chassis 11-14, said upright elements 11 are also joined at their upper ends by a lateral element 12. As shown in Figure 4, said lateral element 12 consists in a curved tubular element 31 connected at its ends 32 to the two upper ends of the upright elements 11. Said curved element 31 is shaped so as to define an upper open area 33, delimited by the internal borders 34 of the curved element 31 and by the segment 35 joining said ends 32 in the plane defined the curved element 31. Said open area 33 is configured so that the moveable part 20 can be slid upward through said open area 33 when the user wants to separate the moveable part 20 from the fixed part 10. In addition, to temporarily connect the fixed part 10 to the floor of the bathtub, suction cup 15 are disposed underneath the chassis 11-14. As shown in Figure 5, each suction cup 15 comprises a central section 16 fixedly connected to the U-shaped element 14 at its upper face, said section 16 having on its underface a concavity which acts as a sucker for temporarily connect said cup 15 to the floor of the bathtub. Each suction cup 15 comprises also at least one, but preferably two, peelable release tab 17 externally extending from the periphery of the central section 16, said tab 17 releasing the suction between the suction cup 15 and the floor of the bathtub when its free end 18 is raised. In the embodiment illustrated in Figure 5, said tab 17 is equipped with a tubular section 18 at its free end. This tubular section 18 is configured so as to be entirely introduced inside a hole 19 formed in the underneath face of the U-shaped element 14 when the tab 17 is elastically twisted so as to align the longitudinal axis of said tubular section 18 with the longitudinal axis of the upright elements 11. Said tubular section 18 is also configured so as to be temporarily connected to said U-shaped element 14 when its longitudinal axis is perpendicular to the longitudinal axis of the upright elements 11. To get this result, one solution consists in configuring said tubular section 18 so that its length is greater than the diameter of said hole 19. Thus, when the user wants to disconnect the chassis 11-14 from the floor of the bathtub, he needs beforehand to release the suction between suction cups 15 and the floor of the bathtub. Accordingly, he has to manually raise the free end of the tabs 17 of two suction cups 15 positioned at one extremity of U-shaped element 14 so as to release the suction between said suction cups 15 and the floor of the bathtub and, afterwards, if the tabs 17 of the suction cups 15 positioned at the other extremity are correctly connected to said U-shaped element 14, he only needs to lift up the U-shaped element 14 from the side which is already disconnected from the floor of the bathtub so that said tab 17 is raised and the suction between said corresponding cups 15 and the floor of the bathtub is released.

[0015] In reference to Figure 3, one can see that the moveable part 20 comprises a seat frame 21 formed by

a first part 21', extending, in use, in an approximately horizontal direction, and by a second part 21", extending, in use, in an approximately vertical direction, said first part 21' supporting the seat plate 22 and said second part 21" supporting the backrest 23. Said first part 21' is configured as a U-shaped element and said second part 21" is configured as a pair of parallel upright elements fixedly connected at their lower ends to the U-shaped element. As best seen in Figure 1, each upright element 21" is advantageously formed by a lower longitudinal section 21"(a) and an upper longitudinal section 21"(b), said sections 21"(a) and 21"(b) defining an approximately triangular form with the backrest 23. Said seat frame 21 is moveable upward and downward relative to the chassis 11-14 via a lifting means 24 arranged on the rear of the backrest 23. To control the sliding displacement of said seat frame 21 relative to the chassis 11-14, the moveable part 20 comprises also two pairs of guiding rollers 25 rotatably connected to the upright elements 21" of said seat frame 21, each pair being slideably mounted onto one upright element 11 of the chassis 11-14 and the guiding rollers 25 of each pair being disposed, in use, on opposite sides of said one upright element 11. In the preferred embodiment illustrated in Figure 1, the guiding rollers 25 of each pair are advantageously positioned on the external lateral side of the lower section 21"(a) of one upright element 21" such that the axes of rotation of said guiding rollers 25 are separated by a distance d, said distance d being greater than the diameter of the upright element 11, on which they are slideably mounted. Indeed, in this configuration, the angle α between the plane containing said axes and the longitudinal axis defined by the upright element 11, on which they are slideably mounted, is, in use, different from 90°. Accordingly, this configuration defines a four-points connection between the moveable part 20 and the fixed part 10 which confers a more stable sitting position for the user compared to the two-points connection when α is equal to 90°. Furthermore, the distance d will be advantageously chosen such that said angle α is, in use, less than 45 degrees, and preferably less than 25 degrees. Indeed, by diminishing the angle α , which corresponds to an increased distance d, it is easier for the user to install the moveable part 20 on the fixed part 10 when said moveable part 20 is initially separated from said fixed part 10. Accordingly, in a first step, the user positions the moveable part 20 relative to the fixed part 10 so that the angle α is greater than its value when the bath lift device 1 is in use and, in a second step, he lowers the moveable part 20 so that said moveable part 20 reaches a position limit and so that both upright elements 11 are continuously surrounded at two opposite sides by the guiding rollers 25 of each pair and, in a final step, he turns the moveable part 20 round so that the angle α reaches its value when the bath lift device 1 is in use. Finally, to improve the sliding displacement of the seat frame 21, the upper rollers 25 of each pair, and respectively the lower rollers 25 of each pair, are advantageously joined by an axle 26 extending,

in use, in an approximately horizontal direction.

[0016] In an alternative embodiment of the present invention, not illustrated on the drawings, it is also possible to use a seat frame 21 comprising upright elements 21" that are completely straight. In this case, one guiding roller 25 of each pair will be connected to one upright elements 21" by a lateral connecting rod extending in a close to perpendicular direction with regard to said upright element 21".

[0017] The lifting means 24 used in the present invention will be configured so as to be lightweight and space-saving. Without to be bound by this specific solution, it will be advantageous to use a lifting means as described in the Canadian patent application CA 2 397 503. In particular, such a lifting means prevents that a body part of a bathing person is trapped when the seat plate is moving downward. Accordingly, the lifting means 24 includes an outer spindle 24' within which is received a linearly extendable inner spindle tube (not shown), said outer spindle tube 24' being fixedly connected to the seat frame 21 and said inner spindle tube being supported at its lower end 24" by the chassis 11-14. In particular, said lower end 24" can be shaped as a fork adapted to be removably connected to the lateral rod 13' of the chassis 11-14. Said inner spindle is linearly extendable via an actuating means (not shown) contained within a housing 29, said housing 29 being fixedly connected to the rear of the backrest 23. In the embodiment illustrated in Figure 3, the outer spindle tube 24' is connected to the axle 26 joining the lower rollers 25 of each pair. This connection is advantageously done by a clamping ring 27. In reference to Figure 6, said clamping ring 27 comprises a tubular section 40 inside which is received the outer spindle tube 24', said tubular section 40 comprising a radial aperture 41. At both sides of said radial aperture 41, the tubular section 40 is extended by two longitudinal sections 42, each section 42 comprising a pair of threaded holes 43 configured to join both sections 42 by two bolts (not shown). Of course, in an alternative embodiment of the present invention, it is also possible to use less or more sections 42 so as to adapt the internal diameter of the tubular section 40 to the external diameter of the outer spindle tube 24'. On the radially opposite side of the tubular section 40 with regard to said sections 42 extend two parallel flanges 44 from the periphery of said tubular section 40. Each flange 44 comprises a hole 45 adapted to receive the axle 26. Of course, in an alternative embodiment of the present invention, it is also possible to use only one flange, said flange being wider than said two parallel flanges 44 of Figure 6. To improve the connection between the outer spindle tube 24' and the tubular section 40, said section 40 is advantageously formed by a first tubular section 46 and a second tubular section 47, said first section 46 having an internal diameter less than the internal diameter of said section 47. Said first section 46 is configured so as to be received inside a corresponding groove (not shown) of said outer spindle tube 24'. In a preferred embodiment of the present in-

vention, the depth of said groove will be advantageously greater than the difference between the internal diameters of said second section 47 and said first section 46. Indeed, this configuration permits to transfer the efforts of the outer spindle tube 24' onto the internal surface of the second section 47, and, accordingly, onto a larger surface of the clamping ring 27 when said second section 47 is higher than said first section 46.

[0018] In reference to Figure 3, one can see that two extension plates 28 can be pivotally connected on both lateral ends of the seat plate 22, said extension plates 28 being configured so as to rest on the rim of the bathtub when the moveable part 20 is positioned in a raised position so that the user can easily sit inside the bath lift device 1. Therefore, when said moveable part 20 is lowered, said extension plates 28 are folded up so as to be positioned inside the bathtub.

[0019] In reference to Figure 3, it is also shown that the backrest 23 comprises at least one rib 23', and preferably two ribs at both left and right sides of said backrest 23, said rib 23' extending in a perpendicular direction with regard to the rear of the backrest 23 and being approximately aligned, in use, with one upright element 11 of the chassis 11-14. Said rib 23 is adapted to contact said upright element 11 when the moveable part 20 is tilting backwards with regard to the fixed part 10. Such a situation can occur when the lower end 24" of the inner spindle tube of the lifting means 24 is no more supported by the chassis 11-14. Therefore, such a configuration improves the safety of the bath lift device 1 as a whole.

Claims

1. Bath lift device (1) for raising and lowering persons into or out of a bathtub comprising two independent parts that can be easily separated, without doing some dismantling operations,:

- a fixed part (10) including a chassis (11-14) adapted to rest, in use, on a floor of the bathtub, said chassis (11-14) comprising two tubular upright elements (11) parallel to each other, extending, in use, in a close to vertical direction,
- a moveable part (20) including a seat frame (21) supporting a seat plate (22) and a backrest (23), said seat frame (21) being moveable upward and downward relative to the chassis (11-14) via a lifting means (24) and being slideably mounted onto said two upright elements (11),

characterized in that said two upright elements (11) are joined by a lateral element (12), said lateral element (12) consisting in a curved tubular element (31) connected at its ends (32) to the two upper ends of the upright elements (11), said tubular element (31) being shaped so as to define an upper open area

(33) permitting the sliding upward displacement of the moveable part (20).

2. Bath lift device (1) according to the preceding claim, wherein said moveable part (20) comprises two pairs of guiding rollers (25) rotatably connected to said seat frame (21), each pair being slideably mounted onto one upright element (11) and the guiding rollers (25) of each pair being disposed, in use, on opposite sides of said one upright element (11).
3. Bath lift device (1) according to the preceding claim, wherein said guiding rollers (25) are fixedly positioned with regard to the backrest (23) so as to define a four-points connection between said moveable part (20) and said fixed part (10) and so that said moveable part (20) is installed on said fixed part (10) by only a combination of tilting and sliding displacements of said seat frame (21).
4. Bath lift device (1) according to claim 2 or claim 3, wherein the distance (d) separating the axes of rotation of the guiding rollers (25) of each pair is chosen such that the angle (α) between the plane containing said axes and the longitudinal axis of the upright element (11), onto which they are slideably mounted, is, in use, different from 90°.
5. Bath lift device (1) according to the preceding claim, wherein the distance (d) separating the axes of rotation of the guiding rollers (25) of each pair is chosen such that the angle (α) between the plane containing said axes and the longitudinal axis of the upright element (11), onto which they are slideably mounted, is, in use, less than 45 degrees, and preferably less than 25 degrees.
6. Bath lift device (1) according to any one of the claims 1 to 5, wherein said seat frame (21) comprises a first part (21'), extending in use in an approximately horizontal direction, and a second part (21"), extending in use in an approximately vertical direction, said first part (21') supporting the seat plate (22) and said second part (21 ") supporting the backrest (23).
7. Bath lift device (1) according to the preceding claim, wherein said second part (21 ") is configured as a pair of parallel upright elements, each upright element comprising a lower longitudinal section (21 "a) and an upper longitudinal section (21 "b), said lower and upper sections (21 "a, 21 "b) defining an approximately triangular form with the backrest (23).
8. Bath lift device (1) according to the preceding claim, wherein said guiding rollers (25) are positioned on the external lateral side of said lower section (21 "a).
9. Bath lift device (1) according to any one of the claims

- 1 to 8, wherein the backrest (23) comprises at least one rib (23'), said rib extending in a perpendicular direction with regard to the rear of the said backrest (23) and being approximately aligned, in use, with one upright element (11) of the chassis (11-14). 5
10. Bath lift device (1) according to the preceding claim, wherein said backrest (23) comprises two ribs (23') respectively at its left and right sides. 10
11. Bath lift device (1) according to any one of the claims 1 to 10, wherein the lifting means (24) includes an outer spindle tube (24') within which is received a linearly extendable inner spindle tube, said outer spindle tube (24') being fixedly connected to the seat frame (21) and said inner spindle tube being supported at its lower end (24'') by the chassis (13'). 15
12. Bath lift device (1) according to the preceding claim, wherein the inner spindle tube is linearly extendable via an actuating means contained within a housing (29), said housing (29) being fixedly connected to the rear of the backrest (23). 20
13. Bath lift device (1) according to claim 11 or claim 12, wherein said lower end (24'') is shaped as a fork adapted to be removably connected to a lateral rod (13') extending between said two upright elements (11) of the chassis (11-14). 25
14. Bath lift device (1) according to any one of the claims 1 to 13, wherein suction cup (15) are disposed underneath the chassis (14) so as to temporarily connect the fixed part (10) to the floor of the bathtub. 30
15. Bath lift device (1) according to the preceding claim, wherein each suction cup (15) comprises a central section (16) fixedly connected to the chassis (14) at its upper face, said section (16) having on its underface a concavity which acts as a sucker for temporarily connect said suction cup (15) to the floor of the bathtub. 35
16. Bath lift device (1) according to the preceding claim, wherein each suction cup (15) comprises at least one peelable release tab (17) externally extending from the periphery of the central section (16), said tab (17) releasing the suction between the suction cup (15) and the floor of the bathtub when its free end (18) is raised. 40
17. Bath lift device (1) according to the preceding claim, wherein said tab (17) includes a connecting means (18) at its free end, said connecting means (18) being configured so as to temporarily connect said tab (17) to the chassis (14). 45
18. Bath lift device (1) according to the preceding claim, 50

wherein at least one circular hole (19) is formed in the chassis (14), said hole (19) being configured to receive the connecting means (18) of said tab (17), said connecting means (18) consisting in a tubular section having a length greater than the diameter of said hole (19).

19. Bath lift device (1) according to any one of the claims 1 to 18, wherein the chassis (11-14) comprises a U-shaped element (14) extending, in use, in an approximately horizontal direction, said U-shaped element (14) being connected to the lower ends of the upright elements (11) via two connecting elements (13). 55
20. Bath lift device (1) according to the preceding claim, wherein each connecting element (13) is connected to said U-shaped element (14) so as to be positioned between an end section (14') of said U-shaped element (14) and the rest of said U-shaped element (14).

Patentansprüche

1. Badeliftvorrichtung (1), um Personen in eine Badewanne hinein abzusenken und daraus anzuheben, wobei die Vorrichtung zwei unabhängige Teile umfasst, die leicht voneinander getrennt werden können, ohne Demontearbeiten durchführen zu müssen:
- ein feststehendes Teil (10) mit einem Chassis (11-14), das so ausgeführt ist, dass es im Gebrauch auf einem Boden der Badewanne ruht, wobei das Chassis (11-14) zwei rohrförmige aufrechte Elemente (11) umfasst, die parallel zueinander stehen und im Gebrauch in einer nahezu vertikalen Richtung verlaufen;
 - ein bewegliches Teil (20) mit einem Sitzrahmen (21), der eine Sitzschale (22) und eine Rückenstütze (23) abstützt, wobei der Sitzrahmen (21) im Verhältnis zum Chassis (11-14) über ein Liftmittel (24) nach oben und nach unten bewegbar und gleitbar Weise an den zwei aufrechten Elementen (11) montiert ist, **dadurch gekennzeichnet, dass** die zwei aufrechten Elemente (11)

durch ein Seitenelement (12) verbunden sind, wobei das Seitenelement (12) aus einem gekrümmten rohrförmigen Element (31) besteht, das an seinen Enden (32) mit den zwei oberen Enden der aufrechten Elemente (11) verbunden ist, wobei das rohrförmige Element (31) so geformt ist, dass es einen oberen offenen Bereich (33) definiert, der das nach oben erfolgende gleitende Verschieben des beweglichen Teils (20) zulässt.

2. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der das bewegliche Teil (20) zwei Paar Führungsrollen (25) umfasst, die drehbar mit dem Sitzrahmen (21) verbunden sind, wobei jedes Paar gleitbar an einem aufrechten Element (11) montiert ist und sich die Führungsrollen (25) eines jeden Paares im Gebrauch an gegenüberliegenden Seiten des einen aufrechten Elements (11) befinden. 5
3. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der die Führungsrollen (25) im Verhältnis zur Rückenlehne (23) fest positioniert sind, um so eine Vier-Punkte-Verbindung zwischen dem beweglichen Teil (20) und dem feststehenden Teil (10) zu definieren, und so dass das bewegliche Teil (20) am feststehenden Teil (10) nur durch eine Kombination aus Kipp- und Gleitverschiebungen des Sitzrahmens (21) installiert ist. 10
4. Badeliftvorrichtung (1) nach Anspruch 2 oder Anspruch 3, bei der die Distanz (d), die die Rotationsachsen der Führungsrollen (25) eines jeden Paares trennt, so gewählt ist, dass der Winkel (α) zwischen der die Achsen enthaltenden Ebene und der Längsachse des aufrechten Elements (11), an dem sie gleitbar montiert sind, im Gebrauch von 90 Grad abweicht. 15
5. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der die Distanz (d), die die Rotationsachsen der Führungsrollen (25) eines jeden Paares trennt, so gewählt ist, dass der Winkel (α) zwischen der die Achsen enthaltenden Ebene und der Längsachse des aufrechten Elements (11), an dem sie gleitbar montiert sind, im Gebrauch kleiner als 45 Grad und vorzugsweise kleiner als 25 Grad ist. 20
6. Badeliftvorrichtung (1) nach einem der Ansprüche 1 bis 5, bei der der Sitzrahmen (21) ein erstes Teil (21'), das im Gebrauch in einer annähernd horizontalen Richtung verläuft, und ein zweites Teil (21'') umfasst, das im Gebrauch in einer annähernd vertikalen Richtung verläuft, wobei das erste Teil (21') die Sitzschale (22) und das zweite Teil (21'') die Rückenlehne (23) abstützt. 25
7. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der das zweite Teil (21'') als ein Paar paralleler aufrechter Elemente konfiguriert ist, wobei jedes aufrechte Element einen unteren Längsbereich (21 "a) und einen oberen Längsbereich (21 "b) umfasst, und wobei die unteren und oberen Bereiche (21 "a, 21 "b) eine annähernd dreieckige Form mit der Rückenlehne (23) definieren. 30
8. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der die Führungsrollen (25) an der äußeren Lateralseite des unteren Bereichs (21 "a) positioniert sind. 35
9. Badeliftvorrichtung (1) nach einem der Ansprüche 1 bis 8, bei der die Rückenlehne (23) mindestens eine Rippe (23') umfasst, wobei die Rippe im Verhältnis zur Rückseite der Rückenlehne (23) in einer senkrechten Richtung verläuft und im Gebrauch annähernd zu einem aufrechten Element (11) des Chassis (11-14) ausgerichtet ist. 40
10. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der die Rückenlehne (23) zwei Rippen (23') umfasst, die sich an ihren linken bzw. rechten Seiten befinden. 45
11. Badeliftvorrichtung (1) nach einem der Ansprüche 1 bis 10, bei der das Liftmittel (24) ein äußeres Spindelrohr (24') beinhaltet, das in seinem Inneren ein sich linear erstreckendes inneres Spindelrohr aufnimmt, wobei das äußere Spindelrohr (24') fest mit dem Sitzrahmen (21) verbunden und das innere Spindelrohr an seinem unteren Ende (24'') durch das Chassis (13') abgestützt ist. 50
12. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der das innere Spindelrohr über ein innerhalb eines Gehäuses (29) enthaltenes Betätigungsmittel linear ausfahrbar ist, und wobei das Gehäuse (29) fest mit der Rückseite der Rückenlehne (23) verbunden ist. 55
13. Badeliftvorrichtung (1) nach Anspruch 11 oder Anspruch 12, bei der das untere Ende (24'') gabelförmig und so ausgebildet ist, dass es entferntbar mit einem Seitenstab (13') verbunden ist, der zwischen den zwei aufrechten Elementen (11) des Chassis (11-14) verläuft.
14. Badeliftvorrichtung (1) nach einem der Ansprüche 1 bis 13, bei der Saugnapfe (15) unterhalb des Chassis (14) vorgesehen sind, um so das feststehende Teil (10) mit dem Boden der Badewanne temporär zu verbinden.
15. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der jeder Saugnapf (15) einen zentralen Bereich (16) umfasst, der fest mit dem Chassis (14) an seiner Oberseite verbunden ist, wobei der Bereich (16) an seiner Unterseite eine Wölbung aufweist, die eine saugende Wirkung ausübt, um den Saugnapf (15) mit dem Boden der Badewanne temporär zu verbinden.
16. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der jeder Saugnapf (15) mindestens eine abziehbare Freigabelasche (17), die sich außen vom Umfang des zentralen Bereichs (16) aus erstreckt, umfasst, wobei die Lasche (17) die

Saugwirkung zwischen dem Saugnapf (15) und dem Boden der Badewanne freigibt, wenn ihr freies Ende (18) angehoben wird.

17. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der die Lasche (17) ein Verbindungsmittel (18) an seinem freien Ende beinhaltet, wobei das Verbindungsmittel (18) so konfiguriert ist, dass die Lasche (17) temporär mit dem Chassis (14) verbunden wird.
18. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der mindestens ein kreisförmiges Loch (19) im Chassis (14) ausgebildet ist, wobei das Loch (19) so konfiguriert ist, dass es das Verbindungsmittel (18) der Lasche (17) aufnimmt, und wobei das Verbindungsmittel (18) aus einem rohrförmigen Bereich besteht, dessen Länge größer als der Durchmesser des Lochs (19) ist.
19. Badeliftvorrichtung (1) nach einem der Ansprüche 1 bis 18, bei der das Chassis (11-14) ein U-förmiges Element (14) umfasst, das im Gebrauch in einer annähernd horizontalen Richtung verläuft, wobei das U-förmige Element (14) über zwei Verbindungselemente (13) mit den unteren Enden der aufrechten Elemente (11) verbunden ist.
20. Badeliftvorrichtung (1) nach dem vorstehend aufgeführten Anspruch, bei der jedes Verbindungselement (13) mit dem U-förmigen Element (14) so verbunden ist, dass es zwischen einem Endbereich (14') des U-förmigen Elements (14) und dem Rest des U-förmigen Elements (14) positioniert ist.

Revendications

1. Dispositif élévateur pour baignoire (1) permettant d'abaisser des personnes dans une baignoire et de les élever hors d'une baignoire, comprenant deux parties indépendantes qui peuvent être aisément séparées sans opération de démontage :
 - une partie fixe (10) comprenant un châssis (11 à 14) conçu pour être en appui, lors de l'utilisation, sur un fond de la baignoire, ledit châssis (11 à 14) comprenant deux éléments formant montants tubulaires (11) parallèles l'un à l'autre, s'étendant, lors de l'utilisation, dans une direction presque verticale,
 - une partie mobile (20) comprenant une structure de siège (21) supportant une plaque d'assise (22) et un dossier (23), ladite structure de siège (21) étant mobile vers le haut et vers le bas par rapport au châssis (11 à 14) par le biais d'un moyen de levage (24) et étant montée à coulissement sur lesdits deux éléments formant

montants (11),

caractérisé en ce que lesdits deux éléments formant montants (11) sont reliés par un élément latéral (12), ledit élément latéral (12) étant constitué d'un élément tubulaire incurvé (31) raccordé au niveau de ses extrémités (32) aux deux extrémités supérieures des éléments formant montants (11), ledit élément tubulaire (31) étant formé de façon à définir une région supérieure ouverte (33) permettant un déplacement vers le haut par coulissement de la partie mobile (20).

2. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel ladite partie mobile (20) comprend deux paires de galets de guidage (25) raccordés à rotation à ladite structure de siège (21), chaque paire étant montée à coulissement sur un élément formant montant (11) et les galets de guidage (25) de chaque paire étant disposés, lors de l'utilisation, sur des côtés opposés dudit élément formant montant (11).
3. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel lesdits galets de guidage (25) sont positionnés de manière fixe par rapport au dossier (23) de façon à définir un raccordement en quatre points entre ladite partie mobile (20) et ladite partie fixe (10) et de telle sorte que ladite partie mobile (20) soit installée sur ladite partie fixe (10) uniquement par une combinaison de déplacements d'inclinaison et de coulissement de ladite structure de siège (21).
4. Dispositif élévateur pour baignoire (1) selon la revendication 2 ou la revendication 3, dans lequel la distance (d) séparant les axes de rotation des galets de guidage (25) de chaque paire est choisie de telle sorte que l'angle (α) entre le plan contenant lesdits axes et l'axe longitudinal de l'élément formant montant (11), sur lequel ils sont montés à coulissement, soit, lors de l'utilisation, différent de 90°.
5. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel la distance (d) séparant les axes de rotation des galets de guidage (25) de chaque paire est choisie de telle sorte que l'angle (α) entre le plan contenant lesdits axes et l'axe longitudinal de l'élément formant montant (11), sur lequel ils sont montés à coulissement, soit, lors de l'utilisation, inférieur à 45 degrés, et de préférence inférieur à 25 degrés.
6. Dispositif élévateur pour baignoire (1) selon l'une quelconque des revendications 1 à 5, dans lequel ladite structure de siège (21) comprend une première partie (21') s'étendant, lors de l'utilisation, dans une direction approximativement horizontale, et une

seconde partie (21 ") s'étendant, lors de l'utilisation, dans une direction approximativement verticale, ladite première partie (21') supportant la plaque d'assise (22) et ladite seconde partie (21 ") supportant le dossier (23).

7. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel ladite seconde partie (21") est configurée sous la forme d'une paire d'éléments formant montants parallèles, chaque élément formant montant comprenant une section longitudinale inférieure (21 "a) et une section longitudinale supérieure (21 "b), lesdites sections inférieure et supérieure (21 "a, 21 "b) définissant une forme approximativement triangulaire avec le dossier (23). 5
8. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel lesdits galets de guidage (25) sont positionnés sur le côté latéral extérieur de ladite section inférieure (21 "a). 10
9. Dispositif élévateur pour baignoire (1) selon l'une quelconque des revendications 1 à 8, dans lequel le dossier (23) comprend au moins une nervure (23'), ladite nervure s'étendant dans une direction perpendiculaire par rapport à l'arrière dudit dossier (23) et étant approximativement alignée, lors de l'utilisation, sur un élément formant montant (11) du châssis (11 à 14). 15
10. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel ledit dossier (23) comprend deux nervures (23') au niveau de ses côtés gauche et droit, respectivement. 20
11. Dispositif élévateur pour baignoire (1) selon l'une quelconque des revendications 1 à 10, dans lequel le moyen de levage (24) comprend un tube d'arbre extérieur (24') à l'intérieur duquel est reçu un tube d'arbre intérieur extensible linéairement, ledit tube d'arbre extérieur (24') étant raccordé de manière fixe à la structure de siège (21) et ledit tube d'arbre intérieur étant supporté au niveau de son extrémité inférieure (24") par le châssis (13'). 25
12. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel le tube d'arbre intérieur est extensible linéairement par le biais d'un moyen d'actionnement se trouvant à l'intérieur d'un logement (29), ledit logement (29) étant raccordé de manière fixe à l'arrière du dossier (23). 30
13. Dispositif élévateur pour baignoire (1) selon la revendication 11 ou la revendication 12, dans lequel ladite extrémité inférieure (24") présente la forme d'une fourche conçue pour être raccordée de manière amovible à une tige latérale (13') s'étendant entre lesdits deux éléments formant montants (11) 35

du châssis (11 à 14).

14. Dispositif élévateur pour baignoire (1) selon l'une quelconque des revendications 1 à 13, dans lequel des ventouses (15) sont disposées sous le châssis (14) de façon à raccorder temporairement la partie fixe (10) au fond de la baignoire. 40
15. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel chaque ventouse (15) comprend une section centrale (16) raccordée de manière fixe au châssis (14) au niveau de sa face supérieure, ladite section (16) comportant, sur sa face inférieure, une concavité qui agit comme une ventouse afin de raccorder temporairement ladite ventouse (15) au fond de la baignoire. 45
16. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel chaque ventouse (15) comprend au moins une languette de libération (17) pelable s'étendant extérieurement à partir de la périphérie de la section centrale (16), ladite languette (17) interrompant la succion entre la ventouse (15) et le fond de la baignoire lorsque son extrémité libre (18) est soulevée. 50
17. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel ladite languette (17) comprend un moyen de raccordement (18) au niveau de son extrémité libre, ledit moyen de raccordement (18) étant configuré de façon à raccorder temporairement ladite languette (17) au châssis (14). 55
18. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel au moins un trou circulaire (19) est formé dans le châssis (14), ledit trou (19) étant configuré pour recevoir le moyen de raccordement (18) de ladite languette (17), ledit moyen de raccordement (18) étant constitué d'une section tubulaire présentant une longueur supérieure au diamètre dudit trou (19). 60
19. Dispositif élévateur pour baignoire (1) selon l'une quelconque des revendications 1 à 18, dans lequel le châssis (11 à 14) comprend un élément en forme de U (14) s'étendant, lors de l'utilisation, dans une direction approximativement horizontale, ledit élément en forme de U (14) étant raccordé aux extrémités inférieures des éléments formant montants (11) par le biais de deux éléments de raccordement (13). 65
20. Dispositif élévateur pour baignoire (1) selon la revendication précédente, dans lequel chaque élément de raccordement (13) est raccordé audit élément en forme de U (14) de façon à être positionné entre une section d'extrémité (14') dudit élément en 70

forme de U (14) et le reste dudit élément en forme de U (14).

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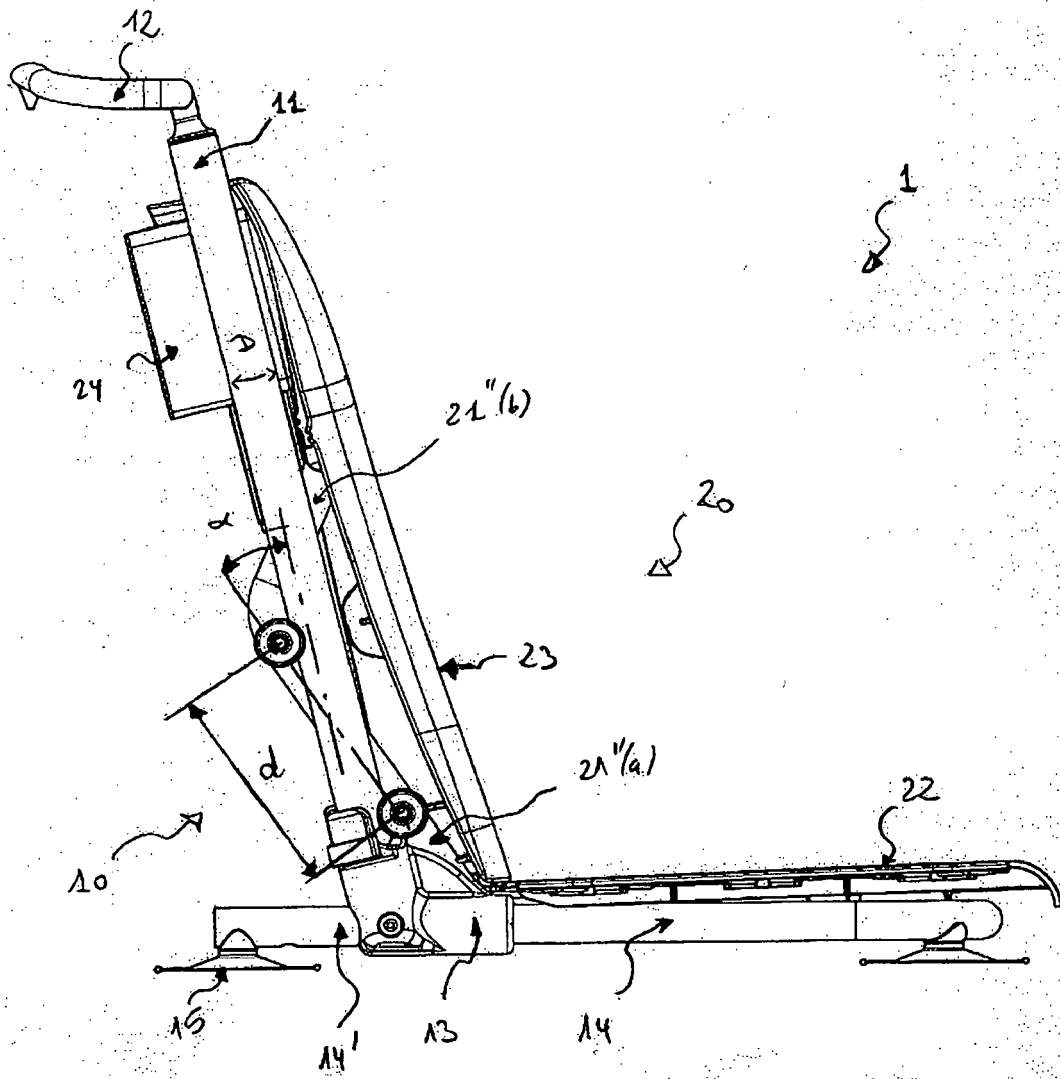


FIG. 1

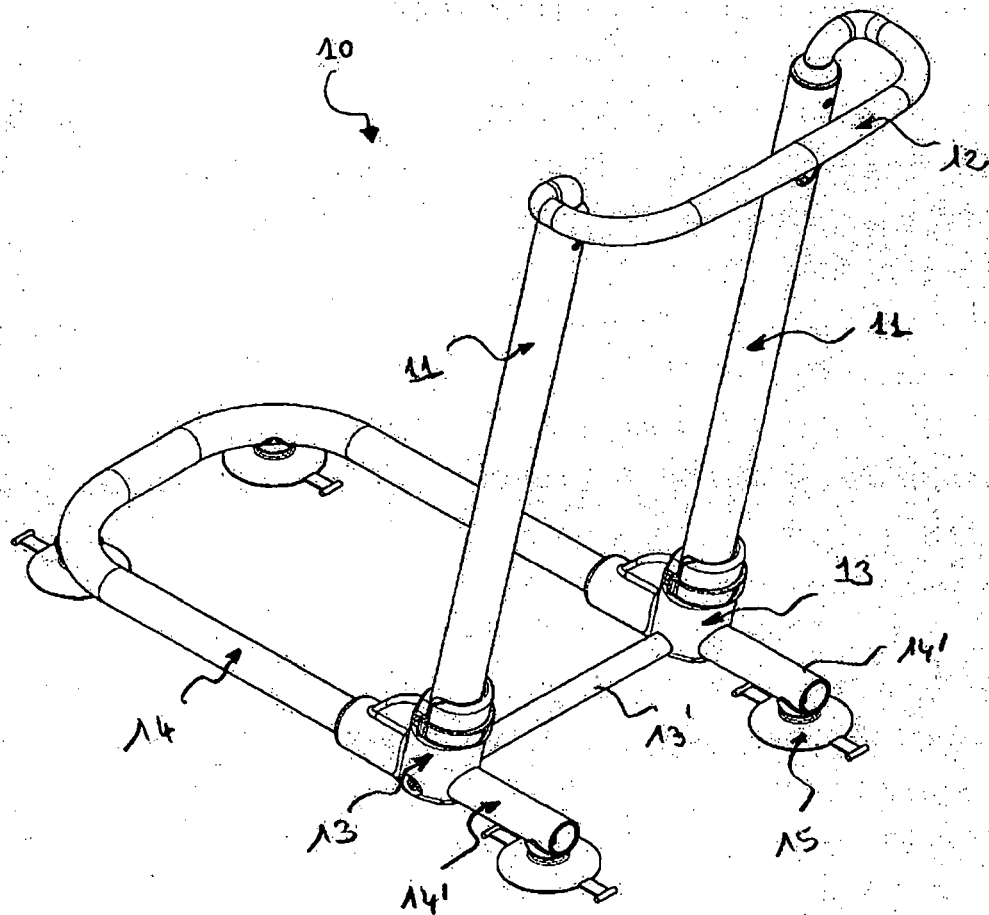


FIG. 2

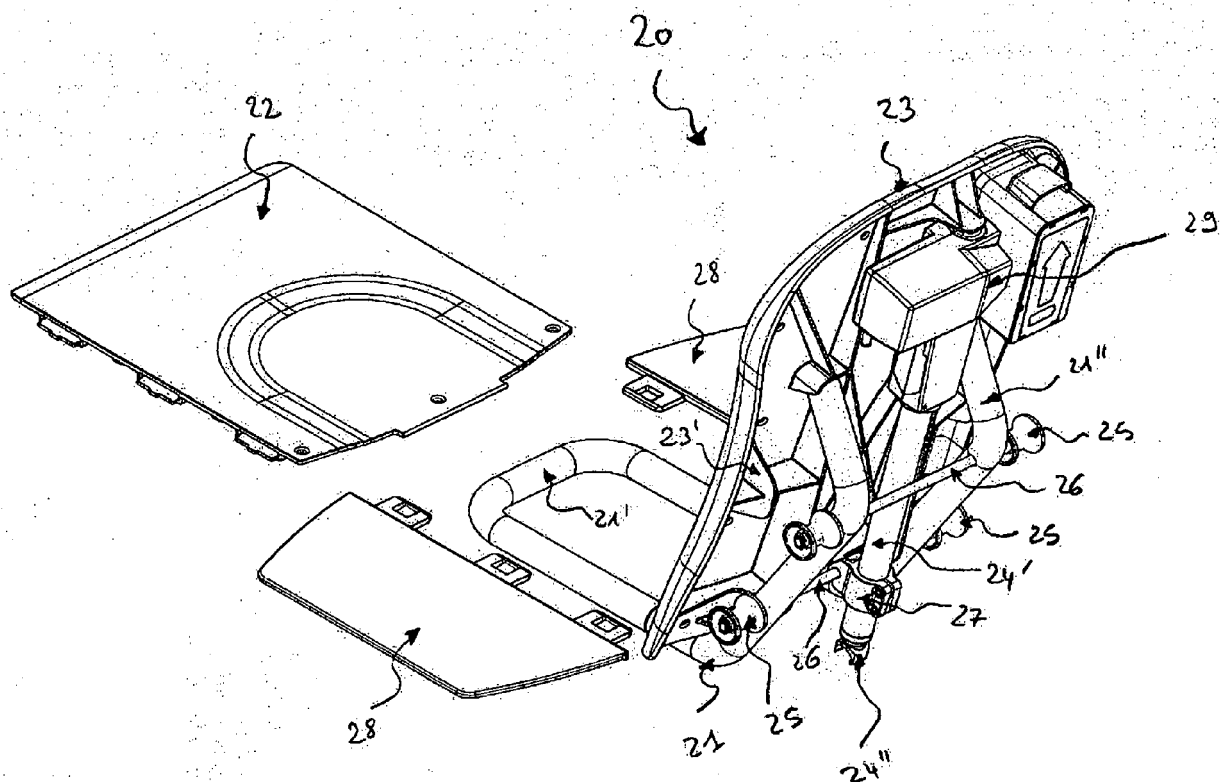


FIG. 3

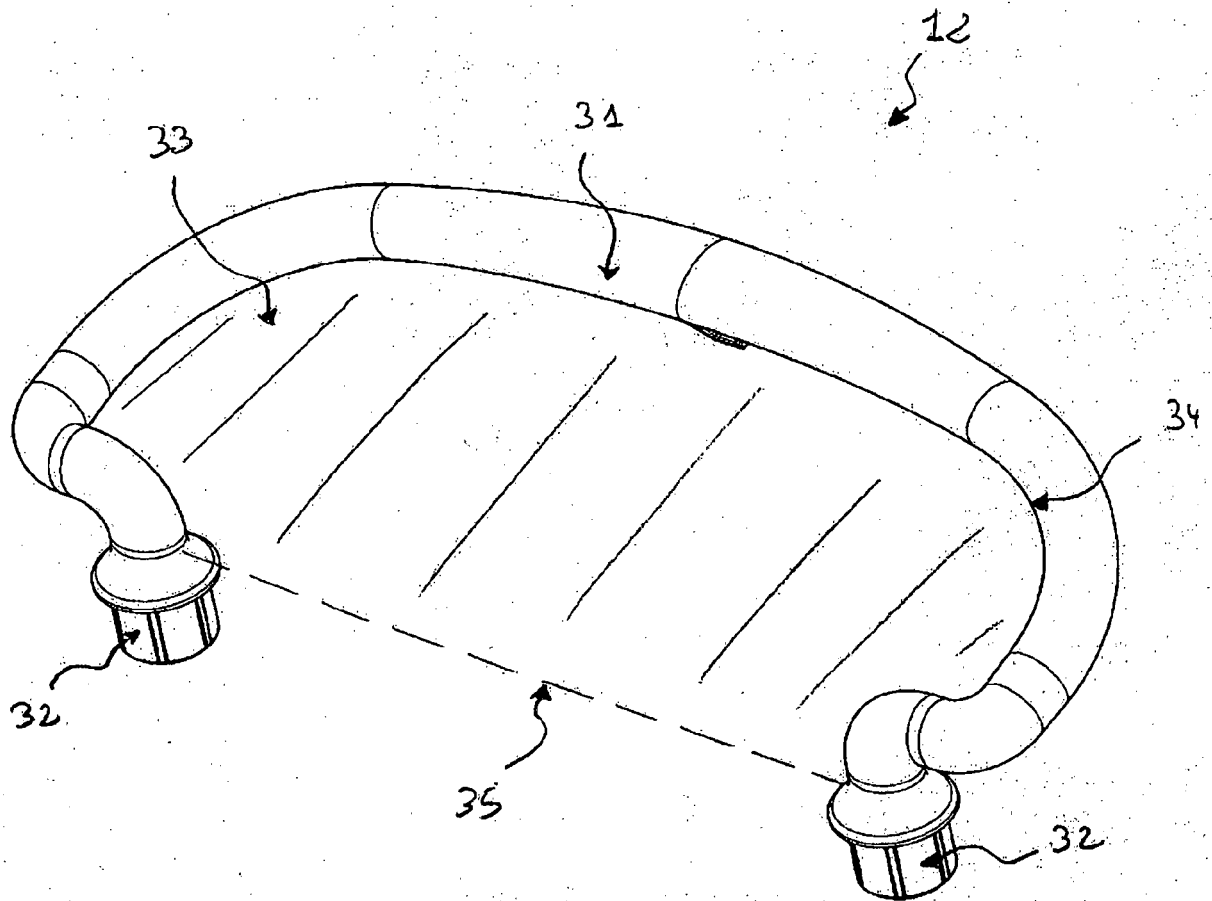


FIG. 4

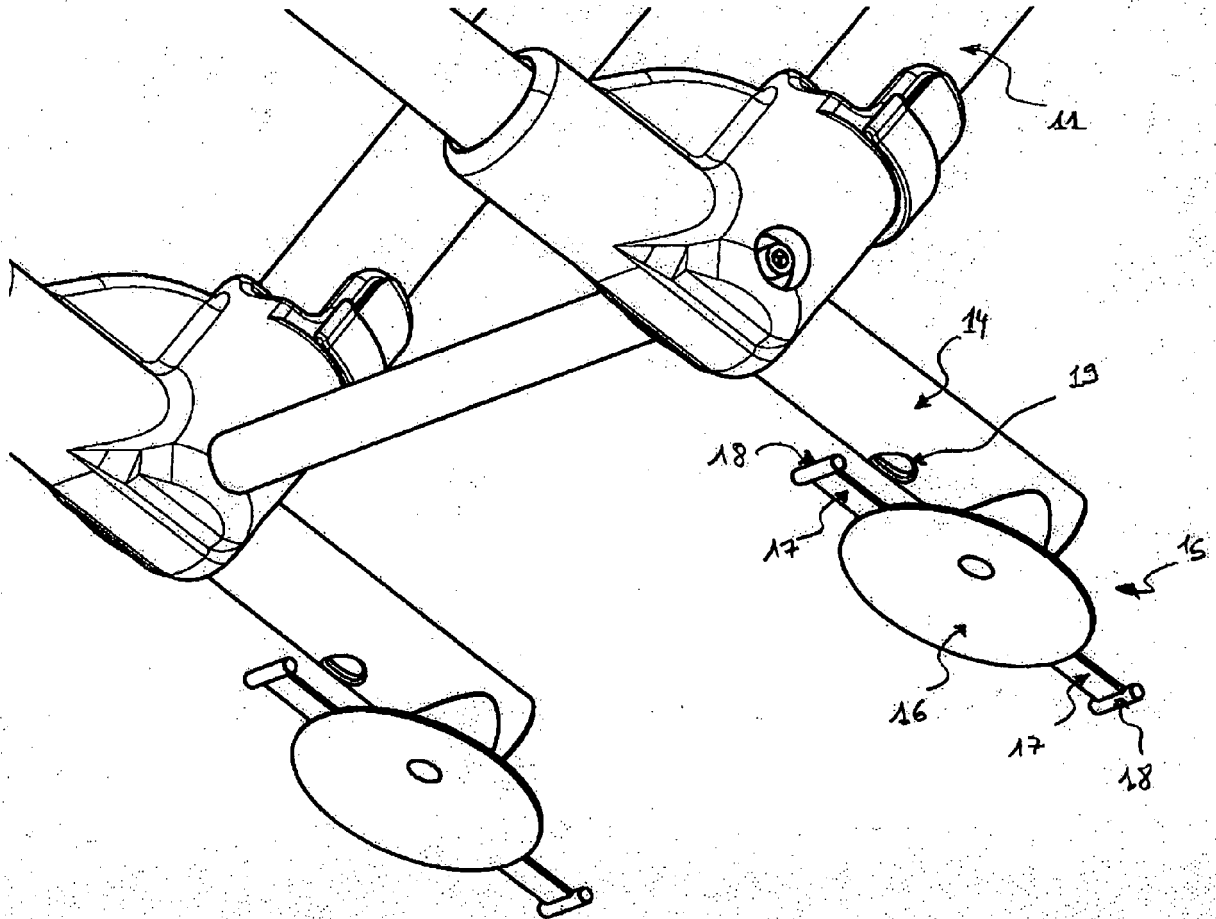


FIG. 5

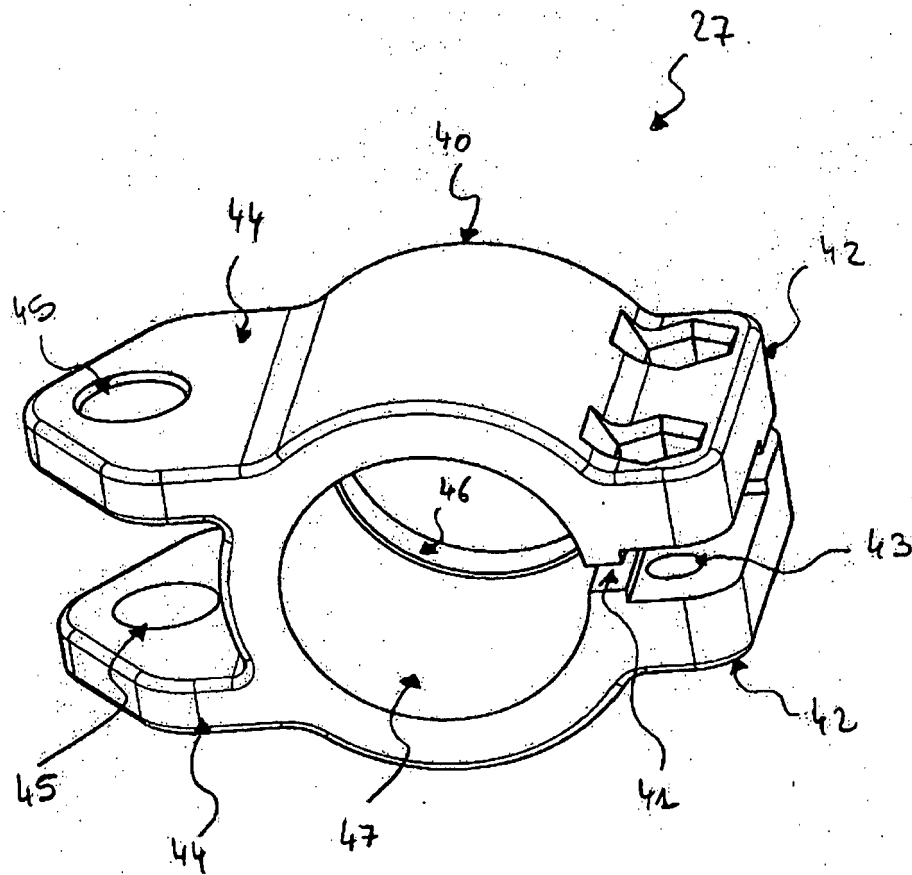


FIG. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2005065621 A [0004]
- EP 1057467 A [0005]
- CA 2397503 [0017]