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### (54) **BATHTUB WITH FACILITATED ACCESS**

(57) A bathtub with facilitated access comprises a long opening (15) provided with a door (2) that acts as a shutter; wherein said bathtub is raised from the ground

by means of a base, in such a way that a user with walking disabilities can enter the bathtub through the opening (15) from a sitting position.

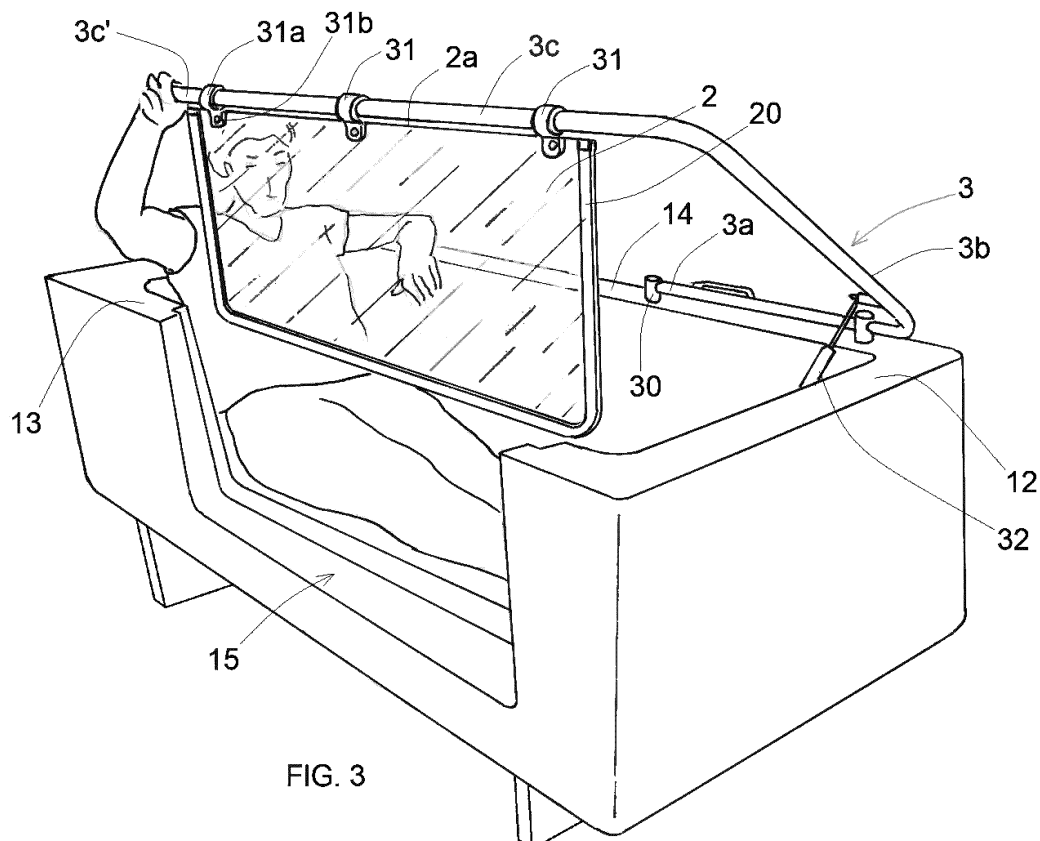


FIG. 3

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## Description

**[0001]** The present invention relates to a bathtub with facilitated access.

**[0002]** Bathtubs with facilitated access for the disabled, for the elderly or for individuals with restricted mobility have been available on the market for long. As a matter of fact, said categories of people may encounter difficulties in entering and exiting an ordinary bathtub because the user must step over the side of the bathtub with both legs in order to perform these operations. Such a requirement makes the entrance and the exit into/from a bathtub extremely dangerous, if not impossible, for individuals with restricted mobility and/or muscular deficit.

**[0003]** In order to remedy the aforementioned problems, the bathtubs with facilitated access of the prior art are provided in one of the longitudinal sides with a section that provides access to the bathtub, said section being substantially shaped like a U and being provided with a revolving door. The section covers the entire height of the longitudinal side of the bathtub, in such a way that, after opening the revolving door, the user can walk into the bathtub, and does not need to step over the side of the bathtub or to raise his/her legs from the ground.

**[0004]** Such an operation is performed after opening the lateral door, while the bathtub is empty. The bathtub can be filled with water after the user has entered the bathtub and the door has been closed.

**[0005]** In order to exit a bathtub of the prior art, the user must open the door and evidently such an operation can be performed only after emptying the bathtub completely.

**[0006]** Consequently, the lateral door of the bathtubs with facilitated access must be perfectly watertight; otherwise, the water contained in the bathtub would leak from the edges of the door and from the edges of the access section provided on the side of the bathtub.

**[0007]** For such a reason, a seal must be provided in intermediate position between the edges of the revolving door and the edges of the access section of the bathtub, and the door must be hinged in such a way to rotate towards the interior of the bathtub during opening. Therefore, when the bathtub is filled with water, the door is subject to the pressure exerted by the mass of water contained in the bathtub. Such a pressure tends to energetically compress the door against the seal, preventing the water from leaking outwards.

**[0008]** Such types of bathtubs with facilitated access are impaired by problems related with the provision of said revolving door that opens towards the interior of the bathtub. In fact, such an opening principle determines an insurmountable constraint with reference to the maximum width of the revolving door. In fact, the width of said door cannot be higher than the distance between the two longitudinal sides of the bathtub because otherwise the door cannot be disposed in a substantially orthogonal position relative to the access section whereto it is hinged, said orthogonal position being necessary to free the access section completely.

**[0009]** The reduced width of the door implies that also the width of the access section of the bathtub must be lower than the distance between the two longitudinal sides of a bathtub. Because of such a limited width of the access section of the bathtub, the user must necessarily enter the bathtub in erected position or in partially erected position, standing on his/her legs or with the help of one or more assistants.

**[0010]** During such a fatiguing operation, the door is opened and is rotated in the direction of the opposite longitudinal side relative to the hinging side, creating an insurmountable obstacle in the center of the bathtub approximately. Therefore, the door must be closed after the user has entered the bathtub in order to free the space inside the bathtub, in such a way that the user, who is quite unsteady, can lie down comfortably on the bottom of the bathtub.

**[0011]** An additional problem encountered in the bathtubs with facilitated access of the prior art is related with the fact that they are installed on the bathroom floor, in such a way that the user of such a bathtub lies down substantially at the same level as the floor and needs to stand up from such a low position. These operations require a considerable effort and imply very serious difficulties for a typical user of a bathtub with facilitated access, with severe risks for his/her personal health.

**[0012]** In view of the above, a bathtub with facilitated access according to the prior art cannot be used by the user alone, even if the user partially maintains his/her muscular tone and mobility, and always requires the presence of an assistant.

**[0013]** US4546506 discloses a home bathing unit according to the preamble of claim 1.

**[0014]** The purpose of the present invention is to remedy the drawbacks of the prior art by disclosing a bathtub with facilitated access that is practical and versatile.

**[0015]** Another purpose is to disclose such a bathtub with facilitated access that is provided with a lateral access section with a large width, said lateral access section being almost as long as the entire longitudinal side of the bathtub, thus ensuring a better comfort and a higher safety for the user compared to the bathtubs of the prior art.

**[0016]** Another purpose is to disclose a bathtub with facilitated access wherein the door does not represent a hindrance and/or a danger for the user during the entrance and the exit into/from the bathtub.

**[0017]** Another purpose is to disclose such a bathtub that can be considerably raised from the floor level.

**[0018]** These purposes are achieved according to the invention with the characteristics of the appended independent claim 1.

**[0019]** Advantageous embodiments appear from the dependent claims.

**[0020]** For the sake of clarity, the description of the invention will continue with reference to the appended drawings, which have a merely illustrative, not limiting value, wherein:

Fig. 1 is a partially interrupted perspective view of the bathtub of the invention, with the door in open position in order to provide an easy access to the user;

Fig. 2 is a perspective view of the bathtub of the invention, with the door in closing position, with the user lying in the bathtub;

Fig. 3 is a perspective view of the bathtub of the invention with the door in an intermediate position between the open position and the closing position.

**[0021]** With reference to the Figures, the bathtub with facilitated access according to the invention is disclosed, it being generally indicated with reference numeral 1.

**[0022]** The bathtub (1) comprises:

- a bottom wall (10) with rectangular shape, and
- a first transverse side (11) and a second transverse side (12) that are joined with a first longitudinal side (13) and a second longitudinal side (14).

**[0023]** The transverse and longitudinal sides (11, 12, 13, 14) protrude upwards from the bottom wall (10).

**[0024]** The length of the bottom wall (10) is such that the user can lie down in the bathtub (1) with extended legs;

The first transverse side (11) has an inclined internal surface suitable for acting as backrest for the user; whereas the second transverse side (12) has a substantially vertical internal surface.

**[0025]** The first longitudinal side (13) has an opening (15) that is the access to the bathtub (1). A door (2) cooperates with the opening (15) in such a way to cover and uncover the opening (15).

**[0026]** The opening (15) has a U-shape and is defined by a first vertical edge (15a), by a second vertical edge (15b) and by a horizontal edge (15c) at the height of the bottom wall (10).

**[0027]** The width of the opening (15), i.e. the distance between the first vertical edge (15a) and the second vertical edge (15b), is preferably equal to two thirds of the length of the first longitudinal side (13) wherein it is provided. Therefore, the width of the opening (15) is not lower than the length of the legs of an adult user with normal height, but in any case higher than the distance between the two longitudinal sides (13, 14) of said bathtub (1).

**[0028]** The opening (15) is not disposed in the center of the first longitudinal side (13), but in an asymmetrical position relative to the first longitudinal side (13).

**[0029]** The opening (15) is closer to the second transverse side (12). Otherwise said, the distance between the first vertical edge (15a) of the opening (15) and the first transverse side (11) of the bathtub (1) is higher than the distance between the second vertical edge (15b) of the opening (15) and the second transverse side (12) of the bathtub (1).

**[0030]** Such a condition, together with the considerable width of the opening (15), allows the user to enter the

bathtub (1) while comfortably and safely sitting, and not in an erected, uncomfortable and dangerous position, such as in the bathtubs with facilitated access of the prior art provided with a reduced width of the opening.

**[0031]** The user inside the bathtub (1), who is sitting in the proximity of the first transverse side (11), can comfortably introduce his/her legs in the bathtub (1) through the opening (15) by means of a simple rotation of approximately 90° and without having to bend his/her legs. At the end of such an operation, the user can be disposed in such a position to rest his/her back against the inclined internal surface of the first transverse side (11), extending his/her legs on the bottom of the bathtub (1), substantially in correspondence of the opening (15).

**[0032]** The fact that the width of the opening (15) is higher than the distance between the first longitudinal side (13) and the second longitudinal side (14) does not permit the provision of a revolving door or traditional type in order to close the opening (15).

**[0033]** The peculiarity of the bathtub (1) consists in the configuration and, most of all, in the operating principle of the door (2) that is mounted in the opening (15). The door (2) cooperates with the opening (15), acting as a shutter. The door (2) is supported in projecting position by a frame (3) mounted in the second longitudinal side (14) of the bathtub (1).

**[0034]** The frame (3) is able to lower the door (2) inside the opening (15), and to rise and move the door (2) towards the second longitudinal side (14) in such a way to free the opening (15) completely. During all the steps that involve a movement of the door (2), the door (2) remains in vertical position, substantially edgewise. The door (2) makes a roto-translation relative to a horizontal axis, always remaining in vertical position.

**[0035]** The shape and the dimensions of the door (2) substantially correspond to the ones of the opening (15) of the bathtub (1). The door has a rectangular shape and develops in longitudinal direction. The door is defined by one upper horizontal edge (2a), by two vertical edges (2b, 2c) and by one lower horizontal edge (2d). The two vertical edges (2b, 2c) and the lower horizontal edge (2d) of the door (2) are provided with a seal (20), with a substantially U shape, which is suitable for being brought in contact with the corresponding internal edges of the opening (15).

**[0036]** The frame (3) of the door (2) has a substantially C-shape. The frame (3) is made with a tubular metal profile with circular section.

**[0037]** The frame (3) comprises:

- a first longitudinal section (3a), with horizontal direction, suitable for acting as a rotational shaft of the entire frame,
- a transverse section (3b) that is joined at 90° with the first longitudinal section (3a),
- a second longitudinal section (3c) that is joined at 90° with the transverse section (3b).

**[0038]** The length of the first longitudinal section (3a) is approximately equal to half of the length of the second longitudinal side (14) of the bathtub (1). The first longitudinal section (3a) is revolvingly mounted in hinges (30) that project in upper position from the second longitudinal side (14) in such a way to rotate around its longitudinal axis by an angle of approximately 90°.

**[0039]** The length of the transverse section (3b) is substantially equal to the width of the transverse sides (11, 12) of the bathtub (1). The transverse section (3b) is disposed above the upper edge of the second transverse side (12).

**[0040]** The length of the second longitudinal section (3c) is at least double than the length of the first longitudinal section (3a). The second longitudinal section (3c) has brackets (31) where to the upper longitudinal edge (2a) of the door (2) is hung, in such a way that the door (2) can constantly be in a vertical position because of gravity, perpendicularly to the bottom wall (10) of the bathtub (1).

**[0041]** Each bracket (31) comprises a collar (31a) revolvingly mounted around the second longitudinal section and a fixing portion (31b) that projects radially from the collar (31a) in order to fasten the upper longitudinal edge (2a) of the door.

**[0042]** This description continues by illustrating the operation of the frame (3) with respect to the various operating conditions imposed on the door (2).

**[0043]** Fig. 1 illustrates the position of the frame (3) in the non-operating position of the door (2). After an upward rotation of the frame around the first longitudinal section (3a), the frame (3) has a substantially vertical position. In such a condition, also the door (2) hung to the frame (3) is disposed above the second longitudinal side (14) on the same plane as the second longitudinal side (14). In view of the above, the opening (15) of the bathtub (1) can be freely used by the user to enter or exit the bathtub (1). The raised backward position of the door (2) does not hinder the realization of said operations.

**[0044]** Fig. 2 shows the position of the frame (3) when the door (2) is in the operating condition, closed inside the opening (15) of the bathtub (1). In such a condition, following to a rotation of the first longitudinal section (3a), the frame (3) is in horizontal position, above the bathtub (1).

**[0045]** The transverse section (3b) is disposed above the second transverse side (12) of the bathtub (1) and the second longitudinal section (3c) is disposed above the first transverse side (13). In such a way, the door (2) is disposed against the internal surface of the first transverse side (13), correspondingly to the opening (15). In order to achieve such a condition, the length of the second longitudinal section (3c) of the frame (3) must be such that the free end (3c') is disposed above the upper edge of the first longitudinal side (13), downstream the first vertical edge (15a) of the opening (15).

**[0046]** The watertightness of the door (2) with respect to the opening (15) is guaranteed by the presence of the

seal (20) that is compressed in view of the pressure exerted by the water introduced in the bathtub (1) on the door (2), from the interior towards the exterior.

**[0047]** The frame (3) can be actuated comfortably and manually by the user who is lying in the bathtub (1) without water. From such an extended position, the user can reach and grab the free end (3c') of the second longitudinal section (3c) of the frame with his/her hands. Such a free end (3c') acts as handgrip. Now the user can rotate the frame (3) downwards, until the door (2) is brought in its operating condition inside the opening (15) of the bathtub.

**[0048]** Successively, the user can turn on the water tap to fill the bathtub (1). When the bath is finished, after emptying the bathtub (1) completely, the user can move the frame (3) in opposite direction in such a way to remove the door (2) from its operating position and to free the opening (15) of the bathtub (1).

**[0049]** The frame (3) can be provided with a shock absorber (32), preferably a telescopic rod or a cylinder-piston assembly, pivoted at the internal surface of the second transverse side (12) and at the transverse section (3b) of the frame. The function of the shock absorber (32) is to support the frame (3) when the frame (3) is in an inclined non-operating position, opposing the spontaneous tendency of the frame to reach its horizontal operating position because of gravity.

**[0050]** The alternate rotations of the frame (3) can be caused by an actuator that can be operated by an electrical motor controlled by a switch.

**[0051]** The bathtub (1) can be installed at a given height from the ground, for instance in such a way that the bottom wall (1a) is disposed at the same height as the mattress of an ordinary bed. In view of the above, the user can enter and exit the bathtub (1) with the same level of comfort that is experienced when the user gets on/off the bed, from a sitting position. Such a "raised" installation is not possible with a bathtub with facilitated access of the prior art because such a bathtub requires the user to enter the bathtub by walking in erected position; consequently, the bottom wall of a bathtub of the prior art must necessarily be disposed at ground level. On the contrary, the bathtub (1) of the invention can be installed in raised position by means of legs (4) that are mounted under its bottom wall (1a) or by means of a dedicated base.

**[0052]** The bathtub (1) of the invention can be mounted and fixed directly on a traditional bathtub that is already installed in the room. Such a solution allows for using the same connections to the water system and to the sewage system that are used by the existing bathtub.

## Claims

1. Bathtub with facilitated access, comprising:

- a bottom wall (10) with rectangular shape, a first transverse side (11) and a second trans-

verse side (12) that are joined with a first longitudinal side (13) and a second longitudinal side (14); wherein the length of said bottom wall (10) with rectangular shape is such that the user of the bathtub (1) can lie down with extended legs;  
 - an opening (15) that acts as access for the user, provided in said first longitudinal side (13); said opening (15) being defined by a first vertical edge (15a) and by a second vertical edge (15c) joined by a horizontal edge (15b) in said bottom wall (10);  
 - a door (2) suitable for closing said opening (15) from the interior;

wherein the width of the opening (15), i.e. the distance between said first vertical edge (15a) and said second vertical edge (15b), is higher than the distance between said longitudinal sides (13, 14), said door (2) is supported by a frame (3) pivoted at the second longitudinal side (14) of the bathtub (1), said frame being suitable for alternately moving said door (2) from an operating position, wherein it closes the opening (15) from the interior, to a non-operating position, wherein the door (2) frees the opening (15) and is moved to a raised position, outside the bathtub (1), in the direction of said second longitudinal side (14);

**characterized in that**

said door (2) is connected to said frame (3) in such a way that during all the movements of the door imposed by the frame (3), the door makes a roto-translation, constantly being in a perpendicular position relative to the bottom wall (10) of the bathtub (1).

2. The bathtub of claim 1, wherein the opening (15) is off-centered relative to the first longitudinal side (13) because the opening (15) is closer to the second transverse side (12).
3. The bathtub of claim 1 or 2, wherein the door (2) has a rectangular shape that substantially corresponds to the shape of the opening (15) of the bathtub (1); wherein said shape of the door (2) is defined by one upper longitudinal edge (2a), by two opposite vertical edges (2b, 2c) and by one lower horizontal edge (2d).
4. The bathtub of claim 3, wherein said vertical edges (2b, 2c) and said lower horizontal edge (2d) of the door (2) are provided with a continuous seal (20) suitable for being pressed against the internal edges of the opening (15) of the bathtub (1) when the door (2) is in closing position.
5. The bathtub of one of the preceding claims, wherein said frame (3) of the door (2) has a substantially C-shaped profile, comprising:

- a first longitudinal section (3a) hinged in hinges

(30) disposed in said second longitudinal side (14) of the bathtub;

- a transverse section (3b) that is joined at 90° with said first longitudinal section (3a),

- a second longitudinal section (3c) that is joined at 90° with said transverse section (3b) where to said door (2) is fixed.

6. The bathtub of claim 5, wherein the length of said first longitudinal section (3a) is approximately equal to half of the length of the second longitudinal side (14) of the bathtub (1), the length of said transverse section (3b) is substantially equal to the width of said second transverse side (12) of the bathtub (1); and the length of said second longitudinal section (3c) is at least double than the length of the first longitudinal section (3a).
7. The bathtub of claim 5 or 6, comprising brackets (31) that support said door (2) and are revolvingly mounted in said second longitudinal section (3c) of the frame.
8. The bathtub according to any one of claims 5 to 7, comprising a shock absorber (32) pivoted at an internal surface of said second transverse side (12) of the bathtub (1) and at said transverse section (3b) of the frame.
9. The bathtub according to one of the preceding claims, wherein said bathtub (1) comprises support means suitable for raising the bathtub from the ground.
10. The bathtub of claim 9, wherein said support means used to raise said bathtub (1) from the ground comprise one or more legs (4).
11. The bathtub of claim 9, wherein said support means suitable for raising said bathtub (1) from the ground comprise a base.
12. The bathtub of claim 9, wherein said support means suitable for raising the bathtub (1) from the ground comprise a traditional bathtub.

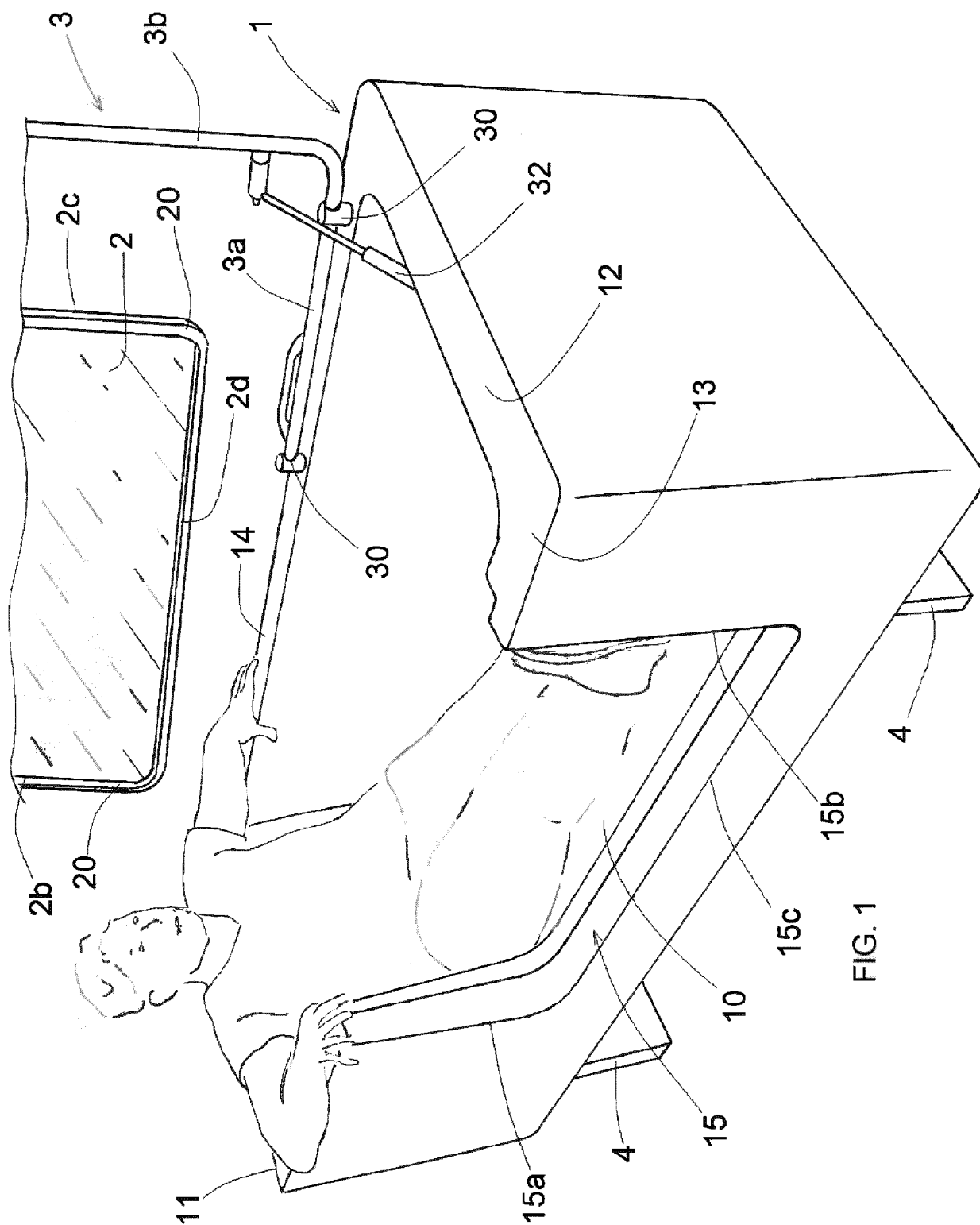


FIG. 1

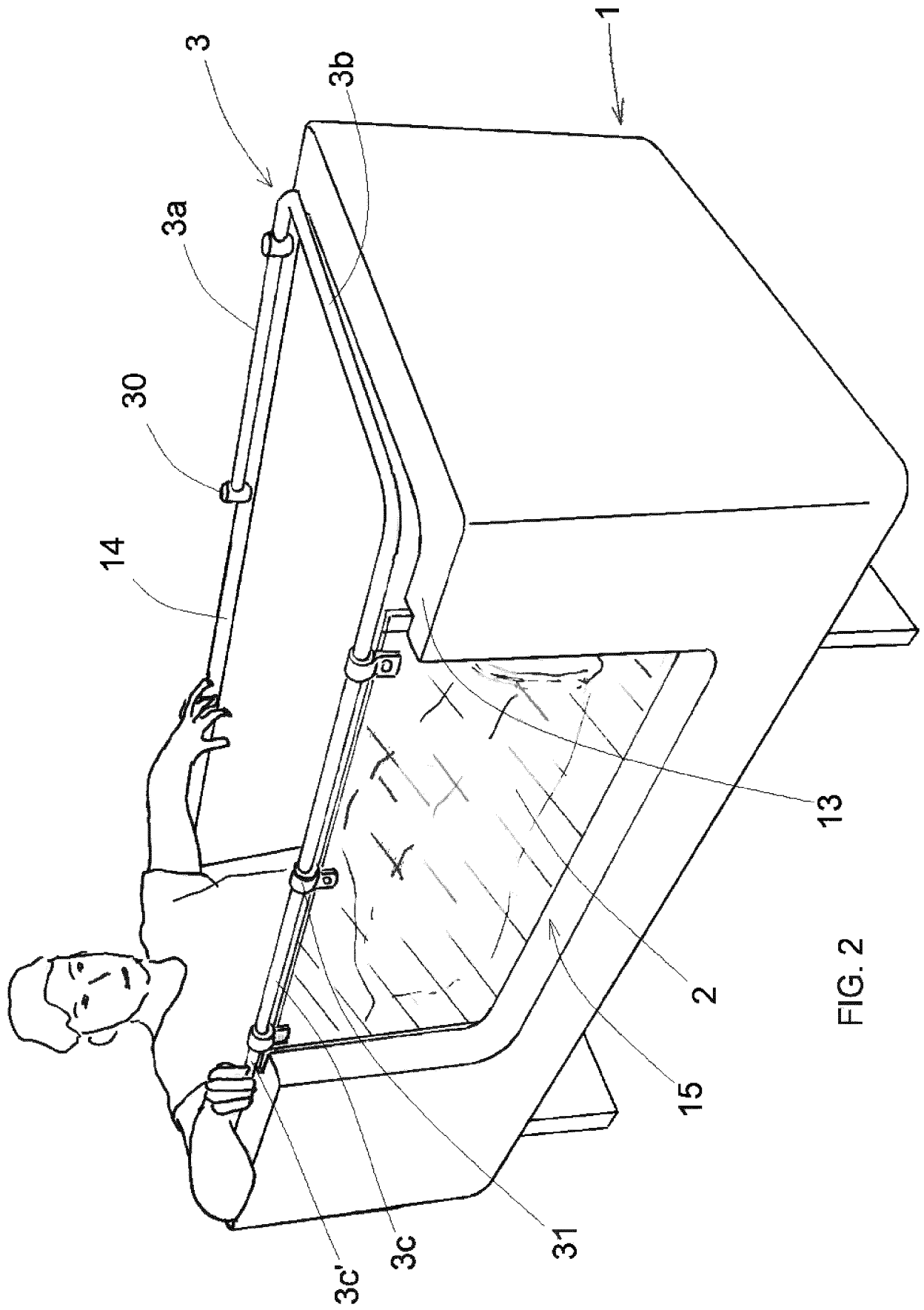


FIG. 2

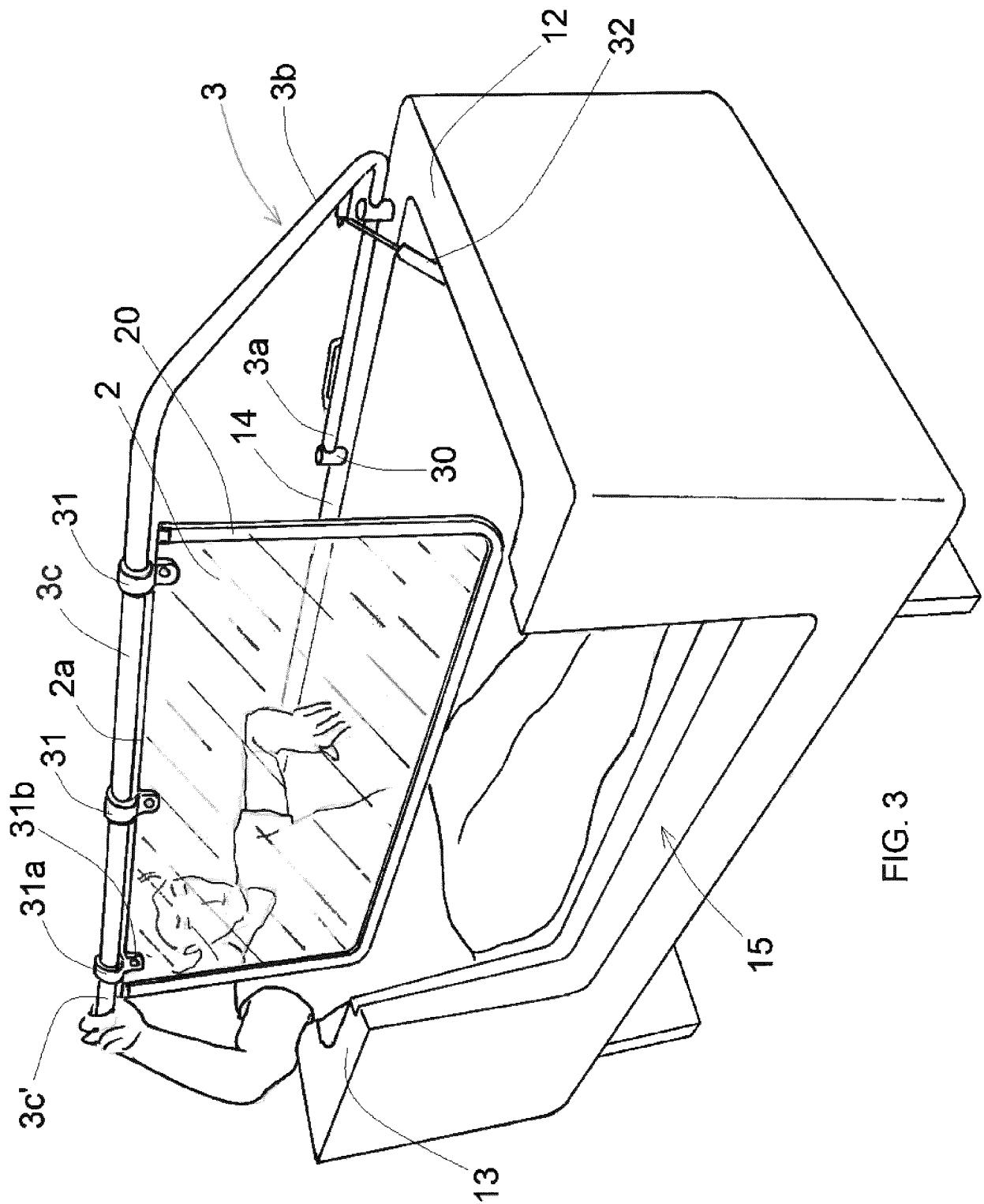


FIG. 3





## EUROPEAN SEARCH REPORT

Application Number  
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 June 2021	Examiner Boyer, Olivier
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**ANNEX TO THE EUROPEAN SEARCH REPORT  
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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
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16-06-2021

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**REFERENCES CITED IN THE DESCRIPTION**

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