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(54) **Bathtub with variable volume**

(57) Bathtub characterized in that it is provided with a watertight pull-out box body in correspondence of an opening obtained on one of its edges, said box body being adapted to be alternately brought from a position

wherein it is entirely contained inside the bathtub to a position wherein it is disposed in projecting position, thus increasing the internal volume of the bathtub.

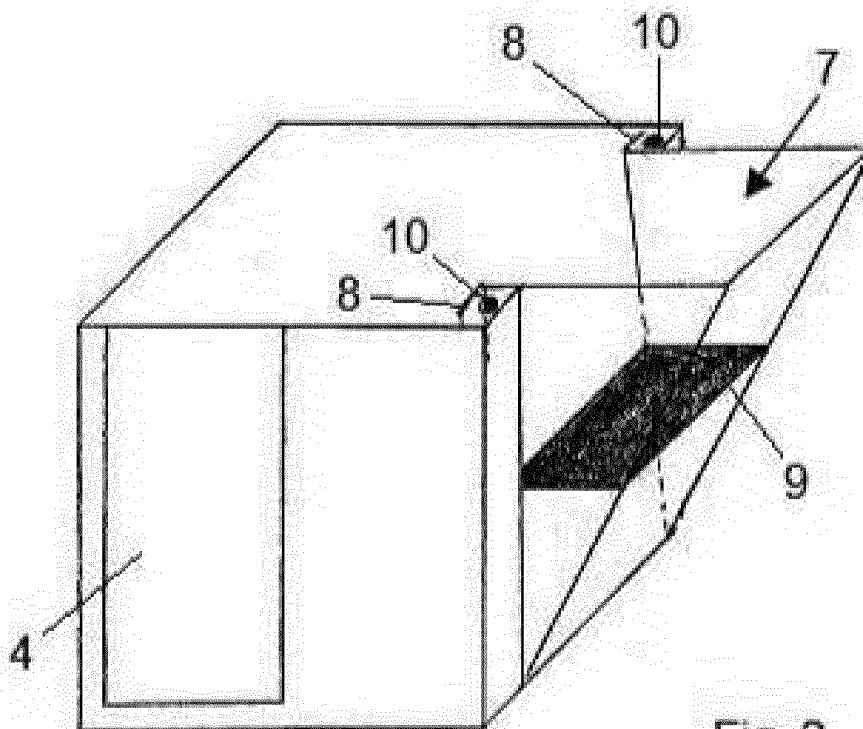


Fig. 2

Description

[0001] The present patent application relates to a bathtub with variable volume.

[0002] The peculiarities and advantages of the present invention will become evident after a brief description of the prior art and its drawbacks.

[0003] As it is known, bathrooms in apartments and flats are generally equipped with bathtubs or shower boxes.

[0004] Evidently, while they offer higher comfort for the user, bathtubs are impaired by a length that is often incompatible with the small dimensions of bathrooms, especially in the case of small flats.

[0005] A shower box is normally installed in similar situations because its total volume corresponds to the dimensions of the square shower tray.

[0006] While saving on space, a typical shower box is impaired by the fact that its conditions of use are quite uncomfortable for the user who is forced to stand for the entire duration of the shower.

[0007] In view of the above the use of a typical shower is especially critical, if not impossible, for elder users and for all those users with stability problems of the lower limbs, who find it difficult to stay for a certain period of time in upright position.

[0008] A careful evaluation of the prior art has resulted in the new bathtub with variable volume of the invention, which is a totally innovative device, it being for the first time able to offer the advantages of a shower box together with the benefits of a bathtub.

[0009] The specific purpose of the present invention is to devise a bathtub with the same longitudinal volume as a shower box (which is substantially limited to the dimensions of a typical shower tray), which at the same time allows the user to comfortably stay inside the bathtub and, most of all, to sit for the entire duration of the shower or bath.

[0010] Such a purpose has been achieved by providing the bathtub of the invention with a vertical, preferably parallelepiped structure, the peculiarity of which consists in the fact that it is provided on one of its vertical walls with a pull-out compartment - which is adapted to project from the vertical wall - used to support a seat whereon the user can comfortably sit.

[0011] More precisely, it consists in a compartment adapted to slide in parallel direction or in a surface adapted to oscillate with respect to the bearing wall of the bathtub of the invention.

[0012] However, the most important feature is that, in both cases, the compartment (together with the seat) can be brought from a non-operating position, wherein it is completely housed inside the bathtub, to an operating position, wherein it projects on the outside of the bearing wall.

[0013] Moreover, it must be noted that the seat mounted in the pull-out compartment can be used by the user only when the pull-out compartment is in operating position.

tion.

[0014] While the pull-out compartment is in non-operating position, it is impossible to use the seat and the useful space inside the bathtub is reduced.

[0015] The capability of the pull-out compartment of the bathtub of the invention of being in two different positions allows for defining the bathtub of the invention as "a bathtub with variable volume"; it being evident that the internal volume of the bathtub (together with its water capacity) will increase when the pull-out compartment is brought to its operating position.

[0016] Evidently, the user can keep the pull-out compartment of the bathtub in the non-operating position to reduce the total volume of the bathtub, whereas he can easily bring the pull-out compartment of the bathtub to the operating position when he intends to use the bathtub and sit inside it.

[0017] In consideration of the fact that the new bathtub of the invention is mainly devised for users who find it difficult to walk or stand in upright position, the additional purpose of the present invention is to facilitate the access and the exit of the user into and from the bathtub.

[0018] In view of the above, the bathtub is provided with a lateral door adapted to open up a passage section used by the user to comfortably access or exit the bathtub in "empty bathtub" condition.

[0019] For explanatory reasons, the description of the invention continues with reference to the attached drawings, which only have an illustrative, not limiting value, wherein:

- Figure 1 is an axonometric view of a first embodiment of the bathtub of the invention, shown with the pull-out compartment in non-operating position;
- Figure 2 is the same as Fig. 1, except for it shows the pull-out compartment in operating position;
- Figure 3 is an axonometric view of a second embodiment of the bathtub of the invention, shown with the pull-out compartment in non-operating position;
- Figure 4 is the same as Fig. 1, except for it shows the pull-out compartment in operating position;
- Figure 5 is an axonometric view of a third embodiment of the bathtub of the invention, shown with the pull-out compartment in non-operating position;
- Figure 6 is the same as the previous one, except for it shows the pull-out compartment in operating position.

[0020] Referring to Figs. 1 and 2, the bathtub of the invention (V) has a substantially parallelepiped structure formed of a substantially rectangular bottom wall (1), from which two transversal edges (2a, 2a') and two longitudinal edges (2b, 2b') project upwards.

[0021] The first transversal edge (2a) is provided with a first vertical opening (3) adapted to facilitate the access and the exit of the user into and from the bathtub of the invention (V).

[0022] The first opening (3) is provided with a water-

tight door (4) that, when in opening position, allows the user to pass from the outside to the inside of the bathtub (V) and vice versa. When in closing position, the watertight door (4) is perfectly watertight with respect to the water loaded inside the bathtub (V).

[0023] A second opening (6) is provided on the first longitudinal edge (2b) for its entire height; in particular, the second opening (6) covers the majority of the central surface of the first longitudinal edge (2b), of which only two short sections remain, basically consisting in its lateral ends.

[0024] An oscillating box body (7) exactly operates in the second opening (6), it being hinged at the base of the border (1 a) of the bottom wall (1) and accordingly adapted to alternately rotate from the inside to the outside of the bathtub (V) through the second opening (6).

[0025] In particular, the oscillating box body (7) is formed of a front wall (7a) with substantially the same surface as the second opening (6), as well as of two lateral walls (7b) in symmetrically opposite position that project towards the inside of the bathtub (V) starting from the vertical borders of the front wall (7a).

[0026] Each of the lateral walls (7b) has a profile shaped as an upturned right-angled triangle and is provided for the entire height of its internal sloping border (7b') with a wing (8) folded at 90° towards the outside of the box body (7).

[0027] A seat (9) is provided inside the box body (7), in the direction of the bathtub (V), it being supported between the front wall (7a) and the two lateral walls (7b).

[0028] After describing its configuration, this description continues illustrating the operation of the bathtub (V).

[0029] Referring to Fig. 1, when the bathtub (V) is not used, the box body (7) is rotated towards the inside of the bathtub (V) in order to minimize its total volume.

[0030] In such a condition, the front wall (7a) of the box body (7) is perfectly aligned with the two lateral sections of the first longitudinal edge (2b) of the bathtub (V), without projecting on the outside of the longitudinal edge (2b).

[0031] Instead, when the user intends to use the bathtub (V), the box body (7) is rotated outwards, thus largely projecting from the first longitudinal wall (2b).

[0032] Such an outward rotation of the box body (7) ends when the two lateral wings (8) are stopped against the internal side of the two ending sections of the first longitudinal edge (2b).

[0033] Evidently, when in operating position, the bathtub of the invention (V) is watertight with respect to the water loaded inside it.

[0034] Such a watertight property is guaranteed by two seals (10) vertically mounted on the inside of the two lateral sections of the first longitudinal edge (2b) and adapted to be compressed when the box body (7) reaches the end of the pulling-out travel, between the lateral ending sections of the first longitudinal edge (2b) and the two lateral wings (8) provided on the lateral walls (7b) of the box body (7).

[0035] The additional circumstance to be verified is that

such an outward oscillation of the box body (7) brings the seat (9) in a perfectly horizontal position substantially outside the perimeter of the bottom wall (1) of the bathtub (V).

5 **[0036]** Now, in order to use the bathtub of the invention (V), the user will access the bathtub (V) through the door (4) and sit on the seat (9), and then he will start supplying water to fill the bathtub (V).

10 **[0037]** Evidently, such a filling will also affect the box body (7), in such manner that the user will be progressively immersed in the water of the bathtub (V), while comfortably sitting on the seat (9).

15 **[0038]** As soon as the bath is finished, the user will empty the bathtub (V), coming out of the bathtub (V) through the door (4) and bringing the box body (7) back to its non-operating position completely rotated towards the inside of the bathtub (V).

20 **[0039]** Referring to Figs. 3 and 4, the bathtub of the invention (V) can be also obtained according to a second embodiment, which is functionally equivalent to the first embodiment.

[0040] In such a case, the first longitudinal wall (2b) is provided with a second central opening (60) that only affects a top section.

25 **[0041]** A box body (70) substantially consisting in a drawer, is adapted to exactly slide through the second opening (60), from the inside to the outside of the bathtub (V) and vice versa.

30 **[0042]** As a matter of fact, the box body (70) is formed of a vertical front wall (70a) to which a horizontal bottom wall (70c) and two opposite lateral walls (70b) are associated.

35 **[0043]** The horizontal bottom wall (70c) is adapted to support a seat (9), whereas the two lateral walls (70b) are provided on the free vertical borders (70b') with wings (80) folded at 90° towards the outside of the box body (70).

40 **[0044]** Because of its capability of sliding in parallel direction, the box body (70) is adapted to be alternately disposed in the non-operating position shown in Fig. 3, and the operating position shown in Fig. 4.

45 **[0045]** In the first case the front wall (70a) is disposed substantially flush with the first longitudinal edge (2b) of the bathtub (V), in such manner that the entire structure of the box body (70), including the seat (9), is contained inside the bathtub (V).

[0046] In the second case, instead, the outward sliding of the box body (70) brings it in projecting position on the outside of the first longitudinal edge (2b), in such a condition that the user can comfortably sit on the seat (9) and be progressively immersed in the water supplied in the bathtub (V) while sitting.

50 **[0047]** Evidently, also in such a case, perfect watertightness must be provided between the box body (70) in the latter operating position, and the first longitudinal edge (2b) of the bathtub (V).

55 **[0048]** In view of the above, two seals (10) are mounted on the inside of the first longitudinal edge (2b), substan-

tially at the height of the vertical edges of the second opening (60).

[0049] The seals (10) are adapted to be compressed between the first longitudinal edge (2b) and the wings (80) that project laterally from the lateral walls (70b) of the box body (70).

[0050] It is understood that the interference between the wings (80) and the internal side of the first longitudinal edge (2b) provides a stop for the outward sliding of the box body (70).

[0051] Although it is not shown in the enclosed figures, an additional seal is provided to guarantee watertightness between the horizontal wall (70c) of the box body (70) - substantially at the height of the internal horizontal border (9a) of the seat (9) - and the lower horizontal edge of the second opening (60) of the first longitudinal edge (2b) of the bathtub (V).

[0052] Figs. 5 and 6 show a third embodiment of the bathtub of the invention (V), which is likewise provided with the same box body (70) of the embodiment shown in Figs. 3 and 4.

[0053] The peculiarity of the third embodiment consists in the fact that the box body (70) is of rotating type and does not slide as a drawer.

[0054] In such a case the first longitudinal border (70c') of the bottom wall (70c) of the box body (70) is hinged on the lower horizontal border of the second opening (60) provided in the center of the first longitudinal edge (2b) of the bathtub (V).

[0055] In view of the above, the box body (70) is adapted to pass from the non-operating position shown in Fig. 5 to the operating position shown in Fig. 6.

[0056] In the first case, in fact, the box body (70) is in such a position that the bottom wall (70c) is flush with the first longitudinal edge (2b) of the bathtub (V), in such a condition that its entire structure is "overturned" and contained inside the bathtub (V).

[0057] In the second case, after an outward rotation of approximately 90°, the box body (70) projects on the outside of the first longitudinal edge (2b), in such a condition that the bottom wall (70c) is in perfect horizontal position together with the seat (9).

[0058] Also in this case, the stop for a similar outward rotation of the box body (70) is provided by the interference established between the lateral wings (80) of the box body (60) and the internal side of the first longitudinal edge (2b).

[0059] Moreover, also in this case, the presence of the seals (10) guarantees watertightness between the lateral wings (80) and the lateral edges of the second opening (60) of the first longitudinal edge (2b).

[0060] With reference to the latter embodiment of the invention, it must be noted that the box body (70) is provided with seals also at the height of the internal horizontal border (9a) of the seat (9) regardless of the fact that the seals are not shown in Figs. 5 and 6.

Claims

1. Bathtub with variable volume formed of a horizontal bottom wall (1) and multiple vertical edges (2a, 2a', 2b, 2b'), **characterized in that** it is provided, in correspondence of a second opening (6, 60) obtained in one of its edges (2b), with a watertight pull-out box body (7, 70) used to support a seat (9), it being adapted to be alternatively brought from a position wherein it is completely contained inside the bathtub (V), exactly covering the second opening (6, 60) and without creating any volume on the outside of the edge (2b), to a position wherein it projects from the edge (2b).

2. The bathtub of claim 1, wherein:

- the second opening (6) that houses the pull-out box body (7) is obtained for the entire height and in the center of the edge (2b) in such manner to be comprised between the two lateral sections of the edge (2b)
- the pull-out box body (7) comprises:

- a front wall (7a) entirely covering the second opening and hinged at the base on the border (1a) of the bottom wall (1) of the bathtub (V)
- two lateral walls (7b) in symmetrically opposite position, with profile shaped as an overturned right-angled triangle and projecting towards the inside of the bathtub (V) starting from the vertical borders of the front wall (7a)
- two wings (8) laterally projecting outwards, basically at 90°, from the internal sloping borders (7b') of the lateral walls (7b), as well as adapted to interfere with the internal side of the lateral sections of the edge (2b), when the entire box body (7) is brought to its projecting position with respect to said edge (3), thus generating the compression of corresponding seals (10) provided therein

- the seat (9) is supported, towards the inside of the bathtub (V), between said front wall (7a) and the lateral walls (7b).

3. The bathtub of claim 1, wherein:

- the second opening (60) that houses the pull-out box body (70) occupies a top central section of the edge (2b)
- the pull-out box body (70) is adapted to slide in parallel direction, similarly to a drawer, in correspondence of the second opening (60) and is formed of:

- a vertical front wall (70a) adapted to exactly occupy the entire surface of the second opening (60), as well as associated with a horizontal bottom wall (70c) and with two lateral opposite walls (70b) facing towards the inside of the bathtub (V) starting from the vertical edges of the front wall (70a)
- two wings (80) laterally projecting outwards, basically at 90°, from the free vertical borders (70b') of the lateral walls (70b), as well as adapted to interfere with the internal side of the edge (2b) at the height of the vertical borders of the second opening (60) when the entire box body (7) is brought to its projecting position with respect to said edge (2b), thus generating the compression of corresponding seals (10) provided therein

- the seat (9) is supported, towards the inside of the bathtub (V), above the bottom wall (70c).

4. The bathtub of claim 1, wherein:

- the second opening (60) that houses the pull-out box body (70) occupies a top central section of the edge (2b)
- the pull-out box body (70) is adapted to alternately rotate by approximately 90°, from the inside to the outside of the bathtub (V), in correspondence of the second opening (60) and is formed of:

- a vertical front wall (70a) adapted to exactly cover the entire surface of the second opening (60), as well as associated with a horizontal bottom wall (70c) and with two opposite lateral walls (70b) facing towards the inside of the bathtub (V) starting from the vertical borders of the front wall (70a); wherein the first longitudinal border (70c') of the bottom wall (70c) is hinged in correspondence of the lower horizontal border of the second opening (60) in such manner that, when the box body (70) is completely contained inside the bathtub (V), the bottom wall (70c) is flush with the edge (2b), and, when the entire box body (70) is brought to its projecting position, the bottom wall (70c) is basically orthogonal to the edge (2b)
- two wings (80) laterally projecting outwards, basically at 90°, from the free vertical borders (70b') of the lateral walls (70b), as well as adapted to interfere with the internal side of the edge (2b) at the height of the vertical borders of the second opening (60) when the entire box body (7) is brought into its projecting position with respect to said

edge (2b), thus generating the compression of corresponding seals (10) provided therein

- the seat (9) is mounted, towards the inside of the bathtub (V), above the bottom wall (70c).

5. The bathtub of one of the preceding claims, wherein one of the edges (2a, 2a', 2b') other than the one associated with said pull-out box body (2b) has a first opening (3) provided with a watertight door (4).

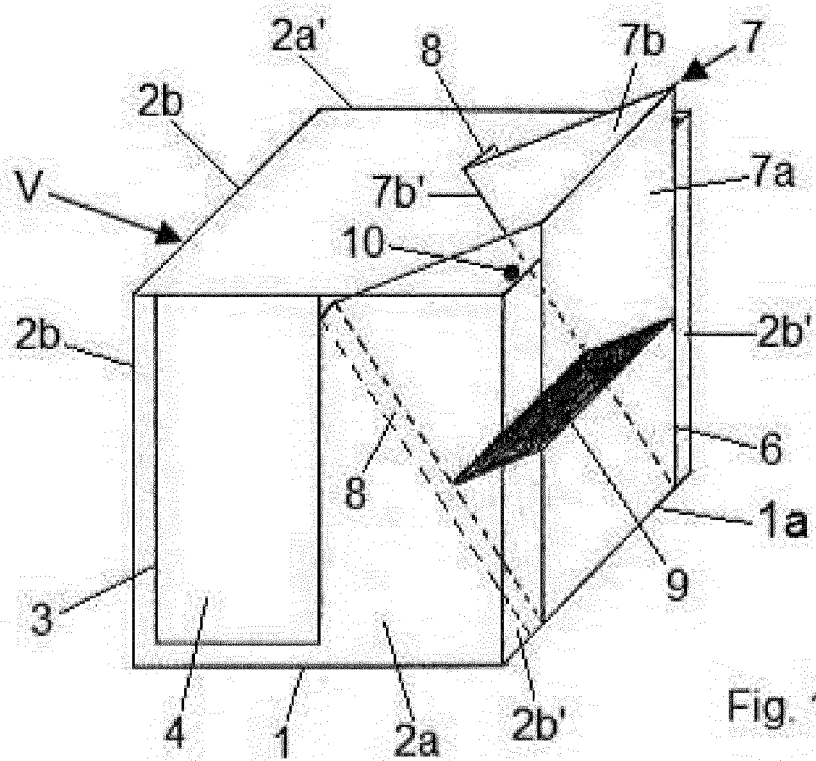


Fig. 1

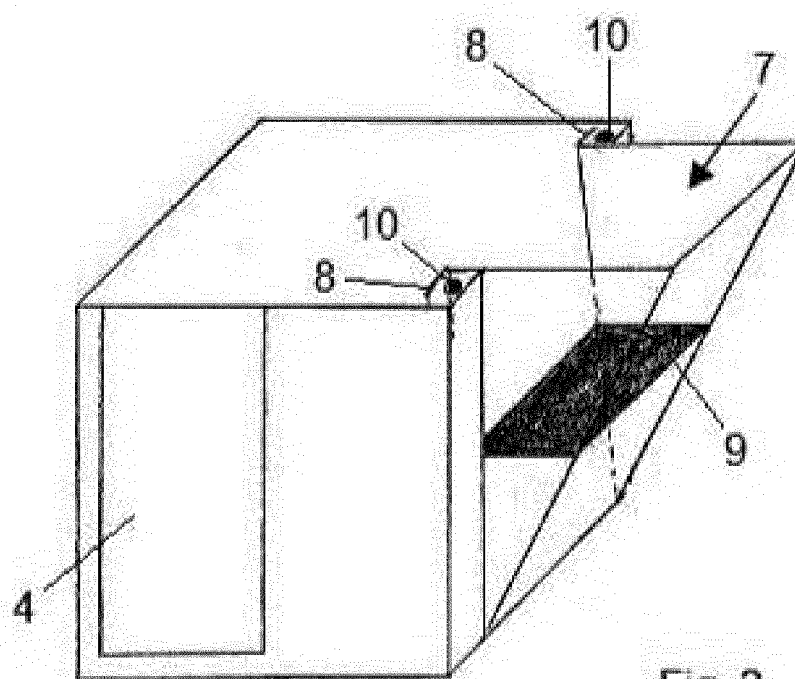
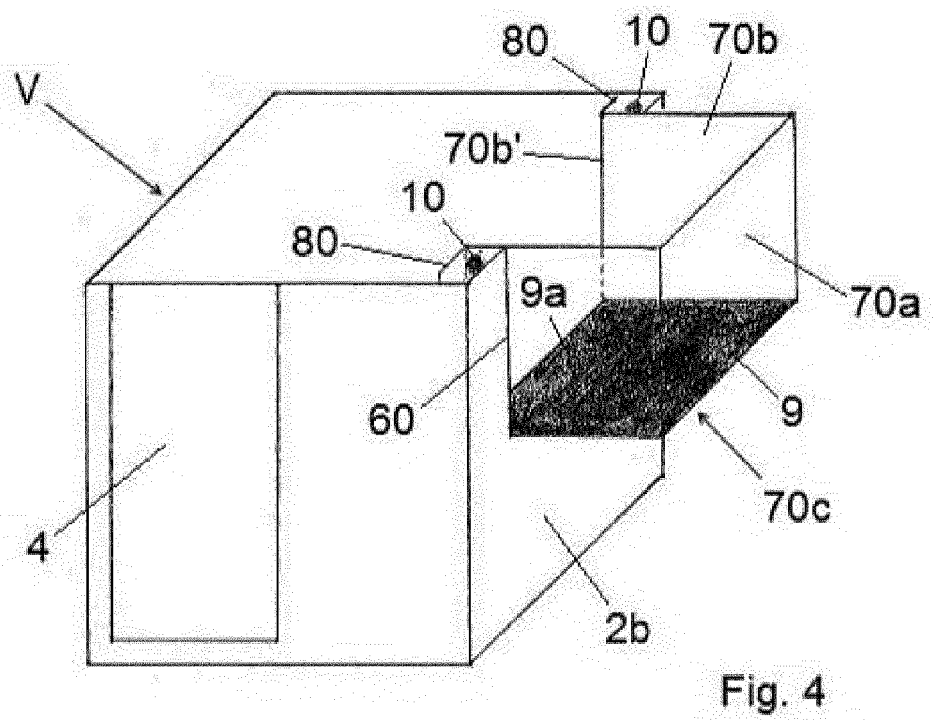
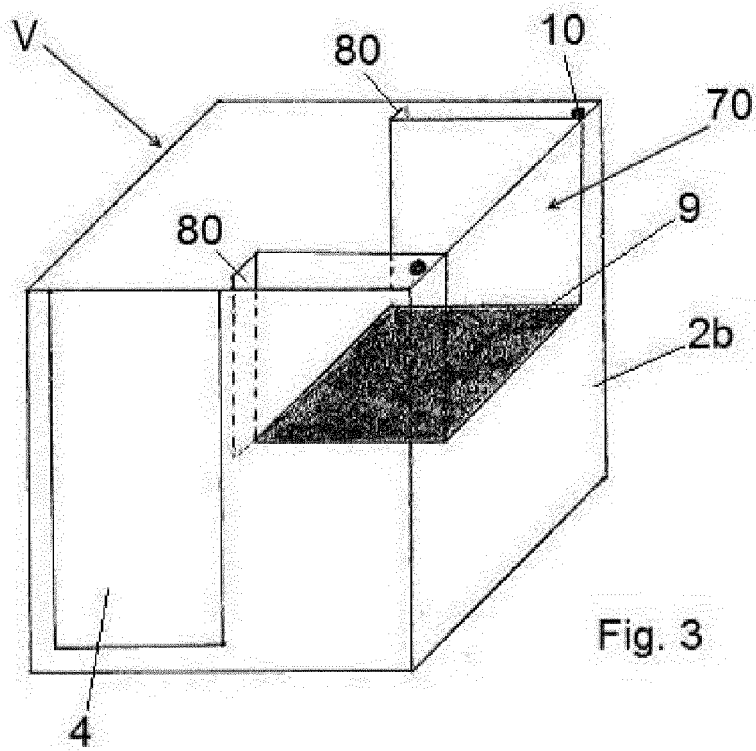
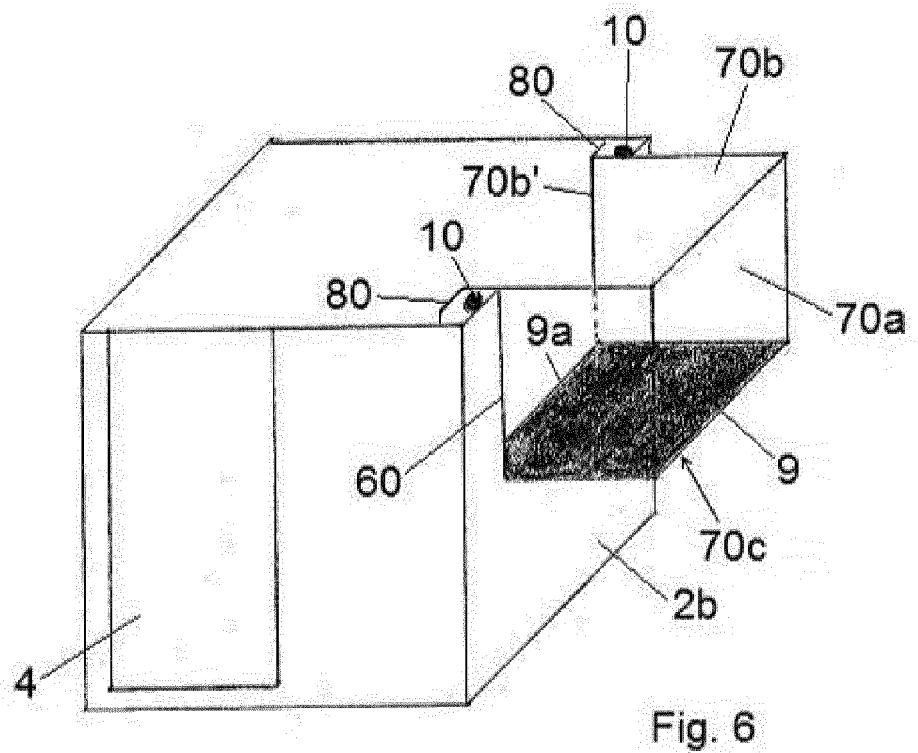
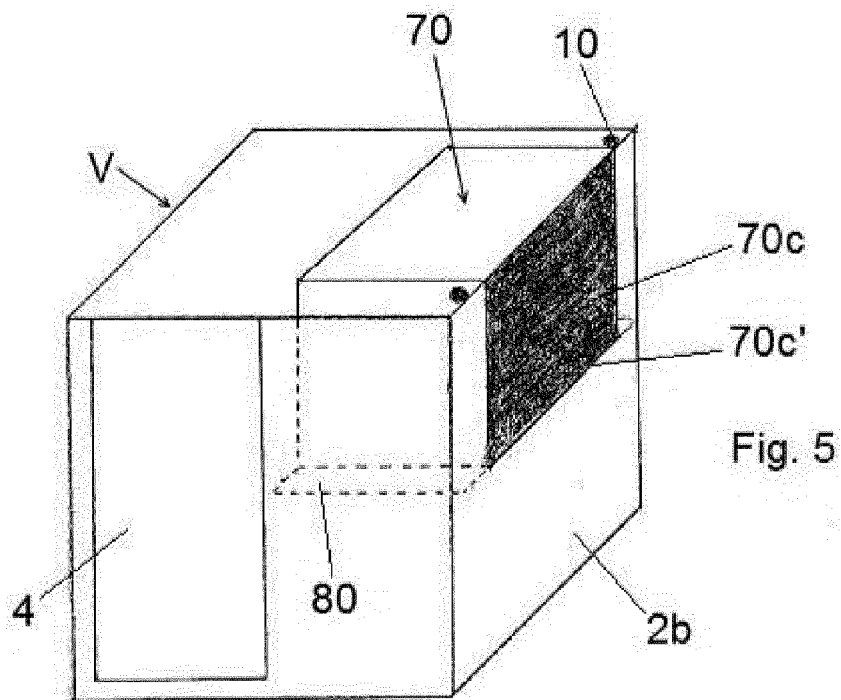


Fig. 2







EUROPEAN SEARCH REPORT

 Application Number
 EP 15 15 0991

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	* figures *	2-4	
X	----- KR 2011 0017964 A (RYU JAE BEK [KR]) 23 February 2011 (2011-02-23)	1	
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A	----- US 3 630 193 A (LANCASTER JOYCE M) 28 December 1971 (1971-12-28) * figures *	1-5	
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			TECHNICAL FIELDS SEARCHED (IPC)
			A47K
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 1 June 2015	Examiner van de Beek-Duijker
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 15 15 0991

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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