



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
06.10.2004 Bulletin 2004/41

(51) Int Cl.7: **A61H 33/00**

(21) Application number: **03405161.5**

(22) Date of filing: **07.03.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

• **Martoia, Michel**
3178 Bösinggen (CH)
• **Sellier, Jean-François**
3178 Bösinggen (CH)

(71) Applicants:
• **Spiral Spas SA**
3178 Bösinggen (CH)
• **G.S.B. Global Sanitary Business Limited**
Tortola (VG)

(74) Representative:
Roshardt, Werner Alfred, Dipl.-Phys.
Keller & Partner
Patentanwälte AG
Schmiedenplatz 5
Postfach
3000 Bern 7 (CH)

(72) Inventors:
• **Doucet, Philippe**
3178 Bösinggen (CH)

(54) **Spa bath**

(57) A Spa bath comprises a moulded shell (4) with modular inserts (9, 10) arranged in recesses (5, 13) of the moulded shell (4), whereby jets (16, 17) operate through bores (11, 12) in the modular inserts (9, 10) and where a water distribution (14) for the jets (16, 17) is arranged substantially outside the moulded shell (4). In a process for manufacture of a spa bath first a moulded shell (4) featuring a plurality of predetermined recesses (5, 13) is formed, preferably by thermoforming. Next, for each recess (5, 13) an appropriate modular insert (9,

10) having a desired jet arrangement is selected and respective bores (11, 12) are drilled in the moulded shell (4) at the locations of jets (16, 17) in the selected modular insert (9, 10). Following this, the jets (16, 17) are affixed at their locations, the water supply (14) disposed outside the moulded shell (4), and finally the selected modular insert (9, 10) is fixed into the recess (5, 13). The spa baths according to the invention may be manufactured inexpensively and allow for a skirt surrounding the tub having a small width.

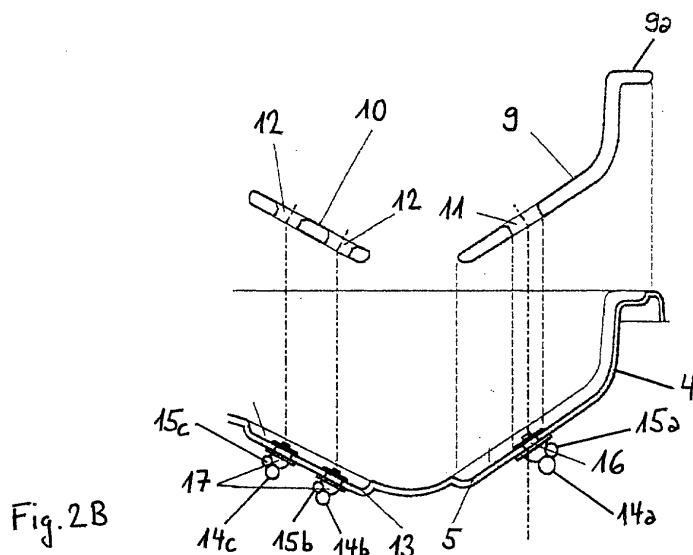


Fig. 2B

Description

Technical Field

[0001] The invention relates to spa baths comprising a moulded shell with modular inserts arranged in recesses of the moulded shell, whereby jets operate through bores in the modular inserts. The invention further relates to a process for manufacture of a spa bath.

Background Art

[0002] Currently, most tubs for spa baths or whirlpools have a moulded shell, usually manufactured by thermoforming a thin sheet of a thermoformable material. Into this watertight shell, water is poured in. The form of the shell is predetermined by the form of a mould on which the sheet is tightly set in a heated and thus plastic condition. Jets for delivering water with a certain pressure may be arranged such that their mouth is arranged below the contact surface of the tub with the user, thus increasing comfort. For each jet a special arrangement for mounting is provided in the moulded shell, e. g. an appropriate bored recess. To create them, the mould used to form the shell features corresponding elements, such as projections and indentations.

[0003] This means that for changing the arrangement of jets from one type of spa bath manufactured to another the mould has to be adapted in a certain way. After the moulding process, the arrangement of jets is fixed. Therefore, customer's options concerning the arrangement of jets have to be taken into account from a very early stage of manufacture of the spa bath. This means that there is much time and labour required to confect a spa after receipt of the order, causing a long time for delivery.

[0004] US patent 6,256,805 (Bullfrog International) shows a modular system for spas. The jets are mounted on jet panels that cover recesses in the moulded shell constituting the tub of the spa. The moulded shell is penetrated only at a single point and the water distribution for the jets is arranged within the moulded shell, comprising a channel extending inside the shell, along the peripheral edge of the tub. This arrangement alleviates the replacement of malfunctioning jets or the upgrade to a new jet configuration. The flexibility and safety of the system is improved.

[0005] However, the jet panels and the water distribution for the jets appertaining to them are technically complicated and therefore expensive. The confection of the spa is labour-intensive. Finally, because of the distribution of the jets included inside the panels, the recesses to receive the panels have a large depth and therefore the skirt surrounding the tub must have a large width.

Summary of the invention

[0006] It is the object of the invention to create a spa

bath pertaining to the technical field initially mentioned, that may be manufactured inexpensively and allows for a skirt surrounding the tub having a small width.

[0007] The solution of the invention is specified by the features of claim 1. According to the invention the water distribution is arranged substantially outside the moulded shell, i. e. outside the cavity defined by the shell. The same preferably applies to the air distribution, which is normally needed as well for jets used in spa baths.

[0008] Keeping the water distribution - and where required the air distribution - outside the moulded shell reduces the depth of the recesses as they do not have to receive any substantial part of the water distribution to the jets. Featuring no means for water distribution, the modular inserts are of a simple construction which reduces their cost. Besides, confection of the spa baths is made easier. Nevertheless, the flexibility of the system is preserved as choosing the arrangement of jets happens only after the moulding of the shell.

[0009] Preferably, each jet is supplied by water directly through a bore in the moulded shell, whereby the bore in the moulded shell is arranged immediately rearward of the bore in the modular insert. This arrangement minimizes the demand for space concerning the distribution of water for the jets. The jet delivers the water into the tub through the bore in the modular insert and is directly supplied with water through the bore in the moulded shell. Therefore, there is no need for any further distribution of water inside the moulded shell. Each bore in the moulded shell is sealed up against the inside of the shell.

[0010] Alternatively, a plurality of close-by jets are combined in one element that fits a respective bore in the modular insert and that is supplied by water through a single bore in the moulded shell, rearward of the element.

[0011] Advantageously the jets are directly affixed to the moulded shell. In this case, the attachment of the jet preferably comprises as well the sealing against water flowing out of the inside of the moulded shell. This way, the jets are firmly mounted and the modular inserts do not have to be mounted such that they are sealed against the recess of the shell.

[0012] Alternatively, the jets may be fixed to the modular insert, thus requiring a sealing of the insert against the shell. Finally, the jets may be attached to both the modular insert as well as the moulded shell. Thereby, by tightly fixing the jets the insert is automatically fixed to the shell, without the need for additional fixation.

[0013] Preferentially, the jets are arranged such that their mouths are arranged below the surface of the modular inserts in order to protect a user of the spa bath. It may be inconvenient if the mouth of a jet directly contacts the skin of a user. For certain types of jets such an arrangement even inhibits their proper operation. Therefore, arranging the mouths of the jets below the surface of the modular insert and therefore below the actual surface of the tub protects the users against harm

due to jets elevating above the surface of the tub and at the same time improves the operation of the jets.

[0014] Still, certain types of jets may be mounted such that their mouths lie in the surface plane of the tub, e. g. jets that are disposed outside the contact surfaces with the user's body. In general, the mounting depth of each jet may be adapted to the type of jet as well as to the portion of the body the jet acts on.

[0015] Preferably the modular inserts are substantially made of polyurethane (PU), this being a durable, inexpensive and easy to work material which provides for comfortable rests, due to its surface structure and its other physical properties.

[0016] Alternatively, other materials, in particular other kinds of plastics, may be chosen.

[0017] Advantageously, the modular inserts have a thickness corresponding to the depth of the recesses, preferably 30-40 mm. The inserts having the same thickness as the depth of the recesses lead to a smooth surface of the tub, constituted by the moulded shell and - at recessed portions - the inserts. A thickness of 30-40 mm allows for mounting the jets such that their mouths are arranged below the surface of the inserts and at the same time for keeping the width of the skirt and thereby the extent of the spa bath reasonably small. This thickness further permits to produce cushion-like soft inserts that are very comfortable rests for users of the spa bath.

[0018] Optionally, the thickness of the inserts may be larger than the depth of the recesses, namely if the inserts have the form of a seat, supporting the whole body of a user. The thickness of the inserts may be as well smaller than the depth of the recesses, particularly if the edge of the recess is designed to support the body in a seat-like form.

[0019] Furthermore, if jets are used that protrude only slightly above the moulded shell, the absolute thickness of the insert (and of the recess) may be reduced to even less than 30 mm, thereby allowing for an even narrower skirt of the spa bath.

[0020] Advantageously, substantial portions of the modular inserts are hollow, i.e. the modular insert is constituted by a shell defining a cavity. This reduces material requirements and therefore the weight of the inserts. At the same time, their comfort for the user is improved.

[0021] Alternatively, the inserts may be compactly formed of a light material or made of a shell of a durable strong material filled by another light material, e. g. polystyrene. Finally, to improve the convenience of the seats of the spa bath the insert may be formed of a ductile cover filled with a soft gel.

[0022] Preferably, the recesses and modular inserts are arranged in portions of the spa bath supporting backs and/or legs of users of the spa bath. These are the portions where jets are primarily needed, e. g. to effect a massage of the back or of the legs.

[0023] Further recesses and inserts may e. g. be arranged in portions of the spa bath where feet of the users are positioned, to effect a foot massage.

[0024] A process for manufacture of a spa bath comprises the following steps:

a) forming a moulded shell featuring a plurality of predetermined recesses, preferably by thermoforming;

b) for each recess selecting an appropriate modular insert having a desired jet arrangement;

c) for each recess drilling bores in the moulded shell at the locations of jets in the selected modular insert;

d) for each recess affixing jets at their locations, including water supply, reaching through the bores in the tub; and

e) for each recess affixing the selected modular insert.

[0025] Preferably, the bores are drilled immediately rearward of bores in the modular insert through which jets will be operating. This simplifies the mounting of the jets and avoids the need for any water distribution inside the moulded shell.

[0026] Other advantageous embodiments and combinations of features come out from the detailed description below and the totality of the claims.

Brief description of the drawings

[0027] The drawings used to explain the embodiments show:

Fig. 1A-1C Modular inserts with different jet arrangements;

Fig. 2A modular inserts supporting the back and the legs of the user, ground view;

Fig. 2B modular inserts supporting the back and the legs of the user, cross-sectional view;

Fig. 3 ground view of the position of the modular inserts with respect to the user;

Fig. 4A-4C cross-sectional views of variants of a jet attached to a recess of the inventive spa bath.

[0028] In the figures, the same components are given the same reference symbols.

Preferred embodiments

[0029] The figures 1A, 1B, 1C show different modular inserts 1a, 1b, 1c for supporting the back of a user of

the spa bath, having different arrangements of bores 2, 3 for mounting jets. All the different inserts 1 a, 1 b, 1 c fit into the same recess 5 of a moulded shell 4.

[0030] Figure 1 A displays a modular insert 1a adapted to the form of the user's upper part of the body. The insert 1a features five small circular bores 2a for mounting small jets arranged along the upper edge of the insert and three larger circular bores 3a arranged along the symmetry axis of the insert 1 a. The smaller bores 2a provide a massage of the neck of the user and the larger bores 3a provide a massage along the spine of the user. The moulded shell 4 shows a recess 5 extending from a ground region of the tub into the upper border of the moulded shell 4. The form of the recess 5 is exactly adapted to the form of the modular insert 1a such that if the insert 1a is positioned in the recess 5 the tub shows a smooth surface.

[0031] During assembly of the spa bath, prior to attaching the insert 1a, bores 6a corresponding to the locations and adapted to the diameter of the smaller bores 2a in the insert 1a and bores 7a corresponding to the locations and adapted to the diameter of the larger bores 3a in the insert 1 a are drilled into the recess 1a of the moulded shell 4. The bores 2a, 3a in the insert 1a and the corresponding bores 6a, 7a in the recess are concentric and therefore continuous straight bores from outside the moulded shell 4 until the inside of the tub are created.

[0032] The diameter of the bores 6a, 7a in the recess 5 of the moulded shell 4 is smaller than the diameter of the bores 2a, 3a in the modular insert 1 a. This allows for the mounting of jets into the bores 6a, 7a of the moulded shell 4 whose outer portion, situated in front of the moulded shell, i. e. inside the moulded shell, features a larger diameter than the bores 6a or 7a respectively. Thereby, the bore is sealed and the jet is supported on the moulded shell 4. However, the diameter of the bores 2a, 3a in the modular insert is large enough to receive the front part of the jet including its outer portion.

[0033] It is apparent from Figure 1 A that the width of the skirt section 4a of the moulded shell 4 is small. This is made possible by the small width of the modular insert 1 a. Therefore, given a certain space available for placing a spa bath, a larger tub may be chosen compared to the situation if another type of spa bath is chosen, needing a skirt with a larger width.

[0034] Figure 1 B displays a variant of a modular insert, featuring another arrangement of small bores 2b and larger bores 3b in the modular insert 1b. Only two small bores 2b are arranged along the upper edge of the insert but six larger bores 3b are arranged in the back region of the insert 1b. Accordingly, the bores 6b, 7b drilled into the recess 4 of the moulded shell 5 show the same, different configuration. Apart from that, the situation is alike the one shown in Figure 1A.

[0035] Figure 1c displays a third variant of a modular insert, featuring in addition one large oval bore 3d arranged on the symmetry axis and near the bottom end

of the insert 1c. The small circular bores 2c are disposed in two rows near the upper end of the insert 1c, the larger circular bores 3c in a horizontal row disposed between the small bores 2c and the large oval bore 3d. Again, bores 6c, 7c, 8c are drilled at the respective positions in the recess 5 of the moulded shell 4. Bore 8c corresponding to the oval bore 3d in the modular insert 1c shows an oval form. It may receive a specially designed oval jet or two usual circular jets arranged on a common oval element.

[0036] Figure 2 shows modular inserts supporting the back and the legs of the user as well as their arrangement in recesses of the spa bath according to the invention.

[0037] Figure 2A is a ground view, depicting a modular insert 9 supporting the back of the user and a modular insert 10 supporting portions of the legs, namely the thighs, of the user. The modular insert 9 comprises a single circular bore 11, arranged on the symmetry axis of the insert and adapted to receive a respective jet 16. The modular insert 10 comprises four circular bores 12 having the same size arranged on a rectangle to receive four respective jets 17. Both elements fit into corresponding recesses 5, 13 in the moulded shell 4.

[0038] Figure 2B is a cross-sectional view of the modular insert 9 along its symmetry axis, depicting as well the respective portion of the moulded shell 4, the water supply 14 and the air supply 15 for the jets 16,17. The modular insert 9 supporting the back of the user extends from almost the ground of the tub up into the upper border of the moulded shell 4. The uppermost portion 9a fitting into a portion of the recess situated in the border is 90° offset to the main portion of the modular insert 9. This provides for a smooth transition between the tub itself and its border. The shape of the modular insert 9 is adapted to the human body. The modular insert 10 supporting the users thighs has a straight form fitting into a respective recess 13.

[0039] The water supply 14 comprises three water pipes 14a, 14b, 14c, whereby pipe 14a supplies the single jet 16 arranged in the modular insert 9 supporting the back of the user. Pipes 14b, 14c each supply two jets 17 arranged in the modular insert 10 supporting the thighs of the user. All the pipes are arranged below of and parallel to the surface of the moulded insert 4. They show a small distance to the moulded insert 4 such that the connection to the jets 16, 17 is short. Parallel and adjacent to all the water pipes 14a, 14b, 14c air pipes 15a, 15b, 15c are disposed.

[0040] Figure 3 is a ground view of the position of the modular inserts 9, 10 in respect of the user. The single modular insert 9 is supporting the user's back extending up to support the user's head. Two modular inserts 10 are provided. The first one corresponds to the one displayed in Figure 2, supporting the users thighs. The second one is built up identically but arranged such that it supports the user's lower legs.

[0041] Figures 4A-4C are cross-sectional views of

variants of a jet attached to a recess of the inventive spa bath, along the symmetry axis of the jet.

[0042] Figure 4A displays a first variant where the jet is attached to the moulded shell, and where the modular insert can be freely removed or inserted without being affected by the jet. The jet 18 is disposed in a recess region of the moulded shell 4. It is attached by a wall fitting 21 of a substantially cylindrical form, having a flange 21 a at its upper end and a thread 21 b along the outside of its shaft. The wall fitting 21 reaches through a bore 19 in the moulded shell 4 and is sealed against the surface of the moulded shell by gasket 20 arranged between the flange 21 a and the inner surface of the moulded shell 4. The jet 18 is fixed by means of a thread 18b arranged on the inside of a shaft 18a of the jet tightened against the thread 21 of the wall fitting. A gasket 22 provides sealing of the jet 18 against the outside of the moulded shell 4.

[0043] The mouth of the jet is constituted by an eyeball 23 mounted between the wall fitting 21 and an escutcheon 24, sealed by an O-Ring 25. The eyeball 23 is universally rotatable such that the direction of the mouth of the jet may be varied. The escutcheon 24 is fixed to the wall fitting 21 by means of a clip (not visible in the cross-section displayed). The mouth of the jet allows for delivering the water through a bore 26 of a modular insert 27. There is a distance of the mouth to the surface 28 of the tub such that the user feels comfortable and such that the operation of the jet 18 is improved. A water pipe 29 is connected to jet 18 as well as an air pipe 30.

[0044] Figure 4B displays an alternative attachment of a jet 32, where the details of the jet 32 are not displayed. In principle any type of jet may be employed. In contrast to the previous example, a modular insert 31 comprising a protrusion 31 a with which an upper part 32a of the jet 32 co-operates is employed, such that the modular insert 31 is automatically held affixed as soon as the jet 32 is fastened. A gasket 33 is arranged between the upper part 32a of the jet 32 and the protrusion 31a of the modular insert 31. The jet 32 is fixed by means of a nut 34 having a thread 34a that co-operates with a thread 32c arranged along the shaft 32b of the jet 32. An additional gasket 35 is arranged in between the nut 34 and the outside of the moulded shell 4. Water and air are supplied by usual supply means 36 and 37 respectively.

[0045] Figure 4C displays another alternative, where a jet 38 is attached to a modular insert 39 by means of corresponding threads 38a, 39a.

[0046] Note, that the invention may be realised without substantial modifications using all the different kinds of jets such as e.g. jets fed by water and air, by water and pulsed air, by water alone (if need be furnished with a pump) etc. Generally, the usual jets available for spa baths may be used with the invention.

[0047] If the modular inserts are not attached by fixation of the jets, as e. g. displayed in Fig. 4A, they are attached to the moulded shell by any of the known

means, such as screws, adhesive sealing, latches etc.

[0048] The size, form and arrangement of recesses in the moulded shell may be varied depending on the flexibility desired. Embodiments featuring only a few large recesses, that e. g. correspond to modular inserts constituting complete seats, are possible as well as other embodiments comprising a larger number of rather small recesses. Above all in the latter case it may be preferable to employ as well modular inserts that do not show bores, for certain places where no jets are desired in a given arrangement of the spa bath.

[0049] In summary, it is to be noted that the invention creates a spa bath comprising a moulded shell with modular inserts arranged in recesses of the moulded shell, whereby jets operate through bores in the modular inserts, that may be manufactured inexpensively and allows for a skirt surrounding the tub having a small width.

Claims

1. Spa bath comprising a moulded shell with modular inserts arranged in recesses of the moulded shell, whereby jets operate through bores in the modular inserts, **characterized in that** a water distribution for the jets is arranged substantially outside the moulded shell.
2. Spa bath according to claim 1, **characterized in that** each jet is supplied by water directly through a bore in the moulded shell, the bore in the moulded shell arranged immediately rearward of the bore in the modular insert.
3. Spa bath according to claim 1 or 2, **characterized in that** the jets are directly affixed to the moulded shell.
4. Spa bath according to one of claims 1 to 3, **characterized in that** the jets are arranged such that their mouths are arranged below the surface of the modular inserts in order to protect a user of the spa bath.
5. Spa bath according to one of claims 1 to 4, **characterized in that** the modular inserts are substantially made of polyurethane (PU).
6. Spa bath according to one of claims 1 to 5, **characterized in that** the modular inserts have a thickness corresponding to the depth of the recesses, preferably 30-40 mm.
7. Spa bath according to one of claims 1 to 6, **characterized in that** substantial portions of the modular inserts are hollow.
8. Spa bath according to one of claims 1 to 7, **characterized in that** the recesses and modular inserts

are arranged in portions of the spa bath supporting backs and/or legs of users of the spa bath.

9. Process for manufacture of a spa bath comprising the following steps:

5

a) forming a moulded shell featuring a plurality of predetermined recesses, preferably by thermoforming;

10

b) for each recess selecting an appropriate modular insert having a desired jet arrangement;

c) for each recess drilling bores in the moulded shell at the locations of jets in the selected modular insert;

15

d) for each recess affixing jets at their locations, including water supply, reaching through the bores in the tub; and

20

e) for each recess affixing the selected modular insert.

25

10. Process according to claim 9, **characterized in that** in the drilling step the bores are created immediately rearward of bores in the modular insert through which jets will be operating.

30

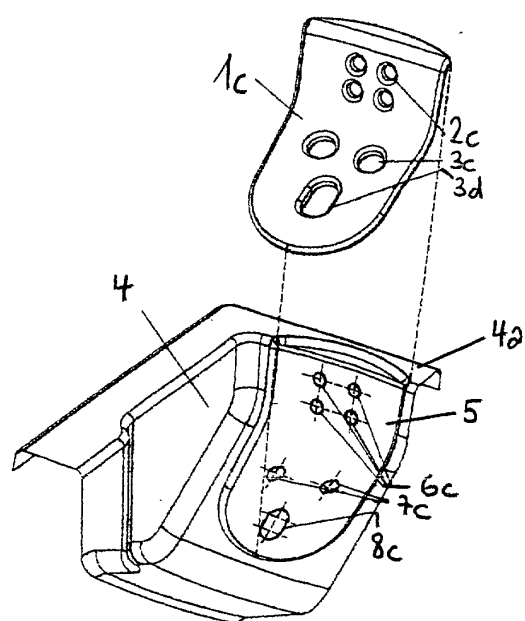
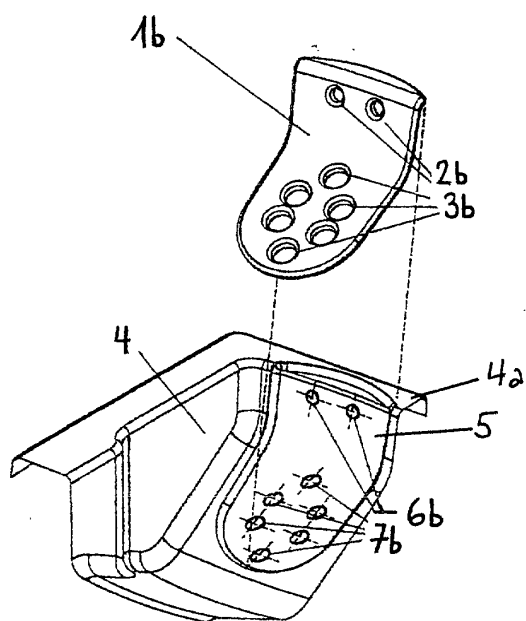
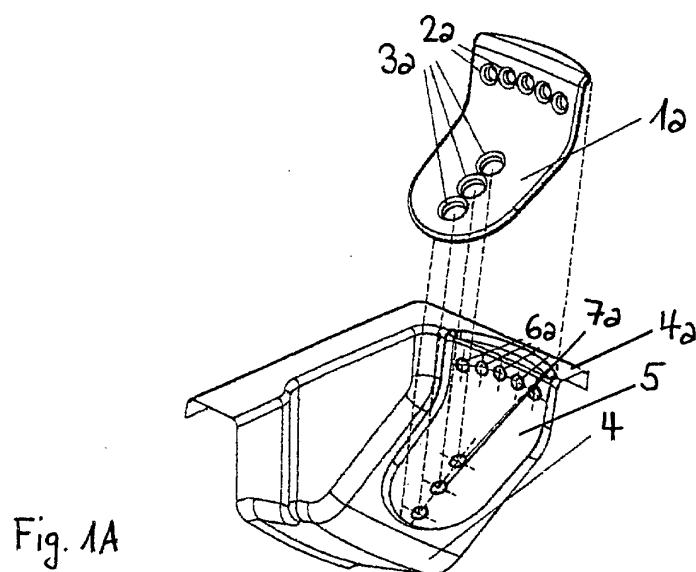
35

40

45

50

55



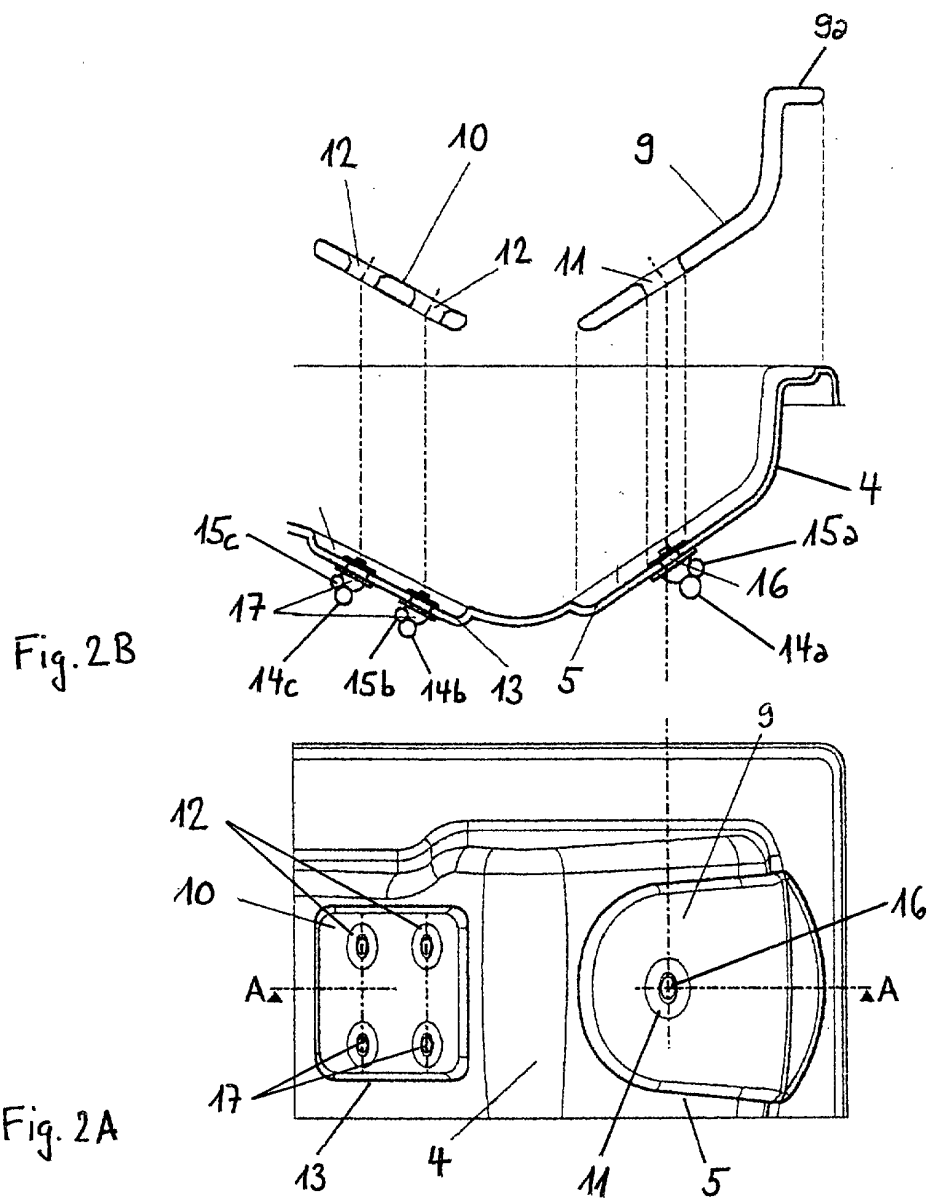
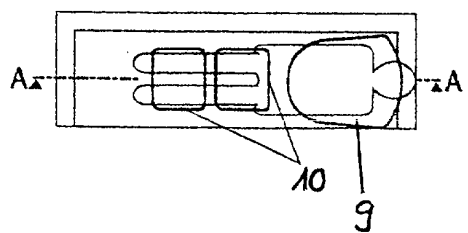


Fig. 3



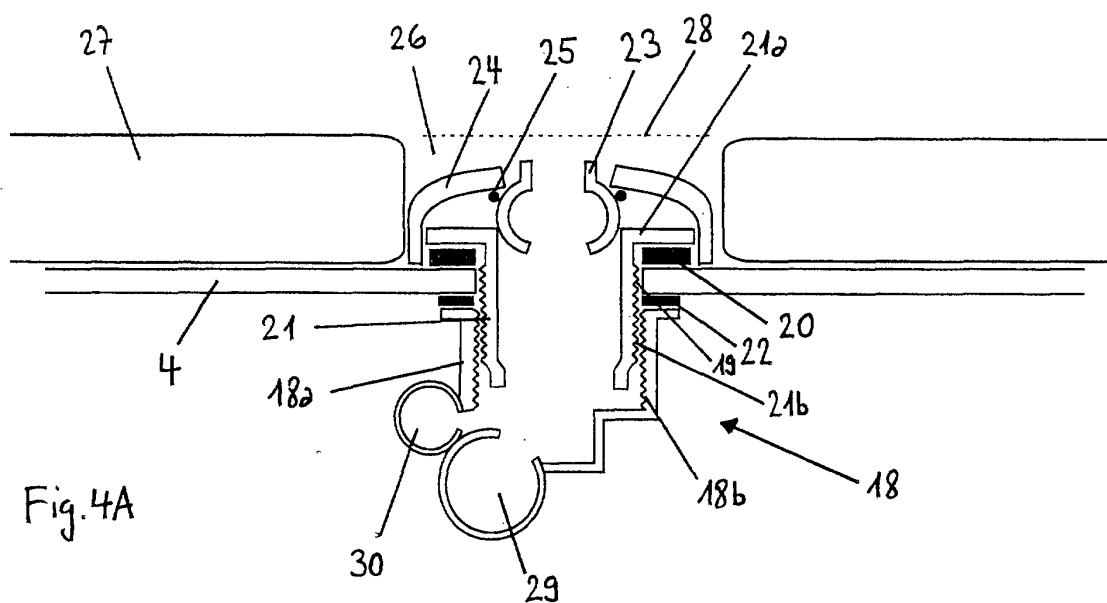


Fig. 4A

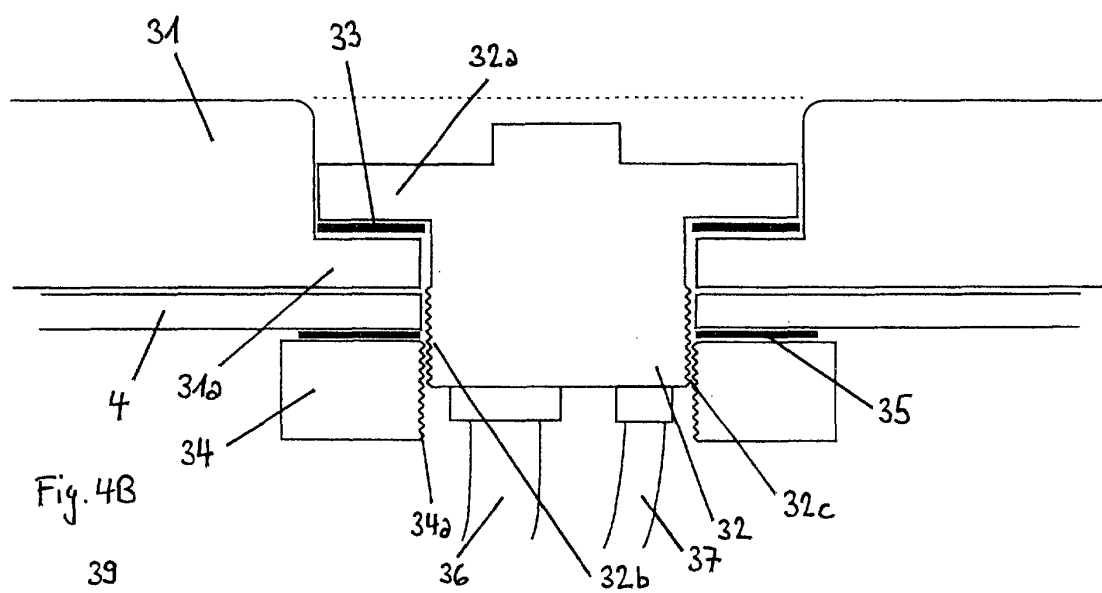


Fig. 4B

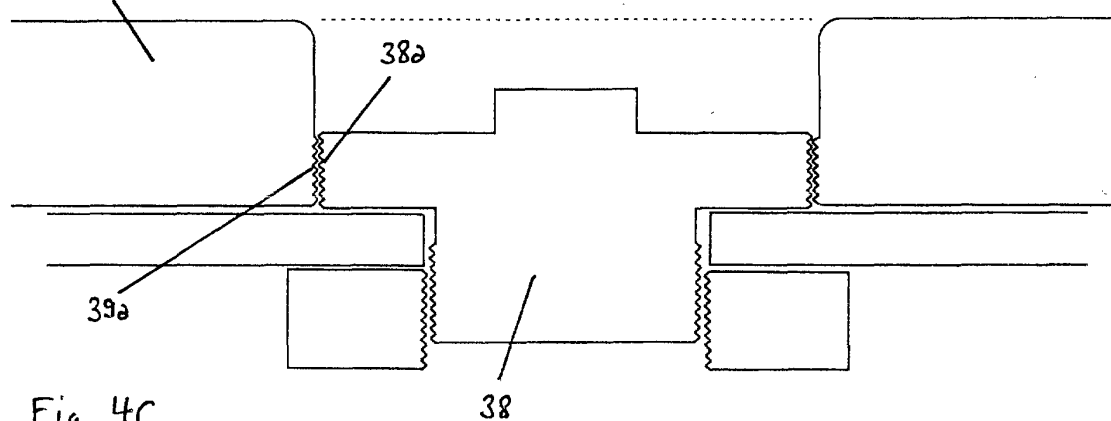


Fig. 4C



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 40 5161

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 682 625 A (KNIGHT JEFF ET AL) 4 November 1997 (1997-11-04) * column 3, line 13 - column 5, line 52; figures 1,2,5 *	1,5-8	A61H33/00
X	US 5 754 989 A (LUDLOW DAVID JON) 26 May 1998 (1998-05-26) * column 3, line 66 - column 9, line 59; figures 1,4-7H *	1,4-8	
X	WO 88 00037 A (NEW TECHNOLOGIES INC) 14 January 1988 (1988-01-14) * page 6, line 28 - page 9, line 17; figures 1-5 *	1-3,6, 8-10	
X	US 5 928 171 A (LARSEN CHRISTOPHER) 27 July 1999 (1999-07-27) * column 3, line 12 - column 5, line 23; figures 1,5 *	1,3-9	
A	US 5 333 324 A (PINCIARO JOHN) 2 August 1994 (1994-08-02) * column 2, line 39 - column 3, line 33; figures 2,3 *	1-10	TECHNICAL FIELDS SEARCHED (Int.Cl.7)
A	US 6 186 964 B1 (BRANHAM TONY J) 13 February 2001 (2001-02-13) * the whole document *	1-10	A61H A47K
A	DE 26 13 529 A (ROCCO ANGELO D) 21 October 1976 (1976-10-21) * page 5, paragraph 3 - page 7, paragraph 3; figures 3-5 *	1-4,8,9	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 August 2003	Examiner Oelschläger, H
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	

EPO FORM 1503 03 82 (P04C01)

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

EP 03 40 5161

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-08-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5682625	A	04-11-1997	NONE	
US 5754989	A	26-05-1998	AU 737335 B2	16-08-2001
			AU 3664397 A	02-02-1998
			CA 2260237 A1	15-01-1998
			EP 0921782 A1	16-06-1999
			NZ 334093 A	29-09-2000
			US 6092246 A	25-07-2000
			WO 9801098 A1	15-01-1998
			US 6000073 A	14-12-1999
			US 5987663 A	23-11-1999
			US 6256805 B1	10-07-2001
WO 8800037	A	14-01-1988	WO 8800037 A1	14-01-1988
US 5928171	A	27-07-1999	US 5716333 A	10-02-1998
			AU 2863595 A	06-05-1996
			CA 2199420 A1	25-04-1996
			WO 9611661 A1	25-04-1996
US 5333324	A	02-08-1994	NONE	
US 6186964	B1	13-02-2001	CA 2248495 A1	26-03-1999
DE 2613529	A	21-10-1976	DE 2613529 A1	21-10-1976
			IT 1071258 B	02-04-1985

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82