(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 333 168 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
15.06.2011 Bulletin 2011/24

(51) Int Cl.:
E03D 11/12 *(2006.01)* ***E03D 11/13*** *(2006.01)*

(21) Application number: **10192496.7**

(22) Date of filing: **25.11.2010**

(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
Designated Extension States:
BA ME

(30) Priority: **30.11.2009 IT RM20090627**

(71) Applicant: **NON SOLO YACHTING s.a.s. di Salzano Alessandro e Grimaldi Orfeo Paolo**
82100 Benevento (BN) (IT)

(72) Inventor: **Grimaldi, Folco**
80067 Sorrento (NA) (IT)

(74) Representative: **Fiammenghi, Eva et al**
Fiammenghi - Fiammenghi
Via Quatro Fontane, 31
00184 Roma (IT)

(54) **Bellows-like foldable bidet**

(57) A bidet is described which can be folded in bellows-like manner to allow the bidet to be installed in restricted spaces. The bidet comprises a plurality of strips (2,2',2'' etc.) which are tightly sealed against each other by gaskets (4,4',4'' etc.) and, in a none-use position, are superimposed on each other.

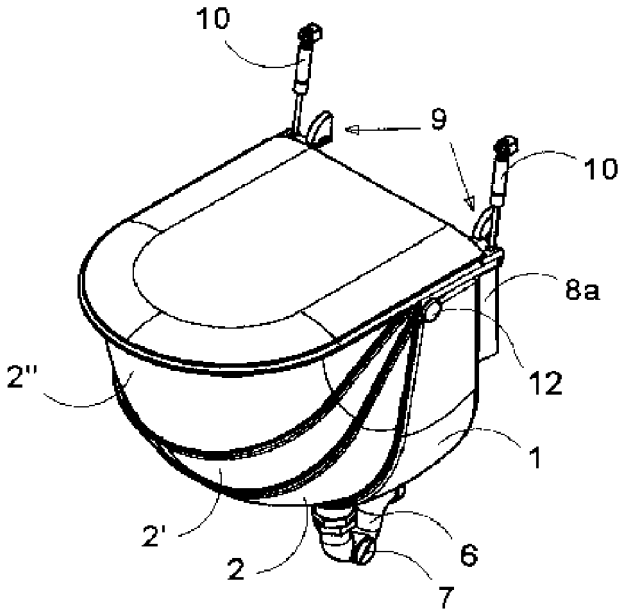

Fig. 1A

EP 2 333 168 A1

Description

Technical Field

[0001] The present invention regards sanitary articles for lavatories, in particular a bathroom bidet, to be installed in private homes and elsewhere, on boats or on other self-propelled means, and on other means such as trains, preferably but not exclusively where the space available is rather limited and the availability of water is limited, since it is able to self-clean after use in a mechanical manner.

Background Art

[0002] Currently, bathroom bidets constitute rigid, monolithic elements of considerable size and limited flexibility of use in terms of installation. In particular, in situations where the bidet must be situated in a restricted space, such need was exclusively met by "miniaturizing" the object of standard type, with considerable difficulty of use by the user and sometimes truly hindering use due to the size/build of the user himself, for example.

[0003] Therefore, there is the need to provide a bathroom bidet which solves the following problems:

- reduction of the bulk of the conventional bidets;
- simplicity and ease of use notwithstanding the reduced bulk;
- convenient cost;
- use of standard technologies which do not involve a cost increase due to apparatuses/means achieved *ad hoc* for obtaining the desired objects.

Summary of invention

[0004] The aforesaid objects are obtained by means of a bidet of the type defined in the claims.

[0005] Several advantageous but more specific variants are defined in the dependent claims.

[0006] The present invention attains its main object by providing a bathroom bidet usable in particular in areas with limited or even quite restricted space, having a fixed part or structure connectable in a direct or indirect manner to a floor or wall, said fixed part having an inlet for the water and said bathroom bidet also having, on its lower part, a discharge for the water to be discharged directly into the sewer or into a suitable hygienic collection container, characterized in that one or more strips or shells are mounted on said fixed part in a manner such that they can rotate around a substantially horizontal axis, i.e. around respective hinges on the fixed part itself, wherein, in use position of the bathroom bidet, said strips are superimposed on each other to a minimum extent and an upper strip has a substantially horizontal upper edge defining the lateral borders of the bathroom bidet, while in a non-use position of the bathroom bidet, said strips are superimposed on each other to a maximum extent and are all assembled together, i.e. housed at least in part but preferably completely inside said fixed part or structure.

[0007] Preferably, a manual or automatic command is provided for opening the bathroom bidet, i.e. for moving the strip group from said non-use position of the bathroom bidet towards its use position, such command preferably being an electric servocontrol.

[0008] Preferably, the bathroom bidet comprises gas springs or conventional springs connectable between a fixed element, for example a wall, and said movable strip group.

[0009] Preferably, in the bathroom bidet, in order to ensure the watertight seal between one strip and the preceding or subsequent strip, gaskets are provided for, acting between the walls of the single strips and also having self-cleaning function.

[0010] Preferably, in a more specific variant of the invention, the gaskets are arranged on an upper projection and on a lower projection, respectively, of every strip, wherein, for every contiguous strip pair, the upper projection and the relative gasket of the lower strip are directed towards the outer wall of the upper strip, whereas the lower projection and the relative gasket of the upper strip of this strip pair are directed towards the inner wall of the lower strip, so as to not create concavities or niches where the dirty matter in the bathroom bidet could be accumulated.

[0011] The invention provides for the normal use of the "siphon" system for the discharge.

[0012] Preferably, the strips will be constituted by rather light but very strong material (e.g. metal, composite material, thermoplastic material, thermosetting material, natural material). Heavy material could also be used.

[0013] In a preferred embodiment of the invention, the bathroom bidet is provided with a simple locking system with a spring latch for locking the group of strips in the open position, such system being releasable manually or via an electric servocontrol which automatically brings the strips back towards said non-use position.

[0014] Advantageously, in another embodiment, the command, in this case electric, for closing the bidet, i.e. for bringing it back towards its non-use and minimum bulk position, is automatically activated by means of a timer, after a possibly settable predetermined time has elapsed from the last actuation of a discharge pump, or via operation on a button, photocell, or sensor.

Brief description of drawings

[0015] The present invention will now be described in a more detailed manner, but only as exemplifying and non-limiting or non-binding with reference to several currently preferred embodiments thereof, shown in the enclosed drawings, in which:

[0016] FIGURES 1A and 1B are respective perspective views, front and rear, of a bidet that is the object of the present invention, in the open position of the strips;

[0017] FIGURE 1C is a longitudinal, vertical section view of the bidet shown in the preceding Figs. 1A and 1B, the section being taken in the plane A-A of the plan view of Fig. 1D;

[0018] FIGURE 1D is the top plan view of the bidet shown in the preceding figures;

[0019] FIGURE 2A shows a front perspective view of the bidet of the preceding figures, but in the closed position of the strips, and omitting several details (pneumatic dampers, components for the wall-mounting);

[0020] FIGURE 2B is the side view analogous to Fig. 2A;

[0021] FIGURE 3 shows a detail of Fig. 1C, with regard to the transition zone between the single strips, where the projections bearing the gaskets are formed;

[0022] FIGURE 4A is a perspective view of a further bidet embodiment of the present invention (in open position), having a bracket for the connection to the floor;

[0023] FIGURE 4B is the side view of the bidet of Fig. 4A,

[0024] FIGURE 4C is the front view of the bidet of Fig. 4A;

[0025] FIGURE 5 is the rear view of the bidet that is the object of the present invention, already shown in Figs. 1A and 1B, wherein one clearly sees the components for mounting the bidet to the wall.

Description of embodiments

[0026] With reference to the preceding drawings and to the various numeric references (always the same in all the figures in order to avoid confusion), the present invention will now be described more in detail, without however going into too much detail on those items which would not be a problem for a man skilled in the art to achieve. Therefore, the object of this part of the description is to place a man skilled in the art in the conditions of being able to actuate the invention, without spending too much time on details that are obvious for such man.

[0027] In addition, the practical embodiments described herein are only a small part of the diverse variants and respective technical equivalents which could come to the mind of a man skilled in the art, without departing from the protective scope which is due to the present finding.

[0028] With reference to Figs. 1A and 1B, these show the perspective view of a bathroom bidet mountable to the wall. Fig. 1C is the relative vertical section (plane A-A, Fig. 1 D). The fundamental characteristic of the present invention, shared by all the embodiments, consists of the fact that unlike conventional bidets, the bidet of the present invention is "foldable", in the sense that it comprises a fixed part or structure, indicated with 1, in which one or more shaped elements are housed (in closed position of the bathroom bidet). Such shaped elements are termed strips (or shells, or segments) 2, 2', 2" and they have a specific curvature; such strips, sliding into each other, can be opened/raised, starting from the closed position of Figs. 2A and 2B, up to the completely open and locked position (Fig. 1A, 1B, 1C), in order to obtain a bathroom bidet of standard size. Therefore, the bathroom bidet of the present invention is a "bellows-like foldable" bathroom bidet.

[0029] The single strips 2, 2', 2" (the three strips labeled should only be considered as exemplifying for this particular embodiment) lack protrusions on their body (see Fig. 3 in particular), but are equipped with projections 3, 3' etc. at the ends, suitable for receiving the gaskets 4, 4', etc. which ensure the watertight seal in all the mutual positions of the strips. More precisely, in the transition zone between one strip and the other, as Fig. 3 shows, the lower strip (e.g. the strip 2) has a projection 3 directed towards the interior of the bathroom bidet, while the upper strip (in this case the strip 2') has a projection 3' directed towards the exterior of the bathroom bidet. In general, the upper projection of each lower strip receives the gasket which is always in contact against the outer wall of the upper strip, while the lower projection of an upper strip receives an analogous gasket which is however in contact with the inner part of the corresponding lower strip. Said gaskets 4, 4' etc. will be respectively placed, as described, in the upper and lower part of each single strip (except for, possibly, the upper part of the strip situated at the highest point in the open position of the "bellows"), and in addition, a gasket will also be provided for in the fixed part or structure, and this will cooperate with the gasket of the lower strip (indicated with 2 in the figures) in order to ensure the seal in the lowest transition point, i.e. between the fixed part 1 and the strip 2 situated at the lowest level. This detail is not shown in the drawings.

[0030] From the drawings (in particular from Fig. 3), it is observed that the arrangement of the gaskets and the projections was deliberately selected in order to prevent that concavities/niches are formed on the inner wall of the strips, in the transition points between one strip and the next. In this manner, the bathroom bidet can be maintained in a perfectly-clean condition, by periodically washing and disinfecting the gaskets.

[0031] The watertight seal gaskets 4, 4' etc. can be made of synthetic, natural or silicon elastomers, for example.

[0032] In addition, the gasket has a self-cleaning effect since it periodically "scrapes" against the inner wall of the lower strip, each time that the bathroom bidet is brought from the open condition shown in Fig. 1 (A, B, C), into the bellows-like closed position shown in Fig. 2 (A and B). In the latter position, the bathroom bidet, in addition to having standard size, also has minimal bulk.

[0033] The material for producing the bathroom bidet of the present invention can be, for example:

- Metal (steel and its alloys, aluminum and its alloys);
- Composite material (glass fiber, carbon fiber, aramid resin fiber);
- Thermoplastic material (any type, loaded or other-

wise);

- Thermosetting material;
- Natural material (all fibrous materials and non-fibrous materials, biocompatible materials).

[0034] The bathroom bidet according to the present invention can be fixed to the floor and/or to the wall. For example, in the embodiment of Fig. 4 (A, B, C) the bracket is observed with screws 5 for fixing to the floor. There is siphon discharge in the various figures, indicated schematically by the tube with the number 6. On the siphon 6, an access 7 is provided for inspection/cleaning. Figs. 1A and 1B show the variant of the bathroom bidet according to the invention, which allows the wall mounting. In such case, in order to ensure the support, a wall support element is provided (see also Fig. 5), in the present case formed by two wall connection components 8a, 8b, symmetrically arranged with respect to a vertical axis and which are integral with the rear side of the structure 1. Otherwise, the two embodiments - i.e. the bidet fixable to the floor and the bidet fixable to the wall - are entirely equivalent.

[0035] Also provided for is the possibility to fix the "bellows-like foldable bathroom bidet" set of the present invention on an accessory service structure (not represented in the drawings) which constitutes a service element in the environment where it is situated. If requested, such structure can also have an aesthetic function.

[0036] The opening of the strips 2, 2', 2", towards the open position shown in Fig. 1 (A, B, C) and in Fig. 4 (A, B, C), is ensured by a mechanism actuatable by a command (manual or automatic, not shown in the figures) typically placed on the top or on the side of the fixed part 1. Therefore, an electric motor (also not shown) might be placed for the automatic lifting of the strips.

[0037] For the seal of the bidet in open position and for the lowering of the strips, a spring latch system 9 is provided for, only schematized in Fig. 1C. The spring latch 9 is made of metal or of an equally-strong material. The spring latch is manually or electrically commanded by means of a servocontrol. Alternatively, the user slightly lifts (with his hand) the upper strip in order to release the spring latch and a spring brings the strips into closed position. In order to prevent the strips from falling sharply towards the closed position shown in Figs. 2A and 2B, pneumatic dampers 10 are provided for (gas springs or an equivalent system). The number 13 in Fig. 1C indicates the hinge/rotation axis of the bidet seat and bidet cover and the number 12 indicates the hinge/rotation axis of the strips 2, 2', 2".

[0038] In other embodiments, the closure system could be automated, also by means of a timer which would automatically activate the electric servocontrol for actuating the cleaning system and then bidet closure (movement of the strips downward) after a predetermined time period has elapsed from the closure of the cover. In this case, the bathroom bidet would normally (i.e. automatically) return into closed position after use.

[0039] In a further embodiment, the bathroom bidet of the present invention can be housed in a shower stall created *ad hoc,* where, once placed in closed position and covered with a suitable structure (that can be made with one or more of the materials usable for the construction of the bathroom bidet of the present invention), it will form a convenient stool for use of the shower itself.

[0040] All of these variants are within the reach of a man skilled in the art and therefore will not be further discussed.

[0041] As merely exemplifying and non-limiting, the following possible dimensions of the bidet are indicated:

- Width: comprised between 260 and 450 mm, preferably about 361 mm;
- Height: comprised between 220 and 700 mm, preferably about 423 mm;
- Depth, i.e. total projection from the wall in the closed position of the bidet: comprised between 50 and 400 mm, preferably about 348 mm.

[0042] The reference number 11 on the rear side of the bidet indicates a tube connector, which serves for feeding the water of the (hot/cold) mixture.

[0043] The reference number 14 instead indicates the overflow discharge pipe. This is joined with the discharge 15 upstream of the overflow grate 16.

[0044] The water is fed through a mixer tap (not shown) and enters into the bidet, passing through the aforesaid connector 11. As stated, an automatic (timed) cleaning discharge could also be provided for, which starts after the bidet cover has been closed (principal cover), and the consequent closing (in such case always automatic) of the strips 2, 2', 2" of the bidet. In such case, the mixer tap would allow water to pass for a certain time period during the cleaning operation, while a possible suction pump would suction the water from the bidet. This system allows an efficient cleaning without wasting water and is therefore useful when there is limited water availability.

Industrial applicability

[0045] The bathroom bidet of the present invention, in addition to the home and public environment, has one its natural applications in nautical use. Given that it can be fixed both to the wall and to the floor, it is perfectly set in the rooms and areas intended for use as bathrooms on a boat, whether a recreation or work craft.

[0046] A further possible application of the bathroom bidet of the present invention is that of the prefabricated housing field, for modules of small size. In this case, the area intended to be used as a bathroom can have small size, since the bathroom bidet can be inserted in a furniture piece due to its "foldability" and installation simplicity. For such purpose, a furnishing module is provided, which together with the bidet also has the function of mirror and sink.

[0047] The bellows-like foldable bathroom bidet ac-

cording to the present invention allows obtaining two antithetical advantages: a bathroom bidet of standard size (in open condition), and at the same time a bathroom bidet installable without problems in limited spaces or even in quite restricted areas. It can also be self-cleaning, due to the system of tiltable strips equipped with suitable gaskets, which by scraping along the edges of the walls ensure the total cleaning of the bidet.

[0048] It is observed that the reference numbers in the following claims, written in parentheses, only serve for an immediate comprehension of the same, and not as a limitation of the invention in any manner. For example, the parentheses (2, 2', 2"), related to the strips, do not constrain the number of strips to "three", and so forth.

[0049] List of the reference terms:

[0050] 1 fixed part (structure)

[0051] 2 strip

[0052] 2' strip

[0053] 2" strip

[0054] 3 projection

[0055] 3' projection

[0056] 4 gasket

[0057] 4' gasket

[0058] 5 bracket for fixing to the floor

[0059] 6 siphon

[0060] 7 access for inspection/cleaning

[0061] 8a component for fixing to the wall

[0062] 8b component for fixing to the wall

[0063] 9 system with spring latch

[0064] 10 pneumatic damper

[0065] 11 connector for feeding mixed water

[0066] 12 strip rotation hinge

[0067] 13 bidet seat/cover rotation hinge

[0068] 14 overflow discharge pipe

[0069] 15 discharge of the water from the bidet

[0070] 16 ring nut/grate

Claims

1. A bathroom bidet usable in particular in areas with limited or even quite restricted space, having a fixed part or structure (1) connectable (5; 8a, 8b) in a direct or indirect manner to a floor or wall, said fixed part (1) having an inlet (11) for the water and said bathroom bidet also having, on its lower part, a discharge (15) for the water to be discharged directly into the sewer or into a suitable hygienic collection container, **characterized in that** one or more strips or shells (2, 2', 2", etc.) are mounted on said fixed part (1) in a manner such that they can rotate around a substantially horizontal axis, i.e. around respective hinges (12) on the fixed part (1) itself, wherein, in a use position of the bathroom bidet, said strips (2, 2', 2") are superimposed on each other to a minimum extent and an upper strip (2") has a substantially horizontal upper edge defining the lateral borders of the bathroom bidet, while in a non-use position of the bathroom bidet, said strips (2, 2', 2") are superimposed on each other to a maximum extent and are all assembled together, i.e. housed at least in part but preferably completely inside said fixed part or structure (1).

2. A bathroom bidet according to claim 1, **characterized in that** it comprises a manual or automatic command for opening the bathroom bidet, i.e. for moving the strip group (2, 2', 2") from said non-use position of the bathroom bidet towards its use position, such command preferably being an electric servocontrol.

3. A bathroom bidet according to claim 1 or 2, **characterized in that** it comprises means (10) for damping the fall of the strips (2, 2', 2") during their opening, e.g. gas springs (10), or conventional springs, connectable between a fixed element, for example a wall, and said movable strip group (2, 2', 2").

4. A bathroom bidet according to any one of the preceding claims, **characterized in that** in order to ensure the watertight seal between one strip (2') and the preceding (2) or subsequent strip (2"), gaskets are provided for, acting between the walls of the single strips and also having self-cleaning function.

5. A bathroom bidet according to claim 4, wherein the gaskets are arranged on an upper (3) and lower (3') projection of every strip, and for every contiguous strip pair (2, 2'), the upper projection (3) and the relative gasket (4) of the lower strip (2) of this strip pair (2, 2') are directed towards the outer wall of the upper strip (2'), whereas the lower projection (3') and the relative gasket (4') of the upper strip (2') of this strip pair (2, 2') are directed towards the inner wall of the lower strip (2), so as to not create concavities or niches where the dirty matter in the bathroom bidet could be accumulated.

6. A bathroom bidet according to any one of the preceding claims, wherein, for the discharge, a siphon tube (6) is provided for, mounted below the lower discharge (15) and below the grate (16) of an overflow pipe (14).

7. A bathroom bidet according to any one of the preceding claims, wherein the strips (2, 2', 2") are composed of light but very strong material, such as metal, composite material, thermoplastic material, thermosetting material and natural material.

8. A bathroom bidet according to any one of the preceding claims, **characterized in that** it comprises a simple locking system with a spring latch (9) for locking the group of strips (2, 2', 2") in the open position, such system being releasable manually or via an electric servocontrol which automatically brings the

strips back towards said non-use position.

9. A bathroom bidet according to any one of the preceding claims except claim 8, **characterized in that** the command, in this case electric, for closing the bidet, i.e. for bringing it back towards its non-use and minimum bulk position, is automatically activated by means of a timer, after a possibly settable predetermined time has elapsed from the last actuation of the discharge pump, or it is activated via operation on a button, photocell or sensor.

10. A bathroom bidet according to any one of the preceding claims, wherein an overflow pipe (14) is also provided for which connects an upper discharge space of the bidet with the lower discharge (15) of the bidet, and in addition a connector (11) forming on the inlet (11) is provided for the mixed hot/cold water supply.

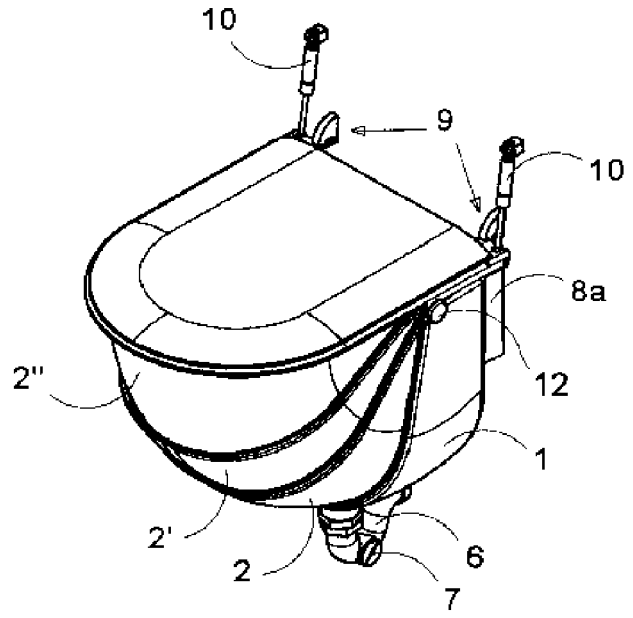

Fig. 1A

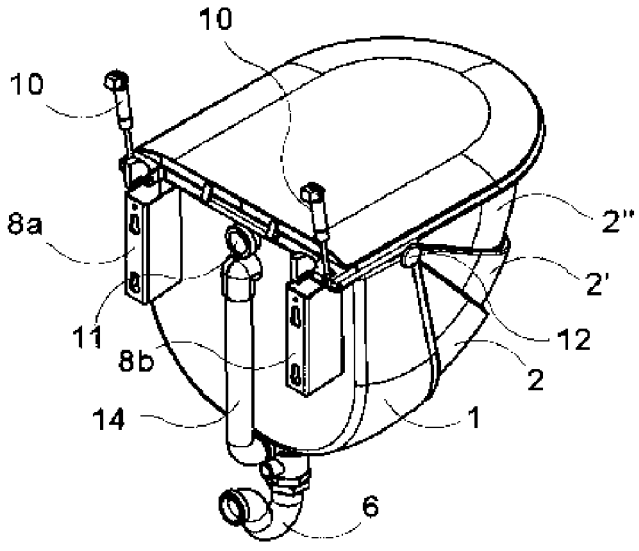

Fig. 1B

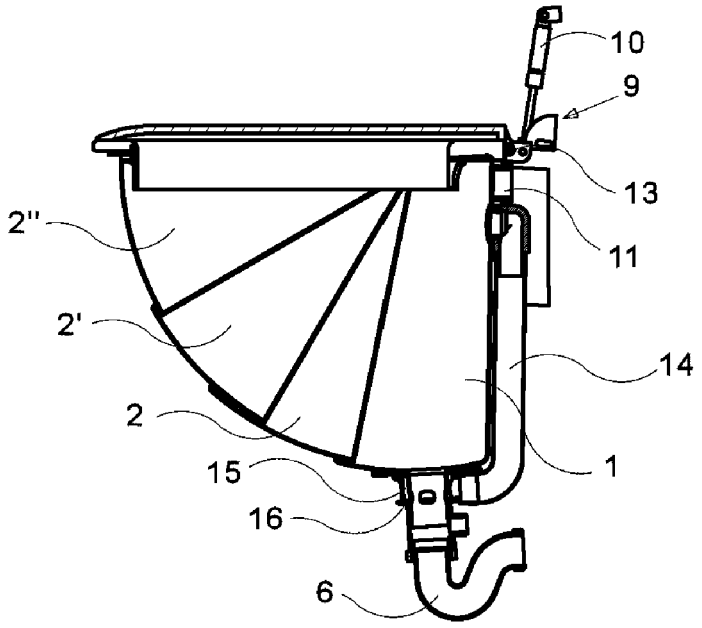

Fig. 1C

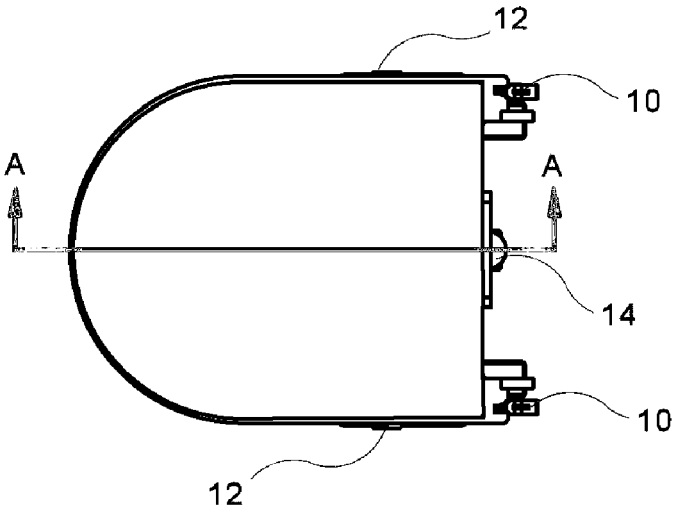

Fig. 1D

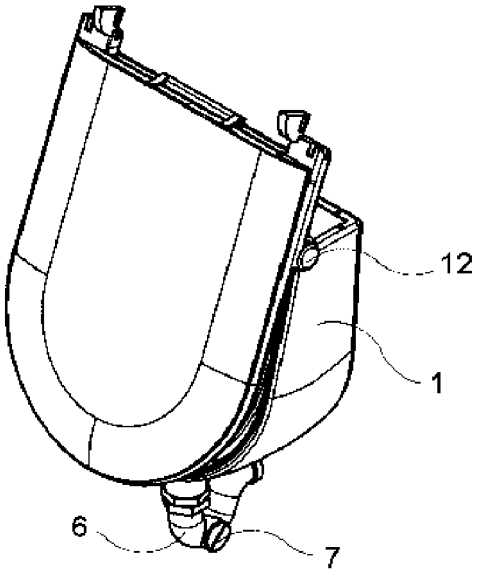

Fig. 2A

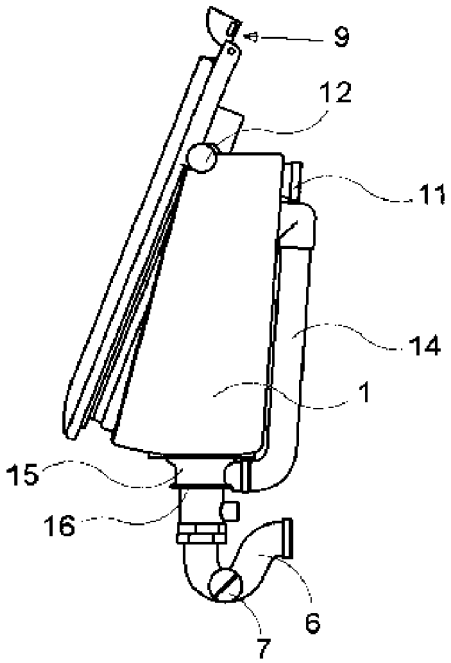

Fig. 2B

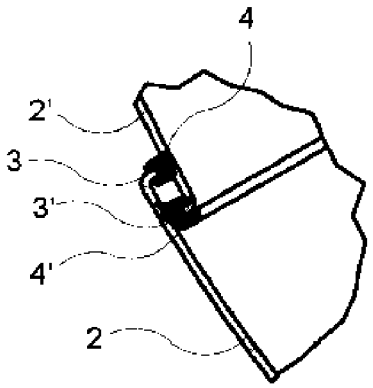

Fig. 3

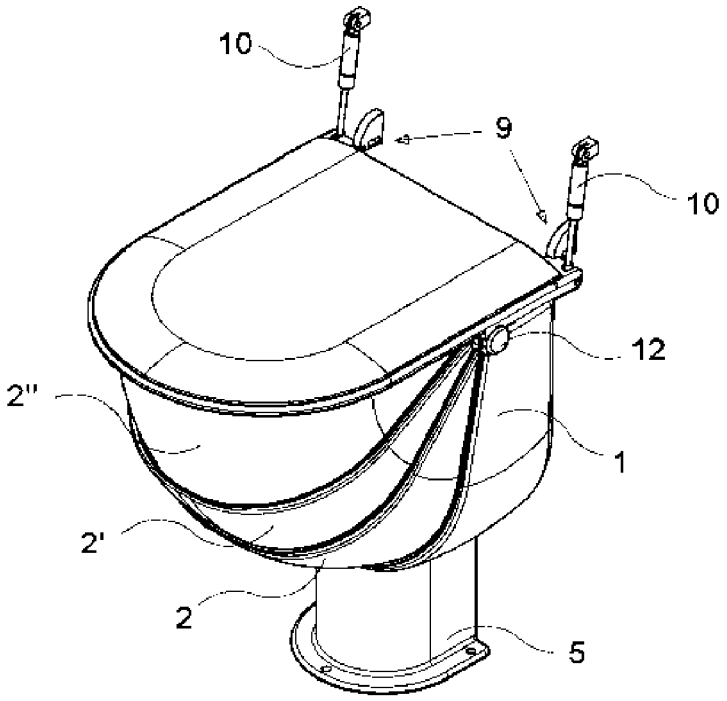

Fig. 4A

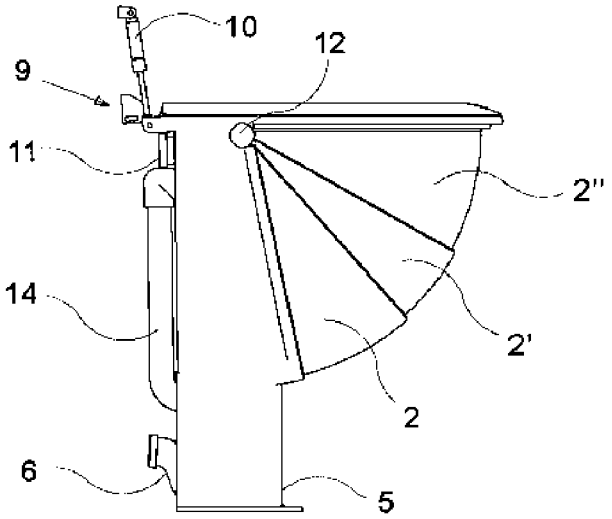

Fig. 4B

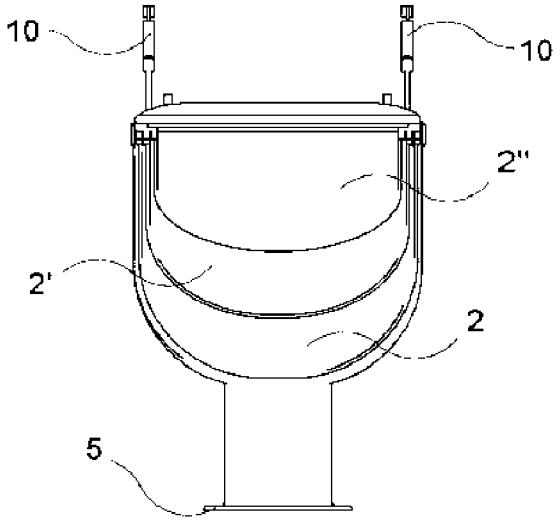

Fig. 4C

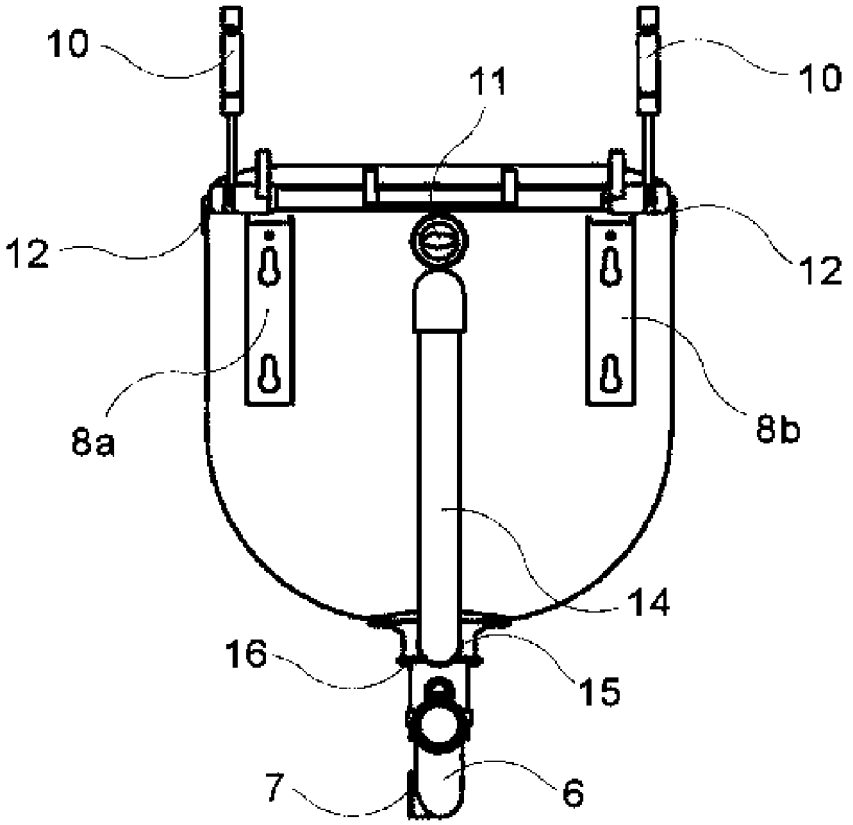

Fig. 5

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 19 2496

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 3 436 764 A (COLONNA ANGELO) 8 April 1969 (1969-04-08) * the whole document *	1	INV. E03D11/12 E03D11/13
A	WO 03/074800 A1 (KAMAU RAPHAEL SEBBY [GB]) 12 September 2003 (2003-09-12) * the whole document *	1	
A	DE 36 31 748 A1 (KIEFER KLAUS JUERGEN [DE]; STRATEN GUENTER [DE]) 7 April 1988 (1988-04-07) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (IPC)

E03D
B63B
B60R

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 March 2011	Horst, Werner

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

1

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 19 2496

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.

03-03-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3436764 A	08-04-1969	NONE	
WO 03074800 A1	12-09-2003	AU 2003212502 A1	16-09-2003
		EP 1485540 A1	15-12-2004
DE 3631748 A1	07-04-1988	NONE	

EPO FORM P0459

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