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

(11) **EP 4 375 433 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
29.05.2024 Bulletin 2024/22

(21) Application number: **22383140.5**

(22) Date of filing: **28.11.2022**

(51) International Patent Classification (IPC):
E03D 9/08 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
E03D 9/08

(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 ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

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(54) TOILET DEVICE TO BE COUPLED TO A TOILET BOWL, AND TOILET COMPRISING THE TOILET DEVICE

(57) The present invention relates to a toilet device (1) to be coupled to a toilet bowl (2), comprising coupling means including a kinematic chain with a pivotable coupling lever (5) and an actuator (6) configured to act on the pivotable coupling lever (5) to pivot the same about a pivot axis (A) between several angular coupling positions, wherein the pivotable coupling lever (5) has a first end portion (5a) arranged opposite to a contact surface (S1) of the toilet device (1) to trap, between the first end portion (5a) and the contact surface (S1), a wall portion (W1) of the toilet bowl (2) pressing against two opposed outer surfaces (W1a, W1b) of the wall portion (W1), at least when at one of the several angular positions. The present invention also relates to a toilet comprising a toilet bowl (2) and coupled thereto the toilet device (1) of the invention.

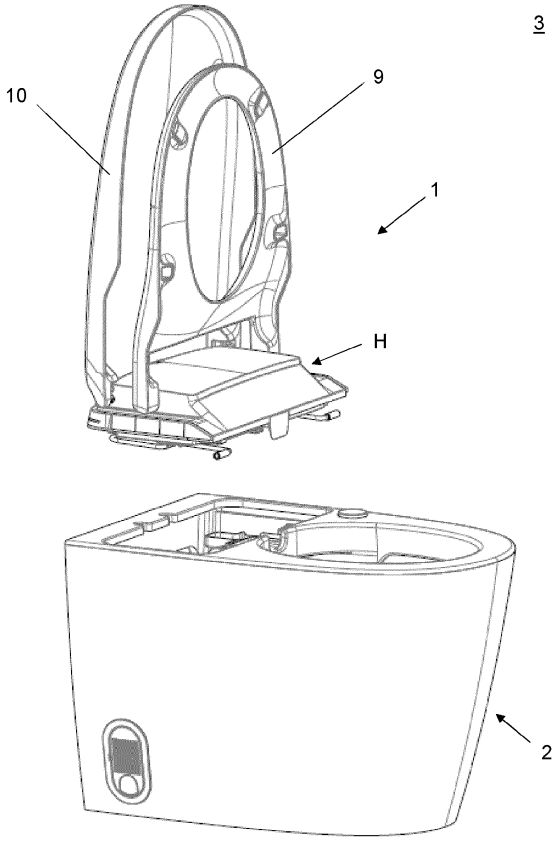

Fig. 9

EP 4 375 433 A1

Description

Field of the Invention

[0001] The present invention generally relates, in a first aspect, to a toilet device to be coupled to a toilet bowl, and more particularly to a toilet device comprising coupling means adapted for providing a firm and simple coupling to toilet bowl wall portions having different thicknesses.

[0002] In a second aspect, the present invention also relates to a toilet comprising a toilet bowl and coupled thereto the toilet device of the first aspect.

Background of the Invention

[0003] Toilet devices to be coupled to a toilet bowl, which comprise the features of the preamble of claim 1 are known in the art.

[0004] However, those known toilet devices comprise coupling means which are complex and are not adapted to different toilet bowls, particularly to toilet bowl wall portions having different thicknesses.

[0005] One of those prior art toilet devices is disclosed in Japanese patent JP3539535B2, and its coupling means comprise a kinematic chain formed by a push/pull rod actuator and a right-to-left lever, the latter including side hook-shaped projections which engage respective hooked-shaped recesses of an engaging member of the toilet bowl. That engaging member is not part of the toilet bowl but a separate part, particularly a plate, which is concealed on a rear upper surface of the toilet bowl. No mention is made in said document about the toilet device described in that Japanese patent being made to be coupled to different toilet bowls or to different wall portions of a toilet bowl.

[0006] It is therefore necessary to offer an alternative to the state of the art, which covers the gaps mentioned above, particularly by providing a toilet device which does not have the above mentioned drawbacks and limitations, and which is really made to provide a firm and simpler coupling to toilet bowl wall portions having different thicknesses.

Description of the Invention

[0007] To that end, the present invention relates, in a first aspect, to a toilet device to be coupled to a toilet bowl, comprising coupling means including a kinematic chain configured to couple the toilet device to said toilet bowl.

[0008] In contrast to the toilet devices known in the prior art, in the toilet device of the first aspect of the present invention the kinematic chain comprises a pivotable coupling lever and an actuator configured and arranged to act on the pivotable coupling lever to pivot the same about a pivot axis between several angular coupling positions, wherein the pivotable coupling lever has at least one first end portion arranged opposite to a contact surface of the toilet device to trap, between the at least one first end portion and said contact surface, a wall portion of the toilet bowl pressing against two opposed outer surfaces of that wall portion, at least when at one of said several angular positions.

[0009] The toilet device of the first aspect of the present invention enables being coupled to toilet bowl wall portions having different thicknesses (whether of distinct toilet bowls or of different regions of the same toilet bowl), particularly by the several angular coupling positions provided by the pivotable coupling lever, some of which will allow the toilet device to be coupled to thinner toilet bowl wall portions and other to thicker toilet bowl wall portions.

[0010] The pivotable coupling lever of the toilet device of the first aspect of the invention eases its mounting to the toilet bowl, without having to drill into the toilet bowl wall portion, and remains concealed.

[0011] For an embodiment of the toilet device of the first aspect of the present invention at least part of the pivoting coupling lever, including the at least one first end portion, is elastically deformable to trap, between the at least one first end portion and the above mentioned contact surface, any of a plurality of toilet bowl wall portions having different thicknesses, for the same one of said several angular positions. I.e., toilet bowl wall portions of different thicknesses can be trapped between the at least one first end portion of the pivotable coupling lever and the contact surface of the toilet device, only by elastically deforming that part of the pivoting coupling lever, without further pivoting the same, i.e., for the same angular position.

[0012] According to an embodiment, the toilet device comprises a further contact surface to contact a further wall portion of the toilet bowl, and the actuator is further configured and arranged to couple said further contact surface to the further wall portion of the toilet bowl once the pivotable coupling lever has been pivoted to at least one of said several angular positions.

[0013] Thus, with a simple design a double coupling function is performed by the actuator, namely acting on the pivotable lever to make it pivot to trap and thus couple to the toilet bowl wall portion, and also to couple said further contact surface to the toilet bowl further wall portion.

[0014] For another embodiment, the toilet device further comprises an abutment contact surface transversally extending from an end of the contact surface, and configured and arranged to, when the wall portion of the toilet bowl is trapped between the at least one first end portion and the contact surface, firmly abut against an edge at which the two opposed outer faces of the wall portion end.

[0015] For an embodiment, the toilet device comprises a housing including a base, said base comprising an articulation at which the pivoting coupling lever is hinged to pivot about said pivot axis, so that the pivoting coupling lever remains, when the toilet device is coupled to the toilet bowl, within an opening of the toilet bowl for all said

several angular positions, particularly within an opening partially demarcated and surrounded by the wall portion.

[0016] For an implementation of that embodiment, the base is not configured to be inserted into that opening of the toilet bowl but to rest on one of the outer faces of the wall portion around the contour of that opening.

[0017] For an alternative implementation of that embodiment, the base is configured to be, when coupled to the toilet bowl, partially inserted into that opening of the toilet bowl.

[0018] For an embodiment, the above mentioned contact surface and/or further contact surface and/or abutment contact surface are/is defined at an outer face of the base of that housing.

[0019] For an embodiment, the toilet bowl wall portion is located at a front region of the contour of that opening of the toilet bowl, and the toilet bowl further wall portion at a back region thereof.

[0020] According to an embodiment, the actuator comprises at least one member traversing a through opening of the base and is movable in a guided manner therethrough transversally to the pivotable coupling lever to push the same by a second end thereof to pivot the pivotable coupling lever about the pivot axis between the above mentioned several angular positions, said at least one member having a first portion to be accessed by a user.

[0021] For an implementation of that embodiment, the actuator further comprises at least one coupling element attached to the first portion of said at least one member, at least a first end of the at least one coupling element being able to be inserted into a hole of the further contact surface (and therefore, of the wall including that further contact surface) of the toilet device, and the at least one coupling element being configured and arranged to be accessed by a user by a second end, opposite to said first end, to longitudinally push the same to introduce further the at least one coupling element into said hole up to a desired position, and thus move said at least one member through the through opening of the base.

[0022] For an embodiment, the first end of the at least one coupling element is configured to also be inserted into a hole of the further wall portion of the toilet bowl, and has a coupling configuration to be coupled to the further wall portion of the toilet bowl at the desired position.

[0023] For different variants of that embodiment, the at least one coupling element has that coupling configuration to be coupled inside the hole of the further wall portion, or to a lower face of that further wall, or to a further element (such as a nut, joint washer, or other type of fastener) placed after that hole ("after" in the insertion direction).

[0024] According to an implementation of that embodiment, the at least one coupling element is a screw to be screwed by the user into the hole of the further wall portion of the toilet bowl, said coupling configuration being a threaded profile of the at least one screw which cooperates with a respective threaded profile inside the hole (defined in the inner contour of the hole or into an anchor plug fit thereinto), to retain the at least one screw into the desired position, said hole of the further wall portion and the hole of the further contact surface being axially coaligned.

[0025] For an alternative implementation, an anchor plug without a threaded profile (such as an expansion anchor plug) is fit into the hole of the further wall portion, the at least one screw being screwed into that anchor plug.

[0026] For still another implementation, the hole of the further wall portion does not have a threaded profile, and the threaded profile of the at least one screw cooperates with a respective threaded profile inside a nut (or similar element) placed after that hole ("after" in the screwing direction), the hole of that nut being axially aligned with the holes of the further wall portion and further contact surface.

[0027] For an alternative implementation, the at least one coupling element has at least one elastically deformably arm, the coupling configuration being a retention tab placed at the end of the at least one elastically deformably arm, so that the coupling process is carried out by elastically deforming the at least one elastically deformably arm while introducing said retention tab into the hole of the further wall portion, and once the retention tab has completely passed through that hole the elastically deformable arm elastically recovers its non-deformed shape so that the retention tab abuts against a lower face of the further wall portion (or of a separate intermediate part) thus retaining and coupling the at least one coupling element to that further wall portion.

[0028] According to an embodiment, the contact surface and the hole of the further contact surface are located at or near respective opposite ends of the base.

[0029] For an embodiment, the at least one member of the actuator further comprises a second portion, which is the one which is movable in a guided manner through the through opening of said base, said first and second portions of the at least one member being, for an implementation of that embodiment, mutually orthogonally arranged so that the at least one member has an inverted L-shape.

[0030] For an embodiment, the length of that second portion is variable in order to enable the adaptation of the toilet device to different toilet bowl wall portion thicknesses. "Variable" means here, depending on the embodiment, that said second portion is indeed adjustable in length and also that there are several members of the actuator with second portions with different lengths and the most appropriate one is selected for a specific toilet bowl based on the toilet bowl wall portion thickness.

[0031] For an embodiment, the housing further comprises a cover removable attached to the base by attaching means accessible to a user to attach/detach said cover to/from the base without the need of uncoupling the base of the toilet device from the toilet bowl.

[0032] For an implementation of that embodiment, the cover of the housing comprises a pivot axis for a toilet seat cover assembly.

[0033] The present invention also relates, in a second aspect to a toilet comprising:

- a toilet bowl comprising a wall portion; and
- the toilet device of the first aspect of the invention coupled to the toilet bowl, by trapping, between the at least one first end portion of the pivotable coupling lever and the contact surface of the toilet device, said wall portion pressing against two opposed outer surfaces of the wall portion, at least when at one of the several angular coupling positions between which the pivotable coupling lever pivots.

[0034] For an embodiment of the toilet device of the second aspect of the invention, the toilet bowl comprises the above mentioned opening of the toilet bowl and further wall portion, and the wall portion and further wall portion partially demarcate and surround different areas of the opening of the toilet bowl, the toilet device being coupled to the toilet bowl also by the at least one coupling element of the actuator coupling the further contact surface of the toilet device to the further wall portion once the pivotable coupling lever has been pivoted to at least one of the several angular positions.

[0035] According to an embodiment, the toilet device is a washing device for a toilet adapted to be used as a bidet, the washing device comprising a water discharge nozzle, for anal and/or perineal washing, at least partially mounted inside the housing.

[0036] For another embodiment, complementary or alternative to the previous one, the toilet device is a deodorizing and/or disinfectant device.

[0037] For other embodiments, the toilet device includes other types of devices, in addition or instead to said washing, deodorizing and/or disinfectant devices, to adapt the same to provide a specific desired function.

Brief Description of the Drawings

[0038] The previous and other advantages and features will be better understood from the following detailed description of embodiments, with reference to the attached drawings, which must be considered in an illustrative and non-limiting manner, in which:

Figure 1 is a perspective view of the toilet device of the first aspect of the present invention, for an embodiment.

Figure 2 is a bottom elevational view of the toilet device of the first aspect of the present invention, for the same embodiment as Figure 1.

Figure 3 is an exploded bottom perspective view of the toilet device of the first aspect of the present invention, for the same embodiment as Figures 1 and 2.

Figure 4 is a perspective view of the toilet of the second aspect of the present invention, with the toilet device of the first aspect, for the same embodiment as in Figures 1 to 4, in a pre-coupling position.

Figures 5A, 5B, and 5C schematically show, by means of respective schematic cross-section views, a sequence of the mounting process of the toilet device to the toilet bowl, for an embodiment for which the toilet device is inserted into an opening of the toilet bowl.

Figures 6A, 6B, and 6C schematically show, by means of respective schematic cross-section views, a sequence of the mounting process of the toilet device to the toilet bowl, for another embodiment for which the toilet device is not inserted into an opening of the toilet bowl but rests above the same.

Figures 7A, 7B, and 7C schematically show, by means of respective perspective views, a sequence of the dismounting process of the cover of the housing of the toilet device without uncoupling the base thereof from the toilet bowl (which is shown only in part).

Figures 8A, 8B, and 8C schematically show, by means of respective perspective views, a sequence of the dismounting process of the toilet device from the toilet bowl (which is shown only in part).

Figure 9 is a perspective view of the toilet of the second aspect of the invention, including the toilet device of the first aspect of the invention for an embodiment for which the toilet device (shown in a pre-coupling position) also comprises a toilet seat and a cover assembly, and the toilet bowl is adapted to operate as a bidet, for an embodiment.

Figure 10 is a perspective view of the toilet of the second aspect of the invention, for the same embodiment as Figure 9, including the toilet device of the first aspect of the invention already coupled to the toilet bowl, with a washing nozzle in an extended position projecting from the housing of the toilet device into the toilet bowl.

Detailed Description of Several Embodiments

[0039] As shown in the appended figures, the toilet device 1 of the first aspect of the present invention comprises coupling means including a kinematic chain configured to couple the toilet device 1 to a toilet bowl 2, wherein the kinematic chain comprises a pivotable coupling lever 5 and an actuator 6 configured and arranged to act on said pivotable coupling lever 5 to pivot the same about a pivot axis A (see Figure 2) between several angular coupling positions, wherein the pivotable coupling lever 5 has at least one first end portion 5a arranged opposite to a contact surface S1 of the toilet device 1 to trap, between said at least one first end portion 5a and said contact surface S1, a wall portion W1 of said toilet bowl 2 pressing against two opposed outer surfaces W1a, W1b of said wall portion W1 (see Figures 5A to 5C

and 6A to 6C), at least when at one of said several angular positions.

[0040] For the embodiments shown, as especially appreciated in Figures 1 to 3, the pivotable coupling lever 5 is a bend rod having two free front ends, each constituting a respective first end portion 5a, with an optional protection cap 5a2 (such as a rubber cap) covering an end 5a1 of each end portion 5a, a back portion 5b, and two intermediate portions 5c.

[0041] The toilet device 1 comprises a housing H including a base B which comprises an articulation Ba at which the pivoting coupling lever 5 is hinged to pivot about the pivot axis A (see Figure 2), so that the pivoting coupling lever 5 remains, when the toilet device 1 is coupled to the toilet bowl 2, concealed within an opening 2a (see Figure 4) of the toilet bowl 2 for all its several angular positions.

[0042] Specifically, as shown in Figures 2 and 3, the articulation Ba is provided by pivotally fixing the two intermediate portions 5c of the lever 5 to projections Ba2 extending for the lower face of the base B, said fixation being provided with fasteners Ba1 and allowing the rotation of the intermediate portions 5c, and thus of the entire coupling lever 5, about pivot axis A.

[0043] As shown in Figures 2, 3, 5A, and 6A, the toilet device 1 comprises a further contact surface S2 to contact a further wall portion W2 of the toilet bowl 2, and the actuator 6 is further configured and arranged to couple said further contact surface S2 to the further wall portion W2 of the toilet bowl 2 once the pivotable coupling lever 5 has been pivoted to at least one of the several angular positions.

[0044] The contact surface S1 and further contact surface S2 are defined at an outer face of base B, particularly at a lower outer face, for the illustrated embodiments.

[0045] For the illustrated embodiments (see Figures 4, 5A, and 6A), the wall portion W1 is located at a front region of the contour of the opening 2a, and the further wall portion W2 at a back region thereof, although other locations are possible, for non-illustrated embodiments.

[0046] As shown especially in Figure 3, the actuator 6 comprises a member 6a and two coupling elements 6b.

[0047] For the illustrated embodiment, member 6a has an inverted U-shape formed by two symmetric respective L-shaped portions, each including a first portion 6a1, to be accessed by a user, and a second portion 6a2. The base B has two through openings 01 each being traversed by a respective second portion 6a2 which is movable in a guided manner therethrough transversally to the pivotable coupling lever 5 to push the same by its second ends 5b thereof to pivot the pivotable coupling lever 5 about the pivot axis A between the several angular positions.

[0048] The actuator 6 further comprises two coupling elements 6b attached to the first portions 6a1, in this case traversing a through opening thereof, a first end 6b1 of each coupling element 6b being able to be inserted into a respective hole O2 (see Figure 2) of the further contact surface S2 of the toilet device 1, and each coupling element 6b being configured and arranged to be accessed by a user by a second end 6b2, opposite to the first end 6b1, to longitudinally push the same to introduce further coupling elements 6b into the holes O2 up to a desired position, and thus move the member 6a to introduce its second portions 6a2 through the through openings 01 (see Figure 3) of the base B.

[0049] The first ends 6b1 are configured to also be inserted into respective holes O3 (see Figures 4, 5A, and 6A) of the further wall portion W2 of the toilet bowl 2, and has a coupling configuration to be coupled to the further wall portion W2 of the toilet bowl 2 at the desired position.

[0050] For the illustrated embodiments, the coupling elements 6b are screws 6b to be screwed by the user into the holes O3 of the further wall portion W2 of the toilet bowl 2, the above mentioned coupling configuration being a threaded profile of the screws 6b which cooperates with respective threaded profiles inside the hole O3 to retain the screws 6b into the desired position, the holes O3 of the further wall portion W2 and the holes O2 of the further contact surface S2 being axially coaligned.

[0051] For the illustrated embodiments (see Figures 5C and 6C), the threaded profiles inside the holes O3 are defined in the inner contour of an anchor plug 8 fit thereinto. Alternatively, an anchor plug without a threaded profile can be used, such as an expansion anchor plug.

[0052] The contact surface S1 and the hole O2 of the further contact surface S2 are located at or near respective opposite ends of the base B, as seen in Figure 2.

[0053] Figures 5A, 5B, and 5C schematically show a sequence of the mounting process of the toilet device 1 to the toilet bowl 2, for an embodiment for which the toilet device 1 is inserted into an opening 2a of the toilet bowl 2.

[0054] For that embodiment, as shown in Figure 5A, the toilet device 1 further comprises an abutment contact surface S3 transversally extending from an end of the contact surface S1, and configured and arranged to, when the wall portion W1 of the toilet bowl 2 is trapped between the first end portions 5a and the contact surface S1, firmly abut against an edge W1c at which the two opposed outer faces W1a, W1b end.

[0055] As clearly shown in Figures 5B and 5C, for that embodiment, the base B, when coupled to the toilet bowl 2, is partially inserted into the opening 2a of the toilet bowl 2.

[0056] The mounting sequence starts by introducing the first ends 5a of the pivotable coupling lever 5 into the opening 2a (see Figure 5A), then partially introducing the base B there into, abutting the abutment contact surface S3 against the edge W1c (see Figure 5B), and the acting on the actuator, particularly screwing the screws 6b to move down the coupling element 6a, so that its second portions 6a2 push down the second ends 5b of the pivotable coupling lever 5 and make it pivot about the pivot axis A until the wall portion W1 is firmly trapped between the contact surface S1 and the first ends 5a. With the

same action, i.e., the screwing action, the screws 6b are screwed to anchor plugs 8 inserted into holes O3, and thus firmly coupled to the further wall portion W2 of the toilet bowl 2, as shown in Figure 5C.

[0057] Figures 6A, 6B, and 6C schematically show, by means of respective schematic cross-section views, a sequence of the mounting process of the toilet device 1 to the toilet bowl 2, for another embodiment for which the toilet device1 is not inserted into the opening 2a of the toilet bowl 2 but rests above the same. As compared to the embodiment of Figures 5A, 5B, and 5B, the sequence is similar to the one explained above, with the only difference that the base B, which does not have the abutment surface S3, is not inserted into the opening 2a, but, as shown in Figure 6B, rests over the upper faces of the wall portion W1 (particularly contact surface S1) and further wall portion W2 (particularly further contact surface S2), and of the rest of wall portions surrounding the contour of opening 2a.

[0058] In Figures 7A, 7B, and 7C a sequence of the dismounting process of the cover C of the housing H of the toilet device 1 without uncoupling the base B thereof from the toilet bowl 2 is shown. Being able to disassemble the cover C without needing to disassemble the base B indeed facilitates maintenance work.

[0059] The cover C is decoupled from the base B by unscrewing screws 7 from holes O4 (see Figure 2). Screws 7, and also screws 6b, are accessed by a user through an opening Co (see Figure 7A) defined in the back of the cover C.

[0060] In Figures 8A, 8B, and 8C a sequence of the dismounting process of the toilet device 1 from the toilet bowl 2 is shown. In this case, the entire toilet device 1 is decoupled from the toilet bowl 2. This is done by unscrewing screws 6b from further wall portion W2, specifically from anchor plugs 8 for the embodiments shown in Figures 5C and 6C.

[0061] In Figures 9 and 10, a further embodiment of the toilet device 1 and of the toilet 3 of the present invention is shown, where the toilet device 1 (shown in a pre-coupling position in Figure 9 and coupled to the toilet bowl in Figure 10) also comprises a toilet seat 9 and a cover 10 assembly , and the toilet bowl 2 is adapted to operate as a bidet, particularly by providing a washing liquid, through a washing nozzle W which is shown in part in Figure 10 in an extended position projecting from the housing H of the toilet device 1 into the toilet bowl 2.

[0062] Further components of the toilet device 1 needed for the operation thereof (such as fluid conducts, electronic circuitry, etc.) remain housed withing housing H, and have not been shown in the appended figures for clarity's sake, not to obscure the description thereof.

[0063] A person skilled in the art could introduce changes and modifications in the embodiments described without departing from the scope of the invention as it is defined in the attached claims.

Claims

1. A toilet device (1) to be coupled to a toilet bowl (2), comprising coupling means including a kinematic chain configured to couple the toilet device (1) to said toilet bowl (2), **characterized in that** said kinematic chain comprises a pivotable coupling lever (5) and an actuator (6) configured and arranged to act on said pivotable coupling lever (5) to pivot the same about a pivot axis (A) between several angular coupling positions, wherein said pivotable coupling lever (5) has at least one first end portion (5a) arranged opposite to a contact surface (S1) of the toilet device (1) to trap, between said at least one first end portion (5a) and said contact surface (S1), a wall portion (W1) of said toilet bowl (2) pressing against two opposed outer surfaces (W1a, W1b) of said wall portion (W1), at least when at one of said several angular positions.

2. A toilet device (1) according to claim 1, wherein at least part of said pivoting coupling lever (5), including said at least one first end portion (5a), is elastically deformable to trap, between the at least one first end portion (5a) and the contact surface (S1), any of a plurality of toilet bowl wall portions (W1) having different thicknesses, for the same one of said several angular positions.

3. A toilet device (1) according to any of claims 1 to 2, wherein the toilet device (1) comprises a further contact surface (S2) to contact a further wall portion (W2) of the toilet bowl (2), and the actuator (6) is further configured and arranged to couple said further contact surface (S2) to the further wall portion (W2) of the toilet bowl (2) once the pivotable coupling lever (5) has been pivoted to at least one of said several angular positions.

4. A toilet device (1) according to any of the previous claims, wherein the toilet device (1) comprises a housing (H) including a base (B), said base (B) comprising an articulation (Ba) at which the pivoting coupling lever (5) is hinged to pivot about said pivot axis (A), so that the pivoting coupling lever (5) remains, when the toilet device (1) is coupled to the toilet bowl (2), within an opening (2a) of the toilet bowl (2) for all said several angular positions.

5. A toilet device (1) according to claim 4, when dependent of claim 3, wherein said contact surface (S1) and/or said further contact surface (S2) are/is defined at an outer face of said base (B).

6. A toilet device (1) according to any of claims 4 or 5, wherein said actuator (6) comprises at least one member (6a) traversing a through opening (01) of said base (B) and is movable in a guided manner

therethrough transversally to the pivotable coupling lever (5) to push the same by a second end (5b) thereof to pivot the pivotable coupling lever (5) about the pivot axis (A) between said several angular positions, said at least one member (6a) having a first portion (6a1) to be accessed by a user.

7. A toilet device (1) according to claim 6, when dependent of claim 3, wherein the actuator (6) further comprises at least one coupling element (6b) attached to said first portion (6a1) of said at least one member (6a), at least a first end (6b1) of said at least one coupling element (6b) being able to be inserted into a hole (O2) of said further contact surface (S2) of the toilet device (1), and said at least one coupling element (6b) being configured and arranged to be accessed by a user by a second end (6b2), opposite to said first end (6b1), to longitudinally push the same to introduce further the at least one coupling element (6b) into said hole (O2) up to a desired position, and thus move said at least one member (6a) through the through opening (01) of the base (B).

8. A toilet device (1) according to claim 7, wherein the first end (6b1) of said at least one coupling element (6b) is configured to also be inserted into a hole (O3) of the further wall portion (W2) of the toilet bowl (2), and has a coupling configuration to be coupled to the further wall portion (W2) of the toilet bowl (2) at said desired position.

9. A toilet device (1) according to claim 8, wherein said at least one coupling element (6b) is a screw (6b) to be screwed by said user into said hole (O3) of the further wall portion (W2) of the toilet bowl (2), said coupling configuration being a threaded profile of said at least one screw (6b) which cooperates with a respective threaded profile inside the hole (O3) to retain the at least one screw (6b) into the desired position, said hole (O3) of said further wall portion (W2) and the hole (O2) of the further contact surface (S2) being axially coaligned.

10. A toilet device (1) according to any of claims 7 to 9, wherein said contact surface (S1) and said hole (O2) of the further contact surface (S2) are located at or near respective opposite ends of the base (B).

11. A toilet device (1) according to any of claims 4 to 10, wherein the housing (H) further comprises a cover (C) removable attached to the base (B) by attaching means (7) accessible to a user to attach/detach said cover (C) to/from the base (B) without the need of uncoupling the base (B) from the toilet bowl (2).

12. A toilet device (1) according to any of claim 11, wherein the cover (C) of the housing (H) comprises a pivot axis for a toilet seat (9) cover (10) assembly.

13. Toilet (3), comprising:

- a toilet bowl (2) comprising a wall portion (W1); and
- the toilet device (1) according to any of the previous claims coupled to said toilet bowl (2), by trapping, between said at least one first end portion (5a) of the pivotable coupling lever (5) and said contact surface (S1) of the toilet device (1), said wall portion (W1) pressing against two opposed outer surfaces (W1a, W1b) of said wall portion (W1), at least when at one of said several angular coupling positions.

14. Toilet (3) according to claim 13, wherein the toilet device (1) is defined according to any of claims 7 to 9, when depending on claim 3, an wherein said toilet bowl (2) comprises said opening (2a) and further wall portion (W2), and the wall portion (W1) and further wall portion (W2) partially demarcate and surround different areas of the opening (2a) of the toilet bowl (2), the toilet device (1) being coupled to the toilet bowl (2) also by the at least one coupling element (6b) of the actuator (6) coupling the further contact surface (S2) of the toilet device (1) to the further wall portion (W2) once the pivotable coupling lever (5) has been pivoted to at least one of said several angular positions.

15. Toilet (3) according to any of claims 13 to 14, wherein the toilet device (1) is a washing device for a toilet adapted to be used as a bidet, said washing device comprising a water discharge nozzle (W), for anal and/or perineal washing, at least partially mounted inside the housing (H).

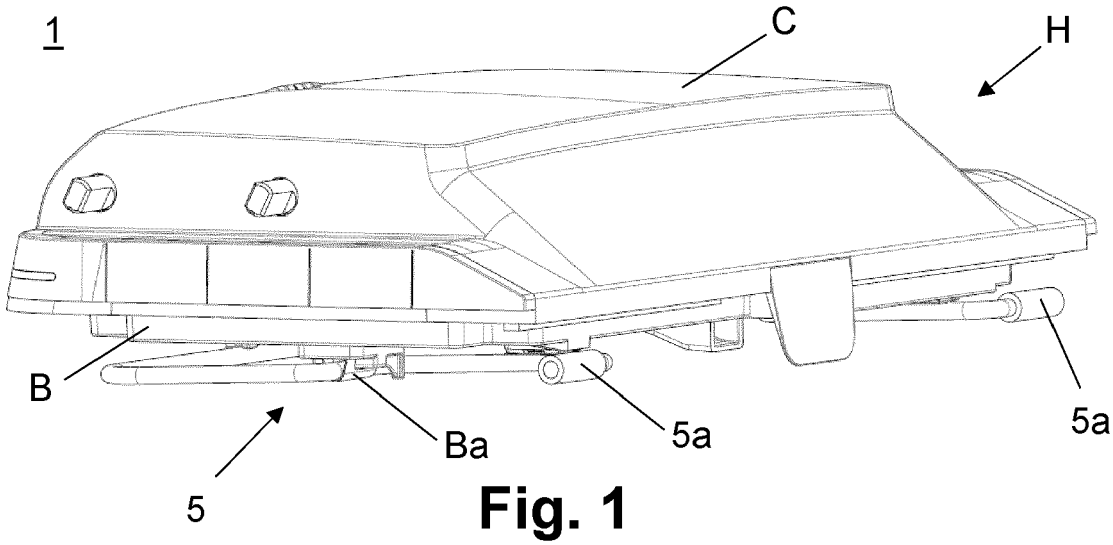

Fig. 1

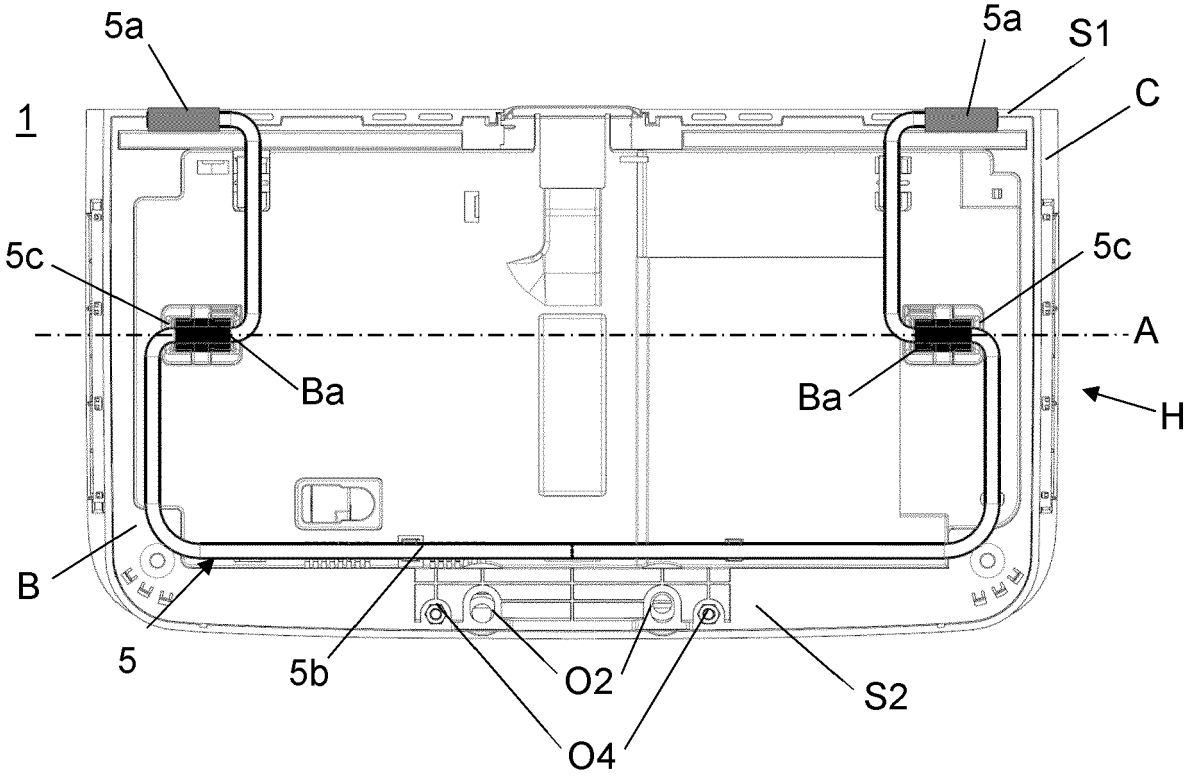

Fig. 2

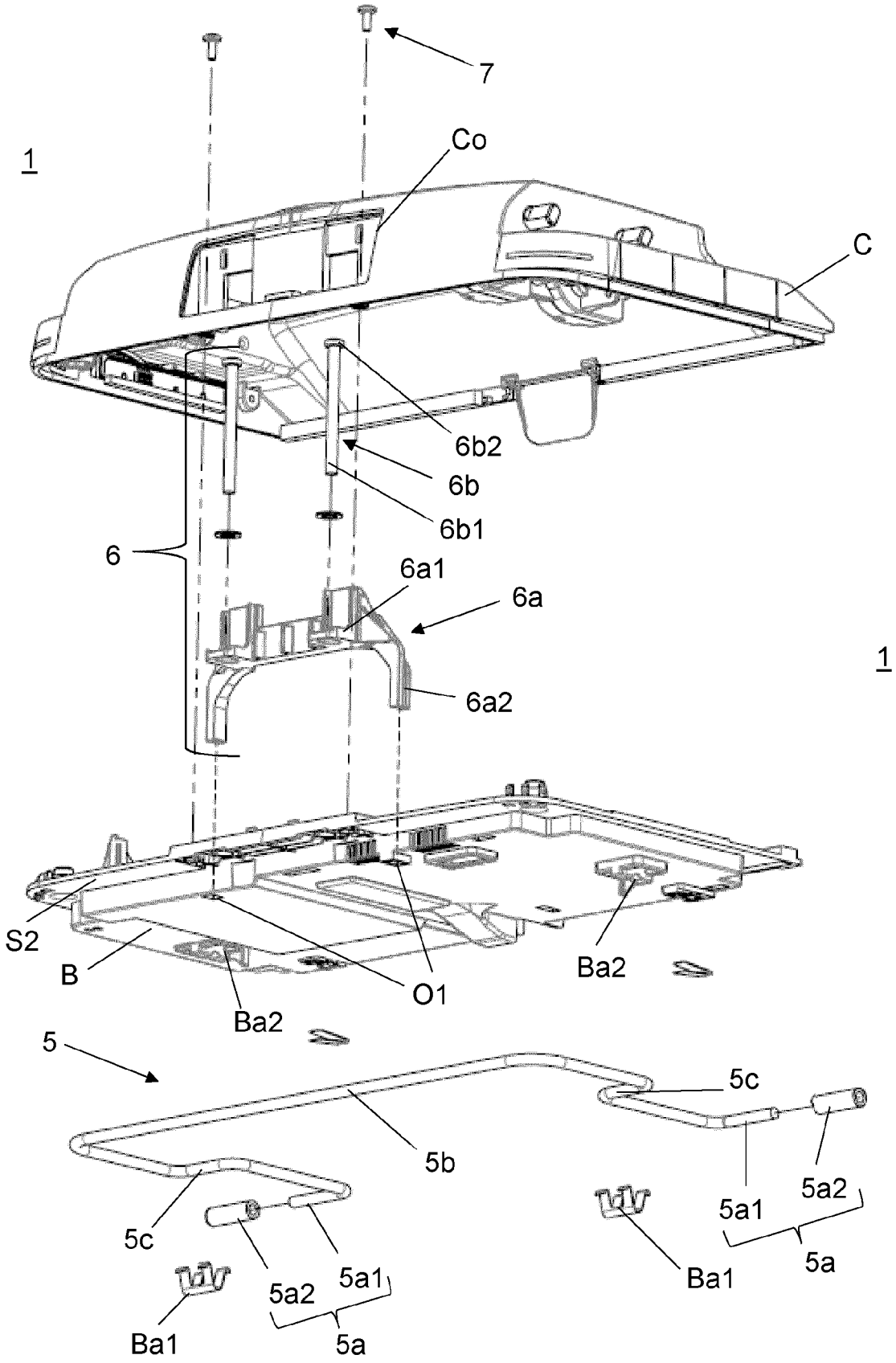
7
1
Co
C
6b2
6b
6b1
6
6a1
6a
1
6a2
S2
B
Ba2
O1
Ba2
5
5c
5b
5c
5a2
5a1
5a
Ba1
5a2
5a1
5a
Ba1

Fig. 3

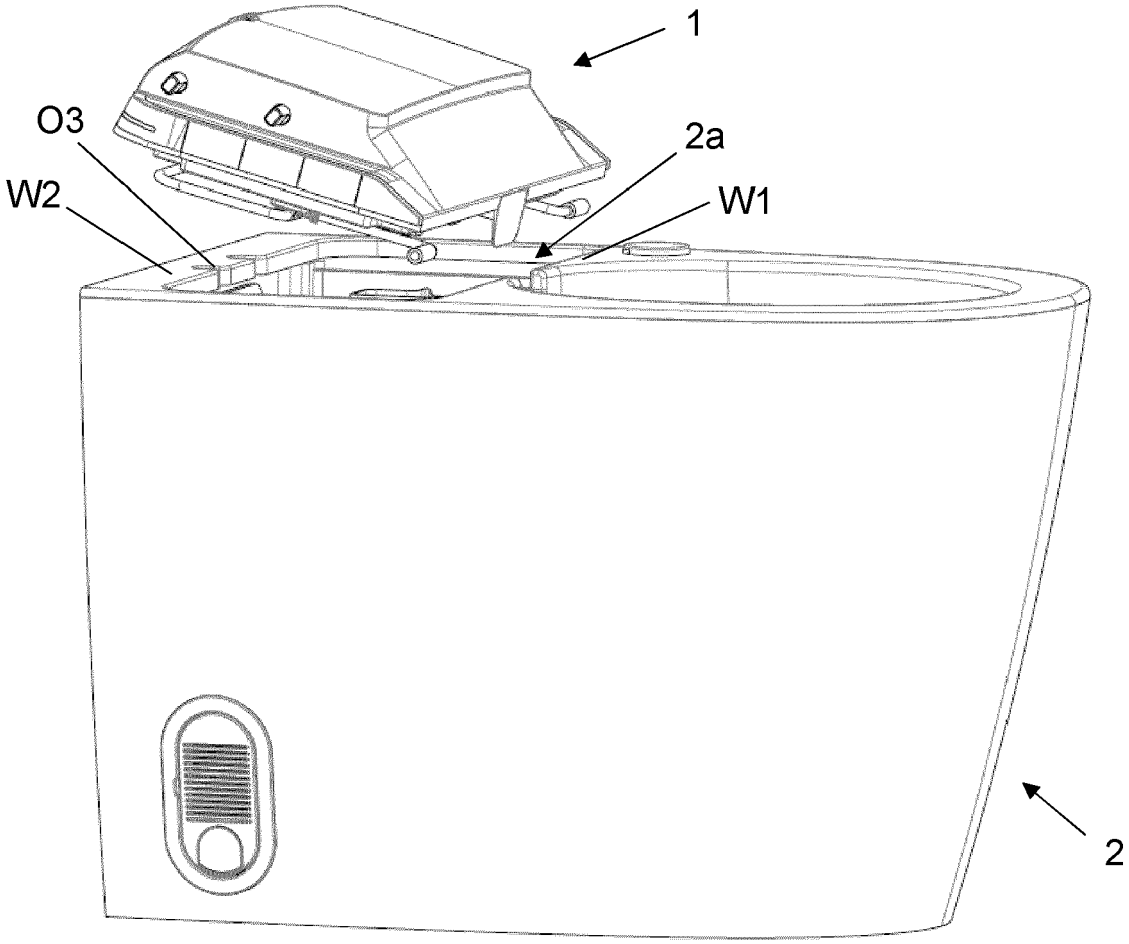

Fig. 4

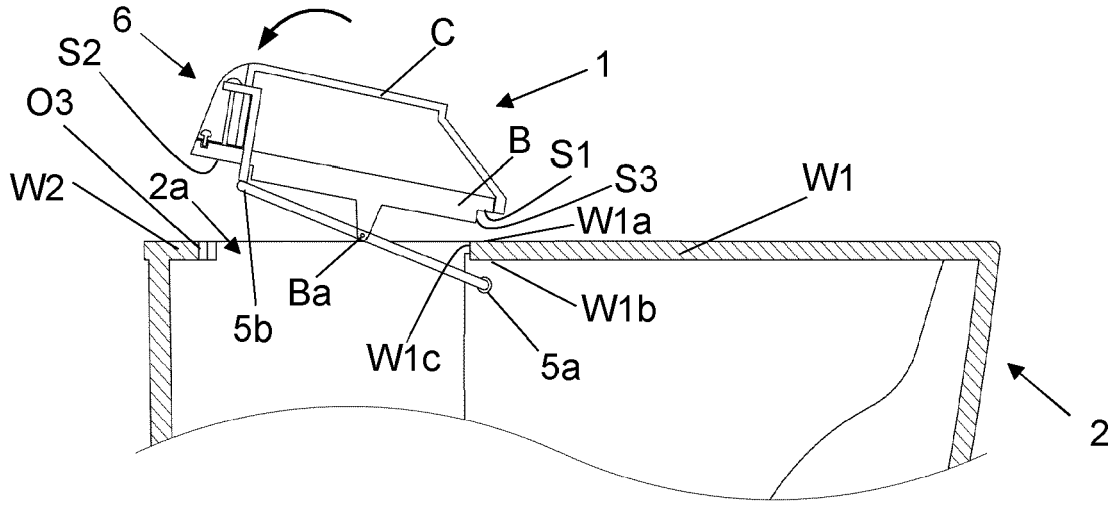

Fig. 5A

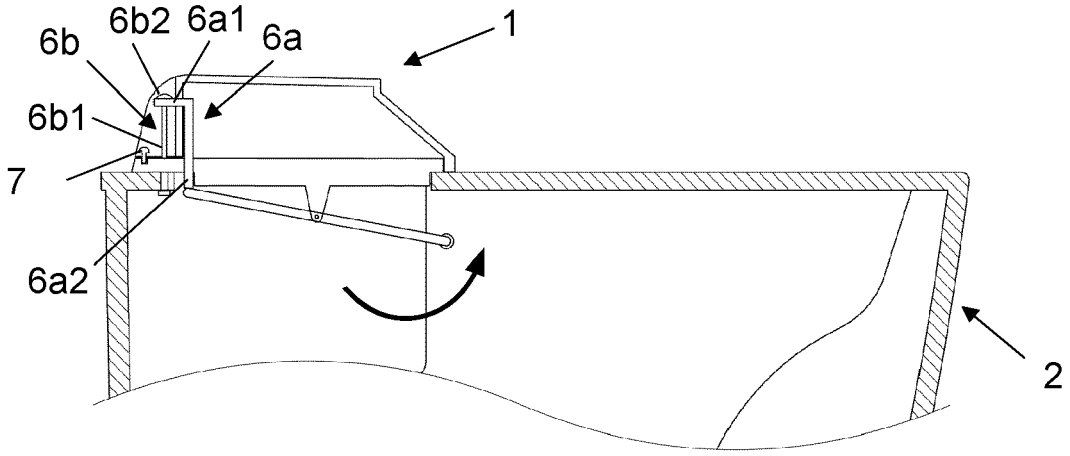

Fig. 5B

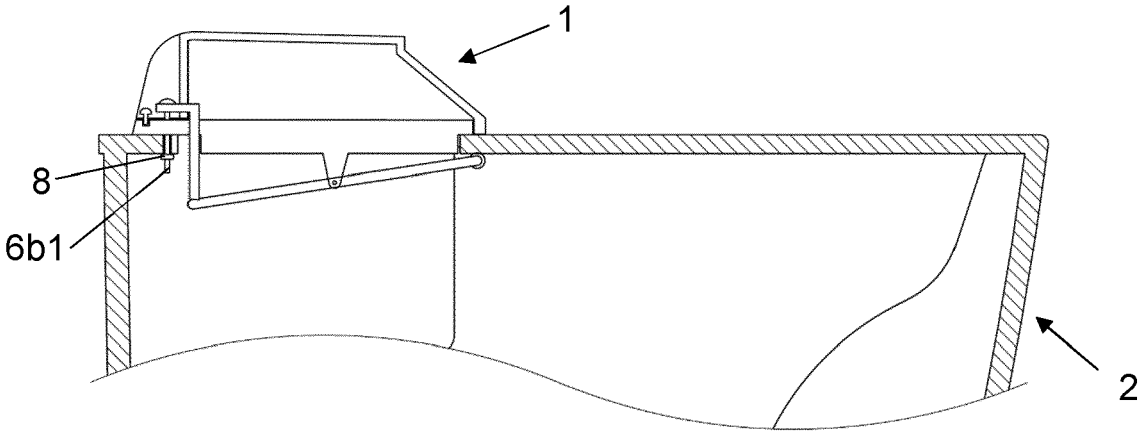

Fig. 5C

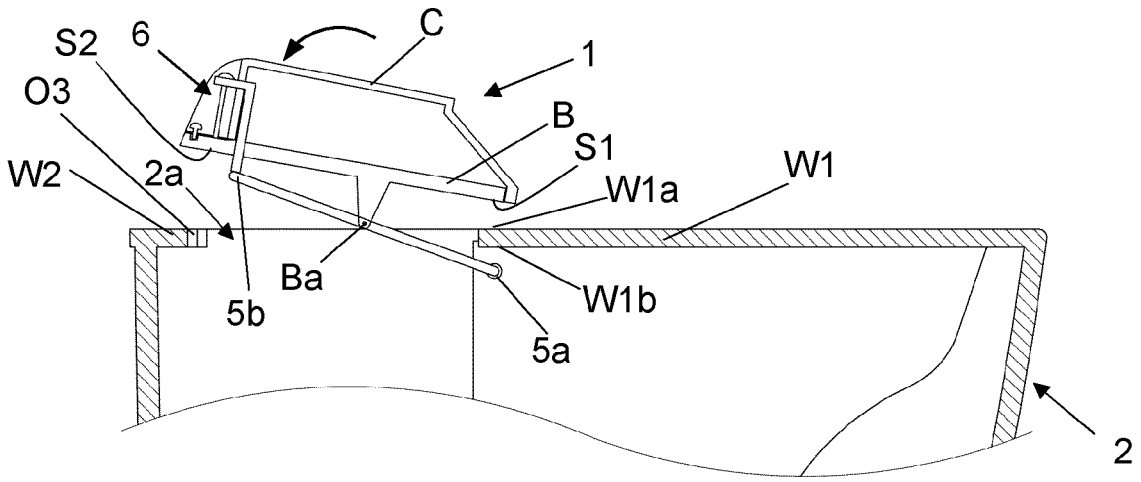

Fig. 6A

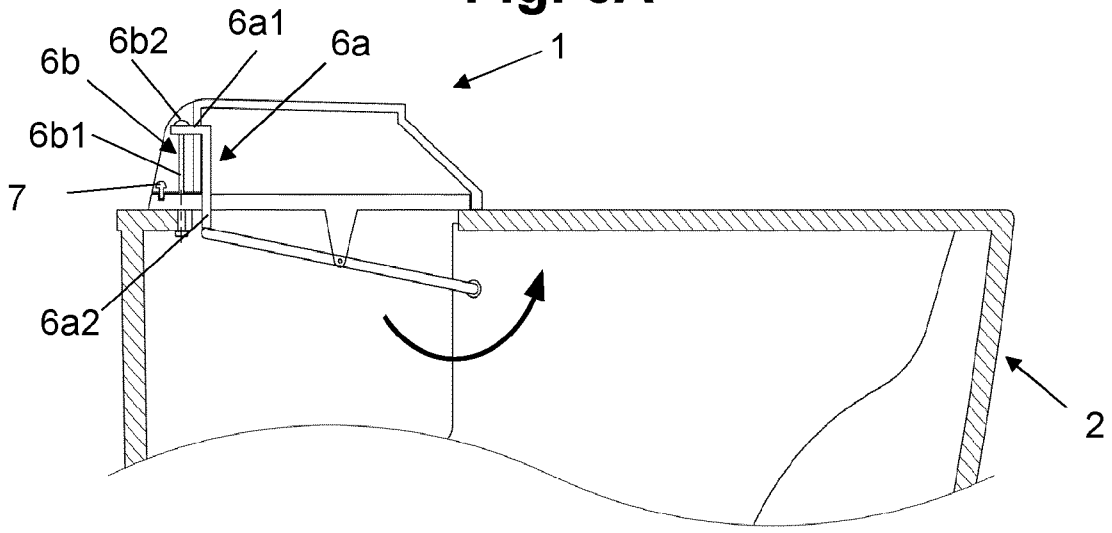

Fig. 6B

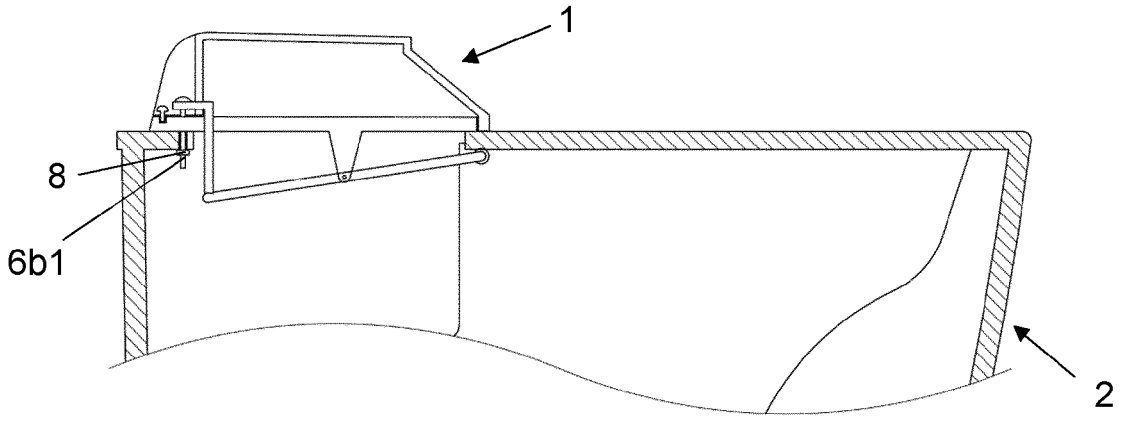

Fig. 6C

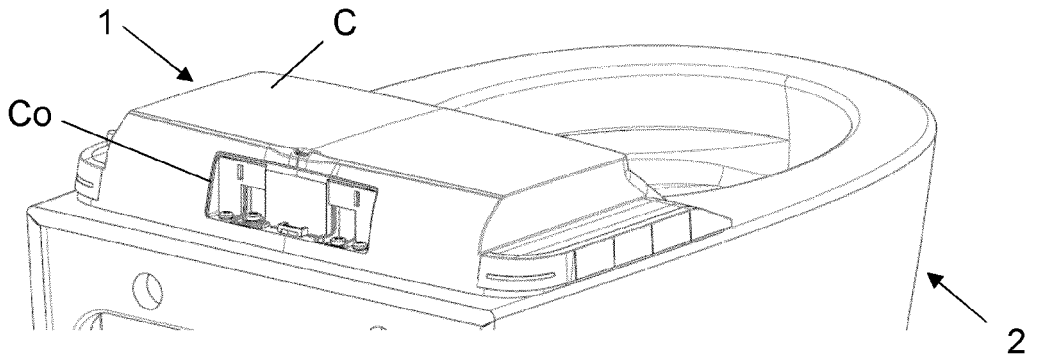

Fig. 7A

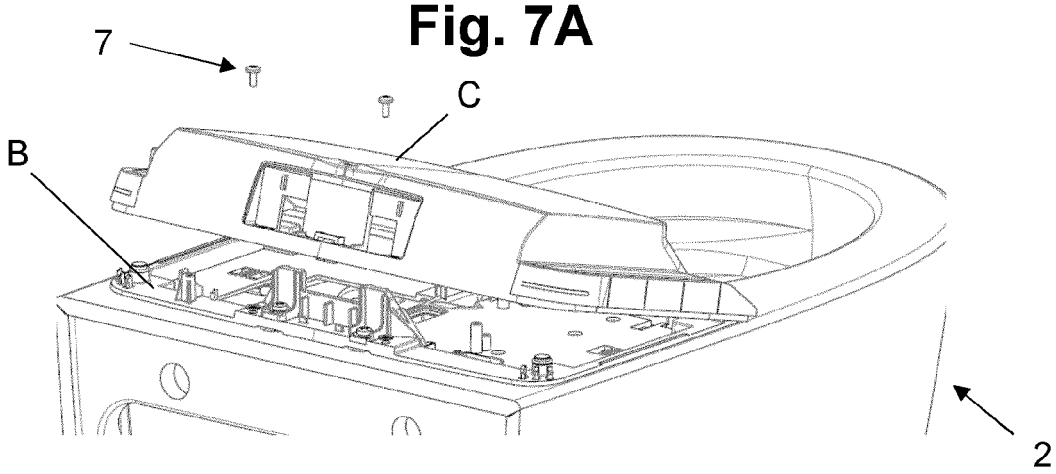

Fig. 7B

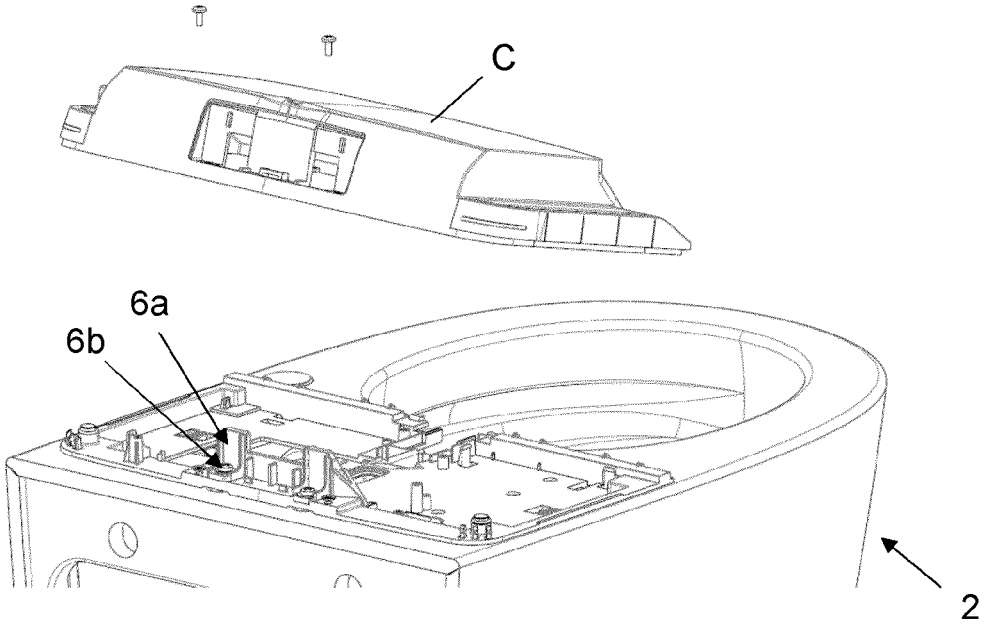

Fig. 7C

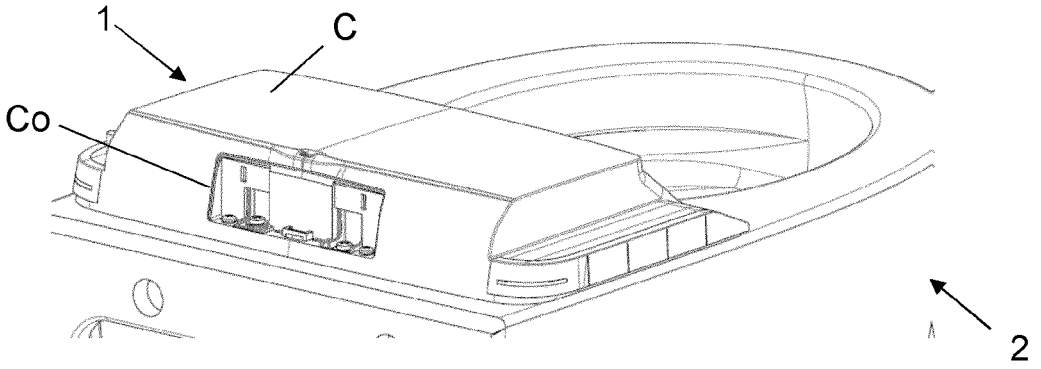

Fig. 8A

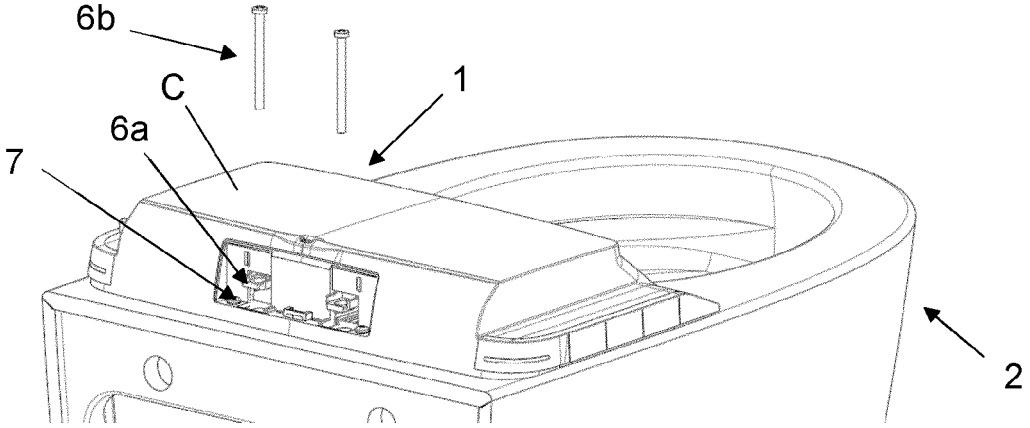

Fig. 8B

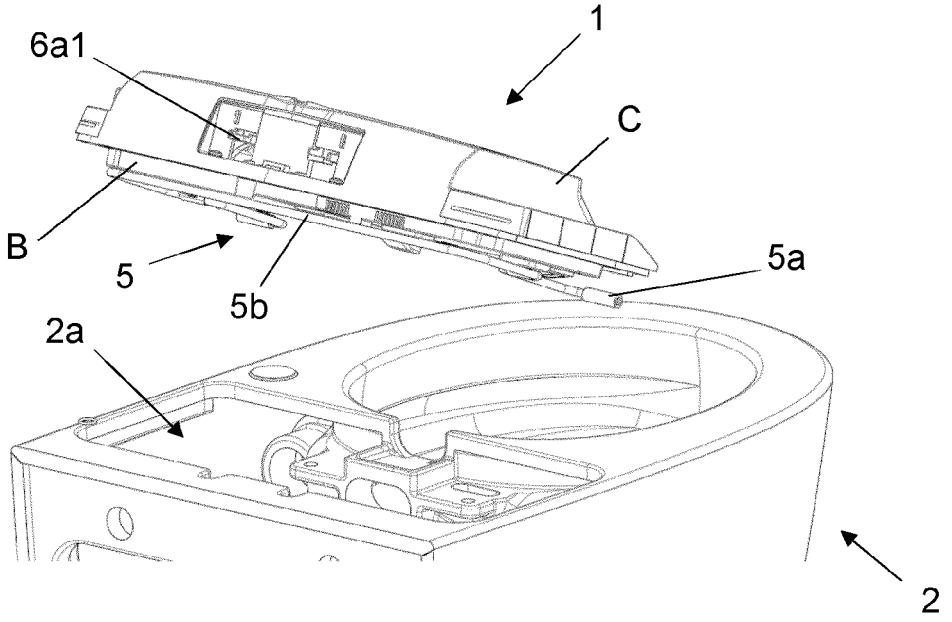

Fig. 8C

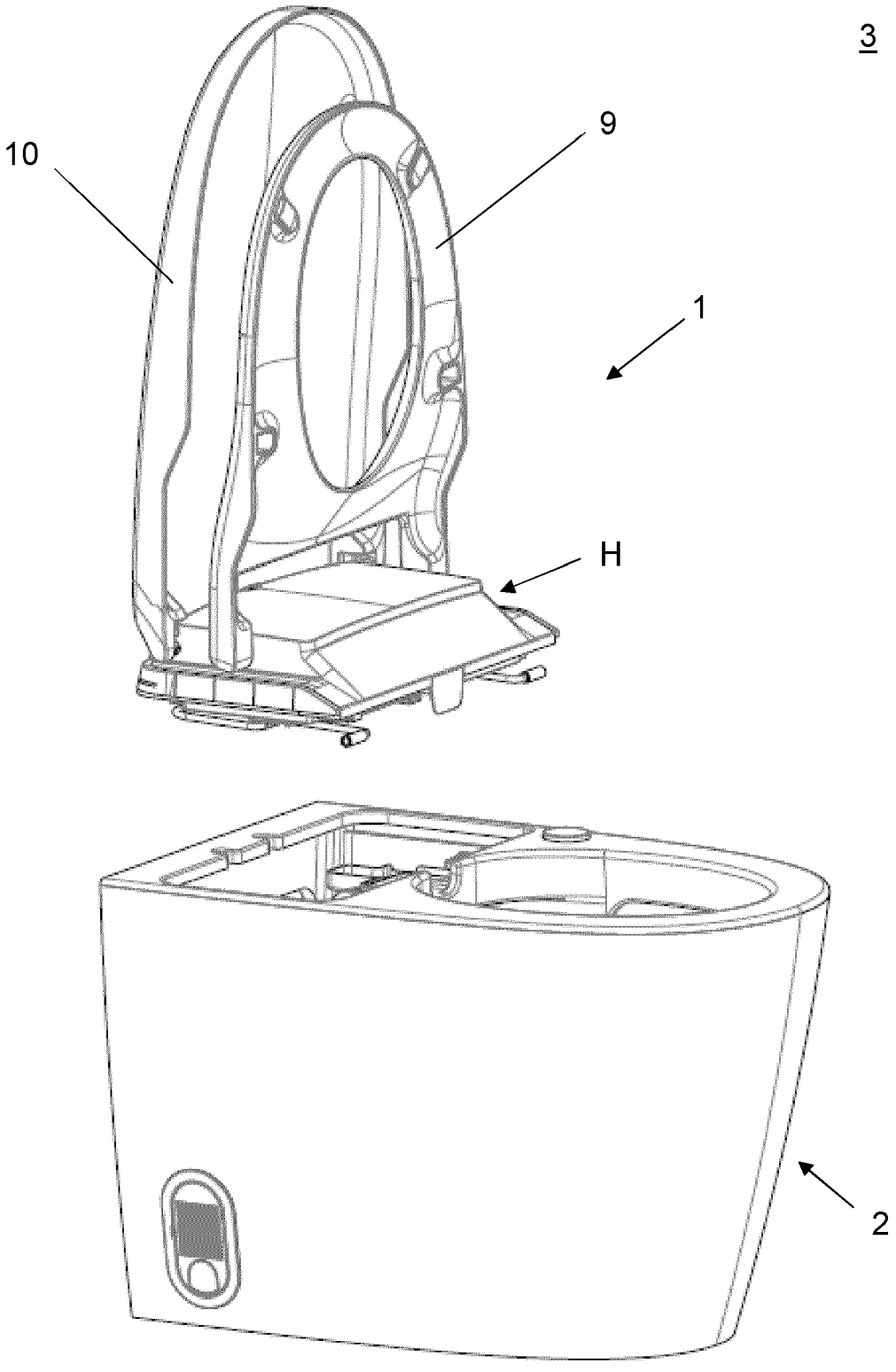

Fig. 9

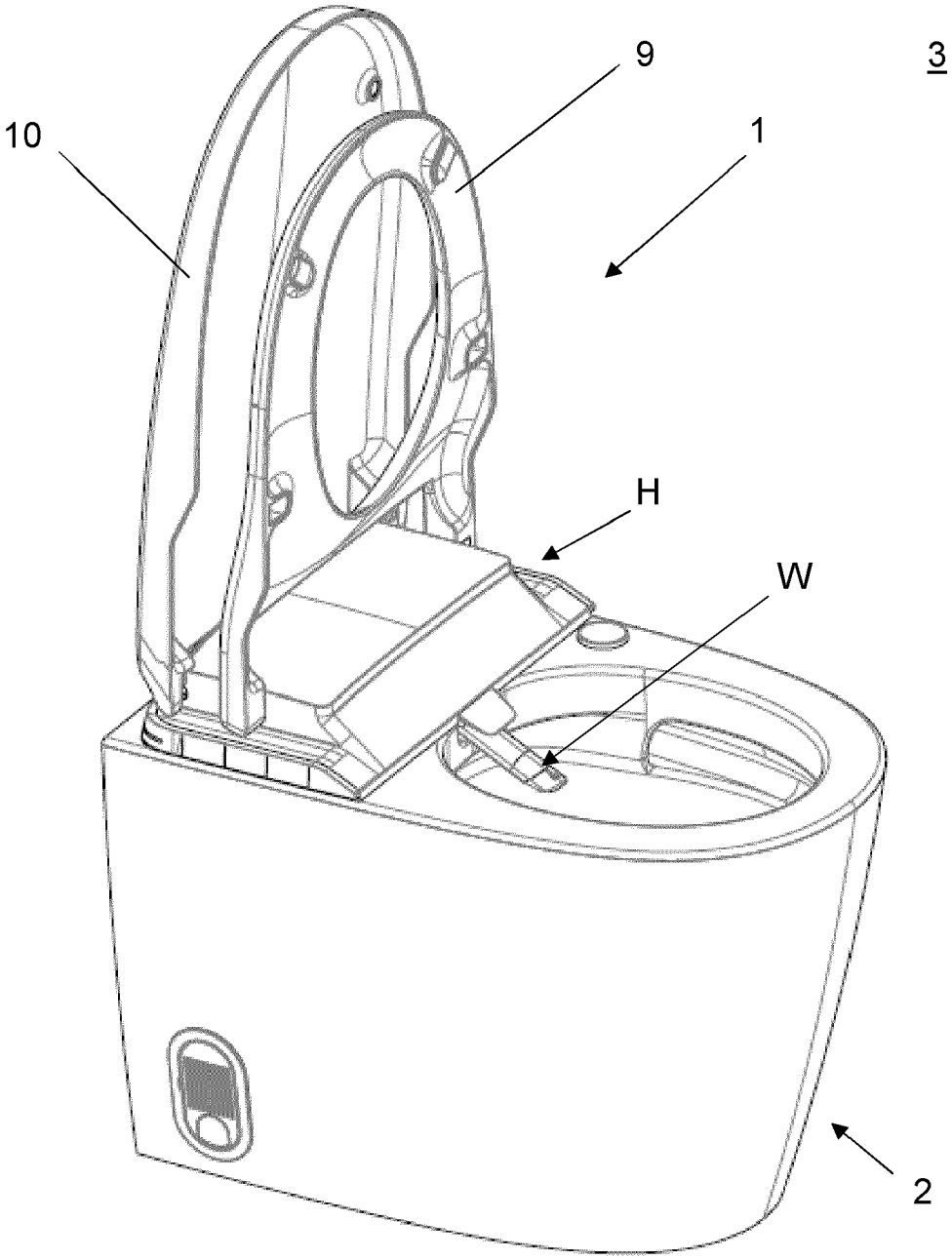

Fig. 10

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EUROPEAN SEARCH REPORT

Application Number
EP 22 38 3140

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 8 382 047 B1 (HILDEBRAND SHAWN ERIC [US]) 26 February 2013 (2013-02-26) * the whole document *	1-15	INV. E03D9/08
A	SE 439 878 B (LEDIN BONEVIK BIRGITTA BARBRO) 8 July 1985 (1985-07-08) * figures 1,2 *	1,13	
A	US 2 705 495 A (MARY VRANA ET AL) 5 April 1955 (1955-04-05) * figure 5 *	1,13	

TECHNICAL FIELDS SEARCHED (IPC)

E03D
E03C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 May 2023	Flygare, Esa

CATEGORY OF CITED DOCUMENTS

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16-05-2023

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