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(54) TOILET, AND TOILET AND DISCHARGE CISTERN ASSEMBLY

(57) Toilet (1) comprising a toilet body (2) provided with a toilet bowl (3), and a conduit (5) for the connection of a water outlet of a discharge cistern (6) to the toilet bowl (3), and is characterized in that said connection conduit (5) includes an attachment end (5a) to a discharge valve (7) of the cistern (6) modified to be able to be fixed to the toilet body (2) in a stable assembly position with the bowl (3), said toilet including means (8, 9, 21) to fix said modified end (5a) of the connection conduit (5) in said stable assembly position with the bowl (3).

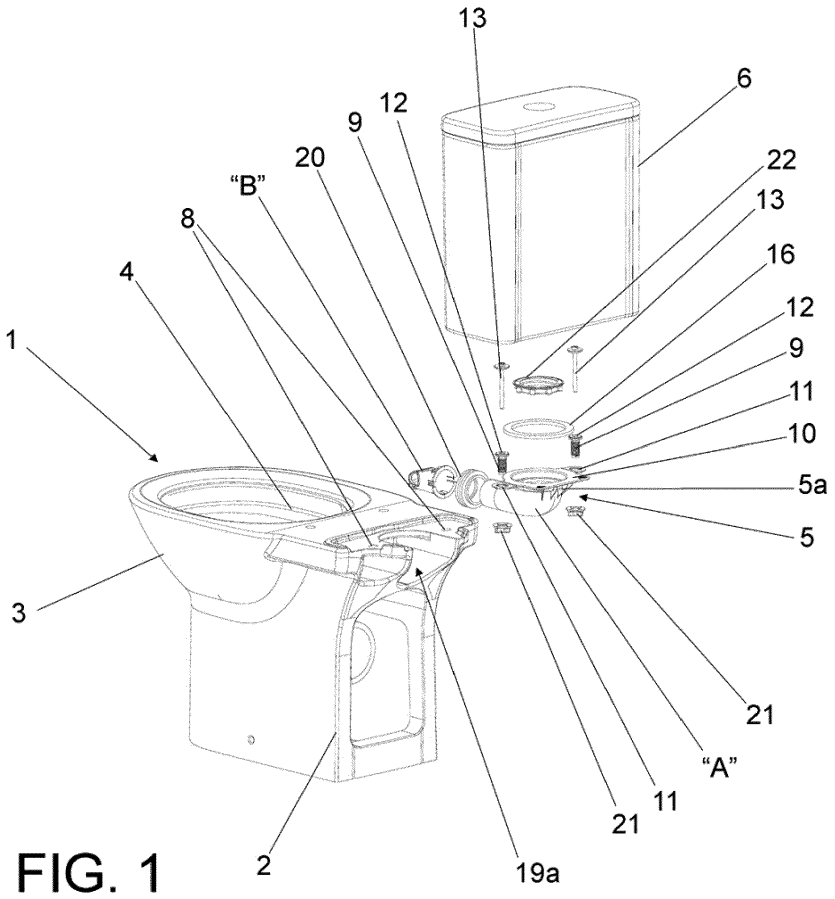

FIG. 1

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Description

[0001] The present invention relates to a toilet comprising a toilet body provided with a toilet bowl and a conduit to connect the outlet of a discharge cistern to the toilet bowl. It also relates to a toilet and discharge cistern assembly.

Background of the invention

[0002] Conventional toilets include a rim, or perimeter channel, provided with orifices, which receive the water from the discharge cistern and distributes them uniformly in the perimeter of the pan of the toilet bowl.

[0003] These conventional toilets have the drawback that the user cannot usually access the inside of the rim, or perimeter channel, to remove the dirt, so that they are unhygienic. To resolve this problem, toilets called "rimless" have been designed, which do not have a rim or perimeter channel.

[0004] Instead of the rim or perimeter channel, the "rimless" toilets include an open perimeter flange which is easily accessible for cleaning. However, in order to ensure the correct water propulsion and distribution, these toilets require the use of a connection conduit to the cistern which includes, at one of its ends, a plurality of suitable openings to drive the water towards the perimeter flange of the bowl. This connection conduit typically has a separate portion for joining to the discharge valve of the cistern which must be assembled inside the bowl at the place where the toilet is assembled, which complicates the installer's work. Furthermore, this separate portion of conduit is configured in a manner which requires the use of intermediate connections with the discharge valve, and the use of special discharge cisterns, different to those used with conventional toilets.

Description of the invention

[0005] The objective of the present invention is that of providing a toilet, preferably a toilet of ceramic material, for example, a toilet provided with a "rimless" bowl, which resolves the above-mentioned drawbacks, and has the advantages described below.

[0006] In accordance with this objective, according to a first aspect, the present invention provides a toilet comprising a toilet body provided with a toilet bowl, and a conduit for the connection of a water outlet of a discharge cistern to the toilet bowl, and which is characterized in that the connection conduit includes an attachment end to a discharge valve of the cistern modified to be able to be fixed to the toilet body in a stable assembly position with the bowl, the body of said toilet including means to fix the modified end of the connection conduit in the stable assembly position with the bowl.

[0007] In the present invention, the conduit which connects the water outlet of the cistern to the toilet bowl includes a modified attachment end to the discharge valve of the cistern which is configured to be able to be fixed to the toilet body in a stable position, by means of means provided for said purpose in the toilet body. Thanks to this, a toilet is obtained which can be factory assembled, thus simplifying the work of the installer in the place of assembly, since the installer only has to couple the cistern as occurs in conventional toilets.

[0008] According to an embodiment, said modified attachment end of the connection conduit includes a mouth which defines a recess for a gasket joining the end of the discharge valve of the cistern and, preferably, the toilet body and the connection conduit are configured so that, in the stable assembly position with the bowl, the mouth of the conduit is disposed substantially flush with a wall of the toilet body.

[0009] Thanks to this, unlike the toilets of the state of the art, the toilet claimed allows the use of standard cisterns that directly couple to the toilet without the need to be modified. Furthermore, the flow of water from the cistern to the toilet bowl is optimized, since the mouth of the connection conduit is adapted to be directly attached to one end of the discharge valve inside the cistern. In this way, the attachment of the discharge valve to the inlet mouth of the connection conduit can be carried out without intermediate connections.

[0010] According to an embodiment, the means to fix the modified end of the connection conduit to the toilet body comprise at least one orifice provided in a wall of the toilet body, and at least one fixing element to insert in said orifice. This fixing element can be, for example, a screw which is inserted in the toilet orifice to fix the modified end of the connection conduit to the toilet body by means of a nut which is threaded in the threaded end of this screw.

[0011] Advantageously, the screw or fixing element of the modified end of the connection conduit comprises an internal threaded bushing susceptible of receiving another fixing element of the discharge cistern. In this way, the discharge cistern can be directly fixed on the mouth of the connection conduit guaranteeing an optimum and compact assembly.

[0012] Advantageously, the mouth of the modified end of the connection conduit comprises an external fixing tab on the toilet body, which is provided with at least one orifice for the passage of one of said fixing elements.

[0013] Preferably, the toilet body has been modified to include a cavity which defines a hollow space dimensioned to house the modified end of the connection conduit. In this way, the connection conduit is integrated inside the toilet body, simplifying the toilet manufacturing (less material and less design complexity) and facilitating assembly of the components, and the transport and handling to the place of assembly.

[0014] According to an embodiment, the toilet claimed comprises a "rimless" toilet bowl provided with an open perimeter flange to distribute and direct the water. According to this embodiment, preferably, the connection conduit includes at least two portions of conduit, a first

portion of conduit which includes the modified end for attaching to the discharge valve and a second portion of conduit provided with a free end with a plurality of openings intended to propel and uniformly distribute the water throughout the perimeter flange of the pan of the toilet bowl.

[0015] Both portions of conduit may define a single piece or part, or constitute two independent pieces or parts which must be coupled together. In any case, the connection conduit, formed by one or more parts, always includes a modified end to be fixed to the toilet body in a stable position by means of means provided for said purpose in the toilet body. Thanks to this, as previously commented, the toilet may come from the factory ready to be connected to the discharge cistern, thus simplifying the assembly that the installer must perform.

[0016] According to the same embodiment of the invention applied to toilets with "rimless" bowl, the toilet body has been modified to include a cavity which defines a first hollow space dimensioned to house the first portion of connection conduit, and a second hollow space dimensioned to house the second portion of conduit inside the toilet body. In this way, the two portions of the connection conduit are integrated inside the toilet body.

[0017] Advantageously, a seal guarantees the watertightness between the first and the second hollow space to avoid the accidental outlet of water outside of the toilet body. This seal may form part of the connection conduit or form an independent element which must be coupled together during assembly.

[0018] According to a second aspect, the present invention provides a toilet and discharge cistern assembly, comprising a toilet as claimed, and a discharge cistern which can be coupled to a wall of the toilet body. The discharge cistern of this assembly has the advantage that it can always be of standard type, irrespective of whether the toilet bowl is "rimless" or a conventional bowl.

[0019] Preferably, the base of the discharge cistern is provided with at least one orifice for the passage of a screw for fixing the cistern on the wall of the toilet body. As commented above, according to an embodiment, the screw for fixing the cistern can be a screw configured to be threaded in a bushing with internal threading of a fixing element of the modified end of the connection conduit. In this way, it guarantees a simple and safe assembly of the cistern on the toilet body.

[0020] Advantageously, in a final assembly position of the assembly, a threaded end of the discharge valve inside the cistern is housed inside the mouth of the modified end of the connection conduit of the toilet, with said modified end being fixed to the toilet body.

[0021] In the present invention, "rimless" toilet bowl is understood as a bowl provided with an open perimeter flange to distribute water, or a bowl lacking a rim or perimeter channel for the distribution of water.

Brief description of the figures

[0022] For a better understanding of all that has been stated, drawings are attached wherein, schematically and only by way of non-limiting example, a practical embodiment has been represented.

Figure 1 is an exploded perspective view of a toilet and discharge cistern assembly of the present invention which is applied to a toilet with a "rimless" bowl".

Figure 2 shows a section of the assembly of figure 1 in a final assembly position.

Figure 3 shows a detail of the section of figure 2.

Figure 4 shows a perspective view of the toilet of figure 1 without the discharge cistern, with the modified end of the connection conduit fixed to the toilet body.

Figure 5 shows a perspective view of the connection conduit with the modified end for attaching to the discharge valve of the cistern. In this embodiment the conduit is formed by two independent parts or pieces that must be coupled together.

Description of a preferred embodiment

[0023] The preferred embodiment of the toilet claimed is described below, making reference to figures 1 to 5.

[0024] The embodiment of the toilet 1 which is described includes a toilet body 2, a "rimless" toilet bowl 3 which is provided with an open perimeter flange 4 to distribute water, and a conduit 5 for the connection of the outlet of a water discharge cistern 6 to the bowl 3 of the toilet 1. The cistern 6 houses therein a discharge valve 7 which is fixed by means of a nut 22 to the base of the same cistern 6.

[0025] The connection conduit 5 includes an attachment end 5a to the outlet of the discharge valve 7 of the cistern 6. In the present invention, the end 5a has been modified to be able to be fixed to the toilet 1 body 2 in a stable assembly position with the bowl 3. Hence, in the embodiment described, at the end 5a of the connection conduit 5 an external tab 10 has been provided with orifices 11 for the passage of fixing screws 9 which also traverse orifices 8 provided in the toilet 1 body 2.

[0026] In the embodiment described, the screws 9 which fix the external tab 10 each include a bushing 12 with an internal thread susceptible of receiving other fixing screws 13 of the base 14 of the discharge cistern 6. In this way, the discharge cistern 6 can be directly fixed on the mouth of the connection conduit 5 guaranteeing optimum assembly.

[0027] Figure 4 shows a perspective view of the toilet 1 with the exterior tab 10 of the modified end 5a of the connection conduit 5 fixed to the toilet 1 body 2 by means of the fixing screws 9 which traverse the orifices 8 provided in the toilet 1 body 2. As shown in figure 4, nuts 21 lock the position of the screws 9 to fix the modified end

5a of the conduit 5 in a stable assembly position with the bowl 3. In this stable position, the toilet 1 can be moved from the factory to the place of assembly where the installer only has to couple the discharge cistern 6.

[0028] According to an embodiment, the modified end 5a of the connection conduit 5 includes a mouth which defines a recess 15 for a gasket16 joining a threaded end 17 of the discharge valve 7 inside the cistern 6. As can be seen in figure 4, the toilet 1 body 2 and the modified end 5a of the connection conduit 5 are configured so that, in the stable assembly position with the bowl 3, the mouth of the connection conduit 5 is disposed substantially flush with a surface of the toilet 1 body 2 designed to contact with the discharge cistern 6.

[0029] In this way, unlike toilets of the state of the art, the toilet 1 claimed allows the use of standard cisterns 6 which do not need to be modified to allow the attachment of the connection conduit 5 with the discharge valve 7 of the cistern 6. Figures 1 and 2 show, respectively, an exploded view and a section of a toilet and discharge cistern assembly of the present invention with a discharge cistern 6 of standard type.

[0030] In the embodiment described, the toilet 1 claimed comprises a toilet bowl 3 of "rimless" type provided with an open perimeter flange 4 to distribute and direct the water. According to this embodiment, as can be seen in the figures, the connection conduit 5 includes a first portion "A" of conduit comprising the modified end 5a for attaching to the discharge valve 7, and a second portion "B" of connection conduit 5 provided with a free end with a plurality of openings 18 intended to propel and uniformly distribute the water throughout the perimeter flange 4 of the pan of the toilet bowl 3. As observed in figures 1 to 3 and, in detail in figure 5, in the embodiment described, both portions "A" and "B" of the conduit 5 constituted two independent parts or pieces susceptible of being coupled together when the toilet 1 is assembled in the factory.

[0031] Figure 3 shows a detail of the cavity which has been provided in the toilet 1 body 2 to house the two parts which form the connection conduit 5. This cavity defines a first hollow space 19a dimensioned to receive the first portion "A" of conduit 5, and a second space 19b dimensioned to house the second portion "B" of conduit inside the toilet 1 body 2. The water-tightness between both hollow spaces 19a, 19b is guaranteed by means of a rubber seal 20 which is inserted in the cavity to avoid the accidental outlet of water. As can be seen in figure 3, in this way the connection conduit 5 is integrated and protected inside the toilet 1 body 2, and the attachment end 5a to the valve 7 of the cistern 6 is fixed to the toilet 1 body 2 in a stable position which facilitates transport to the place of assembly.

[0032] Despite the fact that reference has been made to a specific embodiment of the invention, it is evident for a person skilled in the art that the set described is susceptible to numerous variations and modifications and that all the details mentioned can be replaced by other technically equivalent ones, without departing from the scope of protection defined by the attached claims. For example, although a toilet 1 has been described with a "rimless" type bowl, the present invention could be applied to a toilet 1 which had a bowl 3 other than the "rimless" kind but which also require the presence of a conduit 5 to connect the water outlet of the discharge cistern 6 with the bowl 3. Likewise, although fixing means of the modified end 5a for attaching to the discharge valve 7 have been described consisting of screws 9 susceptible of traversing orifices 8 provided in the toilet 1 body 2, it would also be possible to provide in the toilet 1 body 2 another known type of means of fixing said modified end 5 which also allowed guaranteeing in origin a stable assembly position with the toilet 1 bowl 3.

Claims

1. Toilet (1) comprising a toilet body (2) provided with a toilet bowl (3), and a conduit (5) for the connection of a water outlet of a discharge cistern (6) to the toilet bowl (3), **characterized in that** said connection conduit (5) includes an attachment end (5a) to a discharge valve (7) of the cistern (6) modified to be able to be fixed to the toilet body (2) in a stable assembly position with the bowl (3), said toilet including means (8, 9, 21) to fix the modified end (5a) of the connection conduit (5) in said stable assembly position with the bowl (3).

2. Toilet (1) according to claim 1, wherein said modified end (5a) of the connection conduit (5) includes a mouth which defines a recess (15) for a gasket (16) joining the end (17) of the discharge valve (7) of the cistern (6).

3. Toilet (1) according to claim 2, wherein the mouth of the modified end (5a) of the connection conduit (5) comprises an external fixing tab (10) on the toilet body (2).

4. Toilet (1) according to claims 1 to 3, wherein a portion of the toilet body (2) and the modified end (5a) of the connection conduit (5) are configured in a manner which, in the stable assembly position with the bowl (3), the mouth of the connection conduit (5) is disposed substantially flush with a surface of the toilet body (2).

5. Toilet (1) according to any of the preceding claims, wherein said means to fix the modified end (5a) of the connection conduit (5) comprise at least one orifice (8) provided in a wall of the toilet body, and at least one fixing element (9) to insert in said orifice (8).

6. Toilet (1) according to claim 5, wherein said fixing element (9) comprises an internal threaded bushing

(12) susceptible of receiving another fixing element (13) of the discharge cistern (6).

7. Toilet (1) according to claim 1, wherein the toilet body (2) has been modified to include a cavity which defines a hollow space (19a) dimensioned to house the modified end (5a) of the connection conduit (5).

8. Toilet (1) according to any of the preceding claims, comprising a "rimless" toilet bowl (3) provided with an open perimeter flange (4) to distribute water.

9. Toilet (1) according to claim 8, wherein said connection conduit (5) includes at least two portions of conduit, a first portion ("A") of conduit which includes said modified end (5a) for attaching to the discharge valve (7), and a second portion ("B") of conduit provided with a free end with a plurality of openings (18) intended to propel and uniformly distribute the water throughout the perimeter flange (4) of the pan of the toilet bowl (3).

10. Toilet (1) according to claim 9, wherein the toilet body (2) includes a cavity which defines a first hollow space (19a) dimensioned to house the first portion ("A") of connection conduit (5), and a second hollow space (19b) dimensioned to house the second portion ("B") of conduit inside the toilet body (2).

11. Toilet (1) according to claim 10, which includes a seal (20) to guarantee the water-tightness between the first ("A") and the second ("B") hollow space of the toilet body (2).

12. Toilet (1) and discharge cistern (6) assembly, comprising a toilet (1) according to any of claims 1 to 11, and a discharge cistern (6) attachable to a wall of the toilet body (2).

13. Assembly according to claim 12, wherein the base (14) of said discharge cistern (6) is provided with at least one orifice for the passage of a fixing element (13) of the cistern (6) on the wall of the toilet body (2).

14. Assembly according to any of claims 12 to 13, wherein, in a final assembly position of the assembly, a threaded end (17) of the discharge valve (7) of the cistern (6) is housed inside the mouth of the modified end (5a) of the connection conduit (5) of the toilet.

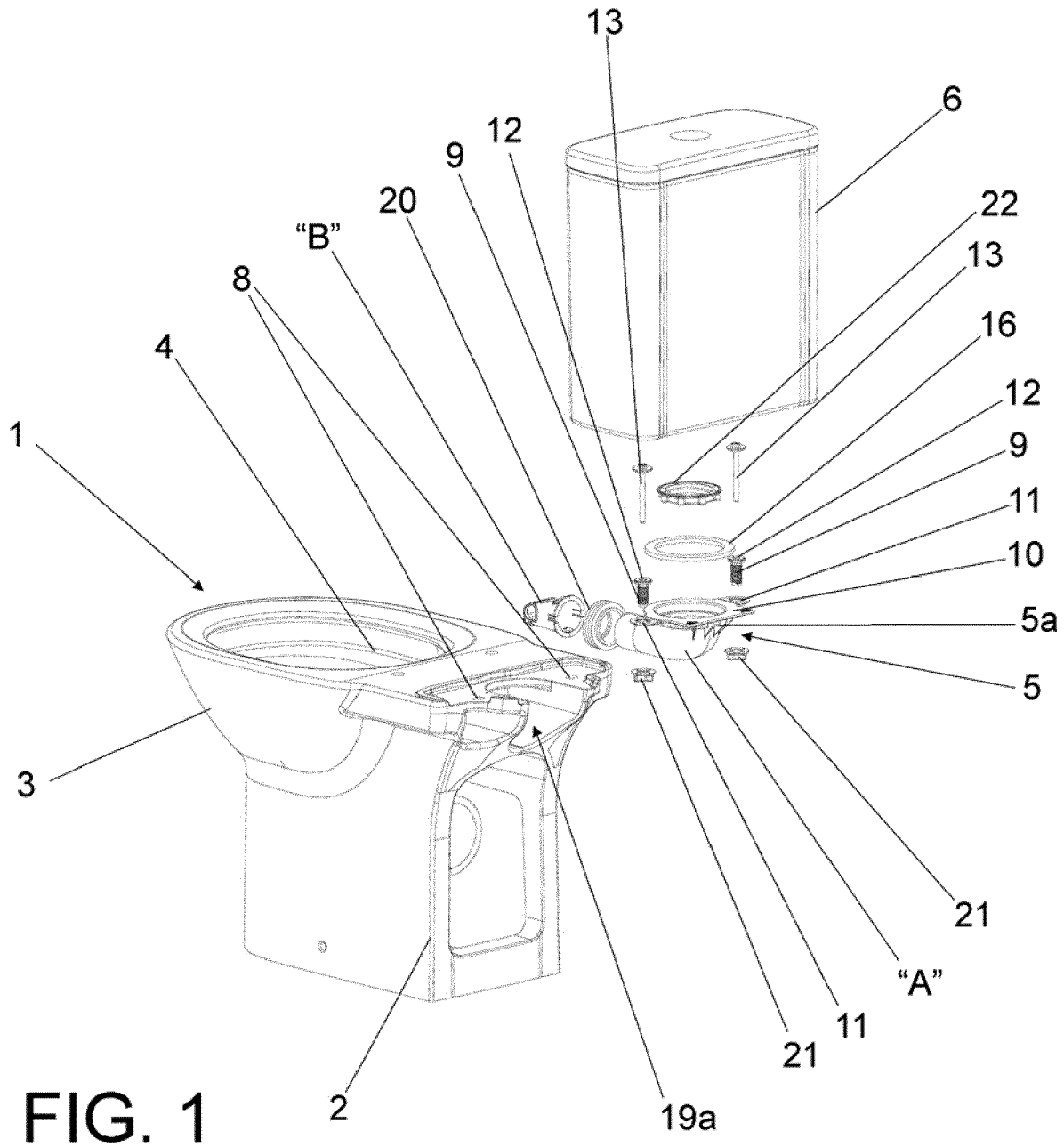

FIG. 1

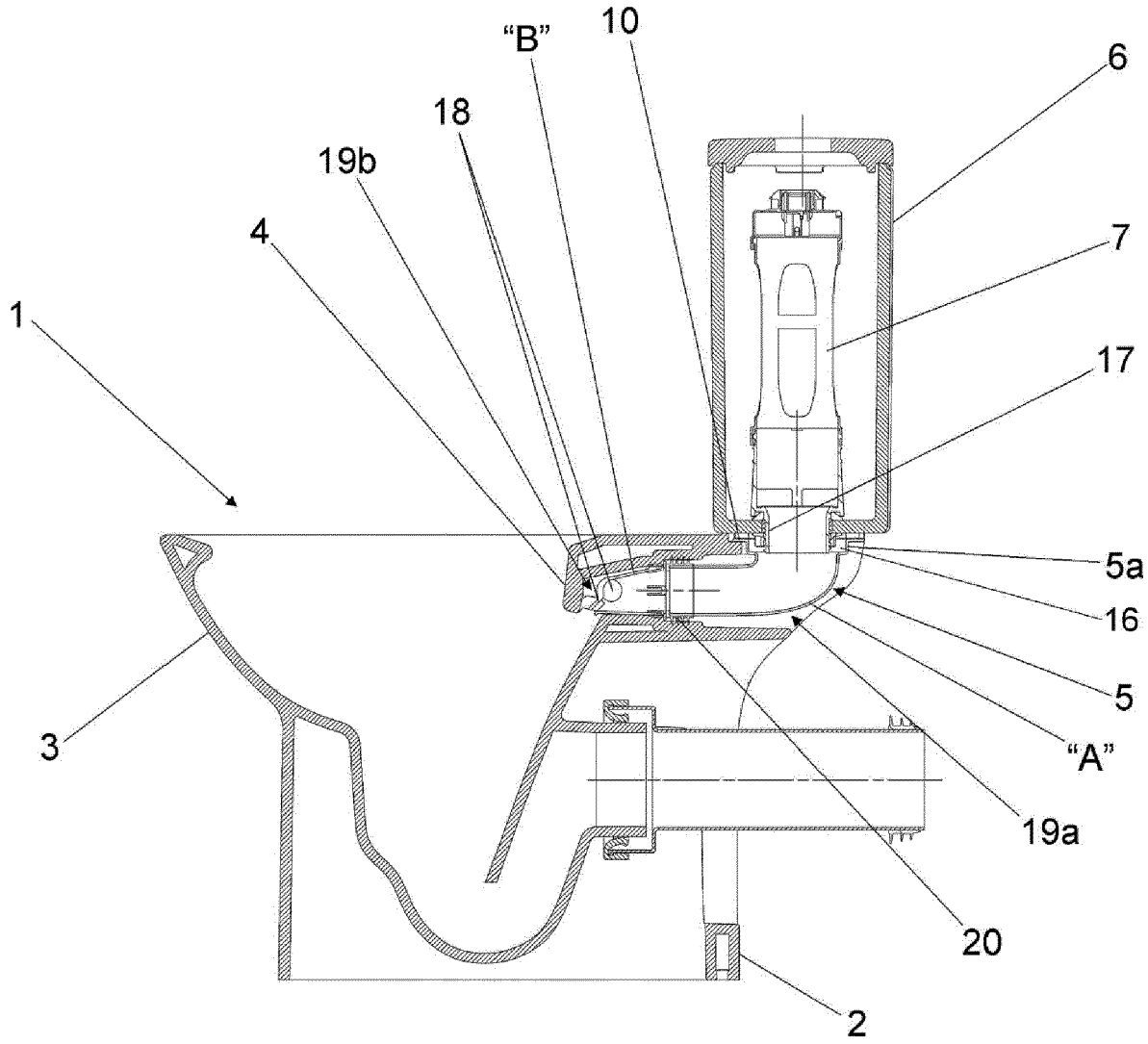

FIG. 2

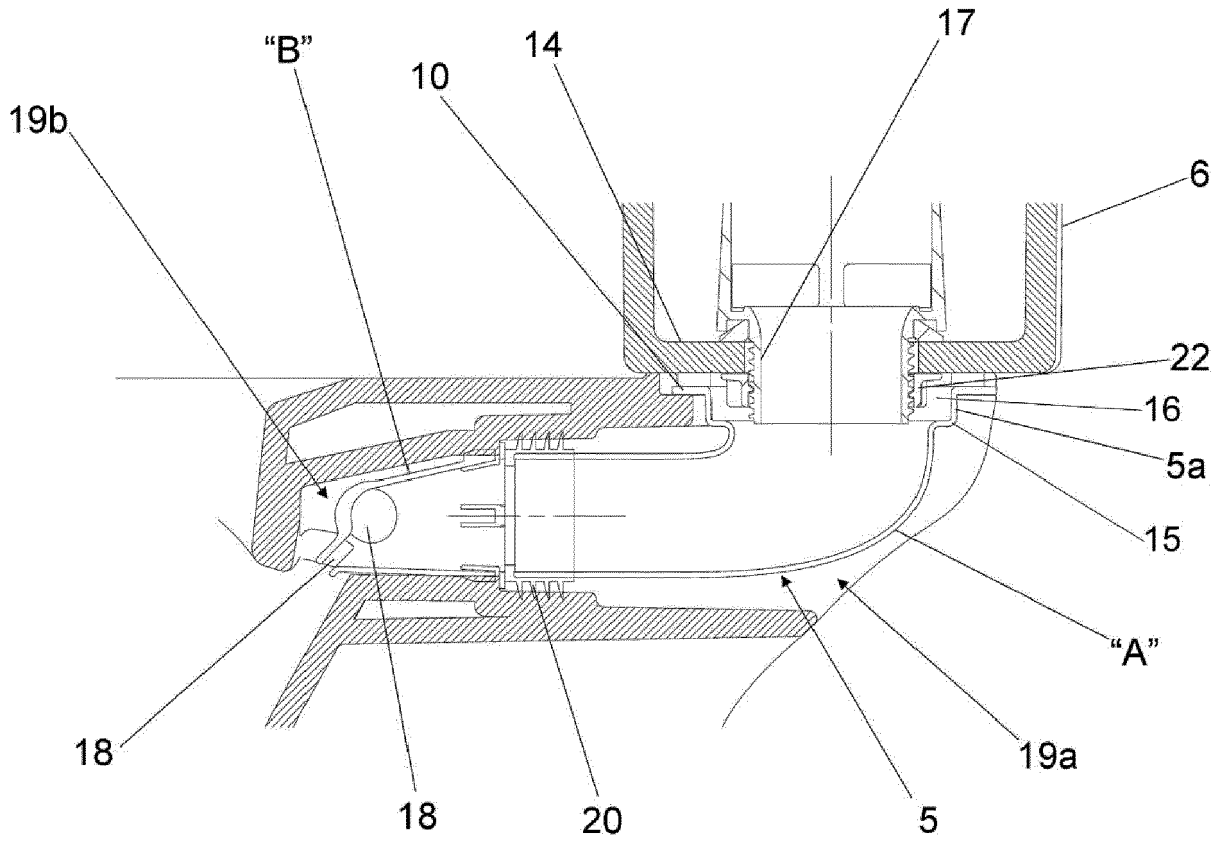

FIG. 3

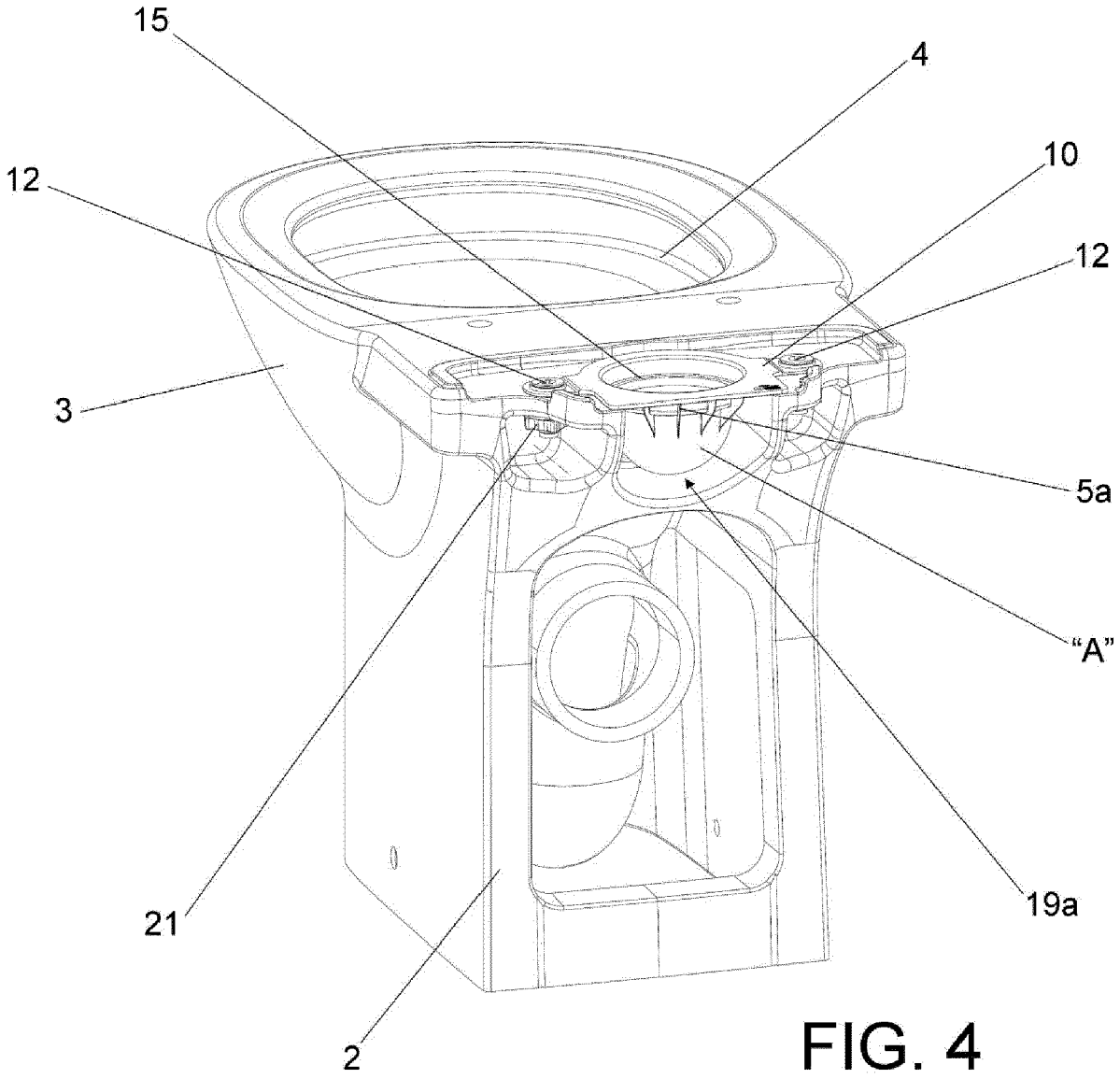

FIG. 4

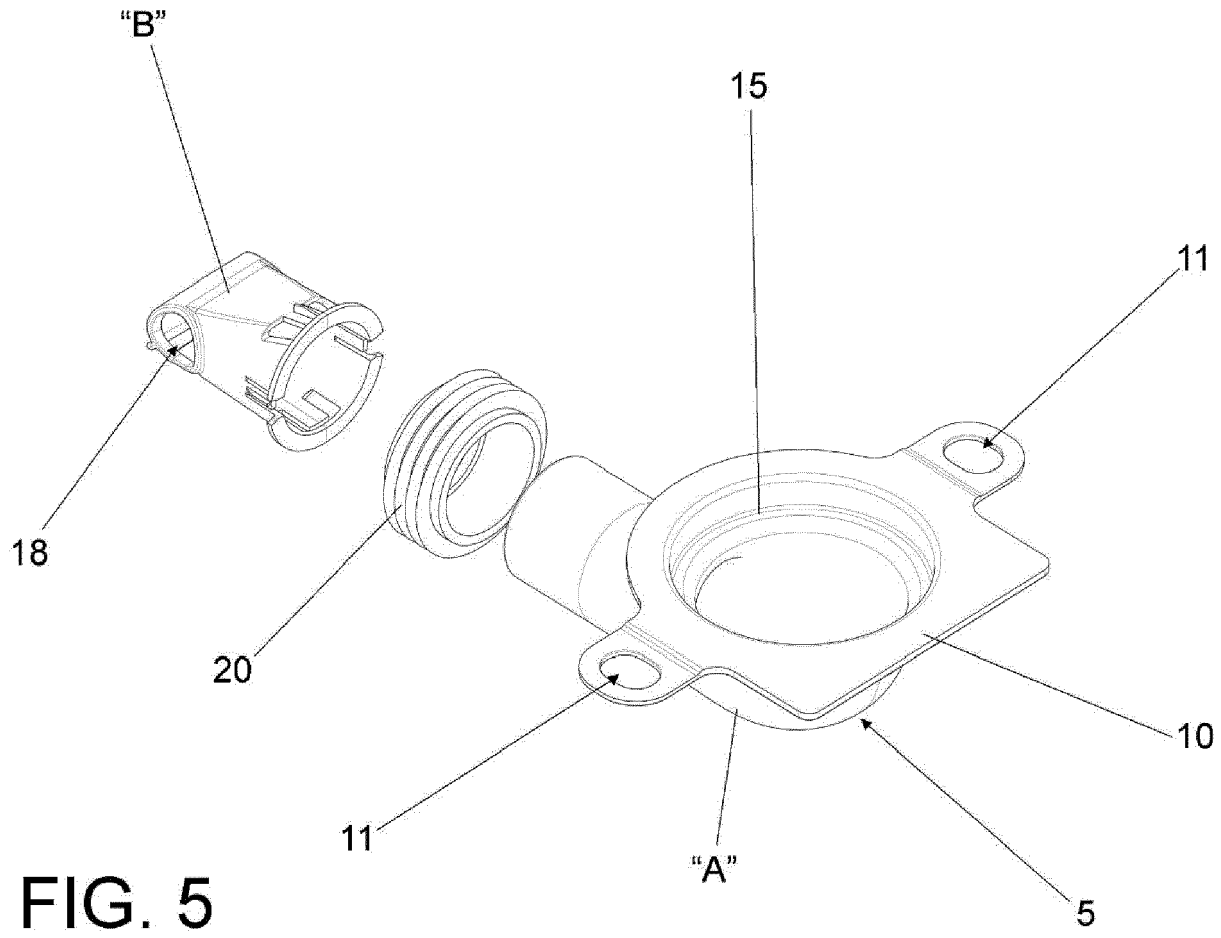

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 17 38 2779

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 April 2018	Leher, Valentina

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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