

(19)



(11)

EP 4 201 281 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

21.01.2026 Bulletin 2026/04

(51) International Patent Classification (IPC):

A47K 13/02 ^(2006.01) **A47K 13/30** ^(2006.01)

(21) Application number: **22216424.6**

(52) Cooperative Patent Classification (CPC):

A47K 13/02; A47K 13/30; A47K 13/12

(22) Date of filing: **23.12.2022**

(54) **TOILET SEAT RING**

TOILETTENSITZRING

BAGUE DE SIÈGE DE TOILETTES

(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**

(72) Inventor: **Sun, Xiaoquan**
Shanghai, 200444 (CN)

(30) Priority: **27.12.2021 CN 202123317369 U**
21.12.2022 US 202218085623

(74) Representative: **Barker Brettell LLP**
100 Hagley Road
Edgbaston
Birmingham, West Midlands B16 8QQ (GB)

(43) Date of publication of application:
28.06.2023 Bulletin 2023/26

(56) References cited:
DE-U1- 202016 001 061 KR-A- 20130 046 343
KR-A- 20170 032 119

(73) Proprietor: **Shanghai Kohler Electronics, Ltd.**
Shanghai 200444 (CN)

EP 4 201 281 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of priority to Chinese Utility Model Application No. 202123317369.X filed in the Chinese Intellectual Property Office on December 27, 2021, and US Patent Application No. 18/085,623 filed in the US Patent & Trademark Office on December 21, 2022.

FIELD

[0002] The present disclosure relates to the field of toilet bidet technologies, and particularly to a seat ring.

BACKGROUND

[0003] Current smart toilets may be provided with an electrical control wiring harness and water pipes. A rear portion of a seat ring of the smart toilet may be provided with a nozzle structure. The nozzle structure needs to be connected with an external power supply through the wiring harness. The nozzle structure also needs to be connected with the water pipe to spray water.

[0004] A through hole is needed to be specially formed in the seat ring to mount the above the wiring harness and water pipes. Thus, the seat ring has a complex structure, and it is inconvenient to assemble the seat ring.

[0005] In view of the above technical problem, it is necessary to provide a seat ring with simplified structure and convenient assembly. KR 2017 0032119 discloses an apparatus for a bidet device having a nozzle assembly on a toilet seat capable of receiving power, control signals and water from the apparatus body and spraying washing water.

SUMMARY

[0006] The present disclosure aims to overcome the defects in the current seat ring and provide a seat ring capable of simplifying a structure of the seat ring and facilitating assembly.

[0007] The present disclosure provides a seat ring, which comprises a seat ring body, a seat ring mounting end connected at a rear end of the seat ring body, and a flexible sealing element mounted in the seat ring mounting end.

[0008] A mounting hole configured to mount a pivot shaft is arranged in the seat ring mounting end, and a mounting cavity communicated with the mounting hole is arranged in the seat ring mounting end.

[0009] The flexible sealing element comprises an assembly portion and a plugging portion connected with the assembly portion.

[0010] The assembly portion is mounted in the mounting cavity, and the plugging portion is sealed in the mounting hole; and

The plugging portion is provided with a wiring harness assembly hole and a water pipe mounting hole, and the water pipe mounting hole is located below the wiring harness assembly hole.

[0011] In an embodiment, a wiring harness assembly channel is arranged between a surface of the plugging portion and the wiring harness assembly hole, and a water pipe assembly channel is arranged between an outer surface of the plugging portion and the water pipe mounting hole.

[0012] In an embodiment, openings of the wiring harness assembly channel and the water pipe assembly channel are both located at a rear end of the plugging portion.

[0013] In an embodiment, the plugging portion is provided with two water pipe mounting holes arranged at an interval front and back.

[0014] In an embodiment, a communication channel is arranged between the two water pipe mounting holes.

[0015] In an embodiment, the plugging portion is integrally formed with the assembly portion.

[0016] In an embodiment, the flexible sealing element is a silicone sealing element.

[0017] In an embodiment, the seat ring mounting end comprises a mounting end lower cover and a mounting end upper cover. A rear end of the mounting end lower cover is provided with an arc-shaped lower cover groove, and a rear end of the mounting end upper cover is provided with an arc-shaped upper cover groove.

[0018] The mounting end upper cover is welded with the mounting end lower cover, and the upper cover groove is butted with or connected to the lower cover groove to form the mounting hole. In an embodiment, the mounting end upper cover and/or the mounting end lower cover is provided with a limiting plate extending into the mounting cavity, the assembly portion is provided with a limiting groove, and the limiting plate is inserted into the limiting groove.

[0019] In an embodiment, the seat ring body comprises a body upper cover and a body lower cover.

[0020] The mounting end upper cover and the body upper cover are integrally formed into a seat ring upper cover, and the mounting end lower cover and the body lower cover are integrally formed into a seat ring lower cover; and

The seat ring upper cover is welded with the seat ring lower cover.

[0021] By adopting the technical solutions above, the present disclosure has the following beneficial effects.

[0022] According to the seat ring provided by the present disclosure, the flexible sealing element is mounted in the seat ring mounting end. A half portion on an outer side of the mounting hole in the seat ring mounting end is sealed by the plugging portion. The plugging portion is provided with the wiring harness assembly hole and the water pipe mounting hole. A wiring harness and a water pipe can enter an inner side of the seat ring through the wiring harness assembly hole and the water pipe mounting hole.

ing hole respectively, without needing to separately form a through hole in the seat ring. Such a configuration may simplify the structure of the seat ring and facilitate the assembly of the wiring harness and the water pipe. The water pipe and the wiring harness are separated from each other without mutual interference. Thus, the stability of the structure may be improved.

BRIEF DESCRIPTION OF THE FIGURES

[0023] With reference to the drawings, the contents disclosed by the present disclosure should be more easily understood. It should be understood that these drawings are merely used for illustration and are not intended to limit the protection scope of the present disclosure. In the drawings:

FIG. 1 is a perspective view of a seat ring according to an example of the present disclosure;
 FIG. 2 is an enlarged view of a seat ring mounting end;
 FIG. 3 is a perspective view of a flexible sealing element;
 FIG. 4 is a sectional view of the flexible sealing element;
 FIG. 5 is a sectional view of the seat ring mounting end along a radial direction of a mounting hole;
 FIG. 6 is a sectional view of the seat ring mounting end along a mounting cavity;
 FIG. 7 is a schematic diagram of the flexible sealing element mounted between a mounting end upper cover and a mounting end lower cover;
 FIG. 8 is a sectional view of the seat ring mounting end along an axial direction of the mounting hole;
 FIG. 9 is an exploded view of the mounting end upper cover and the mounting end lower cover; and
 FIG. 10 is a flow chart of a method for assembling a seat ring according to an example of the present disclosure.

DETAILED DESCRIPTION

[0024] The specific embodiments of the present disclosure are further described with reference to the drawings hereinafter. Same or equivalent parts are denoted by same reference numerals. It should be noted that the terms "front", "back", "left", "right", "up" and "down" used in the following description refer to the directions in the drawings, and the terms "inner" and "outer" refer to the directions towards or far away from geometric centers of specific parts respectively.

[0025] As shown in FIG. 1-FIG. 8, an embodiment of the present disclosure provides a seat ring 1, which comprises a seat ring body 11, a seat ring mounting end 12 connected to a rear end of the seat ring body 11, and a flexible sealing element 3 mounted in the seat ring mounting end 12.

[0026] A mounting hole 123 configured to mount a pivot

shaft is arranged in the seat ring mounting end 12, and a mounting cavity 124 communicated to the mounting hole 123 is arranged in the seat ring mounting end 12.

[0027] The flexible sealing element 3 comprises an assembly portion 31 and a plugging portion 32 connected to the assembly portion 31.

[0028] The assembly portion 31 is mounted in the mounting cavity 124, and the plugging portion 32 seals the mounting hole 123.

[0029] The plugging portion 32 is provided with a wiring harness assembly hole 33 and a water pipe mounting hole 34, and the water pipe mounting hole 34 is located below the wiring harness assembly hole 33.

[0030] The present disclosure provides the seat ring 1, and a side portion of the seat ring is provided with a control panel 2. The seat ring 1 comprises the seat ring body 11 and two seat ring mounting ends 12. The seat ring body 11 has an annular shape. The two seat ring mounting ends 12 are configured to be assembled with the pivot shaft. The mounting hole 123 assembled with the pivot shaft is disposed in the seat ring mounting end 12. One flexible sealing element 3 may be assembled in each of the two seat ring mounting ends 12 or the seat ring mounting end 12 close to the control panel 2 as needed. Also, the mounting cavity 124 is arranged in the seat ring mounting end 12, and the mounting cavity 124 is connected to the mounting hole 123.

[0031] The flexible sealing element 3 is a rubber sealing element or a silicone sealing element and comprises the assembly portion 31 and the plugging portion 32. The plugging portion 32 is connected to the assembly portion 31. The assembly portion 31 is configured for assembly and is mounted or installed in the mounting cavity 124. The plugging portion 32 is configured to plug or block the mounting hole 123, and the plugging portion 32 is located in the mounting hole 123 to plug the mounting hole 123. A thickness of the plugging portion 32 is smaller than a width of the mounting hole 123 along an axial direction. The plugging portion 32 is close to an outside opening of the mounting hole 123.

[0032] In order to facilitate the mounting of the wiring harness and the water pipe, the plugging portion 32 is provided with the wiring harness assembly hole 33 and the water pipe mounting hole 34, and the water pipe mounting hole 34 is located below the wiring harness assembly hole 33.

[0033] During assembly, the wiring harness of the control panel 2 passes through the wiring harness assembly hole 33, and the water pipe passes through the water pipe mounting hole 34. The wiring harness and the water pipe may both pass through the mounting hole 123, without a need to separately form a through hole in the seat ring. Thus, a structure of the seat ring may be simplified. The plugging portion 32 may not only seal the mounting hole 123, but also separate the wiring harness from the water pipe so as to facilitate the assembly of the wiring harness and the water pipe. The water pipe and the wiring harness are separated from each other, without mutual interfer-

ence, and thus a stability of the structure may be improved.

[0034] In an embodiment, as shown in FIG. 2, FIG. 3, FIG. 4, and FIG. 7, a wiring harness assembly channel 35 is arranged between a surface of the plugging portion 32 and the wiring harness assembly hole 33, and a water pipe assembly channel 36 is arranged between an outer surface of the plugging portion 32 (or the same surface where the wiring harness assembly channel 35 is disposed) and the water pipe mounting hole 34.

[0035] During mounting, the wiring harness is inserted into the wiring harness assembly hole 33 through the wiring harness assembly channel 35, and the water pipe is inserted into the water pipe mounting hole 34 through the water pipe assembly channel 36. Then, the flexible sealing element 3 installed with the wiring harness and the water pipe is assembled to a designated position in the seat ring mounting end 12.

[0036] A width of the wiring harness assembly channel 35 is smaller than a diameter of the wiring harness assembly hole 33, and a width of the water pipe assembly channel 36 is smaller than a diameter of the water pipe mounting hole 34. The plugging portion 32 has a flexible structure. When the wiring harness or the water pipe is mounted, the wiring harness assembly channel 35 and the water pipe assembly channel 36 may be expanded. After the wiring harness and the water pipe are mounted in place, the wiring harness assembly channel 35 and the water pipe assembly channel 36 automatically reset to an initial state.

[0037] In an embodiment, as shown in FIG. 2, FIG. 3, FIG. 4, and FIG. 7, openings of the wiring harness assembly channel 35 and the water pipe assembly channel 36 are both located at a rear end of the plugging portion 32, and the opening of the wiring harness assembly channel 35 is located above the opening of the water pipe assembly channel 36, so that the wiring harness assembly channel 35 and the water pipe assembly channel 36 will not intersect. After mounting in place, the openings of the wiring harness assembly channel 35 and the water pipe assembly channel 36 are blocked by a wall of the mounting hole 123.

[0038] In an embodiment, as shown in FIG. 2, FIG. 3, FIG. 4, and FIG. 7, the plugging portion 32 is provided with two water pipe mounting holes 34 spaced apart from with each other along a front and back direction. A hot water pipe and a cold water pipe may be respectively disposed in the two water pipe mounting holes 34 if needed. Thus, different mounting requirements may be met.

[0039] In an embodiment, as shown in FIG. 3, FIG. 4, and FIG. 7, a communication channel 37 is arranged between the two water pipe mounting holes 34, and the two water pipe mounting holes 34 may share one water pipe mounting channel 36. Thus, the structure may be simplified.

[0040] In an embodiment, the plugging portion 32 is integrally formed with the assembly portion 31. The plug-

ging portion 32 and the assembly portion 31 are rubber members and may be integrally formed by vulcanization molding and thus may have a stable structure.

[0041] In an embodiment, the flexible sealing element 3 is the silicone sealing element, and the silicone sealing element is made of a silicone material with a hardness of 60°, which not only meets a requirement of structural hardness, but also meets a requirement of sealing performance.

[0042] In an embodiment, as shown in FIG. 5, FIG. 6, FIG. 7, and FIG. 9, the seat ring mounting end 12 comprises a mounting end lower cover 121 and a mounting end upper cover 122, a rear end of the mounting end lower cover 121 is provided with an arc-shaped lower cover groove 1231, and a rear end of the mounting end upper cover 122 is provided with an arc-shaped upper cover groove 1232.

[0043] The mounting end upper cover 122 is welded with or connected to the mounting end lower cover 121, and the upper cover groove 1232 is butted with or connected to the lower cover groove 1231 to form the mounting hole 123. The mounting cavity 124 is formed between the mounting end lower cover 121 and the mounting end upper cover 122. Accordingly, the mounting end lower cover 121 is provided with a lower cover mounting groove, and the mounting end upper cover 122 is provided with an upper cover mounting groove. When the mounting end upper cover 122 is welded with or connected to the mounting end lower cover 121, the upper cover mounting groove is butted with or connected to the lower cover mounting groove to form the mounting cavity 124.

[0044] During mounting, the wiring harness is inserted into the wiring harness assembly hole 33 through the wiring harness assembly channel 35, and the water pipe is inserted into the water pipe mounting hole 34 through the water pipe assembly channel 36. Then, the flexible sealing element 3 integrated or installed with the wiring harness and the water pipe is assembled to a designated position in the mounting end lower cover 121. Specifically, the assembly portion 31 is located in the lower cover mounting groove, and the plugging portion 32 is located in the arc-shaped lower cover groove 1231. Finally, the mounting end upper cover 122 is welded with the mounting end lower cover 121, so that the flexible sealing element 3 is assembled in place. Such a configuration may facilitate assembly and achieve a stable connection structure.

[0045] In an embodiment, as shown in FIG. 4-FIG. 7, the mounting end upper cover 122 and/or the mounting end lower cover 121 is provided with a limiting plate 125 extending into the mounting cavity 124, the assembly portion 31 is provided with a limiting groove 38, and the limiting plate 125 is inserted into the limiting groove 38. Thus, an assembly stability of the flexible sealing element 3 may be improved.

[0046] In an embodiment, the seat ring body 11 comprises a body upper cover and a body lower cover.

[0047] The mounting end upper cover 122 and the body upper cover are integrally formed into a seat ring upper cover, and the mounting end lower cover 121 and the body lower cover are integrally formed into a seat ring lower cover. The seat ring upper cover is welded with or connected to the seat ring lower cover.

[0048] In an embodiment, the seat ring 1 comprises the seat ring upper cover and the seat ring lower cover, and the seat ring upper cover is welded with or connected to the seat ring lower cover so as to have a stable structure.

[0049] The seat ring upper cover comprises the mounting end upper cover 122 and the body upper cover, and the mounting end upper cover 122 and the body upper cover are integrally formed. The seat ring lower cover comprises the mounting end lower cover 121 and the body lower cover, and the mounting end lower cover 121 and the body lower cover are integrally formed.

[0050] An embodiment of the present disclosure provides a seat ring mounting device configured to be connected to the seat ring body 11 as described. The seat ring mounting device comprises a seat ring mounting end 12 configured to be connected to the seat ring body 11. The seat ring mounting end comprises a mounting hole 123 configured to install a pivot shaft and a mounting cavity 124 connected to the mounting hole 123.

[0051] The seat ring mounting device also comprises a flexible sealing element 3 configured to be disposed in the seat ring mounting end 12. The flexible sealing element 3 comprises an assembly portion 31 configured to be disposed in the mounting cavity 124 and a plugging portion 32 connected to the assembly portion 31 and configured to seal the mounting hole 123. The plugging portion 32 comprises a wiring harness assembly hole 33 and at least one water pipe mounting hole 34 spaced apart from the wiring harness assembly hole 33.

[0052] An embodiment of the present disclosure provides a toilet comprising the seat ring 1 according to any embodiments as described above.

[0053] In an embodiment, the toilet includes a base (e.g., a pedestal, bowl, etc.) and a tank. The base is configured to be attached to another object such as a drainpipe, floor, or another suitable object. The base includes a bowl, a sump (e.g., a receptacle) disposed below the bowl, and a trapway fluidly connecting the bowl to a drainpipe or sewage line. The tank may be supported by the base, such as an upper surface of a rim. The tank may be integrally formed with the base as a single unitary body. In other embodiments, the tank may be formed separately from the base and coupled (e.g., attached, secured, fastened, connected, etc.) to the base. The toilet may further include a tank lid covering an opening and inner cavity in the tank. The toilet may include a seat assembly including a seat and a seat cover rotatably coupled to the base. The toilet may further include a hinge assembly.

[0054] In another embodiment, the toilet may be a tankless toilet. The toilet includes a base and a seat assembly coupled to the base. The base includes a bowl,

a sump disposed below the bowl, and a trapway fluidly connecting the bowl to a drainpipe or sewage line. The toilet includes a waterline that supplies the toilet with water. The toilet may further include a seat assembly including a seat and a seat cover rotatably coupled to the base. The toilets described above are provided herein as non-limiting examples of toilets that may be configured to utilize aspects of the present disclosure.

[0055] In some examples, the bidet may be included in a seat or pedestal of a toilet. In other examples, the bidet may be manufactured separately from and attached or coupled to a seat or pedestal of a toilet. The bidet includes a housing. The housing is configured to receive a flow of water through a housing inlet and dispense the flow of water from a housing outlet. The housing inlet and housing outlet may be located on opposite ends of the housing from one another, such that water may flow through the housing from the housing inlet to the housing outlet. In some examples, the housing further includes a chamber. As the housing receives the flow of water, the chamber may fill with water and provide a flow of water between the housing inlet and the housing outlet. The chamber may be configured to contain the flow of water and direct the flow of water from the housing inlet to the housing outlet. After the chamber has filled with water, the flow of water may travel along a substantially linear path between the housing inlet and the housing outlet. In some examples, one or more walls within the housing may be included to help direct a flow of water between the housing inlet and the housing outlet. The bidet may further include a housing inlet conduit configured to direct a flow of water to the housing inlet. The housing inlet conduit may be coupled to a water supply such as tank or waterline. The housing may further include a gear assembly or a portion of the gear assembly.

[0056] FIG. 10 is a flow chart of a method for assembling a seat ring according to an example of the present disclosure. The seat ring assembled by the method may be the seat ring 1 according to any of the foregoing embodiments and may be configured to perform an operation, function, or the like as described in the present disclosure.

[0057] At act S101, a user may install the seat ring mounting end 12 at the seat ring body 11. As noted above, the seat ring mounting end 12 comprises the mounting hole 123 configured to mount a pivot shaft and comprises the mounting cavity 124 communicated to the mounting hole 123.

[0058] At act S102, the user may insert the wiring harness into the wiring harness assembly hole 33 of the flexible sealing element 3 via the wiring harness assembly channel 35. As noted above, the wiring harness assembly channel 35 is arranged between a surface of the plugging portion 32 and the wiring harness assembly hole 33. The opening of the wiring harness assembly channel 35 is located at the rear end of the plugging portion 32.

[0059] At act S103, the user may insert the at least one

water pipe into the at least one water pipe mounting hole 34 of the flexible sealing element 3 via the water pipe assembly channel 36. As noted above, the water pipe assembly channel 36 is arranged between an outer surface of the plugging portion 32 (or the same surface where the wiring harness assembly channel 35 is disposed) and the water pipe mounting hole 34.

[0060] In an embodiment, a hot water pipe and a cold water pipe may be respectively installed in two water pipe mounting holes 34. The communication channel 37 is arranged between the two water pipe mounting holes 34. Thus, the user may insert one of the hot water pipe and the cold water pipe into one of the two water pipe mounting holes 34 via the water pipe assembly channel 36 and the communication channel 37.

[0061] At act S104, the user may install the flexible sealing element 3 in the mounting end lower cover 121 of the seat ring mounting end 12. As noted above, the flexible sealing element 3 comprises the assembly portion 31 and the plugging portion 32. The plugging portion 32 comprises the wiring harness assembly hole 33 and the at least one water pipe mounting hole 34. The rear end of the mounting end lower cover 121 is provided with the arc-shaped lower cover groove 1231. Thus, the user may install the plugging portion 32 in the arc-shaped lower cover groove 1231. The mounting end lower cover 121 is provided with the lower cover mounting groove. Thus, the user may install the assembly portion 31 in the lower cover mounting groove.

[0062] At act S105, the user may connect the mounting end upper cover 122 of the seat ring mounting end to the mounting end lower cover 121 of the seat ring mounting end 12. As noted above, the rear end of the mounting end upper cover 122 is provided with the arc-shaped upper cover groove 1232. The mounting end upper cover 122 is provided with an upper cover mounting groove. Thus, when the mounting end upper cover 122 is welded with or connected to the mounting end lower cover 121, the upper cover groove 1232 is butted with or connected to the lower cover groove 1231 to form the mounting hole 123, and the upper cover mounting groove is butted with or connected to the lower cover mounting groove to form the mounting cavity 124.

[0063] The acts in the method for assembling the seat ring may be performed in any sequences.

[0064] In the present disclosure, the flexible sealing element 3 (e.g., a rubber sealing element or a silicone sealing element) is used in the above embodiments. However, a non-flexible sealing element 3 may also be used in the present disclosure.

[0065] The above technical solutions may be combined as required to achieve the best technical effect.

[0066] The above description is merely the principle and the embodiments of the present disclosure. It should be pointed out that, for those of ordinary skill in the art, several other modifications may be made based on the principle of the present disclosure as long as falling within the scope of protection defined by the claims.

[0067] An aspect provides a seat ring, comprising a seat ring body, a seat ring mounting end connected at a rear end of the seat ring body and a flexible sealing element mounted in the seat ring mounting end, wherein:

a mounting hole for mounting a pivot shaft is arranged in the seat ring mounting end, and a mounting cavity communicated with the mounting hole is arranged in the seat ring mounting end;

the flexible sealing element comprises an assembly portion and a plugging portion connected with the assembly portion;

the assembly portion is mounted in the mounting cavity, and the plugging portion is sealed in the mounting hole; and

the plugging portion is provided with a wiring harness assembly hole and a water pipe mounting hole, and the water pipe mounting hole is located below the wiring harness assembly hole.

[0068] In an implementation, a wiring harness assembly channel is arranged between a surface of the plugging portion and the wiring harness assembly hole, and a water pipe assembly channel is arranged between an outer surface of the plugging portion and the water pipe mounting hole. Openings of the wiring harness assembly channel and the water pipe assembly channel may both be located at a rear end of the plugging portion.

[0069] The plugging portion may be provided with two water pipe mounting holes arranged at an interval front and back.

[0070] A communication channel may be arranged between the two water pipe mounting holes. The plugging portion may be integrally formed with the assembly portion.

[0071] The flexible sealing element may be a silicone sealing element.

[0072] In an implementation, the seat ring mounting end comprises a mounting end lower cover and a mounting end upper cover, a rear end of the mounting end lower cover is provided with an arc-shaped lower cover groove, and a rear end of the mounting end upper cover is provided with an arc-shaped upper cover groove; and the mounting end upper cover is welded with the mounting end lower cover, and the upper cover groove is butted with the lower cover groove to form the mounting hole.

[0073] In an implementation, the mounting end upper cover and/or the mounting end lower cover is provided with a limiting plate extending into the mounting cavity, the assembly portion is provided with a limiting groove, and the limiting plate is inserted into the limiting groove.

[0074] In an implementation, the seat ring body comprises a body upper cover and a body lower cover; the mounting end upper cover and the body upper cover are integrally formed into a seat ring upper cover, and the mounting end lower cover and the body lower cover are integrally formed into a seat ring lower cover; and the seat ring upper cover is welded with the seat ring lower cover.

Claims**1.** A seat ring mounting device, comprising;

a seat ring mounting end (12) configured to be connected to a seat ring body (11), the seat ring mounting end (12) comprising:

a mounting hole (123) configured to install a pivot shaft; and
a mounting cavity (124) connected to the mounting hole (123); and

a sealing element (3) configured to be disposed in the seat ring mounting end (12), the sealing element (3) comprising:

an assembly portion (31) configured to be disposed in the mounting cavity (124); and
a plugging portion (32) connected to the assembly portion (31) and configured to seal the mounting hole (123), the plugging portion (32) comprising a wiring harness assembly hole (33) and at least one water pipe mounting hole (34) spaced apart from the wiring harness assembly hole (33).

2. The seat ring mounting device according to claim 1, further comprising:

a wiring harness assembly channel (35) connecting a surface of the plugging portion (32) and the wiring harness assembly hole (33); and
a water pipe assembly channel (36) connecting between the surface of the plugging portion (32) and the water pipe mounting hole (34); optionally
wherein openings of the wiring harness assembly channel (35) and the water pipe assembly channel (36) are both disposed at a rear end of the plugging portion (32).

3. The seat ring mounting device according to claim 1 or claim 2, wherein the at least one water pipe mounting hole (34) comprises two water pipe mounting holes (34) spaced apart from each other, optionally wherein a communication channel (37) is connected between the two water pipe mounting holes (34).**4.** The seat ring mounting device according to claim 1, claim 2 or claim 3, wherein:

(i) the plugging portion (32) is integrally formed with the assembly portion (31); and/or
(ii) the at least one water pipe mounting hole (34) is disposed below the wiring harness assembly hole (33).

5. The seat ring mounting device according to any one

of claims 1 to 4, wherein the sealing element (3) is a flexible sealing element.

6. The seat ring mounting device according to claim 5, wherein the flexible sealing element comprises a rubber sealing element or a silicone sealing element.**7.** The seat ring mounting device according to any one of claims 1 to 6,

wherein the seat ring mounting end (12) comprises:

a mounting end lower cover (121) comprising an arc-shaped lower cover groove (1231) disposed at a rear end of the mounting end lower cover (121); and
a mounting end upper cover (122) comprising an arc-shaped upper cover groove (1232) disposed at a rear end of the mounting end upper cover (122), and

wherein when the mounting end upper cover (122) is connected to the mounting end lower cover (121), the mounting cavity (124) is formed between the mounting end upper cover (122) and the mounting end lower cover (121), and the mounting hole (123) is formed between the upper cover groove (1232) and the lower cover groove (1231).

8. The seat ring mounting device according to claim 7,

wherein the assembly portion (31) comprises a limiting groove (38),
wherein the mounting end upper cover (122) or the mounting end lower cover (121) comprises a limiting plate (125) extending into the mounting cavity (124), and
wherein a limiting plate (125) is configured to be inserted into the limiting groove (38).

9. A toilet seat ring (1), comprising:

a seat ring body (11) and the seat ring mounting device according to any one of claims 1 to 8.

10. The toilet seat ring according to claim 9,

wherein the seat ring body (11) comprises a body upper cover and a body lower cover, wherein the mounting end upper cover (122) and the body upper cover are integrally formed into a seat ring upper cover, wherein the mounting end lower cover (121) and the body lower cover are integrally formed into a seat ring lower cover, and wherein the seat ring upper cover is connected to the seat ring lower cover.

11. A method for assembling a toilet seat ring (1), the method comprising:

installing a seat ring mounting end (12) at a seat ring body (11);
 inserting a wiring harness into a wiring harness assembly hole (33) of a sealing element (3) via a wiring harness assembly channel (35);
 inserting at least one water pipe into at least one water pipe mounting hole (34) of the sealing element (3) via a water pipe assembly channel (36);
 installing the sealing element (3) in a mounting end lower cover (121) of the seat ring mounting end (12); and
 connecting a mounting end upper cover (122) of the seat ring mounting end (12) to the mounting end lower cover (121) of the seat ring mounting end (12).

12. The method according to claim 11,

wherein the installing the sealing element (3) in the mounting end lower cover (121) of the seat ring mounting end (12) comprises:

installing a plugging portion (32), comprising the wiring harness assembly hole (33) and the at least one water pipe mounting hole (34), of the sealing element (3) in a mounting hole (123); and
 installing an assembly portion (31) of the sealing element (3) in a mounting cavity (124) of the seat ring mounting end (12) by inserting a limiting plate (125) of the mounting end upper cover (122) of the seat ring mounting end (12) or the mounting end lower cover (121) of the seat ring mounting end (12) into a limiting groove (38) of the assembly portion (31),

wherein the mounting hole (123) and the mounting cavity (124) are formed by connecting the mounting end upper cover (122) of the seat ring mounting end (12) to the mounting end lower cover (121) of the seat ring mounting end (12).

13. The method according to claim 11 or claim 12, further comprising:

wherein the at least one water pipe mounting hole (34) comprises two water pipe mounting holes (34) connected with each other via a communication channel (37),
 wherein the at least one water pipe comprises a hot water pipe and a cold water pipe, and
 wherein the inserting the at least one water pipe into the at least one water pipe mounting hole

(34) of the sealing element (3) via the water pipe assembly channel (36) comprises:

inserting one of the hot water pipe and the cold water pipe into one of the two water pipe mounting holes (34) via the water pipe assembly channel (36) and the communication channel (37).

14. The method according to claim 11, claim 12 or claim 13,

wherein the sealing element (3) is a flexible sealing element,
 wherein a width of the wiring harness assembly channel (35) is smaller than a diameter of the wiring harness assembly hole (33),
 wherein the inserting the wiring harness into the wiring harness assembly hole (33) of the sealing element (3) via the wiring harness assembly channel (35) comprises:
 expanding the width of the wiring harness assembly channel (35) when inserting the wiring harness.

15. The method according to any one of claims 11 to 14,

wherein the sealing element (3) is a flexible sealing element,
 wherein a width of the water pipe assembly channel (36) is smaller than a diameter of the at least one water pipe mounting hole (34),
 wherein the inserting the at least one water pipe into the at least one water pipe mounting hole (34) of the sealing element (3) via the water pipe assembly channel (36) comprises:
 expanding the width of the water pipe assembly channel (36) when inserting the at least one water pipe.

Patentansprüche

1. Sitzring-Montagevorrichtung, umfassend;

ein Sitzring-Montageende (12), das konfiguriert ist, um mit einem Sitzringkörper (11) verbunden zu werden, wobei das Sitzring-Montageende (12) umfasst:

ein Montageloch (123), das konfiguriert ist, um eine Schwenkwelle zu installieren; und
 einen Montagehohlraum (124), der mit dem Montageloch (123) verbunden ist; und

ein Dichtungselement (3), das konfiguriert ist, um im Sitzring-Montageende (12) angeordnet zu werden, wobei das Dichtungselement (3) umfasst:

einen Anordnungsabschnitt (31), der konfigu-

- riert ist, um im Montagehohlraum (124) angeordnet zu werden; und
einen Anschlussabschnitt (32), der mit dem Anordnungsabschnitt (31) verbunden und konfiguriert ist, um das Montageloch (123) abzu- 5
dichten, wobei der Anschlussabschnitt (32) ein Kabelbaum-Anordnungsloch (33) und mindestens ein Wasserrohr-Montageloch (34), das vom Kabelbaum-Anordnungsloch (33) beab- 10
standet ist, umfasst.
2. Sitzring-Montagevorrichtung nach Anspruch 1, weiter umfassend:
- einen Kabelbaum-Anordnungskanal (35), der 15
eine Oberfläche des Anschlussabschnitts (32) und das Kabelbaum-Anordnungsloch (33) verbindet; und
einen Wasserrohr-Anordnungskanal (36), der 20
zwischen der Oberfläche des Anschlussabschnitts (32) und dem Wasserrohr-Montageloch (34) verbindet; optional
wobei Öffnungen des Kabelbaum-Anordnungs- 25
kanals (35) und des Wasserrohr-Anordnungs-
kanals (36) beide an einem hinteren Ende des Anschlussabschnitts (32) angeordnet sind.
3. Sitzring-Montagevorrichtung nach Anspruch 1 oder Anspruch 2, wobei das mindestens eine Wasser- 30
rohr-Montageloch (34) zwei Wasserrohr-Montagelöcher (34) umfasst, die voneinander beabstandet sind, wobei optional ein Verbindungskanal (37) zwischen den beiden Wasserrohr-Montagelöchern (34) verbunden ist. 35
4. Sitzring-Montagevorrichtung nach Anspruch 1, Anspruch 2 oder Anspruch 3, wobei:
- (i) der Anschlussabschnitt (32) integral mit dem Anordnungsabschnitt (31) gebildet ist; und/oder 40
(ii) das mindestens eine Wasserrohr-Montageloch (34) unterhalb des Kabelbaum-Anordnungslochs (33) angeordnet ist.
5. Sitzring-Montagevorrichtung nach einem der Ansprüche 1 bis 4, wobei das Dichtungselement (3) ein flexibles Dichtungselement ist. 45
6. Sitzring-Montagevorrichtung nach Anspruch 5, wobei das flexible Dichtungselement ein Gummidichtungselement oder ein Silikondichtungselement umfasst. 50
7. Sitzring-Montagevorrichtung nach einem der Ansprüche 1 bis 6, 55
wobei das Sitzring-Montageende (12) umfasst:
- eine untere Montageendabdeckung (121), die eine bogenförmige untere Abdeckungs-
nut (1231) umfasst, die an einem hinterem Ende der unteren Montageendabdeckung (121) angeordnet ist; und
eine obere Montageendabdeckung (122), die eine bogenförmige obere Abdeckungs-
nut (1232) umfasst, die an einem hinterem Ende der oberen Montageendabdeckung (122) angeordnet ist, und
wobei, wenn die obere Montageendabdeckung (122) mit der unteren Montageendabdeckung (121) verbunden ist, der Montagehohlraum (124) zwischen der oberen Montageendabdeckung (122) und der unteren Montageendabdeckung (121) gebildet ist, und das Montageloch (123) zwischen der oberen Abdeckungs-
nut (1232) und der unteren Abdeckungs-
nut (1231) gebildet ist.
8. Sitzring-Montagevorrichtung nach Anspruch 7,
wobei der Anordnungsabschnitt (31) eine Begrenzungs-
nut (38) umfasst,
wobei die obere Montageendabdeckung (122) oder die untere Montageendabdeckung (121) eine Begrenzungsplatte (125) umfasst, die sich in den Montagehohlraum (124) erstreckt, und
wobei eine Begrenzungsplatte (125) konfiguriert ist, um in die Begrenzungs-
nut (38) eingesetzt zu werden.
9. Toilettensitzring (1), umfassend:
einen Sitzringkörper (11) und die Sitzring-Montage-
vorrichtung nach einem der Ansprüche 1 bis 8.
10. Toilettensitzring nach Anspruch 9,
wobei der Sitzringkörper (11) eine obere Körper-
abdeckung und eine untere Körperabdeckung umfasst,
wobei die obere Montageendabdeckung (122) und die obere Körperabdeckung integral zu einer oberen Sitzringabdeckung gebildet sind,
wobei die untere Montageendabdeckung (121) und die untere Körperabdeckung integral zu einer unteren Sitzringabdeckung gebildet sind, und
wobei die obere Sitzringabdeckung mit der unteren Sitzringabdeckung verbunden ist.
11. Verfahren zum Zusammensetzen eines Toilettensitzrings (1), wobei das Verfahren umfasst:
Installieren eines Sitzring-Montageendes (12) an einem Sitzringkörper (11);
Einsetzen eines Kabelbaums in ein Kabelbaum-

Anordnungsloch (33) eines Dichtungselements (3) über einen Kabelbaum-Anordnungskanal (35);

Einsetzen mindestens eines Wasserrohres in mindestens ein Wasserrohr-Montageloch (34) des Dichtungselements (3) über einen Wasserrohr-Anordnungskanal (36);

Installieren des Dichtungselements (3) in einer unteren Montageendabdeckung (121) des Sitzring-Montageendes (12); und

Verbinden einer oberen Montageendabdeckung (122) des Sitzring-Montageendes (12) mit der unteren Montageendabdeckung (121) des Sitzring-Montageendes (12).

12. Verfahren nach Anspruch 11,

wobei das Installieren des Dichtungselements (3) in der unteren Montageendabdeckung (121) des Sitzring-Montageendes (12) umfasst:

Installieren eines Anschlussabschnitts (32), der das Kabelbaum-Anordnungsloch (33) und das mindestens eine Wasserrohr-Montageloch (34) des Dichtungselements (3) umfasst, in einem Montageloch (123); und

Installieren eines Anordnungsabschnitts (31) des Dichtungselements (3) in einen Montagehohlraum (124) des Sitzring-Montageendes (12) durch Einsetzen einer Begrenzungsplatte (125) der oberen Montageendabdeckung (122) des Sitzring-Montageendes (12) oder der unteren Montageendabdeckung (121) des Sitzring-Montageendes (12) in eine Begrenzungsnut (38) des Anordnungsabschnitts (31),

wobei das Montageloch (123) und der Montagehohlraum (124) durch Verbinden der oberen Montageendabdeckung (122) des Sitzring-Montageendes (12) mit der unteren Montageendabdeckung (121) des Sitzring-Montageendes (12) gebildet werden.

13. Verfahren nach Anspruch 11 oder Anspruch 12, weiter umfassend:

wobei das mindestens eine Wasserrohr-Montageloch (34) zwei Wasserrohr-Montagelöcher (34) umfasst, die über einen Verbindungskanal (37) miteinander verbunden sind,

wobei das mindestens eine Wasserrohr ein Warmwasserrohr und ein Kaltwasserrohr umfasst, und

wobei das Einsetzen des mindestens einen Wasserrohres in das mindestens eine Wasserrohr-Montageloch (34) des Dichtungselements

(3) über den Wasserrohr-Anordnungskanal (36) umfasst:

Einsetzen eines von dem Warmwasserrohr und dem Kaltwasserrohr in eines von den beiden Wasserrohr-Montagelöchern (34) über den Wasserrohr-Anordnungskanal (36) und den Verbindungskanal (37).

14. Verfahren nach Anspruch 11, Anspruch 12 oder Anspruch 13,

wobei das Dichtungselement (3) ein flexibles Dichtungselement ist, wobei eine Breite des Kabelbaum-Anordnungskanals (35) kleiner ist als ein Durchmesser des Kabelbaum-Anordnungsloches (33),

wobei das Einsetzen des Kabelbaums in das Kabelbaum-Anordnungsloch (33) des Dichtungselements (3) über den Kabelbaum-Anordnungskanal (35) umfasst:

Erweitern der Breite des Kabelbaum-Anordnungskanals (35) beim Einsetzen des Kabelbaums.

15. Verfahren nach einem der Ansprüche 11 bis 14,

wobei das Dichtungselement (3) ein flexibles Dichtungselement ist, wobei eine Breite des Wasserrohr-Anordnungskanals (36) kleiner ist als ein Durchmesser des mindestens einen Wasserrohr-Montageloches (34),

wobei das Einsetzen des mindestens einen Wasserrohres in das mindestens eine Wasserrohr-Montageloch (34) des Dichtungselements (3) über den Wasserrohr-Anordnungskanal (36) umfasst:

Erweitern der Breite des Wasserrohr-Anordnungskanals (36) beim Einsetzen des mindestens einen Wasserrohres.

Revendications

1. Dispositif de montage de lunette, comprenant ;

une extrémité de montage de lunette (12) configurée pour être reliée à un corps de lunette (11), l'extrémité de montage de lunette (12) comprenant :

un trou de montage (123) configuré pour installer un axe pivot ; et

une cavité de montage (124) reliée au trou de montage (123) ; et

un élément d'étanchéité (3) configuré pour être disposé dans l'extrémité de montage de lunette

- (12), l'élément d'étanchéité (3) comprenant :
 une partie d'assemblage (31) conçue pour être
 disposée dans la cavité de montage (124) ; et
 une partie de bouchage (32) reliée à la partie
 d'assemblage (31) et configurée pour sceller le
 trou de montage (123), la partie de bouchage
 (32) comprenant un trou d'assemblage de fais-
 ceau de câbles (33) et au moins un trou de
 montage de tuyau d'eau (34) espacé du trou
 d'assemblage de faisceau de câbles (33). 5 10
2. Dispositif de montage de lunette selon la revendica-
 tion 1, comprenant en outre :
- un canal d'assemblage de faisceau de câbles 15
 (35) reliant une surface de la partie de bouchage
 (32) et le trou d'assemblage de faisceau de
 câbles (33) ; et
 un canal d'assemblage de tuyau d'eau (36)
 reliant la surface de la partie de bouchage 20
 (32) et le trou de montage de tuyau d'eau
 (34) ; facultativement,
 dans lequel des ouvertures du canal d'assem-
 blage de faisceau de câbles (35) et du canal
 d'assemblage de tuyau d'eau (36) sont toutes 25
 deux disposées à une extrémité arrière de la
 partie de bouchage (32).
3. Dispositif de montage de lunette selon la revendica-
 tion 1 ou la revendication 2, dans lequel le au moins 30
 un trou de montage de tuyau d'eau (34) comprend
 deux trous de montage de tuyau d'eau (34) espacés
 l'un de l'autre, facultativement dans lequel un canal
 de communication (37) est relié entre les deux trous
 de montage de tuyau d'eau (34). 35
4. Dispositif de fixation de lunette selon la revendica-
 tion 1, la revendication 2 ou la revendication 3, dans
 lequel : 40
- (i) la partie de bouchage (32) est formée d'un
 seul tenant avec la partie d'assemblage (31) ;
 et/ou
 (ii) le au moins un trou de montage de tuyau
 d'eau (34) est disposé sous le trou d'assem- 45
 blage de faisceau de câbles (33).
5. Dispositif de montage de lunette selon l'une quel-
 conque des revendications 1 à 4, dans lequel l'élé- 50
 ment d'étanchéité (3) est un élément d'étanchéité
 flexible.
6. Dispositif de montage de lunette selon la revendica-
 tion 5, dans lequel l'élément d'étanchéité flexible 55
 comprend un élément d'étanchéité en caoutchouc
 ou un élément d'étanchéité en silicone.
7. Dispositif de montage de lunette selon l'une quel-

conque des revendications 1 à 6,

dans lequel l'extrémité de montage de lunette
 (12) comprend :

un couvercle inférieur d'extrémité de mon-
 tage (121) comprenant une rainure de cou-
 vercle inférieur en forme d'arc (1231) dis-
 posée à une extrémité arrière du couvercle
 inférieur d'extrémité de montage (121) ; et
 un couvercle supérieur d'extrémité de mon-
 tage (122) comprenant une rainure de cou-
 vercle supérieur en forme d'arc (1232) dis-
 posée à une extrémité arrière du couvercle
 supérieur d'extrémité de montage (122), et

dans lequel, lorsque le couvercle supérieur
 d'extrémité de montage (122) est relié au cou-
 vercle inférieur d'extrémité de montage (121), la
 cavité de montage (124) est formée entre le
 couvercle supérieur d'extrémité de montage
 (122) et le couvercle inférieur d'extrémité de
 montage (121) et le trou de montage (123) est
 formé entre la rainure de couvercle supérieur
 (1232) et la rainure de couvercle inférieur
 (1231).

8. Dispositif de montage de lunette selon la revendica-
 tion 7,

dans lequel la partie d'assemblage (31)
 comprend une rainure de limitation (38),
 dans lequel le couvercle supérieur d'extrémité
 de montage (122) ou le couvercle inférieur d'ex-
 trémité de montage (121) comprend une plaque
 de limitation (125) s'étendant dans la cavité de
 montage (124), et
 dans lequel une plaque de limitation (125) est
 configurée pour être insérée dans la rainure de
 limitation (38).

9. Lunette de toilette (1), comprenant :
 un corps de lunette (11) et le dispositif de montage de
 lunette selon l'une quelconque des revendications 1
 à 8.

10. Lunette de toilette selon la revendication 9,

dans laquelle le corps de lunette (11) comprend
 un couvercle supérieur de corps et un couvercle
 inférieur de corps,
 dans laquelle le couvercle supérieur d'extrémité
 de montage (122) et le couvercle supérieur de
 corps sont formés d'un seul tenant dans un
 couvercle supérieur de lunette,
 dans laquelle le couvercle inférieur d'extrémité
 de montage (121) et le couvercle inférieur de
 corps sont formés d'un seul tenant dans un

couvercle inférieur de lunette, et
dans laquelle le couvercle supérieur de lunette
est relié au couvercle inférieur de lunette.

- 11.** Procédé d'assemblage d'une lunette de toilette (1), 5
le procédé comprenant :

l'installation d'une extrémité de montage de lunette (12) sur un corps de lunette (11) ;
l'insertion d'un faisceau de câbles dans un trou d'assemblage de faisceau de câbles (33) d'un élément d'étanchéité (3) via un canal d'assemblage de faisceau de câbles (35) ;
l'insertion d'au moins un tuyau d'eau dans au moins un trou de montage de tuyau d'eau (34) de l'élément d'étanchéité (3) via un canal d'assemblage de tuyau d'eau (36) ;
l'installation de l'élément d'étanchéité (3) dans un couvercle inférieur d'extrémité de montage (121) de l'extrémité de montage de lunette (12) ; 20
et
le raccordement d'un couvercle supérieur d'extrémité de montage (122) de l'extrémité de montage de lunette (12) au couvercle inférieur d'extrémité de montage (121) de l'extrémité de montage de lunette (12). 25

- 12.** Procédé selon la revendication 11,

dans lequel l'installation de l'élément d'étanchéité (3) dans le couvercle inférieur d'extrémité de montage (121) de l'extrémité de montage de lunette (12) comprend :

l'installation d'une partie de bouchage (32), 35
comprenant le trou d'assemblage de faisceau de câbles (33) et le au moins un trou de montage de tuyau d'eau (34), de l'élément d'étanchéité (3) dans un trou de montage (123) ; et
l'installation d'une partie d'assemblage (31) de l'élément d'étanchéité (3) dans une cavité de montage (124) de l'extrémité de montage de lunette (12) en insérant une plaque de limitation (125) du couvercle supérieur d'extrémité de montage (122) de l'extrémité de montage de lunette (12) ou du couvercle inférieur d'extrémité de montage (121) de l'extrémité de montage de lunette (12) dans une rainure de limitation (38) de la partie d'assemblage (31), 40 45 50

dans lequel le trou de montage (123) et la cavité de montage (124) sont formés en reliant le couvercle supérieur d'extrémité de montage (122) de l'extrémité de montage de lunette (12) au couvercle inférieur d'extrémité de montage (121) de l'extrémité de montage de lunette (12). 55

- 13.** Procédé selon la revendication 11 ou la revendication 12, comprenant en outre :

dans lequel le au moins un trou de montage de tuyau d'eau (34) comprend deux trous de montage de tuyau d'eau (34) reliés entre eux par un canal de communication (37),
dans lequel le au moins un tuyau d'eau comprend un tuyau d'eau chaude et un tuyau d'eau froide, et
dans lequel l'insertion du au moins un tuyau d'eau dans le au moins un trou de montage de tuyau d'eau (34) de l'élément d'étanchéité (3) via le canal d'assemblage de tuyau d'eau (36) comprend :
l'insertion d'un du tuyau d'eau chaude et du tuyau d'eau froide dans un des deux trous de montage de tuyau d'eau (34) via le canal d'assemblage de tuyau d'eau (36) et le canal de communication (37).

- 14.** Procédé selon la revendication 11, la revendication 12 ou la revendication 13,

dans lequel l'élément d'étanchéité (3) est un élément d'étanchéité flexible,
dans lequel une largeur du canal d'assemblage de faisceau de câbles (35) est plus petite qu'un diamètre du trou d'assemblage de faisceau de câbles (33),
dans lequel l'insertion du faisceau de câbles dans le trou d'assemblage de faisceau de câbles (33) de l'élément d'étanchéité (3) via le canal d'assemblage de faisceau de câbles (35) comprend :
l'élargissement de la largeur du canal d'assemblage de faisceau de câbles (35) lors de l'insertion du faisceau de câbles.

- 15.** Procédé selon l'une quelconque des revendications 11 à 14,

dans lequel l'élément d'étanchéité (3) est un élément d'étanchéité flexible,
dans lequel une largeur du canal d'assemblage de tuyau d'eau (36) est plus petite qu'un diamètre du au moins un trou de montage de tuyau d'eau (34),
dans lequel l'insertion du au moins un tuyau d'eau dans le au moins un trou de montage de tuyau d'eau (34) de l'élément d'étanchéité (3) via le canal d'assemblage de tuyau d'eau (36) comprend :
l'élargissement de la largeur du canal d'assemblage de tuyau d'eau (36) lors de l'insertion du au moins un tuyau d'eau.

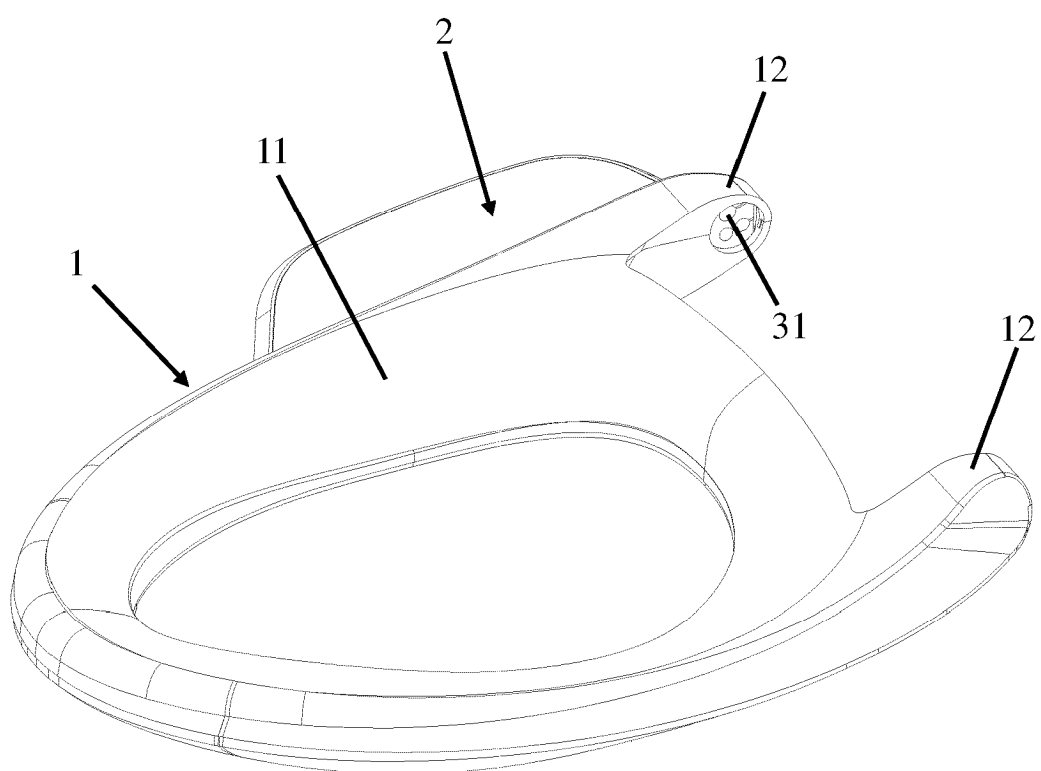


FIG. 1

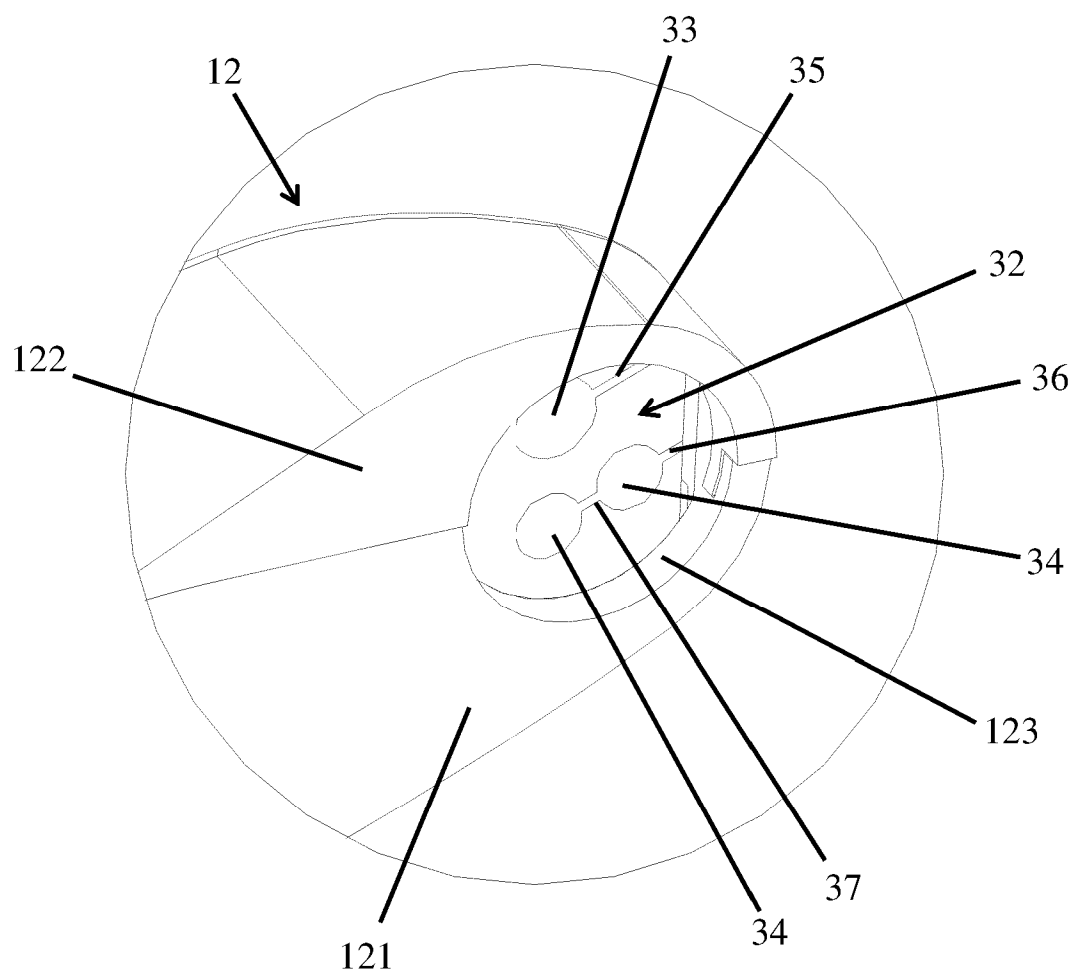


FIG. 2

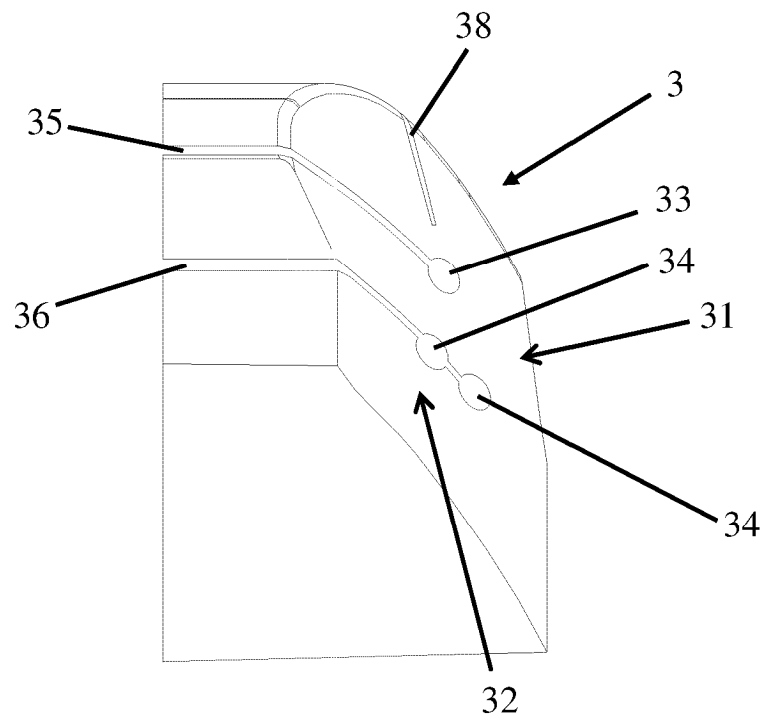


FIG. 3

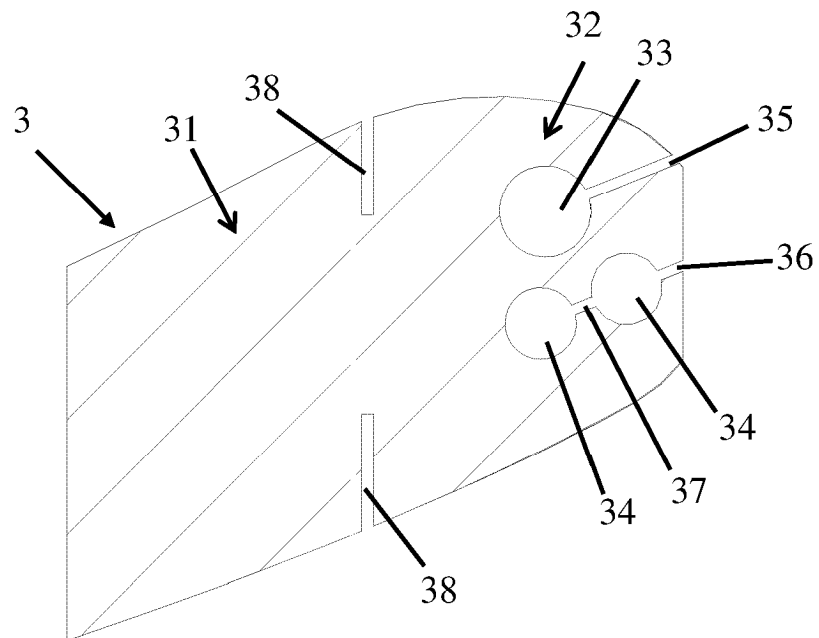


FIG. 4

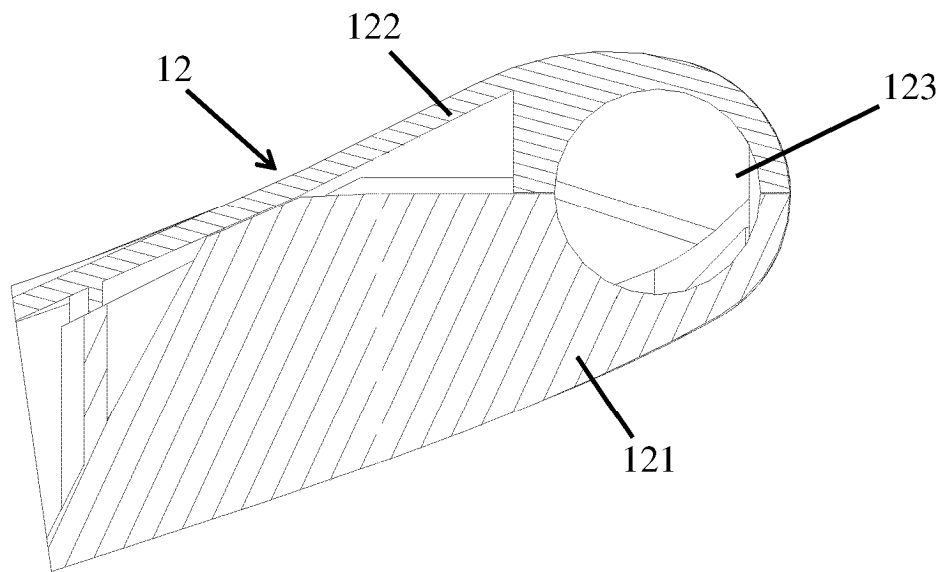


FIG. 5

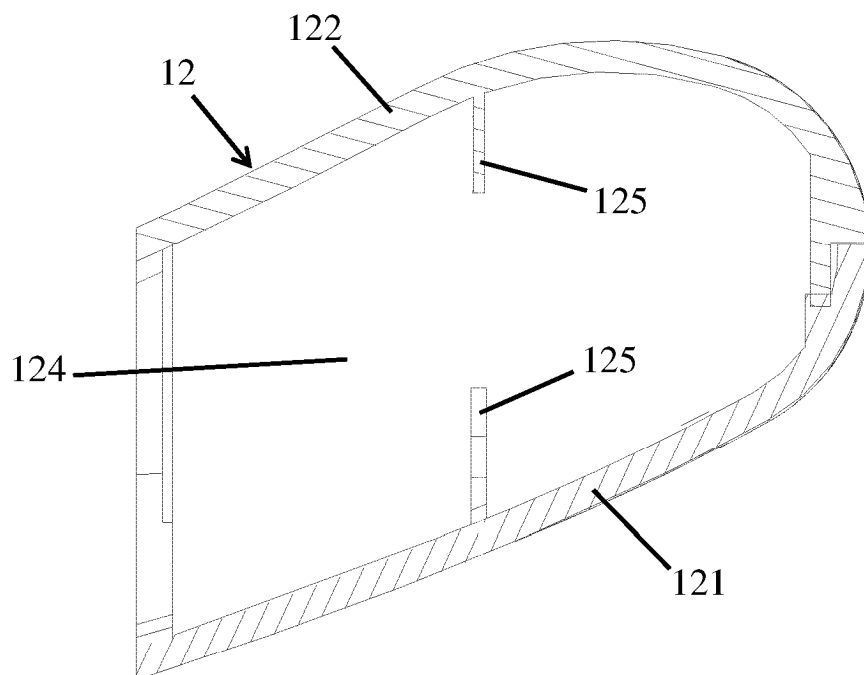


FIG. 6

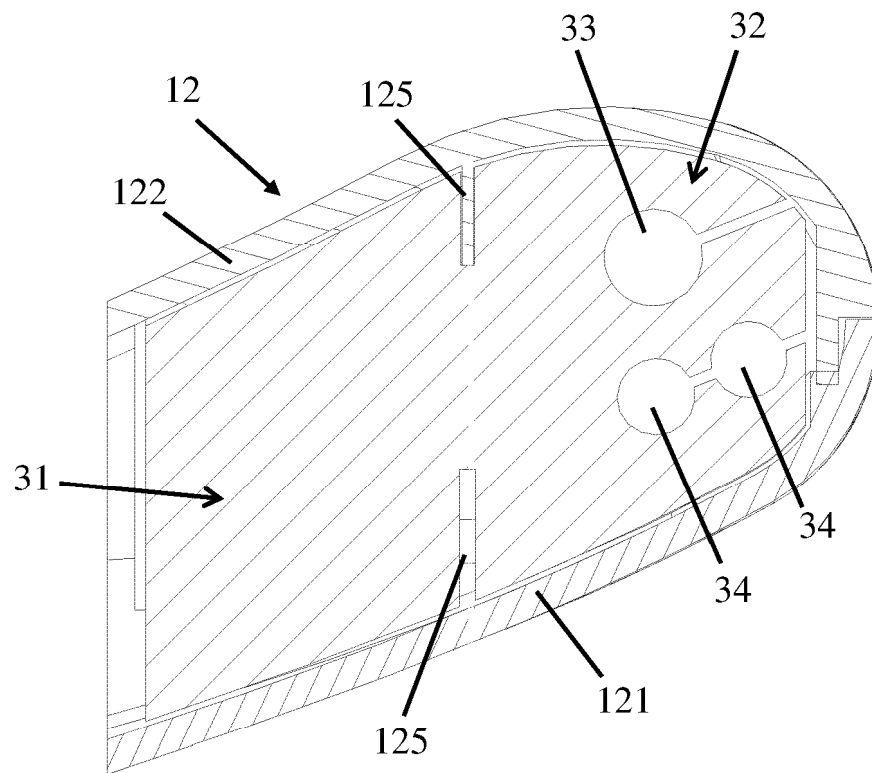


FIG. 7

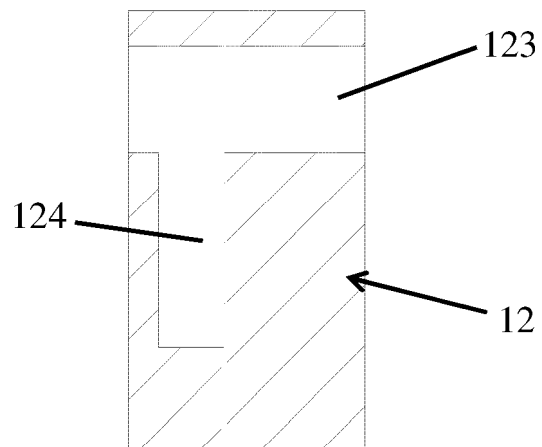


FIG. 8

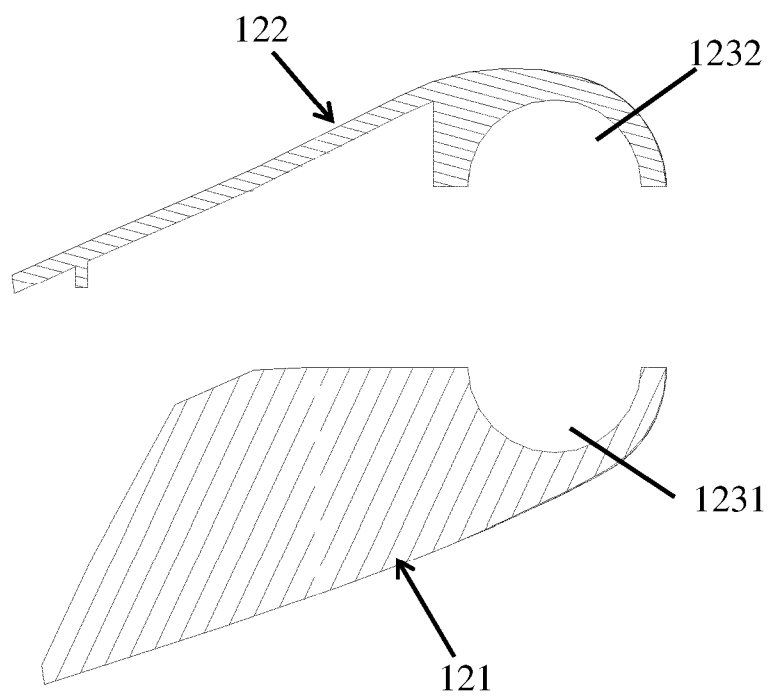


FIG. 9

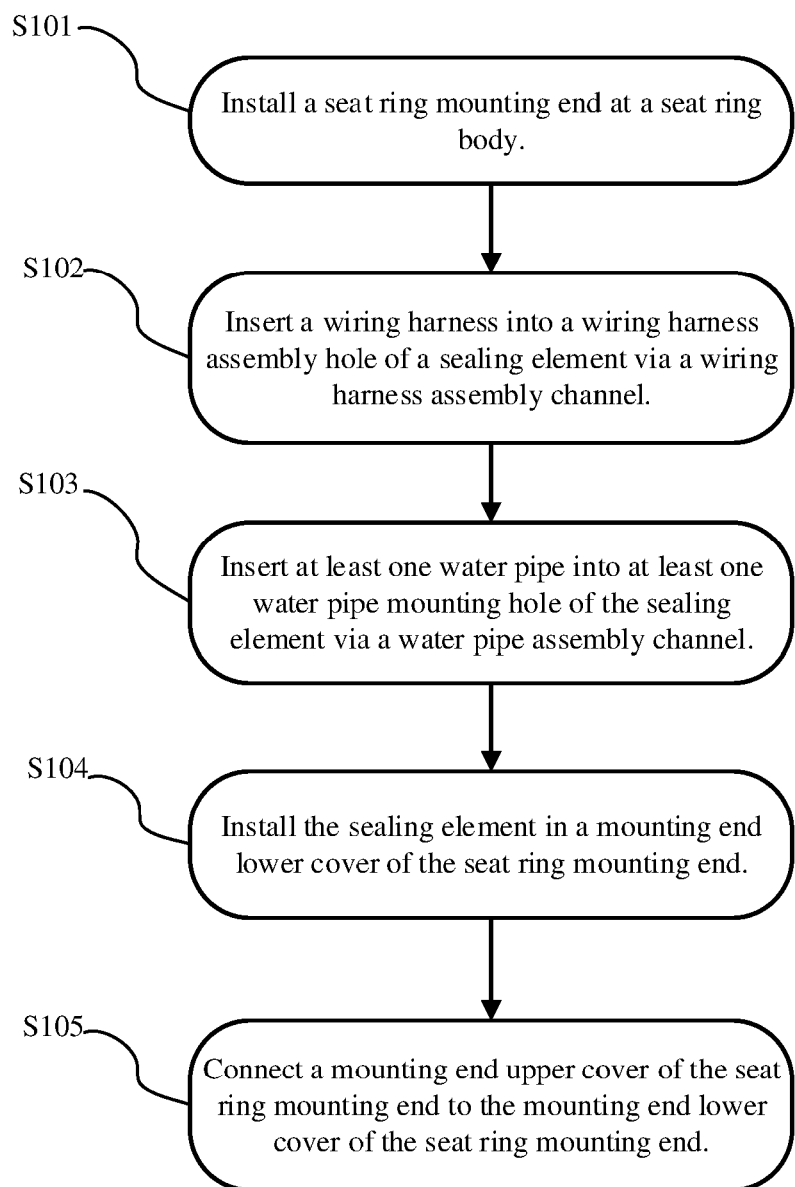


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 202123317369X [0001]
- US 08562322 [0001]
- KR 20170032119 [0005]