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(54) TOILET DEVICE

(57) A toilet device, comprising a toilet seat body (1) and a sewage draining mechanism (2), wherein the toilet seat body (1) is provided with a bowl (11) and a sewage draining port in communication with the bowl (11); a sewage drainage connecting portion (13) is provided at an outer periphery of the sewage draining port, and the sewage drainage connecting portion (13) is located on an outer side of the bowl (11), and is provided with a channel in communication with the sewage draining port; the sewage draining mechanism (2) comprises a sewage draining tank (21); the sewage draining tank (21) is provided with a sewage inlet (211), which is in communication with the channel; and a sewage intake connecting portion (23) is provided at an outer periphery of the sewage inlet (211), the sewage intake connecting portion (23) is arranged on an outer wall of the sewage draining tank (21) in a protruding manner, and the sewage intake connecting portion (23) is detachably connected to the sewage drainage connecting portion (13), so as to fix the sewage draining tank (21) to the toilet seat body (1).

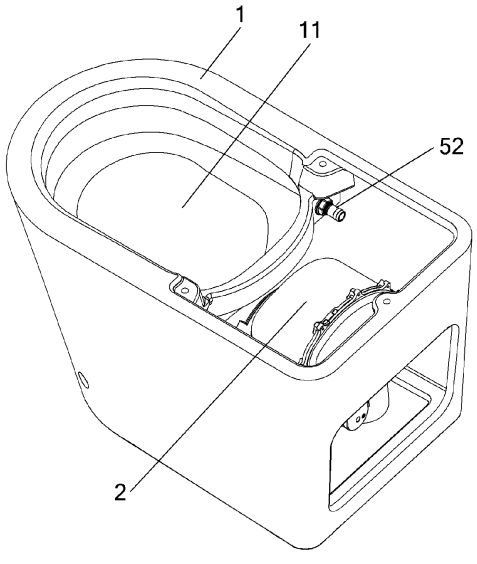

FIG. 1

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Description

Technical Field

[0001] The present application relates to, but is not limited to, the field of toilets, and particularly relates to a toilet device.

Background

[0002] In the current toilet device, some toilets apply a sewage discharge structure with a flipped sewage discharge pipe. The flipped sewage discharge pipe has a horizontal ceramic sewage discharge pipe and an L-shaped bend pipe connected with the sewage discharge pipe.

[0003] A toilet seat body is mainly made of a ceramic material, and a connection with a sewage discharge box (the L-shaped bend pipe is installed in the sewage discharge box) is prone to poor sealing. Although a method of bonding with adhesive glue can solve a sealing problem to a certain extent, an adhesive glue connection method itself further has angle problems. For example, it cannot be conveniently disassembled and assembled, and it is still inconvenient to replace the adhesive glue after aging. In addition, even if bolts and the like are used as connection members for connection, since a quantity of connection members cannot be set too many, there are still problems such as uneven stress in the connection area between the toilet seat body and the sewage discharge box.

Summary

[0004] The following is a summary of the subject matter described in detail herein. This summary is not intended to limit the protection scope of the claims.

[0005] An embodiment of the present application discloses a toilet device. The toilet device includes a toilet seat body and a sewage discharge mechanism. The toilet seat body is provided with a toilet bowl and a sewage discharge port communicated with the toilet bowl, and a sewage discharge connection part is provided on an outer periphery of the sewage discharge port. The sewage discharge connection part is located outside the toilet bowl, and is provided with a channel communicated with the sewage discharge port. The sewage discharge mechanism includes a sewage discharge box. The sewage discharge box is provided with a sewage inlet communicated with the channel, a sewage intake connection part is provided on an outer periphery of the sewage inlet, and the sewage intake connection part protrudes on an outer wall of the sewage discharge box. The sewage intake connection part is detachably connected with the sewage discharge connection part to fix the sewage discharge box on the toilet seat body.

[0006] After reading and understanding the overview of the drawings and implementations of the present application, other aspects may be understood.

Brief Description of Drawings

[0007] When considered in conjunction with the drawings, embodiments of the present application can be more completely and better understood and many of the accompanying advantages thereof can be readily known by referring to the following description. However, the drawings described herein are used to provide an understanding of the embodiments of the present application and form part of the embodiments of the present application, and the schematic embodiments of the present application and their explanations are used to explain the present application and do not constitute a limitation on the present application, wherein:

FIG. 1 is a first schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 2 is a second schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 3 is a third schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 4 is a first schematic diagram of a structure of a first connection element according to an exemplary embodiment.

FIG. 5 is a second schematic diagram of a structure of a first connection element according to an exemplary embodiment.

FIG. 6 is a schematic diagram of a structure of another first connection element according to an exemplary embodiment.

FIG. 7 is a schematic diagram of a structure of a second connection element according to an exemplary embodiment.

FIG. 8 is a fourth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 9 is a schematic diagram of a structure of a sewage discharge part according to an exemplary embodiment.

FIG. 10 is a schematic diagram of a structure of another sewage discharge part according to an exemplary embodiment.

FIG. 11 is a fifth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 12 is an enlarged view of a structure of part A in FIG. 11.

FIG. 13 is a first schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 14 is a schematic diagram of a structure of a sewage discharge box according to an exemplary embodiment.

FIG. 15 is a sixth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 16 is a schematic diagram of a structure of a snap connection element when snapped according to an exemplary embodiment.

FIG. 17 is a seventh schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 18 is an eighth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 19 is a ninth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 20 is a schematic diagram of a structure of a clamp fastener according to an exemplary embodiment.

FIG. 21 is a tenth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 22 is an enlarged view of a structure of part B in FIG. 21.

FIG. 23 is a first schematic diagram of a structure of a toilet seat body according to an exemplary embodiment.

FIG. 24 is a second schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 25 is an eleventh schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 26 is a third schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 27 is a twelfth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 28 is a thirteenth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 29 is a fourteenth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 30 is an enlarged view of a structure of part C in FIG. 39.

FIG. 31 is a schematic diagram of structures of a limiting element, an elastic element, and a connection element according to an exemplary embodiment.

FIG. 32 is a fifteenth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 33 is a sixteenth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 34 is an enlarged view of a structure of part D in FIG. 33.

FIG. 35 is a second schematic diagram of a structure of a toilet seat body according to an exemplary embodiment.

FIG. 36 is a schematic diagram of a structure of a first connection part according to an exemplary embodiment.

FIG. 37 is a fourth schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 38 is a fifth schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 39 is a seventeenth schematic diagram (sectional view in a front view direction) of a structure of a toilet device according to an exemplary embodiment.

FIG. 40 is a eighteenth schematic diagram (sectional view in a front view direction) of a structure of a toilet device according to an exemplary embodiment.

FIG. 41 is a nineteenth schematic diagram (sectional view in a rear view direction) of a structure of a toilet device according to an exemplary embodiment.

FIG. 42 is a twentieth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 43 is a twenty-first schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 44 is a twenty-second schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 45 is a schematic diagram of a structure of a shifter according to an exemplary embodiment.

FIG. 46 is a twenty-third schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 47 is an enlarged view of a structure of part E in FIG. 46.

FIG. 48 is a third schematic diagram of a structure of a toilet seat body according to an exemplary embodiment.

FIG. 49 is a sixth schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 50 is a seventh schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 51 is a twenty-fourth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 52 is an enlarged view of a structure of part F in FIG. 51.

FIG. 53 is a twenty-fifth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 54 is a twenty-sixth schematic diagram (bottom view) of a structure of a toilet device according to an exemplary embodiment.

FIG. 55 is a twenty-seventh schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 56 is a twenty-eighth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 57 is an enlarged view of a structure of part G in FIG. 56.

FIG. 58 is a twenty-ninth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 59 is a thirtieth schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 60 is an enlarged view of a structure of part H in FIG. 59.

FIG. 61 is an eighth schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 62 is a ninth schematic diagram of a structure of a sewage discharge mechanism according to an exemplary embodiment.

FIG. 63 is a thirty-first schematic diagram of a structure of a toilet device according to an exemplary embodiment.

FIG. 64 is a schematic exploded view of a structure of a toilet device according to an exemplary embodiment.

FIG. 65 is a schematic exploded view of a structure of a toilet device according to an exemplary embodiment from another perspective.

FIG. 66 is a schematic half-sectional view of a structure of a toilet device according to an exemplary embodiment from yet another perspective.

FIG. 67 is another schematic exploded half-sectional view of a structure of a toilet device according to an exemplary embodiment.

FIG. 68 is a schematic three-dimensional diagram of a structure of sewage discharge mechanism according to an exemplary embodiment.

FIG. 69 is a schematic half-sectional view of a structure of a sewage discharge mechanism shown in FIG. 68.

FIG. 70 is a schematic sectional view of a structure of a toilet device according to an exemplary embodiment.

FIG. 71 is an enlarged view of a structure of part I in FIG. 70.

FIG. 72 is a schematic sectional view of a structure of a toilet seat body according to an exemplary embo-

diment.

FIG. 73 is a schematic front view of a structure of a sewage discharge box according to an exemplary embodiment.

FIG. 74 is another schematic sectional view of a structure of a toilet device according to an exemplary embodiment.

Reference signs:

[0008]

1- toilet seat body, 11- toilet bowl, 12- sewage outlet, 13- sewage discharge connection part, 131- sewage discharge pipe section, 1311- guidance groove, 1312- rotation groove, 1313-stopper protrusion, 1314- sewage discharge pipe section, 1316- first limiting hole, 132- second annular flange, 1321- limiting groove, 1322- tubular part, 1323- channel, 1324- clamping groove, 1325- sealing groove, 133- protruding part,

2- Sewage discharge mechanism, 21- sewage discharge box, 211- sewage inlet, 2111-clamping protrusion, 2112- cutout, 2114- stopper protrusion, 2115- third sealing element, 22-sewage discharge pipe, 23- sewage intake connection part, 231- sewage intake pipe section, 2311- guidance protrusion, 2312- second limiting hole, 2313- push-pull groove, 232- first annular flange, 233- accommodation groove, 241- accommodation cavity, 2411- connection hole, 2412- limiting groove, 2413- radial opening, 2414- fastener, 2415- bolt, 2416- nut, 2417- spacer, 251- connection protrusion, 252- insertion slot, 253- dirt outlet, 26- threaded fastening sleeve, 260- protruding edge, 261- first anti-rotation wall surface, 262- sewage discharge outlet, 263- installation groove, 264- second anti-rotation wall surface, 265- sealing groove, 266-second installation plate, 267- second installation hole, 268- guidance ramp, 269- driving device,

3- snap connection element, 31- first connection element, 311- snapping element, 312-fixation ring, 3121- installation seat, 313- locking element, 314- installation plate, 3141-installation hole, 32- second connection element, 321- snapping protrusion, 3211- extension part, 3212- limiting part, 322- clamping ring, 323- connection part, 3231- first radial section, 3232- first axial section, 3233- first circumferential section, 3234- second radial section, 3235- second axial section, 3236- second circumferential section,

4- sealing element, 51- shifter, 52- brush ring water outlet.

6- clamp connection element, 61- first limiting flange, 62- second limiting flange, 63-clamp main body, 64- first sub-clamp, 641- first installation part, 642- third installation part, 65- first fastener, 66- second sub-clamp, 661- second installation part, 662- fourth installation part, 67- second fastener,

7- limiting element, 71- limiting rod, 72- push-pull protrusion, 73- first installation plate, 731- first installation hole, 74- elastic element, 75- connection element,

8- first limiting element, 81- connection plate, 82- supporting plate, 83- reinforcement plate, 84- fastener, 85- second limiting element, 91- anti-rotation recess; 92- anti-rotation protrusion.

Detailed Description

[0009] Embodiments of the present application are described below, and examples of the embodiments are shown in the drawings, in which the same or similar designations throughout denote the same or similar elements or elements having the same or similar functions. The embodiments described below by reference to the accompanying drawings are exemplary and are intended only to explain the embodiments of the present application and cannot be interpreted as limitations on the embodiments of the present application.

[0010] For the existing toilet with an L-shaped sewage discharge pipe, there is a big problem in a seal between a sewage discharge box and a toilet seat body: although a surface of the ceramic material is visually relatively flat, a ceramic surface is still uneven for a seal of water and gas. However, the toilet seat body is generally made of a ceramic material, and it is inconvenient to open holes, open threads, and open grooves or the like on the ceramic material, which makes it difficult to connect the toilet seat body and the sewage discharge box, and causes the poor connection effect.

[0011] At present, a method often used is to directly carry out adhesive connection, and apply a large amount of adhesive glue to the connection position of the sewage discharge box and the toilet seat body for bonding, and the adhesive glue plays a role of seal and connection. However, there are still big problems in a connection method of the adhesive glue: it is difficult to disassemble a connection of the adhesive glue, and it is not convenient to repair and replace. And after long-term use, the adhesive glue is easy to age and fail, and there is a risk of water leakage.

[0012] An embodiment of the present application provides a toilet device. The toilet device includes a toilet seat body and a sewage discharge mechanism. The toilet seat body is provided with a toilet bowl and a sewage discharge port communicated with the toilet bowl and a sewage discharge connection part is provided on an outer periphery of the sewage discharge port. The

sewage discharge connection part is located outside the toilet bowl, and is provided with a channel communicated with the sewage discharge port. The sewage discharge mechanism includes a sewage discharge box, the sewage discharge box is provided with a sewage inlet communicated with the channel, a sewage intake connection part is provided on an outer periphery of the sewage inlet, and the sewage intake connection part protrudes on an outer wall of the sewage discharge box. The sewage intake connection part is detachably connected with the sewage discharge connection part to fix the sewage discharge box on the toilet seat body.

[0013] A seal connection structure in a toilet device provided by an embodiment of the present application is reliable in use and can be easily disassembled for maintenance, replacement, and the like. The seal joint has high working reliability and is not easy to be damaged. For members (such as: snap connection element) that may be consumed, the toilet device can be disassembled and replaced, which has strong practicability and improves the service life of the toilet device.

[0014] An embodiment of the present application provides a toilet device, as shown in FIGS. 1 to 16. The toilet device includes a toilet seat body 1, a sewage discharge mechanism 2, and a snap connection element 3. The toilet seat body 1 is provided with a toilet bowl 11 and a sewage outlet 12 communicated with the toilet bowl 11. A sewage discharge connection part 13 is provided on the outer periphery of the sewage outlet 12. The sewage discharge connection part 13 is located outside the toilet bowl 11 and is provided with a channel communicated with the sewage outlet 12. The sewage discharge mechanism 2 includes a sewage discharge box 21, and the sewage discharge box 21 is provided with a sewage inlet 211 communicated with the channel. A sewage intake connection part 23 is provided on the outer periphery of the sewage inlet 211, and the sewage intake connection part 23 protrudes on an outer wall of the sewage discharge box 21, and is fixedly connected to the sewage discharge connection part 13 through the snap connection element 3, so that the toilet seat body 1 and the sewage discharge box 21 are fixedly connected.

[0015] The sewage discharge mechanism 2 may further include a sewage discharge pipe 22 located in the sewage discharge box 21, the sewage discharge pipe 22 is communicated with the sewage inlet 211, and the sewage discharge pipe 22 is rotatable relative to the sewage discharge box 21 to discharge sewage. The sewage discharge pipe 22 and the sewage discharge box 21 may be made of plastic, and the toilet seat body 1 may be made of a ceramic material.

[0016] Multiple snap connection elements 3 may be arranged in a circumferential direction of the sewage discharge box 21, so as to improve the connection effect, so that the toilet seat body 1 and the sewage discharge box 21 are uniformly stressed, and the occurrence of askew and easy disengagement after connection are avoided.

[0017] **In** the toilet device provided by an embodiment of the present application, the toilet seat body 1 and the sewage discharge box 21 are fixedly connected by the snap connection element 3, and the snap connection element 3 has a tight fixation and a good connection effect. **In** this way, end faces of the sewage discharge connection part 13 and the sewage intake connection part 23 are more tightly bonded, so as to avoid a large gap at the connection between the toilet seat body 1 and the sewage discharge box 21, and avoid problems of water leakage and returning of odor.

[0018] **In** an actual operation, the sewage intake connection part 23 may be a plastic element, and after a certain compression force is applied to the snap connection element 3, the sewage intake connection part 23 may be slightly deformed, so that the sewage discharge connection part 13 is more tightly bonded and the sealability is improved.

[0019] The sewage intake connection part 23 is provided at the sewage inlet 211 of the sewage discharge box 21 and the sewage discharge connection part 13 is provided at the sewage outlet 12 of the toilet seat body 1. The sewage intake connection part 23 and the sewage discharge connection part 13 are provided for easy connection. The connection between the toilet seat body 1 and the sewage discharge box 21 may be realized by a fixed connection between the sewage intake connection part 23 and the sewage discharge connection part 13. The connection structure is simplified, and the connection between the main structures of the toilet seat body 1 and the sewage discharge box 21 through hole punching or other methods is avoided, which is efficient and practical.

[0020] **In** an exemplary embodiment, as shown in FIGS. 2 to 5, the snap connection element 3 includes a first connection element 31 and the first connection element 31 includes at least one snapping element 311 that cooperates with a snapping protrusion 321. One of the first connection element 31 and the snapping protrusion 321 is provided at the sewage discharge connection part 13 and the other of the first connection element 31 and the snapping protrusion 321 is provided at the sewage intake connection part 23. The snapping element 311 is configured to buckle on the snapping protrusion 321 and hook and cooperate with the snapping protrusion 321 to prevent the sewage intake connection part 23 from being disengaged from the sewage discharge connection part 13.

[0021] The snapping element 311 may be used as a mother buckle, the snapping protrusion 321 may be used as a child buckle, and the snap connection element 3 is snapped in such a manner that the child buckle and the mother buckle are fastened.

[0022] The first connection element 31 may be provided on the sewage intake connection part 23 and the snapping protrusion 321 may be provided on the sewage discharge connection part 13. The snapping element 311 and the snapping protrusion 321 are snapped in a hooked

manner, so that the sewage intake connection part 23 is limited and fixed at the sewage discharge connection part 13.

[0023] Alternatively, the first connection element 31 may further be provided on the sewage discharge connection part 13, and the snapping protrusion 321 may be provided on the sewage intake connection part 23.

[0024] In an exemplary embodiment, as shown in FIGS. 4 and 5, the first connection element 31 further includes a fixation ring 312. The fixation ring 312 is sleeved outside the sewage intake connection part 23 or the sewage discharge connection part 13, and the snapping element 311 is movably connected to the fixation ring 312.

[0025] The snapping element 311 is sleeved outside the sewage intake connection part 23 by a fixation ring 312, and the fixation ring 312 is used as an intermediate installation member. In this way, a structure of the snapping element 311 may be simplified, and the snapping element 311 may be installed on the sewage intake connection part 23, and may be movable (e.g., rotated) relative to the sewage intake connection part 23 so as to hook with or disengage from the snapping protrusion 321.

[0026] Alternatively, the snapping element 311 may further be provided outside the sewage discharge connection part 13.

[0027] In an exemplary embodiment, as shown in FIGS. 4 and 5, the first connection element 31 further includes a locking element 313, and the locking element 313 is configured to lock the snapping element 311 in a position where the snapping element 311 cooperates in place with the snapping protrusion 321.

[0028] The first connection element 31 further includes the locking element 313 and the locking element 313 cooperates with the snapping element 311. After a hook connection between the snapping element 311 and the snapping protrusion 321 is completed, the locking element 313 limits and fixes the snapping element 311 to prevent the snapping element 311 from being rotated and disengaged by itself.

[0029] In an exemplary embodiment, as shown in FIGS. 4 and 5, the snapping element 311 is rotatably connected to the fixation ring 312, and the locking element 313 is rotatably connected to the fixation ring 312. When the snapping element 311 rotates in a first direction to a position where the snapping element 311 and the snapping protrusion 321 cooperate in place, the locking element 313 rotates in a second direction opposite to the first direction to a locking position, and a resistance increases first and then decreases during the rotation to the locking position. A direction in which the snapping element 311 or the locking element 313 rotates toward the sewage discharge connection part 13 is a first direction, as shown in an A direction in FIG. 4. A direction in which the snapping element 311 or the locking element 313 rotates away from the sewage discharge connection part 13 is a second direction, as shown in a B direction in FIG. 4.

[0030] The locking element 313 may be rotatably connected to the fixation ring 312. After the snapping element 311 rotates to hook and connect with the snapping protrusion 321, the locking element 313 rotates in an opposite direction to lock.

[0031] When the locking element 313 is rotated to the locking position, the resistance increases first and then decreases. In other words, the locking element 313 cannot be disengaged by itself after being in the locking position, so that the locking and limiting effect of the locking element 313 is ensured, the connection between the toilet seat body 1 and the sewage discharge box 21 is stabilized, and the operating reliability of the toilet device is improved. When it is necessary to unlock the locking element 313, the operator overcomes the resistance during the rotation of the locking element 313 so that the locking element 313 rotates to an unlocked position. In other words, the locking element 313 forms a self-lock after the locking element 313 rotates to a locked position. The resistance that changes during the rotation of the locking element 311 may prevent the locking element 311 from being accidentally disengaged due to factors such as external force, vibration and the like.

[0032] In an exemplary embodiment, as shown in FIGS. 4 and 5, the fixation ring 312 is convexly provided with an installation seat 3121, and the snapping element 311 and the locking element 313 are both rotatably connected to the installation seat 3121. The rotation axes of the snapping element 311 and the locking element 313 are staggered, and a rotation shaft of the snapping element 311 is further inserted into the locking element 313.

[0033] The fixation ring 312 is provided with the installation seat 3121, and the locking element 313 is rotatably installed on the installation seat 3121. The snapping element 311 is rotatably installed on the installation seat 3121, and the rotation axes of the snapping element 311 and the locking element 313 are provided in parallel and with a certain distance apart.

[0034] After the snapping element 311 is hooked to and connected with the snapping protrusion 321, the locking element 313 rotates in an opposite direction so that the snapping element 311 and the snapping protrusion 321 are clamped tightly and locked to prevent the clamping connection from automatically disengagement. As for the locking of the locking element 313, the resistance of the locking element 313 increases first and then decreases during the rotation of the locking element 313 to the locking position. That is to say, when unlocking the locking element 313, it is necessary to overcome the resistance during the rotation of the locking element 313 to make the locking element 313 rotate to the non-locking position. In other words, the locking element 313 forms a self-lock after rotating to the locking position, and the locking element 311 may not overcome the greater resistance during the greater rotation to be disengaged by itself, and an operator needs to apply an external force to unlock and open the locking element 313.

[0035] In an exemplary embodiment, the sewage discharge connection part 13 or the sewage intake connection part 23 is provided with a first annular flange 232 for preventing the fixation ring 312 from being disengaged in an axial direction.

[0036] As shown in FIG. 13, the first annular flange 232 is provided at the end part of the sewage intake connection part 23, and the first annular flange 232 may limit the fixation ring 312 to prevent the fixation ring 312 from being disengaged in the axial direction.

[0037] In addition, grooves (i.e., subsequent first installation groove or second installation groove) may be provided on the first annular flange 232 for installing a sealing element 4, so as to facilitate a sealing fit of the sewage discharge connection part 13.

[0038] **In** an exemplary embodiment, as shown in FIGS. 2, 3 and 7, the snap connection element 3 further includes a second connection element 32. One of the second connection element 32 and the first connection element 31 is provided at the sewage discharge connection part 13, the other of the second connection element 32 and the first connection element 31 is provided at the sewage intake connection part 23, and the snapping protrusion 321 is provided at the second connection element 32.

[0039] The second connection element 32 may be provided on the sewage discharge connection part 13, the first connection element 31 may be provided on the sewage intake connection part 23, and the snapping protrusion 321 is provided on the second connection element 32 and is located at the sewage discharge connection part 13.

[0040] **In** an exemplary embodiment, as shown in FIG. 7, the second connection element 32 includes a clamping ring 322. The clamping ring 322 is sleeved outside the sewage discharge connection part 13 or the sewage intake connection part 23, and the snapping protrusion 321 is provided at the clamping ring 322 and protrudes outward in a radial direction of the clamping ring 322.

[0041] The snapping protrusion 321 is provided on the sewage discharge connection part 13 through the clamping ring 322 and the clamping ring 322 serves as an intermediate installation structure. The snapping protrusion 321 mainly functions as an overlap fit with the snapping element 31, and the clamping ring 322 functions as a connection with the sewage discharge connection part 13, which simplifies a structure of the snapping protrusion 321, improves a strength of the snapping protrusion 321, and further improves the stability of the connection between the snapping element 311 and the snapping protrusion 321.

[0042] The snapping protrusion 321 is provided on the second connection element 32, and the snapping protrusion 321 extends out on the second connection element 32 in the radial direction to facilitate a hook connection of the snapping element 311.

[0043] **In** an exemplary embodiment, as shown in FIG. 7, the clamping ring 322 is partially bent to form the snapping protrusion 321. A connection part 323 is provided at a portion of the clamping ring 232 that is opposite to the snapping protrusion 321 in the radial direction, and the connection part 323 is detachably connected to the first connection element 31.

[0044] The clamping ring 322 is convexly bent in a radial direction to form the snapping protrusion 321. **In** other words, the clamping ring 322 and the snapping protrusion 321 are of an integrated structure, thereby improving the connection strength between the clamping ring 322 and the snapping protrusion 321 and reducing the manufacture cost.

[0045] The connection part 323 is provided at a portion of the clamping ring 232 that is opposite to the snapping protrusion 321 in the radial direction and the connection part 323 is detachably connected to the first connection element 31, such as through a hinge connection. The connection part 323 and the snapping protrusion 321 are configured so that there are at least two connections between the first connection element 31 and the second connection element 32, so as to prevent the first connection element 31 and the second connection element 32 from being skewed during the connection process and ensure the stability of the connection between the first connection element 31 and the second connection element 32.

[0046] It should be understood that the connection part 323 may not be provided at a portion of the clamping ring 232 that is opposite to the snapping protrusion 321 in the radial direction, but another snapping protrusion may be provided at the portion instead. **In** other words, two snapping protrusions 321 are provided on the clamping ring 322. As shown in FIG. 6, two snapping elements 311 are provided on the fixation ring 312 accordingly.

[0047] **In** an exemplary embodiment, as shown in FIG. 7, the clamping ring 322 is a strip shape and is bent to form a ring shape with an opening, and head and tail ends at the opening of the clamping ring 322 extend toward the fixation ring 312 to form a connection part 323. The connection part 323 includes a first radial section 3231, a first axial section 3232, and a first circumferential section 3233 located at the head end of the clamping ring 322 and sequentially connected, and a second radial section 3234, a second axial section 3235, and a second circumferential section 3236 located at the tail end of the clamping ring 322 and sequentially connected. The first radial section 3231 and the second radial section 3234 are provided in parallel, the first axial section 3232 and the second axial section 3235 are provided in parallel, and the first circumferential section 3233 and the second circumferential section 3236 are provided facing each other or facing away from each other. The first connection element 31 is provided with an installation plate 314 extending in the radial direction. The installation plate 314 is provided with an installation hole 3141. Two installation plates 314 are provided side by side in the circumferential direction of the first connection element 31, and the first circumferential section 3233 and the

second circumferential section 3236 respectively extend into the installation hole 3141 of one of the installation plates 314.

[0048] The head end and the tail end of the clamping ring 322 extend toward the fixation ring 312 to facilitate the connection of the fixation ring 312. The connection part 323 formed at the head end and the tail end of the clamping ring 322 is detachably connected to the installation plate 314 on the fixation ring 312.

[0049] The first radial section 3231 extends in the radial direction to avoid interference when the clamping ring 322 extends toward the fixation ring 312. The first axial section 3232 extends toward the fixation ring 312. The first circumferential section 3233 is located at the installation plate 314 of the fixation ring 312 and inserted into the installation hole 3141 to achieve a plug connection. The second radial section 3234, the second axial section 3235, and the second circumferential section 3236 are configured in a similar way.

[0050] In an exemplary embodiment, the sewage discharge connection part 13 or the sewage intake connection part 23 is provided with a second annular flange 132 for preventing the clamping ring 322 from being disengaged in an axial direction.

[0051] The clamping ring 322 is installed on the sewage discharge connection part 13, and the sewage discharge connection part 13 is provided with a second annular flange 132 protruding in the radial direction. As shown in FIG. 8, the second annular flange 132 is used to prevent the clamping ring 322 from being disengaged from the sewage discharge connection part 13.

[0052] Further, a groove (i.e., subsequent first installation groove or second installation groove) may be provided on the second annular flange 132 for installing the sealing element 4, so as to facilitate a sealing fit of the sewage intake connection part 23.

[0053] In an exemplary embodiment, an axial end face of the second annular flange 132 facing away from the sewage intake connection part 23 abuts against the clamping ring 322; or, the second annular flange 132 is provided with an annular limiting groove 1321. The clamping ring 322 is embedded in the annular limiting groove 1321.

[0054] The sewage discharge connection part 13 includes a sewage discharge pipe section 131 extending in the axial direction and a second annular flange 132 provided at an end of the sewage discharge pipe section 131 and on an outer sidewall of the sewage discharge pipe section 131. The clamping ring 322 is sleeved on the sewage discharge pipe section 131 of the sewage discharge connection part 13, and is abutted against and limited by the second annular flange 132 to prevent the clamping ring 322 from being disengaged from the sewage discharge pipe section 131.

[0055] The clamping ring 322 may not be provided on the sewage discharge pipe section 131, but may be sleeved on the second annular flange 132. An annular limiting groove 1321 is provided on the second annular flange 132 and the clamping ring 322 is installed in the annular limiting groove 1321. The limiting groove 1321 may be a groove with a U-shaped cross section, or may be an L-shaped stepped groove.

[0056] Alternatively, when the second annular flange 132 is provided on the sewage intake connection part 23, correspondingly, the clamping ring 322 is sleeved on a sewage intake pipe section 231 of the sewage intake connection part 23 or the second annular flange 132.

[0057] In an exemplary embodiment, as shown in FIG. 10, the snapping protrusion 321 and the sewage intake connection part 23 or the sewage discharge connection part 13 are of an integrated structure. A quantity of snapping protrusions 321 is multiple and the multiple snapping protrusions 321 are uniformly arranged in a circumferential direction of the sewage intake connection part 23 or the sewage discharge connection part 13.

[0058] A snapping protrusion 321 may convexly formed on the sewage discharge connection part 13 in a radial direction and the snapping protrusion 321 is provided in multiple, and the multiple snapping protrusion 321 are uniformly distributed in a circumferential direction.

[0059] The snapping protrusions 321 and the sewage discharge connection part 13 are provided as an integrated structure, which may improve the connection strength of the snapping protrusions 321, simplify the assembly process, and eliminate a need for sleeving the clamping ring 322 or the like on the sewage discharge connection part 13, thereby improving the installation efficiency of the toilet device.

[0060] Alternatively, the snapping protrusion 321 may also be provided on the sewage intake connection part 23.

[0061] In an exemplary embodiment, as shown in FIG. 7, the snapping protrusion 321 includes an extension part 3211 and a limiting part 3212, and the extension part 3211 extends in a radial direction of the sewage discharge connection part 13. An end of the limiting part 3212 is connected to the extension part 3211, and the other end of the limiting part 3212 extends obliquely toward a direction away from the snapping element 311.

[0062] The extension part 3211 of the snapping protrusion 321 extends in the radial direction and the snapping element 311 abuts against and hooks with the extension part 3211. A limiting part 3212 is provided at an end of the extension part 3211, and the limiting part 3212 is used to prevent the snapping element 311 from being disengaged from the snapping protrusion 321, so as to improve the reliability of the connection.

[0063] The limiting part 3212 may be in various forms. For example, the limiting part 3212 may be a limiting protrusion to prevent the snapping element 311 from being disengaged in a radial direction; or, an end of the extension part 3211 is bent to form a limiting part 3212. The resistance when the snapping element 311 is disengaged is increased by an inclined surface.

[0064] In an exemplary embodiment, as shown in FIG.

7, an obtuse angle is formed between the extension part 3211 and the limiting part 3212, and an angle of the obtuse angle is in the range of 120° to 175°.

[0065] An obtuse angle is formed between the extension part 3211 and the limiting part 3212, in other words, the resistance when the snapping element 311 is disengaged is increased by the inclined surface (the obtuse angle). The angle of the obtuse angle is in the range of 120° to 175°, such as may be: 120°, 135°, 175°, to ensure an anti-disengagement effect.

[0066] In an exemplary embodiment, the sewage discharge connection part 13 includes a sewage discharge pipe section 131 and a second annular flange 132 provided on an outer sidewall of the sewage discharge pipe section 131. The sewage intake connection part 23 includes a sewage intake pipe section 231 and a first annular flange 232 provided on an outer sidewall of the sewage intake pipe section 231. The sewage intake pipe section 231 and the sewage discharge pipe section131 are docked and communicated, the first annular flange 232 and the second annular flange 132 abut against each other in an axial direction, and the snap connection element 3 locks the first annular flange 232 and the second annular flange 132 to fixedly connect the toilet seat body 1 and the sewage discharge box 21.

[0067] The first connection element 31 may be installed on the sewage intake pipe section 231 and limited by the first annular flange 232, and the second connection element 32 may be installed on the sewage discharge pipe section 131 and limited by the second annular flange 132. The first connection element 31 and the second connection element 32 are snapped to lock the first annular flange 232 and the second annular flange 132, thereby fixedly connecting the toilet seat body 1 and the sewage discharge box 21.

[0068] In an exemplary embodiment, the toilet device further includes an anti-rotation structure for limiting the rotation of the sewage discharge box 21 relative to the toilet seat body 1.

[0069] The anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13 and the anti-rotation structure prevents the sewage discharge box 21 from rotating.

[0070] The snap connection element 3 connects and fixes the sewage discharge connection part 13 and the sewage intake connection part 23, and limits the sewage discharge connection part 13 and the sewage intake connection part 23 in an axial direction, so that the sewage discharge box 21 is prevented from being disengaged backward in an axial direction relative to the toilet seat body 1. When the sewage discharge box 21 is subjected to a circumferential force, the snap connection element 3 has a certain circumferential limitation effect. When the anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, the sewage discharge box 21 may be prevented from rotating relative to the toilet seat body 1 after being subjected to a circumferential force. In this way, the sewage discharge box 21 may be completely fixed and limited, further improving the circumferential limitation effect between the toilet seat body 1 and the sewage discharge box 21, preventing the sewage discharge box 21 from moving or rotating during working process, and ensuring a reliable working of the toilet device.

[0071] In an exemplary embodiment, a protruding part 133 is provided on one of the sewage discharge connection part 13 and the sewage intake connection part 23, and an accommodation groove 233 is provided on the other of the sewage discharge connection part 13 and the sewage intake connection part 23, and the anti-rotation structure includes the protruding part 133 and the accommodation groove 233, as shown in FIGS. 9 and 13. Alternatively, the sewage discharge connection part 13 is provided with a first limiting hole, and the sewage intake connection part 23 is provided with a second limiting hole (not shown in the figure). The anti-rotation structure includes a limiting element, and the limiting element passes through the first limiting hole and the second limiting hole along an axial direction of the sewage intake connection part 23, so as to limit a rotation of the sewage intake connection part 23 relative to the sewage discharge connection part 13.

[0072] The anti-rotation structure may have a variety of forms. For example, a protruding part 133 is provided on the sewage intake connection part 23, and an accommodating groove 233 is provided on the sewage intake connection part 23. The protruding part 133 is clamped into the accommodating groove 233, so as to limit a relative rotation between the sewage discharge mechanism 2 and the toilet seat body 1.

[0073] Alternatively, the limiting element penetrates into the first limiting hole of the sewage discharge connection part 13 and the second connection hole of the sewage intake connection part 23 in an axial direction, so as to limit the relative rotation between the sewage discharge mechanism 2 and the toilet seat body 1.

[0074] In an exemplary embodiment, at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a first installation groove, a first sealing element is provided in the first installation groove, and the first sealing element abuts against an axial end face of the sewage intake connection part 23 and an axial end face of the sewage discharge connection part 13 to form an end face seal. And/or at least one of the sewage intake connection part 23 and sewage discharge connection part 13 is provided with a second installation groove, a second sealing element is provided in the second installation groove, and the second sealing element abuts against a radial inner end of the sewage intake connection part 23 and a radial outer end of the sewage discharge connection part 13 to form a radial seal.

[0075] As shown in FIG. 12, the toilet device further includes a sealing element 4 provided between the sewage intake connection part 23 and the sewage discharge

connection part 13.

[0076] The provision of the sealing element 4 between the sewage intake connection part 23 and the sewage discharge connection part 13, together with the clamping force provided by the snap connection element 3, can further improve the sealability between the sewage intake connection part 23 and the sewage discharge connection part 13. This ensures that a phenomenon of water leakage, returning of odor or the like will not occur at the connection between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0077] The sealing element 4 may function as a static seal. For example, the sealing element may be made of a rubber material.

[0078] The sealing form of the sealing element 4 may be an end face seal, a radial seal, or may have an end face seal and a radial seal.

[0079] For the end face seal, the first installation groove may be provided on the sewage intake connection part 23, the sealing element 4 is installed in the first installation groove in an axial direction, and the sewage discharge connection part 13 abuts against the sealing element 4 in the first installation groove. After connecting the sewage intake connection part 23 and the sewage discharge connection part 13, the snap connection element 3 may exert a certain compression effect on the sealing element 4. In other words, the snap connection element 3 may make the sealing element 4 in a compressed state, so as to improve the sealing effect of the sealing element 4.

[0080] For the radial seal, the second installation groove may be provided on the sewage intake connection part 23, the sealing element 4 is installed into the second sealing groove in a radial direction, and the sewage discharge connection part 13 abuts against the sealing element 4 in the second installation groove. In the radial direction, there may be a clearance fit between the sewage intake connection part 23 and the sewage discharge connection part 13, and the sealing element 4 may be installed in the second installation groove with interference. In other words, the sealing element 4 is compressed by an inner sidewall of the sewage intake connection part 23 and an outer sidewall of the sewage discharge connection part 13, so that the sealing element 4 is in a compressed state, so as to improve the sealing effect of the sealing element 4.

[0081] In the toilet device provided by an embodiment of the present application, the connection between the toilet seat body 1 and the sewage discharge mechanism 2 is simply and reliably realized by a snapping connection between the child buckle and the mother buckle. **In** an actual operation, a locking and unlocking may be realized by rotating the snapping element in the first connection element 31, which is convenient to disassemble and assemble, and convenient to repair and disassemble.

[0082] The sealing element 4 is placed between the toilet seat body 1 and the sewage discharge box 21, and the sewage discharge box 21 and the toilet seat body 1 are tightened and fixed by the snap connection element 3. In this way, the sealing element 4 maintains a large compression amount, and a poor sealing caused by a large fluctuation of a ceramic size of the toilet seat body 1 is reduced.

[0083] The toilet device may also include a shifter 51, the shifter 51 is located below the sewage discharge mechanism 2, an inlet of the shifter 51 is communicated with an outlet of the sewage discharge box 21, and an outlet of the shifter 51 is communicated with an external sewage discharge pipeline. A brush ring water outlet 52 is installed on the toilet seat body 1, and the brush ring water outlet 52 is fixed on the toilet seat body 1 to flush water into the toilet device.

[0084] Further, the sewage discharge pipe 22 forms a dynamic seal with the sewage discharge box 21 by an oil seal. The sewage discharge pipe 22 and the sewage discharge box 21 may be plastic elements, so as to ensure the sealing accuracy, prevent water leakage and returning of odor, and solve the problems of poor sealing, water leakage and returning of odor.

[0085] A toilet device is provided by an embodiment of the present application. As shown in FIGS. 17 to 27, the toilet device includes a toilet seat body 1, a sewage discharge mechanism 2, and a clamp connection element 6. The toilet seat body 1 is provided with a toilet bowl **11** and a sewage discharge outlet 262, and a sewage discharge connection part 13 is provided on an outer periphery of the sewage discharge outlet 262. The sewage discharge connection part 13 is located outside the toilet bowl 11. An end of the sewage discharge outlet 262 is communicated with the toilet bowl 11, and the other end of the sewage discharge outlet 262 is communicated with a channel in the sewage discharge connection part 13. The sewage discharge mechanism 2 includes a sewage discharge box 21, and a sewage inlet of the sewage discharge box 21 is communicated with the channel. A sewage intake connection part 23 is provided on an outer periphery of the sewage inlet and is docked and communicated with the sewage discharge connection part 13 in the axial direction, and the sewage intake connection part 23 is protruded on an outer wall of the sewage discharge box 21. The clamp connection element 6 is sleeved outside the sewage intake connection part 23 and the sewage discharge connection part 13, and clamps and fixes the sewage intake connection part 23 and the sewage discharge connection part 13, so that the toilet seat body 1 and the sewage discharge box 21 are fixedly connected.

[0086] The sewage discharge mechanism 2 may also include a sewage discharge pipe 22 located in the sewage discharge box 21, and the sewage discharge pipe 22 is communicated with the sewage inlet and rotatable relative to the sewage discharge box 21 for sewage discharge. The sewage discharge pipe 22 and the sewage discharge box 21 may be plastic elements, and the toilet seat body 1 may be made of a ceramic material. Further in some cases, the toilet seat body 1 may also be

made of a plastic material, and the sewage discharge connection part 13 of the toilet seat body 1 may be partially made of a plastic material.

[0087] A contact area between the clamp connection element 6 and the sewage discharge connection part 13 and the sewage intake connection part 13 is large and it is not easy for a local connection to be damaged by force. The clamp connection element 6 is a 360° connection in a circumferential direction, in other words, the clamp connection element has an annular structure. Compared with the way that only several bolts or other members are arranged in the circumferential direction for connection, an annular clamp connection element 6 may effectively avoid stress concentration. That is, when the clamp connection element 6 is used for connection, outer edges of the sewage discharge connection part 13 and the sewage intake connection part 23 are uniformly stressed instead of stressing only at a few points, and the stress on the sewage discharge connection part 13 and the sewage intake connection part 23 are more uniform and dispersed. This prevents the stress from concentrating on one or several local points, thereby protecting integrity of the toilet seat body 1 and the sewage discharge box 21.

[0088] Since the clamp connection element 6 is a 360° connection in the circumferential direction, it is not necessary to provide multiple clamp connection elements 6 like other connectors (for example, bolts) to improve the connection effect. One clamp connection element 6 can ensure a reliable connection, and the sewage discharge connection part 13 and the sewage intake connection part 23 are aligned in the axial direction.

[0089] In the toilet device provided by an embodiment of the present application, the toilet seat body 1 and the sewage discharge box 21 are fixedly connected by means of the clamp connection element 6. The clamp connection element 6 is convenient to install, has good positioning and connection effects, and makes the end faces of the sewage discharge connection part 13 and the sewage intake connection part 23 more tightly bonded, so as to avoid a large gap at the connection between the toilet seat body 1 and the sewage discharge box 21, and avoid the problems of water leakage and returning of odor.

[0090] In an exemplary embodiment, as shown in FIGS. 19, 20, 22 and 26, the sewage discharge connection part 13 includes a sewage discharge pipe section 131 and a second annular flange 132 provided on an outer sidewall of the sewage discharge pipe section 131, and the sewage intake connection part 23 includes a sewage intake pipe section 231 and a first annular flange 232 provided on an outer sidewall of the sewage intake pipe section 231. The sewage intake pipe section 231 is docked and communicated with the sewage discharge pipe section 131. The clamp connection element 6 includes a clamp main body 63, a first limiting flange 61, and a second limiting flange 62. The first limiting flange 61 and the second limiting flange 62 are respectively connected to two axial ends of the clamp main body 63, and extend toward an inner side of the clamp main body 63. The clamp main body 63 is sleeved outside the second annular flange 132 and the first annular flange 232. The second annular flange 132 and the first annular flange 232 are located between the first limiting flange 61 and the second limiting flange 62, and are clamped and fixed by the first limiting flange 61 and the second limiting flange 62.

[0091] The sewage discharge pipe section 131 and the second annular flange 132 provided on the outer sidewall of the sewage discharge pipe section 131 form the sewage discharge connection part 13, and the sewage intake pipe section 231 and the first annular flange 232 provided on the sewage intake pipe section 231 form the sewage intake connection part 23. The sewage intake pipe section 231 is docked and communicated with the sewage discharge pipe section 131, so that the sewage in the toilet bowl 11 enters the sewage intake pipe section 231 through the sewage discharge pipe section 131, and then enters the subsequent external sewage discharge pipeline. The sewage intake pipe section 231 and sewage discharge pipe section 131 may be located in the same straight line so that sewage may smoothly enter the sewage intake pipe section 231 from the sewage discharge pipe section 131.

[0092] The clamp connection element 6 connects the second annular flange 132 and the first annular flange 232, thereby fixedly connecting the sewage discharge connection part 13 and the sewage intake connection part 23. The clamp connection element 6 includes a clamp main body 63, a first limiting flange 61, and a second limiting flange 62. The clamp main body 63, the first limiting flange 61, and the second limiting flange 62 enclose a limiting groove with a U-shaped cross section for clamping and fixing the second annular flange 132 and the first annular flange 232. The clamp main body 63, the second annular flange 132, and the first annular flange 232 may all be annular.

[0093] When the clamp connection element 6 is used for clamping and fixing, the first limiting flange 61 and the second limiting flange 62 abut against the second annular flange 132 and the first annular flange 232 in an axial direction, respectively, to limit a separation of the second annular flange 132 and the first annular flange 232 in the axial direction, and the clamp connection element 6 may also limit the misalignment of the second annular flange 132 and the first annular flange 232 in a radial direction. In other words, the clamp connection element 6 may realize the limitation of the relative positional relationship between the sewage discharge connection part 13 and the sewage intake connection part 23 without other auxiliary limiting elements. A rotation limiting structure (such as a subsequent anti-rotation structure) may be further provided on the clamp connection element 6, so that it may ensure that the relative position between the sewage discharge connection part 13 and the sewage intake connection part 23 is determined, and there will be no relative rotation.

[0094] In an exemplary embodiment, as shown in FIG. 22, the second annular flange 132 abuts against the first annular flange 232 in the axial direction, and an outer sidewall of the second annular flange 132 is flush with an outer sidewall of the first annular flange 232.

[0095] The second annular flange 132 abuts against the first annular flange 232 in the axial direction, so that an axial distance between the second annular flange 132 and the first annular flange 232 may be shortened to reduce an axial size of the clamp connection element 6.

[0096] The outer sidewall of the second annular flange 132 is flush with the outer sidewall of the first annular flange 232. In other words, radial dimensions of the second annular flange 132 and the first annular flange 232 are set to be the same, so that the clamp connection element 6 may better clamp and fix the second annular flange 132 and the first annular flange 232, and forces on the second annular flange 132 and the first annular flange 232 are the same and uniform.

[0097] In some cases, there may also be a gap between the second annular flange 132 and the first annular flange 232 rather than a tight abutment. For example, an annular protrusion is provided on an end face of one of the annular flanges as a sealing structure; or, a sealing gasket or the like is provided between the axial end faces of the second annular flange 132 and the first annular flange 232. At this time, it is sufficient to increase an axial length of the clamp connection element 6 accordingly, and the present application is not limited to this.

[0098] In an exemplary embodiment, as shown in FIG. 22, an end of the second annular flange 132 away from the toilet bowl 11 encloses an installation groove 263 with the sewage discharge pipe section 131. The first annular flange 232 is located at an end of the sewage intake pipe section 231 close to the toilet bowl 11, and the sewage intake pipe section 231 is at least partially sleeved outside the sewage discharge pipe section 131 so that the first annular flange 232 is at least partially located in the installation groove 263 and abuts against the second annular flange 132.

[0099] The end of the second annular flange 132 away from the toilet bowl 11 encloses the installation groove 263 with the sewage discharge pipe section 131. In other words, the sewage discharge pipe section 131 extends out of the second annular flange 132 in the axial direction, and then forms an installation groove 263 with an end of the second annular flange 132. The installation groove 263 may be a stepped groove, the installation groove 263 is provided as open at an end facing the first annular flange 232, and a radial outer end of the installation groove 263 is provided as open. The sewage intake pipe section 231 may be sleeved on the sewage discharge pipe section 131 for easy assembly. During an installation process of the sewage discharge mechanism 2, the sewage intake pipe section 231 is first sleeved on the sewage discharge pipe section 131. At this time, the sewage discharge pipe section 131 may play a certain supporting role on the sewage intake pipe section 231, so as to prevent the operator from holding the sewage discharge box 21 for a long time, reduce labor intensity, and facilitate the operator to install the clamp connection element 6 at the connection between the second annular flange 132 and the first annular flange 232.

[0100] In an exemplary embodiment, as shown in FIG. 22, a sealing groove 265 is provided on an inner sidewall of an end of the sewage intake pipe section 231 close to the toilet bowl 11. The sealing groove 265 is provided as open at an end facing the second annular flange 132, a radial inner end of the sealing groove 265 is provided as open, and a sealing element 4 is provided in the sealing groove 265. An end of the sealing element 4 close to the second annular flange 132 abuts against the second annular flange 132 and a radial inner end of the sealing element 4 abuts against an outer sidewall of the sewage discharge pipe section 131.

[0101] A sealing groove 265 is provided on the sewage intake pipe section 231 for installing the sealing element 4, so as to improve the sealability of the connection between the sewage discharge connection part 13 and the sewage intake connection part 23, and prevent water leakage and returning of odor at the connection.

[0102] The sealing groove 265 is provided as open at an end facing the second annular flange 132, and a radial inner end of the sealing groove 265 is provided as open. In other words, the sealing groove 265 is open on two sides and is in a form of a stepped groove.

[0103] Four faces of the sealing element 4 located in the sealing groove 265 abut to realize the axial sealing and the radial sealing simultaneously, which simplifies the sealing structure and improves the sealing effect.

[0104] In an exemplary embodiment, a distance between the first limiting flange 61 and the second limiting flange 62 is gradually increased in a radially inward direction; or, the radial inner end of the first limiting flange 61 and the radial inner end of the second limiting flange 62 are provided with guidance ramps.

[0105] The distance between the first limiting flange 61 and the second limiting flange 62 is gradually increased. In other words, an opening of the clamp connection element 6 is gradually increased, so that the clamp connection element 6 is sleeved outside the second annular flange 132 and the first annular flange 232 to avoid installation difficulties due to dimensional errors during installation.

[0106] Alternatively, guidance ramps may also be provided at a radial inner end of the first limiting flange 61 and a radial inner end of the second limiting flange 62 to facilitate installation of the clamp connection element 6. In other words, guidance ramps are provided at a radial inner end of the first limiting flange 61 and a radial inner end of the second limiting flange 62, so that an opening size of the clamp connection element 6 is increased with a reduction in a radial size. That is, for the limiting groove on the clamp connection element 6, the opening size (width) is greater than the groove bottom size (width), so as to smoothly sleeve the clamp connection element 6

outside the second annular flange 132 and the first annular flange 232, and connect and fix the second annular flange 132 and the first annular flange 232.

[0107] In an exemplary embodiment, the clamp connection element 6 includes multiple sub-clamps, and the multiple sub-clamps are spliced along the circumferential direction of the clamp connection element 6 to form an annular structure.

[0108] The clamp connection element 6 may include two sub-clamps. As shown in FIG. 20, the clamp connection element 6 includes a first sub-clamp 64 and a second sub-clamp 66, a first end of the first sub-clamp 64 is detachably connected to a first end of the second sub-clamp 66, and a second end of the first sub-clamp 64 is hinged or detachably connected to a second end of the second sub-clamp 66. The first sub-clamp 64 and the second sub-clamp 66 are fastened to form a complete annular ring, so as to limit and fix the sewage discharge connection part 13 and the sewage intake connection part 23.

[0109] The first end of the first sub-clamp 64 is provided with a first installation part 641 extending outward in the radial direction, the first end of the second sub-clamp 66 is provided with a second installation part 661 extending outward in the radial direction, and the first installation part 641 is connected to the second installation part 661. The second end of the first sub-clamp 64 is provided with a third installation part 642 extending outward in the radial direction, the second end of the second sub-clamp 66 is provided with a fourth installation part 662 extending outward in the radial direction, and the third installation part 642 is connected to the fourth installation part 662.

[0110] The first installation part 641 is provided with a first connection hole, and the second installation part 661 is provided with a second connection hole. A first fastener 65 passes through the first connection hole and the second connection hole to fixedly connect the first installation part 641 and the second installation part 661. The third installation part 642 is provided with a third connection hole and the fourth installation part 662 is provided with a fourth connection hole. A second fastener 67 passes through the third connection hole and the fourth connection hole to fixedly connect the third installation part 642 and the fourth installation part 662.

[0111] **In** an exemplary embodiment, the toilet device further includes an anti-rotation structure for limiting the rotation of the sewage discharge box 21 relative to the toilet seat body 1.

[0112] An anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, and the anti-rotation structure prevents the sewage discharge box 21 from rotating.

[0113] The clamp connection element 6 connects and fixes the sewage discharge connection part 13 and the sewage intake connection part 23, and limits the sewage discharge connection part 13 and the sewage intake connection part 23 in an axial direction, so that the sewage discharge box 21 may be prevented from being disengaged backward in the axial direction relative to the toilet seat body 1. The clamp connection element 6 limits the sewage discharge connection part 13 and the sewage intake connection part 23 in a radial direction, so that the sewage discharge box 21 and the toilet seat body 1 may be prevented from being misaligned in the radial direction. Combined with the anti-rotation structure, the clamp connection element 6 limits the sewage discharge connection part 13 and the sewage intake connection part 23 in a circumferential direction, so that the sewage discharge box 21 may be prevented from rotating relative to the toilet seat body 1, and the working of the toilet device is guaranteed to be reliable.

[0114] **In** an exemplary embodiment, one of the sewage discharge connection part 13 and the sewage intake connection part 23 is provided with a protruding part, and the other of the sewage discharge connection part 13 and the sewage intake connection part 23 is provided with a mating groove, and the anti-rotation structure includes the protruding part and the mating groove (not shown in the figure). Alternatively, the sewage discharge connection part 13 is provided with a first limiting hole, the sewage intake connection part 23 is provided with a second limiting hole, the anti-rotation structure includes a limiting element, and the limiting element passes through the first limiting hole and the second limiting hole along an axial direction of the sewage intake connection part 23, so as to limit the rotation of the sewage intake connection part 23 relative to the sewage discharge connection part 13 (not shown in the figure). Alternatively, as shown in FIGS. 23 and 24, a non-circular first anti-rotation wall surface 261 is provided on an outer wall of the sewage discharge connection part 13, a non-circular second anti-rotation wall surface 264 is provided on the sewage intake connection part 23, and a third anti-rotation wall surface that cooperates with the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 is provided on an inner sidewall of the clamp connection element 6. The anti-rotation structure includes the first anti-rotation wall surface 261, the second anti-rotation wall surface 264, and the third anti-rotation wall surface.

[0115] The anti-rotation structure may have a variety of forms. For example, a protruding part is provided on the sewage discharge connection part 13, and a mating groove is provided on the sewage intake connection part 23, and the protruding part is inserted into the mating groove, so as to limit a circumferential rotation of the sewage intake connection part 23 (sewage discharge box 21) relative to the sewage discharge connection part 13.

[0116] Alternatively, a first limiting hole is provided in the sewage discharge connection part 13, and a second limiting hole is provided in the sewage intake connection part 23. A limiting element passes through the first limiting hole and the second limiting hole in the axial direction, so as to limit a circumferential rotation of the sewage intake connection part 23 (sewage discharge box 21) relative to

the sewage discharge connection part 13.

[0117] Alternatively, a third anti-rotation wall surface is provided on an inner sidewall of the clamp connection element 6, and a first anti-rotation wall surface 261 and a second anti-rotation wall surface 264 are provided on the sewage discharge connection part 13 and the sewage intake connection part 23, respectively. The first anti-rotation wall surface 261, the second anti-rotation wall surface 264, and the third anti-rotation wall surface are all non-circular wall surfaces, and the third anti-rotation wall surface abuts against the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 in a radial direction. That is, the clamp connection element 6 limits a relative rotation between the sewage intake connection part 23 (sewage discharge box 21) and the sewage discharge connection part 13.

[0118] **In** an exemplary embodiment, a first installation groove is provided on at least one of the sewage intake connection part 23 and the sewage discharge connection part 13, a first sealing element is provided in the first installation groove, and the first sealing element abuts against an axial end face of the sewage intake connection part 23 and an axial end face of the sewage discharge connection part 13 to form an end face seal. And/or a second installation groove is provided on at least one of the sewage intake connection part 23 and the sewage discharge connection part 13, a second sealing element is provided in the second installation groove, and the second sealing element abuts against a radial inner end of the sewage intake connection part 23 and a radial outer end of the sewage discharge connection part 13 to form a radial seal.

[0119] The toilet device also includes a sealing element provided between the sewage intake connection part 23 and the sewage discharge connection part 13. The provision of the sealing element between the sewage intake connection part 23 and the sewage discharge connection part 13, together with the clamping force provided by the clamp connection element 6, may further improve the sealability between the sewage intake connection part 23 and the sewage discharge connection part 13, and ensure that a phenomenon of water leakage, returning of odor or the like will not occur at the connection between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0120] The sealing element may function as a static seal. For example, the sealing element may be made of a rubber material.

[0121] The sealing form of the sealing element may be an end face seal, a radial seal, or may have a end face seal and radial seal (for example, the sealing element 4 in the sealing groove 265 as described above) simultaneously.

[0122] For the end face seal, a first installation groove may be provided on the sewage intake connection part 23, the sealing element is installed in the first installation groove in an axial direction, and the sewage discharge connection part 13 abuts against the sealing element in the first installation groove. After connecting the sewage intake connection part 23 and the sewage discharge connection part 13, the clamp connection element 6 may exert a certain compression effect on the sealing element, in other words, the clamp connection element 6 may make the sealing element in a compressed state, so as to improve the sealing effect of the sealing element.

[0123] For the radial seal, the second installation groove may be provided on the sewage intake connection part 23, the sealing element is installed into the second installation groove in the radial direction, and the sewage discharge connection part 13 abuts against the sealing element in the second installation groove. In the radial direction, there may be a clearance fit between the sewage intake connection part 23 and the sewage discharge connection part 13, and the sealing element may be installed in the second installation groove with interference. In other words, the sealing element is compressed by an inner sidewall of the sewage intake connection part 23 and an outer sidewall of the sewage discharge connection part 13, so that the sealing element is in a compressed state, so as to improve the sealing effect of the sealing element.

[0124] The toilet device may also include a shifter 51, the shifter 51 is located below the sewage discharge mechanism, an inlet of the shifter 51 is communicated with an outlet of the sewage discharge box 21, and an outlet of the shifter 51 is communicated with the external sewage discharge pipeline 22. A brush ring water outlet 52 is installed on the toilet seat body 1, and the brush ring water outlet 52 is fixed on the toilet seat body 1 to flush water into the toilet device.

[0125] Further, the sewage discharge pipe 22 forms a dynamic seal with the sewage discharge box 21 by an oil seal. The sewage discharge pipe 22 and the sewage discharge box 21 may be plastic elements, so as to ensure the sealing accuracy, prevent water leakage and returning of odor, and solve the problems of poor sealing, water leakage and returning of odor.

[0126] In the toilet device provided by an embodiment of the present application, a guidance structure is provided between the sewage discharge connection part and the sewage intake connection part. The guidance structure is configured to guide the sewage intake connection part to move from a setting start position to a setting end position relative to the sewage discharge connection part, so that the sewage intake connection part is sleeved on the sewage discharge connection part and is limited to the sewage discharge connection part.

[0127] In the toilet provided by an embodiment of the present application, the toilet seat body 1 and the sewage discharge box 21 are fixedly connected through a guidance structure. The connection mode is simple and easy to operate, the fixation is tight, and the connection effect is good. End faces of the sewage discharge connection part 13 and the sewage intake connection part 23 are tightly bonded, and a tight connection is convenient. For example, the sealing property may be further im-

proved by adding a sealing element 4 between the sewage intake connection part 23 and the sewage discharge connection part 13, so as to avoid the problems of water leakage and returning of odor.

[0128] Compared with a connection by members such as bolts, the toilet provided by an embodiment of the present application may solve the problems of a large number of parts in the connection structure, parts that are easy to be scattered and lost during construction, and the need for other auxiliary tools for installation. The toilet provided by an embodiment of the present application does not add additional separate connection member, and does not need a special installation tool, and may be installed with bare hands, which is convenient for the operator to install and construct.

[0129] In an actual operation, the sewage intake connection part 23 may be a plastic element. After the sewage discharge connection part 13 and the sewage intake connection part 23 are connected by the guidance structure, a certain pretension force may be formed between the sewage discharge connection part 13 and the sewage intake connection part 23, so that the sewage intake connection part 23 may be slightly deformed, and the sewage discharge connection part 13 may be more tightly bonded, thereby improving the sealability.

[0130] The sewage intake connection part 23 is provided at the sewage inlet 211 of the sewage discharge box 21 and the sewage discharge connection part 13 is provided at the sewage outlet 12 of the toilet seat body 1. The sewage intake connection part 23 and the sewage discharge connection part 13 are provided for easy connection. The connection between the toilet seat body 1 and the sewage discharge box 21 may be realized by a fixed connection between the sewage intake connection part 23 and the sewage discharge connection part 13. The connection structure is simplified, and the connection between the main structures of the toilet seat body 1 and the sewage discharge box 21 through hole punching or other methods is avoided, which is efficient and practical.

[0131] The guidance structure is configured to guide the sewage intake connection part 23 to move from the setting start position to the setting end position relative to the sewage discharge connection part 13. In other words, the sewage intake connection part 23 is detachably connected to the sewage discharge connection part 13, and the sewage intake connection part 23 is installed to the sewage discharge connection part 13 under an action of the guidance structure, and is limited and fixed, so that the toilet seat body 1 is fixedly connected to the sewage discharge mechanism 2.

[0132] Here, the guidance structure plays a guidance role. For example, an operator can provide power to make the sewage intake connection part 23 move in positions (such as axial movement and circumferential rotation) so that the sewage discharge connection part 13 is connected.

[0133] In an exemplary embodiment, the guidance structure is configured to guide the sewage intake connection part 23 to be inserted into the sewage discharge connection part 13 in an axial direction of the sewage intake connection part 23 from the setting start position, and then rotate to the setting end position relative to the sewage discharge connection part 13 in the circumferential direction of the sewage intake connection part 23.

[0134] The guidance structure is configured to guide the sewage intake connection part 23 to be inserted into the sewage discharge connection part 13 in the axial direction of the sewage intake connection part 23 from the setting start position. In other words, the sewage intake connection part 23 is approached axially relative to the sewage discharge connection part 13 along the guidance structure so as to be inserted into the sewage discharge connection part 13.

[0135] The guidance structure then guides the sewage intake connection part 23 to rotate to the setting end position relative to the sewage discharge connection part 13 in the circumferential direction of the sewage intake connection part 23. In other words, after the sewage intake connection part 23 are inserted into and connected with the sewage discharge connection part 13, the sewage intake connection part 23 rotates at a certain angle in the circumferential direction to lock the sewage discharge connection part 13 and the sewage intake connection part 23, so as to prevent the sewage intake connection part 23 from retreating in an opposite direction of the axial direction and separating from the sewage discharge connection part 13.

[0136] The sewage intake connection part 23 guided by the guidance structure moves first in the axial direction and then rotates in the circumferential direction, which not only ensures the reliable connection between the sewage intake connection part 23 and the sewage discharge connection part 13, but also makes the operation simple and the installation fast in the actual assembly, thus improving the assembly efficiency.

[0137] In an exemplary embodiment, as shown in FIGS. 36 to 38, the guidance structure includes a guidance groove 1311, a rotation groove 1312, a stopper protrusion 1313, and a guidance protrusion 2311. One of the sewage discharge connection part 13 and the sewage intake connection part 23 is provided with the guidance groove 1311, the rotation groove 1312, and the stopper protrusion 1313, and the other of the sewage discharge connection part 13 and the sewage intake connection part 23 is provided with the guidance protrusion 2311. The guidance groove 1311 and the rotation groove 1312 are communicated and provided adjacent to each other in the axial direction of the sewage intake connection part 23. The stopper protrusion 1313 and the guidance groove 1311 are provided adjacent to each other in the circumferential direction of the sewage intake connection part 23. The guidance groove 1311 is used for the guidance protrusion 2311 to pass through the guidance groove 1311 in the axial direction of the sewage intake connection part 23 from the setting start position to

enter the rotation groove 1312. The rotation groove 1312 is used for the guidance protrusion 2311 to rotate relative to the sewage discharge connection part 13 in the circumferential direction of the sewage intake connection part 23. The stopper protrusion 1313 is configured to cooperate with the guidance protrusion 2311 in a stop manner when the guidance protrusion 2311 rotates to the setting end position, so as to prevent the sewage intake connection part 23 from being disengaged from the sewage discharge connection part, so that the sewage intake connection part 23 is limited to the sewage discharge connection part 13.

[0138] The guidance groove 1311, the rotation groove 1312, and the stopper protrusion 1313 may be provided on the sewage discharge connection part 13, and the rotation groove 1312 is provided on a side of the guidance groove 1311 away from the sewage intake connection part 23, and the rotation groove 1312 is communicated with the guidance groove 1311. The guidance protrusion 2311 moves within the guidance groove 1311 into the rotation groove 1312 in the axial direction, and the guidance protrusion 2311 rotates circumferentially within the rotation groove 1312 to the setting end position to prevent the guidance protrusion 2311 from being disengaged from the guidance groove 1311 again. When the guidance protrusion 2311 rotates circumferentially within the rotation groove 1312 to the setting end position, the stopper protrusion 1313 abuts against the guidance protrusion 2311 in the axial direction to prevent the guidance protrusion 2311 from retreating and being disengaged in the axial direction, thereby firmly connecting the sewage intake connection part 23 and the sewage discharge connection part 13.

[0139] The guidance protrusion 2311 is provided on the sewage intake connection part 23, and the guidance protrusion 2311 cooperates with the guidance groove 1311 and the rotation groove 1312.

[0140] In addition to the above-described arrangement mode, the guidance groove 1311, the rotation groove 1312, and the stopper protrusion 1313 may be provided on the sewage intake connection part 23, and the guidance protrusion 2311 may be provided on the sewage discharge connection part 13.

[0141] In an exemplary embodiment, as shown in FIG. 36, the sewage intake connection part 23 is sleeved outside the sewage discharge connection part 13. The sewage discharge connection part 13 includes a sewage discharge pipe section 1314 and a second annular flange 132 provided on an outer sidewall of the sewage discharge pipe section 1314. The second annular flange 132 is provided with a notch, the notch forms the guidance groove 1311, and a portion adjacent to the notch on the second annular flange 132 forms the stopper protrusion 1313. An end of the second annular flange 132 close to the toilet bowl 11 and the sewage discharge pipe section 1314 enclose the rotation groove 1312. The guidance protrusion 2311 is provided on an inner sidewall of the sewage intake connection part 23.

[0142] As shown in FIG. 36, the notch may be provided on an outer circumferential surface of the second annular flange 132, and the notch penetrates the second annular flange 132 in an axial direction so that the guidance protrusion 2311 passes through the notch into the rotation groove 1312. Multiple notches are uniformly provided in the circumferential direction of the second annular flange 132, for example, three notches may be provided.

[0143] The sewage intake connection part 23 is sleeved outside the sewage discharge connection part 13, and the guidance protrusion 2311 is provided on an inner sidewall of the sewage intake connection part 23. The guidance groove 1311 and the rotation groove 1312 are provided on an outer sidewall of the sewage discharge connection part 13.

[0144] The sewage discharge connection part 13 includes the sewage discharge pipe section 1314 and the second annular flange 132, the second annular flange 132 may be of an integrated structure, multiple notches are uniformly provided in the circumferential direction of the second annular flange 132, and multiple guidance protrusions 2311 are provided correspondingly on an inner sidewall of the sewage intake connection part 23. The stopper protrusion 1313 is located between adjacent notches.

[0145] The rotation groove 1312 may be a 360° annular groove.

[0146] In an exemplary embodiment, as shown in FIG. 38, the guidance protrusion 2311 is provided at an end of the inner sidewall of the sewage intake connection part 23 close to the toilet bowl 11.

[0147] The guidance protrusion 2311 is provided at an end of the sewage intake connection part 23 to facilitate cooperation with the guidance groove 1311 and the rotation groove 1312 of the sewage discharge connection part 13.

[0148] In an exemplary embodiment, the toilet also includes an anti-rotation structure for limiting the rotation of the sewage discharge box 21 relative to the toilet seat body 1.

[0149] An anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, and the anti-rotation structure prevents the sewage discharge box 21 from rotating.

[0150] A guidance mechanism connects and fixes the sewage discharge connection part 13 and the sewage intake connection part 23, and limits the sewage discharge connection part 13 and the sewage intake connection part 23 in the axial direction. After the guidance protrusion passes through the guidance groove 1311 and enters into the rotation groove, the sewage intake connection part 23 rotates at a certain angle, so that the stopper protrusion 1313 abuts against the guidance protrusion 2311 in the axial direction, the guidance protrusion 2311 is prevented from retreating and being disengaged in the axial direction, and the sewage intake connection part 23 and the sewage discharge connection

part 13 are firmly connected. In this way, a limitation and fixation of the sewage discharge connection part 13 and the sewage intake connection part 23 in the axial direction is realized. However, when the sewage discharge box 21 is subjected to a circumferential force, the guidance mechanism does not provide a circumferential limitation. When the anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, the sewage discharge box 21 can be prevented from rotating relative to the toilet seat body 1 after being subjected to the circumferential force, so that the sewage discharge box 21 may be completely fixed and limited, and the sewage discharge box 21 can be prevented from moving or rotating during working process, thereby ensuring a reliable working of the toilet.

[0151] In an exemplary embodiment, as shown in FIGS. 29, 30, 31, 34, and 36, the sewage discharge connection part 13 is provided with a first limiting hole 1316, the sewage intake connection part 23 is provided with a second limiting hole 2312, and the anti-rotation structure includes a limiting element 7. The limiting element 7 passes through the first limiting hole 1316 and the second limiting hole 2312 in the axial direction of the sewage intake connection part 23 to limit the rotation of the sewage intake connection part 23 relative to the sewage discharge connection part 13.

[0152] After the sewage intake connection part 23 is inserted into and connected with the sewage discharge connection part 13, the sewage intake connection part 23 is rotated at a certain angle in the circumferential direction so that the sewage discharge connection part 13 and the sewage intake connection part 23 are locked, and limited in the axial direction. After the sewage intake connection part 23 moves from the setting start position to the setting end position relative to the sewage discharge connection part 13, the first limiting hole 1316 and the second limiting hole 2312 are aligned in the axial direction, and the limiting element 7 passes through the first limiting hole 1316 and the second limiting hole 2312 to perform a circumferential limitation so as to limit the rotation of the sewage intake connection part 23 relative to the sewage discharge connection part 13.

[0153] The anti-rotation structure may also be in other forms. For example, a limiting groove is provided in the rotation groove 1312, and a limiting part is provided on the guidance protrusion 2311. After the guidance protrusion 2311 rotates at a certain angle along the rotation groove 1312, the limiting part is clamped into the limiting groove to achieve limiting, so as to limit a further rotation of the sewage intake connection part 23 relative to the sewage discharge connection part 13.

[0154] In an exemplary embodiment, as shown in FIG. 36, based on that the sewage intake connection part 23 is sleeved outside the sewage discharge connection part 13, an outer sidewall of the sewage discharge connection part 13 is provided with a protruding part 133. The protruding part 133 is staggered with the guidance structure along the axial direction of the sewage intake connection part 23. The protruding part 133 is provided with the first limiting hole 1316, the sewage intake connection part 23 is provided with the second limiting hole 2312, and an end of the second limiting hole 2312 extends to an end face of the sewage intake connection part 23 close to the toilet bowl 11 to form an opening for installing the limiting element 7.

[0155] The protruding part 133 is additionally provided on the outer sidewall of the sewage discharge connection part 13, and the protruding part 133 is used for opening the first limiting hole 1316. The protruding part 133 is staggered with the guidance structure along the axial direction, and protrudes from a side of the guidance structure away from the sewage intake connection part 23.

[0156] The first limiting hole 1316 may also be provided in the stopper protrusion 1313.

[0157] In an exemplary embodiment, as shown in FIG. 31, the limiting element 7 includes a limiting rod 71 and a push-pull protrusion 72 provided on the limiting rod 71, and the push-pull protrusion 72 is configured to drive the limiting rod 71 to move in the axial direction of the sewage intake connection part 23.The sewage intake connection part 23 is further provided with a push-pull groove 2313, an end of the push-pull groove 2313 communicates with the second limiting hole 2312, and the other end of the push-pull groove 2313 penetrates the sewage intake connection part 23 along the radial direction of the sewage intake connection part 23. The push-pull protrusion 72 is movably located in the push-pull groove 2313 and protrudes from the push-pull groove 2313.

[0158] The limiting element 7 may include the limiting rod 71 and the push-pull protrusion 72 provided on the limiting rod 71, and the operator may move the limiting rod 71 in the axial direction by pushing the push-pull protrusion 72. A push-pull groove 2313 for sliding the push-pull protrusion 72 is further provided on the sewage intake connection part 23.

[0159] An end of the push-pull groove 2313 communicates with the second limiting hole 2312, and the other end of the push-pull groove 2313 extends to an outer circumferential surface of the sewage intake connection part 23 in the radial direction of the sewage intake connection part 23, and forms an opening on the outer circumferential surface. In other words, the push-pull groove 2313 communicates with the second limiting hole 2312, so that the push-pull protrusion 72 moves along the axial direction of the push-pull groove 2313 and may drive the limiting rod 71 to move along the axial direction of the second limiting hole 2312.

[0160] In an exemplary embodiment, the limiting element 7 is configured to be movable between a first position and a second position along the axial direction of the sewage intake connection part 23. When the limiting element 7 is moved to the first position, the limiting element 7 passes through the first limiting hole 1316 and the second limiting hole 2312 to limit the rotation

of the sewage intake connection part 23 relative to the sewage discharge connection part 13. When the limiting element 7 is moved to the second position, the limiting element 7 is disengaged from the first limiting hole 1316 and/or the second limiting hole 2312, so that the sewage intake connection part 23 may rotate relative to the sewage discharge connection part 13.

[0161] When the limiting element 7 is moved to the first position, that is, the limiting element 7 is located in both the first limiting hole 1316 and the second limiting hole 2312, the limiting rod 71 serves to limit the relative rotation between the sewage discharge connection part 13 and the sewage intake connection part 23, so as to ensure a reliable connection between the sewage discharge mechanism 2 and the toilet seat body 1.

[0162] When the limiting element 7 is moved to the second position, that is, the limiting rod 71 is moved to be located only in the first limiting hole 1316 or only in the second limiting hole 2312 in the axial direction, the circumferential limitation is removed to facilitate the disassembly and assembly of the sewage discharge mechanism 2.

[0163] In an exemplary embodiment, the anti-rotation structure further includes an elastic element 74 that cooperates with the limiting element 7. The elastic element 74 is configured to position the limiting element 7 in the first position by using a reset elastic force of the elastic element 74, as shown in FIG. 31. Alternatively, the anti-rotation structure further includes a magnetic element (not shown in the figure) provided opposite to the limiting element 7, and the magnetic element is configured to position the limiting element 7 in the first position by using a magnetic field force of the magnetic element.

[0164] The anti-rotation structure may also include an elastic element 74 or a magnetic element that cooperates with the limiting element 7. The elastic element 74 or the magnetic element applies a reset elastic force or magnetic field force to the limiting element 7 so that the limiting element 7 is always in the first position. That is, the limiting element 7 is always in both the first limiting hole 1316 and the second limiting hole 2312, so as to limit a relative rotation between the sewage discharge connection part 13 and the sewage intake connection part 23.

[0165] The elastic element 74 may be a spring, an end of the spring abuts against the limiting element 7, and the other end of the spring abuts in the first limiting hole 1316 or the second limiting hole 2312 so that the limiting element 7 is located in both the first limiting hole 1316 and the second limiting hole 2312. The magnetic element may be a magnet, the magnet is located in the first limiting hole 1316 or the second limiting hole 2312, and an end of the limiting element 7 facing the magnet is provided as be made of a magnetic material or a metal material. The magnetic element has a suction force or a repulsion force on the limiting element 7 so that the limiting element 7 is located in both the first limiting hole 1316 and the second limiting hole 2312.

[0166] When the sewage discharge mechanism 2 needs to be disassembled, the operator manually pushes the push-pull protrusion 72 to overcome the reset elastic force of the elastic element 74 or the magnetic field force of the magnetic element, so that the limiting rod 71 is moved to the second position.

[0167] In an exemplary embodiment, as shown in FIG. 31, the limiting element 7 includes a limiting rod 71 and a first installation plate 73 provided on the limiting rod 71. A first installation hole 731 is provided in the first installation plate 73. The anti-rotation structure further includes a connection element 75. The connection element 75 passes through the first installation hole 731 to movably limit the limiting element 7 in the first limiting hole 1316 or the second limiting hole 2312, and prevents the limiting element 7 from being disengaged from the first limiting hole 1316 or the second limiting hole 2312. The connection element 75 may be a screw.

[0168] The limiting rod 71 may further be provided with a first installation plate 73, a first installation hole 731 is provided on the first installation plate 73, and the connection element 75 passes through the first installation hole 731 to movably limit the limiting rod 71 in the first limiting hole 1316 or the second limiting hole 2312. After the connection element 75 limits the limiting rod 71 by the first installation plate 73, the limiting rod 71 may still be moved between the first position and the second position in the axial direction, but the limiting rod 71 may be prevented from falling out directly from the first limiting hole 1316 and the second limiting hole 2312.

[0169] As shown in FIG. 30, an accommodation groove 233 communicated with the second limiting hole 2312 may be provided on the sewage intake connection part 23, and the first installation plate 73 is installed in the accommodation groove 233.

[0170] After the first installation plate 73 is provided and fixed by the connection element 75, the limiting rod 71 may be prevented from falling out easily from the first limiting hole 1316 or the second limiting hole 2312 during the actual installation process, thereby preventing the operator from fixing the limiting rod 71 by hand, and facilitating the operator to perform the installation work.

[0171] In an exemplary embodiment, at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a first installation groove, a first sealing element 4 is provided in the first installation groove, and the first sealing element 4 abuts against an axial end face of the sewage intake connection part 23 and an axial end face of the sewage discharge connection part 13 to form an end face seal. And/or, at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a second installation groove, a second sealing element 4 is provided in the second installation groove, and the second sealing element 4 abuts against a radial inner end of the sewage intake connection part 23 and a radial outer end of the sewage discharge connection part 13 to form a radial seal.

[0172] As shown in FIG. 34, the toilet further includes

the sealing element 4 provided between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0173] The provision of the sealing element 4 between the sewage intake connection part 23 and the sewage discharge connection part 13, together with a clamping force provided by the guidance protrusion 2311 and the stopper protrusion 1313, can further improve the sealability between the sewage intake connection part 23 and the sewage discharge connection part 13 to ensure that a phenomenon of water leakage, returning of odor or the like will not occur at the connection between the sewage intake connection part 23 and the sewage discharge connection part 13. The sealing element 4 may function as a static seal, for example, the sealing element may be made of a rubber material.

[0174] The sealing form of the sealing element 4 may be an end face seal, a radial seal, or may have an end face seal and a radial seal simultaneously.

[0175] For the end face seal, the first installation groove may be provided on the sewage intake connection part 23, the sealing element 4 is installed in the first installation groove in an axial direction, and the sewage discharge connection part 13 abuts against the sealing element 4 in the first installation groove. After connecting the sewage intake connection part 23 and the sewage discharge connection part 13, the guidance protrusion 2311 and the stopper protrusion 1313 may exert a certain compression effect on the sealing element 4. In other words, the guidance protrusion 2311 and the stopper protrusion 1313 may make the sealing element 4 in a compressed state, so as to improve the sealing effect of the sealing element 4.

[0176] For the radial seal, the second installation groove may be provided on the sewage intake connection part 23, the sealing element 4 is installed radially into the second sealing groove, and the sewage discharge connection part 13 abuts against the sealing element 4 in the second installation groove. In a radial direction, there may be a clearance fit between the sewage intake connection part 23 and the sewage discharge connection part 13, and the sealing element 4 may be installed in the second installation groove with interference. In other words, the sealing element 4 is compressed by an inner sidewall of the sewage intake connection part 23 and an outer sidewall of the sewage discharge connection part 13, so that the sealing element 4 is in a compressed state, so as to improve the sealing effect of the sealing element 4.

[0177] During the installation process, the sewage discharge box 21 is inclined at a certain angle so that the guidance protrusion 2311 of the sewage discharge box 21 is aligned with the guidance groove 1311 on the toilet seat body 1, the sewage discharge box 21 is pushed in the axial direction so that the guidance protrusion 2311 passes through the guidance groove 1311 and is clamped into the rotation groove 1312, and then the sewage discharge box 21 is rotated at a certain angle and limited and fixed. At this time, the outlet of the sewage discharge box 21 is facing downward, and the sewage discharge box 21 is clamped on the toilet seat body 1.

[0178] The toilet may also include a shifter 51, the shifter 51 is located below the sewage discharge mechanism 2, the inlet of the shifter 51 is communicated with the outlet of the sewage discharge box 21, and the outlet of the shifter 51 is communicated with an external sewage discharge pipeline. A brush ring water outlet 52 is installed on the toilet seat body 1, and the brush ring water outlet 52 is fixed on the toilet seat body 1 to flush water into the toilet.

[0179] A toilet device is provided by an embodiment of the present disclosure, as shown in FIGS. 42 to 53. The toilet device includes: a toilet seat body 1 provided with a toilet bowl 11 and a sewage discharge mechanism 2. The toilet bowl 11 is communicated with a sewage outlet 12 of the toilet seat body 1. A sewage discharge connection part 13 is provided on an outer periphery of the sewage outlet 12, and the sewage discharge connection part 13 is located outside the toilet bowl 11, and is provided with a channel communicated with the sewage outlet 12. The sewage discharge mechanism 2 includes a sewage discharge box 21, a sewage inlet of the sewage discharge box 21 is communicated with the channel, and a sewage intake connection part 23 is provided on an outer periphery of the sewage inlet. The sewage intake connection part 23 protrudes on an outer wall of the sewage discharge box 21. The sewage discharge connection part 13 is sleeved outside the sewage intake connection part 23 or the sewage intake connection part 23 is sleeved outside the sewage discharge connection part 13, and supports the sewage discharge mechanism 2 so that the sewage discharge mechanism 2 is installed on the toilet seat body 1.

[0180] The sewage discharge mechanism 2 may further include a sewage discharge pipe 22 located in the sewage discharge box 21, and the sewage discharge pipe 22 is communicated with the sewage inlet and rotatable relative to the sewage discharge box 21 for sewage discharge. The sewage discharge pipe 22 and the sewage discharge box 21 may be made of plastic, and the toilet seat body 1 may be made of a ceramic material.

[0181] The sewage intake connection part 23 is sleeved outside the sewage discharge connection part 13, and an interference fit may be formed between the sewage intake connection part 23 and the sewage discharge connection part 13, so as to improve the connection reliability. Of course, in order to improve the sealability of the connection, a sealing structure may be provided here in practical applications to further prevent water leakage, returning of odor gas, and the like.

[0182] In the toilet device provided by an embodiment of the present application, the toilet seat body 1 and the sewage discharge box 21 are fixedly connected in a sleeved manner, which is simple and convenient to install, and is convenient to disassemble and replace later.

The contact surfaces of the sewage discharge connection part 13 and the sewage intake connection part 23 are tightly bonded, so as to avoid the problems of water leakage and returning of odor to a certain extent.

[0183] In an actual operation, the sewage intake connection part 23 may be a plastic element. After a certain compression force is generated by the interference fit, the sewage intake connection part 23 may be slightly deformed, so that the sewage discharge connection part 13 may be more tightly bonded, thereby improving the sealability.

[0184] The sewage intake connection part 23 is provided at the sewage inlet of the sewage discharge box 21 and the sewage discharge connection part 13 is provided at the sewage outlet 12 of the toilet seat body 1. The sewage intake connection part 23 and the sewage discharge connection part 13 are provided for easy connection. The connection between the toilet seat body 1 and the sewage discharge box 21 may be realized by a fixed connection between the sewage intake connection part 23 and the sewage discharge connection part 13. The connection structure is simplified, and the connection between the main structures of the toilet seat body 1 and the sewage discharge box 21 through hole punching or other methods is avoided, which is efficient and practical.

[0185] In an exemplary embodiment, the toilet device further includes an anti-detachment structure for preventing the sewage intake connection part 23 from being disengaged from the sewage discharge connection part 23.

[0186] The toilet device also includes an anti-detachment structure for preventing the sewage intake connection part 23 from being disengaged from the sewage discharge connection part 13 in the axial direction, so as to further improve the reliability of the connection and improve the service life of the toilet device.

[0187] The anti-detachment structure may be in various forms. For example, a limiting block or the like is provided to prevent the sewage intake connection part 23 from retreating in the axial direction, or an abutment structure is provided at a rear end of the sewage intake connection part 23 (a rear end of the sewage discharge mechanism 2) to prevent the sewage intake connection part 23 from retreating in the axial direction.

[0188] In an exemplary embodiment, as shown in FIGS. 51 and 52, the anti-detachment structure includes a first limiting element 8, and the first limiting element 8 is located on a rear side of the sewage discharge mechanism 2 and in contact with a rear part of the sewage discharge mechanism 2 and the toilet seat body 1. The first limiting element 8 is connected to at least one of the sewage discharge mechanism 2 and the toilet seat body 1.

[0189] The first limiting element 8 is provided at a rear part of the sewage discharge mechanism 2, and is in contact with the sewage discharge mechanism 2 and the toilet seat body 1, respectively, so as to abut against the sewage discharge mechanism 2, and limit in the axial direction to prevent the sewage discharge mechanism 2 from being disengaged backward.

[0190] A lower end of the first limiting element 8 may be fixed on the toilet seat body 1, and an upper end of the first limiting element 8 may abut against the sewage discharge mechanism 2. Alternatively, an upper end of the first limiting element 8 may be fixed on the sewage discharge mechanism 2, and a lower end of the first limiting element 8 may abut against the toilet seat body 1.

[0191] In an exemplary embodiment, as shown in FIGS. 51 and 52, the lower part of the toilet seat body 1 is provided with a second installation plate 266, and a second installation hole 267 is provided in the second installation plate 266. A lower end of the first limiting element 8 is supported on the second installation plate 266, and a fastener 84 is fixedly connected to the first limiting element 8 through the second installation hole 267, so that the first limiting element 8 is fixed to the toilet seat body 1. An upper end of the first limiting element 8 abuts against the rear part of the sewage discharge mechanism 2.

[0192] The second installation plate 266 is provided at the lower part of the toilet seat body 1, and the second installation plate 266 is provided on an inner wall of the toilet seat body 1, provided horizontally and extending inward. The second installation plate 266 is provided with a limiting hole for cooperation with the first limiting element 8. A lower end of the first limiting element 8 is fixed to the second installation plate 266, and an upper end of the first limiting element 8 abuts against the rear end of the sewage discharge mechanism 2, and limits in the axial direction to prevent the sewage discharge mechanism 2 from being disengaged backward.

[0193] In an exemplary embodiment, as shown in FIGS. 51 and 52, the first limiting element 8 includes a connection plate 81, a supporting plate 82, and a reinforcement plate 83. The connection plate 81 is supported on the second installation plate 266, and is fixedly connected to the toilet seat body 1 by the fastener 84. A lower end of the supporting plate 82 is connected to the second installation plate 266, and an upper end of the supporting plate 82 abuts against the rear part of the sewage discharge mechanism 2. The reinforcement plate 83 is connected to a rear plate surface of the supporting plate 82 and the connection plate 81.

[0194] Both the connection plate 81 and the supporting plate 82 extend in a height direction, and the reinforcement plate 83 is provided in a horizontal direction. A lower end of the connection plate 81 is connected to the second installation plate 266 of the toilet seat body 1, and a lower end of the connection plate 81 may extend horizontally out of a transverse plate. **In** other words, the connection plate 81 may be an L-shaped plate as a whole. **In** FIG. 52, only a transverse plate portion of the L-shaped connection plate 81 is shown, and a vertical plate portion is sheltered. Two supporting plates 82 are provided, respectively located on a left side and a right side of the

connection plate 81.

[0195] The reinforcement plate 83 is used to improve the strength and overall height of the first limiting element 8, and to prevent the first limiting element 8 from bending when the first limiting element 8 abuts against the sewage discharge mechanism 2 in the axial direction, which affects the abutment and limiting effect.

[0196] In an exemplary embodiment, as shown in FIGS. 51 and 52, the sewage discharge mechanism 2 further includes a driving device 269 provided on a rear side of the sewage discharge box 21, and the first limiting element 8 abuts against the sewage discharge box 21 and is staggered from the driving device 269.

[0197] The driving device 269 is used to drive the L-shaped sewage discharge pipe 22 in the sewage discharge box 21 to rotate, so as to realize a rotational sewage discharge. The driving device 269 and the first limiting element 8 are staggered to reduce a total axial length of the sewage discharge mechanism 2 and the first limiting element 8 to facilitate a size control of the toilet.

[0198] In an exemplary embodiment, as shown in FIGS. 44 and 45, the toilet device further includes a shifter 51 fixedly connected to the sewage discharge box 21, an inlet of the shifter 51 communicates with a sewage outlet of the sewage discharge box 21, and an outlet of the shifter 51 communicates with an external sewage discharge pipeline 22. The anti-detachment structure includes a second limiting element 85 provided on the shifter 51, and the second limiting element 85 abuts against the rear part of the toilet seat body 1.

[0199] The toilet device may further include the shifter 51, and the shifter 51 is located below the sewage discharge mechanism 2. The inlet of the shifter 51 communicates with the outlet of the sewage discharge box 21, and the outlet of the shifter 51 communicates with the external sewage discharge pipeline, so that the installation position of the toilet device is more flexible and the choice of the user is improved.

[0200] The shifter 51 is fixedly connected to the sewage discharge box 21, and the second limiting element 85 is provided on the shifter 51 to limit and fix the shifter 51, thereby limiting and fixing the sewage discharge box 21. The second limiting element 85 does not need to directly abut against the sewage discharge box 21, and thus the second limiting element 85 does not need to extend a large length in the height direction so as to abut against the toilet seat body 1. The second limiting element 85 is provided on the shifter 51 and directly abuts against the rear part of the toilet seat body 1, which reduces a length size of the second limiting element 85 and facilitates the arrangement of the second limiting element 85.

[0201] In an exemplary embodiment, as shown in FIGS. 44 and 45, the second limiting element 85 includes an abutment plate, an end of the abutment plate is fixedly connected to the shifter 51, and the other end of the abutment plate abuts against an inner sidewall of the toilet seat body 1.

[0202] The second limiting element 85 may be in a form of an abutment plate, and the abutment and limiting effect is achieved in a smaller size.

[0203] The second limiting element 85 may also be in other forms, for example a limiting rod, which is not limited by the present application.

[0204] In an exemplary embodiment, a guidance ramp 268 is provided at an end of the sewage intake connection part 23 close to the toilet bowl 11, as shown in FIGS. 47 and 49.

[0205] A guidance ramp is provided at an end of the sewage discharge connection part 13 away from the toilet bowl 11.

[0206] The sewage intake connection part 23 and the sewage discharge connection part 13 may be provided with guidance ramps respectively, so that the sewage intake connection part 23 may be sleeved on the sewage discharge connection part 13, and the efficiency of sleeving may be improved.

[0207] An opening at an end of the guidance ramp 268 with a larger diameter on the inner wall surface of the sewage intake connection part 23 is provided toward the sewage discharge connection part 13. An end of the guidance ramp with a smaller diameter on the outer peripheral surface of the sewage discharge connection part 13 is provided toward the sewage intake connection part 23. In other words, when the sewage intake connection part 23 and the sewage discharge connection part 13 are assembled, the end of the guidance ramp with the smaller diameter on the outer peripheral surface of the sewage discharge connection part 13 first passes through an end of the guidance ramp 268 with the larger diameter on the inner wall surface of the sewage intake connection part 23, and then the sewage discharge connection part 13 further extends into the sewage intake connection part 23 to complete the assembly.

[0208] In an exemplary embodiment, a sleeve fitting length of the sewage discharge connection part 13 and the sewage intake connection part 23 is greater than or equal to 25 mm and less than or equal to 94 mm.

[0209] A length of the sewage intake connection part 23 sleeved on the sewage discharge connection part 13 is between 25 mm and 94 mm. On the basis of ensuring the connection strength, it is also convenient to arrange a sealing element at the overlapping portion.

[0210] In an exemplary embodiment, an anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13 for limiting the rotation of the sewage discharge box 21 relative to the toilet seat body 1.

[0211] The anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, and the anti-rotation structure prevents the sewage discharge box 21 from rotating.

[0212] The anti-detachment structure abuts the sewage intake connection part 23 against the sewage intake connection part 23 and fixes them, and limits the two in the axial direction, so that the sewage discharge box 21 may be prevented from being disengaged backward in

the axial direction relative to the toilet seat body 1. However, when the sewage discharge box 21 is subjected to a circumferential force, the fastener 84 does not provide a circumferential limitation. When the anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, the sewage discharge box 21 may be prevented from rotating relative to the toilet seat body 1 after being subjected to a circumferential force, so that the sewage discharge box 21 may be completely fixed and limited, and the sewage discharge box 21 may be prevented from moving or rotating during working process, thereby ensuring reliable working of the toilet device.

[0213] **In** an exemplary embodiment, a protruding part 133 is provided on the outer sidewall of the sewage discharge connection part 13, and an accommodation groove 233 cooperated with the protruding part 133 is provided on the sewage intake connection part 23. The anti-rotation structure includes the protruding part 133 and the accommodation groove 233, as shown in FIGS. 43, 44, 48 and 49. Alternatively, the outer sidewall of the sewage discharge connection part 13 is provided with a non-circular first anti-rotation wall surface, and the sewage intake connection part 23 is provided with a second anti-rotation wall surface cooperated with the first anti-rotation wall surface. The anti-rotation structure includes the first anti-rotation wall surface and the second anti-rotation wall surface.

[0214] The non-circular first anti-rotation wall surface is provided on the outer sidewall of the sewage discharge connection part 13 and the second anti-rotation wall surface is provided on the inner sidewall of the sewage intake connection part 23. The first anti-rotation wall surface and the second anti-rotation wall surface are non-circular wall surfaces of the same shape, so as to prevent the sewage discharge box 21 from rotating relative to the toilet seat body 1.

[0215] The sewage intake connection part 23 is sleeved outside the flange, so that the first anti-rotation wall surface tightly abuts against the second anti-rotation wall surface in the radial direction. Since both the first anti-rotation wall surface and the second anti-rotation wall surface are non-circular, relative rotation between the first anti-rotation wall surface and the second anti-rotation wall surface may be avoided, that is, the sewage discharge mechanism 2 is prevented from rotating relative to the toilet seat body 1.

[0216] For example, the first anti-rotation wall surface and the second anti-rotation wall surface may be an irregular annular shape formed by a circular arc and a straight line, and the first anti-rotation wall surface and the second anti-rotation wall surface may play a role of circumferential limitation after cooperation. Alternatively, the first anti-rotation wall surface and the second anti-rotation wall surface may also be other shapes (such as ellipses, polygons, and the like) that may prevent the relative rotation.

[0217] The first anti-rotation wall surface and the second anti-rotation wall surface cooperate to form an anti-rotation structure.

[0218] In addition to the forms of the first anti-rotation wall surface and the second anti-rotation wall surface described above, other forms of the anti-rotation structure may be adopted. For example, a protruding part 133 is provided on the sewage discharge connection part 13, and a corresponding accommodation groove 233 is provided on the sewage intake connection part 23, and the protruding part 133 is clamped in the accommodation groove 233 in the axial direction to achieve an anti-rotation effect. An annular flange may be provided outside the sewage discharge connection part 13, and then a protruding part 133 may be provided on the annular flange for rotational limitation. The annular flange has a certain distance from the annular flange at the end part of the sewage discharge connection part 13 in the axial direction, so as to form a sealing groove for installation of the sealing element in the axial direction.

[0219] In an exemplary embodiment, at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a first installation groove, a first sealing element is provided in the first installation groove, and the first sealing element abuts against a radial inner end of the sewage intake connection part 23 and a radial outer end of the sewage discharge connection part 13 to form a radial seal, as shown in FIG. 47. And/or at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a second installation groove, a second sealing element is provided in the second installation groove, and the second sealing element abuts against an axial end face of the sewage intake connection part 23 and an axial end face of the sewage discharge connection part 13 to form an end face seal.

[0220] The sealing form of the sealing element may be an end face seal, also may be a radial seal, or yet also may be have an end face seal and a radial seal simultaneously.

[0221] For the radial seal, the first installation groove may be provided on the sewage intake connection part 23, the sealing element is installed into the first sealing groove in the radial direction, and the sewage discharge connection part 13 abuts against the sealing element in the first installation groove. In the radial direction, there may be a clearance fit between the sewage intake connection part 23 and the sewage discharge connection part 13, and the sealing element may be installed in the first installation groove with interference. In other words, the sealing element is compressed by the inner sidewall of the sewage intake connection part 23 and the outer sidewall of the sewage discharge connection part 13, so that the sealing element is in a compressed state, so as to improve the sealing effect of the sealing element.

[0222] For the end face seal, a second installation groove may be provided on the sewage intake connection part 23, the sealing element is installed in the second installation groove in the axial direction, and the sewage

discharge connection part 13 abuts against the sealing element in the second installation groove. After the sewage intake connection part 23 and the sewage discharge connection part 13 are connected, the anti-detachment structure may exert a certain compression effect on the sealing element. In other words, the anti-detachment structure may cause the sealing element to be in a compressed state, so as to improve the sealing effect of the sealing element.

[0223] In addition, the sewage discharge pipe 22 is rotatably installed in the sewage discharge box 21, and an oil seal may be provided at the rotational connection to form a dynamic seal, so as to improve the sealability of the connection.

[0224] A brush ring water outlet 52 is installed on the toilet seat body 1, and the brush ring water outlet 52 is fixed on the toilet seat body 1 to flush water into the toilet device.

[0225] An embodiment of the present application provides a toilet device, as shown in FIGS. 54 to 63. The toilet device includes a toilet seat body 1, a sewage discharge mechanism 2, and a fastener 2414. The toilet seat body 1 is provided with a toilet bowl 11 and a sewage outlet 12 communicated with the toilet bowl 11, and a sewage discharge connection part 13 is provided on an outer periphery of the sewage outlet 12. The sewage discharge connection part 13 is located outside the toilet bowl 11 and is provided with a channel communicated with the sewage outlet 12. The sewage discharge mechanism 2 includes a sewage discharge box 21, the sewage discharge box 21 is provided with a sewage inlet 211 communicated with the channel, a sewage intake connection part 23 is provided on an outer periphery of the sewage inlet 211, and the sewage intake connection part 23 protrudes on an outer wall of the sewage discharge box 21.The sewage discharge connection part 13 is fixedly connected to the sewage intake connection part 23 by the fastener 2414, so that the toilet seat body 1 and the sewage discharge box 21 are fixedly connected. The fastener 2414 may be a threaded connection element.

[0226] The sewage discharge mechanism 2 may also include a sewage discharge pipe 22 located in the sewage discharge box 21, and the sewage discharge pipe 22 is communicated with the sewage inlet 211, and is rotatable relative to the sewage discharge box 21 to discharge sewage. The sewage discharge pipe 22 and the sewage discharge box 21 may be made of plastic, and the toilet seat body 1 may be made of a ceramic material.

[0227] Multiple fasteners 2414 may be provided in the circumferential direction of the sewage discharge box 21 to improve the connection effect. For example, multiple groove structures may be uniformly provided on the outer circumferential surface of the sewage intake connection part 23 for connecting with ends of the fasteners 2414, so that the toilet seat body 1 and the sewage discharge box 21 are uniformly stressed, so as to avoid askew and easy disengagement after connection. In practical application, three fasteners 2414 may be provided, and are arranged uniformly in the circumferential direction.

[0228] In the toilet device provided by an embodiment of the present application, the toilet seat body 1 and the sewage discharge box 21 are fixedly connected by a fastener 2414, and the fastener 2414 has a tight fixation and a good connection effect. In this way, the end faces of the sewage discharge connection part 13 and the sewage intake connection part 23 are more tightly bonded, so as to avoid a large gap at the connection between the toilet seat body 1 and the sewage discharge box 21, and avoid the problems of water leakage and returning of odor.

[0229] In an actual operation, the sewage intake connection part 23 may be a plastic element. When the fastener 2414 exerts a certain compression force, the sewage intake connection part 23 may be slightly deformed, so that the sewage discharge connection part 13 is more tightly bonded, thereby improving the sealability.

[0230] The sewage intake connection part 23 is provided at the sewage inlet 211 of the sewage discharge box 21 and the sewage discharge connection part 13 is provided at the sewage outlet 12 of the toilet seat body 1. The sewage intake connection part 23 and the sewage discharge connection part 13 are provided for easy connection. The connection between the toilet seat body 1 and the sewage discharge box 21 may be realized by a fixed connection between the sewage intake connection part 23 and the sewage discharge connection part 13. The connection structure is simplified, and the connection between the main structures of the toilet seat body 1 and the sewage discharge box 21 through hole punching or other methods is avoided, which is efficient and practical.

[0231] In an exemplary embodiment, as shown in FIGS. 55 to 61, the fastener 2414 includes a bolt 2415 and a nut 2416, and at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a connection hole 2411. The bolt 2415 passes through the connection hole 2411 and is threadedly connected to the nut 2416 to fasten the sewage intake connection part 23 and the sewage discharge connection part 13.

[0232] A connection hole 2411 is provided in the sewage intake connection part 23. An end of the bolt 2415 is fixed in the sewage intake connection part 23, and the other end of the bolt 2415 passes through the connection hole 2411 in the sewage intake connection part 23 and extends toward the sewage discharge connection part 13. The nut 2416 is threadedly connected to an extension part (the other end) of the bolt 2415, that is, the nut 2416 is screwed to the end of the bolt 2415 to fasten the sewage intake connection part 23 and the sewage discharge connection part 13. An end of the bolt 2415 is fixed in the sewage intake connection part 23, and the other end of the bolt 2415 is connected to the sewage discharge connection part 13 by screwing the nut 2416, and a fixed connection between the sewage discharge connection

part 23 and the sewage intake connection part 13 is realized by means of a bolt 2415 and nut 2416.

[0233] Alternatively, the connection hole 2411 may not be provided in the sewage intake connection part 23, but may be provided in the sewage discharge connection part 13. Alternatively, connection holes 2411 are provided in both the sewage intake connection part 23 and the sewage discharge connection part 13, the bolt 2415 passes through the two connection holes 2411 respectively, and nuts 2416 are respectively fixed at both ends for fastening.

[0234] In an exemplary embodiment, as shown in FIG. 57, the sewage intake connection part 23 is provided with an accommodation cavity 241, and the accommodation cavity 241 includes a limiting groove 2412 and a connection hole 2411. The limiting groove 2412 is used to receive a head of the bolt 2415, and the connection hole 2411 is communicated with the limiting groove 2412 for the bolt 2415 to pass through.

[0235] The head of the bolt 2415 is located in the limiting groove 2412. A screw part of the bolt 2415 passes through the connection hole 2411 and extends to the sewage discharge connection part 13, and abuts against the sewage discharge connection part 13 through the nut 2416.

[0236] A size of the connection hole 2411 is smaller than a size of the limiting groove 2412 so that a head located in the limiting groove 2412 does not disengaged from the connection hole 2411.

[0237] In practical application, an installation mode of the bolt 2415 may be adjusted. For example, the bolt 2415 is installed in a reverse direction, the nut 2416 is provided in the accommodation cavity 241, the head of the bolt 2415 is located at the sewage discharge connection part 13, and the screw part of the bolt 2415 passes through the connection hole 2411 and is connected to the nut 2416 located in the limiting groove 2412.

[0238] In an exemplary embodiment, as shown in FIG. 57, the accommodation cavity 241 is provided with a radial opening 2413. The radial opening 2413 is configured for the bolt 2415 to enter the accommodation cavity 241 in the radial direction of the sewage intake connection part 23, and for the bolt 2415 to interfere fit with the accommodation cavity 241. Alternatively, the bolt 2415 is embedded in the sewage intake connection part 23 and forms an integrated structure with the sewage intake connection part 23.

[0239] The accommodation cavity 241 is provided with the radial opening 2413, and the bolt 2415 is installed into the accommodation cavity 241 in the radial direction, so that it is convenient for a person to operate during the installation and construction of the toilet device. There may be an interference fit between the head of the bolt 2415 and the accommodation cavity 241, so that after the head is installed into the accommodation cavity 241, the bolt 2415 will not be disengaged and fall off, and the nut 2416 is screwed at the other end of the bolt 2415 to facilitate operation.

[0240] Alternatively, the accommodation cavity 241 may not be provided with a radial opening 2413, and a processing bolt 2415 is directly embedded in the preset position of the sewage discharge box 21 during the manufacturing process of the sewage discharge box 21, in other words, the bolt 2415 is integrally formed with the sewage intake connection part 23. An integrated structure of the bolt 2415 and the sewage intake connection part 23 is conducive to improving the assembly efficiency.

[0241] In an exemplary embodiment, a threaded section of the bolt 2415 is located outside the sewage discharge connection part 13 in the radial direction. The sewage discharge connection part 13 includes a second annular flange 132, and an end of the second annular flange 132 close to the sewage discharge box 21 abuts against the sewage intake connection part 23. The nut 2416 is located on a side of the second annular flange 132 away from the sewage discharge box 21, and is screwed with the threaded section of the bolt 2415, so that the sewage intake connection part 23 and the sewage discharge connection part 13 are clamped and fixed by the fastener 2414.

[0242] The second annular flange 132 may be an annular protruding structure provided on the sewage discharge connection part 13 and protruding in a radial direction. The second annular flange 132 is located at the end of the sewage discharge connection part 13 and is close to the sewage intake connection part 23 to shorten a distance from the sewage intake connection part 23, thereby reducing a length of the bolt 2415.

[0243] The threaded section (screw part) of the bolt 2415 is located outside the sewage discharge connection part 13 in the radial direction, in other words, no structure such as a through hole or a groove is provided in the sewage discharge connection part 13 for cooperation with the bolt 2415. The threaded section of the bolt 2415 protrudes from the sewage discharge connection part 13 for connecting with the nut 2416. That is, there may further be the threaded section of the bolt 2415 in the connection hole 2411. In practical application, the toilet seat body 1 is generally integrally formed with ceramics, and the threaded section of the bolt 2415 is located outside the sewage discharge connection part 13 in the radial direction, which may avoid operations such as opening holes in the toilet seat body 1, avoid affecting the strength of the toilet seat body 1, and simplify the process.

[0244] The nut 2416 is located on a side of the second annular flange 132 of the sewage discharge connection part 13 away from the sewage discharge box 21. The nut 2416 is threadedly connected to the bolt 2415, and the nut 2416 abuts against the second annular flange 132. The head end of the bolt 2415 abuts against or is fixedly connected to the sewage intake connection part 23. By screwing and tightening the nut 2416 on the bolt 2415, the sewage discharge connection part 13 and the sewage intake connection part 23 are clamped and fixed.

[0245] In an exemplary embodiment, as shown in FIG. 60, the nut 2416 abuts against an end of the second annular flange 132 away from the sewage discharge box 21. Alternatively, the fastener 2414 also includes a spacer 2417 located between the nut 2416 and the sewage discharge connection part 13, the spacer 2417 is sleeved on the bolt 2415 and abuts against an end of the second annular flange 132 away from the sewage discharge box 21, and a diameter of the spacer 2417 is greater than a diameter of the nut 2416.

[0246] At the sewage discharge connection part 13, the second annular flange 132 may be directly abutted against by means of a nut 2416, so that the sewage discharge connection part 13 and the sewage intake connection part 23 are clamped and fixed. The structure is simple and a quantity of parts is less.

[0247] In addition, a spacer 2417 may be provided between the nut 2416 and the sewage discharge connection part 13. A diameter of the spacer 2417 is greater than a diameter of the nut 2416, so that an area of the spacer 2417 that abuts against the second annular flange 132 is increased, so as to improve the reliability of the spacer 2417 that abuts against the second annular flange 132, avoid sliding, being disengaged, and the like, and ensure that the sewage discharge connection part 13 and the sewage intake connection part 23 are reliably clamped and fixed.

[0248] In an exemplary embodiment, the sewage discharge connection part 13 is provided with a connection hole 2411, and the sewage intake connection part 23 is provided with a threaded hole. The fastener 2414 includes a screw, and the screw passes through the connection hole 2411 and is screwed into the threaded hole (not shown in figure).

[0249] In addition to the aforementioned "the fastener 2414 includes the bolt 2415 and the nut 2416", the fastener 2414 may also be in other forms. For example, the fastener 2414 includes a screw, a connection hole 2411 (smooth hole) is provided in the sewage discharge connection part 13, an end that is the head of the screw is located on a side of the sewage discharge connection part 13 facing away from the sewage intake connection part 23, and the other end of the screw passes through the connection hole 2411 and is screwed into the threaded hole of the sewage intake connection part 23. The connection between the toilet seat body 1 and the sewage discharge box 21 is realized by cooperation between the screw and the threaded hole. In other words, the fastener 2414 may be a separate screw (one member) to further reduce a quantity of parts and components of the toilet device and simplify the structure of the toilet device.

[0250] In practical application, the threaded hole in the sewage intake connection part 23 may be a through hole or a blind hole.

[0251] In an exemplary embodiment, as shown in FIG. 60, the toilet device further includes a sealing element 4 provided between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0252] The provision of the sealing element 4 between the sewage intake connection part 23 and the sewage discharge connection part 13, together with the clamping force provided by the fastener 2414, can further improve the sealability between the sewage intake connection part 23 and the sewage discharge connection part 13 to ensure that a phenomenon of water leakage, returning of odor or the like will not occur at the connection between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0253] The sealing element 4 may function as a static seal. For example, the sealing element may be made of a rubber material.

[0254] In an exemplary embodiment, at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with the first installation groove, and the sealing element 4 is installed in the first installation groove and abuts against the axial end face of the sewage intake connection part 23 and the axial end face of the sewage discharge connection part 13 to form an end face seal. And/or the sewage intake connection part 23 is sleeved outside the sewage discharge connection pat 13, at least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a second installation groove, and the sealing element 4 is installed in the second installation groove and abuts against the radial inner end of the sewage intake connection part 23 and the radial outer end of the sewage discharge connection part 13 to form a radial seal.

[0255] The sealing form of the sealing element 4 may be an end face seal, a radial seal, or may have an end face seal and a radial seal simultaneously.

[0256] For the end face seal, the first installation groove may be provided on the sewage intake connection part 23, the sealing element 4 is installed in the first installation groove in an axial direction, and the sewage discharge connection part 13 abuts against the sealing element 4 in the first installation groove. After connecting the sewage intake connection part 23 and the sewage discharge connection part 13, the fastener 2414 may exert a certain compression effect on the sealing element 4. In other words, the fastener 2414 may make the sealing element 4 in a compressed state, so as to improve the sealing effect of the sealing element 4.

[0257] For the radial seal, the second installation groove may be provided on the sewage intake connection part 23, the sealing element 4 is installed into the second sealing groove in the radial direction, and the sewage discharge connection part 13 abuts against the sealing element 4 in the second installation groove. In the radial direction, there may be a clearance fit between the sewage intake connection part 23 and the sewage discharge connection part 13, and the sealing element 4 may be installed in the second installation groove with interference. In other words, the sealing element 4 is compressed by an inner sidewall of the sewage intake

connection part 23 and an outer sidewall of the sewage discharge connection part 13, so that the sealing element 4 is in a compressed state, so as to improve the sealing effect of the sealing element 4.

[0258] In an exemplary embodiment, an anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13 for limiting the rotation of the sewage discharge box 21 relative to the toilet seat body 1.

[0259] The anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, and the anti-rotation structure prevents the sewage discharge box 21 from rotating.

[0260] The fastener 2414 clamps and fixes the sewage discharge connection part 13 and the sewage intake connection part 23, and limits the sewage discharge connection part 13 and the sewage intake connection part 23 in an axial direction, so that the sewage discharge box 21 may be prevented from being disengaged backward in the axial direction relative to the toilet seat body 1. However, when the sewage discharge box 21 is subjected to a circumferential force, the fastener 2414 does not provide a circumferential limitation. When the anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13, the sewage discharge box 21 may be prevented from rotating relative to the toilet seat body 1 after being subjected to a circumferential force, so that the sewage discharge box 21 may be completely fixed and limited, and the sewage discharge box 21 may be prevented from moving or rotating during working process, thereby ensuring reliable working of the toilet device.

[0261] In an exemplary embodiment, as shown in FIGS. 58 and 62, the sewage intake connection part 23 is sleeved outside the second annular flange 132, the outer sidewall of the sewage discharge connection part 13 is provided with a non-circular first anti-rotation wall surface 261, and the sewage intake connection part 23 is provided with a second anti-rotation wall surface 264 that cooperates with the first anti-rotation wall surface 261. The anti-rotation structure includes the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264.

[0262] The sewage intake connection part 23 is sleeved outside the second annular flange 132, which may play a certain guiding role, so that the sewage intake connection part 23 and the sewage discharge connection part 13 are accurately aligned.

[0263] The non-circular first anti-rotation wall surface 261 is provided on the outer sidewall of the sewage discharge connection part 13, and the second anti-rotation wall surface 264 is provided on the inner sidewall of the sewage intake connection part 23. The first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 are non-circular wall surfaces of the same shape, so as to prevent the sewage discharge box 21 from rotating relative to the toilet seat body 1.

[0264] The sewage intake connection part 23 is sleeved outside the second annular flange 132, so that the first anti-rotation wall surface 261 tightly abuts against the second anti-rotation wall surface 264 in the radial direction. Since both the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 are non-circular, relative rotation between the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 may be avoided, that is, the sewage discharge mechanism 2 is prevented from rotating relative to the toilet seat body 1.

[0265] For example, the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 may be an irregular annular shape formed by a circular arc and a straight line, and the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 may play a role of circumferential limitation after cooperation. Alternatively, the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 may also be other shapes (such as ellipses, polygons, and the like) that may prevent the relative rotation.

[0266] The first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 cooperate to form an anti-rotation structure.

[0267] In addition to the forms of the first anti-rotation wall surface 261 and the second anti-rotation wall surface 264 described above, other forms of the anti-rotation structure may be adopted. For example, a limiting block is provided on the sewage discharge connection part 13, a corresponding accommodation groove 233 is provided on the sewage intake connection part 23, and the limiting block and the accommodation groove 233 that cooperate with each other serve as the anti-rotation structure.

[0268] In addition, the sewage discharge pipe 22 is rotatably installed in the sewage discharge box 21, and an oil seal may be provided at the rotational connection to form a dynamic seal, so as to improve the sealability of the connection.

[0269] The toilet device may also include a shifter 51, the shifter 51 is located below the sewage discharge mechanism 2, the inlet of the shifter 51 is communicated with the outlet of the sewage discharge box 21, and the outlet of the shifter 51 is communicated with an external sewage discharge pipeline 22. A brush ring water outlet 52 is installed on the toilet seat body 1, and the brush ring water outlet 52 is fixed on the toilet seat body 1 to flush water into the toilet device.

[0270] As shown in FIGS. 64 to 74, an embodiment of the present application provides a toilet device. Referring to FIG. 2, the toilet device includes a toilet seat body 1, a sewage discharge mechanism 1, and a threaded fastening sleeve 26.

[0271] The toilet seat body 1 is provided with a toilet bowl 11 and a sewage outlet 12 communicated with the toilet bowl 11. A sewage discharge connection part 13 is provided on an outer periphery of the sewage outlet 12. The sewage discharge connection part 13 is located outside the toilet bowl 11 and is provided with a channel 1323 communicated with the sewage outlet 12.

[0272] The sewage discharge mechanism 1 includes a sewage discharge box 21 and a sewage discharge pipe 22 located within the sewage discharge box 21. The sewage discharge box 21 is provided with a sewage inlet 211 communicated with the channel 1323. A sewage intake connection part 23 is provided on an outer periphery of the sewage inlet 211. The sewage intake connection part 23 protrudes on an outer wall of the sewage discharge box 21 and is sleeved outside the sewage discharge connection part 13. The sewage discharge pipe 22 is communicated with the sewage inlet 211, and is rotatable relative to the sewage discharge box 21.

[0273] The threaded fastening sleeve 26 is sleeved outside the sewage intake connection part 23 and is threadedly connected with the sewage intake connection part 23, so that the sewage intake connection part 23 is fastened to the sewage discharge connection part 13, so as to fix the sewage discharge box 21 to the toilet seat body 1.

[0274] The toilet device provided by an embodiment of the present application includes the toilet seat body1, the sewage discharge mechanism 1, and the threaded fastening sleeve 26. The toilet seat body 1 is provided with the toilet bowl 11 and the sewage outlet 12, and sewage in the toilet bowl 11 is discharged through the sewage outlet 12. The sewage outlet 12 is provided with a sewage discharge connection part 13 for connecting the sewage discharge mechanism 1. The sewage discharge mechanism 1 includes the sewage discharge box 21 and the sewage discharge pipe 22, and the sewage discharge pipe 22 may be communicated with the sewage outlet 12 through the channel 1323 in the sewage discharge connection part 13 and the sewage inlet 211 of the sewage discharge box 21, and a flipped and sewage discharge function may be realized by rotation. The sewage discharge box 21 accommodates the sewage discharge pipe 22, and an indirect connection between the sewage discharge pipe 22 and the sewage outlet 12 is realized.

[0275] The sewage discharge box 21 is provided with a sewage intake connection part 23 correspondingly, and the outer sidewall of the sewage intake connection part 23 is provided with an external thread adapted to the threaded fastening sleeve 26. During the assembly process, the sewage intake connection part 23 may be sleeved outside the sewage discharge connection part 13 to form a shaft and hole fitting structure. Then, the threaded fastening sleeve 26 is screwed outside the sewage intake connection part 23, and the threaded fastening sleeve 26 may press the sewage intake connection part 23 radially inward, so that the sewage intake connection part 23 is tightly fixed on the sewage discharge connection part 13 and may not be disengaged from the sewage discharge connection part 13 in a reverse direction, thereby realizing a fixed connection between the sewage discharge box 21 and the toilet seat body 1.

[0276] Compared with the bonding and fixing method, the threaded fastening sleeve 26 is not prone to aging failure, so the threaded fastening sleeve 26 is used to realize a fixed connection between the sewage discharge box 21 and the toilet seat body 1, and the connection strength is high, and the fixation is relatively reliable. In addition, the threaded fastening sleeve 26 is more convenient to disassemble, so this solution is also convenient for maintenance of the toilet and replacement of internal parts and components during subsequent use.

[0277] In one example, the sewage discharge connection part 13 and the sewage intake connection part 23 may be designed as short tubular structures. The sewage outlet 12 is located at a lower rear part of the toilet bowl 11, and the sewage discharge connection part 13 protrudes outward from the sewage outlet 12 and toward the rear part of the toilet seat body 11, as shown in FIG. 64. The protrusion direction of the sewage discharge connection part 13 may be horizontal or downward inclined so that the inner channel 1323 extends horizontally backward or extends obliquely backward, which facilitates the smooth discharge of sewage and avoids the backflow of sewage.

[0278] The sewage discharge box 21 and the sewage discharge pipe 22 may be plastic elements, which are convenient for processing into desired shapes according to needs, and are further convenient for processing and molding of the external threads on the sewage intake connection part 23 of the sewage discharge box 21. The toilet seat body 1 may be a ceramic element, or may be made of a rigid plastic or other material.

[0279] In one example, the sewage discharge box 21 is provided with a dirt outlet 253. The dirt outlet 253 may be communicated with an external sewage discharge pipeline (for example a floor sewage discharge pipeline) through a shifter 51, as shown in FIGS. 64 to 67, and the sewage discharged from the sewage discharge pipe 22 is discharged into the external sewage discharge pipeline.

[0280] In an exemplary embodiment, as shown in FIGS. 65, 67, 71, and 72, the sewage discharge connection part 13 includes a tubular part 1322 and a second annular flange 132 provided on an outer sidewall of the tubular part 1322. A channel 1323 is provided in the tubular part 1322, as shown in FIG. 72. As shown in FIGS. 68, 69, 71, and 73, a clamping protrusion 2111 is provided on an inner sidewall of the sewage intake connection part 23. The clamping protrusion 2111 hooks the second annular flange 132, as shown in FIG. 71, to limit a movement of the sewage intake connection part 23 in a direction away from the toilet bowl 11.

[0281] During the process in which the sewage intake connection part 23 is sleeved outside the sewage discharge connection part 13, when the clamping protrusion 2111 passes over the second annular flange 132 and hooks the second annular flange 132, it indicates that the sewage intake connection part 23 is installed in place in an axial direction, and the threaded fastening sleeve 26 may be screwed on at this time. Due to a limiting and cooperation between the clamping protrusion 2111 and

the second annular flange 132, it is difficult for the sewage intake connection part 23 to be disengaged from the sewage discharge connection part 13 in a reverse direction, thereby improving the position stability of the sewage discharge box 21 in the axial direction.

[0282] Therefore, the cooperation of the clamping protrusion 2111 and the second annular flange 132 may position and limit an assembly between the sewage discharge box 21 and the toilet seat body 1, which is not only conducive to improving the assembly efficiency of the toilet device, but also conductive to improving the stability of the sewage discharge mechanism 1 after the assembly is completed.

[0283] In one example, the clamping protrusion 2111 is provided on an inner sidewall of the sewage intake connection part 23 and integrally formed with the inner sidewall of the sewage intake connection part 23.

[0284] A projection of the clamping protrusion 2111 on a longitudinal section of the sewage intake connection part 23 may be a right-angled triangle, a rectangle, or a right-angled trapezoid, and an end face away from the toilet bowl 11 is perpendicular to an axis of the sewage intake connection part 23, and is configured to abut against an end face of the second annular flange 132 close to the toilet bowl 11.

[0285] In an exemplary embodiment, as shown in FIGS. 68 and 69, the clamping protrusion 2111 is provided at an end of the sewage intake connection part 23 close to the toilet bowl 11. The tubular part 1322, the second annular flange 132, and the toilet seat body 1 enclose a clamping groove 1324 for accommodating the clamping protrusion 2111, as shown In FIG. 71.

[0286] This is beneficial to shortening an axial length of the sewage intake connection part 23, thereby reducing the installation space requirement of the sewage discharge mechanism 1, and reducing an axial length of the toilet device.

[0287] In one example, the clamping groove 1324 is formed between an upper part of the tubular part 1322, an upper part of the second annular flange 132 and the toilet seat body 1, and a bottom part of the tubular part 1322 is smoothly connected with the toilet seat body 1. As shown in FIGS. 68, 69, and 73, a quantity of clamping protrusions 2111 is multiple, and the multiple clamping protrusions 2111 are provided at intervals along a circumferential direction of the sewage intake connection part 23. A portion of the clamping protrusions 2111 is located within the clamping groove 1324.

[0288] As shown in FIG. 65, the clamping protrusions 2111 are provided at intervals along the circumferential direction of the sewage intake connection part 23, a quantity of the clamping protrusions 2111 is at least two (such as, it may be 2, 3, 4, 5, 6, 7, 8, or the like), and all the clamping protrusions 2111 are of the same size, so that the force applied on each clamping protrusion 2111 is the same.

[0289] In an exemplary embodiment, as shown in FIGS. 68, 69, and 73, the sewage intake connection part 23 is provided with at least one cutout 2112, and the cutout 2112 allows the sewage intake connection part 23 to expand and deform during the process of being sleeved to the sewage discharge connection part 13.

[0290] Since the sewage intake connection part 23 and the sewage discharge connection part 13 have to form the shaft and hole fitting structure, and the threaded fastening sleeve 26 is used to achieve a radial locking and fixing, an inner diameter of the sewage intake connection part 23 is very close to an outer diameter of the sewage discharge connection part 13, resulting in difficulty in assembling the sewage intake connection part 23 and the sewage discharge connection part 13. Moreover, the toilet seat body 1 is generally a ceramic body. Due to the limitations of the ceramic manufacturing process, there may be a defect of low accuracy of the sewage discharge connection part 13, which makes the assembly between the sewage intake connection part 23 and the sewage discharge connection part 13 more difficult.

[0291] Therefore, at least one cutout 2112 is provided on the sewage intake connection part 23, so that the sewage intake connection part 23 may be expanded and deformed during the assembly process, which means that the sewage intake connection part 23 may be expanded and thickened during the assembly process. This may reduce the difficulty of sleeving the sewage intake connection part 23 onto the sewage discharge connection part 13, thereby improving the assembly efficiency. The expanded portion of the sewage intake connection part 23 is tightened during the subsequent tightening of the threaded fastening sleeve 26, so that the sewage intake connection part 23 will not crack and affect the service reliability of the sewage discharge box 21.

[0292] In particular, for a solution in which the second annular flange 132 for hooking the sewage discharge connection part 13 is provided on an inner sidewall of the sewage intake connection part 23, an arrangement of the cutout 2112 may reduce the difficulty of the clamping protrusion 2111 passing over the second annular flange 132, reduce the interference force between the clamping protrusion 2111 and the second annular flange 132, thereby reducing the difficulty of installation and improving the installation efficiency.

[0293] In an exemplary embodiment, as shown in FIGS. 68 and 69, the cutout 2112 extends in an axial direction of the sewage intake connection part 23 and runs through an end of the sewage intake connection part 23 close to the toilet bowl 11.

[0294] In this way, the end of the sewage intake connection part 23 close to the toilet bowl 11 may be thickened during assembly, so that the sewage intake connection part 23 forms a flared structure, which is beneficial to further reducing the difficulty of sleeving the sewage intake connection part 23 onto the sewage discharge connection part 13, thereby improving assembly efficiency. Moreover, this further facilitates the processing and molding of the cutout 2112.

[0295] In an exemplary embodiment, as shown in

FIGS. 62 and 69, a length of the cutout 2112 is less than the axial length of the sewage intake connection part 23.

[0296] In this way, the portion of the sewage intake connection part 23 close to the toilet bowl 11 may be expanded and deformed, which facilitates the smooth and rapid sleeving of the sewage intake connection part 23 onto the sewage discharge connection part 13. The portion of the sewage intake connection part 23 away from the toilet bowl 11 may not be expanded and deformed, and the portion is intact in the circumferential direction. Since the portion is closer to the sewage inlet 211, it is beneficial to preventing sewage or odor from leaking out from the portion.

[0297] As shown in FIGS. 68 and 69, the cutout 2112 starts at an end (i.e., a front end) of the sewage intake connection part 23 away from the sewage inlet 211, and extends backward in the axial direction of the sewage intake connection part 23. In the radial direction of the sewage intake connection part 23, the cutout 2112 runs through the inner sidewall and the outer sidewall of the sewage intake connection part 23.

[0298] In one example, as shown in FIGS. 68, 69, and 73, a quantity of cutouts 2112 is multiple, and the multiple cutouts 2112 are provided at intervals in the circumferential direction of the sewage intake connection part 23, for example uniformly provided.

[0299] For a solution in which the inner sidewall of the sewage intake connection part 23 is provided with a clamping protrusion 2111, the cutout 2112 may be staggered from the clamping protrusion 2111, as shown in FIG. 73.

[0300] For example, a quantity of the cutouts 2112 in the sewage intake connection part may be two, three, four, five, six, seven, eight, or the like. The widths and the depths of all the cutouts 2112 may be provided to be the same.

[0301] On one hand, the multiple cutouts 2112 are beneficial to increasing the expansion degree of the sewage intake connection part 23, thereby further reducing the difficulty in installation. On the other hand, the multiple cutouts 2112 are beneficial to dispersing the force exerted by the expansion and deformation of the sewage intake connection part 23, so that the force exerted on the sewage intake connection part 23 is more balanced, and the risk of tearing and failure of the sewage intake connection part 23 due to excessive expansion is reduced.

[0302] In one example, as shown in FIGS. 68 and 69, a length of the cutout 2112 is greater than a width of the clamping protrusion 2111 in the axial direction of the sewage intake connection part 23.

[0303] In an exemplary embodiment, an axial length of the threaded fastening sleeve 26 is less than an axial length of the sewage intake connection part 23, as shown in FIG. 71.

[0304] In this way, the threaded fastening sleeve 26 may be sleeved on the sewage intake connection part 23 in advance, and screwed to a part of the sewage intake connection part 23 away from the toilet bowl 11. The sewage intake connection part 23 may be sleeved on the sewage discharge connection part 13 with a threaded fastening sleeve 26. When the sewage intake connection part 23 is sleeved in place, the threaded fastening sleeve 26 is screwed in a reverse direction so that the threaded fastening sleeve 26 is rotated to a part of the sewage intake connection part 23 close to the toilet bowl 11, and the part is pressed in a radial direction to ensure a firm connection between the sewage intake connection part 23 and the sewage discharge connection part 13. In addition, this is also helpful to prevent the threaded fastening sleeve 26 from being lost.

[0305] For a solution in which the sewage intake connection part 23 is further provided with the cutout 2112, the threaded fastening sleeve 26 is sleeved on the sewage intake connection part 23. In this way, the sewage intake connection part 23 may be prevented from being torn due to the rearward extension of the cutout 2112 during the expansion process, thereby improving the reliability of the sewage intake connection part 23.

[0306] The screwing direction of the threaded fastening sleeve 26 is not limited. For example, the threaded fastening sleeve 26 is screwed to the rear part of the sewage intake connection part 23 in a counterclockwise direction, and when the sewage intake connection part 23 is sleeved in place, the threaded fastening sleeve 26 is screwed to a front part of the sewage intake connection part 23 in a clockwise direction.

[0307] In an exemplary embodiment, an end of the threaded fastening sleeve 26 close to the toilet bowl 11 abuts against the toilet seat body 1, as shown in FIGS. 70 and 71.

[0308] Thus, when the threaded fastening sleeve 26 is screwed to contact the toilet seat body 1 during assembly, further screwing may be stopped. In this way, the toilet seat body 1 has a positioning effect on the assembly of the threaded fastening sleeve 26, and it is possible to prevent the threaded fastening sleeve 26 from being unduly screwed.

[0309] In an exemplary embodiment, an outer sidewall of the threaded fastening sleeve 26 is provided with an instruction and identification part.

[0310] This facilitates the installation worker to screw the threaded fastening sleeve 26 in a correct direction according to the instruction and identification part, and avoids the process of trial assembling of the threaded fastening sleeve 26 in forward and reverse directions, which is further beneficial to improving the assembly efficiency of the toilet device.

[0311] In one example, the instruction and identification part is a protruding edge 260 provided at an end of the threaded fastening sleeve 26, as shown in FIGS. 67 and 71.

[0312] In this way, the protruding edge 260 may not only serve as an instruction and identification, but also help to increase a rotating torque of the threaded fastening sleeve 26. This helps to reduce an acting force ex-

erted by the threaded fastening sleeve 26, thereby further reducing the difficulty in installation and improving the assembly efficiency.

[0313] Alternatively, the instruction and identification part is not limited to this form, but may include indicative arrows, indicative characters, or the like.

[0314] In an exemplary embodiment, the toilet device further includes a first sealing element (not shown in figures). At least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a first installation groove (not shown in figures). The first sealing element is installed in the first installation groove and abuts against an axial end face of the sewage intake connection part 23 and an axial end face of the sewage discharge connection part 13 to form an end face seal.

[0315] The first sealing element may realize an axial seal between the sewage intake connection part 23 and the sewage discharge connection part 13, which is beneficial to preventing sewage or odor from leaking out between the sewage intake connection part 23 and the sewage discharge connection part 13. Thus it is beneficial to improving the reliability of the toilet device and improving the user experience.

[0316] In an exemplary embodiment, the toilet device further includes a second sealing element (not shown in figures). At least one of the sewage intake connection part 23 and the sewage discharge connection part 13 is provided with a second installation groove (not shown in figures). The second sealing element is installed in the second installation groove and abuts against a radial inner end of the sewage intake connection part 23 and a radial outer end of the sewage discharge connection part 13 to form a radial seal.

[0317] The second sealing element may realize a radial seal between the sewage intake connection part 23 and the sewage discharge connection part 13, which is further beneficial to preventing sewage or odor from leaking out between the sewage intake connection part 23 and the sewage discharge connection part 13. Thus it is beneficial to improving the reliability of the toilet device and improving the user experience.

[0318] In an exemplary embodiment, as shown in FIG. 71, a sealing groove 1325 is provided in the sewage discharge connection part 13, and a sealing element 4 is provided in the sealing groove 1325.

[0319] A stopper protrusion 2114 is provided on an inner sidewall of the sewage intake connection part 23, and the stopper protrusion 2114 abuts against and cooperates with an end of the sewage discharge connection part 13 away from the toilet bowl 11.

[0320] An outer sidewall of the sealing element 4 abuts against the inner sidewall of the sewage intake connection part 23, and an axial end face of the sealing element 4 away from the toilet bowl 11 abuts against the stopper protrusion 2114.

[0321] In this solution, the cooperation between the stopper protrusion 2114 and the sewage discharge connection part 13 may position the assembly of the sewage discharge box 21, and prevent the sewage discharge box 21 from being pushed excessively toward the sewage intake connection part 23 in the axial direction.

[0322] Since the inner sidewall of the sealing element 4 abuts against the outer sidewall of the sewage discharge connection part 13, and the outer sidewall of the sealing element 4 abuts against the inner sidewall of the sewage intake connection part 23, a radial seal between the sewage intake connection part 23 and the sewage discharge connection part 13 may be achieved. Since an axial end face (i.e., a front end face) of the sealing element 4 close to the toilet bowl 11 is in contact with the sewage discharge connection part 13, and an axial end face (i.e., a rear end face) of the sealing element 4 away from the toilet bowl 11 abuts against the stopper protrusion 2114, an axial seal between the sewage intake connection part 23 and the sewage discharge connection part 13 may be achieved.

[0323] In this way, the axial seal and the radial seal between the sewage intake connection part 23 and the sewage discharge connection part 13 may be realized by using one sealing element 4, which effectively improves the sealing reliability between the sewage discharge box 21 and the toilet seat body 1. The structure is simple, which is beneficial to reducing costs and simplifying the installation process.

[0324] In one example, a portion of the outer sidewall of the tubular part 1322 located on a rear side of the second annular flange 132 and the second annular flange 132 enclose the sealing groove 1325, so that a rear end of the sealing groove 1325 is provided as open, and an radially outer end of the sealing groove 1325 is provided as open. A structure of the entire sewage discharge connection part 13 is simpler.

[0325] In one example, as shown in FIGS. 70 and 71, a sealing element 4 is provided in the sealing groove 1325. Since the sealing element 4 has elasticity, in order to achieve a tighter seal, a radial thickness of the sealing element 4 when it is not pressed is configured to be greater than a radial thickness of the second annular flange 132. In this way, when sleeving between the sewage intake connection part 23 and the sewage discharge connection part 13 is completed, the sealing element 4 simultaneously applies pressure to the sewage intake connection part 23 and the sewage discharge connection part 13 in the radial direction due to its elasticity, so that a good radial sealing effect is achieved between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0326] Similarly, an axial width of the unpressed sealing element 4 is configured to be greater than a distance from an end of the second annular flange 132 away from the toilet bowl 11 to the stopper protrusion 2114. In this way, when the sleeving between the sewage intake connection part 23 and the sewage discharge connection part 13 is completed, the sealing element 4 presses the second annular flange 132 and the stopper protrusion

2114 in the axial direction by pressing the second annular flange 132 and the stopper protrusion 2114, so that a good axial sealing effect is achieved between the sewage intake connection part 23 and the sewage discharge connection part 13.

[0327] Moreover, an embodiment of the present application allows the above-mentioned sealing elements (the first sealing element, the second sealing element, and the sealing element) to maintain a large compression amount, so as to reduce the poor sealing of the ceramic toilet seat body1 due to greater size fluctuations.

[0328] In an exemplary embodiment, the anti-rotation structure is provided between the sewage intake connection part 23 and the sewage discharge connection part 13 for limiting the rotation of the sewage discharge box 21 relative to the toilet seat body 1.

[0329] As a quantity of times of the sewage discharge pipe 22 being rotated for sewage discharge is increased, the sewage intake connection part 23 of the sewage discharge box 21 may rotate in a circumferential direction with respect to the sewage discharge connection part 13, which may cause the sewage discharge box 21 to deviate from the original upright position and affect the sewage discharge performance. Therefore, by providing the anti-rotation structure between the sewage intake connection part 23 and the sewage discharge connection part 13, the rotation of the sewage discharge box 21 relative to the toilet seat body1 may be limited, thereby improving the position stability of the sewage discharge box 21 and the sewage discharge pipe 22, and ensuring the service reliability of the sewage discharge mechanism 1.

[0330] In an exemplary embodiment, the anti-rotation structure includes an anti-rotation protrusion 92 (as shown in FIG. 73) and an anti-rotation recess 91 (as shown in FIG. 72). One of the sewage discharge connection part 13 and the sewage intake connection part 23 is provided with the anti-rotation recess 91, and the other of the sewage discharge connection part 13 and the sewage intake connection part 23 is provided with the anti-rotation protrusion 92. The anti-rotation recess 91 and the anti-rotation protrusion 92 are in a concave and convex fit to limit the rotation of the sewage intake connection part 23 relative to the sewage discharge connection part 13. This solution has a simple structure and is convenient for processing and molding.

[0331] In one example, as shown in FIG. 72, the anti-rotation recess 91 is provided at an end of the sewage discharge connection part 13 away from the toilet bowl 11. As shown in FIG. 73, the anti-rotation protrusion 92 is provided at the corresponding position of the sewage intake connection part 23. When the sleeving between the sewage intake connection part 23 and the sewage discharge connection part 13 is completed (at this time, the sewage discharge box 21 is in an upright position), the anti-rotation protrusion 92 is inserted into the anti-rotation recess 91, and a shape and size of the anti-rotation protrusion 92 matches a shape and size of the anti-rotation recess 91, thereby preventing the rotation of the sewage discharge box 21.

[0332] A quantity of anti-rotation recess(s) 91 may be one, or may be multiple. A quantity of anti-rotation protrusion(s) 92 may be equal to and in one-to-one correspondence with the anti-rotation recess(s) 91.

[0333] In other embodiments, the anti-rotation recess 91 may be located in the sewage intake connection part 23, and the anti-rotation protrusion 92 may be provided correspondingly on the sewage discharge connection part 13.

[0334] Of course, the anti-rotation structure is not limited to the above-mentioned solution. The anti-rotation function may be played as long as the sewage intake connection part 23 and the sewage discharge connection part 13 form a non-circular fitting structure in the circumferential direction.

[0335] In an exemplary embodiment, as shown in FIGS. 68, 69 and 71, the sewage discharge mechanism 1 further includes the sewage discharge pipe 22 located within the sewage discharge box 21, and the sewage discharge pipe 22 is communicated with the sewage inlet 211 and is rotatable relative to the sewage discharge box 21. The sewage discharge box 21 is internally provided with an insertion slot 252 with an opening facing away from the sewage inlet, and an end of the sewage discharge pipe 22 is rotatably inserted into the insertion slot 252.

[0336] A third sealing element 2115 for sealing the sewage discharge pipe 22 and the sewage discharge box 21 is further provided in the insertion slot 252. The third sealing element 2115 may be an oil seal.

[0337] In this way, the sewage discharge pipe 22 forms a dynamic seal with the sewage discharge box 21 by the oil seal, so that the sewage discharge pipe 22 always seals a gap between the sewage discharge pipe 22 and the sewage discharge box 21 during rotation with respect to the sewage discharge box 21, thereby preventing the problems of water leakage and returning of odor from occurring.

[0338] A connection protrusion 251 is provided inside the sewage discharge box 21, and the connection protrusion 251 and the inner wall of the sewage discharge box 21 enclose the insertion slot 252.

[0339] Alternatively, the third sealing element 2115 may also adopt other structural forms.

[0340] In this embodiment, both the sewage discharge pipe 22 and the sewage discharge box 21 are plastic elements. In other embodiments, the sewage discharge pipe 22 and the sewage discharge box 21 may also be made of other materials.

[0341] As shown in FIGS. 68, 69 and 71, the insertion slot 252 is located outside the circumferential edge of the sewage inlet 211, and a depth and a width of the insertion slot 252 are suitable for receiving an end of the sewage discharge pipe 22, so that the sewage discharge pipe 22 is partially inserted into the insertion slot. The sewage discharge pipe 22 is communicated with the sewage outlet 12 of the toilet bowl 11 through the sewage inlet

211 and an internal channel of the connection protrusion 251. The sewage discharge pipe 22 is located in the sewage discharge box 21. When sewage is discharged, the sewage in the toilet bowl 11 enters the sewage discharge pipe 22, rotates downward with the sewage discharge pipe 22, as shown in FIG. 74, and is discharged from the sewage discharge pipe 22 under an action of gravity. The sewage is discharged into the floor sewage discharge pipeline through the dirt outlet 253 of the sewage discharge box 21 and through the shifter 51.

[0342] The above embodiments are only for the purpose of illustrating the present application, and do not have any limiting effect on the scope of protection of the present application. The scope of protection of the present application is determined by the claims. According to the well-known techniques in the art and the technical solutions disclosed in the present application, many variant solutions can be deduced or associated, and all of these variant solutions should also be considered to be within the scope of protection of the present application.

[0343] In the description of an embodiment of the present application, it should be noted that the orientations or positional relationships indicated by "upper", "lower", "an end", "the other end" and the like are based on the orientations or positional relationships shown in the drawings, which are only for the convenience of describing the present application and simplifying the description, and do not indicate or imply that the referred structure has a specific orientation, or is constructed and operates in a specific orientation, and therefore cannot be understood as a limitation on the present application.

[0344] In the description of an embodiment of the present application, unless otherwise expressly specified and defined, the term "connection" may be a fixed connection, a detachable connection, or an integral connection. It may be a direct connection, or an indirect connection through an intermediate medium, or it may be an internal communication between two elements. For those of ordinary skills in the art, specific meanings of the above terms in the present application can be understood according to situations.

[0345] The embodiments described in the present application are exemplary and not limiting. It will be apparent to those of ordinary skill in the art that more embodiments and implementations may be available within the scope of the embodiments described in the present application. Although many possible combinations of features are shown in the drawings and discussed in the implementations, many other combinations of the disclosed features are also possible. Unless specifically limited, any feature or element of any embodiment may be used in combination with, or may substitute for, any other feature or element of any other embodiment.

Claims

1. A toilet device, comprising a toilet seat body and a sewage discharge mechanism, wherein the toilet seat body is provided with a toilet bowl and a sewage discharge port communicated with the toilet bowl, and a sewage discharge connection part is provided on an outer periphery of the sewage discharge port; the sewage discharge connection part is located outside the toilet bowl, and is provided with a channel communicated with the sewage discharge port;

the sewage discharge mechanism comprises a sewage discharge box, the sewage discharge box is provided with a sewage inlet communicated with the channel, a sewage intake connection part is provided on an outer periphery of the sewage inlet, and the sewage intake connection part protrudes on an outer wall of the sewage discharge box; and
the sewage intake connection part is detachably connected with the sewage discharge connection part to fix the sewage discharge box on the toilet seat body.

2. The toilet device according to claim 1, further comprising a snap connection element; wherein the sewage intake connection part and the sewage discharge connection part are fixedly connected through the snap connection element, so that the toilet seat body and the sewage discharge box are fixedly connected.

3. The toilet device according to claim 2, wherein: the snap connection element comprises a first connection element, and the first connection element comprises at least one snapping element that cooperates with a snapping protrusion;

one of the first connection element and the snapping protrusion is provided at the sewage discharge connection part, and the other of the first connection element and the snapping protrusion is provided at the sewage intake connection part; and
the snapping element is configured to buckle on the snapping protrusion and hooks and cooperates with the snapping protrusion to prevent the sewage intake connection part from being disengaged from the sewage discharge connection part.

4. The toilet device according to claim 3, wherein: the first connection element further comprises a fixation ring, the fixation ring is sleeved outside the sewage intake connection part or the sewage discharge connection part, and the snapping element is movably connected to the fixation ring.

5. The toilet device according to claim 4, wherein: the first connection element further comprises a locking

element and the locking element is configured to lock the snapping element in a position where the snapping element cooperates in place with the snapping protrusion.

6. The toilet device according to claim 5, wherein: the snapping element is rotatably connected to the fixation ring and the locking element is rotatably connected to the fixation ring;
when the snapping element rotates in a first direction to a position where the snapping element cooperates in place with the snapping protrusion, the locking element rotates in a second direction opposite to the first direction to a locking position to lock the snapping element, and a resistance increases first and then decreases during the rotation to the locking position.

7. The toilet device according to claim 6, wherein: the fixation ring is convexly provided with an installation seat, the snapping element and the locking element are both rotatably connected to the installation seat, and a rotation axis of the snapping element and a rotation axis of the locking element are staggered, and a rotation shaft of the snapping element is further inserted into the locking element.

8. The toilet device according to any one of claims 4-7, wherein: the sewage discharge connection part or the sewage intake connection part on which the fixation ring is sleeved is provided with a first annular flange for preventing the fixation ring from being disengaged in an axial direction.

9. The toilet device according to any one of claims 4-7, wherein: the snap connection element further comprises a second connection element, one of the second connection element and the first connection element is provided at the sewage discharge connection part, the other of the second connection element and the first connection element is provided at the sewage intake connection part, and the snapping protrusion is provided at the second connection element.

10. The toilet device according to claim 9, wherein: the second connection element comprises a clamping ring, the clamping ring is sleeved outside the sewage discharge connection part or the sewage intake connection part, and the snapping protrusion is provided at the clamping ring and protrudes outward in a radial direction of the clamping ring.

11. The toilet device according to claim 10, wherein: the clamping ring is partially bent to form the snapping protrusion, and a connection part is provided at a portion of the clamping ring that is opposite to the snapping protrusion in the radial direction, and the connection part is detachably connected to the first connection element.

12. The toilet device according to claim 10, wherein: the sewage discharge connection part or the sewage intake connection part on which the clamping ring is sleeved is provided with a second annular flange for preventing the clamping ring from being disengaged in an axial direction.

13. The toilet device according to claim 12, wherein: an axial end face of the second annular flange facing away from the sewage intake connection part abuts against the clamping ring; or
the second annular flange is provided with an annular limiting groove and the clamping ring is embedded in the annular limiting groove.

14. The toilet device according to any one of claims 3-7, wherein: the snapping protrusion and the sewage intake connection part or the sewage discharge connection part are of an integrated structure;

a quantity of snapping protrusions is a plurality and the plurality of snapping protrusions are uniformly arranged in a circumferential direction of the sewage intake connection part or the sewage discharge connection part; or
the snapping protrusion comprises an extension part and a limiting part, the extension part extends in a radial direction of the sewage discharge connection part, an end of the limiting part is connected to the extension part, and the other end of the limiting part extends obliquely toward a direction away from the snapping element.

15. The toilet device according to any one of claims 2-7, wherein: the sewage intake connection part comprises a sewage intake pipe section and a first annular flange provided on an outer sidewall of the sewage intake pipe section;

the sewage discharge connection part comprises a sewage discharge pipe section and a second annular flange provided on an outer sidewall of the sewage discharge pipe section; the sewage intake pipe section is docked and communicated with the sewage discharge pipe section; the first annular flange and the second annular flange abut against each other in an axial direction, and the snap connection element locks the first annular flange and the second annular flange to fixedly connect the toilet seat body and the sewage discharge box.

16. The toilet device according to claim 1, further comprising a clamp connection element, wherein the

clamp connection element is sleeved outside the sewage intake connection part and the sewage discharge connection part, and clamps and fixes the sewage intake connection part and the sewage discharge connection part, so that the toilet seat body and the sewage discharge box are fixedly connected.

17. The toilet device according to claim 16, wherein: the clamp connection element comprises a plurality of sub-clamps, and the plurality of sub-clamps are spliced along a circumferential direction of the clamp connection element to form an annular structure.

18. The toilet device according to claim 16, wherein: the sewage discharge connection part comprises a sewage discharge pipe section and a first annular flange provided on an outer sidewall of the sewage discharge pipe section, and the sewage intake connection part comprises a sewage intake pipe section and a second annular flange provided on an outer sidewall of the sewage intake pipe section; the sewage intake pipe section is docked and communicated with the sewage discharge pipe section;

the clamp connection element comprises a clamp main body, a first limiting flange, and a second limiting flange; the first limiting flange and the second limiting flange are respectively connected to two axial ends of the clamp main body, and extend toward an inner side of the clamp main body;
the clamp main body is sleeved outside the first annular flange and the second annular flange; the first annular flange and the second annular flange are located between the first limiting flange and the second limiting flange, and are clamped and fixed by the first limiting flange and the second limiting flange.

19. The toilet device according to claim 18, wherein: the first annular flange abuts against the second annular flange in an axial direction, and an outer sidewall of the first annular flange is flush with an outer sidewall of the second annular flange.

20. The toilet device according to claim 19, wherein: an end of the first annular flange away from the toilet bowl encloses an installation groove with the sewage discharge pipe section;
the second annular flange is located at an end of the sewage intake pipe section close to the toilet bowl, and the sewage intake pipe section is at least partially sleeved outside the sewage discharge pipe section, so that the second annular flange is at least partially located in the installation groove and abuts against the first annular flange.

21. The toilet device according to claim 20, wherein: a sealing groove is provided on an inner sidewall of an end of the sewage intake pipe section close to the toilet bowl, the sealing groove is provided as open at an end facing the first annular flange, a radial inner end of the sealing groove is provided as open, and a sealing ring is provided in the sealing groove;
an end of the sealing ring close to the first annular flange abuts against the first annular flange and a radial inner end of the sealing ring abuts against an outer sidewall of the sewage discharge pipe section.

22. The toilet device according to claim 1, wherein a guidance structure is provided between the sewage discharge connection part and the sewage intake connection part, and the guidance structure is configured to guide the sewage intake connection part to move from a setting start position to a setting end position relative to the sewage discharge connection part, so that the sewage intake connection part is sleeved on the sewage discharge connection part and is limited to the sewage discharge connection part.

23. The toilet device according to claim 22, wherein: the guidance structure is configured to guide the sewage intake connection part to be inserted into the sewage discharge connection part in an axial direction of the sewage intake connection part from the setting start position, and then rotate to the setting end position relative to the sewage discharge connection part in a circumferential direction of the sewage intake connection part.

24. The toilet device according to claim 23, wherein: the guidance structure comprises a guidance groove, a rotation groove, a stopper protrusion, and a guidance protrusion; one of the sewage discharge connection part and the sewage intake connection part is provided with the guidance groove, the rotation groove and the stopper protrusion, and the other of the sewage discharge connection part and the sewage intake connection part is provided with the guidance protrusion;

the guidance groove and the rotation groove are communicated and provided adjacent to each other in the axial direction of the sewage intake connection part; the stopper protrusion and the guidance groove are provided adjacent to each other in the circumferential direction of the sewage intake connection part;
the guidance groove is used for the guidance protrusion to pass through the guidance groove in the axial direction of the sewage intake connection part from the setting start position to enter the rotation groove; the rotation groove is used for the guidance protrusion to rotate

relative to the sewage discharge connection part in the circumferential direction of the sewage intake connection part;

the stopper protrusion is configured to cooperate with the guidance protrusion in a stop manner when the guidance protrusion rotates to the setting end position, so as to prevent the sewage intake connection part from being disengaged from the sewage discharge connection part, so that the sewage intake connection part is limited to the sewage discharge connection part.

25. The toilet device according to claim 24, wherein: the sewage intake connection part is sleeved outside the sewage discharge connection part;

the sewage discharge connection part comprises a sewage discharge pipe section and an annular flange provided on an outer sidewall of the sewage discharge pipe section, the annular flange is provided with a notch, the notch forms the guidance groove, and a portion adjacent to the notch on the annular flange forms the stopper protrusion, and an end of the annular flange close to the toilet bowl and the sewage discharge pipe section enclose the rotation groove;

the guidance protrusion is provided on an inner sidewall of the sewage intake connection part.

26. The toilet device according to claim 25, wherein: the guidance protrusion is provided at an end of an inner sidewall of the sewage intake connection part close to the toilet bowl.

27. The toilet device according to any one of claims 22-26, further comprising an anti-rotation structure for limiting the rotation of the sewage discharge box relative to the toilet seat body.

28. The toilet device according to claim 27, wherein: the sewage discharge connection part is provided with a first limiting hole, and the sewage intake connection part is provided with a second limiting hole;

the anti-rotation structure comprises a limiting element, the limiting element passes through the first limiting hole and the second limiting hole in an axial direction of the sewage intake connection part to limit the rotation of the sewage intake connection part relative to the sewage discharge connection part.

29. The toilet device according to claim 28, wherein: based on that the sewage intake connection part is sleeved outside the sewage discharge connection part, an outer sidewall of the sewage discharge connection part is provided with a protruding part, the protruding part is staggered with the guidance structure along the axial direction of the sewage intake connection part, the protruding part is provided with the first limiting hole, the sewage intake connection part is provided with the second limiting hole, and an end of the second limiting hole extends to an end face of the sewage intake connection part close to the toilet bowl to form an opening.

30. The toilet device according to claim 29, wherein: the limiting element comprises a limiting rod and a push-pull protrusion provided on the limiting rod, and the push-pull protrusion is configured to drive the limiting rod to move in the axial direction of the sewage intake connection part;

the sewage intake connection part is further provided with a push-pull groove, an end of the push-pull groove communicates with the second limiting hole, the other end of the push-pull groove penetrates the sewage intake connection part along a radial direction of the sewage intake connection part, and the push-pull protrusion is movably located in the push-pull groove and protrudes from the push-pull groove.

31. The toilet device according to claim 28, wherein: the limiting element is configured to be movable between a first position and a second position along the axial direction of the sewage intake connection part;

when the limiting element is moved to the first position, the limiting element passes through the first limiting hole and the second limiting hole to limit the rotation of the sewage intake connection part relative to the sewage discharge connection part;

when the limiting element is moved to the second position, the limiting element is disengaged from the first limiting hole and/or the second limiting hole, so that the sewage intake connection part is rotatable relative to the sewage discharge connection part.

32. The toilet device according to claim 31, wherein: the anti-rotation structure further comprises an elastic element that cooperates with the limiting element, the elastic element is configured to position the limiting element in the first position by using a reset elastic force of the elastic element; or,

the anti-rotation structure further comprises a magnetic element provided opposite to the limiting element and the magnetic element is configured to position the limiting element in the first position by using a magnetic field force of the magnetic element.

33. The toilet device according to claim 28, wherein: the limiting element comprises a limiting rod and an installation plate provided on the limiting rod, an installation hole is provided in the installation plate;

the anti-rotation structure further comprises a connection element;
the connection element passes through the installation hole and movably limits the limiting element in the first limiting hole or the second limiting hole, and prevents the limiting element from being disengaged from the first limiting hole or the second limiting hole.

34. The toilet device according to claim 1, wherein: the sewage discharge connection part is sleeved outside the sewage intake connection part or the sewage intake connection part is sleeved outside the sewage discharge connection part, and supports the sewage discharge mechanism so that the sewage discharge mechanism is installed on the toilet seat body.

35. The toilet device according to claim 34, further comprising an anti-detachment structure for preventing the sewage intake connection part from being disengaged from the sewage discharge connection part.

36. The toilet device according to claim 35, wherein: the anti-detachment structure comprises a first limiting element, the first limiting element is located on a rear side of the sewage discharge mechanism and is in contact with a rear part of the sewage discharge mechanism and the toilet seat body; and the first limiting element is connected to at least one of the sewage discharge mechanism and the toilet seat body.

37. The toilet device according to claim 36, wherein: a lower part of the toilet seat body is provided with an installation plate, and an installation hole is provided in the installation plate; a lower end of the first limiting element is supported on the installation plate, and a fastener is fixedly connected to the first limiting element through the installation hole, so that the first limiting element is fixed to the toilet seat body; and an upper end of the first limiting element abuts against a rear part of the sewage discharge mechanism.

38. The toilet device according to claim 37, wherein: the first limiting element comprises a connection plate, a supporting plate, and a reinforcement plate;

the connection plate is supported on the installation plate, and is fixedly connected to the toilet seat body by the fastener;
a lower end of the supporting plate is connected to the installation plate, and an upper end of the supporting plate abuts against a rear part of the sewage discharge mechanism;
the reinforcement plate is connected to a rear plate surface of the supporting plate and the connection plate.

39. The toilet device according to claim 38, wherein: the sewage discharge mechanism further comprises a driving device provided on a rear side of the sewage discharge box, and the first limiting element abuts against the sewage discharge box and is staggered from the driving device.

40. The toilet device according to claim 35, further comprising a shifter fixedly connected to the sewage discharge box, wherein an inlet of the shifter communicates with a sewage outlet of the sewage discharge box, and an outlet of the shifter communicates with an external sewage discharge pipeline;
the anti-detachment structure comprises a second limiting element provided on the shifter, and the second limiting element abuts against a rear part of the toilet seat body.

41. The toilet device according to claim 40, wherein: the second limiting element comprises an abutment plate, an end of the abutment plate is fixedly connected to the shifter, and the other end of the abutment plate abuts against an inner sidewall of the toilet seat body.

42. The toilet device according to claim 1, further comprising a fastener, wherein the sewage discharge connection part and the sewage intake connection part are fixedly connected by the fastener, so that the toilet seat body and the sewage discharge box are fixedly connected.

43. The toilet device according to claim 42, wherein: the fastener comprises a bolt and a nut, at least one of the sewage intake connection part and the sewage discharge connection part is provided with a connection hole, and the bolt passes through the connection hole and is threadedly connected to the nut to fasten the sewage intake connection part and the sewage discharge connection part.

44. The toilet device according to claim 43, wherein: the sewage intake connection part is provided with an accommodation groove, the accommodation groove comprises a limiting groove and the connection hole; the limiting groove is used for accommodating a head of the bolt and the connection hole communicates with the limiting groove for the bolt to pass through.

45. The toilet device according to claim 44, wherein: the accommodation groove is provided with a radial opening, the radial opening is configured for the bolt to enter the accommodation groove in a radial direction of the sewage intake connection part, and for the bolt to interfere fit with the accommodation groove; or

the bolt is embedded in the sewage intake connection part and forms an integrated structure with the sewage intake connection part.

46. The toilet device according to claim 44, wherein: a threaded section of the bolt is located outside the sewage discharge connection part in a radial direction;
the sewage discharge connection part comprises a flange, and an end of the flange close to the sewage discharge box abuts against the sewage intake connection part; the nut is located on a side of the flange away from the sewage discharge box, and is screwed with the threaded section of the bolt, so that the sewage intake connection part and the sewage discharge connection part are clamped and fixed by the fastener.

47. The toilet device according to claim 46, wherein: the nut abuts against an end of the flange away from the sewage discharge box; or
the fastener further comprises a spacer located between the nut and the sewage discharge connection part, the spacer is sleeved on the bolt and abuts against an end of the flange away from the sewage discharge box, and a diameter of the spacer is greater than a diameter of the nut.

48. The toilet device according to claim 1, further comprising a threaded fastening sleeve sleeved outside the sewage intake connection part, wherein the threaded fastening sleeve is threaded into the sewage intake connection part, so that the sewage intake connection part is fastened to the sewage discharge connection part, so as to fix the sewage discharge box to the toilet seat body.

49. The toilet device according to claim 48, wherein:
the sewage intake connection part is provided with at least one cutout, and the cutout allows the sewage intake connection part to expand and deform during a process of being sleeved to the sewage discharge connection part.

50. The toilet device according to any one of claims 48-49, wherein:

the sewage discharge connection part comprises a tubular part and an annular flange provided on an outer sidewall of the tubular part, a channel is provided in the tubular part;
a clamping protrusion is provided on an inner sidewall of the sewage intake connection part and the clamping protrusion hooks the annular flange to limit a movement of the sewage intake connection part in a direction away from the toilet bowl.

51. The toilet device according to claim 50, wherein:

the clamping protrusion is provided at an end of the sewage intake connection part close to the toilet bowl;
the tubular part, the annular flange, and the toilet seat body enclose a clamping groove for accommodating the clamping protrusion.

52. The toilet device according to any one of claims 48-49, wherein:
an outer sidewall of the threaded fastening sleeve is provided with an instruction and identification part.

53. The toilet device according to claim 52, wherein:
the instruction and identification part is a protruding edge provided at an end of the threaded fastening sleeve.

54. The toilet device according to any one of claims 48-49, wherein:

the sewage discharge mechanism further comprises a sewage discharge pipe located within the sewage discharge box and the sewage discharge pipe is communicated with the sewage inlet and is rotatable relative to the sewage discharge box;
the sewage discharge box is internally provided with an insertion slot with an opening facing away from the sewage inlet and an end of the sewage discharge pipe is rotatably inserted into the insertion slot;
a third sealing element for sealing the sewage discharge pipe and the sewage discharge box is further provided in the insertion slot.

55. The toilet device according to any one of claims 2, 16, 34, 42, and 48, further comprising an anti-rotation structure for limiting rotation of the sewage discharge box relative to the toilet seat body.

56. The toilet device according to any one pf claims 2, 16, 22, 34, 42, and 48, wherein: at least one of the sewage intake connection part and the sewage discharge connection part is provided with a first installation groove, a first sealing element is installed in the first installation groove, the first sealing element abuts against an axial end face of the sewage intake connection part and an axial end face of the sewage discharge connection part to form an end face seal; and/or,
at least one of the sewage intake connection part and the sewage discharge connection part is provided with a second installation groove, a second sealing element is installed in the second installation groove, and the second sealing element abuts against a radial inner end of the sewage intake connection

part and a radial outer end of the sewage discharge connection part to form a radial seal.

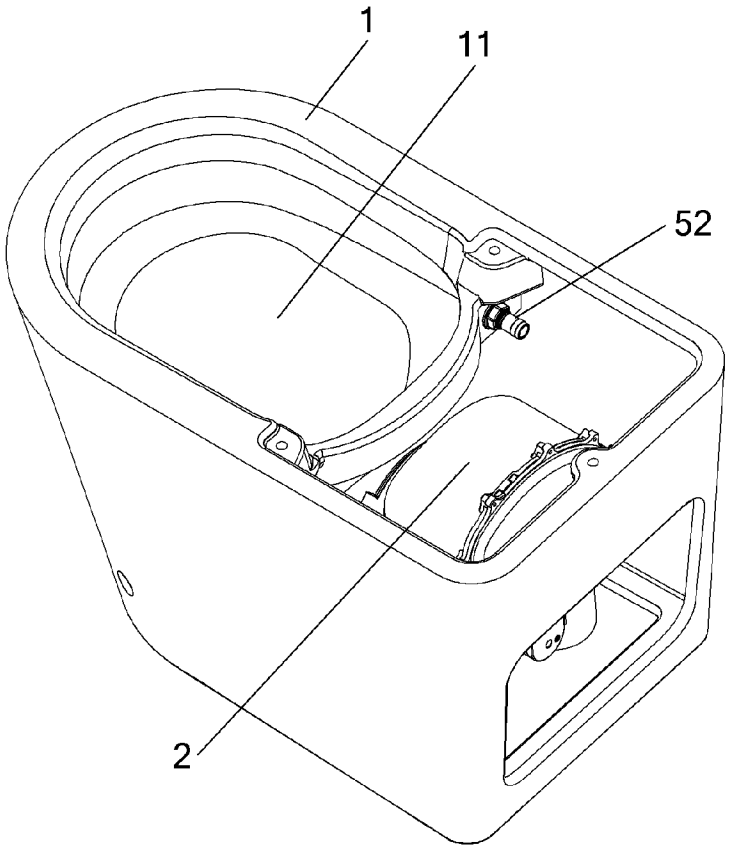

FIG. 1

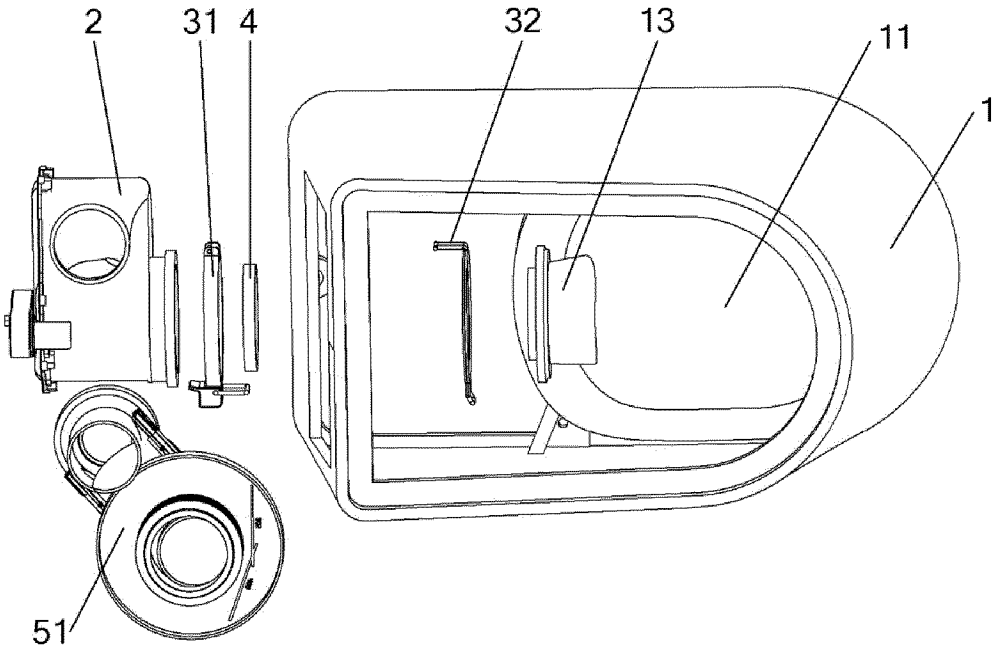

FIG. 2

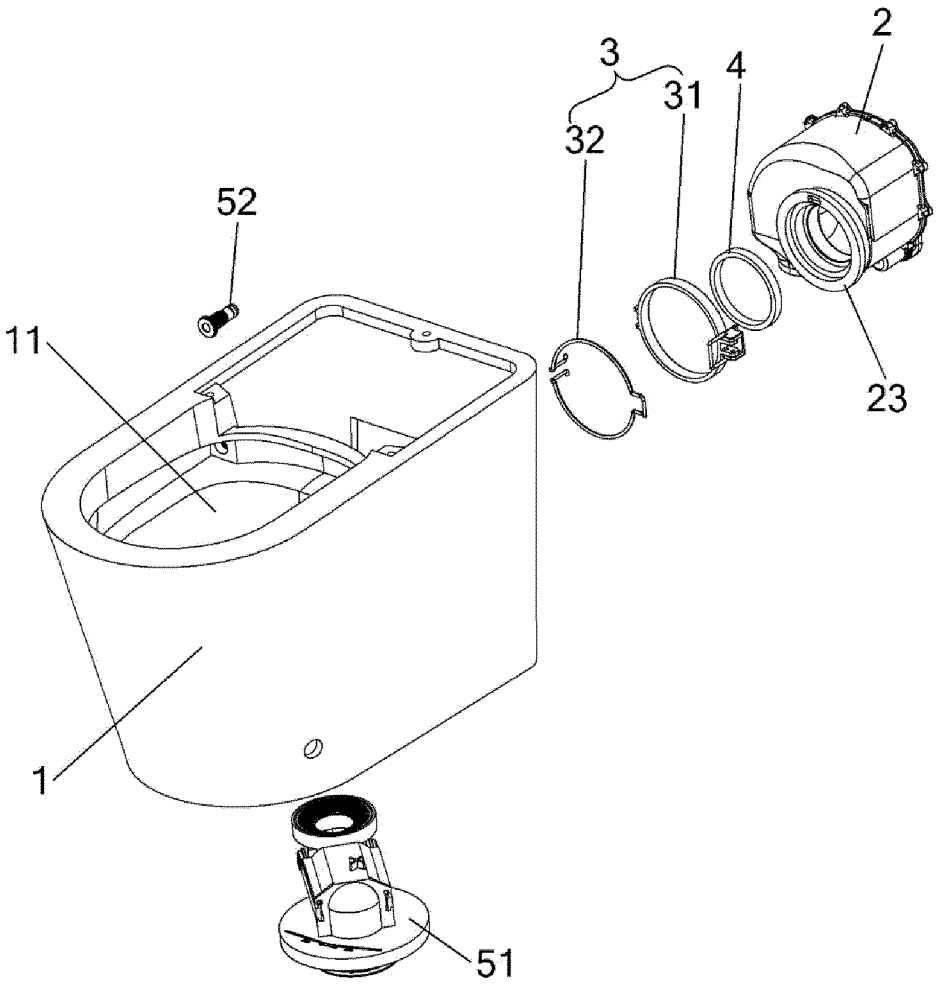

FIG. 3

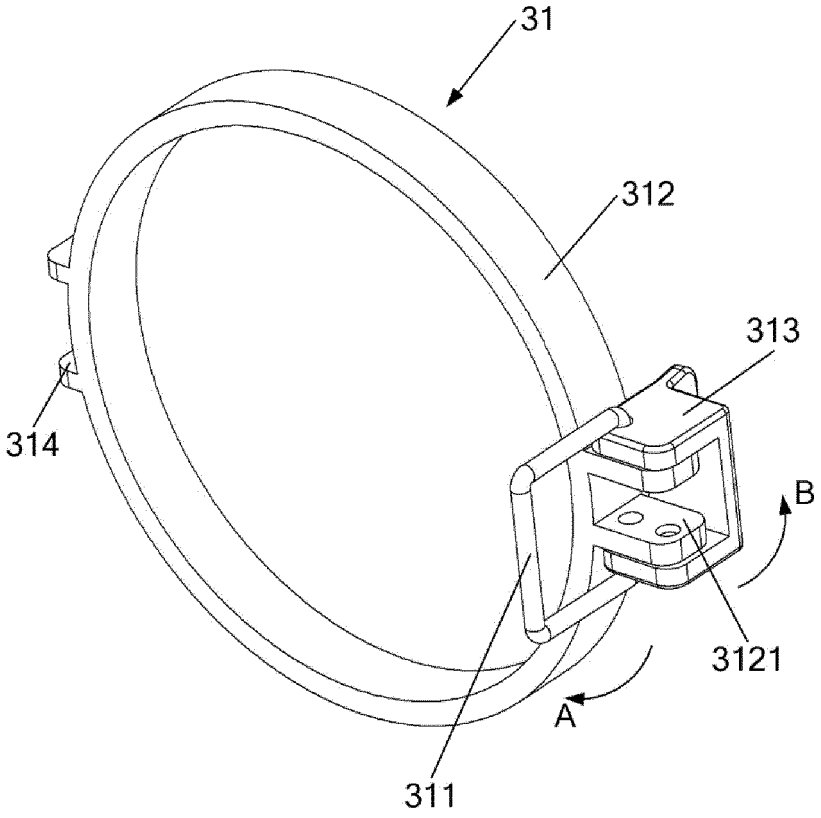

FIG. 4

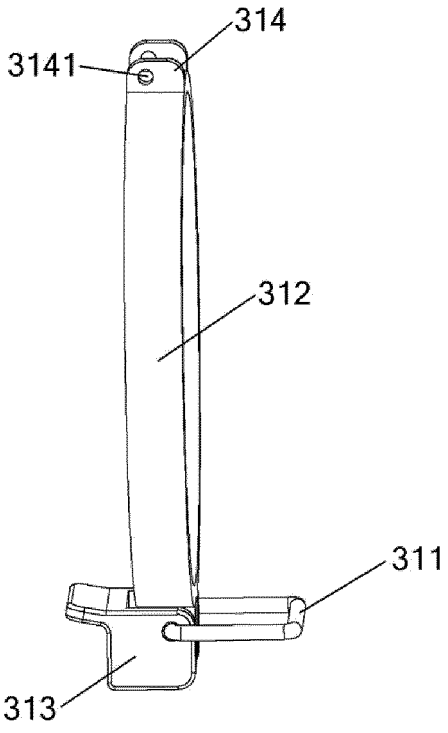

FIG. 5

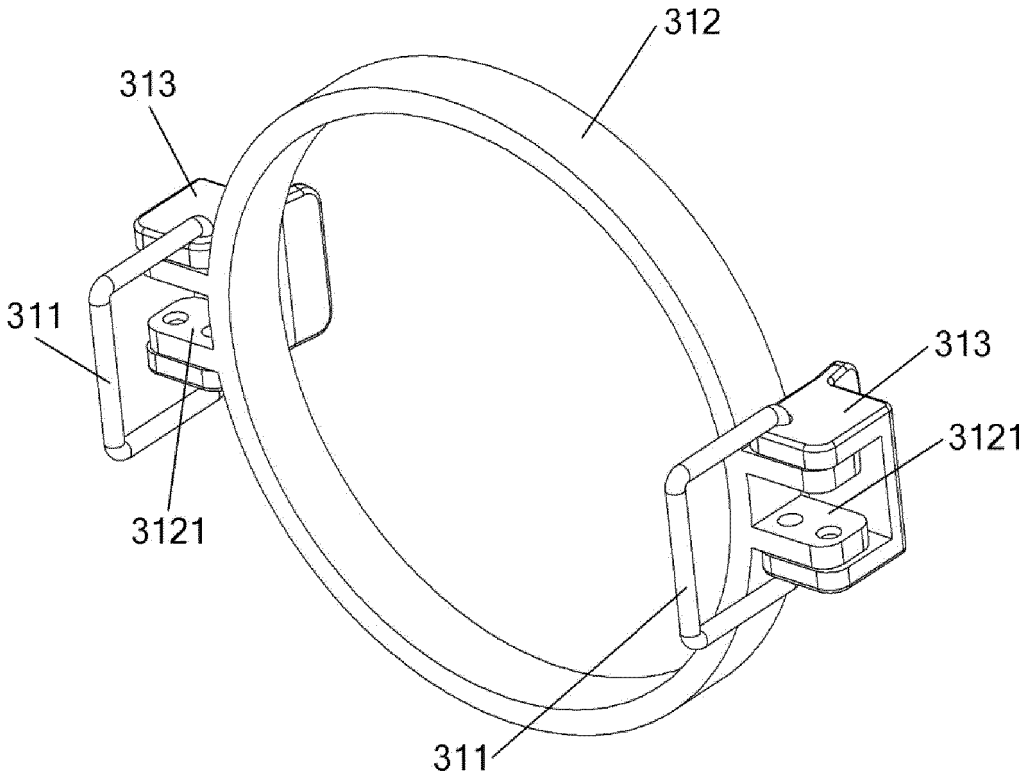
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FIG. 6

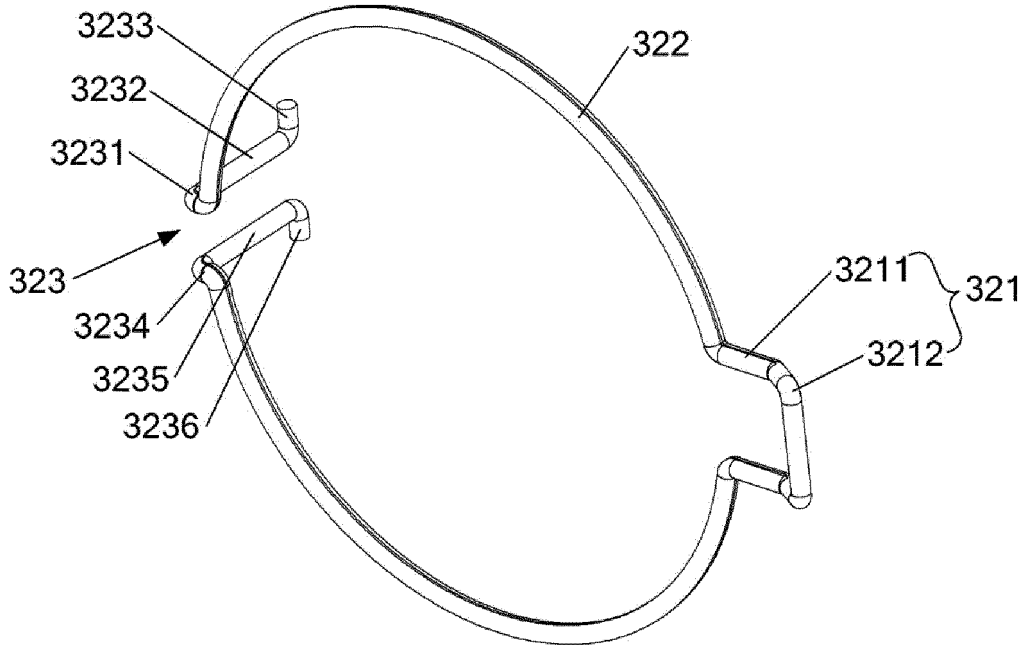
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FIG. 7

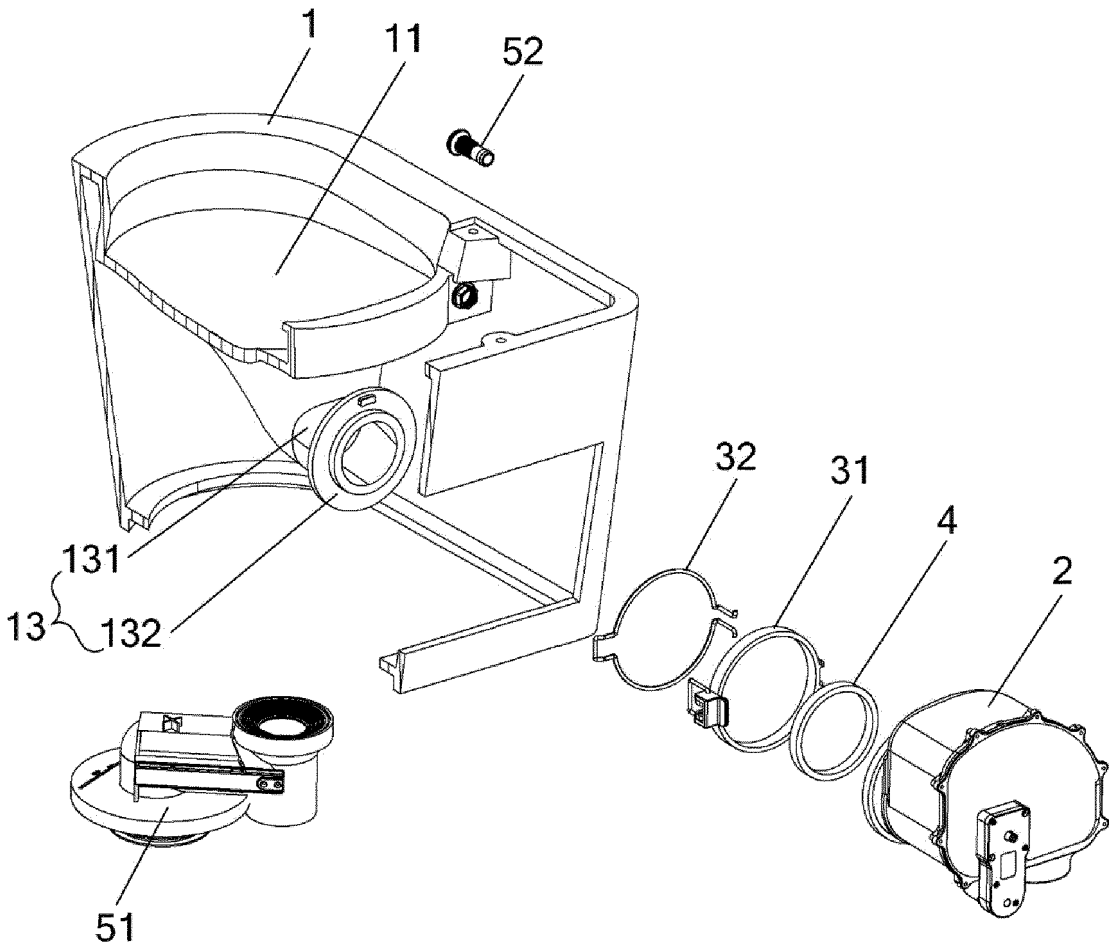


FIG. 8

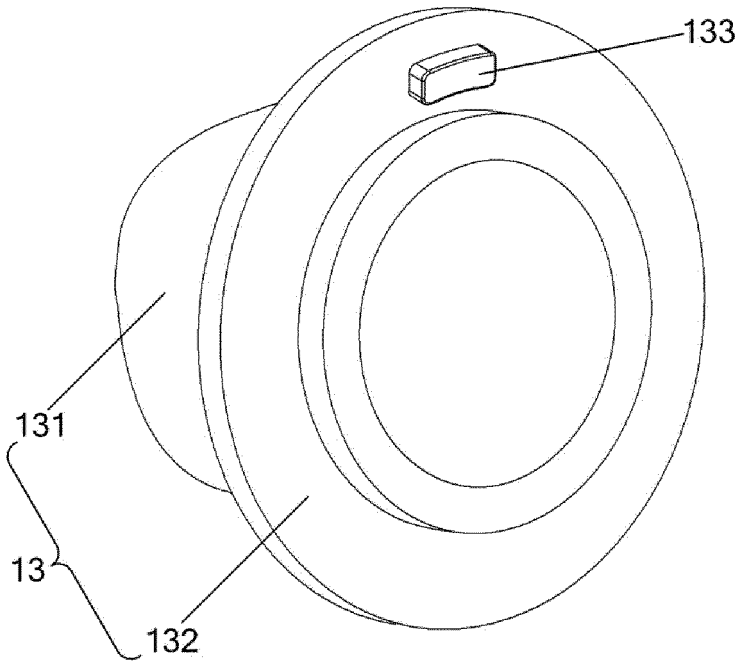


FIG. 9

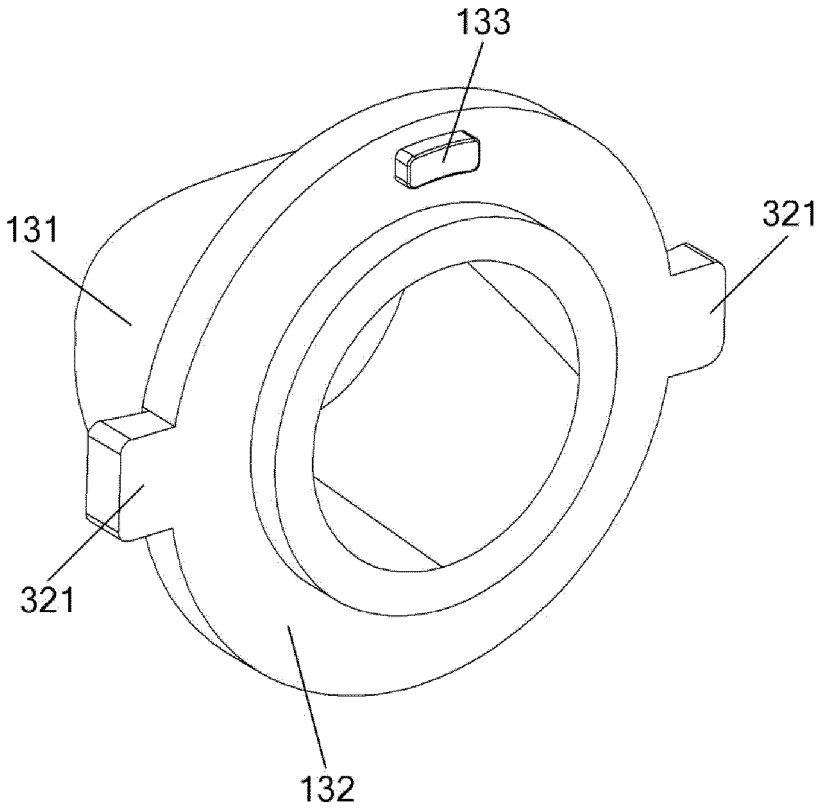


FIG. 10

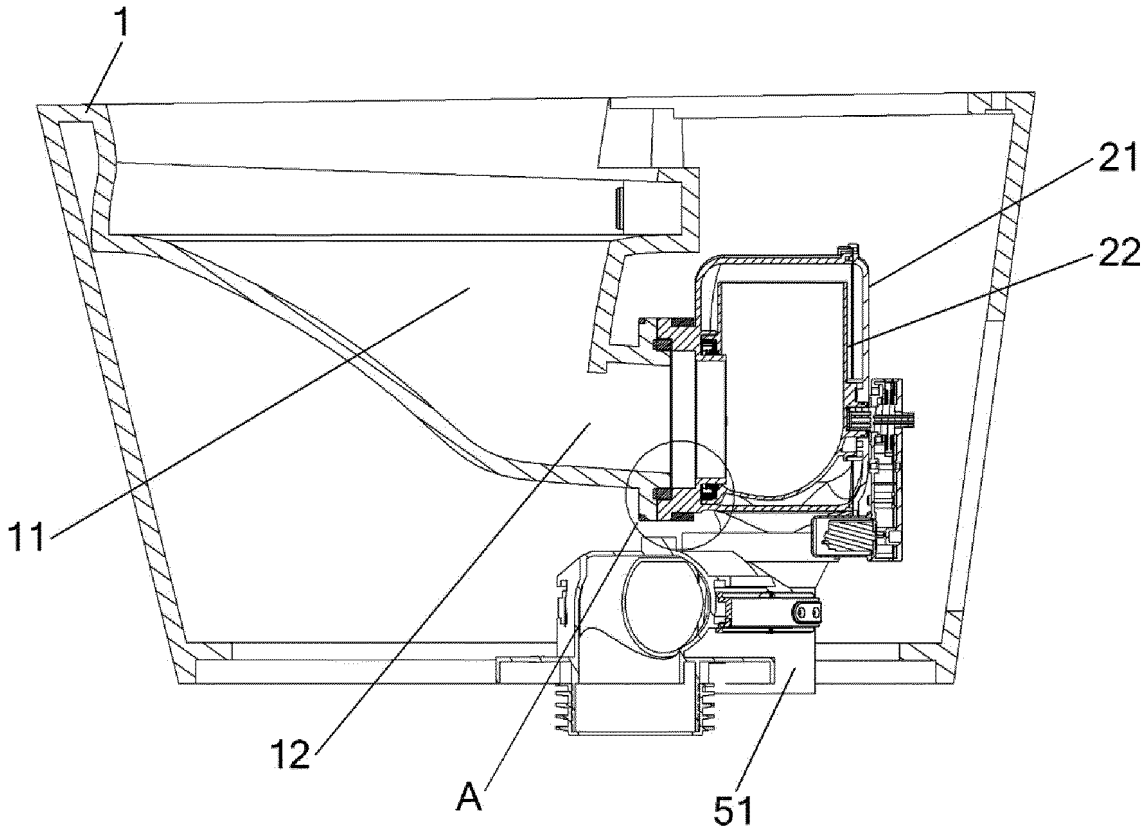


FIG. 11

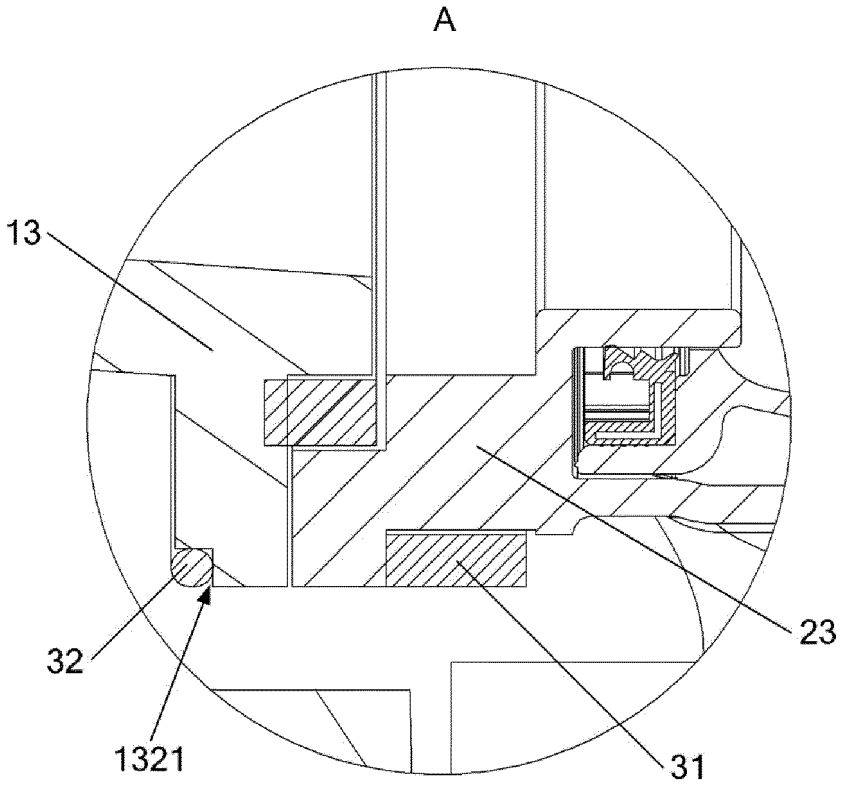


FIG. 12

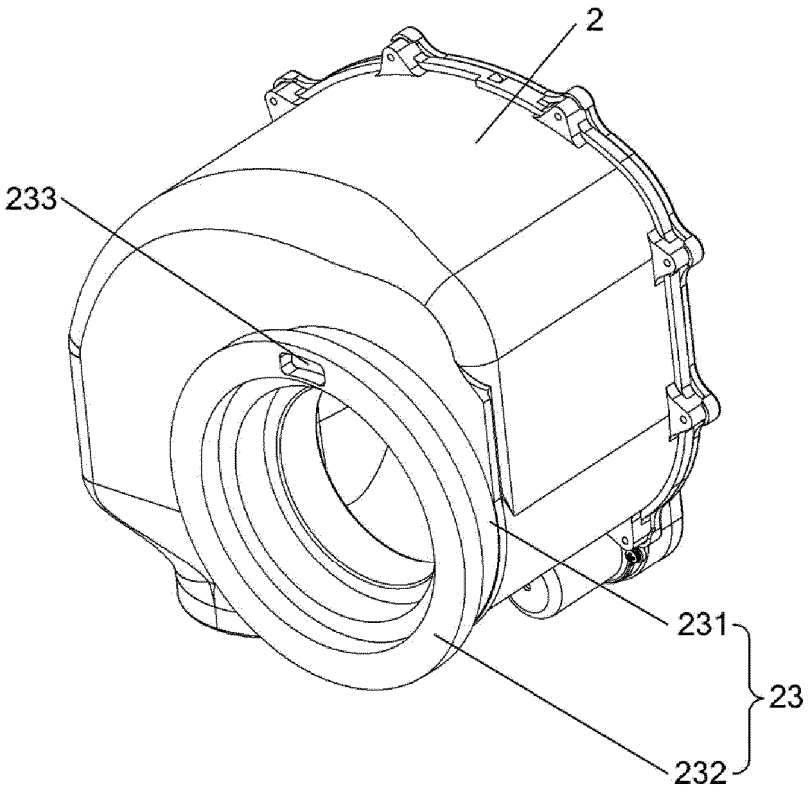


FIG. 13

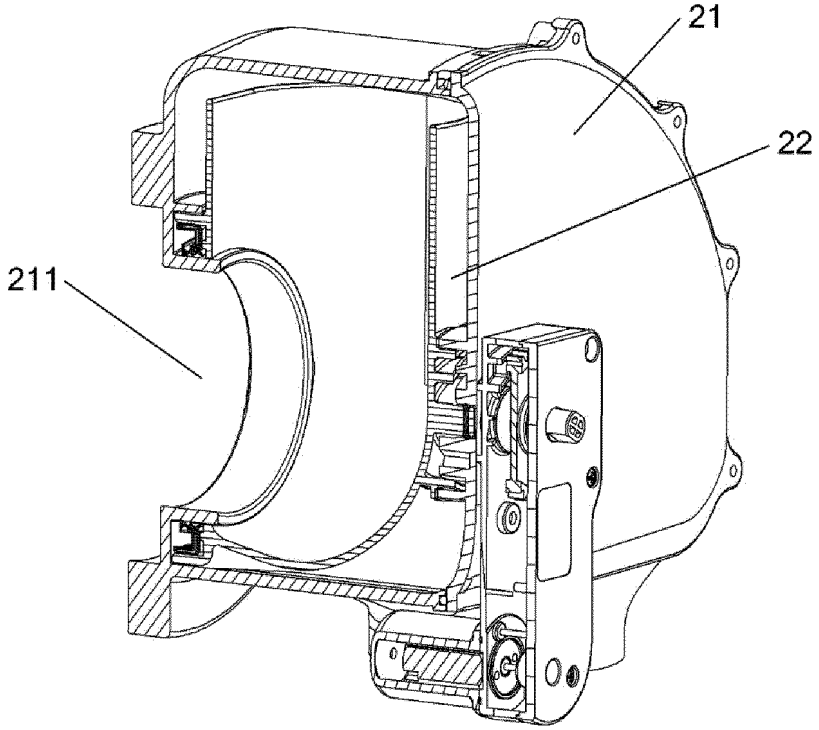


FIG. 14

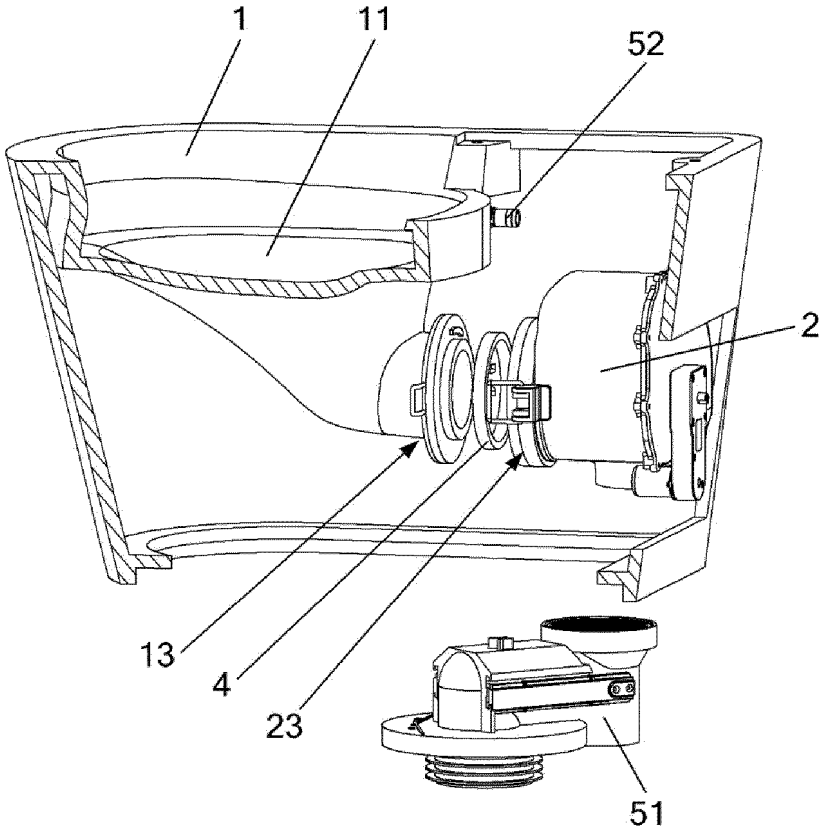


FIG. 15

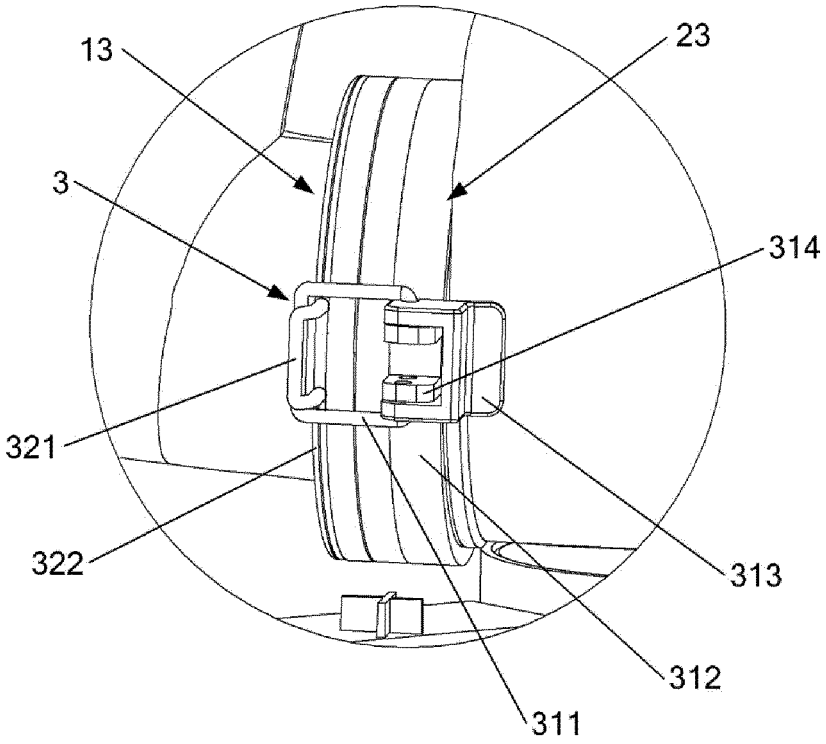


FIG. 16

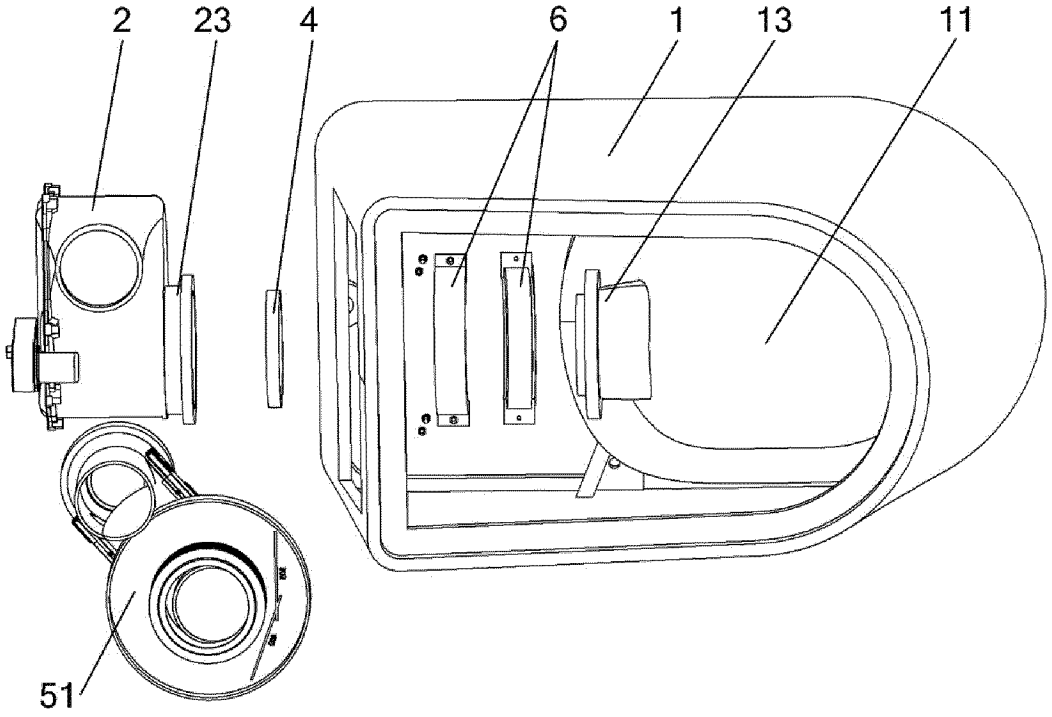


FIG. 17

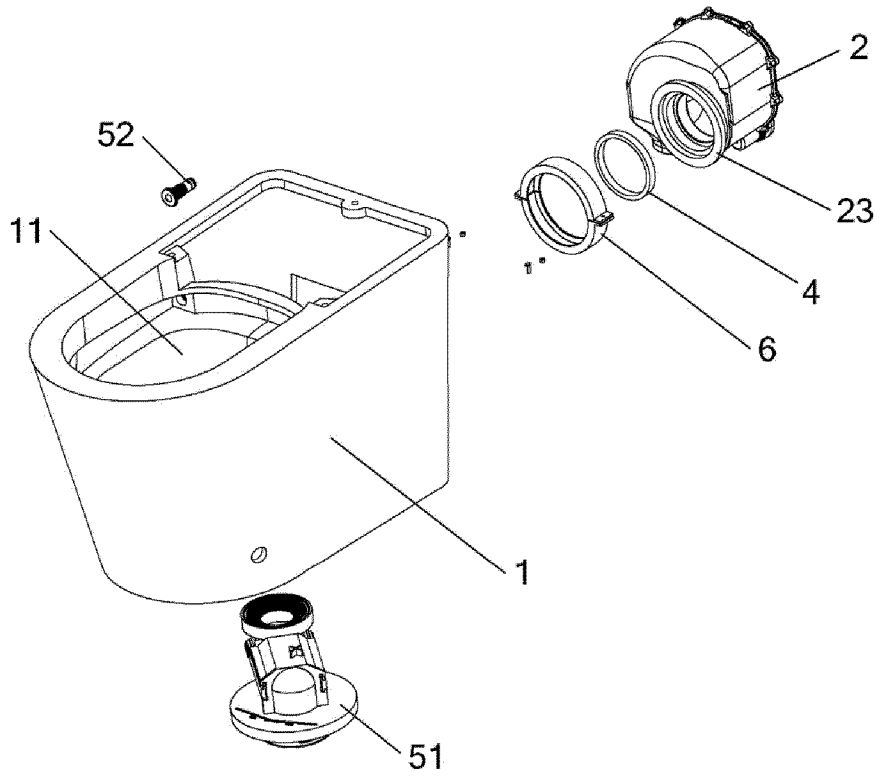


FIG. 18

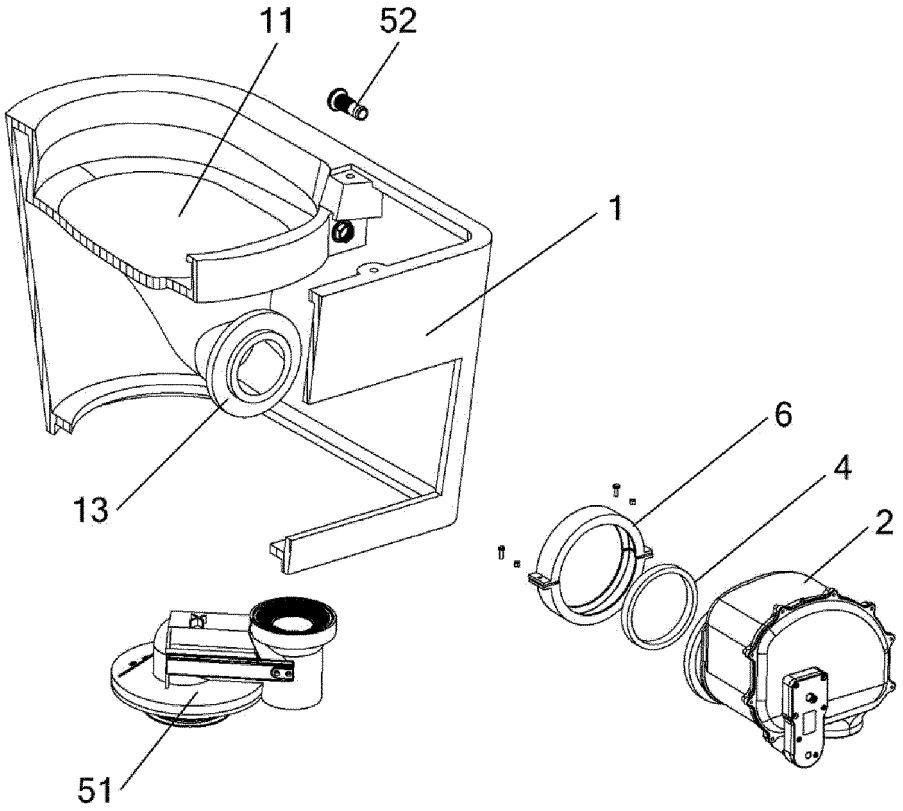


FIG. 19

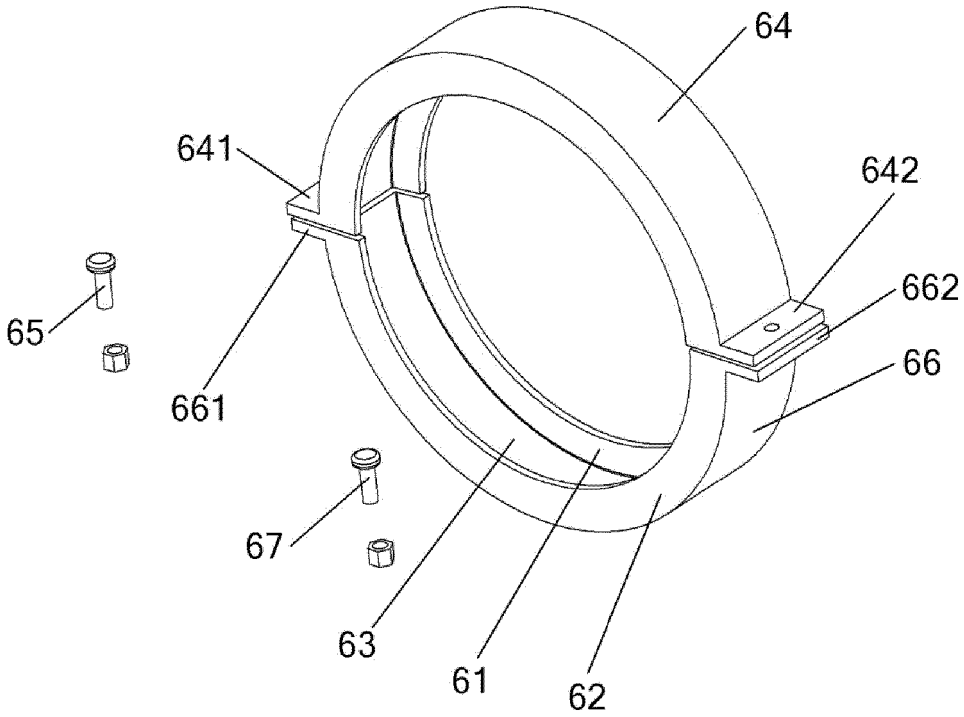


FIG. 20

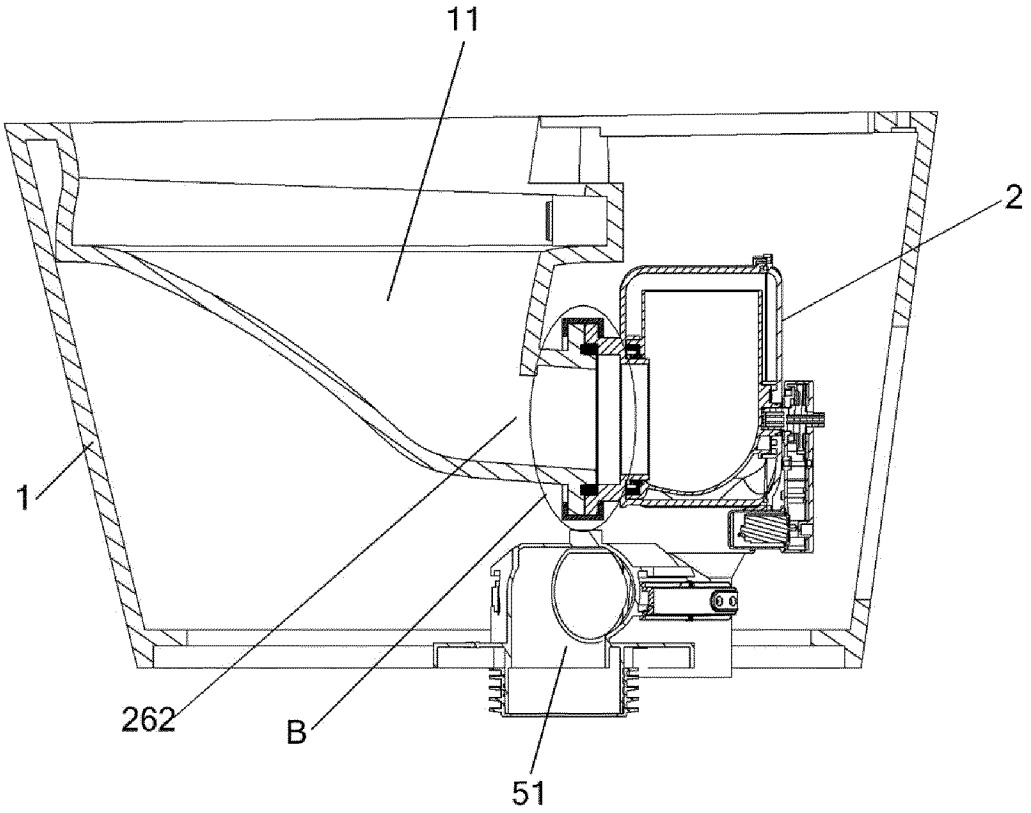


FIG. 21

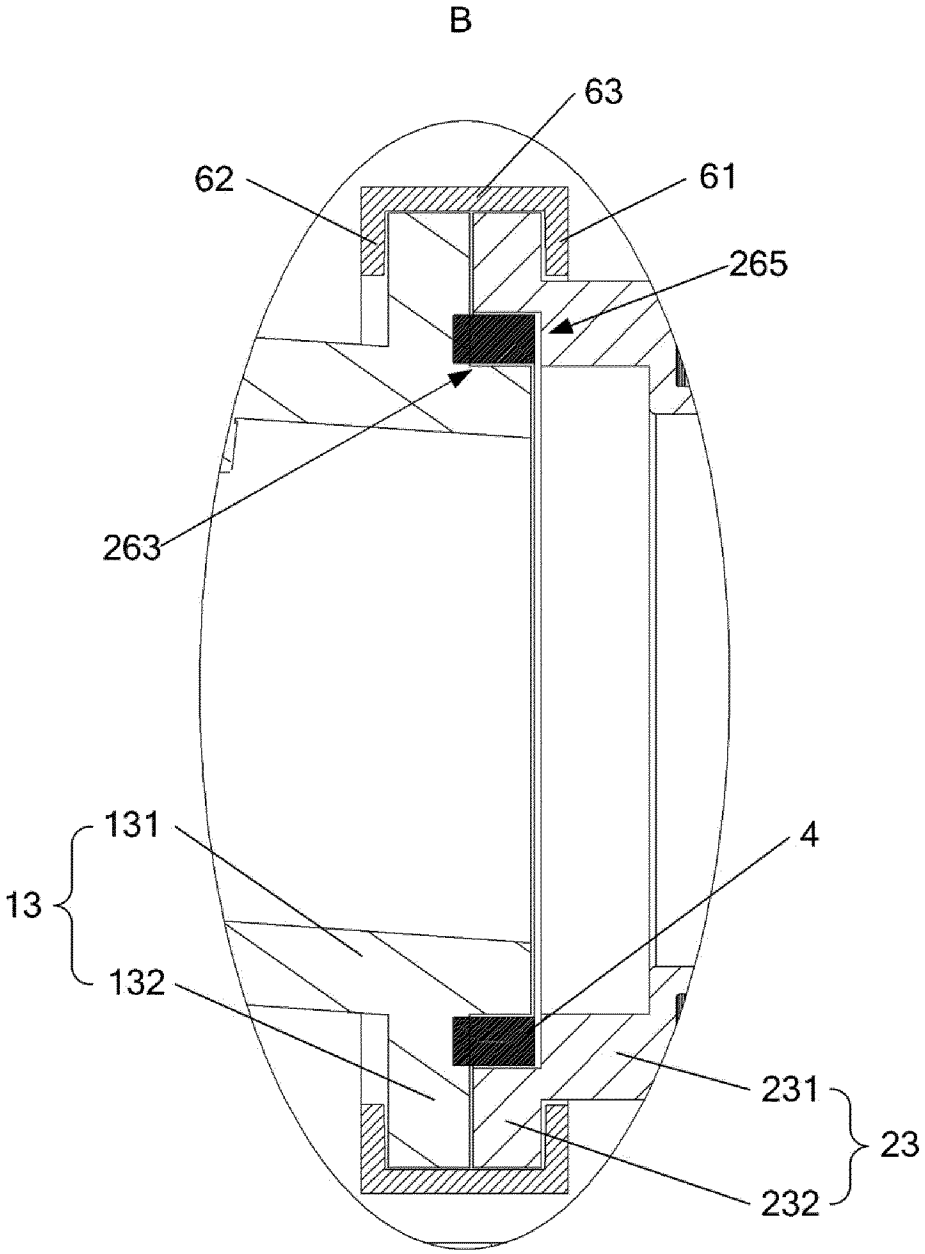


FIG. 22

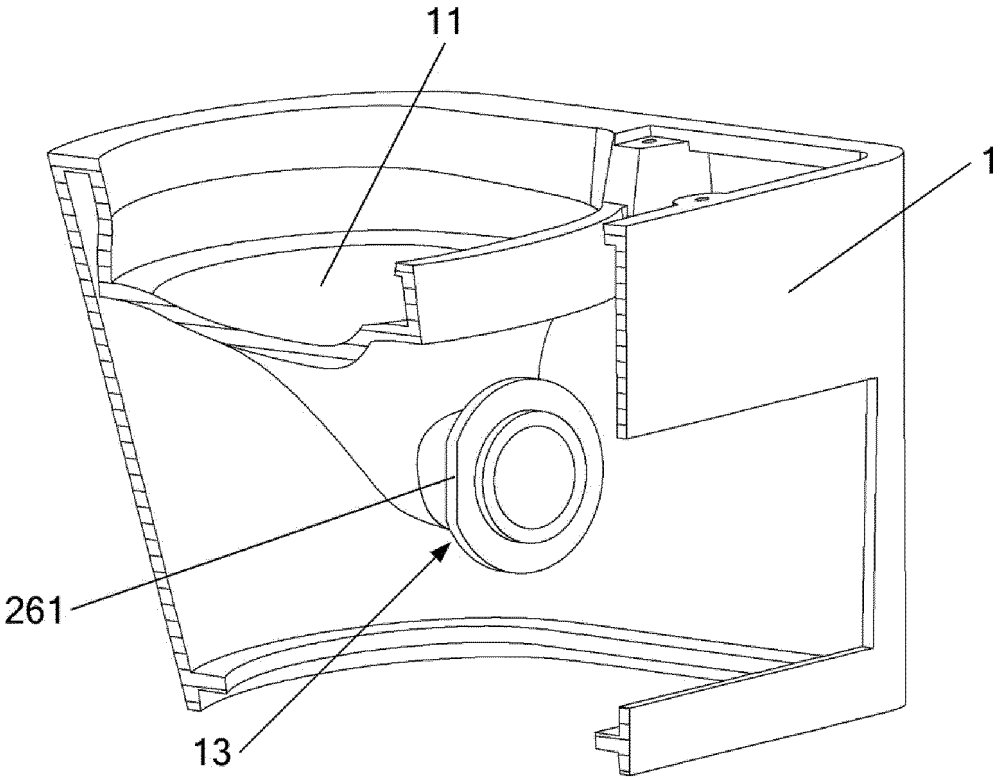


FIG. 23

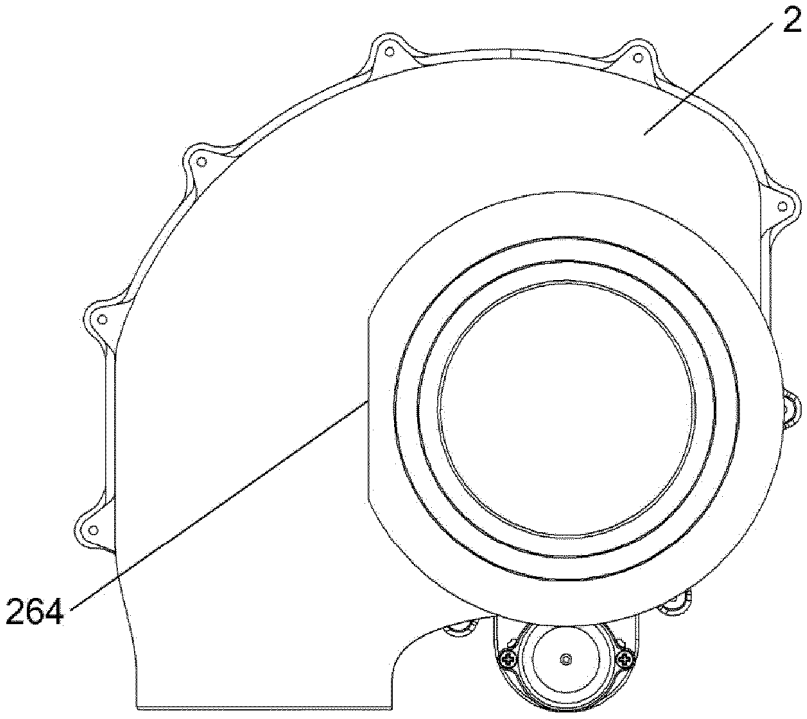


FIG. 24

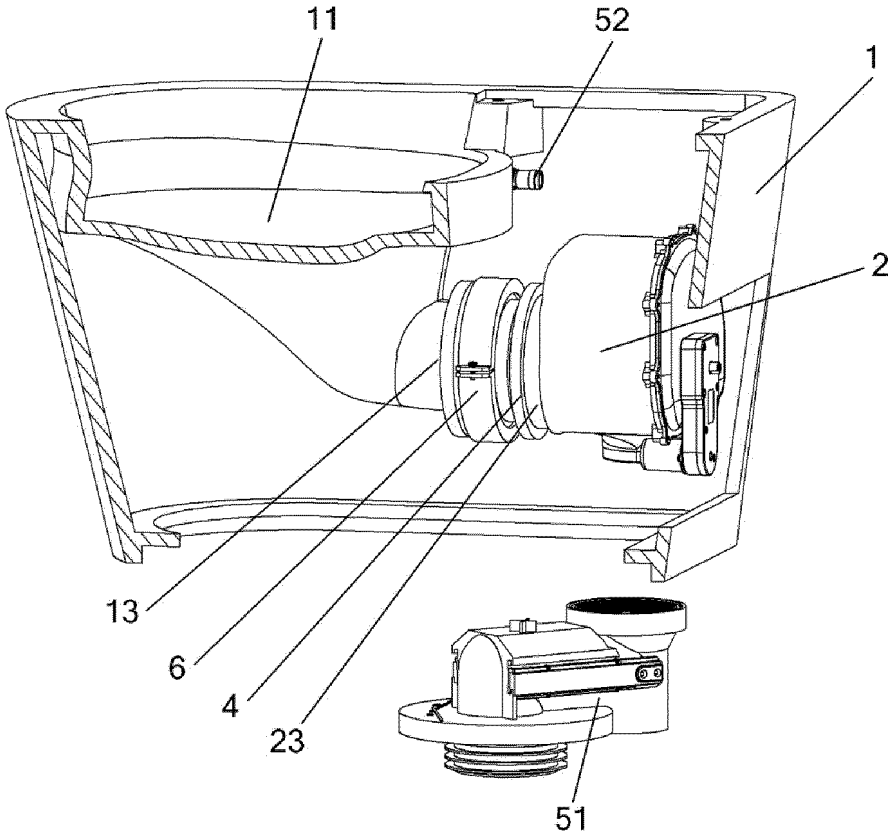


FIG. 25

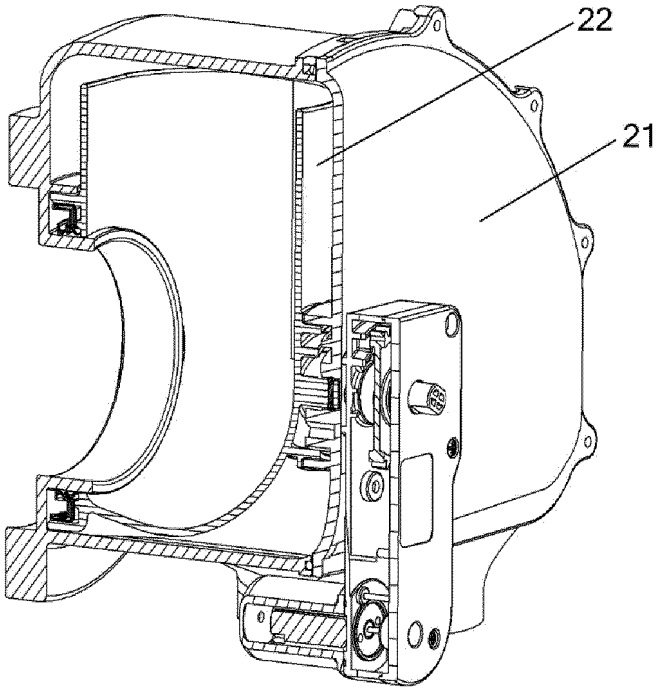


FIG. 26

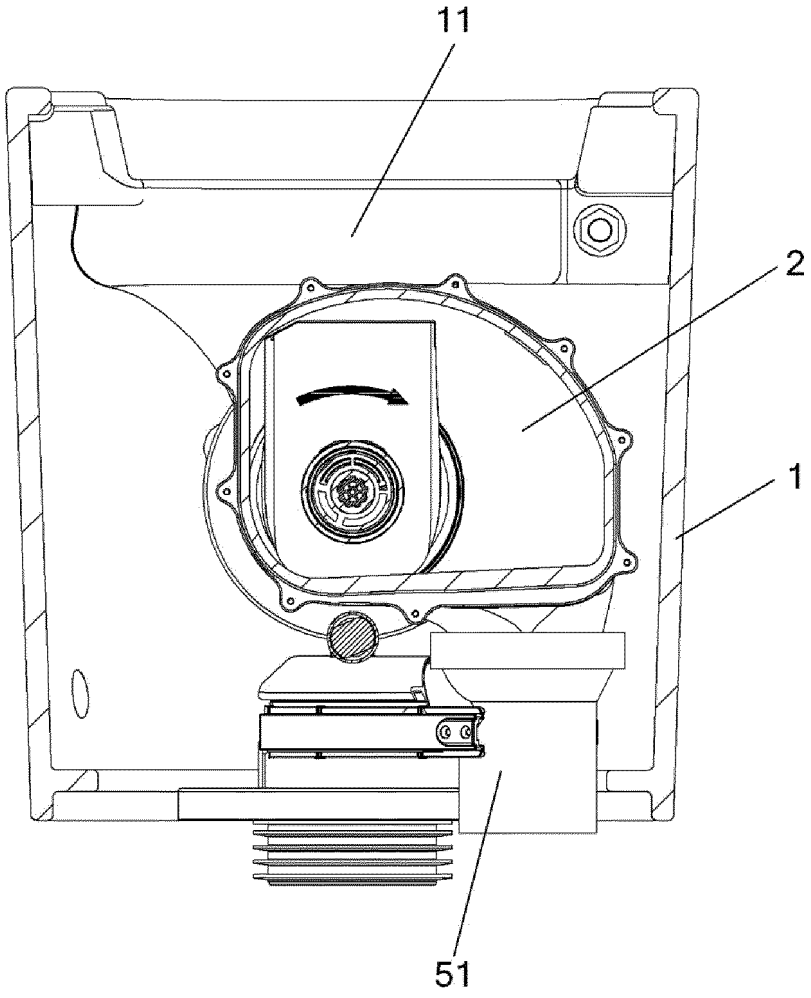


FIG. 27

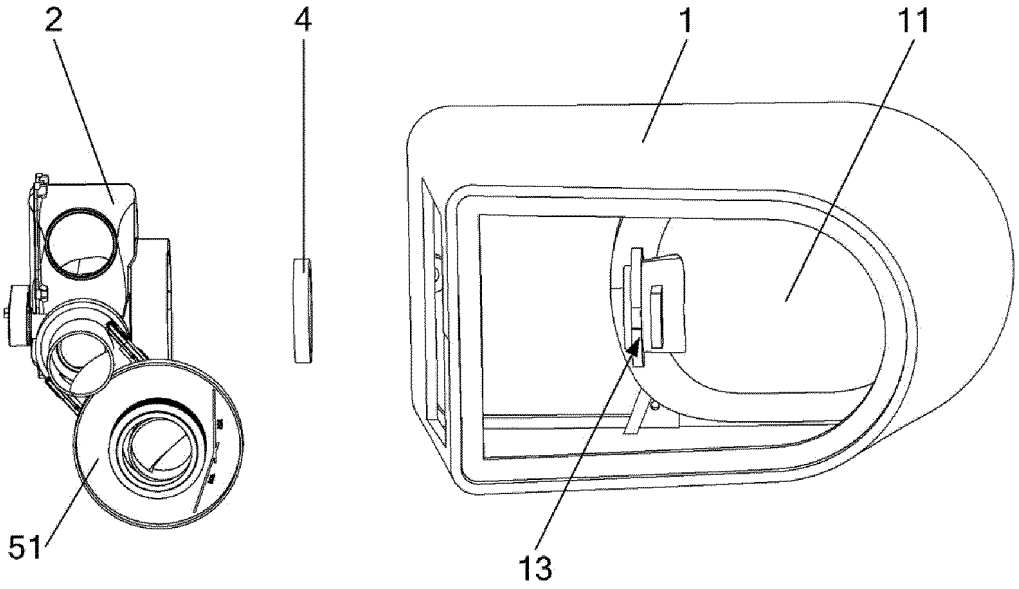


FIG. 28

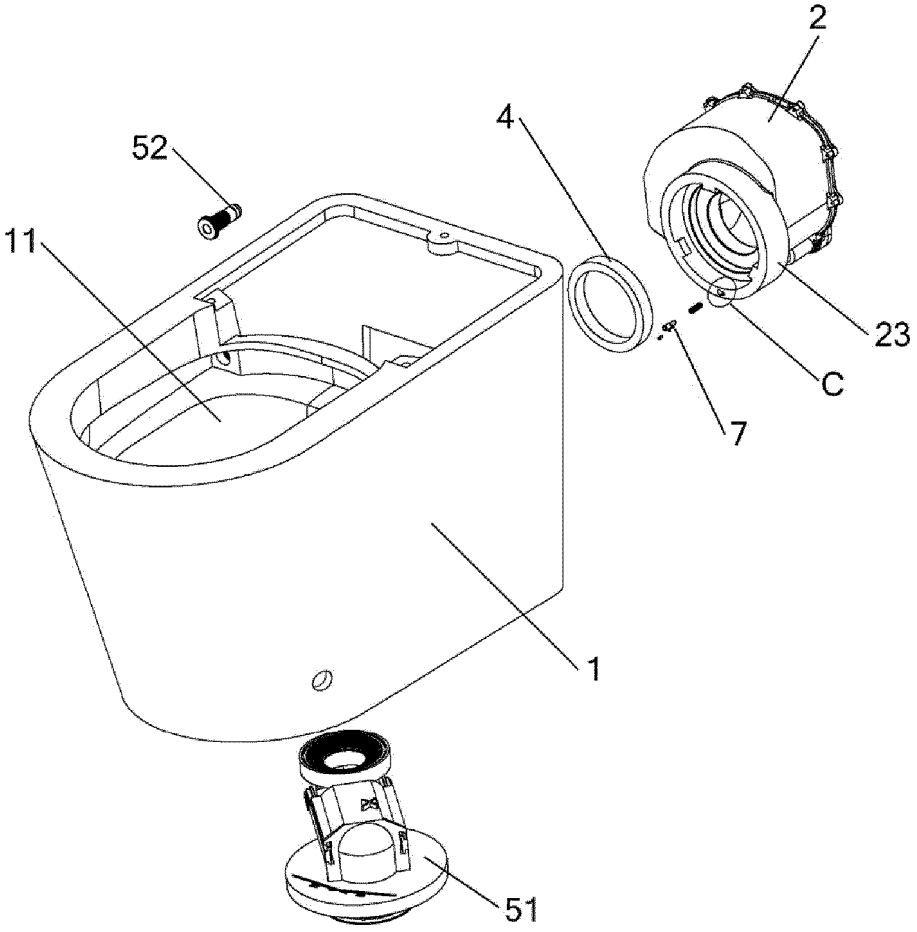


FIG. 29

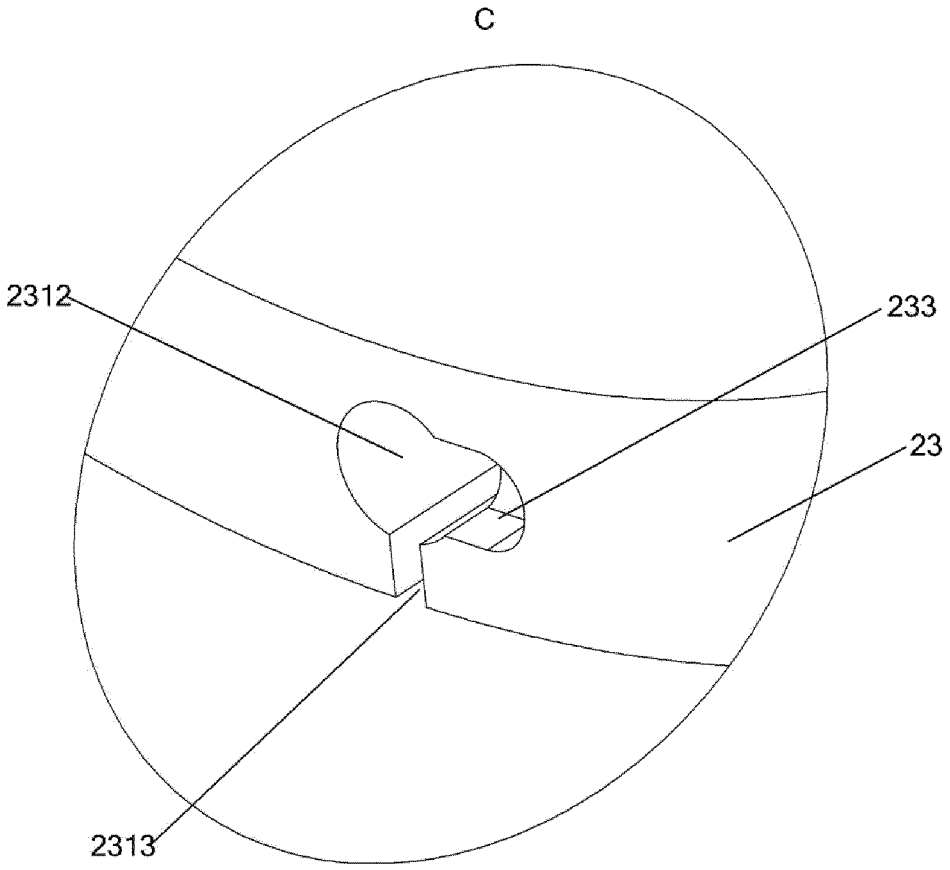


FIG. 30

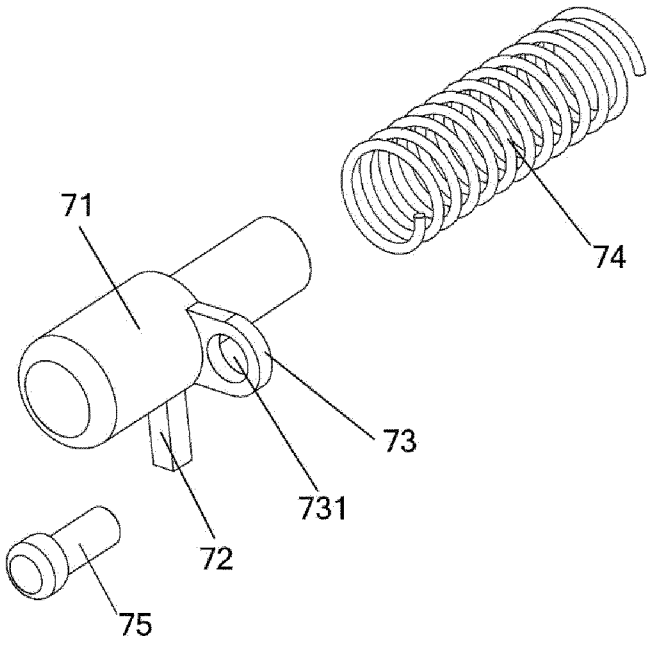


FIG. 31

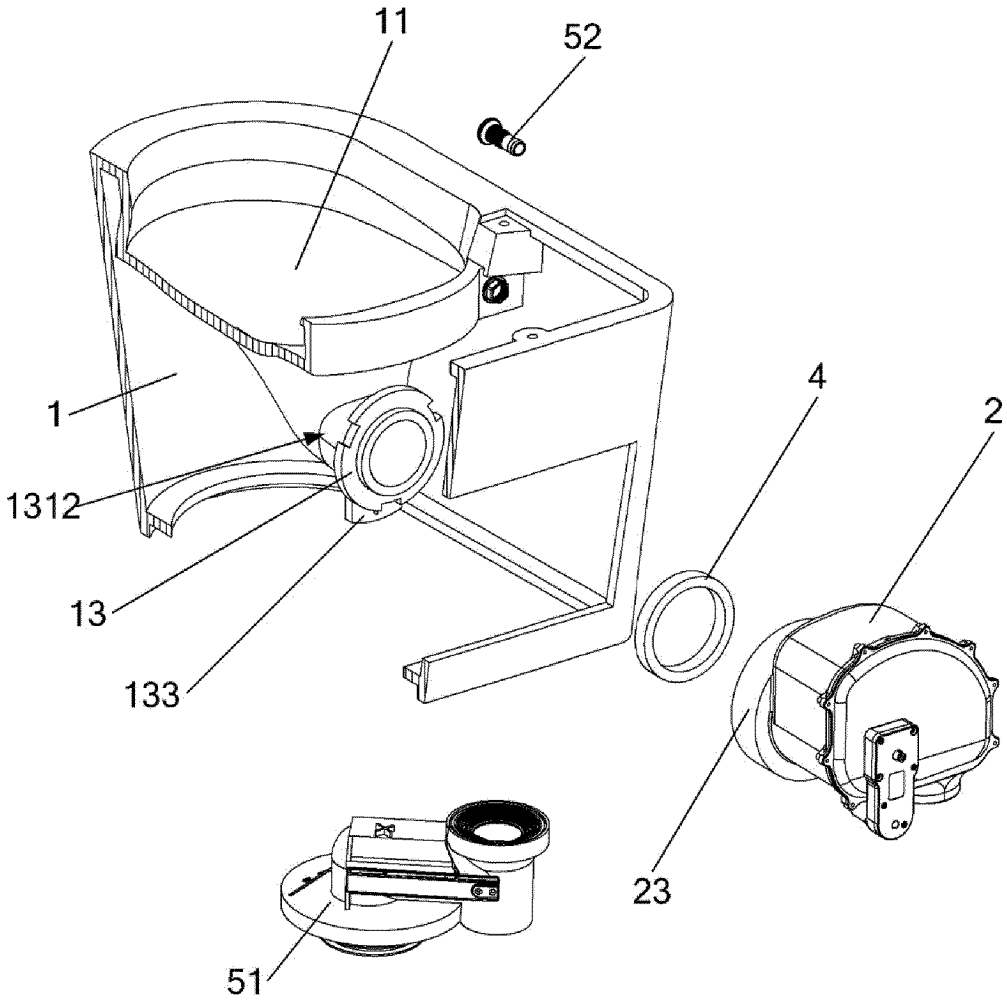


FIG. 32

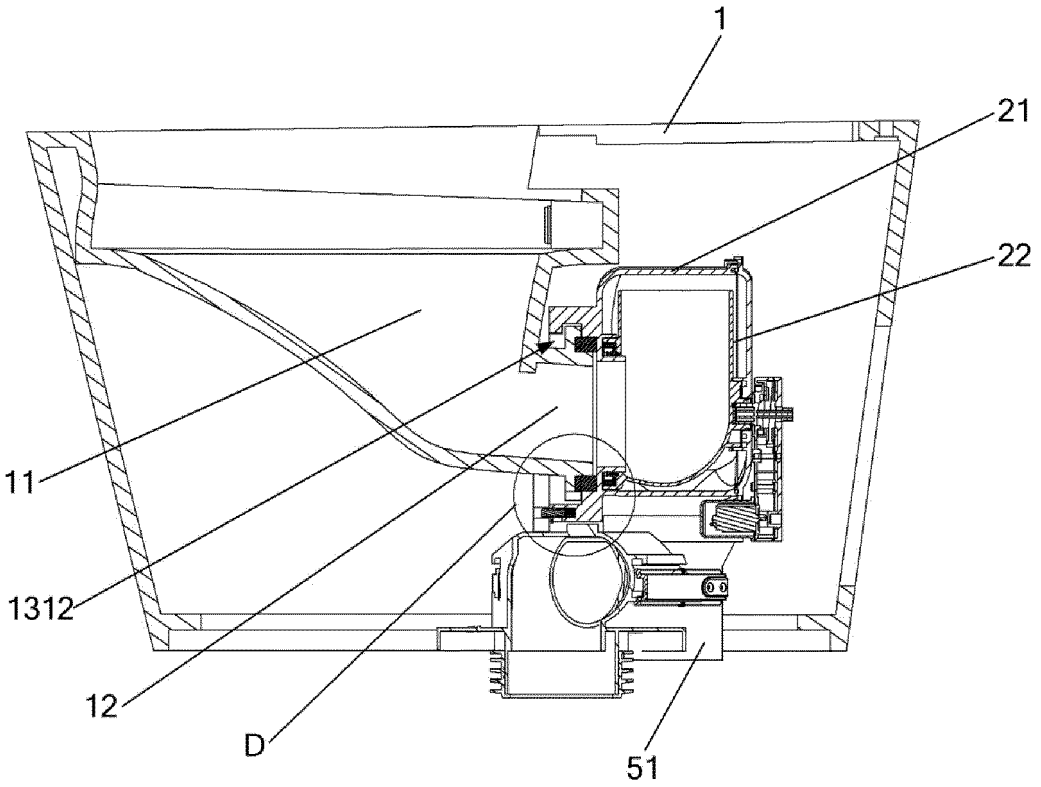


FIG. 33

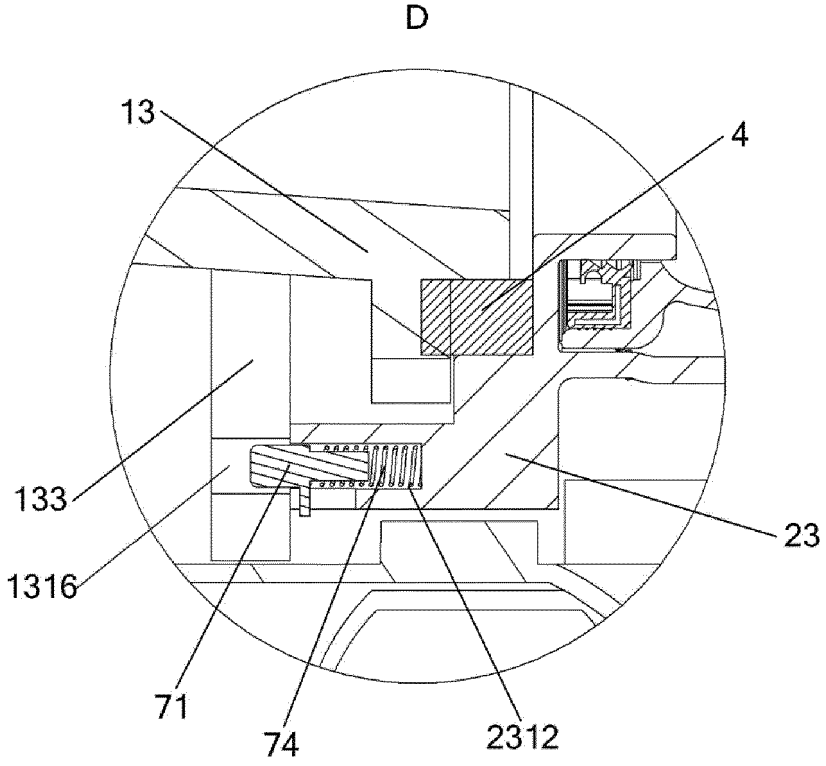


FIG. 34

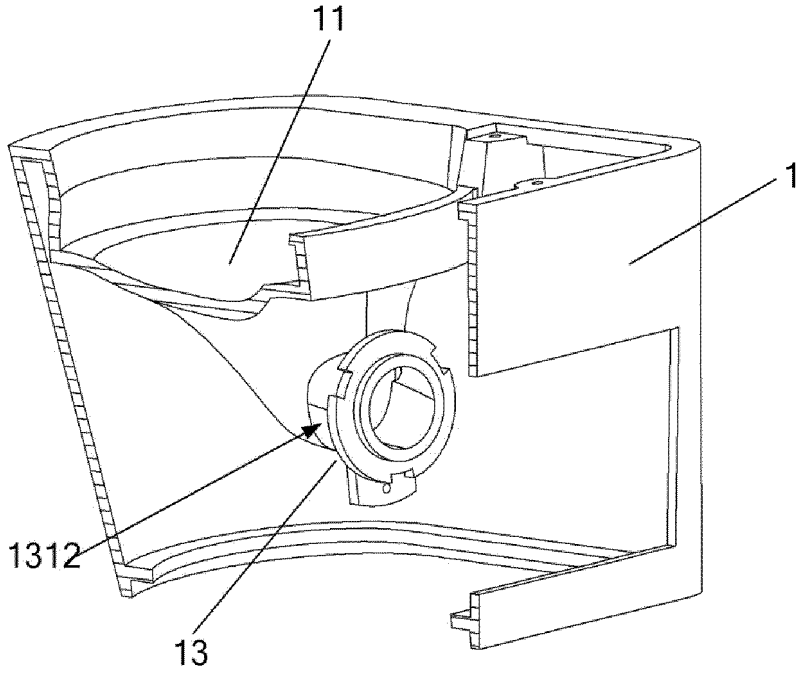


FIG. 35

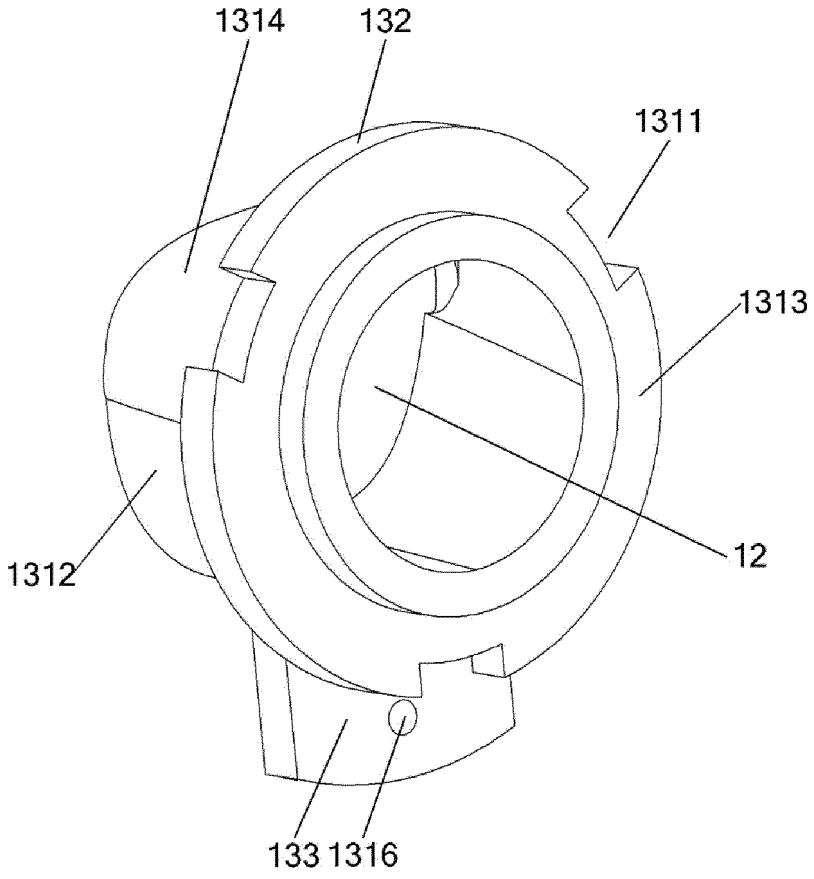


FIG. 36

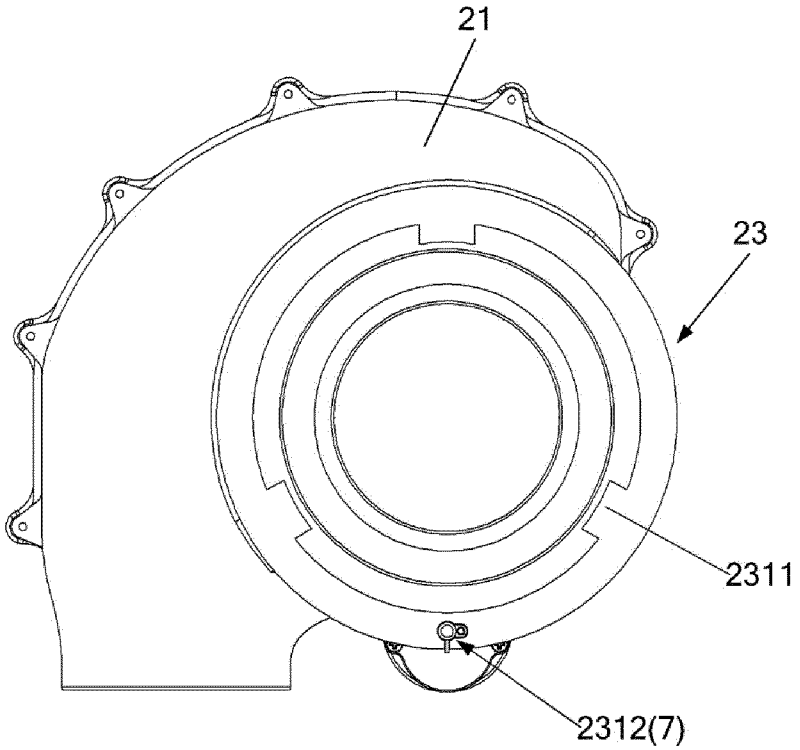


FIG. 37

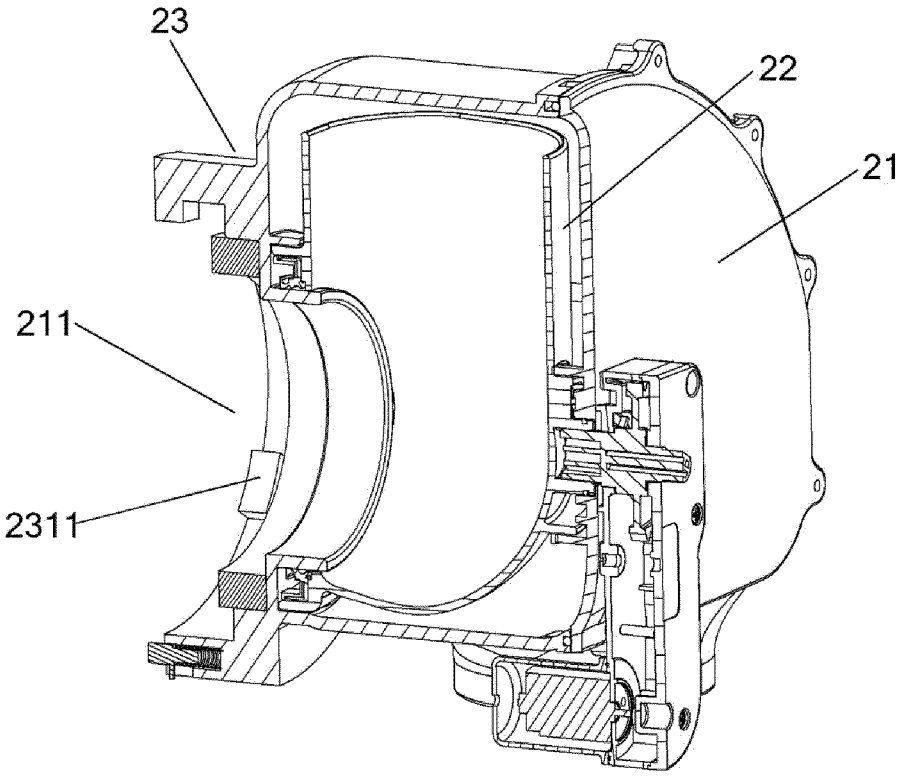


FIG. 38

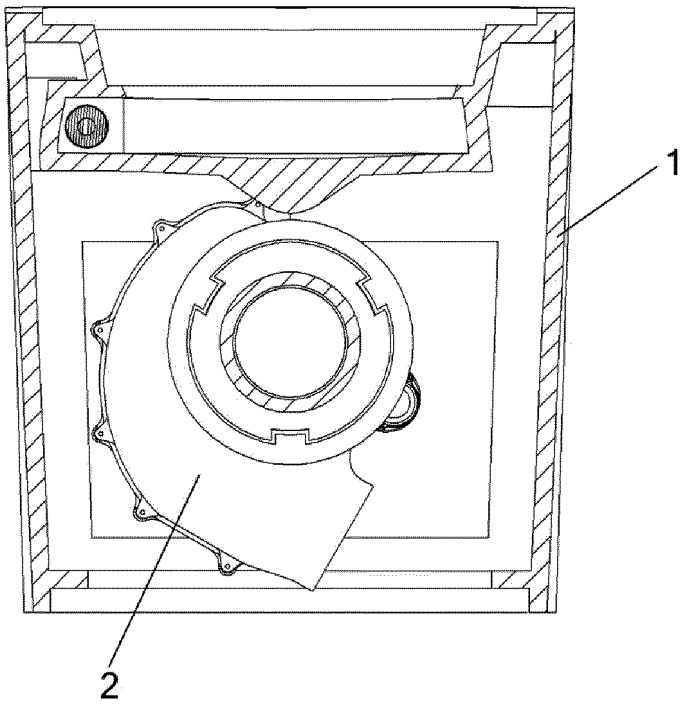


FIG. 39

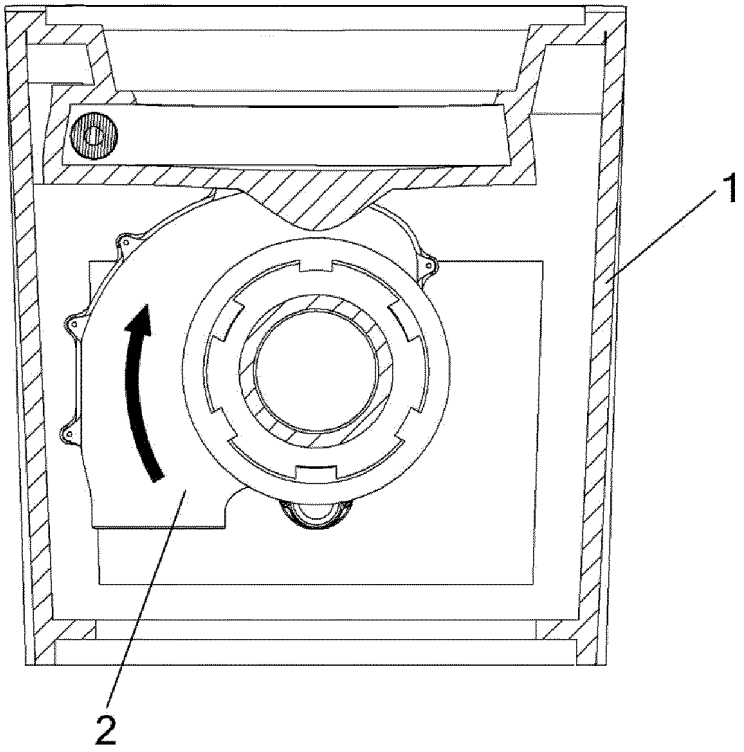


FIG. 40

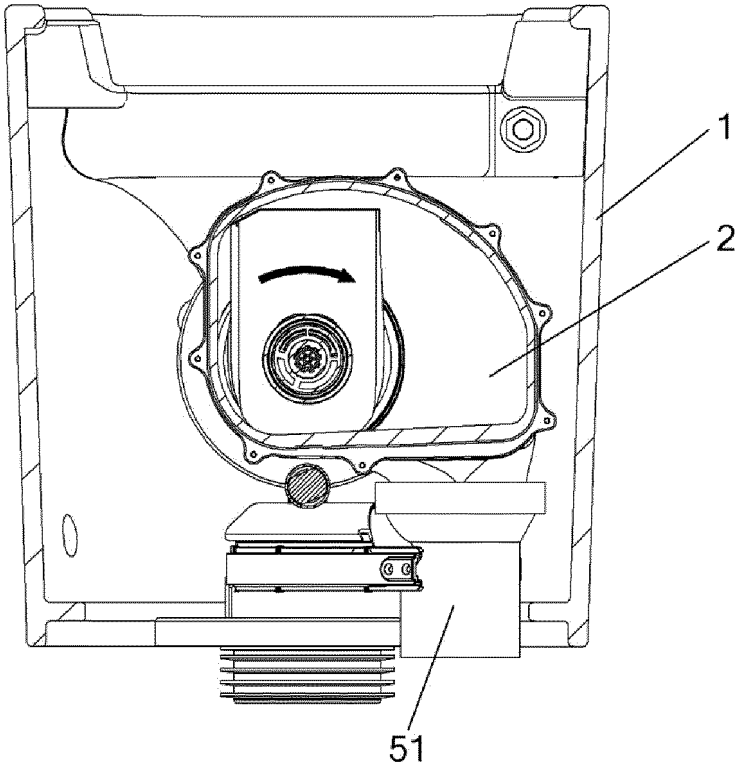


FIG. 41

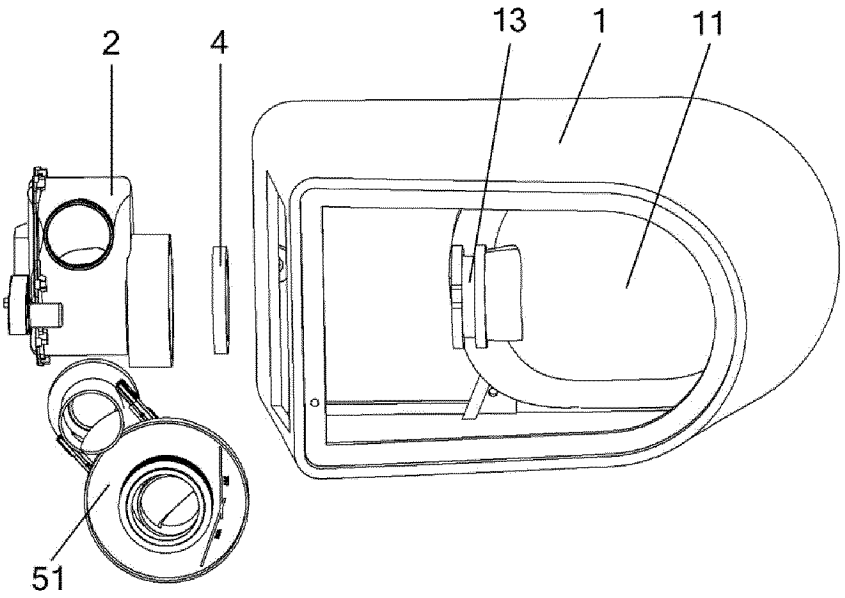


FIG. 42

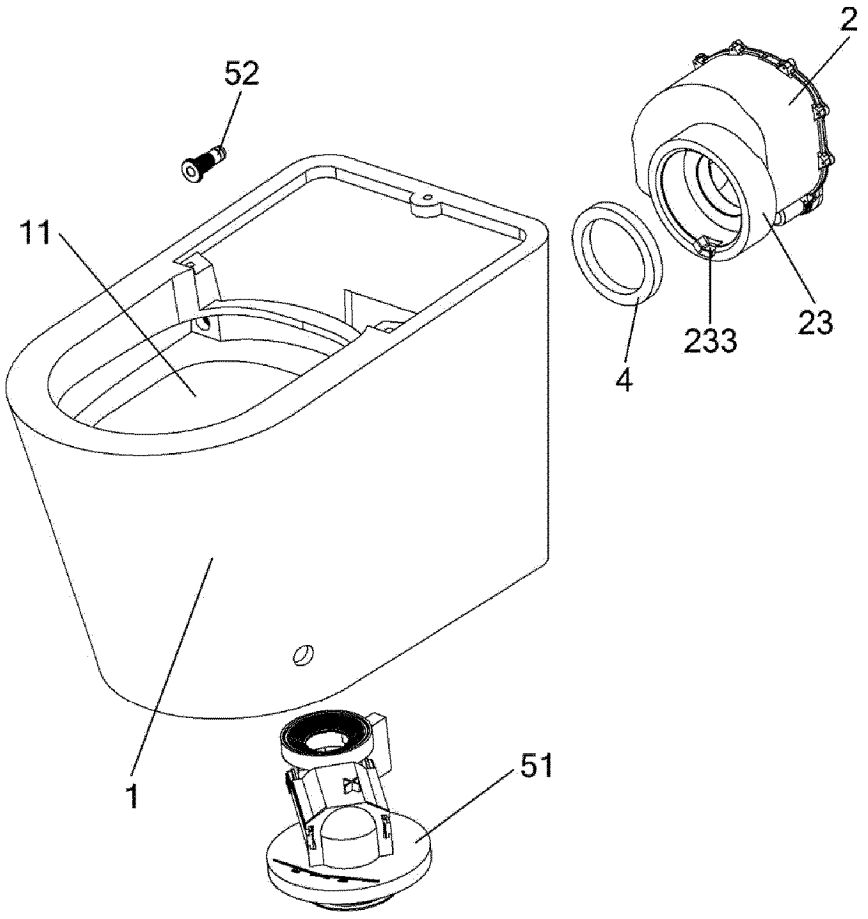


FIG. 43

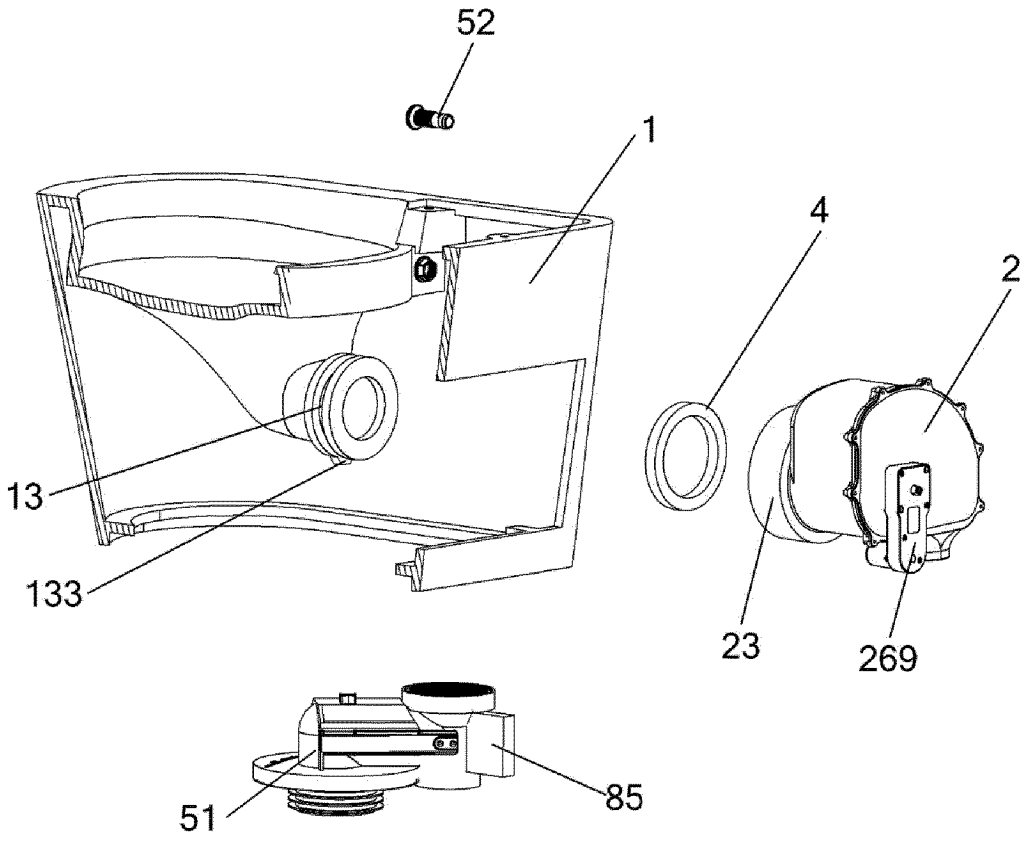


FIG. 44

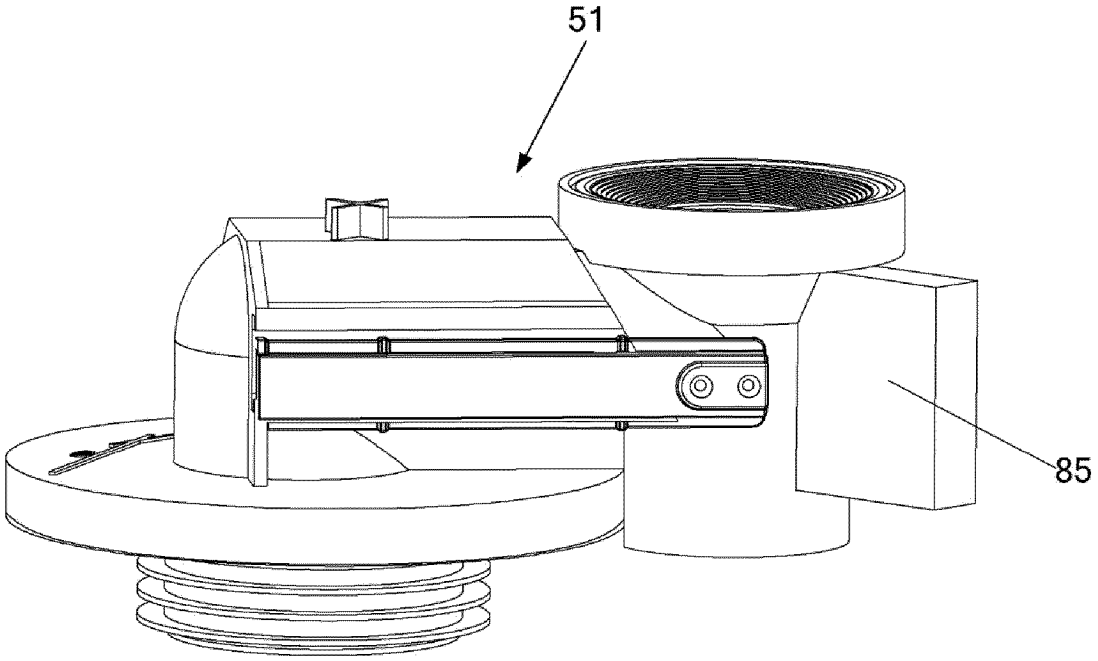


FIG. 45

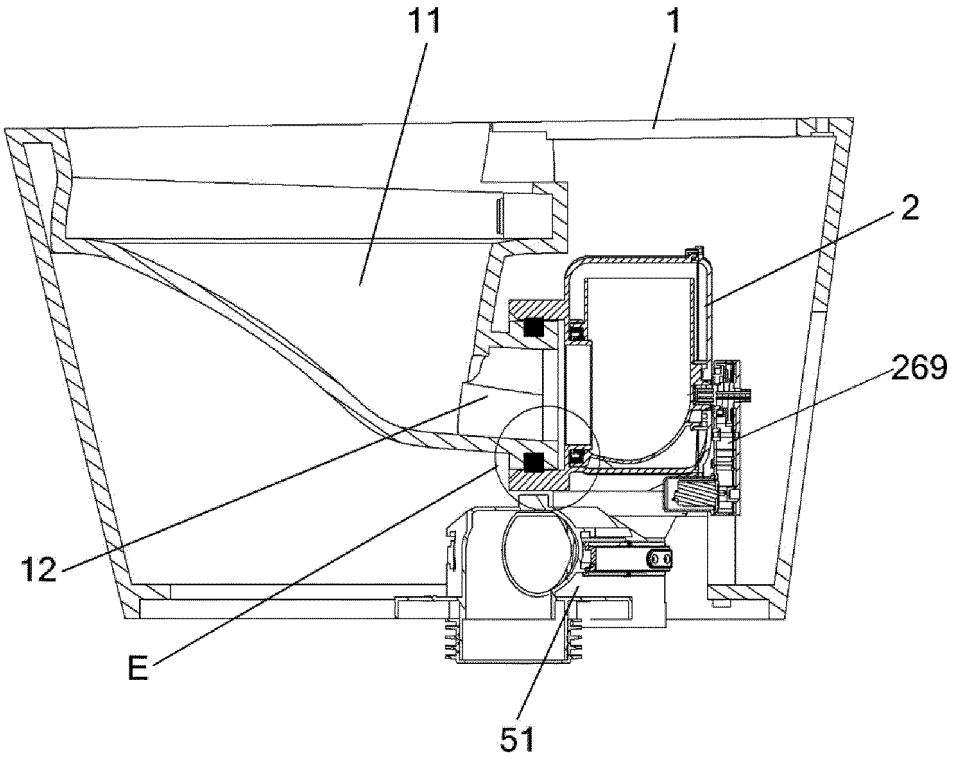


FIG. 46

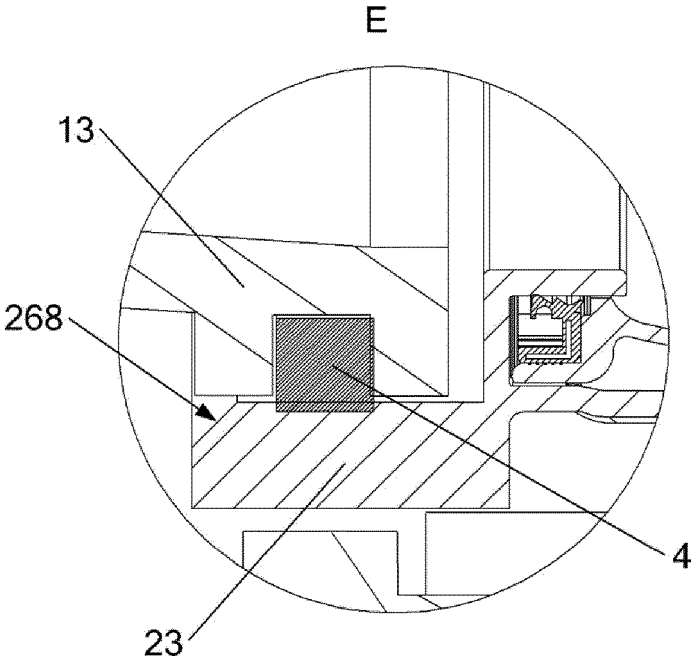


FIG. 47

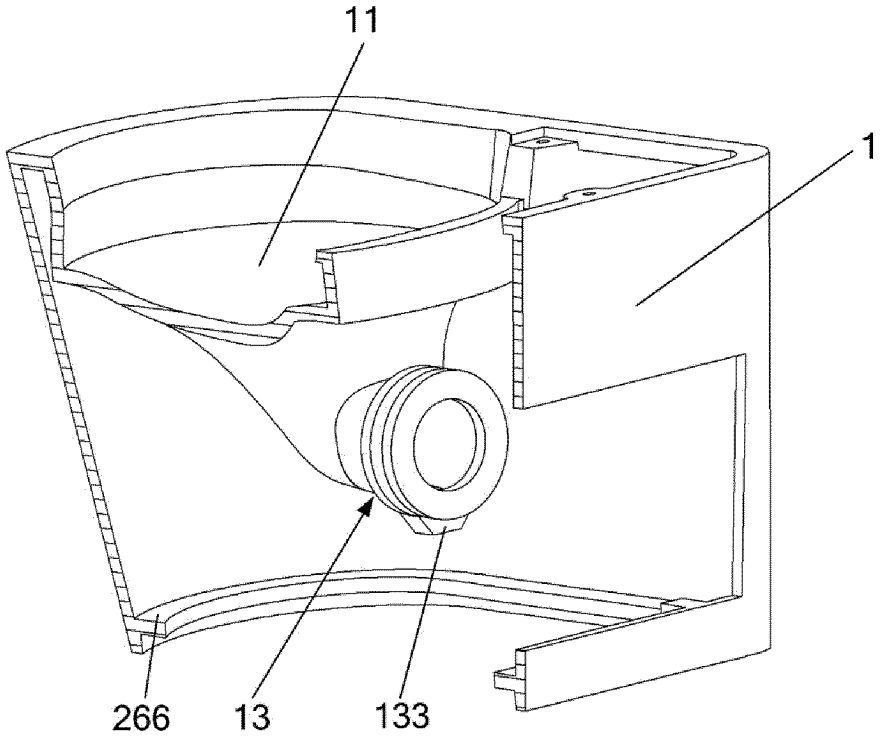


FIG. 48

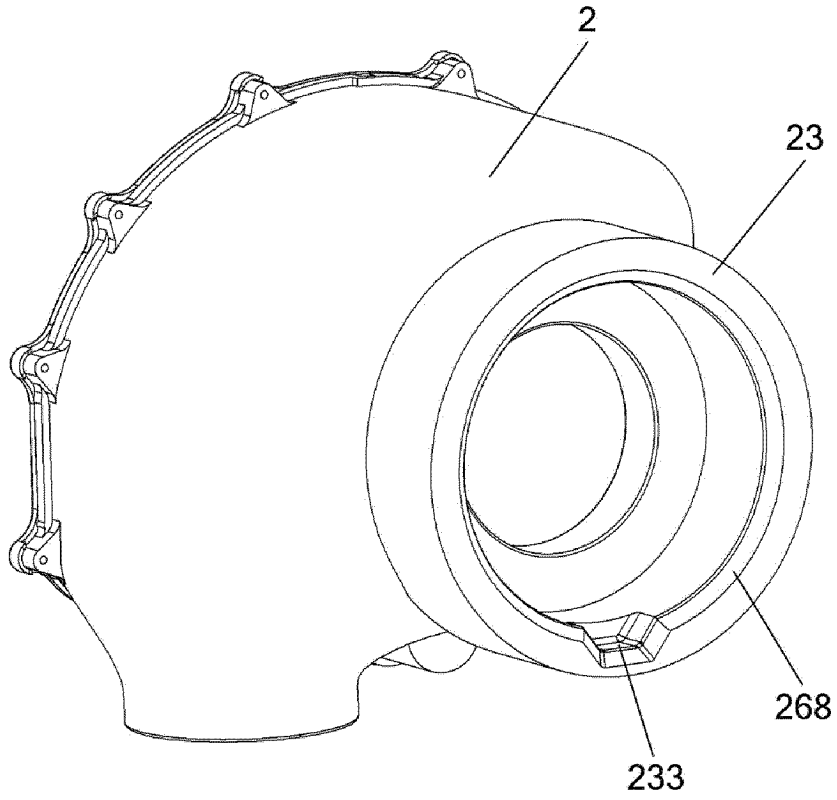


FIG. 49

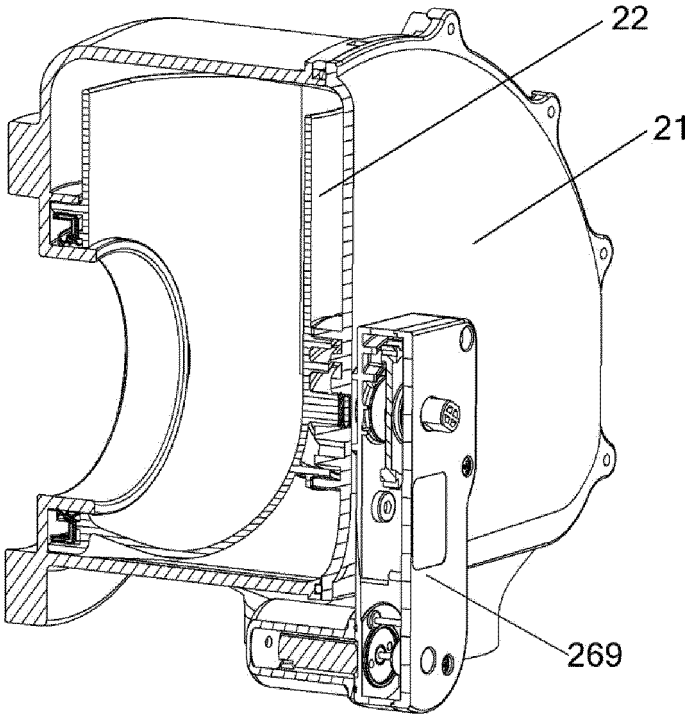


FIG. 50

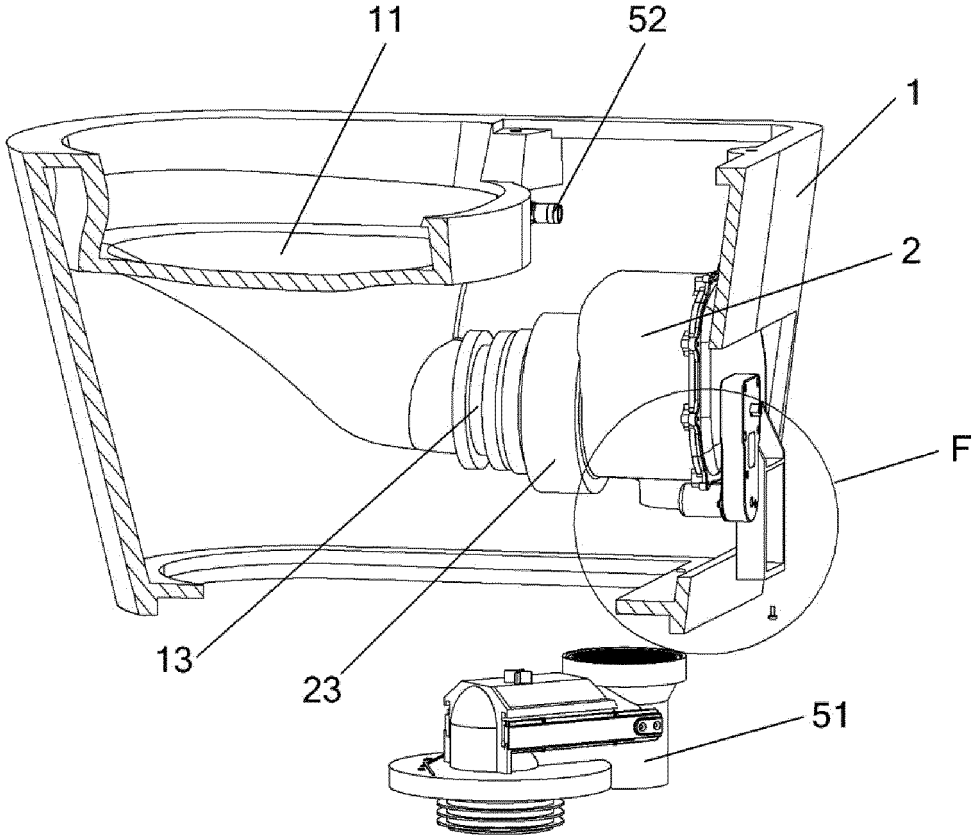


FIG. 51

F

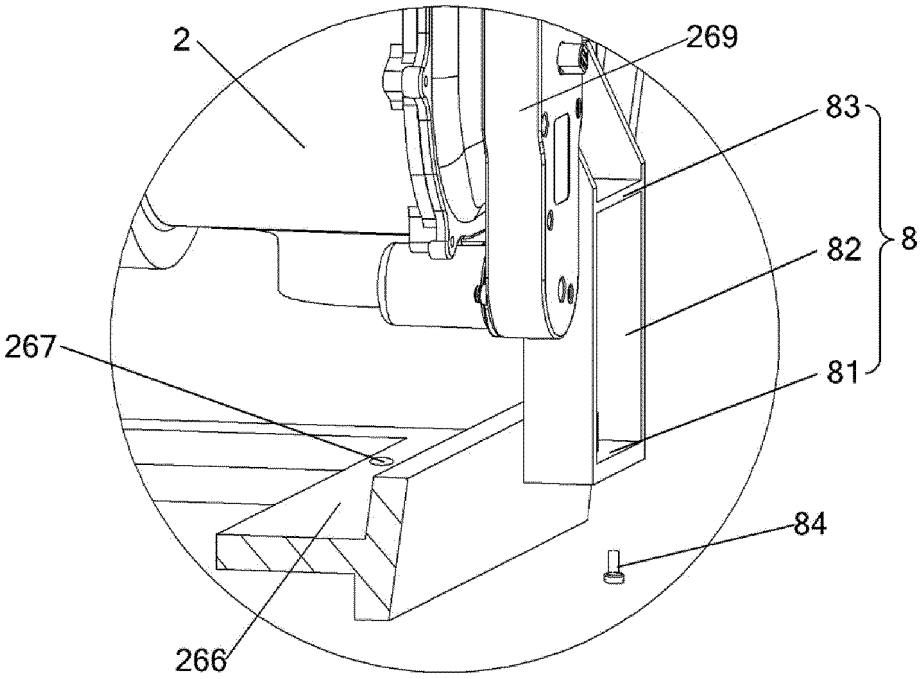


FIG. 52

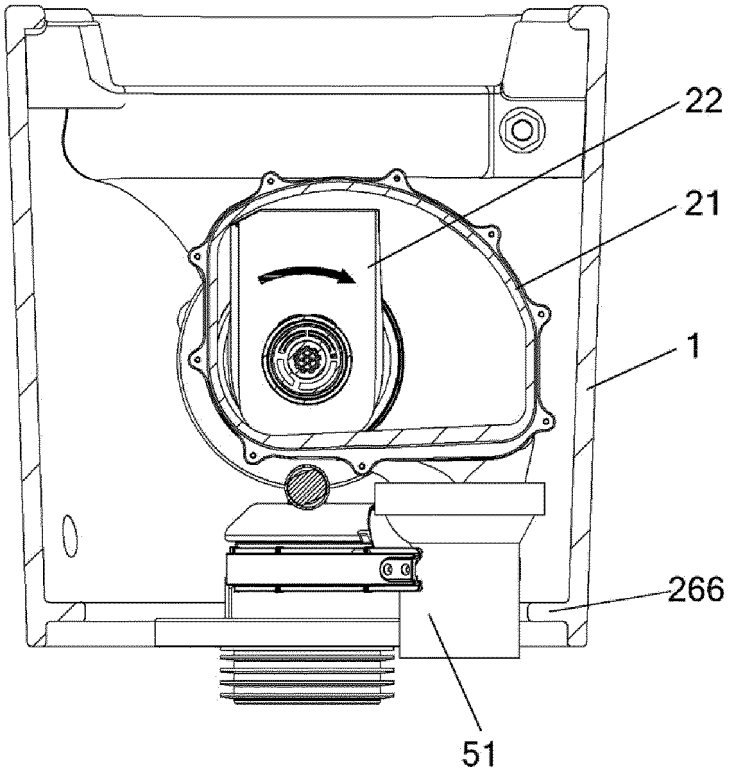


FIG. 53

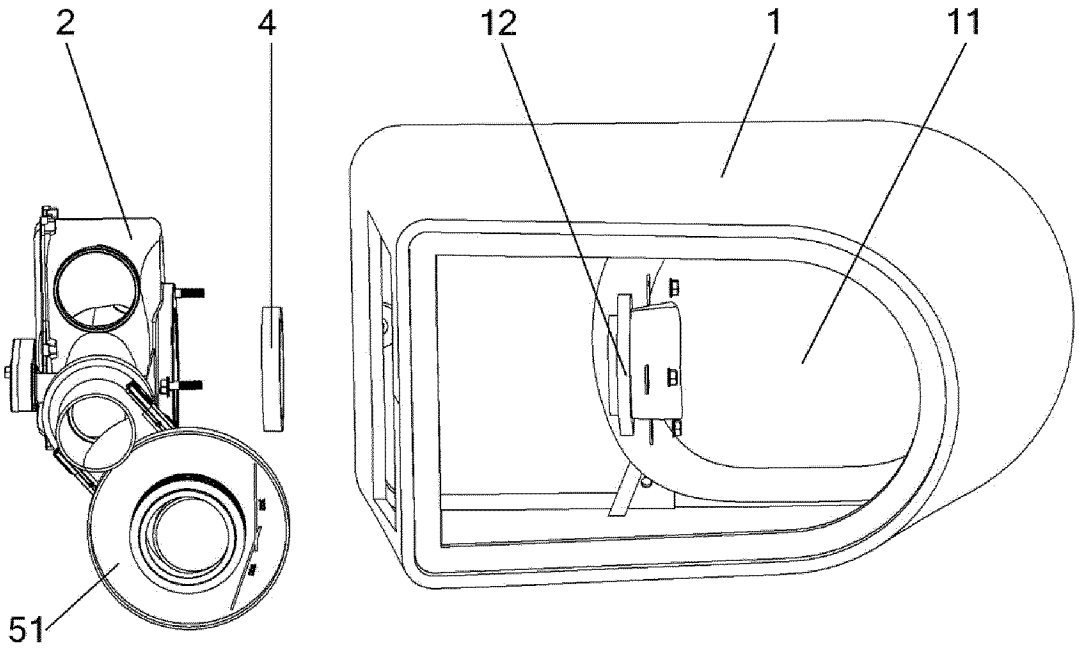


FIG. 54

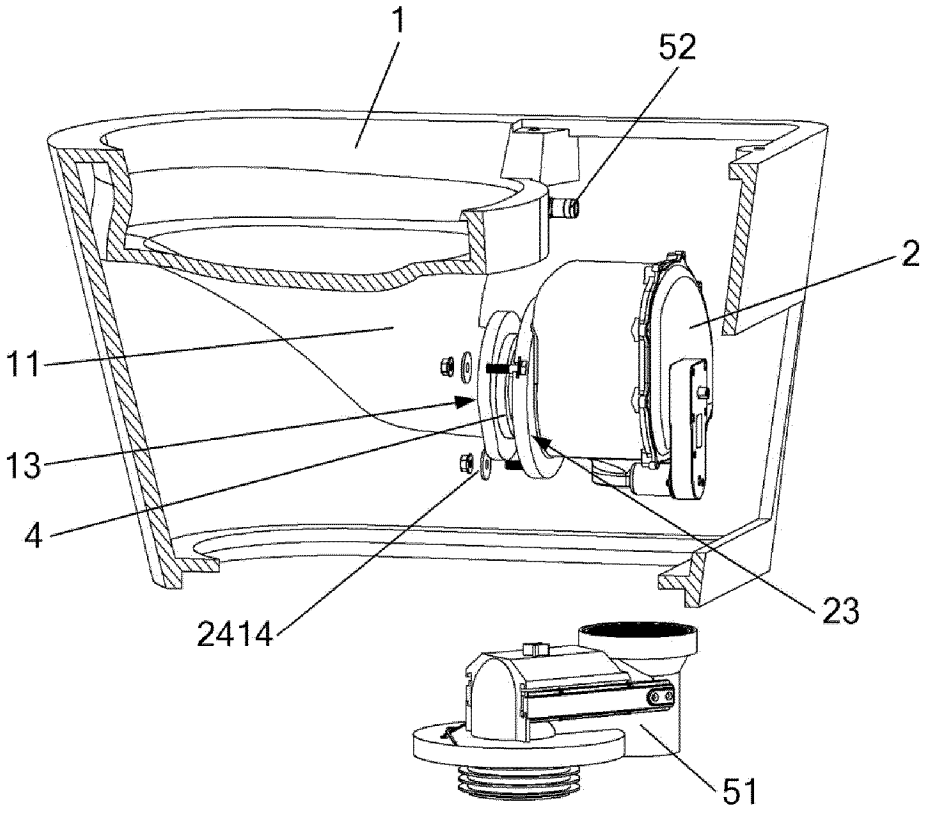


FIG. 55

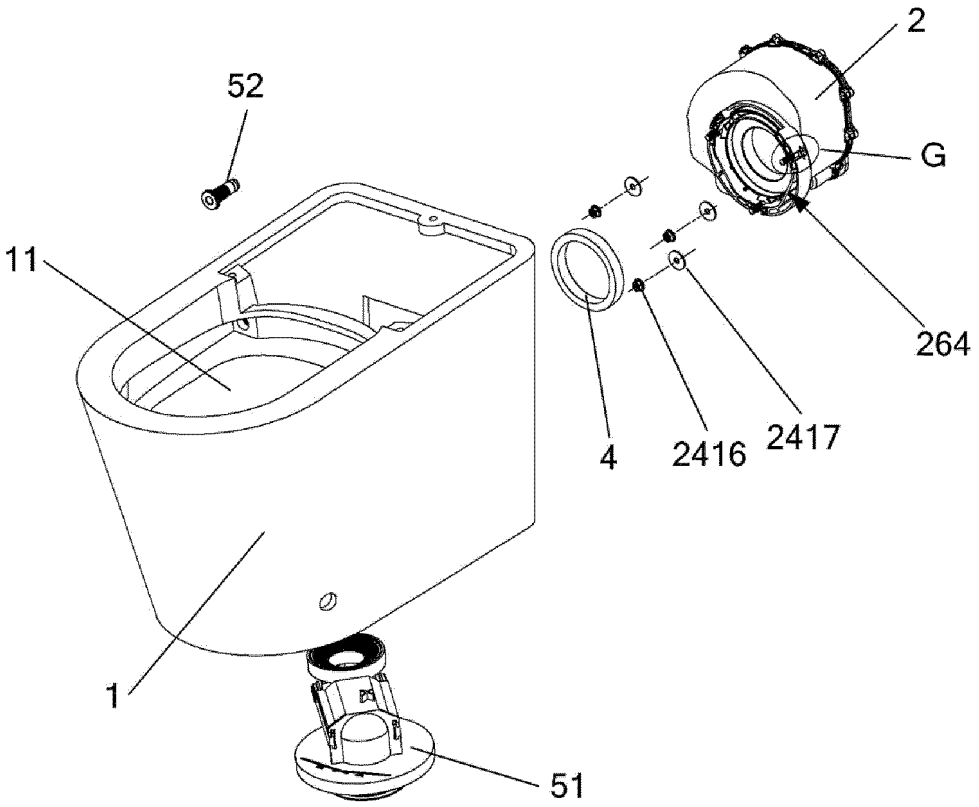


FIG. 56

G

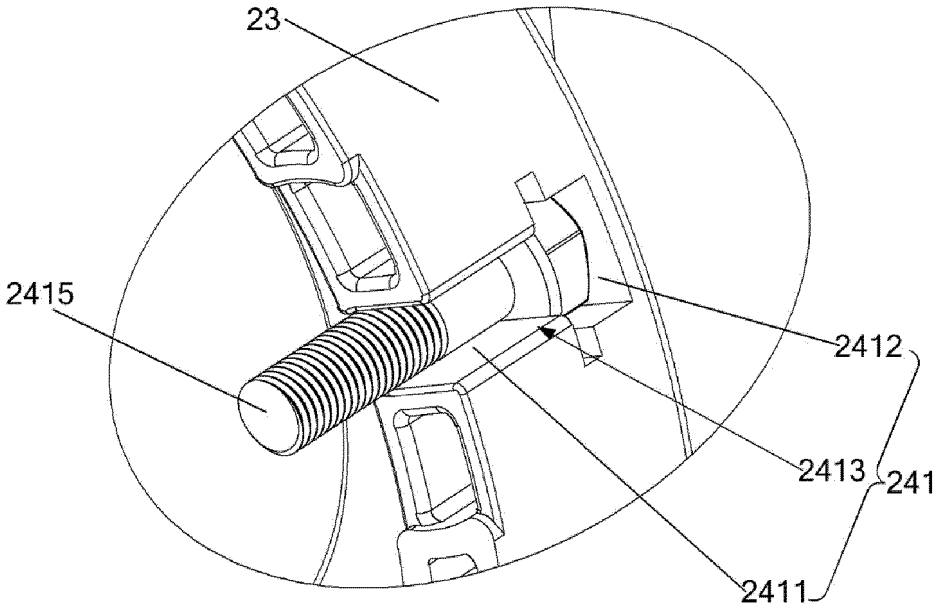


FIG. 57

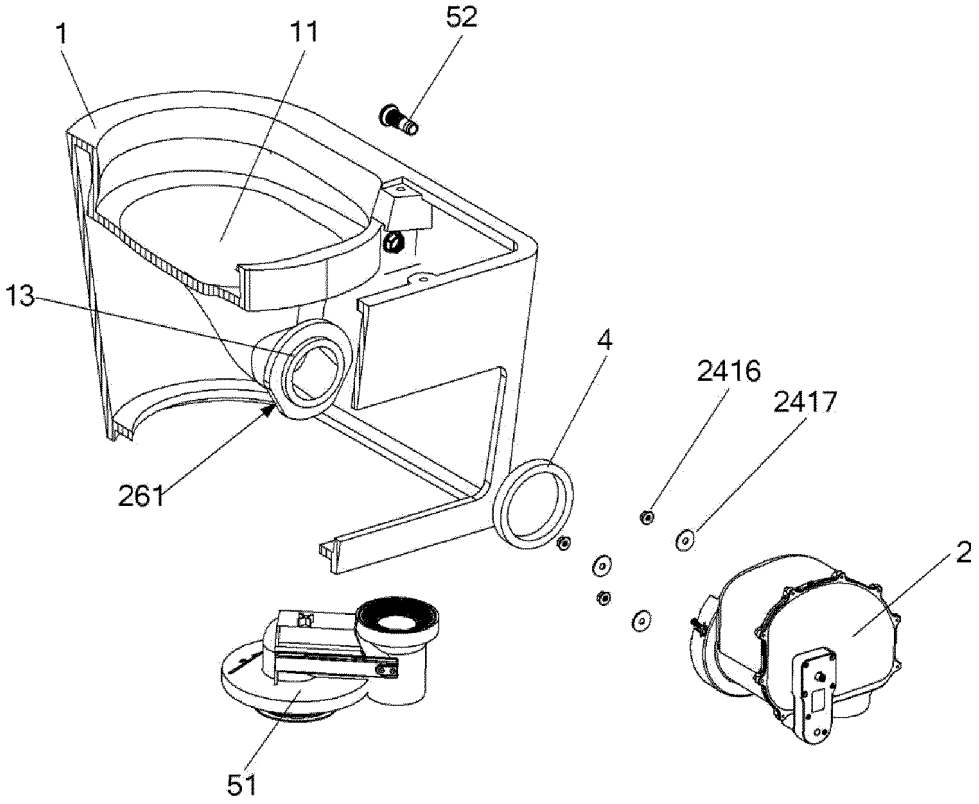


FIG. 58

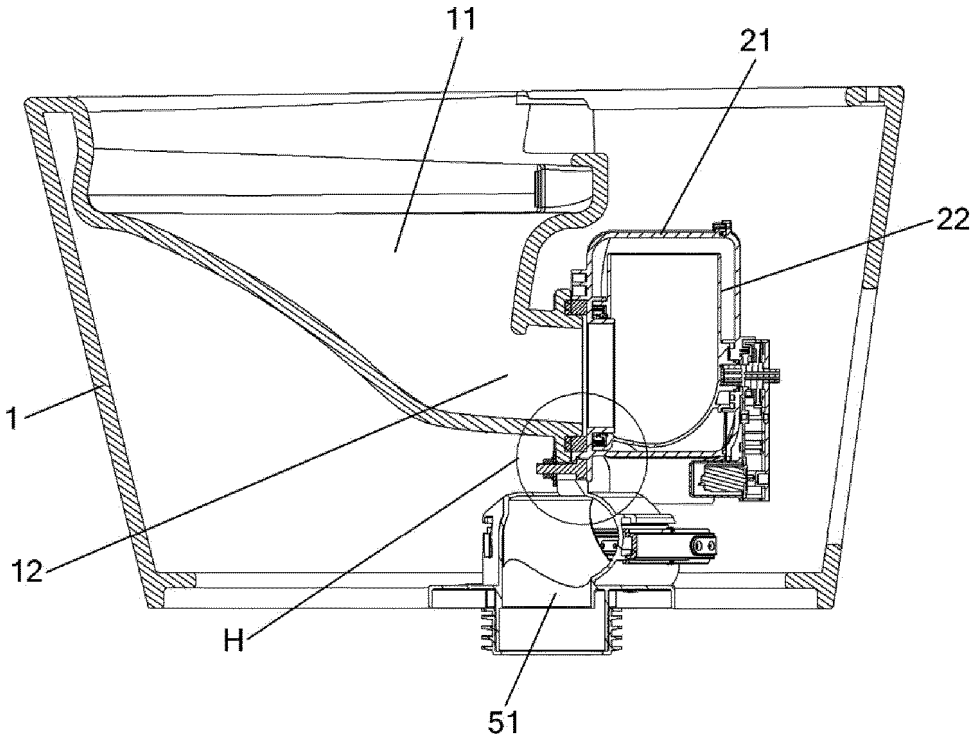


FIG. 59

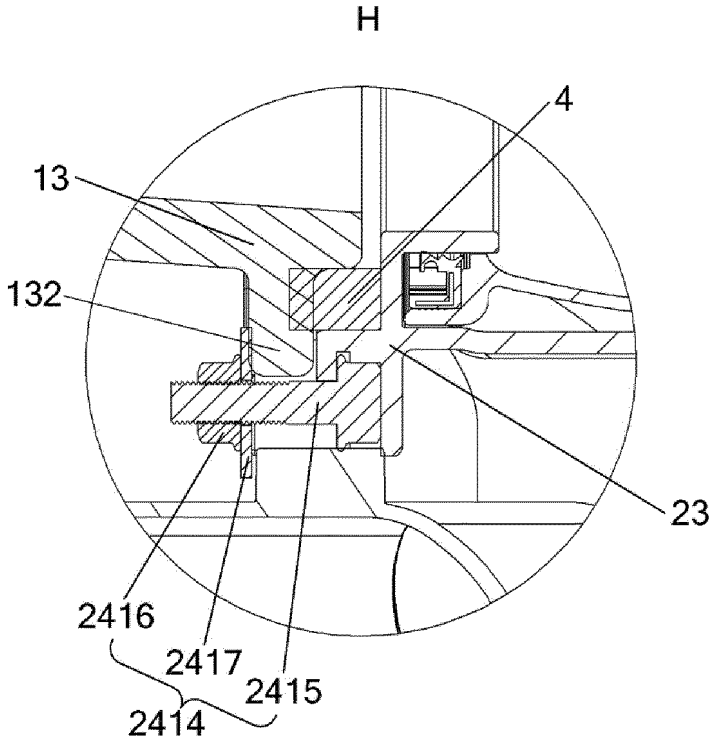


FIG. 60

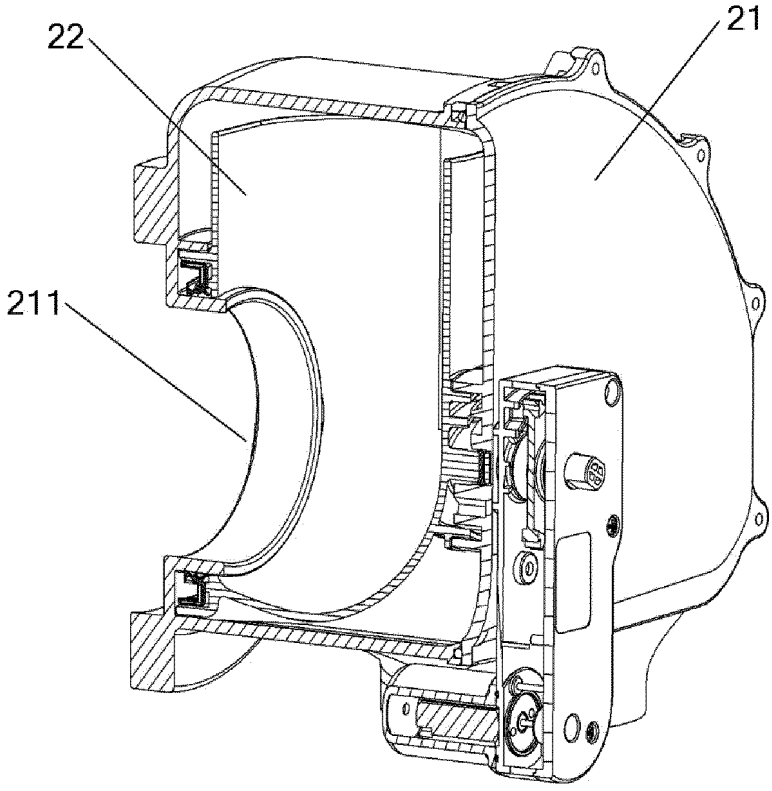


FIG. 61

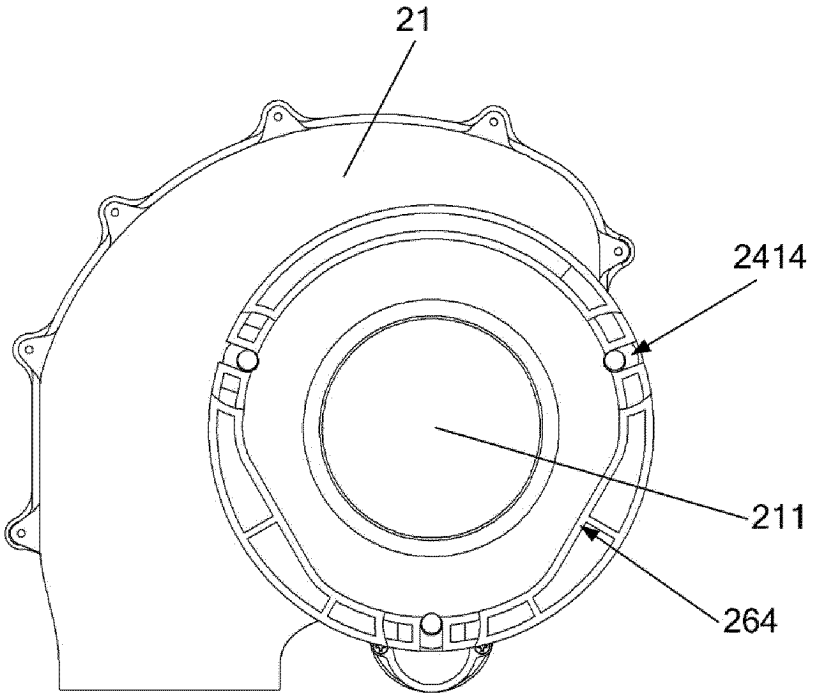


FIG. 62

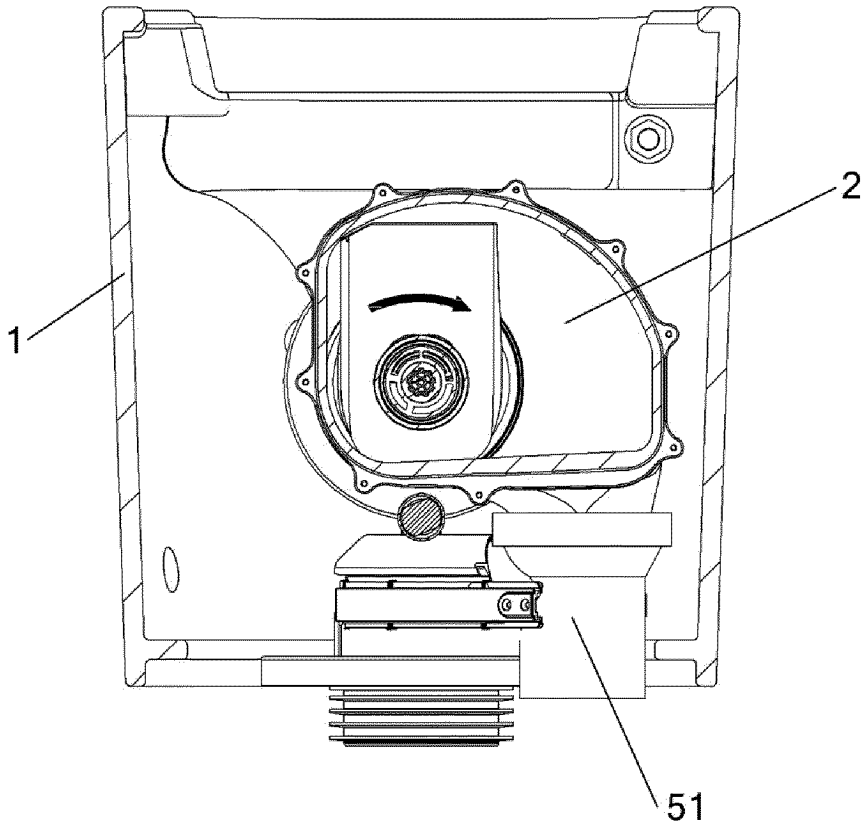


FIG. 63

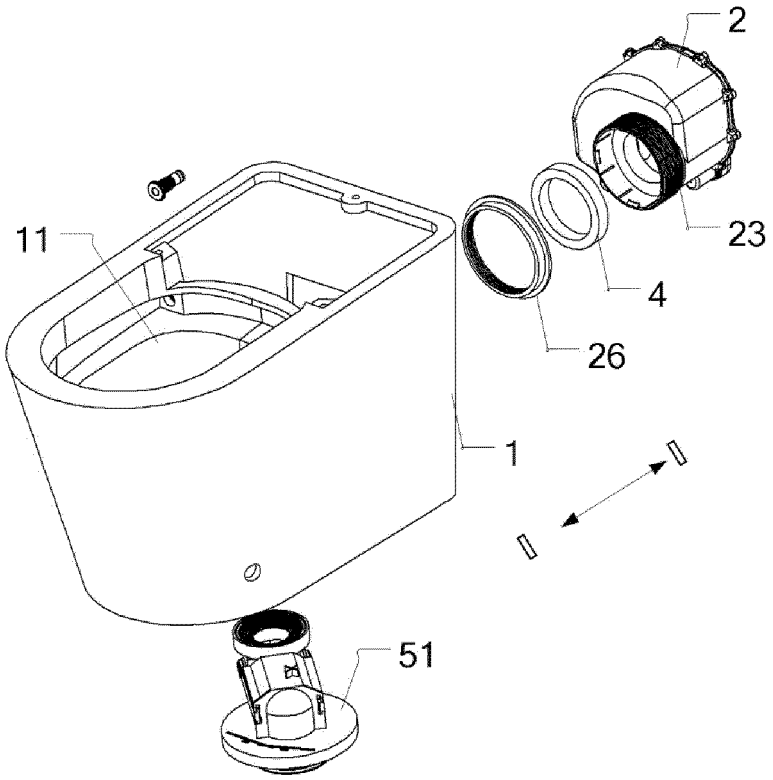


FIG. 64

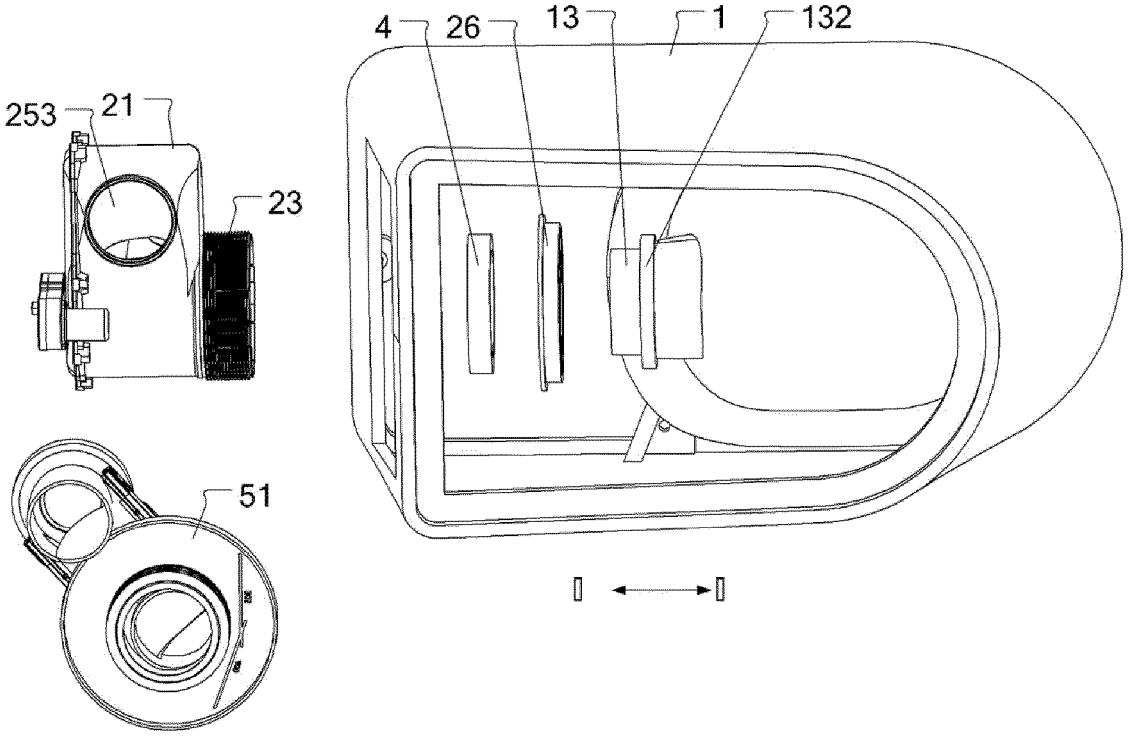


FIG. 65

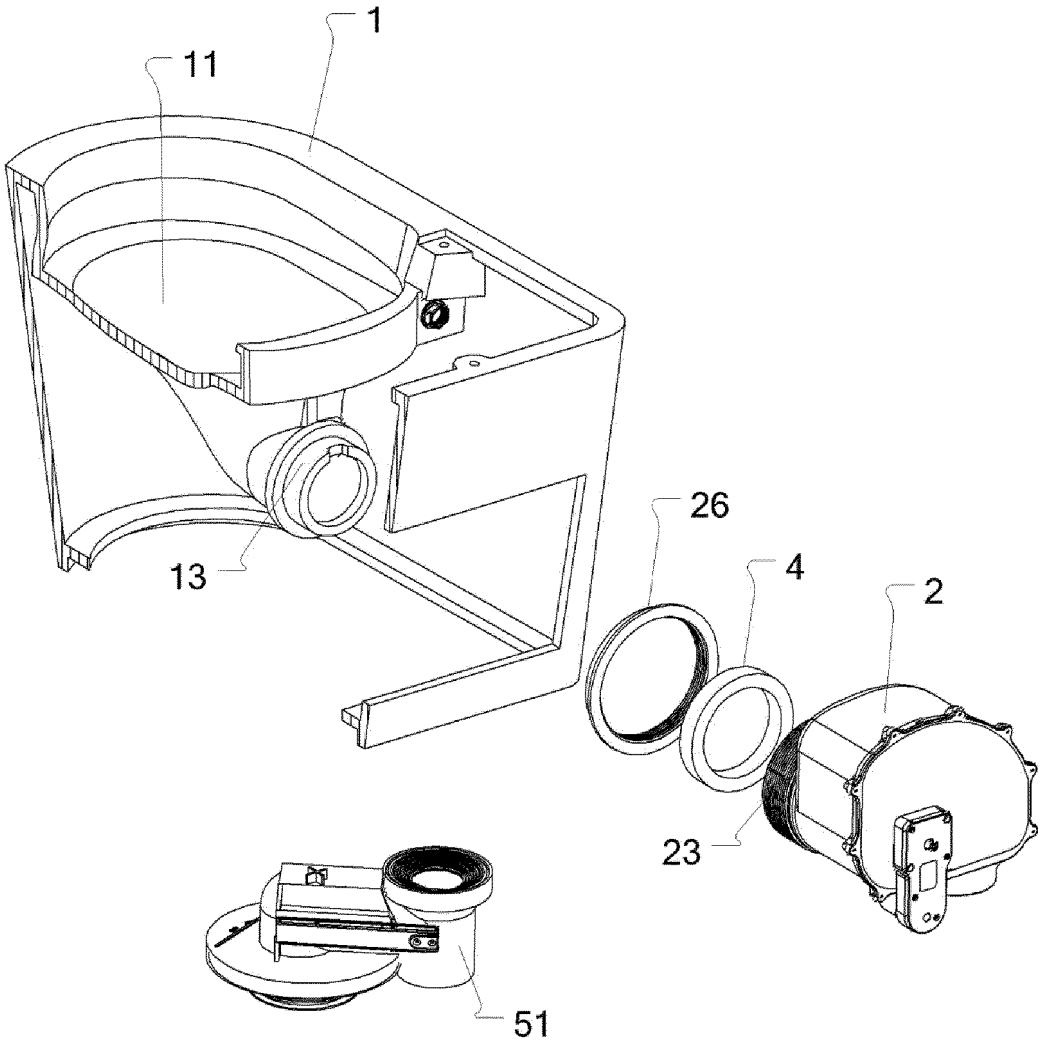
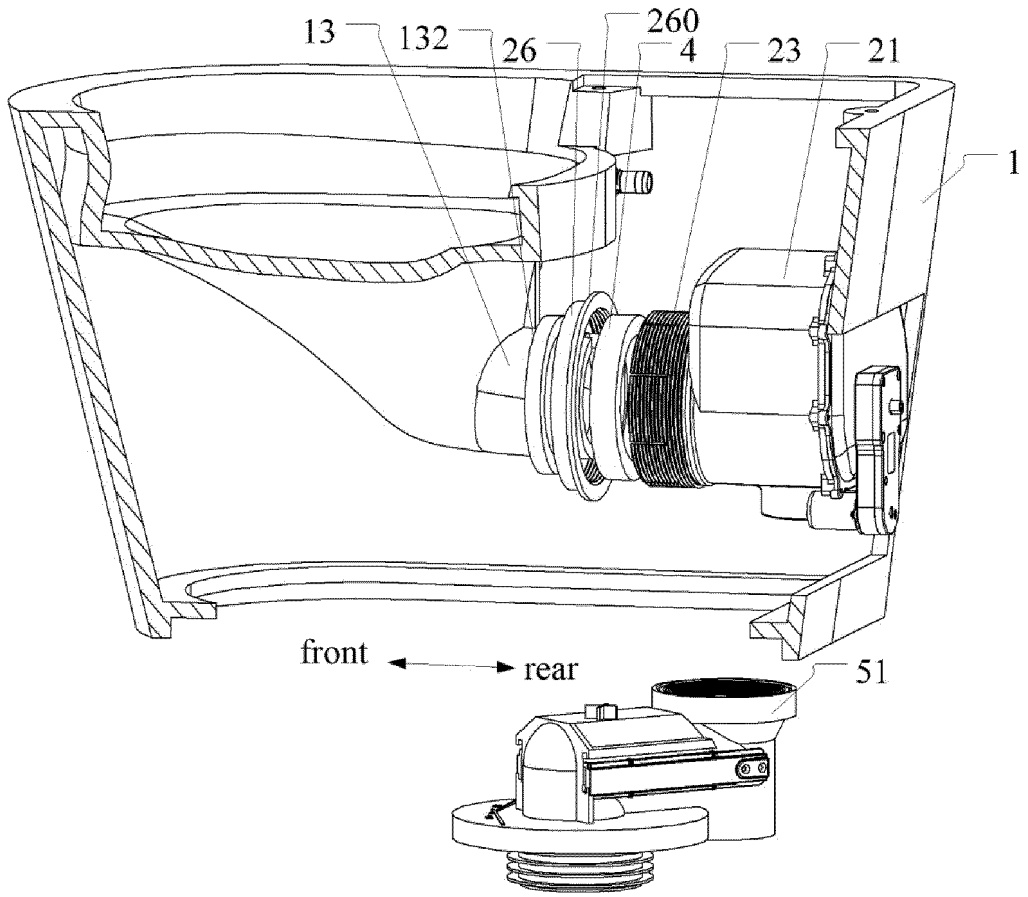


FIG. 66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132
26
260
4
23
21
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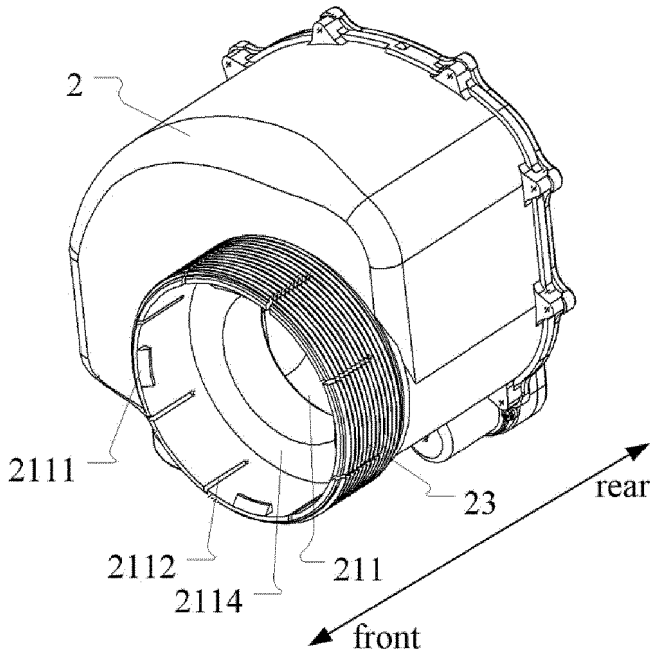
front
rear
51

FIG. 67


2
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2112
2114
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rear
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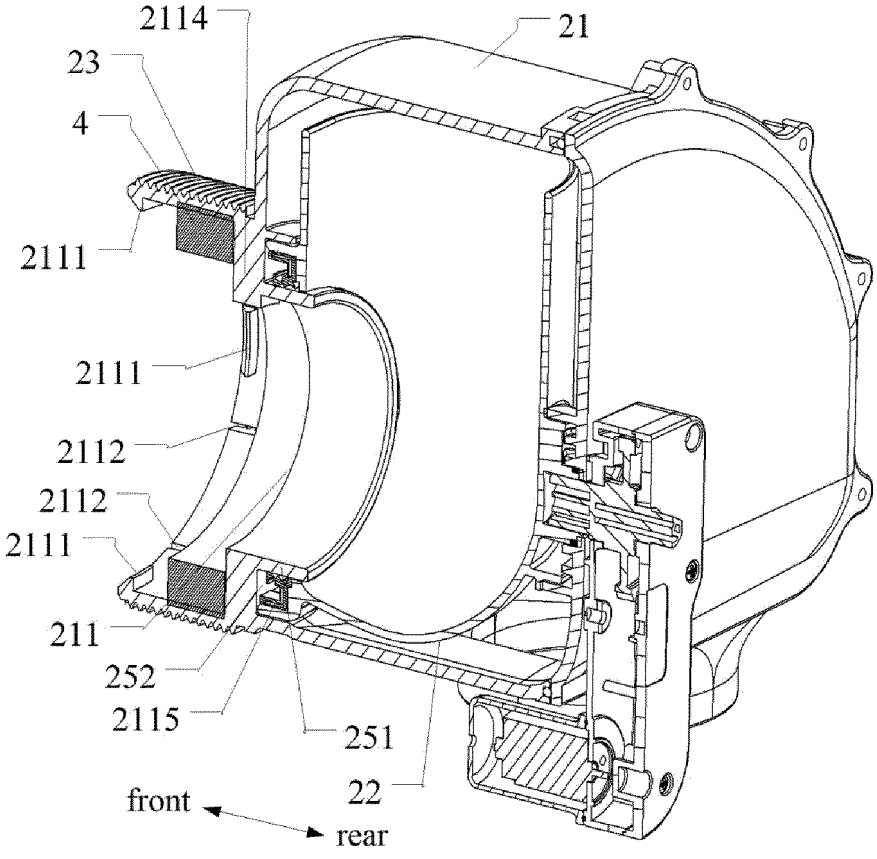
FIG. 68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2112
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211
252
2115
251
22
front
rear

FIG. 69

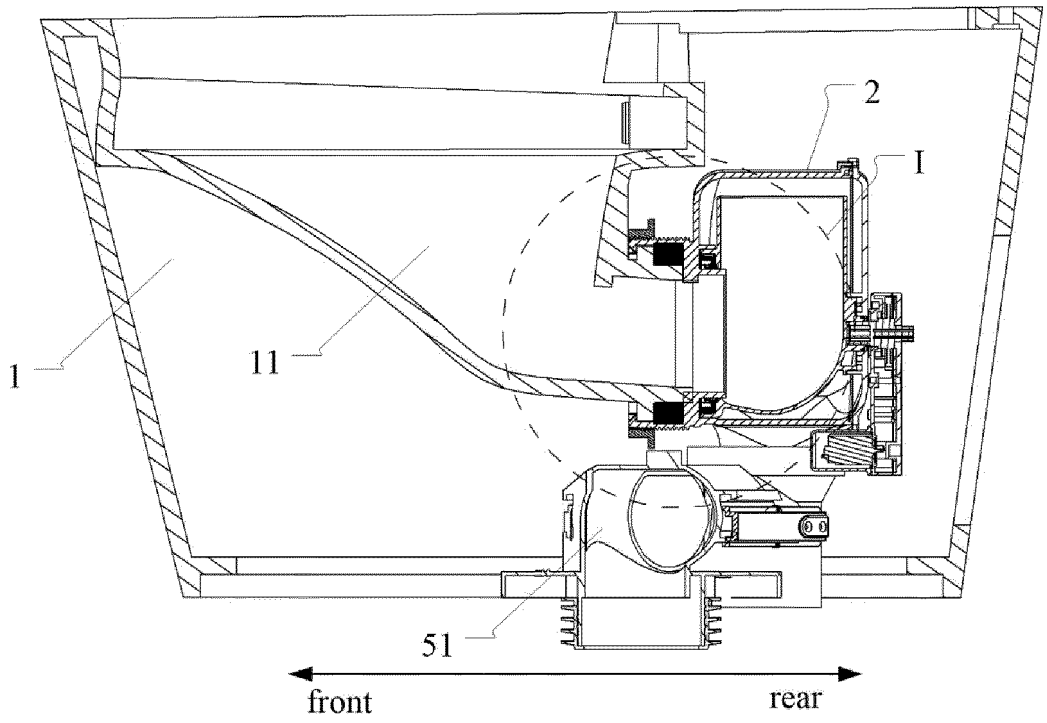
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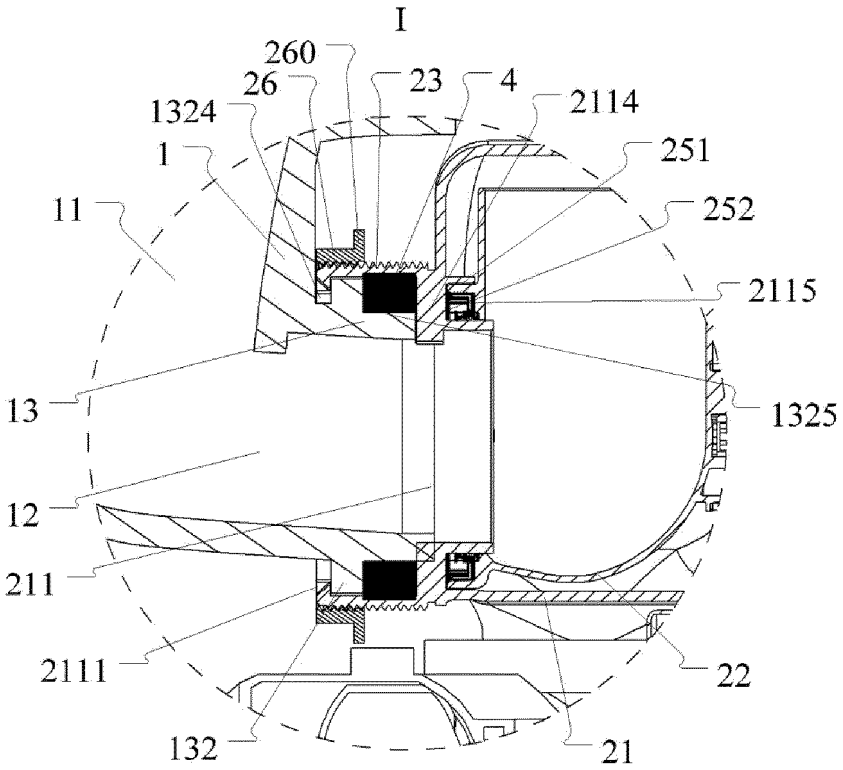
FIG. 70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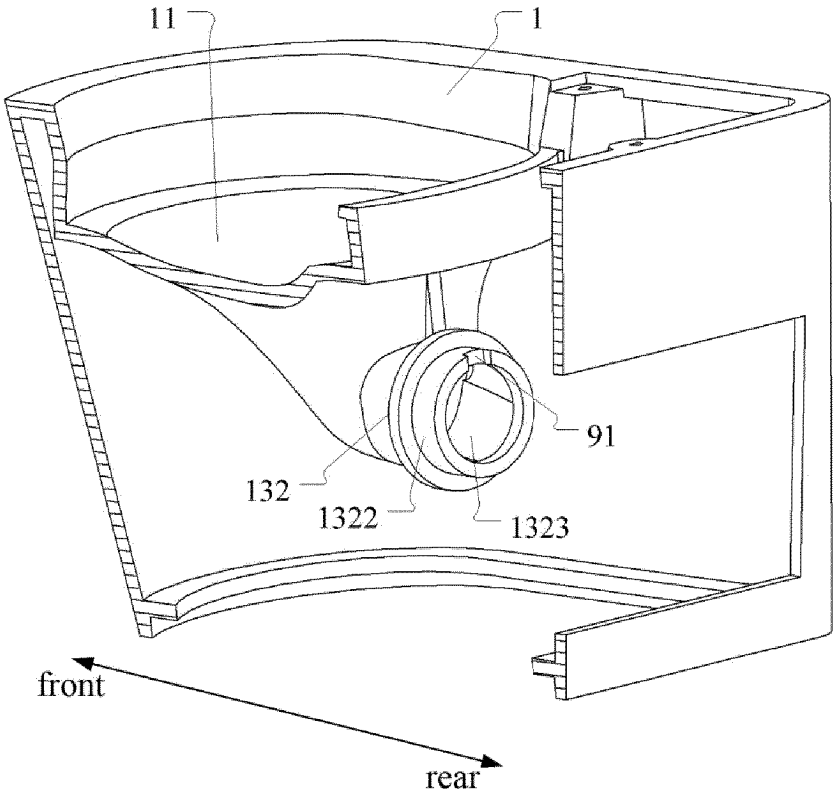
132
21

FIG. 71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91
132
1322
1323
front
rear

FIG. 72

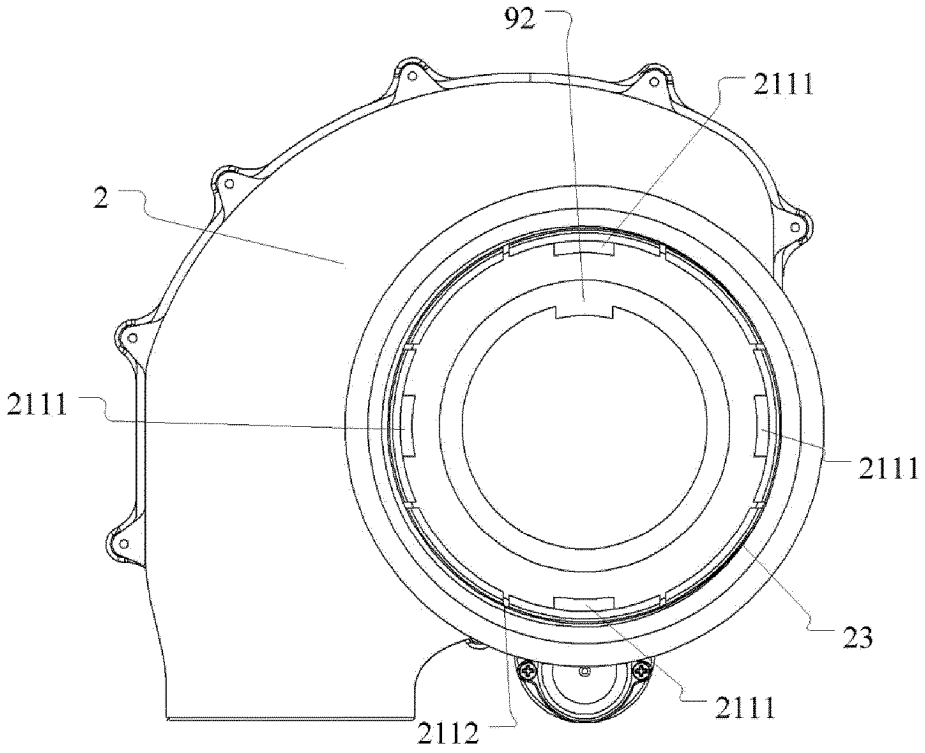
92
2111
2
2111
2111
23
2111
2112

FIG. 73

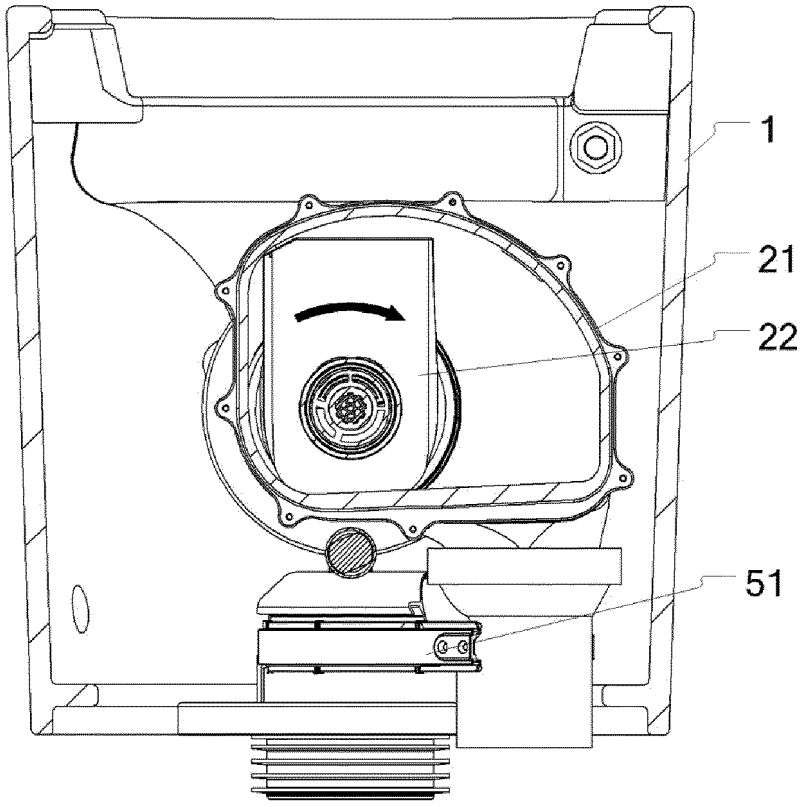

FIG. 74

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/143522

A. CLASSIFICATION OF SUBJECT MATTER

E03D11/06(2006.01)i;E03D11/13(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E03D F16B F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS; CNTXT; CNKI; 超星, CHAOXING, 读秀, DUXIU; WPABS; VCN; VEN; USTXT; WOTXT; EPTXT; ISI_Web of Knowledge: 科牧, 松下, TOTO, 盒, 壳, 箱, 连接, 安装, 拆, 马达, 电机, 驱动, 法兰, 钩, 勾, 扣, 卡, 箍, 锁, trap, rotat+, mov+, turn+, driv+, motor, case, tank, connect+, detachable, +mount+, thread+, clamp+, lock+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2010150920 A (MURAYAMA TETSUO) 08 July 2010 (2010-07-08) description, paragraphs 30-49, and figures 1-6	1, 34-47, 55, 56
Y	JP 2010150920 A (MURAYAMA TETSUO) 08 July 2010 (2010-07-08) description, paragraphs 30-49, and figures 1-6	2-33, 48-54
Y	CN 207093998 U (CHINA NATIONAL PETROLEUM CORP.) 13 March 2018 (2018-03-13) description, paragraphs 30-39, and figures 1 and 2	2-15
Y	CN 214274794 U (XIAOYUN CONSTRUCTION CO., LTD.) 24 September 2021 (2021-09-24) description, paragraphs 33-38, and figures 1-4	16, 17
Y	EP 0637541 A1 (KATZ JOHANNES) 08 February 1995 (1995-02-08) description, column 3, line 19 to column 6, line 12, and figures 1-8	18-21
Y	TW 201540967 A (HANWIT PRECISION INDUSTRIES LTD.) 01 November 2015 (2015-11-01) description, paragraphs 13-27, and figures 1-12	22-33

☑ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"D" document cited by the applicant in the international application
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 March 2023	**19 April 2023**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **China No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/143522

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 208503664 U (XIAMEN KOMOO INTELLIGENT TECHNOLOGY CO., LTD.) 15 February 2019 (2019-02-15) description, paragraphs 40-49, and figures 1-13	48-54
X	JP 2010138692 A (MURAYAMA TETSUO) 24 June 2010 (2010-06-24) description, paragraphs 30-47, and figures 1-8	1, 42
A	CN 114411910 A (QUANZHOU KOMOO INTELLIGENT KITCHEN & SANITARY WARES CO., LTD.) 29 April 2022 (2022-04-29) description, paragraphs 59-134, and figures 1-20	1-56
A	CN 216948602 U (QUANZHOU KOMOO INTELLIGENT KITCHEN & SANITARY WARES CO., LTD.) 12 July 2022 (2022-07-12) description, paragraphs 36-76, and figures 1-8	1-56

Form PCT/ISA/210 (second sheet) (July 2022)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/143522

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
JP 2010150920 A	08 July 2010	None	
CN 207093998 U	13 March 2018	None	
CN 214274794 U	24 September 2021	None	
EP 0637541 A1	08 February 1995	EP 0637541 B1	19 November 1997
		DE 9311643 U1	07 October 1993
		DE 59404611 D1	02 January 1998
		AT 160329 T	15 December 1997
TW 201540967 A	01 November 2015	TWI 529311 B	11 April 2016
CN 208503664 U	15 February 2019	CN 108413135 A	17 August 2018
JP 2010138692 A	24 June 2010	None	
CN 114411910 A	29 April 2022	None	
CN 216948602 U	12 July 2022	None	

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