(19) Europäisches Patentamt
European Patent Office
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(11) **EP 4 094 655 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.11.2022 Bulletin 2022/48

(21) Application number: **22164636.7**

(22) Date of filing: **28.03.2022**

(51) International Patent Classification (IPC):
A47K 13/12 *(2006.01)* *A47K 13/24* *(2006.01)*

(52) Cooperative Patent Classification (CPC):
A47K 13/12; A47K 13/26

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **26.05.2021 CN 202121150056 U**

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(54) SELF-LOCKING STRUCTURE FOR TOILET SEAT BUMPER

(57) The present disclosure discloses a self-locking structure for a toilet seat bumper, including a fixed seat and a cover plate, a mounting hole is arranged on the cover plate, a seat hinge assembly is installed in the mounting hole, and the cover plate is provided with an arc-shaped hole communicated with the mounting hole in the radial direction. The seat hinge assembly includes a hinge shaft and an annular elastic buckle. The annular elastic buckle includes an annular portion and a raised portion arranged on the end face of the annular portion and protruding radially outward of the annular portion. The outer circumference of the hinge shaft is provided with an annular groove in which the annular portion is sleeved, and the outer circumference of the hinge shaft is further provided with an avoidance slot communicated with the annular groove, and the avoidance slot is configured for accommodating the raised portion entirely. When the annular portion of the annular elastic buckle is sleeved on the periphery of the annular groove of the hinge shaft, the top of the raised portion is higher than the peripheral surface of the hinge shaft, so that during the assembly process, the raised portion of the annular elastic buckle is clamped in the arc-shaped hole from outside to inside through the mounting hole along the axis direction of the mounting hole, so as to realize the axial fixation of the seat hinge assembly in the mounting hole.

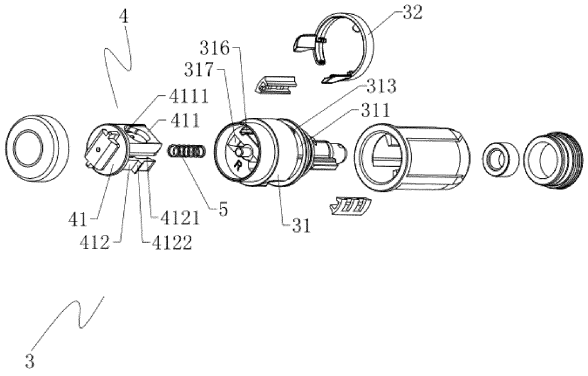

FIG.5

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of toilet, in particular to a self-locking structure for toilet seat bumper.

BACKGROUND

[0002] At present, after assembling the cover plate, the bumper of toilet seat in the market needs to be fixed by additional assembly of decorative ring, snap ring, snap nails and other parts. Generally, the installation way is to provide corresponding holding slots on the cover plate for the installation of snap nails and decorative rings, or install snap rings between the seat ring and the cover plate, but the structure has the following disadvantages: 1. The gap between the cover plate and the seat ring is too large and the flip stability is poor; 2. It is not only troublesome to assemble, but also increases the operating hours. At the same time, it is difficult to disassemble. The cover plate or seat ring is often scratched, which leads to the scrapping of parts and the increase of production cost.

SUMMARY

[0003] In order to solve the above problems, the present disclosure provides a self-locking structure for a toilet seat bumper.

[0004] In order to achieve the above object, the present disclosure provides the following technical solution:

A self-locking structure for a toilet seat bumper, including a fixed seat fixedly arranged on a toilet and a cover plate rotatably arranged on the fixed seat, wherein a mounting hole is arranged on the cover plate, and a seat hinge assembly configured to hinge the fixed seat and the cover plate is installed in the mounting hole; the cover plate is provided with an arc-shaped hole communicated with the mounting hole in a radial direction; the seat hinge assembly includes a hinge shaft and an annular elastic buckle sleeved on an outer circumference of the hinge shaft; the annular elastic buckle includes an annular portion and a raised portion arranged on an end face of the annular portion and outwardly protruding toward the radial direction of the annular portion; the outer circumference of the hinge shaft is provided with an annular groove in which the annular portion is sleeved, and the outer circumference of the hinge shaft is further provided with an avoidance slot communicated with the annular groove, and the avoidance slot is configured for accommodating the raised portion entirely; when the annular portion of the annular elastic buckle is sleeved on a periphery of the annular groove of the hinge shaft, a top of the raised portion is higher than a peripheral surface of the hinge shaft, so that during the assembly process, the raised portion of the annular elastic buckle is clamped in the arc-shaped hole from outside to inside through the mounting hole along an axis direction of the mounting hole, so as to realize an axial fixation of the seat hinge assembly in the mounting hole.

[0005] As a further improvement, an insertion boss is arranged on an inner side of the annular portion, and an insertion hole located at a bottom of the annular groove and configured for an insertion of the insertion boss is arranged on the hinge shaft; when the annular portion of the annular elastic buckle is sleeved in the annular groove, the annular portion is inserted into the insertion hole through the insertion boss.

[0006] As a further improvement, the inner side of the annular portion is provided with clamping blocks symmetrically, and the hinge shaft is provided with clamping notches located at the bottom of the annular groove, and the clamping notches are respectively configured for clamping the clamping blocks; when the annular portion of the annular elastic buckle is sleeved in the annular groove, the annular portion is correspondingly clamped into the clamping notches through the clamping blocks.

[0007] As a further improvement, the number of the raised portions corresponds to the number of the avoidance slots and there are two raised portions, and the two raised portions are arranged along the circumference of the annular portion, so that when the cover plate is in an open or a closed state, the arc-shaped hole on the cover plate is switched to engage with at least one of the raised portions.

[0008] As a further improvement, the fixed seat is fixedly provided with a connection column, the peripheral surface of the hinge shaft is provided with an accommodation hole located between the two avoidance slots, the accommodation hole is configured for an insertion of the connection column, and the connection column is inserted into the accommodation hole and connected through a buckle mechanism.

[0009] As a further improvement, the buckle mechanism includes a fastener, an insertion block is arranged on the fastener, and an end of the hinge shaft is provided with a first accommodation slot communicated with the accommodation hole, and the first accommodation slot is configured for an insertion of the insertion block; the insertion block is provided with a limit hole and the limit hole is penetrated through the insertion block, and the limit hole is provided with a fastening position and a tripping position; when the connection column is inserted into the tripping position of the limit hole through the accommodation hole, the connection column is in a tripping state, when the connection column is inserted into the fastening position of the limit hole through the accommodation hole, the connection column is in the fastening state, and a return spring is arranged between the hinge shaft and the insertion block and the return spring is configured to drive a return movement of the fastener, so as to realize a switch of the connection column between different states.

[0010] As a further improvement, the fastener is sym-

metrically provided with insertion strips, sides of the insertion strips facing to each other are provided with a first hook respectively, and sides of the insertion strips opposite to each other are provided with a second hook respectively; the end of the hinge shaft is provided with a second accommodation slot for the corresponding insertion of the insertion strips, and the second accommodation slot is provided with a third hook and a fourth hook matching to the first hook and the second hook; when the connection column is in the tripping position, the first hook and the third hook are engaged, and when the connection column is in the fastening position, the second hook and the fourth hook are engaged.

[0011] As a further improvement, the annular portion is provided with an opening, so that the annular portion is a non-enclosed ring.

[0012] The advantageous effects of the present disclosure are:

1. The outer surface of the raised portion is a gentle inclined surface, which is convenient for the raised portion to be clamped into the arc-shaped hole from outside to inside. During disassembly, the user needs to press down the raised portion to make it entirely move into the avoidance slot. At this time, the raised portion is removed away from the arc-shaped hole, so as to facilitate to pull out the whole seat hinge assembly from the mounting hole. The user can complete the fixation of the seat hinge assembly without adding snap nails, decorative rings, or snap rings etc.. The annular elastic buckle makes the installation and disassembly of the bumper more convenient.
2. The number of raised portions is set to two, so that at least one raised portion can be clamped with the arc-shaped hole when the cover plate is overturned at a certain angle, so as to ensure the effectiveness of mechanical operation between various parts.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

FIG. 1 is the first structural diagram of the present disclosure.
FIG. 2 is an exploded view of the present disclosure.
FIG. 3 is the second structural diagram of the present disclosure.
FIG. 4 is an enlarged view at portion A of FIG. 3.
FIG. 5 is the first exploded view of the seat hinge assembly.
FIG. 6 is the second exploded view of the seat hinge assembly.
FIG. 7 is a side view of the seat hinge assembly.
FIG. 8 is a cross-sectional at B-B of FIG. 7.
FIG. 9 is a cross-sectional at C-C of FIG. 7.
FIG. 10 is a structural diagram of an annular elastic buckle installed on a hinge shaft.
FIG. 11 is a structural diagram of the annular elastic buckle.
FIG. 12 is a structural diagram when the connection column is in the coupling state.
FIG. 13 is a structural diagram when the connection column is in the decoupling state.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0014] The present disclosure will be further described in detail below in combination with the accompanying drawings and specific embodiments:

As shown in FIG. 1 to FIG. 6, a self-locking structure for toilet seat bumper includes a fixed seat 1 fixedly arranged on the toilet and a cover plate 2 rotatably arranged on the fixed seat 1. The cover plate 2 is provided with a mounting hole 21, and a seat hinge assembly 3 is provided in the mounting hole 21 and configured to hinge the fixed seat 1 and the cover plate 2. The cover plate 2 is provided with an arc-shaped hole 22 communicated with the mounting hole 21 at the radial direction. The seat hinge assembly 3 includes a hinge shaft 31 and an annular elastic buckle 32 sleeved on the outer circumference of the hinge shaft 31. The annular elastic buckle 32 includes an annular portion 321 and a raised portion 322 arranged on the end face of the annular portion 321 and outwardly protruding toward the radial direction of the annular portion 321, and the annular portion 321 has an opening, so that the annular portion 321 is a non-enclosed ring. The outer circumference of the hinge shaft 31 is provided with an annular groove 311 in which the annular portion 321 is sleeved, and the outer circumference of the hinge shaft 31 is also provided with an avoidance slot 312 communicated with the annular groove 311. The raised portion 322 can entirely accommodated in the avoidance slot 312. When the annular portion 321 of the annular elastic buckle 32 is sleeved on the periphery of the annular groove 311 on the hinge shaft 31, the top of the raised portion 322 is higher than the peripheral surface of the hinge shaft 31, so that the raised portion 322 of the annular elastic buckle 32 is clamped in the arc-shaped hole 22 through the mounting hole 21 from outside to inside along the axis direction of the mounting hole 21 during assembly, to realize that the seat hinge assembly 3 is axially fixed in the mounting hole 21. The outer surface of the raised portion 322 is a gentle inclined surface, which is convenient for the raised portion 322 to be clamped into the arc-shaped hole 22 from the outside to the inside. During disassembly, the user needs to press down the raised portion 322 to make it entirely move into the avoidance slot 312. At this time, the raised portion 322 is removed from the arc-shaped hole 22, so as to facilitate to pull out the whole seat hinge assembly 3 from the mounting hole. The user can complete the fixation of the seat hinge assembly 3 without adding snap nails, decorative rings, or snap rings etc.. The annular elastic buckle 32 makes the installation and disassembly

of the bumper more convenient.

[0015] As shown in FIG. 10 and FIG. 11, the inner side of the annular portion 321 is provided with an insertion boss 3211, and the hinge shaft 31 is provided with a insertion hole 313 located at the bottom of the annular groove 311 and configured for the inserted of the insertion boss 3211. When the annular portion 321 of the annular elastic buckle 32 is sleeved in the annular groove 311, the annular portion 321 is inserted into the insertion hole 313 through the insertion boss 3211. So that the annular elastic buckle 32 is fixed circumferentially with respect to the hinge shaft, which further enables the raised portion 322 to remain clamped in the arc-shaped hole 22 when the cover plate is overturned, so as to prevent tripping of the seat hinge assembly 3.

[0016] As shown in FIG. 10 and FIG. 11, the inner side of the annular portion 321 is provided with clamping blocks 3212 symmetrically, and the hinge shaft 31 is provided with clamping notches 314 located at the bottom of the annular groove 311, and the clamping notches are respectively configured for clamping the clamping blocks 3212. When the annular portion 321 of the annular elastic buckle 32 is sleeved in the annular groove 311, the annular portion 321 is correspondingly clamped into the clamping notches 314 through the clamping blocks 3212. The circumferential fixation stability of the annular elastic buckle 32 with respect to the hinge shaft can be further increased.

[0017] As shown in FIG. 10 and FIG. 11, the number of the raised portions 322 corresponds to the number of the avoidance slots 312 and there are two raised portions, and the two raised portions 322 are arranged along the circumference of the annular portion 321, so that when the cover plate 2 is in an open or a closed state, the arc-shaped hole 22 on the cover plate 2 can be switched to engage with at least one of the raised portions 322. The number of raised portions 322 is set to two, so that at least one raised portion 322 can be clamped with the arc-shaped hole 22 when the cover plate is overturned at a certain angle, so as to ensure the effectiveness of mechanical operation between various parts.

[0018] As shown in FIG. 6 to FIG. 9, FIG. 12 and FIG. 13, the fixed seat 1 is fixedly provided with a connection column 11. The peripheral surface of the hinge shaft 31 is provided with an accommodation hole 315 located between the two avoidance slots 312, and the accommodation hole 315 is configured for the insertion of the connection column 11. The connection column 11 is inserted into the accommodation hole 315 and connected through a buckle mechanism 4. The buckle mechanism 4 includes a fastener 41, an insertion block 411 is arranged on the fastener 41, and the end of the hinge shaft 31 is provided with a first accommodation slot 316 communicated with the accommodation hole 315, and the first accommodation slot 316 is configured for the insertion of the insertion block 411. The insertion block 411 is provided with a limit hole 4111 and the limit hole is penetrated through the insertion block, and the limit hole 4111 is provided with a fastening position and a tripping position. The limit hole 4111 is formed by two circles with different diameters. The position of the circle with small diameter is the fastening position, and the position of the circle with large diameter is the tripping position. When the connection column 11 is inserted into the tripping position of the limit hole 4111 through the accommodation hole 315, the connection column 11 is in a tripping state, when the connection column 11 is inserted into the fastening position of the limit hole 4111 through the accommodation hole 315, the connection column 11 is in the fastening state. Specifically, the outer circumference of the connection column 1111 is provided with an annular clamping groove 111. In the fastening state, the fastening position of the limit hole 4111 is clamped into the annular clamping groove 111. And a return spring 5 is arranged between the hinge shaft 31 and the insertion block 411 and the return spring 5 is configured to drive a return movement of the fastener 41, so as to realize a switch of the connection column 11 between different states.

[0019] As shown in FIG. 6, FIG. 12 and FIG. 13, the fastener 41 is symmetrically provided with insertion strips 412, sides of the insertion strips 412 facing to each other are provided with a first hook 4121 respectively, and sides of the insertion strips 412 opposite to each other are provided with a second hook 4122 respectively. The end of the hinge shaft 31 is provided with a second accommodation slot 317 for the corresponding insertion of the insertion strips 412, and the second accommodation slot 317 is respectively provided with a third hook 318 and a fourth hook 319 which are matched to the first hook 4121 and the second hook 4122. When the connection column 11 is in the tripping position, the first hook 4121 and the third hook 318 are engaged, and when the connection column is in the fastening position, the second hook 4122 and the fourth hook 319 are engaged. Further, the sides of the insertion strips 412 facing to each other is further provided with a tripping bulge 4123, and the connection column 11 is provided with an annular flange 112 located below the annular clamping groove 111. When the connection column 11 is in the tripping position, the first hook 4121 and the third hook 318 are engaged. During the pulling out of the connection column 11, the annular flange 112 of the connection column 11 will push the tripping bulge 4123 to apart towards both sides, so as to drive the insertion strip 412 to move.

[0020] At this time, the first hook 4121 will disengage from the engagement with the third hook 318. At the same time, the fastener 41 will move back under the action of the return spring 5, and the fastener 41 can drive the second hook 4122 to engage with the fourth hook 319 during the return movement, to facilitate the next insertion and fastening of the connection column 11.

Claims

1. A self-locking structure for a toilet seat bumper, com-

prising a fixed seat (1) fixedly arranged on a toilet and a cover plate (2) rotatably arranged on the fixed seat (1), **characterized in that** a mounting hole (21) is arranged on the cover plate (2), and a seat hinge assembly (3) configured to hinge the fixed seat (1) and the cover plate (2) is installed in the mounting hole (21); the cover plate (2) is provided with an arc-shaped hole (22) communicated with the mounting hole (21) in a radial direction; the seat hinge assembly (3) comprises a hinge shaft (31) and an annular elastic buckle (32) sleeved on an outer circumference of the hinge shaft (31); the annular elastic buckle (32) comprises an annular portion (321) and a raised portion (322) arranged on an end face of the annular portion (321) and outwardly protruding toward the radial direction of the annular portion (321); the outer circumference of the hinge shaft (31) is provided with an annular groove (311) in which the annular portion (321) is sleeved, and the outer circumference of the hinge shaft (31) is further provided with an avoidance slot (312) communicated with the annular groove (311), and the avoidance slot is configured for accommodating the raised portion (322) entirely; when the annular portion (321) of the annular elastic buckle (32) is sleeved on a periphery of the annular groove (311) of the hinge shaft (31), a top of the raised portion (322) is higher than a peripheral surface of the hinge shaft (31), so that during the assembly process, the raised portion (322) of the annular elastic buckle (32) is clamped in the arc-shaped hole (22) from outside to inside through the mounting hole (21) along an axis direction of the mounting hole (21), so as to realize an axial fixation of the seat hinge assembly (3) in the mounting hole (21).

2. The self-locking structure for the toilet seat bumper according to claim 1, **characterized in that** an insertion boss (3211) is arranged on an inner side of the annular portion (321), and an insertion hole (313) located at a bottom of the annular groove (311) and configured for an insertion of the insertion boss (3211) is arranged on the hinge shaft (31); when the annular portion (321) of the annular elastic buckle (32) is sleeved in the annular groove (311), the annular portion (321) is inserted into the insertion hole (313) through the insertion boss (3211).

3. The self-locking structure for the toilet seat bumper according to claim 2, **characterized in that** the inner side of the annular portion (321) is provided with clamping blocks (3212) symmetrically, and the hinge shaft (31) is provided with clamping notches (314) located at the bottom of the annular groove (311), and the clamping notches are respectively configured for clamping the clamping blocks (3212); when the annular portion (321) of the annular elastic buckle (32) is sleeved in the annular groove (311), the annular portion (321) is correspondingly clamped into the clamping notches (314) through the clamping blocks (3212).

4. The self-locking structure for the toilet seat bumper according to claim 2, **characterized in that** the number of the raised portions (322) corresponds to the number of the avoidance slots (312) and there are two raised portions, and the two raised portions (322) are arranged along the circumference of the annular portion (321), so that when the cover plate (2) is in an open or a closed state, the arc-shaped hole (22) on the cover plate (2) is switched to engage with at least one of the raised portions (322).

5. The self-locking structure for the toilet seat bumper according to claim 4, **characterized in that** the fixed seat (1) is fixedly provided with a connection column (11), the peripheral surface of the hinge shaft (31) is provided with an accommodation hole (315) located between the two avoidance slots (312), the accommodation hole is configured for an insertion of the connection column (11), and the connection column (11) is inserted into the accommodation hole (315) and connected through a buckle mechanism (4).

6. The self-locking structure for the toilet seat bumper according to claim 5, **characterized in that** the buckle mechanism (4) comprises a fastener (41), an insertion block (411) is arranged on the fastener (41), and an end of the hinge shaft (31) is provided with a first accommodation slot (316) communicated with the accommodation hole (315), and the first accommodation slot is configured for an insertion of the insertion block (411); the insertion block (411) is provided with a limit hole (4111) and the limit hole is penetrated through the insertion block, and the limit hole (4111) is provided with a fastening position and a tripping position; when the connection column (11) is inserted into the tripping position of the limit hole (4111) through the accommodation hole (315), the connection column (11) is in a tripping state, when the connection column (11) is inserted into the fastening position of the limit hole (4111) through the accommodation hole (315), the connection column (11) is in the fastening state, and a return spring (5) is arranged between the hinge shaft (31) and the insertion block (411) and the return spring is configured to drive a return movement of the fastener (41), so as to realize a switch of the connection column (11) between different states.

7. The self-locking structure for the toilet seat bumper according to claim 6, **characterized in that** the fastener (41) is symmetrically provided with insertion strips (412), sides of the insertion strips (412) facing to each other are provided with a first hook (4121) respectively, and sides of the insertion strips (412)

opposite to each other are provided with a second hook (4122) respectively; the end of the hinge shaft (31) is provided with a second accommodation slot (317) for the corresponding insertion of the insertion strips (412), and the second accommodation slot (317) is provided with a third hook (318) and a fourth hook (319) matching to the first hook (4121) and the second hook (4122); when the connection column (11) is in the tripping position, the first hook (4121) and the third hook (318) are engaged, and when the connection column (11) is in the fastening position, the second hook (4122) and the fourth hook (319) are engaged.

8. The self-locking structure for the toilet seat bumper according to any one of claims 1 to 7, **characterized in that** the annular portion (321) is provided with an opening, so that the annular portion (321) is a non-enclosed ring.

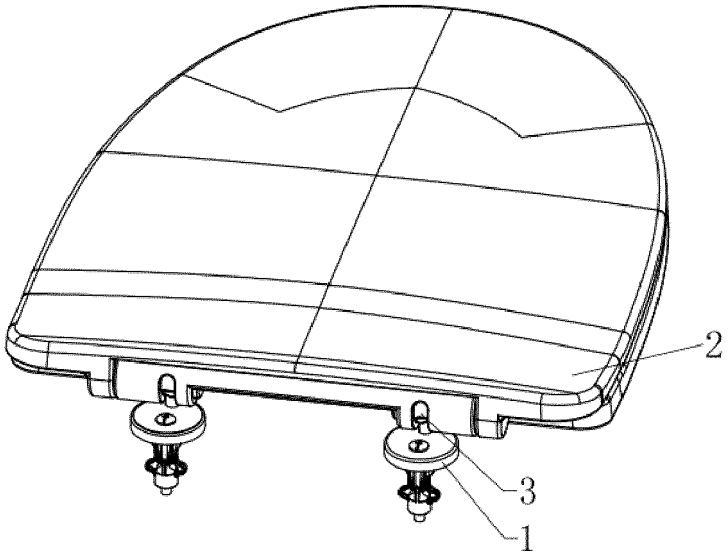

FIG.1

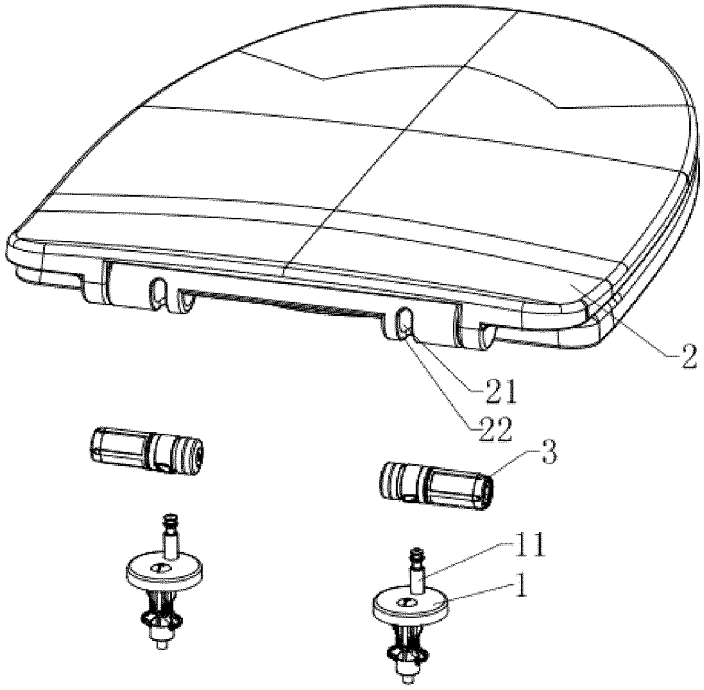

FIG.2

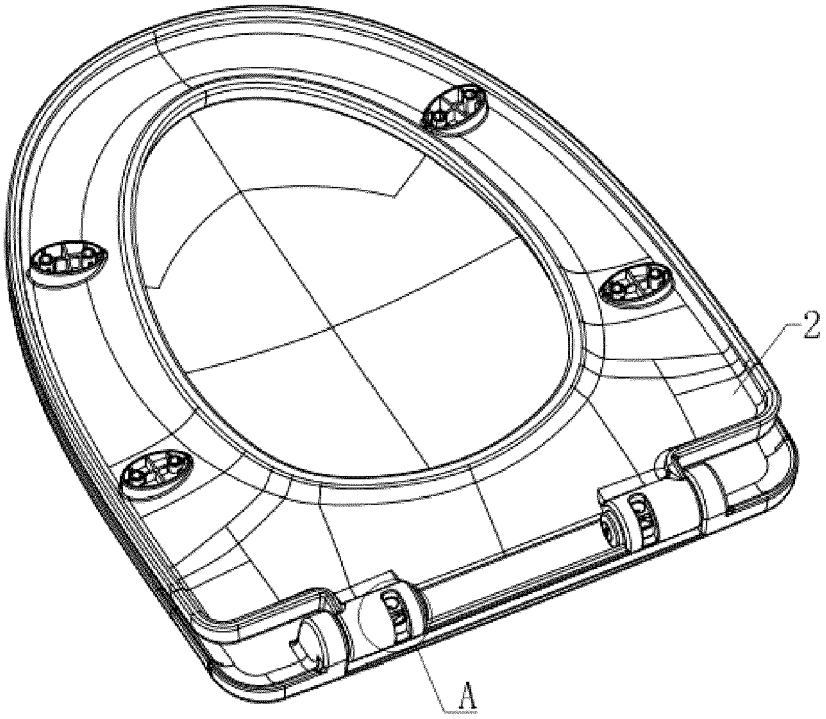

FIG.3

A

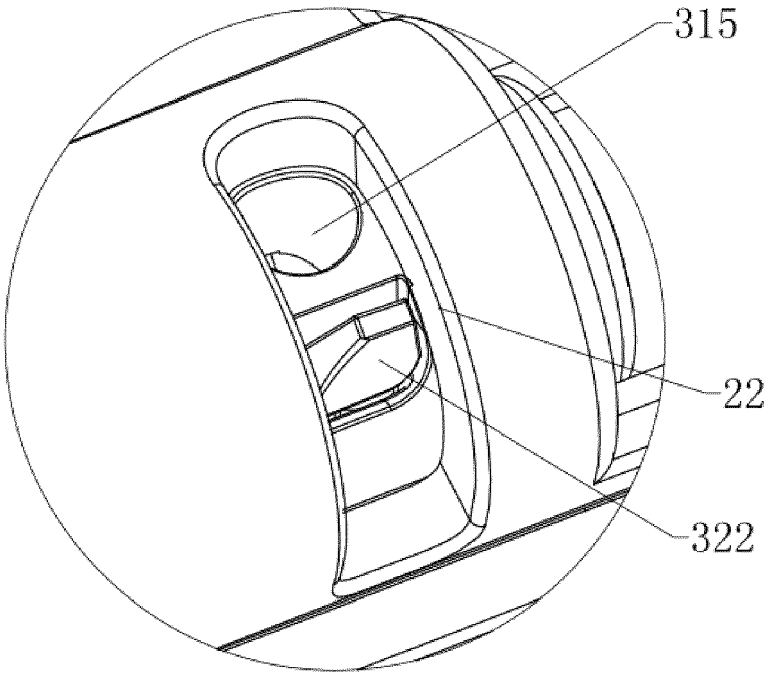

FIG.4

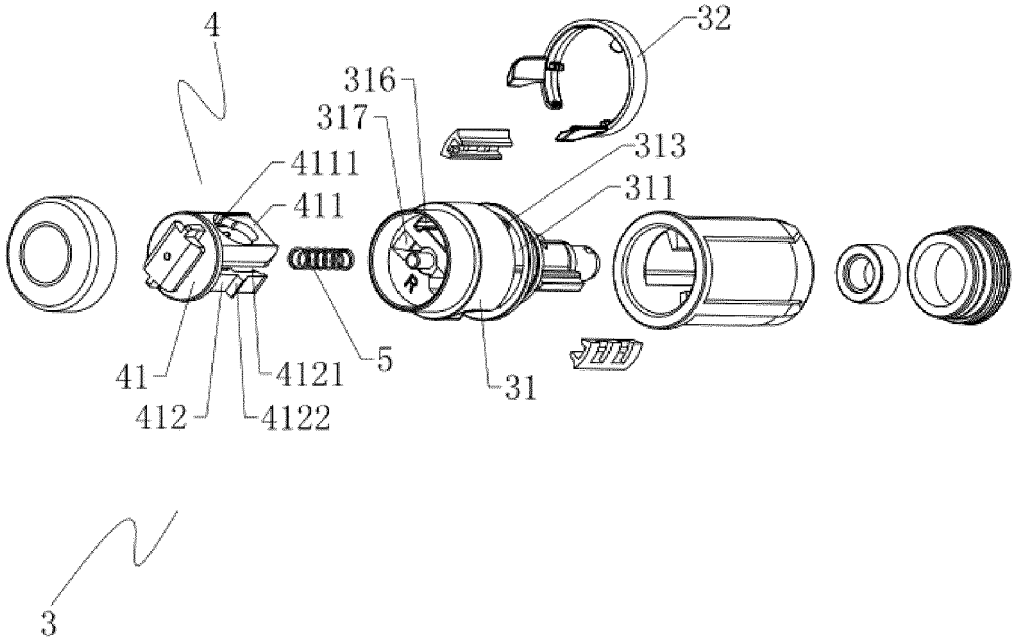
4
32
316
317
313
4111
311
411
41
5
4121
31
412
4122
3

FIG.5

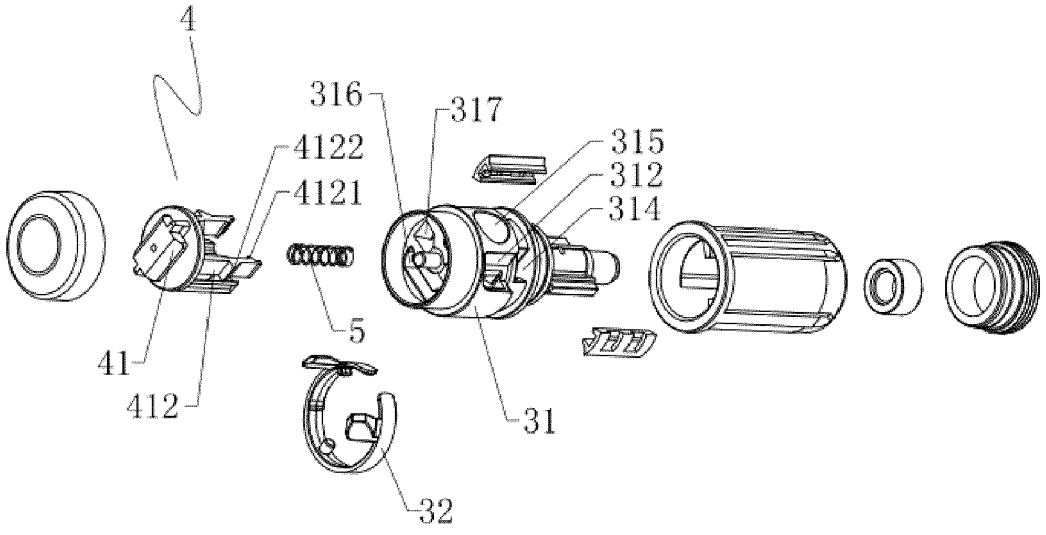
4
316
317
315
4122
312
4121
314
5
41
412
31
32

FIG.6

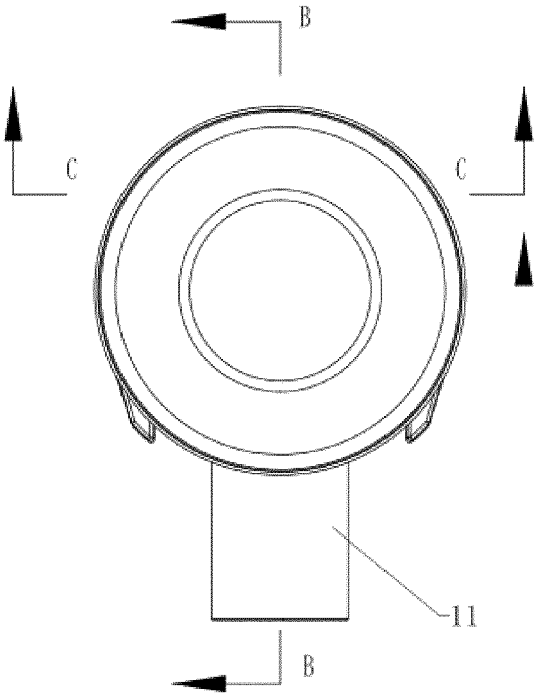

FIG.7

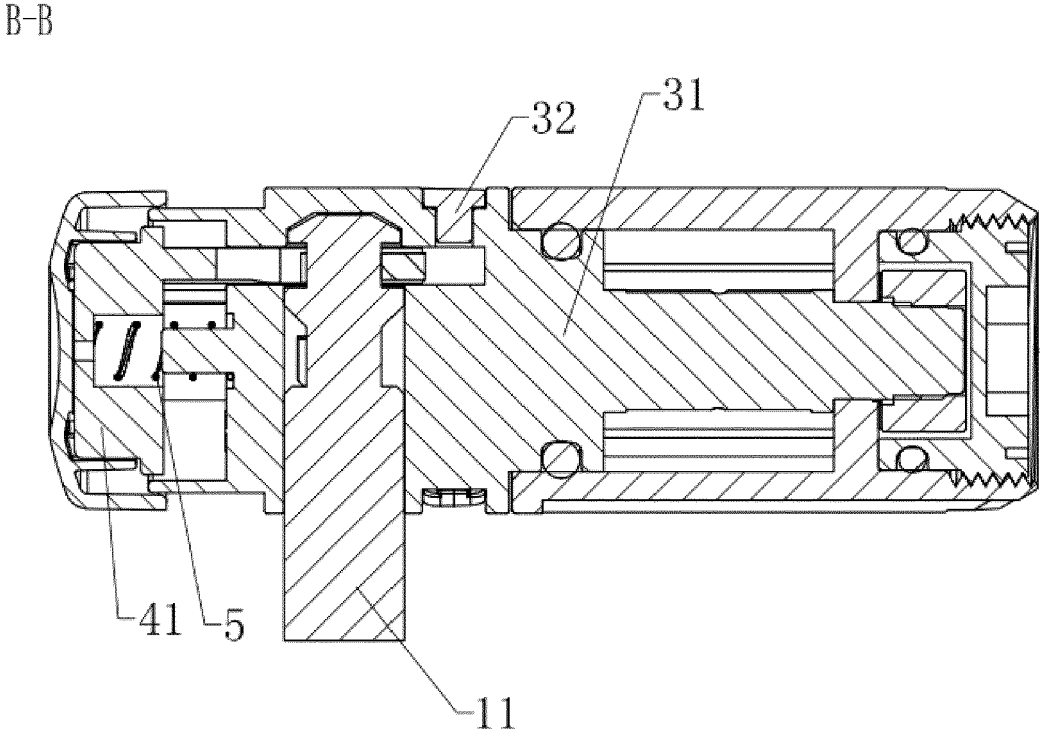

FIG.8

C-C

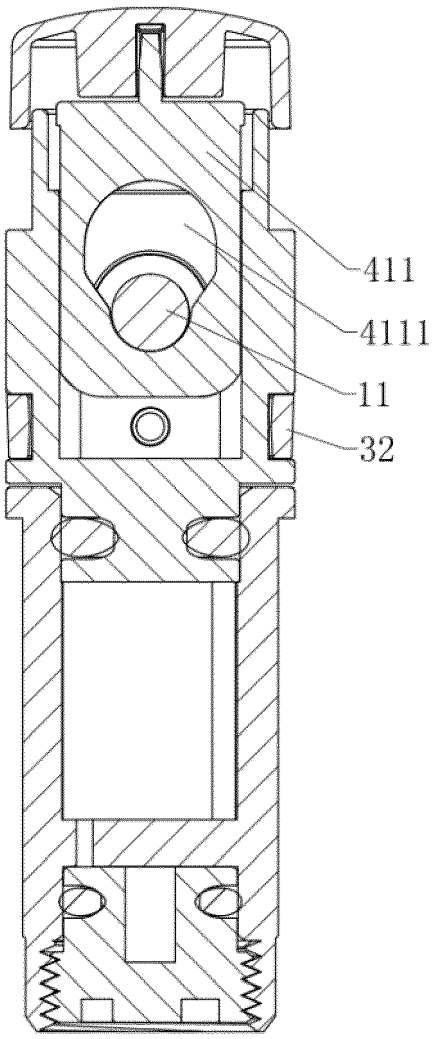

FIG.9

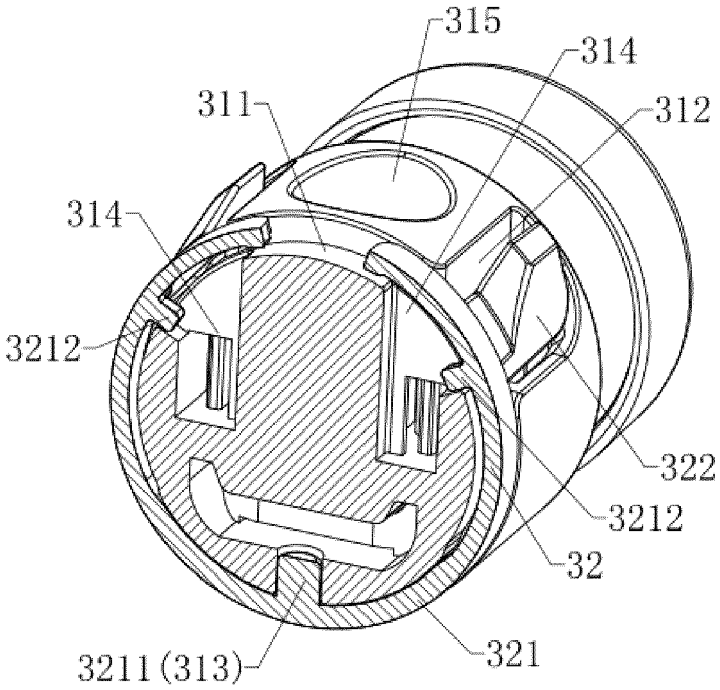
315
314
311
312
314
3212
322
3212
32
321
3211 (313)

FIG.10

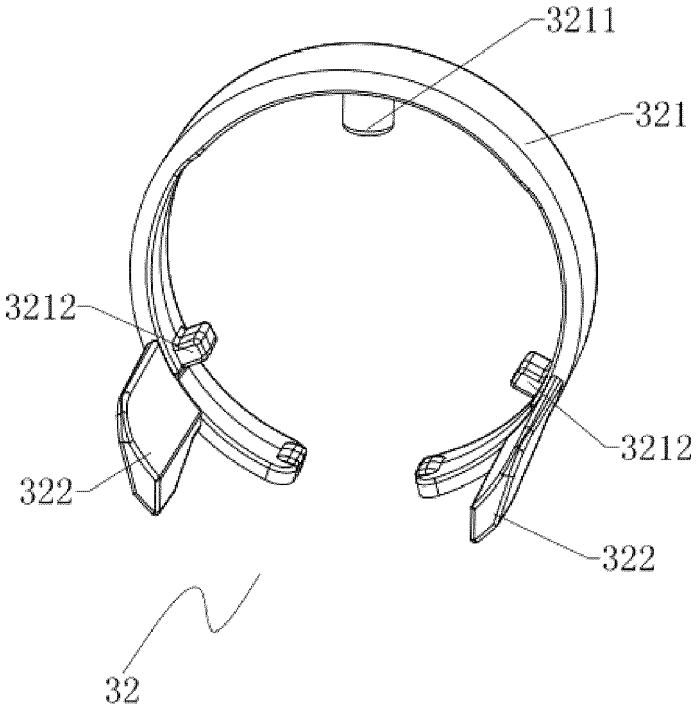
3211
321
3212
3212
322
322
32

FIG.11

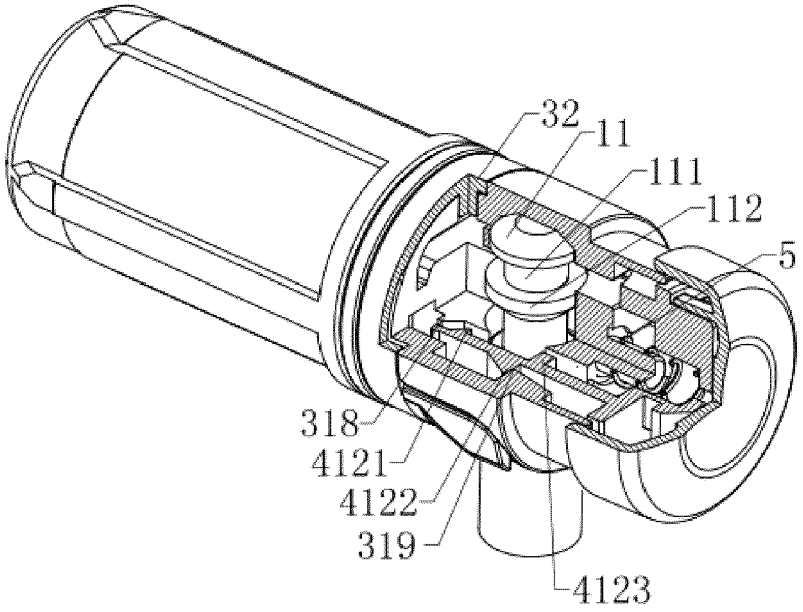
32
11
111
112
5
318
4121
4122
319
4123

FIG.12

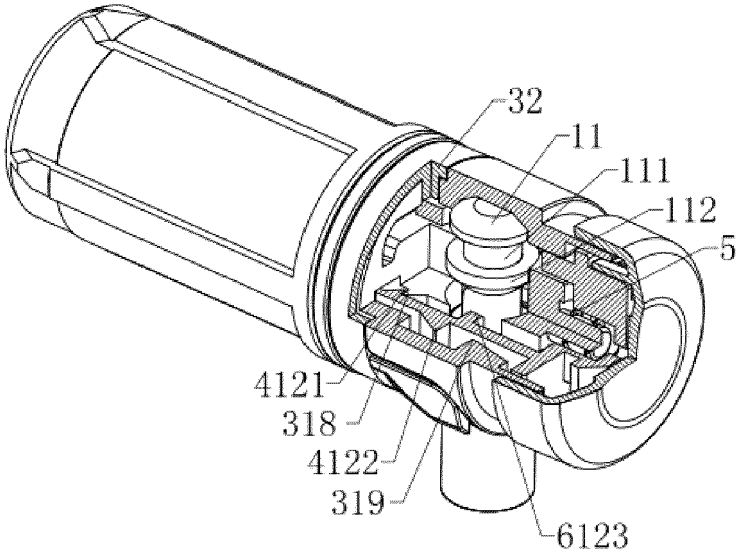
32
11
111
112
5
4121
318
4122
319
6123

FIG.13

Europäisches Patentamt
European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 22 16 4636

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	CN 203 762 997 U (HOTI XIAMEN PLUMBING INC) 13 August 2014 (2014-08-13) * figures 1-6 * -----	1-8	INV. A47K13/12 ADD. A47K13/24

TECHNICAL FIELDS SEARCHED (IPC)

A47K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26 August 2022	Zuurveld, Gerben

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 16 4636

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 203762997 U	13-08-2014	NONE	

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