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(54) FACIAL CLEANSING INSTRUMENT

(57) A facial cleansing instrument of the embodiments of the present disclosure includes a water outlet assembly (100) and a micro-bubble generating assembly (200), the micro-bubble generating assembly (200) is connected to the water outlet assembly (100); the micro-bubble generating assembly (200) is configured to generate micro-bubble water when water flows through the micro-bubble generating assembly (200), and the water outlet assembly (100) is configured to spray the micro-bubble water.

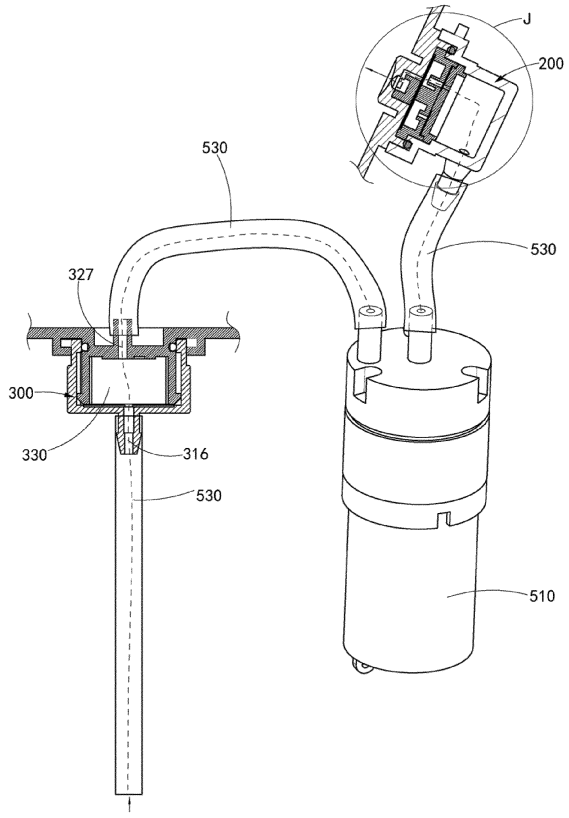

FIG.2

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Description

TECHNICAL FIELD

[0001] The present disclosure generally relates to the technical field of beauty appliances, and in particular, to a facial cleansing instrument.

BACKGROUND

[0002] In view of the fact that the facial cleansing instrument can achieve a better effect of removing facial oil and keratin, it is widely used in contemporary society. However, the cleaning effect of the facial cleansing instrument in the related art is not significant, which brings a bad use experience to the user.

SUMMARY

[0003] The embodiments of the present disclosure provide a facial cleansing instrument with remarkable cleaning effect.

[0004] The facial cleansing instrument of the embodiments of the present disclosure includes a water outlet assembly and a micro-bubble generating assembly, the micro-bubble generating assembly is connected to the water outlet assembly; where, the micro-bubble generating assembly is configured to generate micro-bubble water when water flows through the micro-bubble generating assembly, and the water outlet assembly is configured to spray the micro-bubble water.

[0005] According to some embodiments of the present disclosure, the micro-bubble generating assembly includes a first generator and a second generator. The first generator includes one or more first water outlet holes; the second generator includes one or more second water outlet holes, the one or more second water outlet holes are corresponded to the one or more first water outlet holes one-to-one, and a flow area of each second water outlet hole is larger than a flow area of a corresponding first water outlet hole.

[0006] According to some embodiments of the present disclosure, a return gap is further provided between the first generator and the second generator; the second generator further comprises one or more return holes, the return gap is connected to each return hole and each second water outlet hole, and each return hole is not disposed corresponding to each first water outlet hole.

[0007] According to some embodiments of the present disclosure, the facial cleansing instrument further includes an accommodating assembly connected to the micro-bubble generating assembly, wherein the accommodating assembly comprises an accommodating cavity, a water inlet hole, and a water outlet hole, the water inlet hole and the accommodating cavity are connected, and the water inlet hole is connected with a water supply assembly, the water supply assembly is configured to provide water flow to the accommodating cavity, and the water outlet hole is connected to the accommodating cavity and the micro-bubble generating assembly; the accommodating cavity is configured to accommodate a solid matter, and the solid matter is dissolved during the water flows through the accommodating cavity to form formula water, and the formula water is sprayed by the water outlet assembly.

[0008] According to some embodiments of the present disclosure, the accommodating assembly is disposed upstream of the micro-bubble generating assembly to make the formula water flow through the micro-bubble generating assembly.

[0009] According to some embodiments of the present disclosure, the accommodating assembly comprises a first accommodating component and a second accommodating component, and the first accommodating component and the second accommodating component are detachably connected, and an accommodating cavity is formed with a connection of the first accommodating component and the second accommodating component; the water inlet hole is provided at the first accommodating component, and the water outlet hole is provided at the second accommodating component.

[0010] According to some embodiments of the present disclosure, the first accommodating component and the second accommodating component are connected by a first engagement structure; the first engagement structure comprises a first slot and a hook that are cooperated with each other, the hook is disposed on one of the first accommodating component and the second accommodating component, and the first slot is disposed on the other of the first accommodating component and the second accommodating component.

[0011] According to some embodiments of the present disclosure, the first accommodating component is provided with at least two hooks, the second accommodating component is provided with at least two first slots; the at least two hooks are respectively engaged in the at least two first slots when the first accommodating component is rotated relative to the second accommodating component.

[0012] According to some embodiments of the present disclosure, the first accommodating component and the second accommodating component are connected by a second engagement structure; the second engagement structure comprises a limit slot and a limit hook which is movably cooperated with the limit slot, the limit hook is disposed on one of the first accommodating component and the second accommodating component, and the limit slot is disposed on the other of the first accommodating component and the second accommodating component; when the first accommodating component and the second accommodating component are moved far away from each other, the limit hook is blocked by the limit slot to prevent the first accommodating component and the second accommodating component from being separated, and an opening is formed at the accommodating cavity, the solid matter is placed into the accommodating

cavity through the opening.

[0013] According to some embodiments of the present disclosure, the limit hook is an elastic member.

[0014] According to some embodiments of the present disclosure, the first accommodating component comprises a cover part and a sleeve part, and the cover part is arranged to cover one end of the sleeve part, an inner wall surface of the sleeve part is provided with the limit slot; the second accommodating component comprises a main body and the limit hook connected to a side of the main body; when the first accommodating component is rotated along a circumferential direction of the sleeve part or the first accommodating component is moved away from the second accommodating component, the limit hook is movably cooperated with the limit slot.

[0015] According to some embodiments of the present disclosure, the facial cleansing instrument further includes a water tank which is provided with an installation opening; the main body and an inner edge of the installation opening are connected through a third engagement structure; the third engagement structure comprises a second slot and a buckle, the second slot is provided on one of the main body and a wall of the inner edge of the installation opening, and the buckle is provided on the other of the main body and the wall of the inner edge of the installation opening; a side wall of the second slot is provided with a groove, the buckle is provided with a boss, when the buckle is engaged in the second slot, the boss is engaged in the groove to lock the main body and the water tank.

[0016] According to some embodiments of the present disclosure, an inner wall surface of the accommodating cavity is provided with one or more protrusions, the protrusions are configured to separate the solid matter from the inner wall surface of the accommodating cavity to prevent the solid matter from blocking the water inlet hole and/or the water outlet hole.

[0017] The facial cleansing instrument in any of the above embodiments has the following advantages or beneficial effects:

[0018] In the facial cleansing instrument of the embodiments of the present disclosure, by arranging the micro-bubble generating assembly, the water outlet assembly can spray the micro-bubble water. Compared with the facial cleansing instrument in the related art, after the micro-bubble water sprayed by the facial cleansing instrument of the embodiments of the present disclosure contacts the face, the micro-bubbles can penetrate deep into the pores, so that the face is cleaned more thoroughly, the cleaning effect is more obvious, and the user experience is improved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] The above and other features and advantages of the present disclosure will become more apparent by describing in detail exemplary embodiments thereof with reference to the drawings.

FIG. 1 is an exploded view of a facial cleansing instrument of the embodiments of the present disclosure.

FIG. 2 is a schematic diagram of the flow direction of the water flow of the facial cleansing instrument of the embodiments of the present disclosure.

FIG. 3 is a partial enlarged view of J in FIG. 2.

FIG. 4 is a partial enlarged view of K in FIG. 3.

FIG. 5 is a schematic structural diagram of a micro-bubble generating assembly and an accommodating assembly of the facial cleansing instrument of the embodiments of the present disclosure.

FIG. 6 is a schematic structural diagram of a first accommodating component of the embodiments of the present disclosure.

FIG. 7 is another schematic structural diagram of a first accommodating component of the embodiments of the present disclosure.

FIG. 8 is a cross-sectional view taken along line A-A in FIG. 7.

FIG. 9 is a schematic structural diagram of a second accommodating component of the embodiments of the present disclosure.

FIG. 10 is a partial enlarged view of L in FIG. 9.

FIG. 11 is a partial enlarged view of M in FIG. 5.

FIG. 12 is a schematic diagram of the first accommodating component and the second accommodating component being far away from each other of the embodiments of the present disclosure.

FIG. 13 is a schematic structural diagram of a water tank of the embodiments of the present disclosure.

FIG. 14 is a partial enlarged view of N in FIG. 13.

FIG. 15 is a schematic structural diagram of a facial cleansing instrument of the embodiments of the present disclosure after removing the water tank and the first housing.

FIG. 16 is a partial cross-sectional view of the facial cleansing instrument of the embodiments of the present disclosure.

FIG. 17 is a cross-sectional view of the facial cleansing instrument of the embodiments of the present disclosure.

[0020] The reference numerals are described as follows:

110. first housing; 111. water outlet; 120. second housing; 130. fixing member; 200. micro-bubble generating assembly; 210. cavity; 220. first generator; 221. first water outlet hole; 230. second generator; 231. second water outlet hole; 232. return hole; 233. return gap; 240. commutator; 250. filter screen; 300. accommodating assembly; 310. first accommodating component; 311. cover part; 312. sleeve part; 313. hook; 314. limit slot; 315. first protrusion; 316. water inlet hole; 320. second accommodating component; 321. main body; 322. limit hook; 323. first slot; 324. second protrusion; 325. buckle; 326. boss; 327. water outlet hole; 330. accommodating cavity; 331. Opening; 340. first sealing ring; 350. second sealing ring;

400. vibration assembly; 410. Bracket; 420. vibration motor; 430. rubber sleeve; 431. brush portion; 510. water pump; 520. water tank; 521. installation opening; 522. second slot; 523. groove; 530. water pipe; 600. electric control assembly; 610. battery; 620. circuit board.

DETAILED DESCRIPTION

[0021] Exemplary embodiments will now be described more fully with reference to the drawings. However, the exemplary embodiments can be implemented in various forms and should not be construed as being limited to the embodiments set forth herein; rather, these embodiments are provided so that the present disclosure will be comprehensive and complete, and will fully convey the concept of exemplary embodiments to those skilled in the art. The same reference numerals in the drawings denote the same or similar structures, and thus their detailed description will be omitted.

[0022] As shown in FIG. 1, FIG. 1 shows an exploded view of the facial cleansing instrument of the embodiments of the present disclosure. The facial cleansing instrument of the embodiments of the present disclosure includes a water outlet assembly, a micro-bubble generating assembly 200, an accommodating assembly 300, a vibration assembly 400, a water supply assembly 500, and an electric control assembly 600. The micro-bubble generating assembly 200 is connected to the water outlet assembly 100. When the water flows through the micro-bubble generating assembly 200, micro-bubble water can be generated, so that the water outlet assembly 100 can spray the micro-bubble water.

[0023] In the facial cleansing instrument of the embodiments of the present disclosure, by arranging the micro-bubble generating assembly 200, the water outlet assembly 100 can spray the micro-bubble water. Compared with the facial cleansing instrument in the related art, after the micro-bubble water sprayed by the facial cleansing instrument of the embodiments of the present disclosure contacts the face, the micro-bubbles can penetrate deep into the pores, so that the face is cleaned more thoroughly, the cleaning effect is more obvious, and the user experience is improved.

[0024] As shown in FIG. 2, FIG. 2 shows a schematic diagram of the flow direction of the water flow of the facial cleansing instrument of the embodiments of the present disclosure. The accommodating assembly 300 of the facial cleansing instrument in the embodiments of the present disclosure is connected to the micro-bubble generating assembly 200. The accommodating assembly 300 includes an accommodating cavity 330, a water inlet hole 316 and a water outlet hole 327, the water inlet hole 316 and the accommodating cavity 330 are connected, and the water inlet hole 316 is connected with the water supply assembly 500, the water supply assembly 500 can provide water flow to the accommodating cavity 330, and the water outlet hole 327 is connected to the accommodating cavity 330 and the micro-bubble generating assembly 200. The accommodating cavity 330 can accommodate a solid matter, and when the water flows through the accommodating cavity 330, the solid matter can be dissolved, so that the water outlet assembly 100 can spray formula water.

[0025] It can be understood that the solid matter in the present disclosure may be a solid formula, and when the water flows through the accommodating cavity 330, the solid matter is dissolved, so that the water outlet assembly 100 sprays formula water. For example, the solid matter can be facial cleanser solids or other suitable solids with a cleansing effect, and essential oil solids or other suitable solids with a cosmetic effect.

[0026] Generally speaking, the facial cleansing instrument in the related art needs to be used in conjunction with a cleansing lotion to achieve a better effect of removing facial oil and keratin. However, in most of the related art, the lotion is first applied to the face, and then the face is massaged by the vibration of the cleansing instrument to achieve a cosmetic effect.

[0027] In the facial cleansing instrument of the embodiments of the present disclosure, after the water flows through the accommodating cavity 330, it can dissolve the solid matter to generate formula water, and the formula water can be sprayed from the water outlet assembly 100. Compared with the technical solution in which the daubing action and the cleansing action are separated in the related art, the facial cleansing instrument of the embodiments of the present disclosure can spray formula water, that is, the daubing action and the cleansing action are integrated together, which can achieve better cleansing/beauty effects, facilitate user operation, and improve user experience.

[0028] Please continue to refer to FIG. 2, the accommodating assembly 300 is disposed upstream of the micro-bubble generating assembly 200, and the water flow first flows through the accommodating assembly 300, and then flows into the micro-bubble generating assembly 200. When the water flows through the accommodating assembly 300, formula water can be generated, and then the formula water flows into the micro-bubble generating assembly 200.

[0029] Through the combination of the accommodating assembly 300 and the micro-bubble generating assembly 200, and the design that the accommodating assembly 300 is arranged upstream of the micro-bubble generating assembly 200, under the action of the micro-bubble generating assembly 200 , the substances in the formula water is fully refined into tiny particles, and finally, the water outlet assembly 100 can spray the micro-bubble water with the functional substances of tiny particles. Since the facial cleansing instrument of the embodiments of the present disclosure adopts the technical means that the substances in the formula water are fully refined into tiny particles and combined with the micro-bubble water, the additional functions realized by the micro-bubble water on the formula substances are further strengthened, rather than simply combining formula substances and

micro-bubble water, but to achieve the special effect of "one plus one is greater than two".

[0030] For example, when the formula material is a facial cleanser solid or other suitable solid with a cleansing effect, the substance of the cleansing lotion can be refined into tiny particles by the micro-bubble water, and the emulsion particles are easier to penetrate into the pores of the face, making the cleansing effect more thorough. When the formula material is essential oil solid or other suitable solid with cosmetic effect, the essential oil is refined into tiny particles, and the essential oil particles are easier to penetrate into the facial pores, making the beauty effect better.

[0031] As shown in FIG. 3, FIG. 3 shows a partial enlarged view of J in FIG. 2. The micro-bubble generating assembly 200 of the embodiments of the present disclosure includes a cavity 210, a first generator 220 and a second generator 230. The first generator 220 is connected to the second generator 230 and disposed in the cavity 210. The first generator 220 includes one or more first water outlet holes 221, the second generator 230 includes one or more second water outlet holes 231, the one or more second water outlet holes 231 correspond to the one or more first water outlet holes 221 one-to-one, and the flow area of each second water outlet hole 231 is larger than that of the corresponding first water outlet hole 221.

[0032] Because the flow area of each second water outlet hole 231 is larger than the flow area of the corresponding first water outlet hole 221, when the water flow flows from the first water outlet hole 221 into the second water outlet hole 231, the water pressure becomes smaller and the air solubility decreases, so the air bubbles in the water flow are precipitated, and finally micro-bubble water is formed.

[0033] Please continue to refer to FIG. 3, the micro-bubble generating assembly 200 further includes a filter screen 250, and the filter screen 250 is disposed at the water outlet end of the second water outlet hole 231. When the water flows through the filter screen 250, the filter screen 250 can cut the air bubbles in the bubble water into micro-bubbles.

[0034] As shown in FIG. 1 and FIG. 3, the micro-bubble generating assembly 200 further includes a commutator 240, the commutator 240 is fixedly connected to the water outlet 111 of the first housing 110, and is disposed at the side of the filter screen 250 away from the second water outlet hole 231. Specifically, the inner side of the water outlet 111 is provided with a groove, and the groove is used for accommodating the commutator 240. The water outlet 111 is provided with a water outlet hole, and the water outlet hole corresponds to the commutator 240. Of course, it can be understood that the number of grooves may be multiple, the number of the water outlet holes may be multiple, and each groove corresponds to each water outlet hole respectively.

[0035] The outer circumference of the commutator 240 includes a plurality of water grooves spaced around a ring, and a side wall of the water groove is tangent to the ring, that is, the plurality of water grooves are centrifugally distributed on the outer circumference of the commutator 240 at intervals. and the inner wall of the groove of the water outlet 111 has an arc surface that matches the outer circumference of the commutator 240. When the water flows through the commutator 240, a conical spray can be sprayed.

[0036] As shown in FIG. 4, FIG. 4 shows a partial enlarged view of K in FIG. 3. There is also a return gap 233 between the first generator 220 and the second generator 230. The second generator 230 further includes one or more return holes 232, each return hole 232 is connected to the return gap 233, and each return hole 232 is not disposed corresponding to each first water outlet hole 221. That is to say, the first water outlet hole 221 and the return hole 232 are staggered from each other, the projection of the first water outlet hole 221 on the first generator 220 does not overlap with the projection of the return hole 232 on the first generator 220.

[0037] The water flow from the second water outlet hole 231 of the second generator 230 can flow back from the return hole 232 to the return gap 233 and flow out from the second water outlet hole 231 again. By arranging the return hole 232 and the return gap 233, the precipitation of air bubbles can be prevented from being affected by the excessive pressure at the water outlet end of the second water outlet hole 231.

[0038] The micro-bubble generating assembly 200 in the above-mentioned embodiments generates micro-bubble water by reducing the water pressure to change the solubility of water, thereby precipitating air bubbles in the water flow. It can be understood that the way to generate micro-bubble water can also be as follows: a negative pressure area is formed inside the facial cleansing instrument, and the negative pressure area can inhale the outside air through the suction hole, so that the outside air and the water flow are mixed, and finally bubble water is formed.

[0039] As shown in FIG. 5, FIG. 5 shows a schematic structural diagram of the micro-bubble generating assembly 200 and the accommodating assembly 300 of the facial cleansing instrument of the embodiments of the present disclosure. The water supply assembly 500 of the embodiments of the present disclosure may include a water pump 510, a water tank 520 and a water pipe 530. The water pump 510 is respectively connected to the micro-bubble generating assembly 200 and the accommodating assembly 300 through the water pipe 530. The water tank 520 is connected to the accommodating assembly 300, and the water tank 520 stores water inside. When the water pump 510 is running, the water in the water tank 520 can be pumped into the accommodating assembly 300, and the solid matter is first dissolved to form formula water. Under the action of the water pump 510, the formula water flows into the micro-bubble generating assembly 200 and is finally ejected from the water outlet 111.

[0040] The facial cleansing instrument of the embodiments of the present disclosure adopts the water supply assembly 500 having the water pump 510 and the water tank 520, since water can be stored in the water tank 520, the facial cleansing instrument of the embodiments of the present disclosure can be carried around and used anytime and anywhere, and there is no need to limit the use place.

[0041] Of course, it can be understood that the water tank 520 and the water pump 510 can also be omitted in the water supply assembly 500 of the facial cleansing instrument in the embodiments of the present disclosure, and the water inlet hole 316 of the accommodating assembly 300 is directly connected to the water source with pressure.

[0042] The structure and connection relationship of each component of the accommodating assembly 300 according to the embodiments of the present disclosure will be described in detail below with reference to FIGS. 6 to 12.

[0043] The accommodating assembly 300 in the embodiments of the present disclosure includes a first accommodating component 310 and a second accommodating component 320, and the first accommodating component 310 and the second accommodating component 320 are detachably connected, and when the first accommodating component 310 and the second accommodating component 320 are connected, an accommodating cavity 330 is formed, and the accommodating cavity 330 can accommodate the above-mentioned solid matter. The water inlet hole 316 is provided at the first accommodating component 310, and the water outlet hole 327 is provided at the second accommodating component 320.

[0044] The water flow enters the accommodating cavity 330 through the water inlet hole 316, dissolves a small part of the solid matter to form formula water, and the formula water flows out from the water outlet hole 327.

[0045] The first accommodating component 310 and the second accommodating component 320 are connected by a first engagement structure and/or a second engagement structure, the first engagement structure includes a first slot 323 and a hook 313 that cooperated with each other, the hook 313 is disposed on one of the first accommodating component 310 and the second accommodating component 320, and the first slot 323 is disposed on the other of the first accommodating component 310 and the second accommodating component 320. The second engagement structure includes a limit slot 314 and a limit hook 322 which is movably cooperated with the limit slot 314, the limit hook 322 is disposed on one of the first accommodating component 310 and the second accommodating component 320, and the limit slot 314 is disposed on the other of the first accommodating component 310 and the second accommodating component 320. The first engagement structure and the second engagement structure will be described in detail later.

[0046] As shown in FIG. 6 to FIG. 8, FIG. 6 shows a schematic structural diagram of the first accommodating component 310 of the embodiments of the present disclosure. FIG. 7 shows another schematic structural diagram of the first accommodating component 310 of the embodiments of the present disclosure. FIG. 8 shows a cross-sectional view along A-A in FIG 7.

[0047] The first accommodating component 310 in the embodiments of the present disclosure includes a cover part 311 and a sleeve part 312, and the cover part 311 covers one end of the sleeve part 312. The outer circumference of the sleeve part 312 is provided with at least two hooks 313, for example, there are two hooks 313 arranged evenly. Of course, the number of the hooks 313 may also be three, four, or the like.

[0048] When the first accommodating component 310 is rotated relative to the second accommodating component 320, the at least two hooks 313 can be respectively engaged in the at least two first slots 323 to lock the first accommodating component 310 and the second accommodating component 310.

[0049] Of course, it can be understood that the first accommodating component 310 may also be provided with the first slots 323, and the second accommodating component 320 is provided with the hooks 313 that are engaged with the first slots 323.

[0050] The inner wall surface of the sleeve part 312 is provided with a limit slot 314, and the limit slot 314 can be engaged with the limit hook 322 on the second accommodating component 320. When the first accommodating component 310 and the second accommodating component 320 are moved away from each other, the limit slot 314 can block the limit hook 322 to prevent the first accommodating component 310 and the second accommodating component 320 from being separated.

[0051] Of course, it can be understood that the first accommodating component 310 can also be provided with a limit hook 322, and the second accommodating component 320 is provided with a limit slot 314 that is engaged with the limit hook 322.

[0052] Please continue to refer to FIG. 6 to FIG. 8, the water inlet hole 316 is provided on the cover part 311 and penetrates through the inner wall surface and the outer wall surface of the cover part 311. One or more first protrusions 315 are provided on the inner wall surface of the cover part 311. When the solid matter is accommodated in the accommodating cavity 330, the plurality of first protrusions 315 can butt against the bottom surface of the solid matter, so that the solid matter is spaced apart from the inner wall surface of the cover part 311 to prevent the solid matter from blocking the water inlet hole 316, and the water flow can enter the accommodating cavity 330 through the gap between the solid matter and the cover part 311.

[0053] As shown in FIG. 9 and FIG. 10, FIG. 9 shows a schematic structural diagram of the second accommodating component 320 of the embodiments of the present disclosure. FIG. 10 shows a partial enlarged view of L in

FIG. 9. The second accommodating component 320 includes a main body 321 and a limit hook 322 connected to a side of the main body 321, and the limit hook 322 is snapped into the limit slot 314. Where, when the first accommodating component 310 is rotated along the circumferential direction of the sleeve part 312 or the first accommodating component 310 is moved away from the second accommodating component 320 along the axial direction of the sleeve part 312, the limit hook 322 is movably cooperated with the limit slot 314.

[0054] The second accommodating component 320 is provided with at least two first slots 323, and the at least two first slots 323 can be engaged with at least two hooks 313 of the first accommodating component 310.

[0055] The water outlet hole 327 is provided on the main body 321 and penetrates through both sides of the main body 321. One or more second protrusions 324 are provided on one side of the main body 321. When the solid matter is accommodated in the accommodating cavity 330, the plurality of second protrusions 324 can butt against the top surface of the solid matter, so that the solid matter is spaced apart from the side surface of the main body 321 to prevent the solid matter from blocking the water outlet hole 327, and the water flow can flow out from the accommodating cavity 330 through the gap between the solid matter and the main body 321 .

[0056] The second accommodating component 320 in the embodiments of the present disclosure may be connected to the water tank 520 through a third engagement structure. The third engagement structure includes a second slot 522 and a buckle 325. The second slot 522 is provided on one of the main body 321 and the water tank 520, and the buckle 325 is provided on the other of the main body 321 and the water tank 520.

[0057] As shown in FIG. 9 and FIG. 10, the outer periphery of the main body 321 is provided with a buckle 325, and the buckle 325 may be L-shaped. The buckle 325 can be engaged with the second slot 522 on the water tank 520, so that the second accommodating component 320 can be detachably connected to the water tank 520.

[0058] The buckle 325 in the embodiments of the present disclosure is provided with a boss 326. When the buckle 325 is snapped into the second slot 522, the boss 326 can be snapped into the groove 523 of the second slot 522 to lock the main body 321 and the water tank 520 to prevent the second accommodating component 320 and the water tank 520 from being disengaged.

[0059] As shown in FIG. 11 and FIG. 12, FIG. 11 shows a partial enlarged view of M in FIG. 5. FIG. 12 is a schematic diagram showing the first accommodating component 310 and the second accommodating component 320 being far away from each other of the embodiments of the present disclosure. When the first accommodating component 310 and the second accommodating component 320 are connected to form the accommodating cavity 330, the hook 313 of the first accommodating component 310 is engaged with the first slot 323 of the second accommodating component 320 connected to lock the first accommodating component 310 and the second accommodating component 320.

[0060] After the solid matter in the accommodating cavity 330 are dissolved, a new solid matter needs to be placed in. At this time, the first accommodating component 310 is rotated in the circumferential direction relative to the second accommodating component 320, so that the hook 313 is disengaged from the first slot 323. Then, move the first accommodating component 310 away from the second accommodating component 320 along the axial direction of the sleeve part 312, and the accommodating cavity 330 forms an opening 331 through which the solid matter is placed into the accommodating cavity 330. Since the limit hook 322 is movably cooperated with the limit slot 314, the opening 331 described above can be opened to a sufficient size to accommodate a new solid matter. In addition, because the limit slot 314 can stop the limit hook 322 and prevent the first accommodating component 310 and the second accommodating component 320 from being separated, the first accommodating component 310 will not fall off the second accommodating component 320.

[0061] After the new solid matter is placed into the accommodating cavity 330, the first accommodating component 310 is reversely operated, the first accommodating component 310 and the second accommodating component 320 can be clamped together, which will not be repeated here.

[0062] It can be understood that a first sealing ring 340 is further provided between the first accommodating component 310 and the second accommodating component 320, so that the accommodating cavity 330 is a sealed cavity except for the water inlet hole 316 and the water outlet hole 327, so as to avoid water leakage.

[0063] In one embodiment, the limit hook 322 may be an elastic member. When the first accommodating component 310 and the second accommodating component 320 are assembled, a force is applied to the limit hook 322, so that the limit hook 322 is deformed inwardly in the radial direction, and the deformed limit hook 322 is installed into the sleeve part 312 of the first accommodating component 310. Afterwards, the force is removed, and the limit hook 322 returns to its original state, and is engaged with the limit slot 314.

[0064] As shown in FIG. 13, FIG. 13 shows a schematic structural diagram of a water tank 520 of the embodiments of the present disclosure. The water tank 520 is provided with an installation opening 521 through which a water source can be placed into the water tank 520. The inner edge of the installation opening 521 is provided with a second slot 522, and the second slot 522 can be engaged with the buckle 325 of the second accommodating component 320. The second slot 522 may be L-shaped.

[0065] As shown in FIG. 14, FIG. 14 shows a partial enlarged view of N in FIG. 13. The side wall of the second slot 522 is provided with a groove 523. When the buckle

325 is engaged in the second slot 522, the boss 326 is engaged in the groove 523 to lock the main body 321 and the water tank 520.

[0066] Of course, it can be understood that the second accommodating component 320 can also be provided with a second slot 522, and the water tank 520 is provided with a buckle 325.

[0067] In an embodiment, the water tank 520 may be made of a transparent or translucent material, so that the user can check the liquid level of the water in the water tank 520 and add water to the water tank 520 in time.

[0068] It can be understood that a second sealing ring 350 is further provided between the outer periphery of the main body 321 of the second accommodating component 320 and the inner edge of the installation opening 521 of the water tank 520 to prevent the water in the water tank 520 from flowing out from the gap between the second accommodating component 320 and the water tank 520.

[0069] As shown in FIG. 15 to FIG. 17, FIG. 15 is a schematic structural diagram of a facial cleansing instrument of the embodiments of the present disclosure after removing the water tank 520 and the first housing 110. FIG. 16 is a partial cross-sectional view of the facial cleansing instrument of the embodiments of the present disclosure. FIG. 17 is a cross-sectional view of the facial cleansing instrument of the embodiments of the present disclosure.

[0070] The vibration assembly 400 of the embodiments of the present disclosure includes a bracket 410, a vibration motor 420 and a rubber sleeve 430. As shown in FIG. 1, the water outlet assembly 100 of the embodiments of the present disclosure includes a first housing 110, a second housing 120 and a fixing member 130. The electric control assembly 600 of the embodiments of the present disclosure includes a battery 610 and a circuit board 620.

[0071] The bracket 410 is installed on the second housing 120, the vibration motor 420 is installed on the bracket 410, and the water pump 510 is fixedly connected to the bracket 410 through the fixing member 130. The first housing 110 is connected to the second housing 120 to form a space for enclosing the above-mentioned micro-bubble generating assembly 200, the water pump 510, the bracket 410, and the vibration motor 420. The rubber sleeve 430 is sleeved on the outside of the first housing 110 and the second housing 120. When the vibration motor 420 is operating, it can drive the rubber sleeve 430 to generate vibration.

[0072] The rubber sleeve 430 is provided with a brush portion 431. Combining the above-mentioned formula water, micro-bubble water and the vibration of the brush portion 431, the cleansing effect is more obvious.

[0073] To sum up, the advantages and beneficial effects of the facial cleansing instrument of the embodiments of the present disclosure are:

[0074] In the facial cleansing instrument of the embodiments of the present disclosure, by arranging the micro-bubble generating assembly 200, the water outlet assembly 100 can spray the micro-bubble water. Compared with the facial cleansing instrument in the related art, after the micro-bubble water sprayed by the facial cleansing instrument of the embodiments of the present disclosure contacts the face, the micro-bubbles can penetrate deep into the pores, so that the face is cleaned more thoroughly, the cleaning effect is more obvious, and the user experience is improved.

[0075] In the facial cleansing instrument of the embodiments of the present disclosure, through the combination of the accommodating assembly 300 and the micro-bubble generating assembly 200, and the design that the accommodating assembly 300 is arranged upstream of the micro-bubble generating assembly 200, under the action of the micro-bubble generating assembly 200, the substances in the formula water is fully refined into tiny particles, and finally, the water outlet assembly 100 can spray the micro-bubble water with the functional substances of tiny particles. Since the facial cleansing instrument of the embodiments of the present disclosure adopts the technical means that the substances in the formula water are fully refined into tiny particles and combined with the micro-bubble water, the additional functions realized by the micro-bubble water on the formula substances are further strengthened, rather than simply combining formula substances and micro-bubble water, but to achieve the special effect of "one plus one is greater than two".

[0076] In the embodiments of the present disclosure, the purpose of using terms "first", "second" and "third" is only for description, and should not be construed as indicating or implying relative importance; the term "plurality/multiple" refers to two or more, unless expressly limited otherwise. Terms such as "installed", "connected with", "connected to" and "fixed" should be understood in a broad sense, for example, "connected with" may be a fixed connection, a detachable connection, or an integral connection; "connected to" may be directly connected or indirectly connected through an intermediary. Those of ordinary skill in the art can understand the specific meanings of the above terms in the embodiments of the present disclosure according to specific situations.

[0077] In the description of the embodiments of the present disclosure, it should be understood that, the orientation or positional relationship indicated by the terms "upper", "lower", "left", "right", "front", "rear", etc. is based on the orientation or positional relationship shown in the drawings, which is only for the convenience of describing the embodiments of the present disclosure and simplifying the description, rather than indicating or implying that the referred device or unit must have a specific direction, be constructed and operated in a specific orientation. Therefore, it should not be construed as a limitation on the embodiments of the present disclosure.

[0078] In the description of this specification, description of the terms "an embodiment," "some embodiments", "a specific embodiment", etc. means that a particular fea-

ture, structure, material or characteristic described in connection with this embodiment or example is included in at least one embodiment or example of an embodiment of the present disclosure. In this specification, schematic representations of the above terms do not necessarily refer to the same embodiment or instance. Furthermore, the particular features, structures, materials or characteristics described may be combined in any suitable manner in any one or more embodiments or examples.

Claims

1. A facial cleansing instrument, **characterized in that**, the facial cleansing instrument comprises:

   a water outlet assembly (100); and
   a micro-bubble generating assembly (200) connected to the water outlet assembly (100);
   wherein the micro-bubble generating assembly (200) is configured to generate micro-bubble water when water flows through the micro-bubble generating assembly (200), and the water outlet assembly (100) is configured to spray the micro-bubble water.

2. The facial cleansing instrument according to claim 1, wherein the micro-bubble generating assembly (200) comprises:

   a first generator (220) which comprises one or more first water outlet holes (221);
   a second generator (230) which comprises one or more second water outlet holes (231), the one or more second water outlet holes (231) are corresponded to the one or more first water outlet holes (221) one-to-one, and a flow area of each second water outlet hole (231) is larger than a flow area of a corresponding first water outlet hole (221).

3. The facial cleansing instrument according to claim 2, wherein a return gap (233) is further provided between the first generator (220) and the second generator (230);
   the second generator (230) further comprises one or more return holes (232), the return gap (233) is connected to each return hole (232) and each second water outlet hole (231), and each return hole (232) is not disposed corresponding to each first water outlet hole (221).

4. The facial cleansing instrument according to any one of claims 1 to 3, further comprising:

   an accommodating assembly (300) connected to the micro-bubble generating assembly (200), wherein the accommodating assembly (300) comprises an accommodating cavity (330), a water inlet hole (316), and a water outlet hole (327), the water inlet hole (316) and the accommodating cavity (330) are connected, and the water inlet hole (316) is connected with a water supply assembly (500), the water supply assembly (500) is configured to provide water flow to the accommodating cavity (330), and the water outlet hole (327) is connected to the accommodating cavity (330) and the micro-bubble generating assembly (200);
   the accommodating cavity (330) is configured to accommodate a solid matter, and the solid matter is dissolved during the water flows through the accommodating cavity (330) to form formula water, and the formula water is sprayed by the water outlet assembly (100).

5. The facial cleansing instrument according to claim 4, wherein the accommodating assembly (300) is disposed upstream of the micro-bubble generating assembly (200) to make the formula water flow through the micro-bubble generating assembly (200).

6. The facial cleansing instrument according to claim 4, wherein the accommodating assembly (300) comprises a first accommodating component (310) and a second accommodating component (320), and the first accommodating component (310) and the second accommodating component (320) are detachably connected, and an accommodating cavity (330) is formed with a connection of the first accommodating component (310) and the second accommodating component (320);
   the water inlet hole (316) is provided at the first accommodating component (310), and the water outlet hole (327) is provided at the second accommodating component (320).

7. The facial cleansing instrument according to claim 6, wherein the first accommodating component (310) and the second accommodating component (320) are connected by a first engagement structure;
   the first engagement structure comprises a first slot (323) and a hook (313) that are cooperated with each other, the hook (313) is disposed on one of the first accommodating component (310) and the second accommodating component (320), and the first slot (323) is disposed on the other of the first accommodating component (310) and the second accommodating component (320).

8. The facial cleansing instrument according to claim 7, wherein the first accommodating component (310) is provided with at least two hooks (313), the second accommodating component (320) is provided with at least two first slots (323);

the at least two hooks are respectively engaged in the at least two first slots (323) when the first accommodating component (310) is rotated relative to the second accommodating component (320).

9. The facial cleansing instrument according to claim 6, wherein the first accommodating component (310) and the second accommodating component (320) are connected by a second engagement structure;

the second engagement structure comprises a limit slot (314) and a limit hook (322) which is movably cooperated with the limit slot (314), the limit hook (322) is disposed on one of the first accommodating component (310) and the second accommodating component (320), and the limit slot (314) is disposed on the other of the first accommodating component (310) and the second accommodating component (320);
when the first accommodating component (310) and the second accommodating component (320) are moved far away from each other, the limit hook (322) is blocked by the limit slot (314) to prevent the first accommodating component (310) and the second accommodating component (320) from being separated, and an opening (331) is formed at the accommodating cavity (330), the solid matter is placed into the accommodating cavity (330) through the opening (331).

10. The facial cleansing instrument according to claim 9, wherein the limit hook (322) is an elastic member.

11. The facial cleansing instrument according to claim 9, wherein the first accommodating component (310) comprises a cover part (311) and a sleeve part (312), and the cover part (311) is arranged to cover one end of the sleeve part (312), an inner wall surface of the sleeve part (312) is provided with the limit slot (314);

the second accommodating component (320) comprises a main body (321) and the limit hook (322) connected to a side of the main body (321);
when the first accommodating component (310) is rotated along a circumferential direction of the sleeve part (312) or the first accommodating component (310) is moved away from the second accommodating component (320), the limit hook (322) is movably cooperated with the limit slot (314).

12. The facial cleansing instrument according to claim 11, further comprising a water tank (520) which is provided with an installation opening (521);

the main body (321) and an inner edge of the installation opening (521) are connected through a third engagement structure;
the third engagement structure comprises a second slot (522) and a buckle (325), the second slot (522) is provided on one of the main body (321) and a wall of the inner edge of the installation opening (521), and the buckle (325) is provided on the other of the main body (321) and the wall of the inner edge of the installation opening (521);
a side wall of the second slot (522) is provided with a groove (523), the buckle (325) is provided with a boss (326), when the buckle (325) is engaged in the second slot (522), the boss (326) is engaged in the groove (523) to lock the main body (321) and the water tank (520).

13. The facial cleansing instrument according to claim 4, an inner wall surface of the accommodating cavity (330) is provided with one or more protrusions, the protrusions are configured to separate the solid matter from the inner wall surface of the accommodating cavity (330) to prevent the solid matter from blocking at least one of the water inlet hole (316) and the water outlet hole (327).

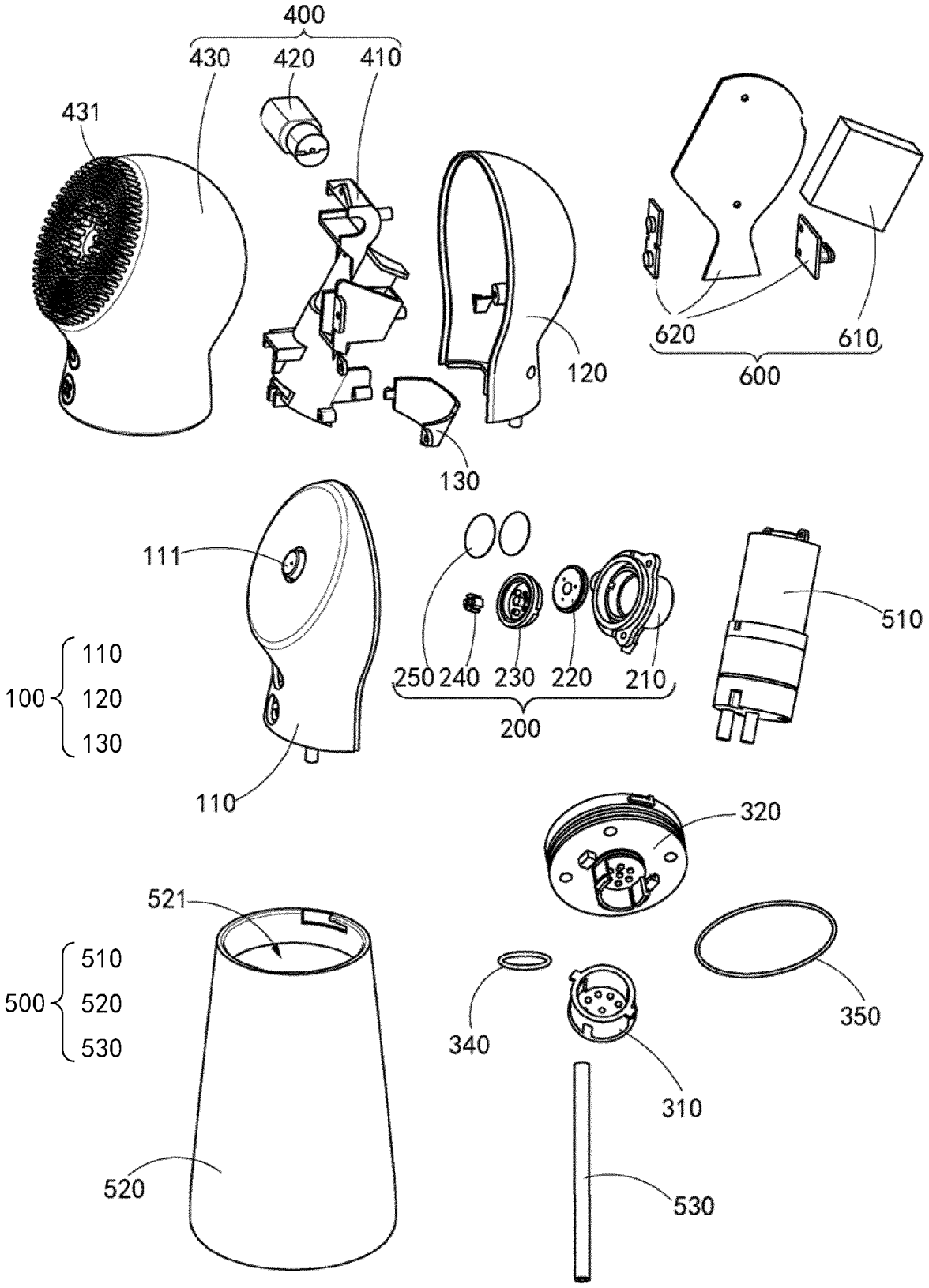
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FIG.1

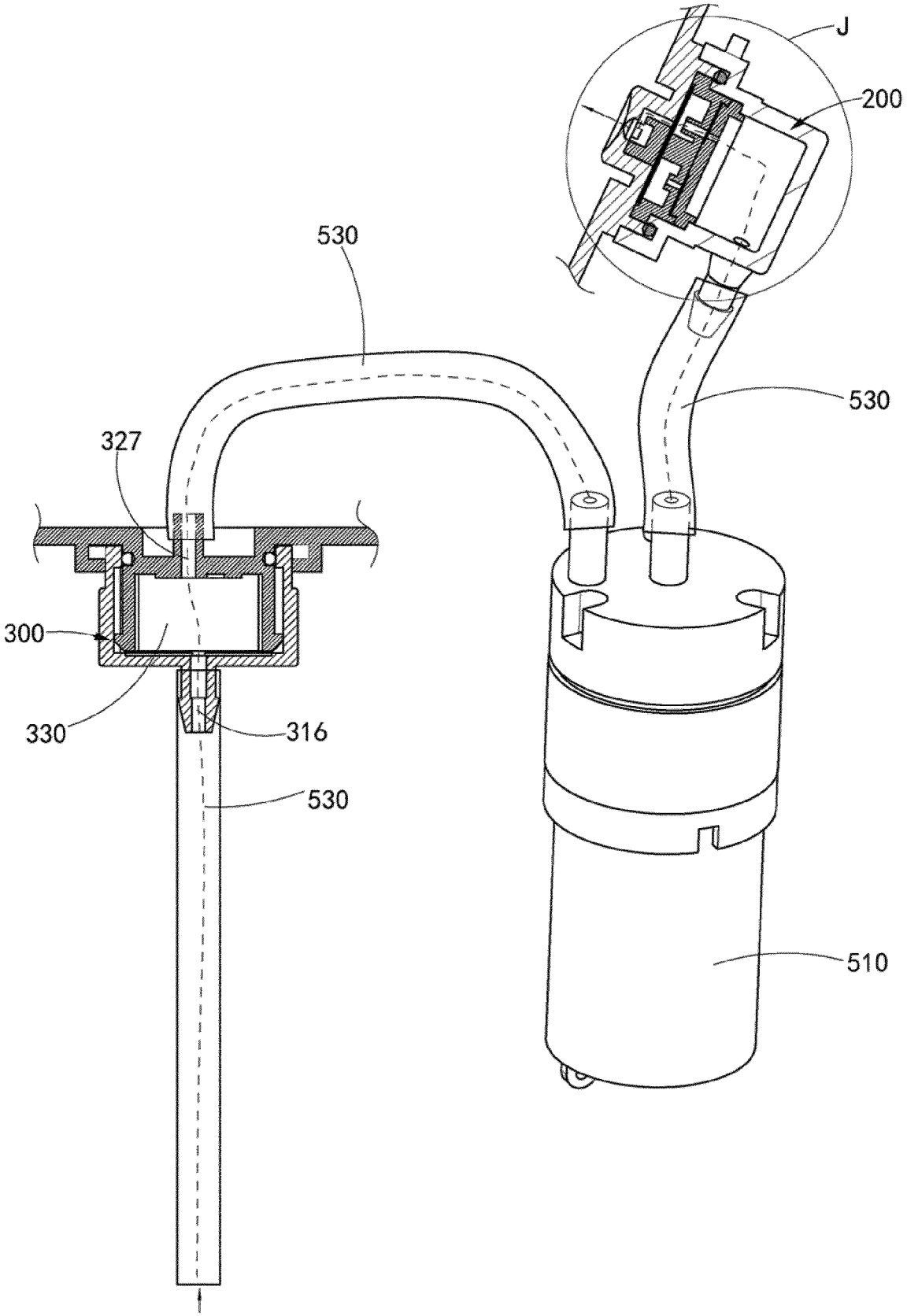

FIG.2

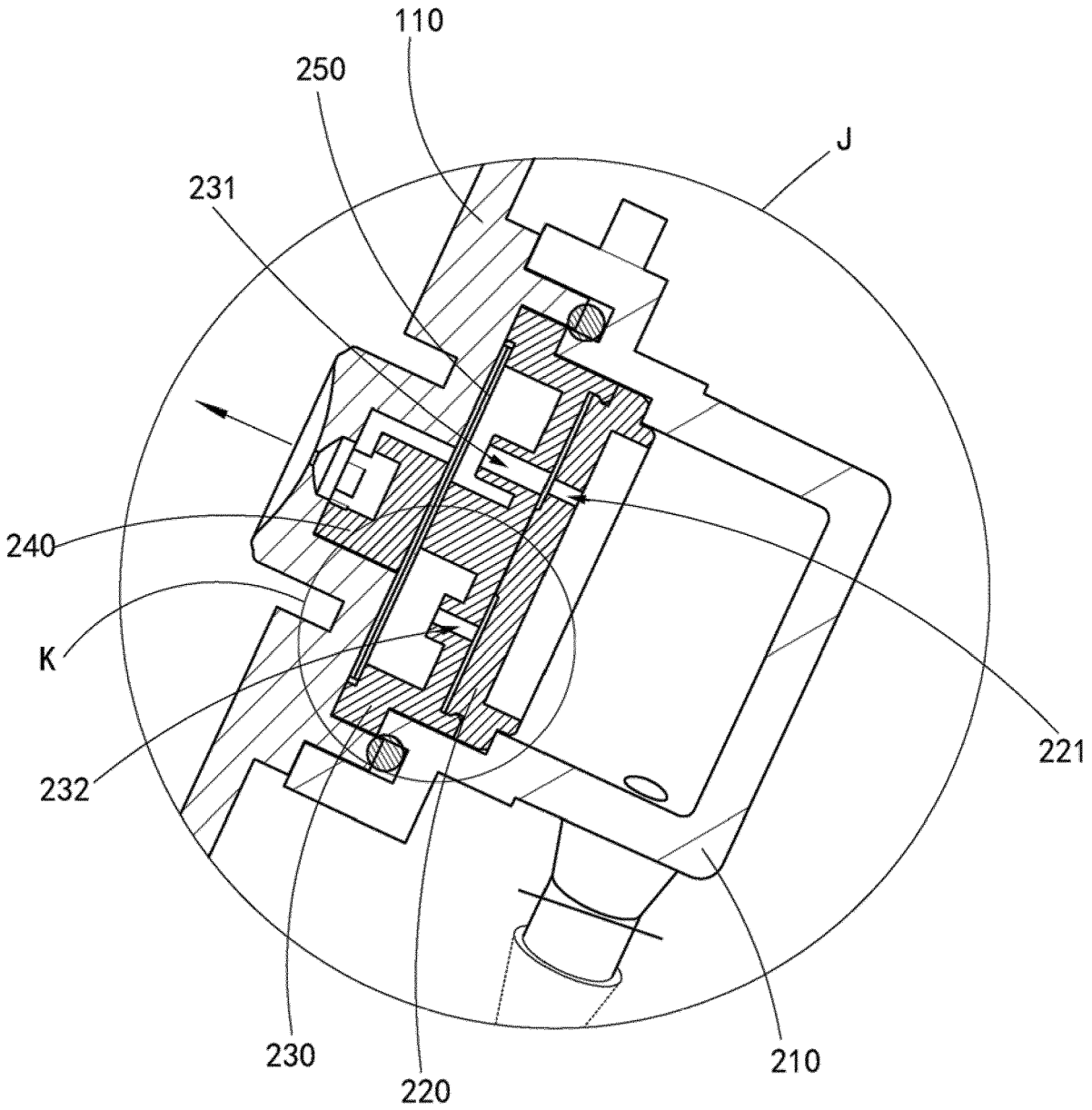

FIG.3

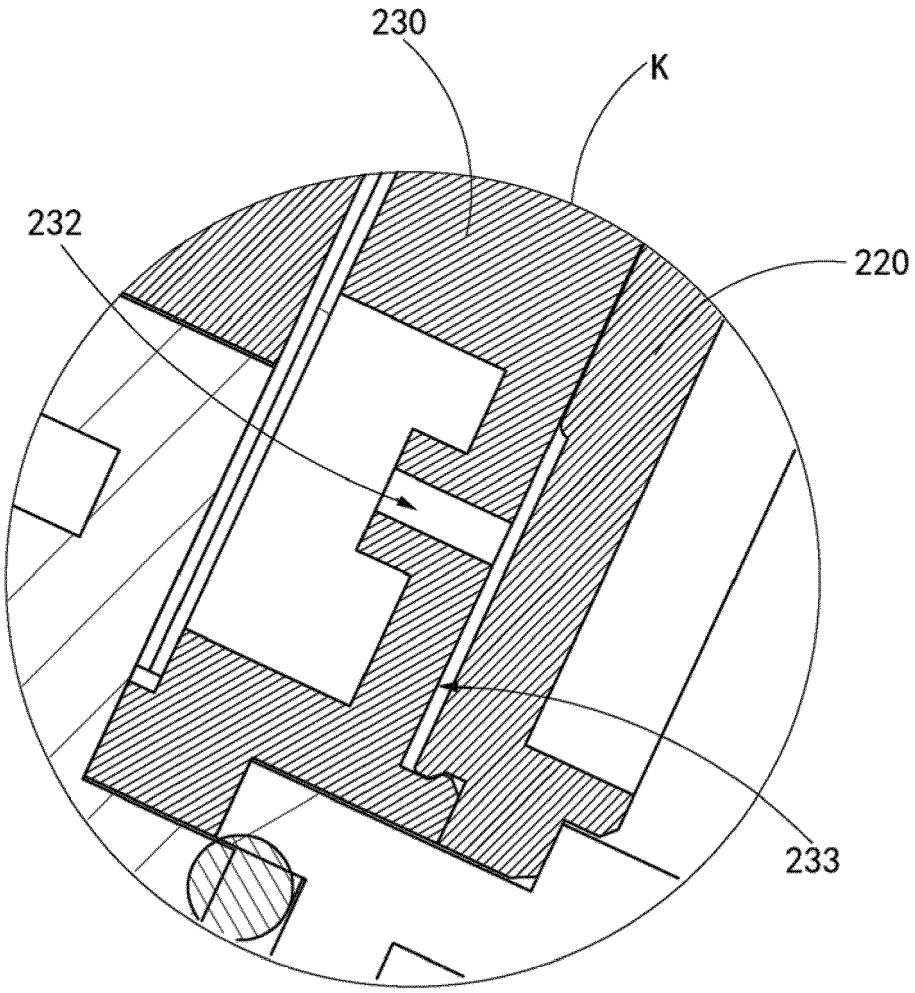

FIG.4

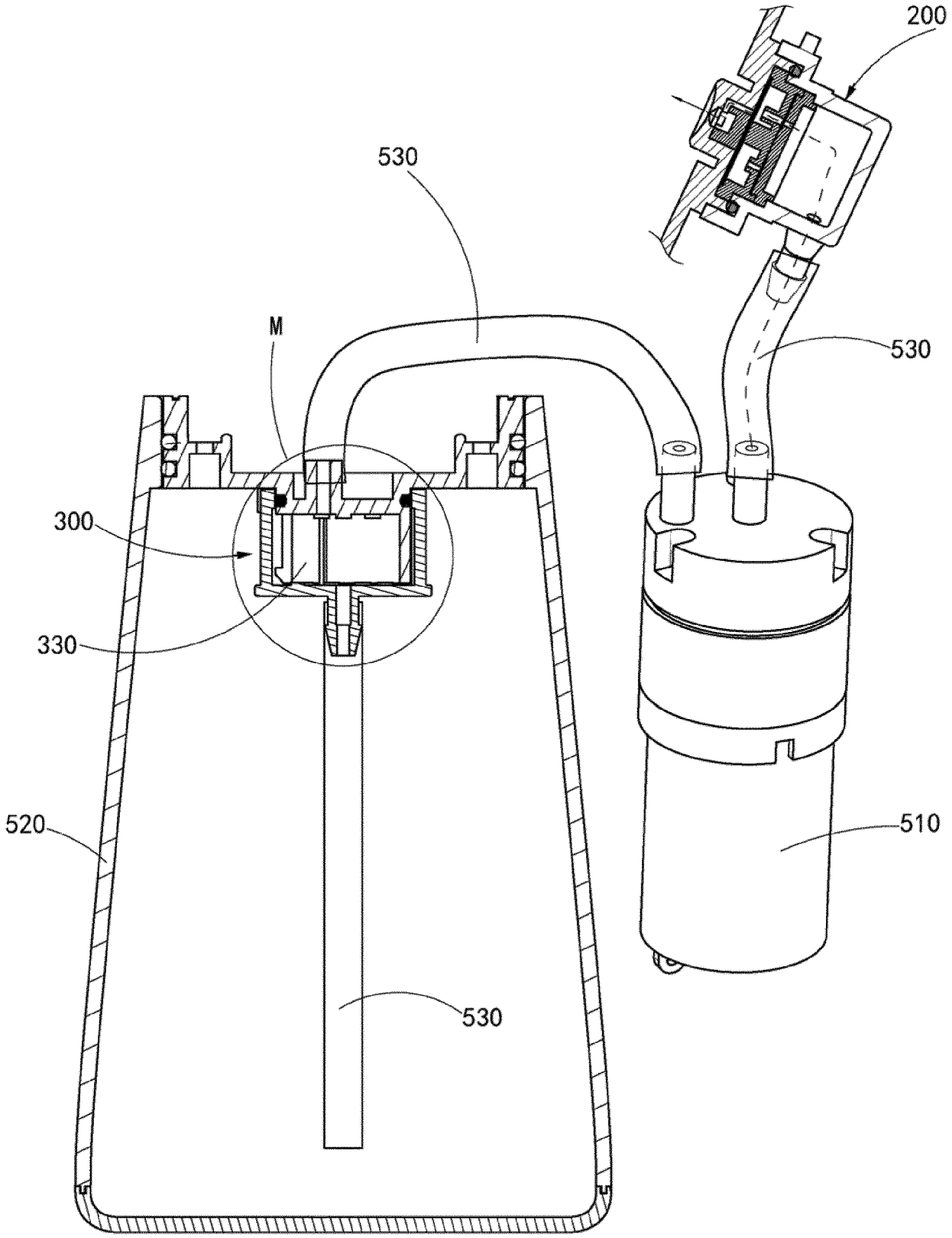

FIG.5

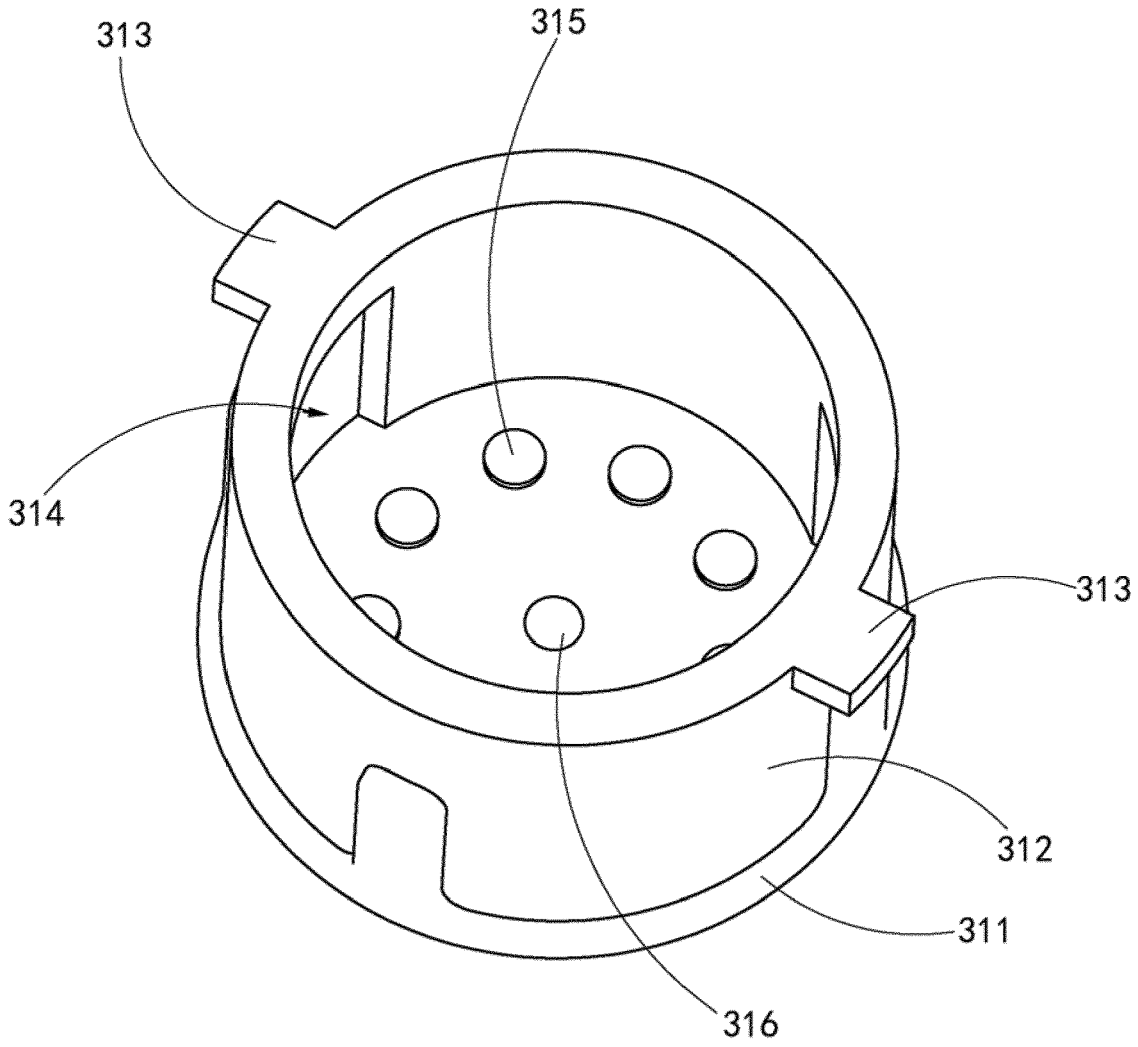

FIG.6

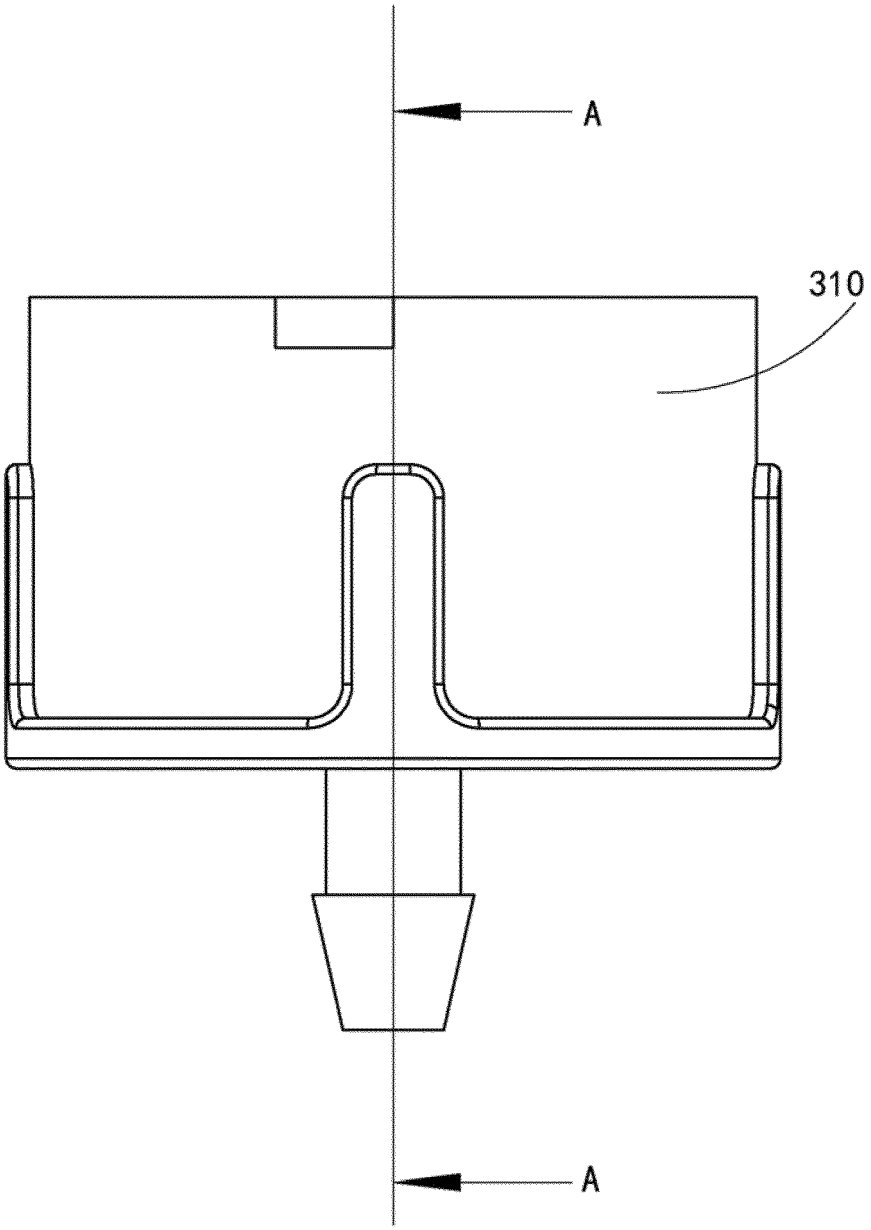

FIG.7

A-A

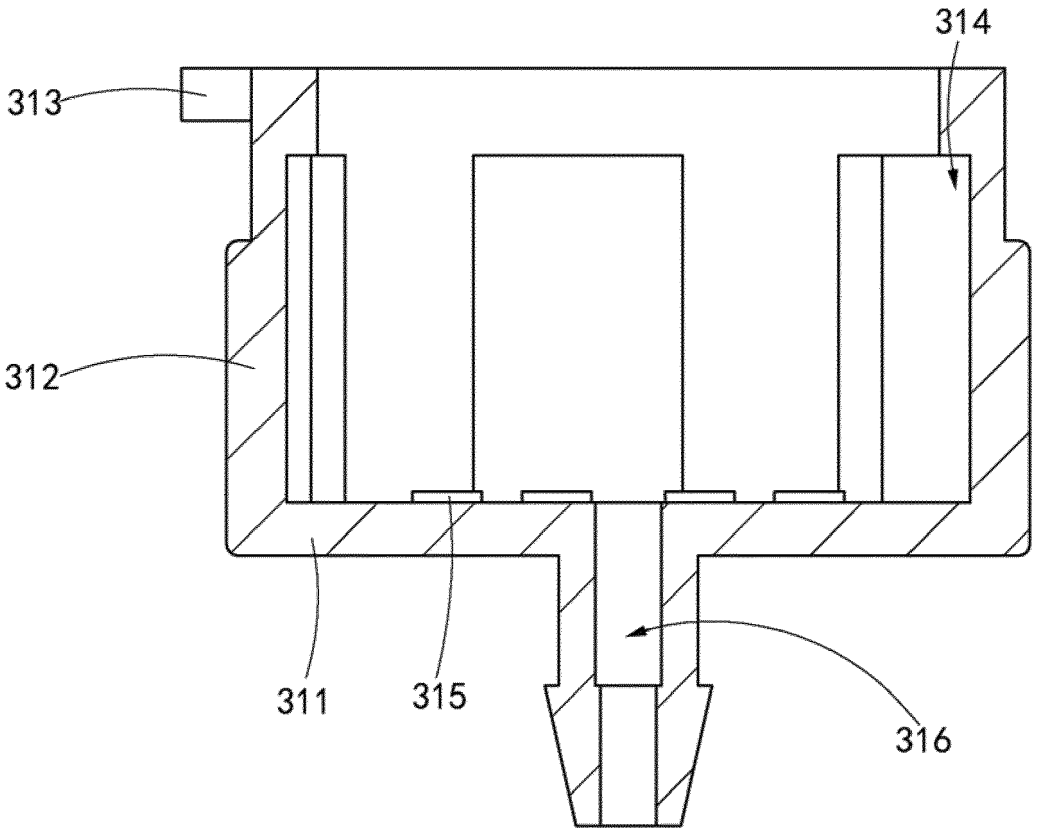

FIG.8

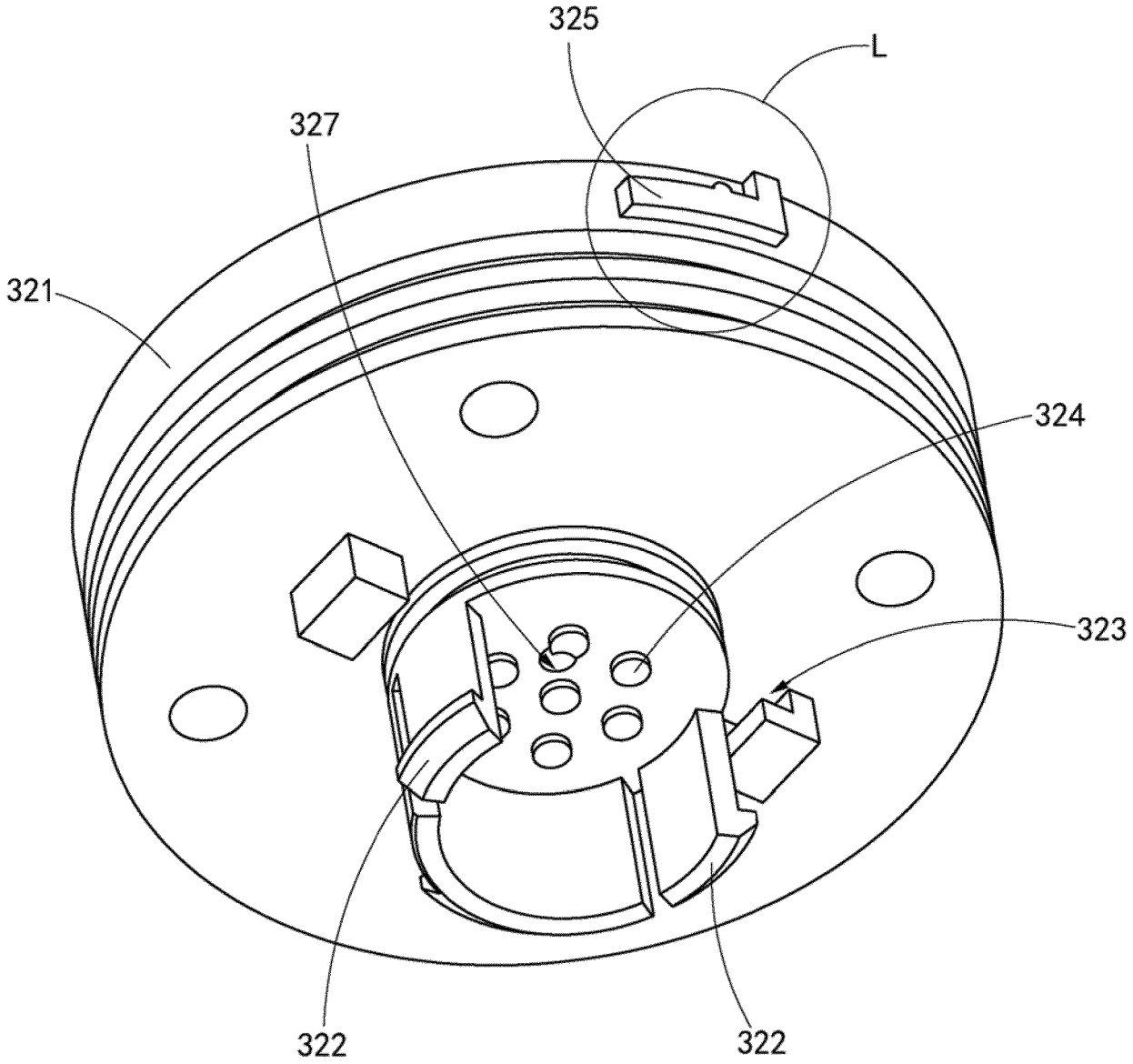

FIG.9

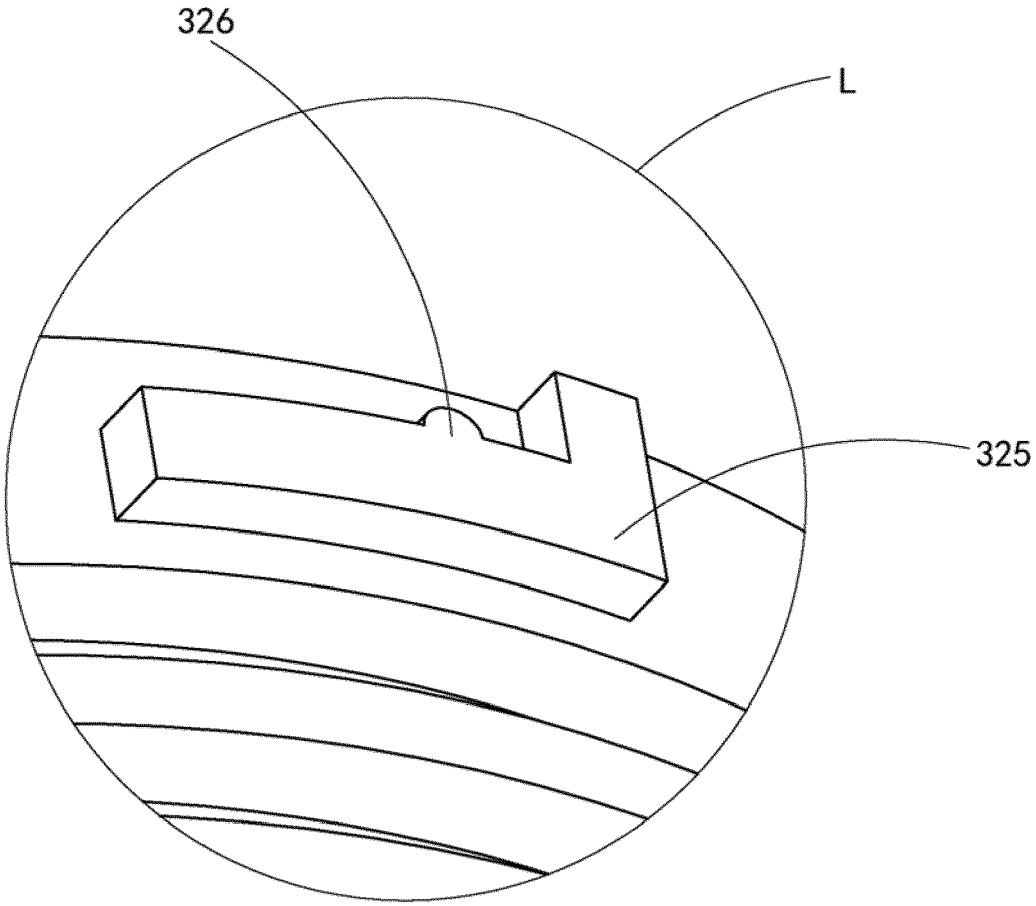

FIG.10

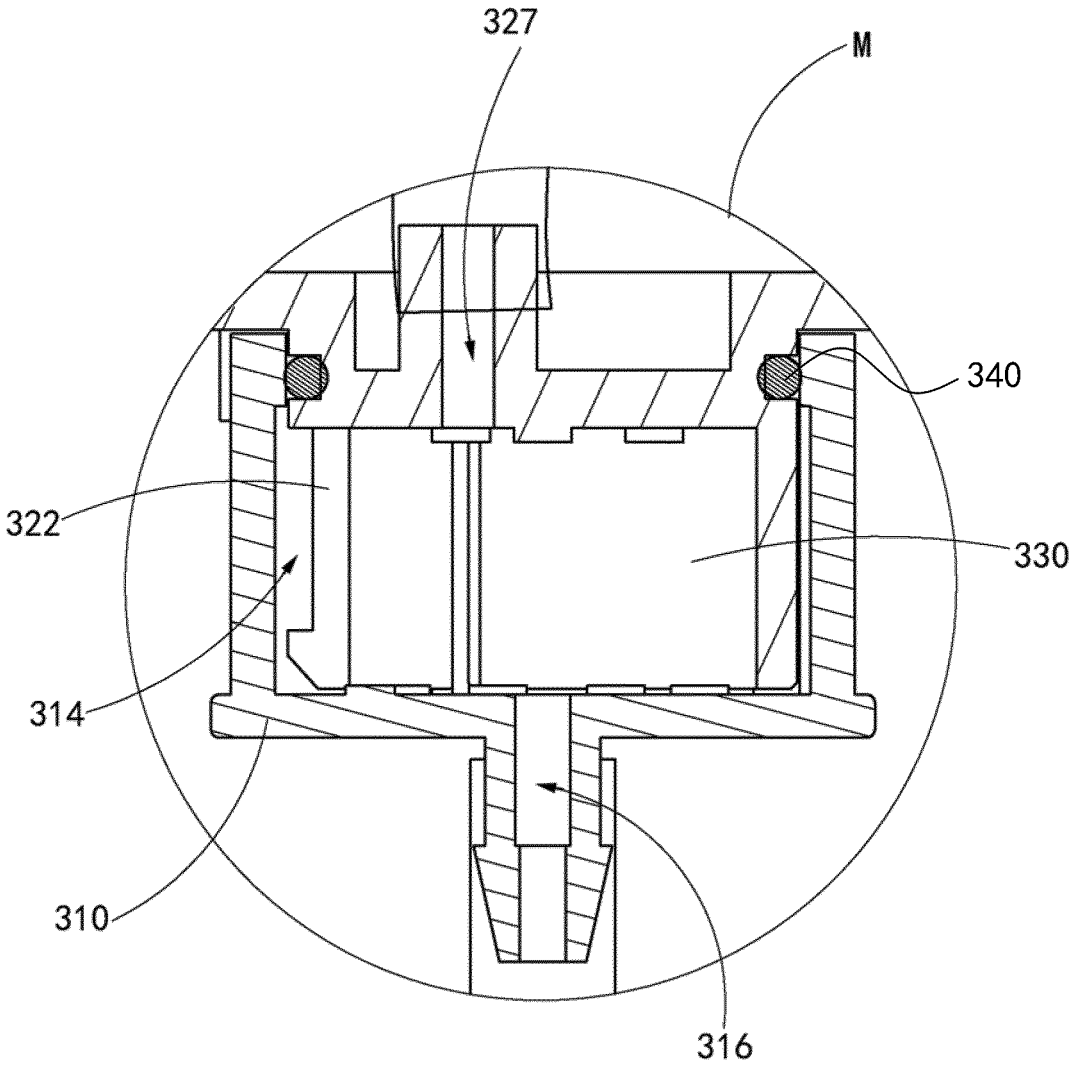

FIG.11

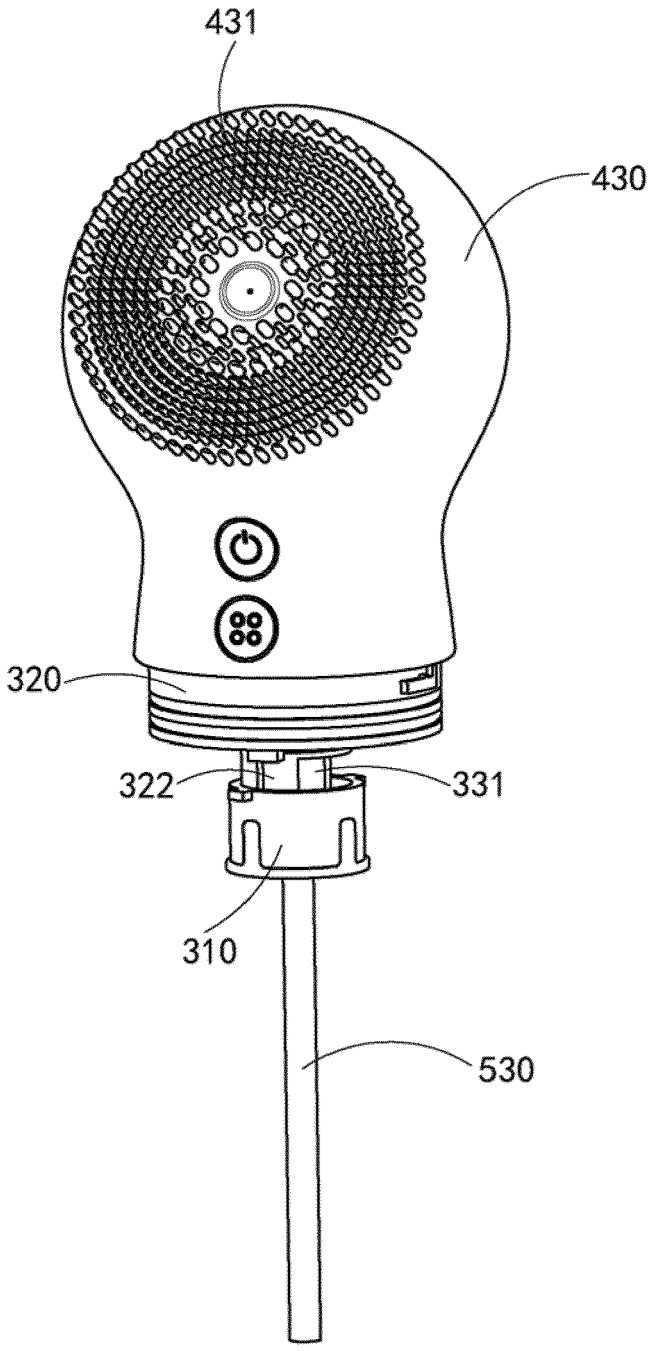

FIG.12

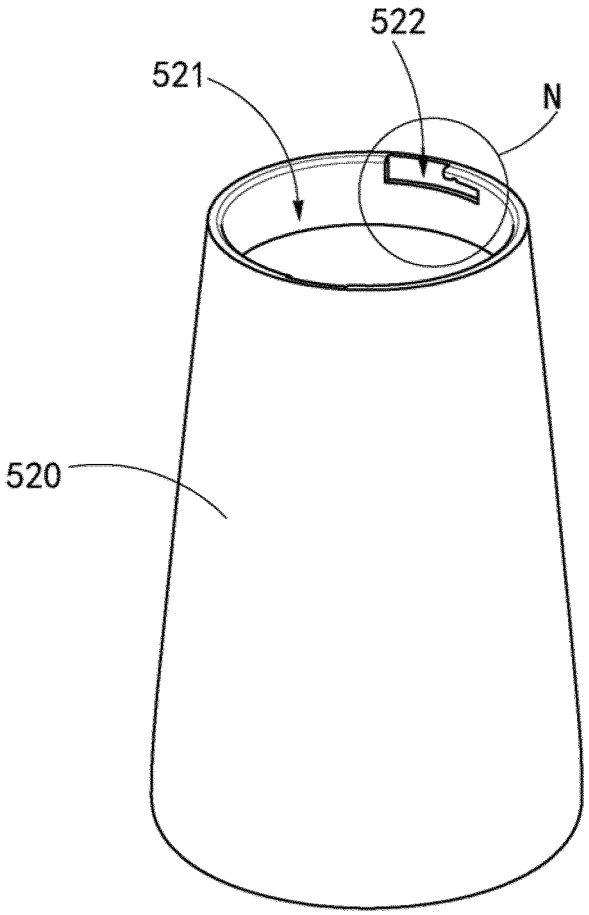

FIG.13

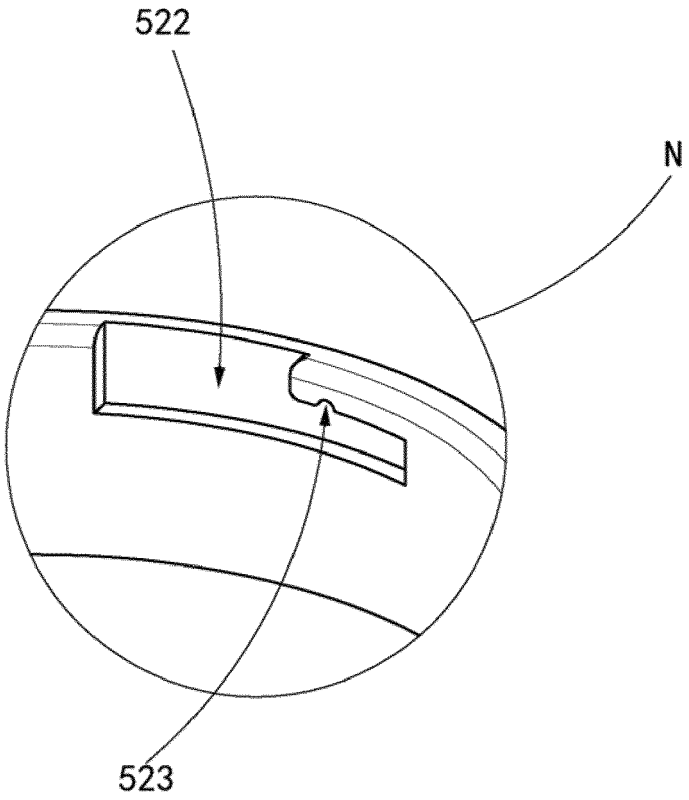

FIG.14

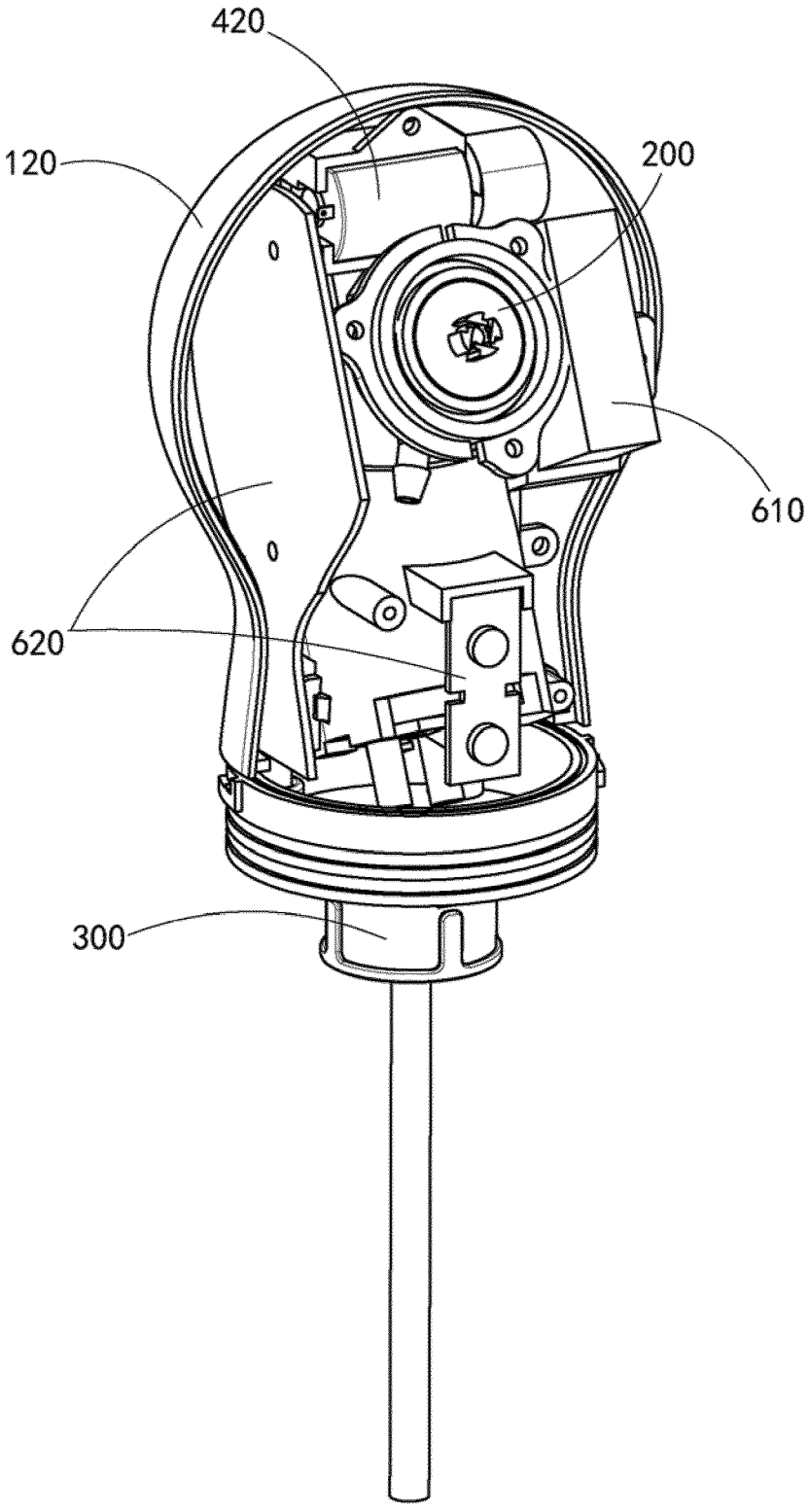

FIG.15

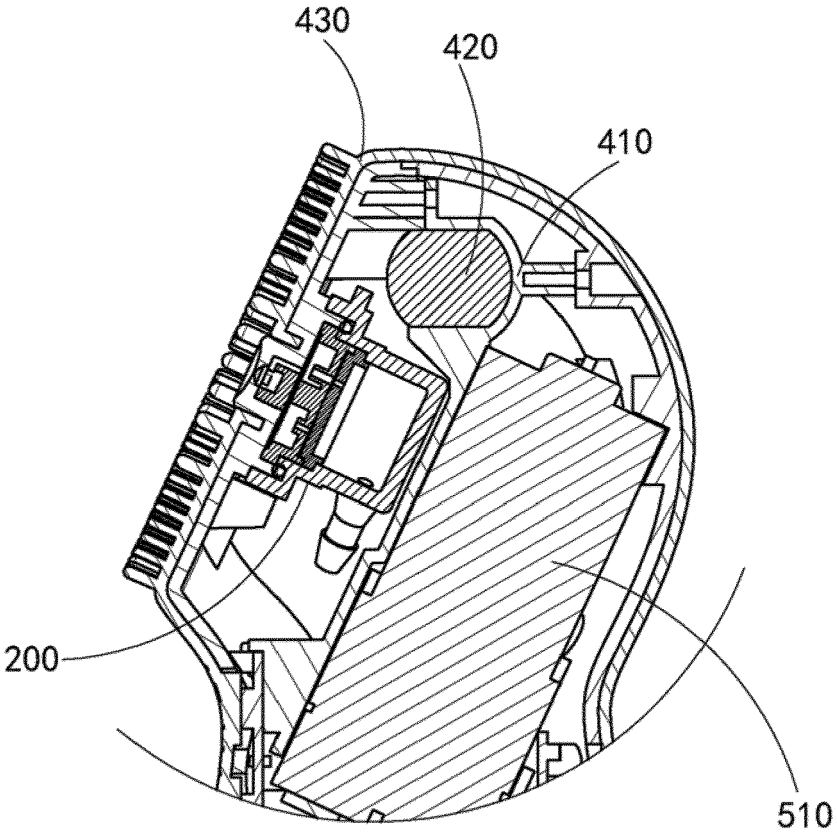

FIG.16

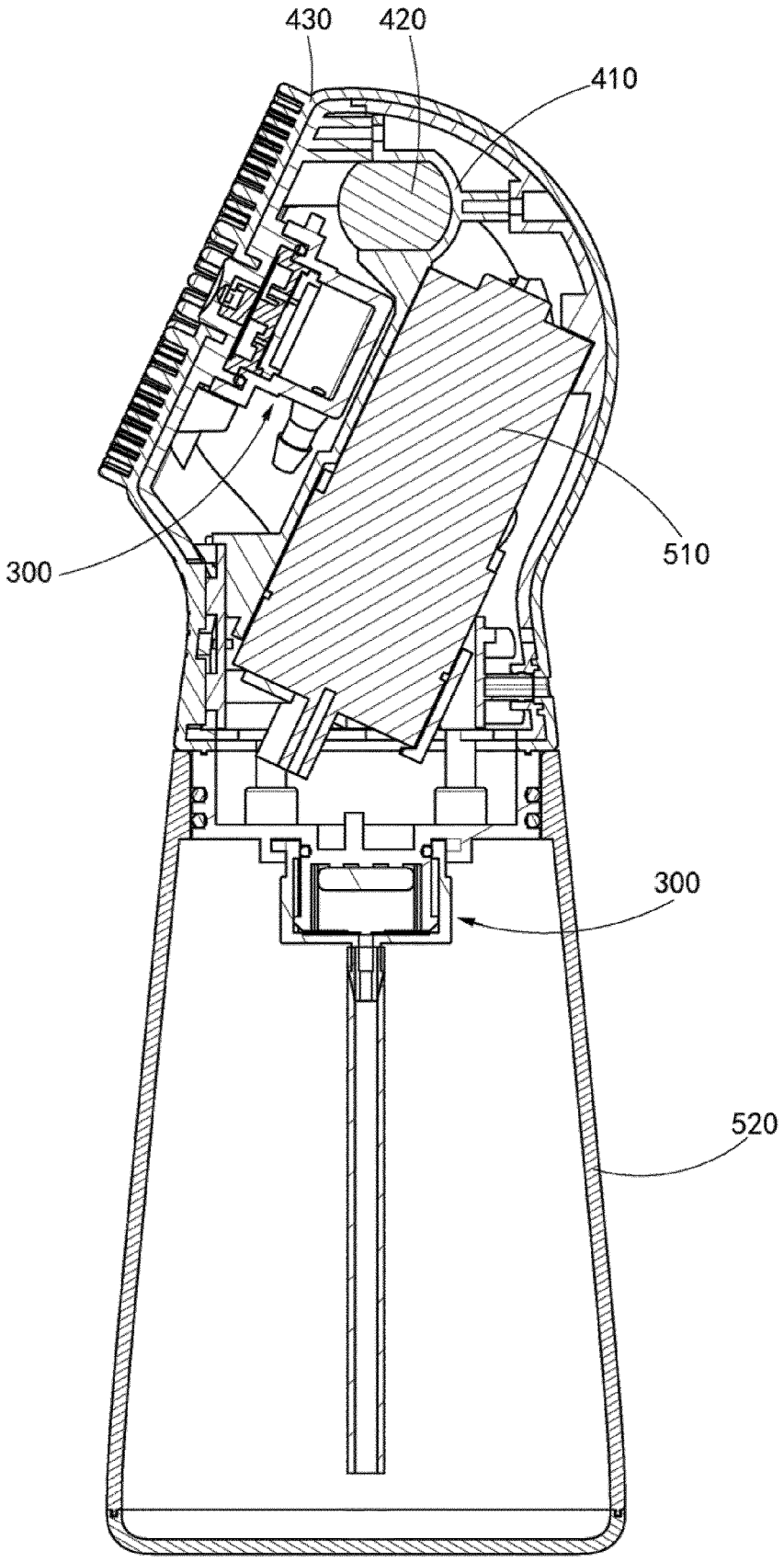

FIG.17

Europäisches Patentamt
European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 22 15 8490

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 108 523 743 A (LI CHANGDE) 14 September 2018 (2018-09-14) * abstract; claims 1-10; figures 1-4 * * paragraph [0047] - paragraph [0063] *	1-6,13	INV. A47K7/04
X	CN 105 640 405 A (SUZHOU NEW DISTR JIANJINJIAN INTELLIGENT TECH CO LTD) 8 June 2016 (2016-06-08)	1	
A	* abstract; claims 1-3; figures 1-4 *	2-13	

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	24 June 2022	Oliveras, Mariana

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 22 15 8490

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24-06-2022

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 108523743 A	14-09-2018	NONE	
CN 105640405 A	08-06-2016	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82