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(54) CLEANING APPARATUS AND SEWAGE TANK THEREOF

(57) A cleaning apparatus includes a chassis, a main body, a first chamber, a second chamber, a first suction device, and a second suction device. The main body is rotatably connected to the chassis, the first chamber is arranged on the main body, and the second chamber is communicated to the first chamber. The first suction device is communicated with the first chamber to provide power to drive external liquid into the first chamber, and the second suction device provides power to drive the liquid in the first chamber entering the second chamber. Due to the liquid driving force from the first chamber to the second chamber provided by the second suction device, the probability of liquid flowing back from the second chamber to the first chamber under conditions such as shaking, tilting, or the main body lying down can be reduced, also the probability of liquid entering the first suction device from the first chamber can be reduced.

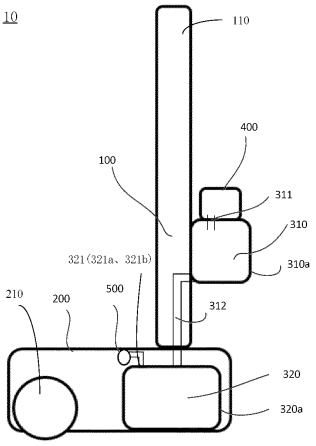

Fig. 4

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the technical field of cleaning apparatus, in particular to a cleaning apparatus and a water tank thereof.

BACKGROUND

[0002] With the continuous increasing cleaning demands and the continuous improvement of the cleaning technology, various floor washers have been provided to clean hard surfaces such as floors, tiles, marbles, etc. Generally, the floor washer cleans the ground by rotating its roller brush located at the front end of its cleaning assembly, clean water may flow to the ground from the roller brush when the roller brush is rotated to clean the stains, oil stains, and impurities. Then, the dirt is suctioned and stored in the cleaning apparatus through a negative pressure device.

[0003] However, when the floor washer is in use or when user maintains the floor washer, liquid in a sewage tank or a clean water tank of the floor washer may flow back or be suctioned into the negative pressure device as a main body of the floor washer is lying down, tilting or shaking. The liquid entering the negative pressure device may affect the reliability of the floor washer; also, the liquid entering the negative pressure device may probably leak through a gap of the housing of the floor washer, causing secondary pollution. A solution for the problem in related art is to limit a lying angle of the main body of the floor washer, so as to reduce the risk of water entering the negative pressure device. However, this will limit the working angle of the floor washer.

SUMMARY

[0004] The embodiments of the present disclosure provides a cleaning apparatus and a water tank thereof, which can suction external liquid into a first chamber through a first suction device, and then suction the liquid in the first chamber into a second chamber through a second suction device, so as to prevent the liquid in the first chamber from flowing back into the first suction device, especially when the cleaning apparatus is shaking, tilting, or when a main body of the cleaning apparatus is in a lying down state relative to a chassis of the cleaning apparatus.

[0005] A first aspect of the embodiments of the present disclosure provides a cleaning apparatus including a chassis, a main body, a first chamber, a second chamber, a first suction device, and a second suction device. The main body is rotatably connected to the chassis, the first chamber is arranged on the main body, and the second chamber is communicated with the first chamber. The first suction device is communicated with the first chamber to provide power to drive an external liquid into the first chamber, and the second suction device is communicated with the second chamber to provide power to drive liquid in the first chamber entering the second chamber.

[0006] A second aspect of the present disclosure provides a cleaning apparatus including a chassis, a main body, a first chamber, a second chamber, and a first suction device. The main body is rotatably connected with the chassis, the first chamber is arranged on the main body, and the second chamber is communicated with the first chamber. The first suction device is communicated with the first chamber through a first suction channel, the first suction device provides power to drive external liquid into the first chamber; the first suction device is also communicated with the second chamber through a second suction channel, and the first suction device provides power to drive liquid in the first chamber entering the second chamber.

[0007] A third aspect of the present disclosure provides a water tank, the water tank is configured to be installed on the main body of the cleaning apparatus, and the main body is rotatably connected with the chassis of the cleaning apparatus. The water tank includes: a first chamber arranged on the main body and capable of communicating with the first suction device, and a second chamber communicated with the first chamber and capable of communicating with a second suction device. The first suction device provides power to drive external liquid into the first chamber, and the second suction device provides power to drive liquid in the first chamber entering the second chamber.

[0008] A fourth aspect of the present disclosure provides a water tank, the water tank is configured to be installed on the main body of the cleaning apparatus, and the main body is rotatably connected with the chassis of the cleaning apparatus. The water tank includes: a first chamber arranged on the main body, a second chamber communicated with the first chamber, and a first suction device. The first suction device is communicated with the first chamber through a first suction channel, the first suction device provides power to drive external liquid into the first chamber; the first suction device is also communicated with the second chamber through a second suction channel, the first suction device provides power to drive liquid in the first chamber entering the second chamber.

[0009] The embodiments of the present disclosure provide a cleaning apparatus and a water tank thereof. The cleaning apparatus includes a chassis, a main body, a first chamber, a second chamber, a first suction device, and a second suction device. The first chamber is arranged on the main body, the first suction device is capable of suctioning external liquid into the first chamber, and then the first suction device or a second suction device suctions the liquid in the first chamber into the second chamber, so as to prevent the liquid in the first chamber from flowing back into the first suction device which may affect the use reliability of the first suction

device, especially when the cleaning apparatus is shaking, tilting, or when the main body of the cleaning apparatus is lying down relative to the chassis.

[0010] It should be understood that the above general description and the detailed description of the following are only exemplary and explanatory, which is not to limit the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] In order to explain the technical solutions of the embodiments of the present disclosure more clearly, the following accompanying drawings are briefly described. Obviously, the accompanying drawings are only some embodiments of the present disclosure, for those skilled in the field, other drawings can be obtained based on these drawings without any creative effort.

Fig. 1 shows a structural schematic diagram of a cleaning apparatus at upright state according to an embodiment of the present disclosure;
Fig. 2 shows a structural schematic diagram of the cleaning apparatus at a tilting state according to an embodiment of the present disclosure;
Fig. 3 shows a structural schematic diagram of the cleaning apparatus at a lying-down state according to an embodiment of the present disclosure;
Fig. 4 shows an overall structure of the cleaning apparatus according to an embodiment of the present disclosure;
Fig. 5 shows an overall structure of the cleaning apparatus according to another embodiment of the present disclosure;
Fig. 6 shows an overall structure of the cleaning apparatus according to a further embodiment of the present disclosure;
Fig. 7 shows a formation of a first chamber and a second chamber when the first housing and the second housing are nested structure according to an embodiment of the present disclosure;
Fig. 8 shows a formation of the first chamber and the second chamber when the first housing and the second housing are nested structure according to another embodiment of the present disclosure;
Fig. 9 shows a formation of the first chamber and the second chamber when the first housing and the second housing are nested structure according to a further embodiment of the present disclosure;
Fig. 10 shows a formation of the first chamber and the second chamber when the first housing and the second housing are nested structure according to a further embodiment of the present disclosure;
Fig. 11 shows a schematic diagram of a control device of the cleaning apparatus;
Fig. 12 shows a cross-sectional view of a water tank of the cleaning apparatus;
Fig. 13 shows a comparison of a liquid level of the cleaning apparatus in lying-down state;
Fig. 14 shows a second suction channel according to an embodiment of the present disclosure;
Fig. 15 shows the second suction channel according to another embodiment of the present disclosure;
Fig. 16 shows the second suction channel according to still another embodiment of the present disclosure;
Fig. 17 shows a first detachable arrangement for separation plates in the second suction channel;
Fig. 18 shows a second detachable arrangement for separation plates in the second suction channel;
Fig. 19 shows a formation of the second suction channel when the first housing is nested in the second housing according to an embodiment of the present disclosure;
Fig. 20 shows a formation of the second suction channel when the first housing is nested in the second housing according to another embodiment of the present disclosure;
Fig. 21 shows a formation of the second suction channel when the first housing is nested in the second housing according to a further embodiment of the present disclosure;
Fig. 22 shows an air leakage section of the first housing according to an embodiment of the present disclosure;
Fig. 23 shows an air leakage section of the first housing according to another embodiment of the present disclosure;
Fig. 24 shows an air leakage section of the first housing according to a further embodiment of the present disclosure;
Fig. 25 shows a liquid leakage channel according to an embodiment of the present disclosure;
Fig. 26 shows a liquid leakage channel according to another embodiment of the present disclosure;
Fig. 27 shows a radial contraction portion according to an embodiment of the present disclosure;
Fig. 28 shows an enlarged diagram of portion A in Fig. 27;
Fig. 29 shows a radial contraction portion according to another embodiment of the present disclosure;
Fig. 30 shows an enlarged diagram of portion B in Fig. 29;
Fig. 31 shows a cross-sectional view of a sealing member;
Fig. 32 shows the cleaning apparatus using a liquid suction device according to an embodiment of the present disclosure;
Fig. 33 shows the cleaning apparatus using a liquid suction device according to another embodiment of the present disclosure;
Fig. 34 shows the cleaning apparatus using a liquid suction device according to a further embodiment of the present disclosure;
Fig. 35 shows a schematic diagram of a handle in a first position;
Fig. 36 shows a schematic diagram of a handle in a second position;

Fig. 37 shows a schematic diagram of removing the first housing from the second housing;
Fig. 38 shows an in-position indication device according to an embodiment;
Fig. 39 shows a cross-sectional diagram of the in-position indication device in Fig. 36;
Fig. 40 shows an enlarged diagram of portion C in Fig. 39;
Fig. 41 shows an in-position indication device according to another embodiment;
Fig. 42 shows a schematic diagram of taking or placing the first housing;
Fig. 43 shows a filter screen according to an embodiment of the present disclosure;
Fig. 44 shows a schematic diagram of a sewage suction pipeline;
Fig. 45 shows a schematic diagram of a filter screen according to another embodiment of the present disclosure;
Fig. 46 shows a schematic diagram of a filter screen according to still another embodiment of the present disclosure;
Fig. 47 shows a schematic diagram of a first suction channel;
Fig. 48 shows another schematic diagram of the first suction channel;
Fig. 49 shows still another diagram of a first suction channel;
Fig. 50 shows still another diagram of a first suction channel;
Fig. 51 shows a sixth sealing member according to an embodiment of the present disclosure;
Fig. 52 shows the sixth sealing member according to another embodiment of the present disclosure;
Fig. 53 shows the sixth sealing member according to a further embodiment of the present disclosure;
Fig. 54 shows a schematic diagram of the first suction device providing suction power for the second chamber;
Fig. 55 shows another schematic diagram of the first suction device providing suction power for the second chamber;
Fig. 56 shows a principal diagram of the first suction device providing suction power for the second chamber;
Fig. 57 shows content detection according to an embodiment;
Fig. 58 shows content detection according to another embodiment;
Fig. 59 shows content detection according to still another embodiment;
Fig. 60 shows content detection according to still another embodiment.

Reference numerals:

[0012]

10, cleaning apparatus;
100, main body; 110, handle; 112, sewage suction pipeline; 112a, sewage suction pipe; 112b, sewage inlet pipe; 112c, outlet of the sewage suction pipeline;
200, chassis; 210, cleaning member;
300, water tank;
310, first chamber; 310a, first housing; 310b, top wall; 310c, side wall; 310d, air leakage section; 310e, movable member; 310f, first body; 310g, second body; 310h, front-end face; 310k, rear-end face; 310m, end face; 310n, sewage inlet pipe hole;
311, first suction channel;
312, liquid leakage structure; 312a, liquid leakage notch;
313, handle; 313d, rotating shaft; 313e, holding portion; 313f, abutment portion; 3131f, first surface; 3132f, second surface; 3133f, abutment surface;
314, in-position indication device; 314a, in-position protrusion; 314b, in-position groove; 314c, limiting portion;
315, accommodation groove; 316. solid waste chamber; 317. air suction port;
318, liquid-blocking structure; 318a, first liquid-blocking portion; 318b, second liquid-blocking portion; 318c, third liquid-blocking portion; 318d, fourth liquid-blocking portion;
319, dirt anti-leakage pipe; 319a, convex edge;
320, second chamber; 320a, second housing; 320b, first inner wall; 320c, second inner wall; 320d, first contact surface; 320e, second contact surface;
321, second suction channel; 321a, air outlet; 321b, air inlet; 321c, separation plate; 3211c, first separation plate; 3212c, second separation plate; 3213c, baffle; 321d, flow guiding outlet; 321e, unit air flow channel; 321f, first side wall; 321g, second side wall; 321h, guiding wall; 321k, first opening; 321m, second opening;
322, separation rack; 325, opening; 326, radial contraction portion; 327, holder;
330, first sealing member;
340, second sealing member; 340a, first sealing portion; 340b, second sealing portion; 340c, sealing body; 340d, sealing lip;
350 - Filter Mesh; 350a - First Filter Mesh; 350b - Second Filter Mesh; 350c - Filter Mesh Base; 350d - Filter Mesh Side Wall; 351 - Rotary Joint; 352 - Filtering Hole; 353 - Rotary Mounting Portion;
360, content detection assembly; 361, first detection assembly; 362, second detection assembly; 363, third detection assembly; 364, electrical connector; 365, contact; 3611, first electrode; 3612, second electrode; 3631, fifth electrode; 3632, sixth electrode; 367, connection hole;
390, third sealing member;
400, first suction device;
500, second suction device;
600, control device;
700, posture detection device;

910, fourth sealing member;
920, fifth sealing member;
930, sixth sealing member.

DETAILED DESCRIPTION

[0013] The following is a clear and complete description of the technical solutions of the embodiments in combination with the accompanying drawings. Obviously, the described embodiments only a part of the embodiments of the present disclosure, rather than all of the embodiments. Based on the embodiments, all other embodiments obtained by a person of ordinary skill in the art without creative labor will fall within the protection scope of the present disclosure.

[0014] Without conflict, the following embodiments and features in the embodiments may be combined with each other.

[0015] Referring to Figs. 1-3, in some embodiments of the present disclosure, a cleaning apparatus 10 includes a main body 100 and a chassis 200. The main body 100 is rotatably arranged on the chassis 200, and includes a handle 110 for users to hold. During the cleaning apparatus 10 being used, user holds the handle 110 and uses the main body 100 to push the chassis 200, so as to control the cleaning apparatus 10 to move forward, backward, or turn, so as to clean the surface to be cleaned through a cleaning member 210 on the chassis 200. Generally, the cleaning apparatus 10 includes a clean water tank and a sewage tank. The clean water tank supplies water to the cleaning member 210 or the ground to wet the surface to be cleaned, making the cleaning member 210 clean the ground better. During cleaning process, a first suction device 400 (such as a negative pressure source, e.g., a fan) may be used by the cleaning apparatus 10 to take back the dirt into the sewage tank. The first suction device 400 is communicated with the sewage tank. However, in case the sewage tank or part of the sewage tank is arranged on the main body 100 which may shake, tilt (compared with the horizontal plane), or get level (compared with the horizontal plane) during the cleaning process, water or water vapor in the sewage tank may enter the first suction device 400 and even cause damage to the first suction device 400. In particular, the smaller the angle between the main body 100 and the horizontal plane, the greater the probability that water enters the first suction device 400. In related art, in order to ensure that water does not enter the first suction device 400, the angle of the main body 100 rotating with respect to the chassis 200 is commonly limited. As a result, the cleaning apparatus 10 cannot clean the low areas such as the bed bottom and the sofa bottom. Based on this, the embodiments of the present disclosure propose solutions as follows.

[0016] Referring to Figs. 1-3, a first aspect of the embodiments of the present disclosure provides a cleaning apparatus 10 including a chassis 200, a main body 100, a first chamber 310, a second chamber 320, a first suction device 400, and a second suction device 500, and the main body 100 is rotatably connected with the chassis 200.

[0017] It should be noted that the main body 100 is rotatably connected with the chassis 200, so that the main body 100 can switch among an upright state (as shown in Fig. 1), a tilting state (as shown in Fig. 2), and a lying-down state (as shown in Fig. 3). When a length direction of the main body 100 (referring to the dotted line as shown in Fig. 1) is approximately (such as $\pm$ 10° to the vertical direction) in perpendicular to the chassis 200 (or the horizontal plane), the cleaning apparatus 10 is in the upright state, which is usually the placement posture of the cleaning apparatus 10; when an angle between the length direction of the main body 100 and the chassis 200 (or the horizontal plane) is an acute angle, the cleaning apparatus 10 is in the tilting state, which is usually the normal working posture of the cleaning apparatus 10; when the length direction of the main body 100 is roughly parallel (for example, $\pm$ 10° to the horizontal direction) to the chassis 200 (or the horizontal plane), the cleaning apparatus 10 is in the lying-down state, which is usually the extreme working posture of the cleaning apparatus 10 for cleaning low areas, such as bed bottom, sofa bottom, etc.

[0018] It should be noted that, the front side, the rear side, the left side, and the right side of the cleaning apparatus 10 are defined in the embodiments of the present disclosure to clearly indicate the orientation. As shown in Fig. 1, the front side refers to the forward side of the cleaning apparatus 10 in non-turning situation; the rear side is the opposite side to the front side, that is, the side that deviates from the forward direction of the cleaning apparatus 10 in non-turning situation; the left side is the left-hand side when a user stands facing the front side; the right side is the right-hand side when a user stands facing the front side. As to the main body 100, the front side refers to the side of the main body 100 pivoting forward, and the rear side refers to the side of the main body 100 pivoting backward. The main body 100 may change its pivoting angle, when the main body 100 is in the upright state (as shown in Fig. 1), the front side of the main body 100 is the forward side of the cleaning apparatus 10 in non-turning situation; when the main body 100 is in the lying-down state (as shown in Fig. 3), the front side of the main body 100 is the upper side of the main body 100, and the rear side of the main body 100 is the lower side of the main body 100.

[0019] Referring to Fig. 4, in some embodiments, the first chamber 310 is arranged on the main body 100, and the second chamber 320 is arranged on the chassis 200. In some other embodiments, as shown in Figs. 5 and 6, both the first chamber 310 and the second chamber 320 are arranged on the main body 100. The first suction device 400 and the second suction device 500 may be both arranged on the main body 100; or the first suction device 400 is arranged on the main body 100 and the second suction device 500 is arranged on the chassis

200; or the first suction device 400 and the second suction device 500 are arranged outside of the cleaning apparatus 10, which is not limited here.

[0020] With regard to how to form the first chamber 310 and the second chamber 320, as shown in Figs. 4-6, in some embodiments, the cleaning apparatus 10 may include a first housing 310a and a second housing 320a, the first housing 310a defines the above-mentioned first chamber 310, the second housing 320a defines the above-mentioned second chamber 320, and the first housing 310a is fixed to the outside of the second housing 320a by assembly (as shown in Fig. 5); or, the first housing 310a is arranged on the main body 100, and the second housing 320a is arranged on the chassis 200 (as shown in Fig. 4). Since the first housing 310a and the second housing 320 are independent of each other, they may be respectively assembled and fixed to the main body 100, as shown in Fig. 4, and the assembly herein means to be installed and fixed together by means of clasps, fastening, etc.. As shown in Fig. 4, the first housing 310a and the second housing 320 may also be separated and arranged on the main body 100 and the chassis 200 respectively. Or, as shown in Fig. 6, the cleaning apparatus 10 includes a first housing 310a and a second housing 320a, at least part of the first housing 310a is nested into the second housing 320a. Typically, referring to Figs. 7-10, a portion of the inner wall of the second housing 320a and a portion of the outer wall of the first housing 310a define the second chamber 320; the first housing 310a defines the first chamber 310 (as shown in Figs. 7 and 8); or, a portion of the inner wall of the first housing 310a and a portion of the inner wall of the second housing 320 define the first chamber 310 (as shown in Figs. 9 and 10).

[0021] It should be noted that "external liquid" described in the embodiments of the present disclosure may be dirt (including solid-liquid mixture and sewage), or clean water. The first suction device 400 in the embodiments of the present disclosure is configured to mainly provide power to drive the external liquid entering the first chamber 310. And, the "external" herein refers to the outside of the first chamber 310 and the second chamber 320.

[0022] In case the liquid needs to be suctioned is sewage or solid-liquid mixture, the water tank 300 may be a sewage tank, and the first suction device 400 can suction the dirt generated during the cleaning process of the cleaning apparatus 10 to the sewage tank, to facilitate a subsequent operation for users.

[0023] In case the liquid needs to be suctioned is clean water, the first suction device 400 may suction the external clean water into the first chamber 310. In case the first chamber 310 and the second chamber 320 define a sewage tank, the clean water can clean the first chamber 310 and/or the second chamber 320 to maintain the water tank.

[0024] External liquid being solid-liquid mixture or sewage will be described in detail as an example.

[0025] Referring to Figs. 4-6, the first suction device 400 is configured to suction the external dirt (including solid-liquid dirt, sewage, etc.) during the cleaning process of the cleaning apparatus 10 into the first chamber 310, to take back stains, oil stains, or impurities on the ground. Also, the cleaning apparatus 10 is capable of suctioning a mixture of external solid dirt and sewage into the first chamber 310, which is not limited here. The chassis 200 of the cleaning apparatus 10 is provided with a cleaning member 210 for cleaning surfaces which needs to be cleaned. The cleaning member 210 may be a roller brush. One end of the main body 100 is provided with a handle 110 for user to hold, user holds the handle 110 to drive the main body 100 to push the chassis 200 forward, backward, or turn. The first chamber 310 is arranged on the main body 100, the second chamber 320 is communicated with the first chamber 310, and the first suction device 400 is communicated with the first chamber 310, so that the first suction device 400 is capable of providing power to drive external liquid entering into the first chamber 310. Typically, the first suction device 400 is a high-flow negative pressure source capable of providing negative pressure, such as a fan or the like, which is able to suction external liquid into the first chamber 310. The second chamber 320 is communicated with the first chamber 310, it may be understood that the second chamber 320 is indirectly communicated with the first suction device 400 through the first chamber 310, in case the communication between the first chamber 310 and the second chamber 320 is cut off, the first suction device 400 is merely communicated with the first chamber 310.

[0026] As shown in Figs. 4 to 10, a partitioning member (which may be the bottom wall and/or the side wall of the first chamber 310) is provided between the first chamber 310 and the second chamber 320, so as to make the first chamber 310 and the second chamber 320 be independent with each other, and the partitioning member can further prevent the liquid in the second chamber 320 from flowing back to the first chamber 310. The communication between the first chamber 310 and the second chamber 320 herein means that there is a channel between the two chambers for liquid flowing through, wherein, the "channel" includes but is not limited to, a hole, a pipe, a gap, etc., the channel is configured to allow liquid in the first chamber 310 to enter the second chamber 320.

[0027] The second suction device 500 is communicated with the second chamber 320, and the second suction device 500 is capable of providing power to drive the liquid in the first chamber 310 into the second chamber 320, which may further prevent the liquid in the second chamber 320 from flowing back to the first chamber 310.

[0028] The second suction device 500 introduced by the embodiments of the present disclosure can drive the liquid in the first chamber 310 into the second chamber 320, so liquid in the first chamber 310 can be reduced or

removed, as such, the risk of liquid entering the first suction device 400 is reduced. It should be noted that the first suction device 400 is configured to drive external liquid into the first chamber 310, it has a long suction path, requiring a larger flow rate; while the second suction device 500 is configured to drive the liquid in the first chamber 310 into the second chamber 320, thus the required flow rate can be slight smaller. In case the second suction device 500 is an air suction device, there is also a liquid intake risk for the second suction device 500. However, it should be understood that when facing a same amount of liquid to be suctioned, the larger the flow rate, the greater the risk of liquid entering the suction device. Since a smaller flow rate is required to drive the liquid in the first chamber 310 into the second chamber 320, the second suction device 500 can be a suction device with smaller flow rate, thus the risk of liquid entering the second suction device 500 is reduced. Since the flow rate required to drive the liquid in the first chamber 310 into the second chamber 320 may be small, the air resistance of the suction channel which is communicated with the second suction device 500 can be increased, for example, by adding some blocking structures which can prevent water and/or water vapor entering the second suction device 500, to further reduce the risk of liquid intake of the second suction device 500.

[0029] In addition, the risk of liquid intake of the first suction device 400 can also be reduced by adding blocking structures. The blocking structures for the first suction device 400 may be simple to provide an appropriate air resistance for the first suction device 400, since it is necessary to ensure that the first suction device 400 can always provide a larger suction flow rate to ensure the external liquid being suctioned into the first chamber 310, such that the risk of liquid intake is reduced and impact on the first suction device 400 to always provide a large suction flow rate is minimized. In the following embodiments, it will describe in detail how to design a blocking structure to reduce the risk of liquid intake of the second suction device 500 and the specific form of the blocking structure.

[0030] In some embodiments, the second suction device 500 includes an air suction device, the first chamber 310 is communicated to the second chamber 320 through a liquid leakage structure 312, and a cross-sectional area of a suction port of the air suction device 500 is similar to a cross-sectional area of the liquid leakage structure. "Similar" means that the area difference between the two is relatively small. For example, it could be less than 20 square millimeters. The cross-sectional areas of the two are arranged to be similar to each other, so that "suction force" of the second suction device 500 can effectively act on the liquid leakage structure 312 at a ratio close to 1:1, so the liquid in the first chamber 310 can smoothly enter the second chamber 320 through the liquid leakage structure 312.

[0031] In the embodiments of the present disclosure, during the cleaning apparatus 10 is used, liquid in the first chamber 310 come from the outside is prone to enter the first suction device 400 since the first suction device 400 is directly communicated with the first chamber 310, especially when the first chamber 310 is full filled with the liquid or the main body 100 is tilted or lying down. However, the provided second suction device 500 is communicated with the second chamber 320 and provides power to drive the liquid in the first chamber 310 into the second chamber 320, as such, there is always a relatively small amount of liquid in the first chamber 310, thus minimizing the risk of the liquid entering the first suction device 400 even though the main body 100 is shaking, tilted, or lying down, which can cause secondary pollution and even damage to the first suction device 400. In addition, the second suction device 500 can effectively prevent the liquid in the second chamber 320 flowing back to the first chamber 310, which may cause failure of the first suction device 400.

[0032] It should be noted that the first suction device 400 and the second suction device 500 are independent suction sources, and the suction power of both can be controlled independently. Typically, suction power of the first suction device 400 may be adjusted based on environmental factors during the first suction device 400 provides power to drive the solid-liquid mixture, sewage, or clean water entering the first chamber 310, while the second suction device 500 may maintain a greater power in any case to ensure that liquid is suctioned into the second chamber 320 from the first chamber 310.

[0033] In some embodiments, as shown in Fig. 11, the cleaning apparatus 10 may further include a posture detection device 700 and a control device 600. The posture detection device 700 is configured to detect a current motion state parameter of the cleaning apparatus 10. The control device 600 is connected to the posture detection device 700, the control device 600 is also connected to the first suction device 400 and/or the second suction device 500 (by means of a wired connection or a wireless connection), and is configured to adjust an operating parameter of the first suction device 400 and/or the second suction device 500 according to the current motion state parameter of the cleaning apparatus 10 detected by the posture detection device 700, to reduce the likelihood of the liquid in the first chamber 310 entering the first suction device 400 and/or the second suction device 500.

[0034] Illustratively, the motion state parameter of the cleaning apparatus 10 detected by the posture detection device 700 includes at least one of an angle between the main body 100 and the chassis 200, an angular velocity between the main body 100 and the chassis 200, an angular acceleration between the main body 100 and the chassis 200, a motion speed of the cleaning apparatus 10, a motion acceleration of the cleaning apparatus 10, and a height of the first chamber 310 relative to a ground. In the embodiments, the posture detection device 700 may be configured to determine whether the cleaning apparatus 10 is currently in the upright state, the

tilting state, or the lying-down state. Also, the posture detection device 700 may detect the speed or acceleration of the cleaning apparatus 10 during its movement while in operation. If the main body 100 is in the lying-down state or the cleaning apparatus 10 experiences excessive shaking (i.e., the acceleration is too high) or moves too quickly during operation, to protect the first suction device 400 and the second suction device 500, the control device 600 may adjust an operating parameter of the first suction device 400 and/or the second suction device 500, namely the suction force, the operating power, the operating duration, or the operating current of the first suction device 400 or the second suction device 500, according to the current motion state parameter detected by the posture detection device 700. This reduces the risk of the liquid in the first chamber 310 and/or the second chamber 320 entering the first suction device 400 and/or the second suction device 500 when the cleaning apparatus 10 is shaking or in the tilting state, or when the main body 100 is in the lying-down state.

[0035] In some embodiments, as shown in Fig. 1, the cleaning apparatus 10 includes a water tank 300, and the first chamber 310 and the second chamber 320 are defined in the water tank 300. If dirt is collected, the water tank 300 is served as a sewage tank. In case the cleaning apparatus 10 is in the upright state, the first chamber 310 is located upon the second chamber 320. The water tank 300 may be detachably mounted on the main body 100, the first suction device 400 and the second suction device 500 are arranged on the main body 100, allowing the first suction device 400 to suction external liquid into the first chamber 310 of the sewage tank 300, and the second suction device 500 to suction the liquid in the first chamber 310 into the second chamber 320.

[0036] In some embodiments, as shown in Fig. 7, the cleaning apparatus 10 may further include a first detection assembly 361. The control device 600 is connected to the first detection assembly 361. The first detection assembly 361 is arranged in the first chamber 310 and configured to detect information of content accommodated in the first chamber 310. This allows the control device 600 to adjust the operating parameter of the first suction device 400 and/or the second suction device 500 according to the content information detected by the first detection assembly 361. The content information may include an amount of solid waste accommodated, a liquid level, information on presence or absence of liquid, and the like.

[0037] Illustratively, a filter screen 350 is provided in the first chamber 310 to allow the first chamber 310 to define separated solid and liquid chambers. In this case, the content information may be the amount of solid waste accommodated.

[0038] Illustratively, the first detection assembly 361 in the first chamber 310 is arranged at the upper part of the first chamber 310.

[0039] Illustratively, the first detection assembly 361 in the first chamber 310 is arranged on the upper rear side of the first chamber 310. As such, when the cleaning apparatus is in the lying-down state, if the first detection assembly 361 is triggered by liquid, it indicates that there is a risk of liquid intake of the first suction device 400 at this moment.

[0040] Further, the cleaning apparatus 10 may include an indication device (not shown). The indication device is electrically connected to the first detection assembly 361, such that when the amount of dirt accommodated in the first chamber 310 reaches a preset value or a trigger occurs, the indication device can notify users to replace or clean the first chamber 310 and/or the second chamber 320, thereby reducing the possibility of safety hazards caused by the backflow of liquid in the first chamber 310 and the second chamber 320.

[0041] Illustratively, the control device 600 is connected to the first detection assembly 361 and the first suction device 400 and/or the second suction device 500. When the amount of dirt accommodated in the first chamber 310 reaches the preset value or a trigger occurs, the control device 600 may adjust the operating parameter of the first suction device 400, to reduce the suction force of the first suction device 400 or turn off the first suction device 400, thereby reducing the possibility of the liquid in the first chamber 310 entering the first suction device 400.

[0042] When the amount of dirt in the first chamber 310 is relatively large (for example, there is a lot of solid waste in the first chamber 310), it can to some extent make it difficult for the liquid in the first chamber 310 to enter the second chamber 320. In such scenario, the control device 600 may adjust the operating parameter of the second suction device 500 to increase the suction force of the second suction device 500. This allows the second suction device 500 to provide a greater suction power to draw a sufficient amount of liquid from the first chamber 310 into the second chamber 320.

[0043] It should be noted that the first detection assembly 361 detects the amount of dirt in the first chamber 310, including the detection of solid content, viscous content, and liquid content accommodated in the first chamber 310. The specific detection methods include, but are not limited to, the detection of the height of dirt accumulation, the weight of dirt, and even the direct acquisition of the amount of dirt through visual means. The present disclosure does not limit the specific detection methods.

[0044] In an embodiment, the cleaning apparatus includes a second detection assembly 362, which is configured to detect information of content accommodated in the second chamber. Illustratively, when the amount of dirt accommodated in the second chamber 320 reaches a preset value, the control device 600 may adjust the operating parameter of the second suction device 500, to reduce the suction force of the second suction device 500 or turn off the second suction device 500, thereby reducing the likelihood of the liquid in the second chamber 320 entering the second suction device 500. In this case, to

reduce the probability of liquid intake of the first suction device 400, the control device 600 may reduce the suction force of the first suction device 400 or turn off the first suction device 400 when the amount of dirt accommodated in the second chamber 320 reaches the preset value, to prevent continuous increase of liquid in the second chamber 320.

[0045] Illustratively, the operating parameters of the first suction device 400 and the second suction device 500 include at least one of an operating power, an operating duration, an operating voltage, an operating duty cycle current, and the like. This allows the control device 600 to control the operating duration and suction force of the first suction device 400 and the second suction device 500 by the operating parameters, such that external liquid can enter the first chamber 310, and the liquid in the first chamber 310 can enter the second chamber 320. Moreover, under the control of the control device 600, the operating parameters of the first suction device 400 and the second suction device 500 can be flexibly adjusted according to the current state of the cleaning apparatus 10, or based on the amount of dirt in the first chamber 310 and/or the second chamber 320. In particular, when the amount of liquid dirt is relatively large, the suction device may be turned off in time or the suction force of the suction device may be reduced (the greater the suction force, the higher the operating power required, and the higher the operating power, the greater the risk of liquid intake of the suction device), to provide timely protection for the first suction device 400 and the second suction device 500.

[0046] Moreover, since the operating parameter of the second suction device 500 can be flexibly adjusted according to the amount of dirt in the first chamber 310, the operating power of the second suction device 500 can be reduced when there is less dirt in the first chamber 310, and the operating power of the second suction device 500 can be increased when there is more dirt in the first chamber 310. By matching the amount of dirt in the first chamber 310 with the operating parameter of the second suction device 500, the operating parameter of the second suction device 500 can be dynamically adjusted to prevent consistent high noise levels of the second suction device 500 caused by always operating at high powers. This reduces the impact of operational noise on users, thereby effectively enhancing the user experience.

[0047] In some embodiments, as shown in Fig. 7, the cleaning apparatus 10 may further include a first detection assembly 361, and the first detection assembly 361 is arranged in the first chamber 310 and configured to detect the information of content accommodated in the first chamber. Typically, as shown in Fig. 18 and Fig. 20, a filter screen 352 is arranged in the first chamber 310 to allow the first chamber 310 defining separated solid and liquid chambers, in this case, the information of content accommodated in the first chamber may indicate the amount of solid waste that can be accommodated.

[0048] In some embodiments, referring to Figs. 4-10, the first chamber 310 and the second chamber 320 are communicated through the liquid leakage structure 312, such that liquid within the first chamber 310 is capable of entering the second chamber 320. The liquid leakage structure 312 may be a leakage hole, a leakage passage, or a leakage gap disposed between the first chamber 310 and the second chamber 320, which is not limited here. It should be noted that the liquid leakage area formed by the liquid leakage structure 312 may be minimized, and concentrated. For example, the ratio of the area of the liquid leakage structure 312 to the cross-sectional area of the water tank is less than 1/4, or the area of the liquid leakage structure 312 is less than 1 square centimeter. In this way, the rest of the bottom wall of the first housing 310a can isolate the first chamber 310 and the second chamber 320, and the second suction device 500 is allowed to concentrate its suction force on the small liquid leakage structure 312, such that liquid in the first chamber 310 can be quickly suctioned into the second chamber 320. As such, the possibility of liquid flowing back to the first chamber 310 from the second chamber 320, or swaying liquid flowing back to the first chamber 310 when the cleaning apparatus 10 is shook will be reduced. That is, most of the liquid remains in the second chamber 320 and the amount of liquid retained in the first chamber 310 is less, which reduces the risk of liquid entering the first suction device 400.

[0049] It should be noted that when the first chamber 310 is located above the second chamber 320, both the gravity of the liquid and the suction force provided by the second suction device 500 may drive the liquid in the first chamber 310 entering the second chamber 320.

[0050] In some embodiments, the liquid leakage structure 312 may be set at the rear side of the first chamber 310. In this way, when the main body 100 is tilted backward or lying down, the liquid leakage structure 312 can be at the lowest point of the first chamber 310, to facilitate flow of the liquid from the first chamber 310 into the second chamber 320 when the main body 100 is tilted backward or lying down during use.

[0051] In some embodiments, the liquid leakage structure 312 may be arranged at a lower portion of the first chamber 310. The lower portion of the first chamber 310 refers to the bottom wall of the first chamber 310 or a side wall 310c of the first chamber 310 which is closer to the chassis 200. By positioning the liquid leakage structure 312 at the lower portion, when the main body 100 is tilted or upright, the liquid leakage structure 312 is positioned at the lowest point of the first chamber 310, so that all the liquid in the first chamber 310 can flow into the second chamber 320 through the liquid leakage structure 312.

[0052] In some embodiments, the liquid leakage structure 312 is arranged at a lower rear portion of the first chamber 310. In this case, regardless of whether the main body 100 is tilted, upright, or lying down, it can ensure that the liquid leakage structure 312 is located at the lowest point of the first chamber 310 in its current state, so that all the liquid in the first chamber 310 can flow

into the second chamber 320 through the liquid leakage structure 312.

[0053] In one embodiment, referring to Fig. 12, the maximum size of the liquid leakage structure 312 along the front-rear direction is smaller than the minimum size of the liquid leakage structure 312 along the left-right direction, such that the liquid leakage structure 312 can be closer to the rear side while ensuring efficient liquid flow. Typically, the liquid leakage structure 312 may have a flat shape.

[0054] In an embodiment, there is one liquid leakage structure 312 or a plurality of liquid leakage structures 312.

[0055] In the embodiments of the present disclosure, the second suction device 500 may be an air suction device such as a vacuum pump, a fan; or a liquid suction device such as a water pump, a peristaltic pump, which is not limited here, as long as it can provide power to drive the liquid in the first chamber 310 entering the second chamber 320. The following is an example of the second suction device 500 as an air suction device.

[0056] In some embodiments, the second suction device 500 includes an air suction device 500, and the air suction device 500 is communicated with the second chamber 320, so the air suction device 500 can suction the air in the second chamber 320 to allow a negative pressure generating in the second chamber 320. In this case, in addition to the liquid in the first chamber 310 flowing into the second chamber 320 under the influence of gravity, the negative pressure generated by the air suction device 500 can also provide a certain auxiliary force to drive the liquid in the first chamber 310 entering the second chamber 320. The air suction device 500 may be a vacuum pump, an air pump, a fan or the like which is capable of suctioning air.

[0057] Referring to Figs. 4-6, the first suction device 400 is communicated with the first chamber 310 through a first suction channel 311, and the second suction device 500 is communicated with the second chamber 320 through a second suction channel 321. The first chamber 310 may generate a negative pressure by virtue of the first suction device 400 to allow external liquid entering the first chamber 310 and then being suctioned into the second chamber 320 by virtue of the second suction device 500. Illustratively, as shown in Figs. 4 and 5, the second suction channel 321 is a suction interface; or, as shown in Fig. 6, the second suction channel 321 is an air channel.

[0058] It should be understood that, during the first suction device 400 and the air suction device 500 are working, the negative pressure of the first chamber 310 at the connection between the first chamber 310 and the second chamber 320 may be smaller than the negative pressure of the second chamber 320 at the connection between the first chamber 310 and the second chamber 320, so that the liquid in the first chamber 310 can flow into the second chamber 320 smoothly; due to the negative pressure difference, the dirt in the first chamber 310 can easily enter the second chamber 320, and since the liquid has fluidity, the liquid in the second chamber 320 would not return to the first chamber 310 in case the cleaning apparatus 10 is tilted, lying down, or shaking, which effectively protects the first suction device 400.

[0059] In some embodiments, a filtering member may be provided in the first chamber 310 to filter the dirt, allowing the solid waste to retained in the first chamber 310 and the liquid in the dirt to enter the second chamber 320 under its own gravity and the negative pressure generated by the air suction device. With regard how to design the filtering member in the first chamber 310 and the specific structures of the filtering member will be described in detail in subsequent embodiments.

[0060] Compared with the related art, the cleaning apparatus 10 in the embodiments of the present disclosure is additionally provided with the second suction device 500. In case the second suction device 500 is an air suction device 500, similar to the first suction device 400, the air suction device 500 also faces the risk of damage caused by liquid intake. In order to further reduce the risk of liquid intake of the air suction device 500 (the second suction device 500), the embodiments of the present disclosure propose solutions as follows.

[0061] In some embodiments, referring to Figs. 4-10, the second suction channel 321 includes an air inlet 321b and an air outlet 321a, the air inlet 321b is communicated with the second chamber 320, and the air outlet 321a is communicated with the air suction device 500 (the second suction device 500). The shape of the second suction channel 321 is not limited herein.

[0062] As shown in Figs. 4-10, the air inlet 321b of the second suction channel 321 may be located at the front side of the second chamber 320, in case the cleaning apparatus 10 is lying down, the air inlet 321b can be kept as far away from the liquid level in the second chamber 320 as possible, so as to reduce the probability that the liquid in the second chamber 320 is suctioned into the air inlet 321b. Further, when the cleaning apparatus 10 is lying down, the farther the air inlet 321b is from the liquid level of the second chamber 320, the larger the volume of the second chamber 320 can be utilized. For example, as the air inlet 321b is arranged at the front side of the second chamber 320, in case the cleaning apparatus 10 is lying down, the liquid level in the second chamber 320 may approach the front side of the second chamber 320, while if the air inlet 321b is arranged at the middle of the second chamber 320, in order to reduce the liquid intake probability of the first suction device 400 from the air inlet 321b, the liquid level in the second chamber 320 should be controlled to be lower than the middle portion of the second chamber 320. Therefore, the liquid level of the former is higher than that of the latter, namely, the liquid storage capacity of the second chamber 320 with the air inlet 321b locating at the middle is not as good as that of when the air inlet 321b being arranged at the front side of the second chamber 320. Therefore, arranging the air inlet 321b at the front side of the second chamber 320

may increase the effective utilization volume of the second chamber 320.

[0063] In some embodiments, as shown in Figs. 4-10, the air inlet 321b of the second suction channel 321 is located at the top of the second chamber 320, the "top" herein means at the top of the whole second chamber 320, such an arrangement allows the air inlet 321b being away from the liquid level of the second chamber 320, thus the probability of the liquid in the second chamber 320 being suctioned into the second suction channel 321 is reduced.

[0064] In some embodiments, as shown in Figs. 12 and 13, the maximum size of the air inlet 321b along the front-rear direction of the main body 100 is smaller than the minimum size of the air inlet 321b along the left-right direction of the main body 100; typically, the air inlet 321b may have a flat shape. In the case the position of the air inlet 321b is fixed, in a lying down state, the flat shape of the air inlet 321b makes the lowest point of the opening of the air inlet 321b be as high as possible. In this way, at the same liquid level, the lower part of the air inlet 321b can be further away from the liquid level in the second chamber 320, thus the probability of the liquid in the second chamber 320 entering the second suction channel 321 is reduced. In the case the cleaning apparatus 10 is lying down, the further the air inlet 321b is from the liquid level of the second chamber 320, the larger the effective volume of the second chamber 320 can be utilized. For example, as shown in Fig. 13, in the case the cleaning apparatus 10 is lying down and the air inlet 321b has a flat shape, the liquid level in the second chamber 320 is allowed to be closer to the front side of the second chamber 320; however, if the air inlet 321b is not flat but is set to increase its thickness in the front-to-back direction, that is, in a lying down state, the opening of the air inlet 321b is lowered in the height direction, in this case, the liquid level in the second chamber 320 need to be controlled to be lower than the opening to reduce the probability of liquid entering the second suction device 500 from the air inlet 321b, correspondingly, the effective volume of the second chamber 320 is reduced. Therefore, the air inlet 321b having a flat shape can also increase the effective volume of the second chamber 320.

[0065] It should be noted that the whole second suction channel 321 may have a flat shape.

[0066] In addition, the air inlet 321b and/or the second suction channel 321 being both located at the front side and/or top of the second chamber 320 can further reduce the probability of liquid entering the air inlet 321b and increase the effective volume of the second chamber 320.

[0067] In one embodiment, as shown in Fig. 14, the cross-sectional area of the second suction channel 321 can gradually decrease in the direction from the air inlet 321b to the air outlet 321a, such an arrangement allows the air inlet 321b to be as large or wide as possible in a limited space, so as to reduce the probability of the air inlet 321b being completely blocked by the liquid. In this way, even if the air inlet 321b is partially blocked by liquid, the air suction device can still perform suction through the part of the air inlet 321b which is not blocked by the liquid, due to the greater flowability of air compared to liquid. As such, the second suction device 500 can continue to work in such a situation, so the possibility of a failure of the second suction device 500 caused by partial water intake of the air inlet 321b is reduced. Further, the cross-sectional area of the second suction channel 321 gradually decreases along a suction direction, even if there is liquid entering the second suction channel 321 through the air inlet 321b, the liquid that is shaken into the second suction channel 321 is prone to hit the inner wall of the second suction channel 321, thus being blocked by the inner wall from directly entering the air suction device through the air outlet 321a.

[0068] In one embodiment, as shown in Fig. 15, the second suction channel 321 includes at least one guiding wall 321h which is configured to guide airflow in the second suction channel 321 to flow from the air inlet 321b to the air outlet 321a along a curved path. The guiding wall 321h assists to define a curved path in the second suction channel 321, even if there is water vapor entering the second suction channel 321 through the air inlet 321b, the water vapor needs to traverse the curved path to reach the air outlet 321a, that is, it prolongs the path of the water vapor from the air inlet 321b to the air outlet 321a, which undoubtedly increases the difficulty of the water vapor entering the second suction device 500 from the air outlet 321a. In addition, during the water vapor passes along the guiding wall 321h, water vapor can be separated and blocked by the guiding wall 321h, so that the water vapor can be prevented from being directly drawn into the second suction device 500 through the second suction channel 321.

[0069] In some other embodiments, the side wall of the second suction channel 321 is curved, forming the guiding wall 321h; or, the second suction channel 321 may be provided with one or more curved side walls, and the one or more curved side walls define the guiding wall 321h.

[0070] In some embodiments, referring to Fig. 14 to Fig. 17, the second suction channel 321 is provided with separation plates 321c arranged at intervals and in a staggered manner along the suction direction. The length direction of the separation plate 321c may extend substantially along the left-right direction of the main body 100. The separation plate 321c defines the guiding wall 321h, and the separation plate 321c is further configured to prevent the liquid in the second chamber 320 from flowing into the air outlet 321a through the second suction channel 321, to reduce the possibility of the liquid in the second chamber 320 entering the air suction device 500.

[0071] In some embodiments, referring to Fig. 14 to Fig. 16, the separation plate 321c is defined with a flow guiding outlet 321d; or, a flow guiding outlet 321d is defined between the separation plate 321c and the side wall of the second suction channel 321. At least two flow

guiding outlets 321d are staggered. The flow guiding outlets 321d and the separation plates 321c are configured to guide the air flow along a curved path, preventing the liquid in the second chamber 320 from entering the air suction device 500.

[0072] Illustratively, the separation plate 321c may be defined with an opening, and the opening defines the flow guiding outlet 321d. Alternatively, one end of each separation plate 321c is connected to the inner wall of the second suction channel 321, and there is a gap between the other end of each separation plate 321c and the inner wall of the second suction channel 321. Gaps are staggered and form the flow guiding outlets 321d.

[0073] In an embodiment, referring to Fig. 15, the flow guiding outlet 321d formed on one of two adjacent separation plates 321c is located at the left end of the separation plate 321c, and the flow guiding outlet 321d formed on the other one of the two adjacent separation plates 321c is located at the right end of the separation plate 321c, such that the two flow guiding outlets 321d are staggered. In this way, the air flow path can be made as long as possible, thereby improving the gas-liquid separation effect to a greater extent.

[0074] In some embodiments, as shown in Fig. 16 and Fig. 17, at least one separation plate 321c is defined with at least one first opening 321k. At least one first opening 321k is disposed in the middle of the separation plate 321c; or, at least two first openings are respectively disposed at two ends of the separation plate 321c. At least another separation plate 321c is defined with at least two second openings 321m. The second openings 321m are staggered with the first opening 321k. The first opening 321k and the second openings 321m define the flow guiding outlets 321d. That is, the separation plate 321c may be defined with more than one opening to reduce the air resistance when the air suction device suctions air from the second suction channel 321. Besides, there may be multiple separation plates 321c defined with multiple openings, and the openings of adjacent separation plates 321c are staggered to form a curved path for the air flow. The size of the first opening 321k may be different from the size of the second opening 321m.

[0075] In some embodiments, as shown in Fig. 14 to Fig. 16, and Fig. 18, the separation plate 321c may be obliquely arranged, and the flow guiding outlet 321d may be located at the lowest position of the separation plate 321c. This helps the separation plate 321c to prevent the liquid from entering the second suction channel 321, and allows the liquid that has entered the second suction channel 321 to flow out due to gravity when the main body 100 is in the tilting or upright state.

[0076] In some embodiments, as shown in Fig. 14 to Fig. 18, a unit air flow channel 321e is formed between every two adjacent separation plates 321c. A cross-sectional area of each unit air flow channel 321e gradually decreases along the airflow direction. If liquid enters the unit air flow channel 321e, the gradually decreasing cross-sectional area along the airflow direction can cause the liquid to easily impact the inner wall of the unit air flow channel 321e, creating a blocking effect on the liquid. This allows the liquid to be blocked at a position of the unit air flow channel 321e with a smaller cross-sectional area, thereby reducing the probability of the liquid entering the air suction device 500.

[0077] In some embodiments, as shown in Fig. 14 and Fig. 15, in every two adjacent unit air flow channels 321e, a minimum cross-sectional area of one unit air flow channel 321e closer to the air inlet 321b is smaller than a maximum cross-sectional area of the other unit air flow channel 321e, to provide a periodic change in the size of the cross-sectional area of the air flow channel. In this way, the air flow entering the unit air flow channel 321e can slow down at the position with a larger cross-sectional area, to allow the liquid entrained in the air flow to fall under the influence of gravity, which aids in the gas-liquid separation, thereby reducing the probability of liquid intake of the second suction device.

[0078] Illustratively, as shown in Fig. 15, the separation plates 321c include a first separation plate 3211c and a second separation plate 3212c staggered with each other along the suction direction. The second suction channel 321 has a first side wall 321f and a second side wall 321g facing each other along the left-right direction. The first separation plate 3211c is arranged on the first side wall 321f of the second suction channel 321 and inclined downward toward the second side wall 321g, and the second separation plate 3212c is arranged on the second side wall 321g of the second suction channel 321 and inclined downward toward the first side wall 321f, such that the first separation plate 3211c and the second separation plate 3212c are both inclined downward and staggered with each other along the up-down direction.

[0079] Further, as shown in Fig. 15, a baffle 3213c may be provided on the separation plate 321c. The baffle 3213c is arranged at an included angle with the airflow direction, to prevent the liquid from entering the second suction channel 321. By setting the baffle 3213c, at least part of the suctioned air flow can directly impact the baffle 3213c, and since the air flow carries vapor, the vapor can flow down along the extension direction of the baffle 3213c when impacting on the baffle 3213c. This further reduces the risk of liquid entering the second suction device 500 through the second suction channel 321.

[0080] Illustratively, the extension direction of the baffle 3213c may be substantially perpendicular to the airflow direction to minimize the possibility of liquid entering the second suction channel 321. In some other embodiments, the included angle formed between the extension direction of the baffle 3213c and the airflow direction may be an acute angle, as long as the purpose of the baffle 3213c blocking the liquid in the air flow can be achieved.

[0081] In some embodiments, the first sidewall 321f and/or the second sidewall 321g may be curved walls to form a curved air flow channel.

[0082] In some embodiments, as shown in Fig. 16,

multiple separation plates 321c are arranged in the part of the second suction channel 321 close to the air inlet 321b, while no blocking member is arranged in the part of the second suction channel 321 close to the air outlet 321a. With such arrangement, the front part of the second suction channel 321 close to the air inlet 321b primarily serves the purpose of preventing liquid from entering the second suction channel 321; and the rear part of the second suction channel 321 close to the air outlet 321a forms a relatively large space, which helps to slow down the speed of the liquid that has accidentally entered the rear part of the second suction channel 321, allowing the liquid to flow back into the second chamber. In this case, the first side wall 321f and the second side wall 321g of the second suction channel 321 may be set as straight walls.

[0083] In some embodiments, referring to Fig. 17 and Fig. 18, the separation plates 321c may be detachably connected to the inner wall of the second suction channel 321, which facilitates the cleaning of the separation plates 321c and the second suction channel 321. In case the second suction channel 321 is flat-shaped, it is particularly difficult to clean the interior of the second suction channel 321, and if separation plates are further arranged, it is almost impossible to clean them. Thus, the separation plates of the disclosure are set to be detachable to allow users to remove them for cleaning.

[0084] Further, referring to Fig. 17 to Fig. 18, a separation rack 322 is detachably mounted on the second suction channel 321, and the separation plates 321c are arranged on the separation rack 322. The separation rack 322 is plate-shaped. The second suction channel 321 is defined after the separation rack 322 is installed properly. The separation rack 322 can be detached from the second suction channel 321 for cleaning. The structure is simple and practical. Especially when the second suction channel 321 is flat-shaped, it is particularly challenging to clean the second suction channel 321. Thus, the separation rack 322 facilitates the removal of the separation plates, which is convenient for removal and for cleaning.

[0085] Specifically, as shown in Fig. 17 and Fig. 18, there are at least two arrangement manners for the separation rack 322. As shown in Fig. 17, the separation rack 322 is slid arranged inside the second suction channel 321. The separation rack 322 includes two support bars connected to the left and right ends of the separation plates 321c. The separation rack 322 can be inserted or removed from the bottom along the second suction channel 321. Alternatively, as shown in Fig. 18, the separation rack 322 is a flat plate, all the separation plates are arranged on the flat plate, and the side of the flat plate on which the separation plates are mounted forms part of the inner wall of the second suction channel 321. Users can remove the separation plates by removing the flat plate, to completely open the second suction channel 321, making it convenient for cleaning.

[0086] In some embodiments, as shown in Figs. 15 and 16, the cleaning apparatus 10 may be provided with a third detection assembly 363 which is configured to detect whether there is water entering the second suction channel 321, so as to reduce the failure risk of the air suction device 500 caused by liquid intake. In case it is detected that water has entered the second suction channel 321, the air suction device may be controlled to be shut down or reduce the power, so as to prevent the liquid in the second suction channel 321 from entering the air suction device. Optionally, the third detection assembly 363 may be an electrode type sensor or a photoelectric type sensor. Optionally, the third detection assembly 363 is arranged in the second suction channel 321.

[0087] Specifically, as shown in Fig. 16, the third detection assembly 363 may include a detection electrode. There may be two detection electrodes. The two detection electrodes 323 are both arranged in the second suction channel 321. Alternatively, one detection electrode 323 is arranged in the second suction channel 321, and the other detection electrode 323 is arranged at the upper part of the second chamber 320. The detection electrodes 323 are configured to detect whether liquid enters the second suction channel 321.

[0088] Understandably, the control device 600 may be connected to the third detection assembly 363, and is configured to control the on-off state or the power of the air suction device 500 according to the information detected by the third detection assembly 363 regarding whether liquid has entered the second suction channel 321, to reduce the likelihood of damage to the air suction device 500 due to liquid intake. Specifically, when a certain amount of liquid enters the second suction channel 321, the two detection electrodes 323 are conductive to send a liquid entry signal, then the control device 600 controls the second suction device 500 to turn off or reduce the power of the air suction device 500; when a certain amount of liquid flows out of the second suction channel 321, the two detection electrodes 323 are disconnected to send a no-liquid signal, then the control device 600 controls the second suction device 500 to turn on or increase the power of the air suction device 500.

[0089] In one embodiment, as shown in Fig. 7, a second detection assembly 362 is arranged in the second chamber 320 to detect liquid level information in the second chamber 320. In this embodiment, the second detection assembly 362 is a liquid level sensor, or a liquid presence sensor. The liquid level information includes the liquid level information in the second chamber 320, and the information of whether there is liquid reaching to the second detection assembly 362 instantly under the situation of shaking and tilting.

[0090] Typically, the second detection assembly 362 may be installed below the air inlet 321b of the second suction channel 321, and/or behind the air inlet 321b. The second detection assembly 362 may trigger a liquid presence signal when it detects the liquid or liquid level reaching the installation position of the second detection

assembly 362. In this case, the control device 600 is configured to control the air suction device to turn off or reduce the power of the air suction device. Therefore, the second detection assembly 362 needs to be arranged below the air inlet 321b; and/or, the second detection assembly 362 is located behind the air inlet 321b of the second suction channel 321. As such, regardless of whether the second detection assembly 362 is in an upright state, a tilting state, or a lying down state, the second detection assembly 362 is closer to the liquid level than the air inlet 321b, so that an alarm can be triggered before the liquid enters the air inlet 321b, which reduces the liquid intake probability of the air suction device.

[0091] The following is a detailed description of how to form the first chamber 310, the second chamber 320, and the second suction channel 321.

[0092] In some embodiments, as shown in Figs. 4 and 5, the cleaning apparatus 10 includes a first housing 310a and a second housing 320a, the first housing 310a defines the above-mentioned first chamber 310, the second housing 320a defines the above-mentioned second chamber 320. The first housing 310a is fixed to the outside of the second housing 320a (as shown in Fig. 5) through assembling, and the first housing 310a and the second housing 320a may be assembled together by means of fasteners, buckles, clasps, and the like; or, the first housing 310a is arranged on the main body 100, and the second housing 320a is arranged on the chassis 200 (as shown in Fig. 4), such an arrangement may reduce the weight of the main body 100, which may facilitate the operations such as pushing or twisting of the main body 100 by users.

[0093] In this way, the first chamber 310 and the second chamber 320 are independent of each other, and the air outlet 321a of the second suction channel 321 is defined on the second housing 320 and located at the top of the second chamber 320 to communicate with the interface of the second suction device 500.

[0094] In some embodiments, referring to Figs. 6-10, the cleaning apparatus 10 includes a first housing 310a and a second housing 320a, at least part of the first housing 310a is nested in the second housing 320a. The second chamber 320 is defined by part of the inner wall of the second housing 320a and part of the first housing 310a (as shown in Figs. 6-10). The first chamber 310 may be defined in two different ways, for example, the first chamber 310 is defined in the first housing 310a (as shown in Figs. 7 and 8), or a partial inner wall of the first housing 310a and a partial inner wall of the second housing 320a co-enclose the first chamber 310 (as shown in Figs. 9, 10).

[0095] In this way, the first chamber 310 and the second chamber 320 are both installed on the main body 100, and defined by the nesting of the first housing 310a and the second housing 320a. The second suction channel 321 may be all defined in a wall surface of the first housing 310a (as shown in Figs. 19 and 20) or a wall surface of the second housing 320, namely, the second suction channel 321 is defined inside a solid structure. Or, part of the second suction channel 321 is defined in the wall surface of the first housing 310a and isolated from the first chamber 310, and the other part of the second suction channel 321 is cooperatively defined by a portion of an outer wall of the first housing 310a and a portion of an inner wall of the second housing 320 (as shown in Fig. 21), wherein the portion of the inner wall of the second housing 320 defining the first chamber 310 is different from the portion of the inner wall of the second housing 320 defining the second suction channel 321.

[0096] In some embodiments, as shown in Figs. 14-16, the first housing 310a is nested in the second housing 320a, and the outer wall of the first housing 310a is slotted and enclosed with the inner wall of the second housing 320a to form the second suction channel 321.

[0097] In some embodiments, the air outlet 321a of the second suction channel 321 is arranged on a wall surface of the second housing 320a.

[0098] Typically, as shown in Figs. 6-10 and 19-21, the first housing 310a is nested in the second housing 320, the first housing 310a defines the first chamber 310, the bottom of the first housing 310a and a part of the inner wall of the second housing 320 define the second chamber 320, the upper part of the first housing 310a is sealed with the upper part of the second housing 320. The air outlet 321a may be arranged at the top of the second chamber 320 and at the middle part of the second housing 320a, so as to allow the suction to be performed directly at the top of the second chamber 320; or the air outlet 321a may be provided at the upper part of the second housing 320a, allowing the suction to be performed at the top of the second chamber 320 through the second suction channel 321 formed by an outer wall of the first housing 310a and an inner wall of the second housing 320, and the air outlet 321a is configured to dock with the interface of the second suction device 500.

[0099] In some embodiments, as shown in Figs. 19-21, the first housing 310a is partially nested in the second housing 320a, and the air outlet 321a is arranged on a wall surface of the first housing 310a and located at a portion of the first housing 310a exposed from the second housing 320a.

[0100] Typically, as shown in Figs. 19-21, compared with the Figs. 7-10, the upper part of the first housing 310a is not completely nested in the second housing 320a, and the air outlet 321a is defined on the upper part of the first housing 310a which is exposed from the second housing 320a. In this case, the second suction channel 321 is at least partially defined inside the solid structure of the first housing 310a, a communication port for the second suction channel 321 and the second chamber 320 is defined at a lower portion of the first housing 310a, and the second suction channel 321 in the first housing 310a is isolated from the first chamber 310a. In this embodiment, there's no need to process the air outlet 321a on the second housing 320a, which ensures the

integrity of the second housing 320. Since the second housing 320 is mostly configured to store liquid, the integrity of the side wall of the second housing 320 may reduce an occurrence of liquid leakage, thereby improving the stability of the second housing 320 in containing liquids.

[0101] In one embodiment, the first housing 310a or the second housing 320a is detachably connected with the main body 100. When the first housing 310a or the second housing 320 is full of liquid or dirt, it is convenient for users to remove the first housing 310a and/or the second housing 320 to dispose the liquid or dirt. The air outlet 321a is sealed and coupled with the suction port of the air suction device 500 arranged on the main body 100.

[0102] In some other embodiments, as shown in Fig. 21, in case a part of the second suction channel 321 is located on the wall surface of the first housing 310a, the remaining part of the second suction channel 321 is defined by the outer wall of the first housing 310a and the inner wall of the second housing 320a.

[0103] Further, as shown in Figs. 12 and 14-16, the cleaning apparatus10 may include a first sealing portion 340a for sealing the channel 3212 defined by the outer wall of the first housing 310a and the inner wall of the second housing 320a as shown in Figs. 11 and 17. Since the channel 3212 is enclosed by the outer wall of the first housing 310a and the inner wall of the second housing 320a, there are gaps around the periphery of the channel 3212, liquid from the rear side of the second chamber 320 or liquid at the gap between the first housing 310a and the second housing 320a is prone to enter the suction channel 321. Therefore, the first sealing portion 340a is provided to concentrate the suction force of the second suction channel 321 at the air inlet 321b, which facilitates the control of the liquid source, and further facilitates the arrangement of the position of the air inlet 321b, so that there is less risk of liquid intake whatever the cleaning apparatus 10 is in the lying-down state, the upright state, or the tilting state.

[0104] When part of the first housing 310a is nested in the second housing 320, in order to ensure that the first chamber 310 and the second chamber 320 are independent of each other (communicating with each other through only the liquid leakage structure) and are sealed, the following design is proposed.

[0105] In some embodiments, referring to Figs. 7 and 8, a first sealing member 330 is arranged between the first housing 310a and the second housing 320a, the first sealing member 330 is squeezed between the first housing 310a and the second housing 320a to provide circumferential sealing between the first housing 310a and the second housing 320a. In this case, the side wall 310c of the first housing 310a is an integrated side wall, the first sealing member 330 is configured to seal the gap between the first housing 310a and the second housing 320a, allowing the second chamber 320 to be defined between portion of the outer wall of the first housing 310a and portion of the inner wall of the second housing 320a, and the liquid in the second chamber 320 can be ensured to not flow out to cause a leakage. Simultaneously, the suction force of the air suction device 500 is allowed to act on the liquid leakage structure 312.

[0106] In some embodiments, referring to Figs. 17-19 and 21, the side wall 310c of the first housing 310a is not an integrated side wall, that is, the side wall 310c of the first housing 310a defines an air leakage section 310d. A second sealing member 340 is also provided between the first housing 310a and the second housing 320a, the first sealing member 330 and the second sealing member 340 are spaced apart along a height direction of the first housing 310a, and the first sealing member 330 is located above the second sealing member 340. The air leakage section 310d is located between the first sealing member 330 and the second sealing member 340. Due to the presence of the air leakage section 310d defined on the side wall 310c of the first housing 310a, it is impossible to form an airtight first chamber 310. Therefore, the sealing members are used to isolate the first chamber 310 and second chamber 320 from each other and the outside world to ensure that they can independently form airtight first chamber 310 and second chamber 320, so as to ensure that a negative pressure can be formed in the first chamber 310 and the second chamber 320.

[0107] In some embodiments, referring to Figs. 9, 17-19, and 21, an opening 325 of the first housing 310a defines the above-described air leakage section 310d. It should be understood that the opening 325 of the first housing 310a facilitates pouring out of the dirt in the first chamber 310 when the first housing 310a is taken out from the second housing 320, which improves the using experience.

[0108] In some other embodiments, as shown in Fig. 22, the side wall 310c of the first housing 310a is provided with filtering holes 352, the filtering holes 352 define the above-mentioned air leakage section 310d. Solid and liquid in the first chamber 310 can be separated through the filtering holes 352, allowing the solid waste to remain in the first chamber 310 while the liquid to enter into the second chamber 320. Compared with the opening 325, the filtering holes 352 can prevent the dirt in the first chamber 310 from falling out when the first housing 310a is taken out from the second housing 320a.

[0109] In some embodiments, referring to Figs. 22-24, the first housing 310a includes at least one movable member 310e, and the movable member 310e at least forms the side wall 310c of the first housing 310a. A gap is defined between the movable members 310e, or between the movable member 310e and the side wall 310c of the first housing 310a. The gap is located at the side wall 310c of the first housing 310a, and the gap defines the air leakage section 310d. Since the movable member 310e forms the side surface of the first housing 310a, dirt is not prone to fall out during the first housing 310a is taken out from the second housing 320. Further, in order to facilitate the processing of the dirt in

the first chamber 310, the side wall is set as the movable member 310e, so as to facilitate the user's operation when dirt needs to be poured out. In addition, filtering holes 352 can also be defined on the movable member 310e to further facilitate the solid-liquid separation.

[0110] Typically, the first housing 310a may include at least one movable member 310e that is movable with respect to the first housing 310a. The movable member 310e is slidably connected or rotatably connected (as shown in Figs. 22-24). The gap between the movable members 310e defines the above-mentioned air leakage section 310d.

[0111] In one embodiment, as shown in Figs. 7-8, the first housing 310a includes a first body 310f and a second body 310g. The first body 310f is movably assembled on an upper portion of the second body 310g, namely, the first body 310f is detachably mounted on the second body 310g. Generally, a HEPA for protecting the first suction device 400 is installed above the first body 310f. A third sealing member 390 is arranged between the first body 310f and the second body 310g, and the third sealing member 390 is configured to provide circumferential sealing between the first body 310f and the second body 310g. Alternatively, as shown in Fig. 10, the first main body 310f and the second main body 310g are spaced apart in the second housing 320a to define the first chamber 310, a fourth sealing member 910 is provided for circumferential sealing between the first body 310f and the second housing 320a, and a fifth sealing member 920 is provided for circumferential sealing between the second body 310g and the second housing 320a.

[0112] In some embodiments, as shown in Figs. 14-16 and 21, a portion of the outer wall of the first housing 310a and a portion of the inner wall of the second housing 320a cooperatively define at least a portion of the second suction channel 321, namely, the channel 3212. The second sealing member 340 includes a first sealing portion 340a and a second sealing portion 340b, the first sealing portion 340a surrounds the outside of the second suction channel 321, the second sealing portion 340b surrounds the first housing 310a along a circumferential direction of the first housing 310a, and the first sealing portion 340a and the second sealing portion 340b are connected with each other. The second sealing member 340 herein serves both to form the shape of the second suction channel 321 and to isolate the first chamber 310 from the second chamber 320.

[0113] In one embodiment, as shown in Fig. 25, a liquid leakage notch 312a is provided on the outside of the side wall 310c of the first housing 310a, and the liquid leakage notch 312a defines the above-mentioned liquid leakage structure 312 with the interior of the second housing 320a. The liquid leakage notch 312a may be arranged on the outside of the bottom wall of the first housing 310a, the second sealing member 340 is provided with a sealing strip notch, and the position of the sealing strip notch corresponds to the position of the liquid leakage notch 312a, so that when the main body 100 is tilted or lying down, the liquid leakage structure 312 is arranged at the rear side of the main body 100, so the liquid leakage notch 312a can be closer to the rear side and located at a lower water level, as such, it is more convenient for the liquid in the first chamber 310 to flow into the second chamber 320 to prevent a liquid accumulating in the first chamber 310 which may cause a safety hazard to the first suction device 400; further, by such an arrangement, after the first housing 310a is removed from the second housing 320a, the liquid leakage structure 312 remains only the liquid leakage notch 312a , such that the cleaning of the liquid leakage notch 312a is facilitated.

[0114] In some embodiments, as shown in Fig. 26, the liquid leakage structure 312 is disposed on the bottom wall of the first housing 310a, and the second sealing member 340 surrounds the liquid leakage structure 312.

[0115] In some embodiments, a radial contraction portion 326 is provided around the inner wall of the second housing 320a along the circumferential direction. An inner diameter corresponding to the radial contraction portion 326 is smaller than an inner diameter corresponding to an inner wall of an area above the radial contraction portion 326, to allow the lower part of the first housing 310a to abut against the radial contraction portion 326 (as shown in Fig. 27 and Fig. 28). The lower part of the first housing 310a abuts against the radial contraction portion 326, such that the first housing 310a can be stably nested in the second housing 320a. The lower part of the first housing 310a may be flexible, allowing for an interference fit with the radial contraction portion 326; and the remaining part of the first housing 310a may be either flexible or rigid. When the second sealing element 340 is arranged at the lower part of the first housing 310a, the second sealing element 340 abuts against the radial contraction portion 326 (as shown in Fig. 29 and Fig. 30), causing the second sealing element 340 to deform. This deformation realizes a better sealing between the second sealing element 340 and the second housing 320a, which better isolates the first chamber 310 from the second chamber 320, allowing the first chamber 310 to be independent of the second chamber 320. In addition, since there is a gap between the lower part of the first housing 310a and the part above the radial contraction portion 326 of the second housing 320a, when removing the first housing 310a from the second housing 320a, it only needs to overcome the initial frictional force between the radial contraction portion 326 and the lower part of the first housing 310a. After the lower part of the first housing 310a is separated from the radial contraction portion 326 of the second housing 320a, there is no contact between the lower part of the first housing 310a and the inner wall of the second housing 320a in the subsequent removal process, without frictional resistance. This makes it more convenient to remove the first housing 310a.

[0116] Illustratively, referring to Figs. 28 and 30, the second housing 320a includes a first inner wall 320b and a second inner wall 320c. The first inner wall 320b is located above the second inner wall 320c. An inner

diameter corresponding to the second inner wall 320c is less than an inner diameter corresponding to the first inner wall 320b. The first inner wall 320b and the second inner wall 320c are connected by the radial contraction portion 326.

[0117] In an embodiment, referring to Figs. 28 and 30, the inner diameter of the radial contraction portion 326 gradually decreases along the installation direction of the first housing 310a, allowing for a smoother installation or removal process of the first housing 310a. Moreover, in case the second sealing member 340 is arranged at the lower part of the first housing 310a, a better sealing performance can be realized. That is, the lower part of the first housing 310a abuts against the radial contraction portion 326.

[0118] An embodiment of the present disclosure further provides a sealing member, which may be applied to the first sealing member 330 to the fifth sealing member 920.

[0119] Specifically, as shown in Fig. 28, Fig. 30, and Fig. 31, the sealing member includes a sealing body 340c and a sealing lip 340d. The sealing lip 340d extends radially outward from the sealing body 340c for abutting against the radial contraction portion 326. In the cleaning apparatus 10 of the present disclosure, the sealing member is arranged on the first housing 310a.

[0120] In an embodiment, there may be multiple sealing lips 340d. The terms "multiple" herein refers to two or more than two. The multiple sealing lips 340d are all arranged on the sealing body 340c to enhance the sealing effect and achieve multi-layer sealing.

[0121] In an embodiment, referring to Fig, 31, when multiple sealing lips 340d are provided, the lengths of the multiple sealing lip 340d extending in the direction away from the sealing body 340c gradually decrease along the installation direction of the first housing 310a. This arrangement allows for a smoother installation process of the first housing 310a (i.e., the process of the sealing member coming into contact with the radial contraction portion 326).

[0122] In an embodiment, referring to Fig. 31, the thicknesses of the multiple sealing lips 340d gradually decrease along the installation direction of the first housing 310a. In this way, the sealing lip 340d that first comes into contact with the radial contraction portion is easier to deform to continue to interact with the radial contraction portion, and the sealing lip 340d that comes into contact with the radial contraction portion last is less likely to deform, ensuring the sealing effect and facilitating the installation of the first housing 310a. This allows for a smoother installation process of the first housing 310a and also ensures the sealing effect.

[0123] In an embodiment, referring to Fig. 31, the sealing lip 340d is inclined on the sealing body 340c, with the inclination direction toward the removal direction of the first housing 310a. This arrangement makes the installation of the first housing 310a smoother, facilitating the installation of the first housing 310a.

[0124] In an embodiment, referring to Fig. 31, the thickness of each sealing lip 340d gradually decreases from the sealing body 340c toward the direction away from the sealing body 340c. This arrangement enhances the strength at the root of the sealing lip 340d while increasing the flexibility at its end, allowing the end to deform more effectively and provide improved sealing effect.

[0125] Illustratively, the cross section of each sealing lip 340d is triangular or trapezoidal, which facilitates the installation of the first housing 310a and ensures the sealing effect.

[0126] In an embodiment, the length of the sealing lip 340d extending outward is greater than the size of the gap between the first housing 310a and the second inner wall 320c of the second housing 320a, and less than the size of the gap between the first housing 310a and the first inner wall 320b of the second housing 320a. That is, after the first housing 310a is properly installed, the sealing lip 340d can abut against the second inner wall 320c for sealing; when the first housing 310a is not properly installed or removed, the sealing lip 340d is located in the first inner wall 320b and not in contact with the first inner wall 320b. In this case, a gap is defined between the sealing lip 340d and the first inner wall 320b, to avoid additional frictional resistance during the installation or removal process, thereby making the installation and removal of the first housing 310a smoother. Moreover, if there is liquid within the first housing 310a, or between the first housing 310a and the second housing 320, the liquid can flow into the second chamber 320 through the gap during the removal process of the first housing 310a, to prevent the liquid from being brought out with the removal of the first housing 310a, preventing affecting the user experience.

[0127] The second suction device 500 described in the foregoing embodiments is an air suction device. Since the air suction device carries a certain risk of liquid intake, to solve the problem of liquid intake of the air suction device, the gas-liquid separation design is applied to the second suction channel 321, such as the above-mentioned separation plate structure. In some other embodiments, the second suction device 500 may be a liquid suction device. Since the liquid suction device itself allows liquid to pass through, there is no need to solve the problem of liquid intake.

[0128] In some embodiments, referring to Fig. 32 to Fig. 34, the second suction device 500 includes a liquid suction device 500 located in the second suction channel 321. In this case, the second suction channel 321 and the channel of the liquid leakage structure 312 are the same channel. The second suction channel 321 includes a liquid inlet and a liquid outlet. The liquid inlet is communicated with a liquid suction end of the liquid suction device, and the liquid outlet is communicated with a liquid outlet end of the liquid suction device. The liquid suction device is configured to pump the sewage that has entered the first chamber 310 into the second chamber 320. This

configuration alleviates concerns regarding the liquid suction device being damaged due to liquid intake. To provide a better operation of the liquid suction device, a filter screen 350 may be further arranged in the first chamber 310 for solid-liquid separation of dirt suctioned into the first chamber 310 from the outside, such that only the separated sewage is driven into the second chamber 320 by the liquid suction device. This configuration ensures that, regardless of whether the cleaning apparatus 10 is tilting, lying down, shaking, or standing upright, the liquid in the second chamber 320 can be effectively prevented from flowing back into the first chamber 310; also, the liquid in the first chamber 310 can be ensured to be discharged in time to prevent it from entering the first suction device 400.

[0129] In the embodiments, when the first housing 310a is partially or completely located in the second housing 320, that is, when the first housing 310a is nested in the second housing 320, there is a relatively large friction force during removing or installing the first housing 310a, or it is inconvenient for users to take out the first housing 310a, especially when the first housing 310a is in an interference fit with the second housing 320 for ensuring a stable installation between the first housing 310a and the second housing 320, . This leads to an unfriendly user experience when users disassemble the first housing 310a and the second housing 320. Based on this, the embodiments propose solutions as follows.

[0130] In some embodiments, as shown in Figs. 35 to 41, the first housing 310a is detachably connected to the second housing 320a. The first housing 310a is provided with a handle 313, such that users can hold the handle 313 to pull the first housing 310a out of the second housing 320a.

[0131] In an embodiment, referring to Figs. 35 and 36, the handle 313 is rotatably arranged on the first housing 310a. The handle 313 has a first position (as shown in Fig. 35) where it is received on the first housing 310a and a second position (as shown in Fig. 36) where it is rotatable for a user to hold. When in the first position, the handle 313 can be fastened on the peripheral side of the first housing 310a, and the side surface of the handle 313 is flush with the end face 310m of the first housing 310a, such that the handle 313 will not hinder the installation of the water tank 300, which is formed by the first housing 310a and the second housing 320a, onto the main housing 100. When in the second position, an included angle is formed between the handle 313 and the end face 310m of the first housing 310a for users to hold and apply a force, allowing the first housing 310a to be removed from the second housing 320a.

[0132] In an embodiment, referring to Fig. 37, in case the side surface of the first housing 310a is defined with an opening 325 communicated with the first chamber 310, the handle 313 can be rotated from the first position to the second position along the side of the first housing 310a having the opening 325, to allow the user to hold the handle 313 and press the fingers against the upper end of the first housing 310a, thereby stably picking up the first housing 310a. This reduces the likelihood of the content in the first chamber 310 falling out of the opening 325.

[0133] In an embodiment, referring to Fig. 37, an included angle formed between the handle 313 and the end face 310m of the first housing 310a may be that, the included angle between the handle 313 which is in the second position and a front-end face 310h of the first housing 310a is greater than or equal to 90°. This arrangement ensures that users can hold the first housing 310a more stably when removing it to pour out the waste. The end face 310m of the first housing 310a is divided into the front-end face 310h and a rear-end face 310k by the rotating shaft 313d of the handle 313. The front-end face 310h is the part of the end face in the rotation direction when the handle 313 is rotated from the first position to the second position, and, the rear-end face 310k is the part of the end face in the rotation direction when the handle 313 is rotated from the second position to the first position.

[0134] In an embodiment, referring to Figs. 38 to 41, the first housing 310a and/or the handle 313 is provided with an in-position indication device 314, such that when the handle 313 is rotated to the first position and/or the second position, the in-position indication device 314 can generate an in-position indication to indicate users that the handle 313 has been rotated to a particular position.

[0135] In an embodiment, the in-position indication device 314 may be arranged only at the first position or at the second position, or the in-position indication device 314 may be arranged at both the first position and the second position.

[0136] Illustratively, users may apply a force to the handle 313 during the process of rotating the handle 313. The in-position indication device 314 is a structure capable of providing a changed resistance to the handle 313 during the rotation of the handle 313. The resistance values at the first and second positions of the handle 313 are different from those at other positions, which allows users to clearly perceive different resistance values during the process of rotating the handle 313, thereby identifying the different positions. In other embodiments, the resistance value at the first position is different from that at the second position. Thus, different resistance values are set between the handle 313 and the first housing 310a and/or the second housing 320, and the different resistance values are further transmitted to users, achieving the purpose of indicating users that the handle 313 is in place.

[0137] It should be noted that the in-place indication device 314 may be a mechanical structure, or an in-place detection component. Specifically, the in-position indication device 314 includes an in-position protrusion 314a and an in-position groove 314b fitting the in-position protrusion 314a. The in-position protrusion 314a and the in-position groove 314b are respectively located on the handle 313 and the first housing 310a. Either the in-position protrusion 134a is located on the first housing

310a, or the in-position groove 314b is located on the first housing 310a. Specifically, when the handle 313 is rotated to the first or second position, the handle 313 passing over the in-position protrusion 314a will cause a change in the resistance value felt of the handle 313, thereby indicating users that the handle 313 is in place. The in-position indication device 314 may also be magnetic attraction components. For example, magnetic attraction components are arranged on the handle 313 and the first housing 310a and/or the second housing 320, such that the in-place indication function can be realized by the connection between two magnetic attraction components. Further, the magnetic attraction components may be located at the first position and/or the second position, respectively.

[0138] In an embodiment, the handle 313 is arranged on the first housing 310a by means of damping rotation. The rotational resistance when the handle 313 is at the first position and/or the second position is greater than the rotation resistance when the handle 313 is located between the first position and the second position. The damping sensation allows users to know that the handle 313 is in place. When the handle 313 is in the second position, the damping between the handle 313 and the first housing 310a allows users to more stably grip the first housing 310a via the handle 313 when dumping waste.

[0139] It should be noted that, the rotational resistance may be achieved by providing a damping rubber ring between the handle 313 and the first housing 310a to form the damping sensation, or by sleeving a rubber ring over the rotating shaft 313d, and assembling them into the handle 313 or the first housing 310a, to form the damping sensation during the rotation of the handle 313, which is not limited herein.

[0140] In an embodiment, as shown in Fig. 38 to Fig. 40, the first housing 310a is provided with a limiting portion 314c, and the limiting portion 314c is configured to prevent the handle 313 from continuing to rotate forward. The handle 313 includes a holding portion 313e, a rotating shaft 313d, and an abutment portion 313f. The holding portion 313e is arranged on one side of the rotating shaft 313d, and the abutment portion 313f is arranged on the opposite side of the rotating shaft 313d. The holding portion 313e is configured for users to hold, and the limiting portion 314c is arranged in front of the holding portion 313e (not shown) and/or behind the abutment portion 313f (as shown in Fig. 38 and Fig. 40), in the direction of the limiting portion 314c rotating from the first position to the second position.

[0141] The limiting portion 314c may be arranged such that the handle 313 can stay at the second position, which makes it convenient to apply a force to the handle 313 to lift the first housing 310a out of the second housing 320a. This allows users to have a more stable holding during the process of cleaning the waste inside the first housing 310a.

[0142] In an embodiment, referring to Fig. 35 and Fig. 36, the abutment portion 313f is arranged at the rotating shaft 313d of the handle 313, and the second housing 320a includes a first contact surface 320d. During the rotation process of the handle 313 from the first position to the second position, the abutment portion 313f is rotated toward the first contact surface 320d and finally abuts against the first contact surface 320d. With the continuous rotation of the handle 313, the abutment portion 313f of the handle 313 interacts with the first contact surface 320d. Taking the contact point between the abutment portion 313f and the first contact surface 320d as a fulcrum, an upward force is applied to the rotating shaft 313d of the handle 313, thereby pushing the rotating shaft 313d of the handle 313 away from the first contact surface 320d, and ultimately driving the first housing 310a to detach from the second housing 320. In some cases, the first housing 310a is nested in the second housing 320a, and a sealing member is arranged between the first housing 310a and the second housing 320a. Due to the sealing effect, the resistance is the greatest when the first housing 31a is just taken out. By utilizing the principle of a force-saving lever, the elongated arm of the handle 313 is configured to drive the abutment portion to lever the first housing 310a in the in-place state out a short distance. This overcomes the largest resistance when the first housing 31a is just taken out, making the removal process of the first housing 310a smoother.

[0143] In an embodiment, as shown in Figs. 35 and 36, the second housing 320a includes a second contact surface 320e. After the first housing 310a is installed in the second housing 320a, in the rotation process of the handle 313 from the second position to the first position, the handle 313 drives the abutment portion 313f to rotate toward the second contact surface 320e and contact with the second contact surface 320e. With the continuous rotation of the handle 313, the abutment portion 313f interacts with the second contact surface 320e. Taking the contact point between the abutment portion 313f and the second contact surface 320e as a fulcrum, a downward force is applied to the rotating shaft 313d of the handle 313, thereby pressing the first housing 310a downward to the installation position of the second housing 320a. Through the process, by utilizing the principle of a force-saving lever, the elongated arm of the handle 313 is configured to drive the abutment portion to press the first housing 310a, which has not yet been installed into the second housing 320a, into the second housing 320a. In some cases, a sealing member is arranged between the first housing 310a and the second housing 320a. By the cooperation of the abutment portion 313f of the handle 313 and the second contact surface 320e, the first housing 310a can be accurately installed into the second housing 320a, allowing for a better sealing effect between the first housing 310a and the second housing 320a.

[0144] In an embodiment, the second housing 320a is defined with an accommodation groove 315 for accommodating the abutment portion 313f of the handle 313.

The bottom wall of the accommodation groove 315 forms the first contact surface 320d, and the top wall of the accommodation groove 315 forms the second contact surface 320e. The bottom wall and the top wall may face each other or may be in a state of substantially facing each other.

[0145] In an embodiment, referring to Fig. 36, the abutment portion 313f includes an abutment surface 3133f, and a first surface 3131f and a second surface 3132f located on two sides of the abutment surface 3133f. The distance from the abutment surface 3133f to the center of the rotating shaft of the holding portion 313e is greater than the distance from the first surface 3131f to the center of the rotating shaft of the holding portion 313e. When the handle 313 is in the first position, the first surface 3131f faces the first contact surface 320d; when the handle 313 is in the second position, the abutment surface 3133f abuts against the first contact surface 320d. This arrangement allows the surface of the abutment portion 313f facing the first contact surface 320d to transition from the first surface 3131f to the abutment surface 3133f during the rotation process of the handle 313 from the first position to the second position. In this case, the gap between the abutment portion 313f and the first contact surface 320d gradually decreases until the abutment surface 3133f is in contact with the first contact surface 320d. With the rotation of the handle 313, the abutment surface 3133f further abuts against the first contact surface 320d, allowing the first housing 310a to detach from the second housing 320.

[0146] In an embodiment, when the handle 313 is in the second position, there is a gap between the second surface 3132f and the second contact surface 320e; and when the handle 313 is in the first position, the second surface 3132f abuts against the second contact surface 320e. This arrangement allows the gap between the second contact surface 320e and the abutment portion 313f gradually decreases in the rotation process of the handle 313 from the second position to the first position. That is, the second surface 3132f gradually approaches the second contact surface 320e in the rotation process of the handle 313, until the second surface 3132f is in contact with the second contact surface 320e. Further, with the continuous rotation of the handle 313, the second surface 3132f comes into contact with the second contact surface 320e, such that the second abutment surface 3133f provides a downward force on the second surface 3132f, thereby pressing the first housing 310a into the second housing 320.

[0147] In an embodiment, the abutment portion 313f is in the shape of a cam or an elongated arm; the protruding face of the cam corresponds to the abutment surface 3133f; and the surface at one end of the elongated arm corresponds to the abutment surface 3133f.

[0148] In an embodiment, the first housing 310a is in an interference fit with the second housing 320a, allowing for a more stable installation of the first housing 310a and the second housing 320. The interference fit may be a direct interference fit between the first housing 310a and the second housing 320, or an indirect fit between the first housing 310a and the second housing 320 by another component, such as a sealing member or an elastic member. Since the interference fit may result in a large friction force in the processes of installing the first housing 310a into the second housing 320 and removing the first housing 310a out of the second housing 320, it is not conducive to the user experience or may cause the problem that the first housing 310a is improperly installed.

[0149] Therefore, to facilitate the removal of the first housing 310a from the second housing 320, the abutment portion 313f is provided at the rotation connection of the handle 313. The abutment portion 313f includes the abutment surface 3133f. The distance from the abutment surface 3133f to the center of the rotating shaft of the handle 313e is greater than an interference fit stroke of the first housing 310a and the second housing 320a in the removal direction. The term "interference fit stroke" herein refers to the displacement between the starting point and the position where the interference fit is released in the process of removing the first housing 310a from the second housing 320. The second housing 320 has different inner diameter sizes, so the interference fit is formed at the location where the inner diameter is smaller, and the interference fit is released at the location where the inner diameter is larger. The distance between the abutment surface 3133f and the center of the rotating shaft is set such that during the process of removing the first housing 310a from the second housing 320, when the handle 313 is turned upward, the abutment surface 3133f of the abutment portion 313f will gradually come into contact with the second housing 320, forming the displacement between the first housing 310a and the second housing 320.This distance of the displacement is also the distance that the handle 313 assists in removing the first housing 310a. As long as this distance is greater than the interference fit stroke of the first housing 310a and the second housing 320a during the removal process, the handle 313 can help users to overcome the difficulty of removal caused by the interference fit over this distance, thereby enhancing the user experience.

[0150] In an embodiment, a sealing member is arranged between the first housing 310a and the second housing 320. The sealing member is configured to isolate the first chamber 310 from the second chamber 320, or is configured to define the suction channel of the second suction device 500. Due to the presence of the sealing member, there may be a relatively large friction force when the first housing 310a is removed from or installed into the second housing 320, thus the lever action of the handle 313 can be utilized to save effort for users, enhancing the user experience.

[0151] In an embodiment, a radial contraction portion 326 is arranged between the first housing 310a and the second housing 320. The radial contraction portion 326 is mainly configured to reduce the gap between the first

housing 310a and the second housing 320, allowing a stable fit between the first housing 310a and the second housing 320. Additionally, the radial contraction portion 326 can cooperate with the sealing member, allowing for a more stable fit between the first housing 310a and the second housing 320 and enhancing the sealing performance.

[0152] In order to prevent users from accidentally pouring out the dirt inside the first housing 310a in the process of taking out the first housing 310a, the following design is proposed.

[0153] As shown in Fig. 42, in the embodiment in which the first housing 310a is nested in the second housing 320a, in order to facilitate the taking out of the first housing 310a from the second housing 320a, the outer wall of the second housing 320a may be provided with a holder 327, and the side wall 310c of the first housing 310a has the opening 325 which is arranged towards the holder 327. The holder 327 is configured for users to hold the water tank 300. The opening 325 toward the holder 327 is provided to facilitate that, after the sewage tank 300 is removed, the user holds the holder 327 of the second housing 320a with one hand (as shown in Fig. 42, such as the right hand) and holds the first housing 310a with the other hand (as shown in Fig. 42, the left hand) to take the first housing 310a out from the second housing 320a along a substantially horizontal direction. At this time, the opening of the first chamber 310 is roughly upward, the dirt in the first chamber 310 can be blocked by the non-opened side wall 310c of the first housing 310a, which effectively prevents the dirt in the first chamber 310 from falling out.

[0154] The second suction device 500 described in the above embodiments is an air suction device, so there is a certain risk of water intake of the air suction device. In order to solve the problem of water intake, the second suction channel 321a is designed as being capable of separating gas and liquid, for example, a partitioning member structure is provided. In some other embodiments of the present disclosure, the second suction device 500 may be a liquid suction device, the liquid suction device itself may allow liquid to pass through, so there is no need to solve the problem of water intake.

[0155] In some embodiments, the second suction device 500 includes a liquid suction device 500 which is located in the second suction channel 321. The second suction channel 321 includes a liquid inlet and a liquid outlet, the liquid inlet is communicated with a liquid suction end of the liquid suction device, and the liquid outlet is communicated with a liquid outlet end of the liquid suction device. In this way, the second suction channel 321 and a channel of the liquid leakage structure 312 are the same channel, and the liquid suction device is configured to drive the sewage in the first chamber 310 entering into the second chamber 320. By this arrangement, there is no need to worry about the damage to the liquid suction device caused by water intake. In order to make the liquid suction device work better, a filter screen 350 can be arranged in the first chamber 310 to separate the solid waste from the sewage in the first chamber 310, such that only the separated sewage needs to be driven into the second chamber 320 by the liquid suction device. By this arrangement, it can effectively prevent the liquid in the second chamber 320 from flowing back to the first chamber 310, regardless of whether the cleaning apparatus 10 is tilted, lying down, shaking, or upright; it can also ensure that the liquid in the first chamber 310 is discharged in time to prevent water entering the first suction device 400.

[0156] In the embodiments of the present disclosure, the dirt collected by the cleaning apparatus 10 is a solid-liquid mixture which is not easy for users to handle, for example, if the solid-liquid mixture is poured into the sewer, the sewer may be blocked; if the solid-liquid mixture is poured into a garbage can, the garbage bag may be damaged to cause a liquid leakage. So, the embodiments of the present disclosure provide the following solutions with regard the above-mentioned specific technical problems.

[0157] In one embodiment, the cleaning apparatus 10 further includes a sewage suction pipeline 112, and an outlet 112c of the sewage suction pipeline is communicated with the first chamber 310. As shown in Figs. 4 and 5, in case the first housing 310a and the second housing 320 are independent of each other, the outlet 112c of the sewage suction pipeline is directly communicated with the first chamber 310. As shown in Figs. 6-10 and 44, in case the first housing 310a is at least partially nested in the second housing 320, the sewage suction pipeline 112 includes a sewage suction pipe 112a and a sewage inlet pipe 112b. The sewage suction pipe 112a is arranged on the chassis 200 and the main body 100 of the cleaning apparatus 10, namely, the outside of the first chamber 310 and the second chamber 320; while the sewage inlet pipe 112b is arranged inside the water tank, and the outlet of the sewage inlet pipe 112b is the outlet 112c of the sewage suction pipeline 112, to drive the dirt outside entering the first chamber 310. The first suction device 400 is capable of sequentially suctioning air from the first suction channel 311, the first chamber 310, and the first suction channel 311 to generate a negative pressure to suction external dirt into the first chamber 310.

[0158] In some embodiments, typically, as shown in Figs. 18, 24, and 43, a filter screen 350 is provided in the first chamber 310, and the filter screen 350 is arranged between the liquid leakage structure 312 of the first chamber 310 and the second chamber 320 and the outlet 112c of the sewage suction pipeline. The first chamber 310 defines a solid waste chamber 316 located on a side of the outlet end for receiving the solid waste, such that when the first suction device 400 suctions external dirt into the first chamber 310 through the sewage suction pipeline 112, the solid waste can be accumulated in the solid waste chamber 316, and the liquid flows into the second chamber 320 through the liquid leakage structure 312 or is suctioned into the second chamber 320 by the second suction device 500, to achieve a solid-liquid

separation.

[0159] The filter screen 350 is capable of separating solid waste and liquid, allowing the solid waste to be stored in the first chamber 310, and the liquid to be stored in the second chamber 320, which facilitates the dirt separation for users. As such, the probability of sewer blocking or liquid pouring to the ground may be reduced. Further, the separated liquid is driven to enter the second chamber 320 by the second suction device 500 (including the air suction device and the liquid suction device), so the dryness in the first chamber 310 is improved, which reduces the probability that water or water vapor in the first chamber 310 enters the first suction device 400. In addition, the dryness of the solid-liquid dirt can also be improved, when users handle the solid-liquid dirt, the probability of water dripping to the ground which may cause a bad experience may be reduced. In one embodiment, as shown in Figs. 18 and 24, the filter screen 350 is located at the bottom of the first chamber 310, that is, the filter screen 350 is arranged above the bottom wall of the first housing 310a, the liquid leakage structure is arranged below the filter screen 350, such that the solid waste and liquid in the dirt can also be separated by the filter screen 350 under the dirt's own gravity, allowing the solid waste to be accumulated in the solid waste chamber 316 which is defined above the filter screen 350, and the liquid to flow to the second chamber 320 through the liquid leakage structure 312 which is arranged below the filter screen 350.

[0160] In some embodiments, as shown in Fig. 18, Fig. 24, and Fig. 43, the filter screen 350 is rotatably arranged in the first chamber 310, such that the filter screen 350 can be flipped from the inside to the outside of the first chamber 310 for cleaning the filter screen 350 or removing solid waste from the solid waste chamber 316. When pouring out waste, after tilting the first housing 310a to a certain angle, the filter screen 350 will be flipped due to gravity, to take the waste on the filter screen 350 away from the solid waste chamber, which prevents the solid waste from adhering to the inside of the solid waste chamber 316. The filter screen 350 and the solid waste adhering to it can be directly rinsed, causing the waste to fall off. This arrangement facilitates the handling of the waste in the solid waste chamber.

[0161] In some embodiments, as shown in Fig. 24, Fig. 43, and Fig. 45, the filter screen 350 is rotatably mounted in the first chamber 310 by a revolute pair 351.

[0162] Illustratively, the filter screen 350 is rotatably mounted in the first chamber 310 by the revolute pair 351. The rotation axis of the revolute pair 351 is arranged in a substantially horizontal direction or a substantially vertical direction. The terms "substantially horizontal" and "substantially vertical" refer to that when the main body 100 of the cleaning apparatus 10 is in a vertical state, the rotation axis of the revolute pair 351 is within a horizontal or vertical range not exceeding 10°.

[0163] In an embodiment, a side surface of the first chamber 310 is configured as the opening 325, and a rotational mounting portion 353 is arranged at the lower part of the opening 325 of the first chamber 310. The revolute pair 351 is mounted on the rotational mounting portion 353. The filter screen 350 can be flipped outward around the lower side at the opening 325 of the first chamber 310 to open the first chamber 310, as shown in Fig. 43.

[0164] In an embodiment, as shown in Fig. 24, a side surface of the first chamber 310 is configured as the opening 325, and a rotational mounting portion 353 is provided on a side of the opening 325 of the solid waste chamber 316. The revolute pair 351 is mounted on the rotational mounting portion 353. The filter screen 350 can be flipped around the left or right side at the opening 325 of the first chamber 310 to open the first chamber 310.

[0165] In an embodiment, as shown in Fig. 24, the filter screen 350 includes a first filter screen 350a and a second filter screen 350b that are rotatable toward each other. A side surface of the first chamber 310 is configured as the opening 325. The first filter screen 350a is rotatably mounted on the left side of the solid waste chamber 316, and the second filter screen 350b is rotatably mounted on the right side of the solid waste chamber 316. The first filter screen 350a and the second filter screen 350b are respectively flipped around the left and right sides of the opening 325 at the opening 325 of the first chamber 310 to open the first chamber 310.

[0166] In an embodiment, as shown in Fig. 24, the filter screen 350 includes a filter screen bottom plate 350c and a filter screen side plate 350d connected to an edge of the filter screen bottom plate 350c. Filter holes 352 are defined in the filter screen bottom plate 350c and/or the filter screen side plate 350d. Thus, after the first housing 310a is removed, the filter screen side plate 350d can enclose the waste on the filter screen bottom plate 350c, preventing the waste on the filter screen bottom plate 350c from leaking out from the edge. Furthermore, the filter screen side plate 350d increases the effective area of the filter screen 350, to improve the efficiency of solid-liquid separation for the waste inside the first chamber 310. This allows the sewage in the first chamber 310 to enter the second chamber 320 through the liquid leakage structure 312 more quickly, thereby advantageously reducing the risk of liquid intake of the first suction device 400.

[0167] Illustratively, the height of the filter screen side plate 350d is adapted to match the height of the first chamber 310 to seal the side surface of the first chamber 310, further preventing the waste in the first chamber 310 from falling out.

[0168] In an embodiment, the filter screen 350 is detachably connected to the first chamber 310. When pouring out waste, the filter screen 350 and the waste can be removed together, then the waste on the filter screen 350 is dumped and the filter screen 350 is cleaned, which facilitates replacement or cleaning of the filter screen 350.

[0169] In an embodiment, the filter screen 350 may be

provided with a filter screen holding portion, which is configured to facilitate removing the filter screen 350 from the first chamber 310, facilitating the placement and removal of the filter screen 350.

[0170] In an embodiment, the filter screen 350 is located at the lower end of the first chamber 310, to realize solid-liquid separation at the bottom of the first chamber 310. This maximizes the utilization of the volume of the first chamber 310, thereby maximizing the size of the solid waste chamber 316 inside the first chamber 310.

[0171] In an embodiment, as shown in Fig. 46, the filter screen 350 has a three-dimensional structure, such as a column structure. The filter screen 350 is arranged around the peripheral side of the liquid leakage structure 312. The filter screen 350 is arranged along the height direction, which increases the area of the filter screen 350 in the height direction. Thus, during the accumulation of solid waste, the filter screen 350 is less prone to be clogged, ensuring a high filtration efficiency at any height of the solid waste within the solid waste chamber 316.

[0172] In an embodiment, the filter screen 350 is a disposable box body, which may be placed in the first chamber 310. The shape of the box body is adapted to match the first chamber 310. The box body has a bottom wall and a side wall. The bottom wall may be defined with the filter holes 352. The bottom wall of the box body is adapted to match the bottom wall of the first chamber 310, and the side wall of the box body is adapted to match the inner side wall of the first housing 310a and/or the second housing 320a. The side wall of the box body can prevent waste from falling when the filter screen 350 is removed. The side wall of the box body may also be defined with the filter holes 352. The box body may also be set up in the same way as the filter screen described above. By setting the filter screen as disposable, it further reduces the difficulty for users in dealing with waste.

[0173] The first suction device 400 may be a device capable of generating negative pressure in the cleaning apparatus 10, such as a fan. The first suction device 400 is communicated with the first chamber 310 through the first suction channel 311, and is configured to provide power to suction the dirt collected by the cleaning apparatus 10 to the first chamber 310. However, the dirt commonly contains water or water vapor, and the water or water vapor is prone to enter the first suction device 400 through the first suction channel 311, this in turn may cause a damage to the first suction device 400 or a liquid leakage. Therefore, the embodiments of the present disclosure propose the following improvement.

[0174] In one embodiment, as shown in Figs. 47-49, the first housing 310a is provided with an air suction port 317, the air suction port 317 is configured to communicate the first suction device 400 and the first chamber 310, and the air suction port 317 defines a passage which forms a part of the first suction channel 311. The first suction device 400 provides suction power to the first chamber 310 through the air suction port 317 so that external dirt can be suctioned into the first chamber 310.

[0175] Illustratively, as shown in Fig. 47 and Fig. 48, the first housing 310a includes a top wall 310b and a side wall 310c. The air suction port 317 is arranged in the top wall 310b, and there is a spacing between the edge of the air suction port 317 and the side wall 310c. During the process of the first suction device 400 performing suction on the first chamber 310 through the air suction port 317, liquid on the side wall 310c may be drawn up along the side wall 310c due to the suction force of the first suction device 400, potentially entering the first suction device 400. When the liquid moves upward along the side wall 310c, it can be blocked by the top wall 310b between the edge of the air suction port 317 and the side wall 310c, to prevent the liquid from directly moving upward along the side wall 310c into the air suction port 317, which in turn reduces the probability of the liquid directly entering the first suction device 400 through the air suction port 317.

[0176] In an embodiment, a liquid-blocking structure 318 is provided on the top wall 310b of the first housing 310a. The liquid-blocking structure 318 is configured to block the liquid from entering the air suction port 317.

[0177] Illustratively, as shown in Fig. 46 and Fig. 47, the liquid-blocking structure 318 may include a first liquid-blocking portion 318a. The first liquid-blocking portion 318a is located on the rear side of the air suction port 317, to block the liquid in the first chamber 310 from vibrating toward the air suction port 317 from the rear side. Especially, when the main body 100 is tilting or lying down, the liquid will flow to the rear side that will result in a higher base liquid level, making the liquid further vibrating upward. However, the liquid can be blocked by the first liquid-blocking portion 318a behind the air suction port 317. In an embodiment, the first liquid-blocking portion 318a is arranged along the left-right direction.

[0178] In an embodiment, as shown in Fig. 47, the liquid-blocking structure 318 includes a second liquid-blocking portion 318b, which is located between the air suction port 317 and the side wall 310c of the first housing 310a. The second liquid-blocking portion 318b is spaced from the side wall 310c of the first housing 310a, to block wall-hanging liquid on the top wall 310b and the side wall 310c. Illustratively, the second liquid-blocking portion 318b is a wall surface extending downward from the top wall 310b. The wall surface may be a flat surface or an arc-shaped surface, and arranged around the air suction port 317. In the suction process of the first chamber 310 through the air suction port 317, liquid droplets or a liquid film may be suctioned upward along the side wall 310c due to the surface tension of liquid, and the second liquid-blocking portion 318b can prevent the liquid droplets or the liquid film from continuing to flow along the top wall 310b into the air suction port 317.

[0179] In an embodiment, the outlet 112c of the sewage suction pipeline is communicated with the first chamber 310, and the liquid-blocking structure 318 includes a third liquid-blocking portion 318c. The third liquid-blocking portion 318c is located between the air suction port 317 and the outlet 112c of the sewage suction pipeline,

and is configured to prevent the liquid at the outlet 112c of the sewage suction pipeline from being directly drawn into the air suction port 317. Illustratively, as shown in Fig. 50, the third liquid-blocking portion 318c is a ring-shaped baffle arranged at the top of the first chamber 310, with its lower edge located below the outlet 112c of the sewage suction pipeline.

[0180] It should be noted that the first liquid-blocking portion 318a, the second liquid-blocking portion 318b, and the third liquid-blocking portion 318c may be connected to form a whole, and the whole may be arranged around at least part of the air suction port 317. Illustratively, the whole is cylindrical.

[0181] In some embodiments, as shown in Fig. 48, the liquid-blocking portion 318 further includes a fourth liquid-blocking portion 318d. The fourth liquid-blocking portion 318d is arranged between the air suction port 317 and the third liquid-blocking portion 318c, and configured to prevent wall-mounted liquid of the liquid-blocking portion 318c from entering the air suction port 317. The fourth liquid-blocking portion 318d, the first liquid-blocking portion 318a, and the second liquid-blocking portion 318b may form a whole, and the whole may be arranged around at least part of the air suction port 317. Illustratively, the whole is cylindrical.

[0182] The liquid-blocking portion 318 is mainly configured to block liquid from entering the air suction port 317 from the first chamber 310. The present disclosure does not limit the structure of the liquid-blocking portion 318, as long as it can block the liquid from entering the air suction port 317 from the first chamber 310. In some embodiments, one or two of the first liquid-blocking portion 318a, the second liquid-blocking portion 318b, the third liquid-blocking portion 318c, and the fourth liquid-blocking portion 318d may be provided.

[0183] In an embodiment, referring to Fig. 46 and Fig. 47, the air suction port 317 is located on the front side of the first chamber 310, to reduce the probability of the liquid flowing into the air suction port 317 from the first chamber 310 when the main body 100 is tilting or lying down. When the main body 100 is lying down, the air suction port 317 on the front side is located on the upper side of the first chamber 310 which is in the lying-down state, thus the air suction port 317 is far from the liquid level, preventing the liquid from flowing into the air suction port 317 when the first chamber 310 is in the lying-down state.

[0184] In an embodiment, there are two air suction ports 317, which are respectively located on two sides of the outlet 112c of the sewage suction pipeline 112 in the left-right direction. The sequential arrangement makes the space inside the first chamber 310 more compact. The sewage suction pipeline 112 and the air suction ports 317 may be arranged on the same side of the first chamber 310 (i.e., the front side of the first chamber 310). The sewage suction pipeline 112 and the air suction ports 317 are both arranged on the front side of the first chamber 310, when the main body 100 is lying down, the outlet 112c of the sewage suction pipeline 112 and the air suction ports 317 are all located on the upper side of the first chamber 310, and thus are far away from the liquid level in the first chamber 310, thereby preventing the liquid in the first chamber 310 from flowing back into the air suction ports 317 or flowing back to the surface to be cleaned through the outlet 112c of the sewage suction pipeline 112. Further, the third liquid-blocking portion 318c may be arranged between the sewage suction pipeline 112 and the air suction port 317, to prevent the liquid from being directly drawn into the air suction port 317 from the outlet 112c of the sewage suction pipeline.

[0185] In an embodiment, the outlet 112c of the sewage suction pipeline is located on the front side of the first chamber 310, such that when the main body 100 is in the tilting or lying-down state, the outlet 112c of the sewage suction pipeline is located on the upper side of the first chamber 310 and thus is far away from the liquid level in the first chamber 310, preventing the liquid in the first chamber 310 from flowing back to the ground along the outlet 112c of the sewage suction pipeline.

[0186] In an embodiment, the outlet 112c of the sewage suction pipeline is located higher than the lower edge of the third liquid-blocking portion 318c, capable of changing the direction of the fluid (including liquid flow and air flow) by 180 degrees. Initially, the fluid flow is directed from upward to downward, and after being suctioned through the air suction port 317 located above, the direction of the fluid flow is reversed from downward to upward. Through two changes of direction, the liquid entrained in the fluid is flung out, which aids the liquid-gas separation in the first chamber 310.

[0187] Understandably, the third liquid-blocking portion 318c may be in the shape of a circular ring, a rectangular frame or a polygonal frame, and arranged around the outlet 112c of the sewage suction pipeline. Alternatively, the third liquid-blocking portion 318c may be a baffle. In some embodiments, there are at least two third liquid-blocking portions 318c. Similarly, the number of the first liquid-blocking portion 318a and the number of second liquid-blocking portion 318b are not limited herein.

[0188] In an embodiment, as shown in Fig. 50, the distance between the left side of the third liquid-blocking portion 318c and the sewage suction pipeline 112 and the distance between the right side of the third liquid-blocking portion 318c and the sewage suction pipeline 112, are less than the distance between the rear side of the third liquid-blocking portion 318c and the sewage suction pipeline 112. That is, the liquid and air flow exiting the sewage suction pipeline 112 will flow downward through the gap between the third liquid-blocking portion 318c and the sewage suction pipeline 112. The larger gap between the rear side of the third liquid-blocking portion 318c and the sewage suction pipeline 112 is beneficial to reduce the speed of the liquid and the air flow exiting from the rear side, thereby preventing the liquid leakage struc-

ture 312 from being significantly impacted by the air flow and liquid exiting from the rear side. The greater the impact, the more it exerts a force on the liquid accumulated at the liquid leakage structure 312. The liquid, which has not yet entered the second chamber 320 and is accumulated here, may be dispersed under a strong impact, especially when most of what enters from the sewage suction pipeline 112 is air. This will affect the convergence of the liquid toward the liquid leakage structure 312, thereby affecting the normal operation of the liquid leakage structure 312. The smaller gap between the left/right side of the third liquid-blocking portion 318c and the sewage suction pipeline 112 is beneficial for increasing the speed of the liquid and air flow exiting from the left and right sides, thereby enhancing the separation effect of the liquid and air flow exiting from the two sides.

[0189] In some embodiments, the height of the front side of the outlet 112c of the sewage suction pipeline is greater than the height of the rear side (as shown in Fig. 49), so that the sewage exiting the sewage suction pipeline 112 can be directed to the rear side. Since the sewage suction pipeline 112 is arranged on the front side, the sewage flowing out of the outlet 112c can enter a larger space at the rear side of the sewage suction pipeline 112, preventing blockage at the outlet 112c of the sewage suction pipeline.

[0190] In some embodiments, as shown in Fig. 7, the content detection assembly 360 of the cleaning apparatus 10 further includes a first detection assembly 361. The control device 600 is connected to the first detection assembly 361. The first detection assembly 361 is arranged in the first chamber 310 and/or the second chamber 320, and is configured to detect information of content accommodated in the first chamber 310 and/or the second chamber 320. This allows the control device 600 to adjust the operating parameter of the first suction device 400 and/or the second suction device 500 according to the content information detected by the first detection assembly 361.

[0191] Illustratively, a filter screen 350 may be provided in the first chamber 310 to allow the first chamber 310 to define the solid-liquid chamber. In this case, the content information may indicate the amount of solid waste accommodated.

[0192] Illustratively, the first detection assembly 361 in the first chamber 310 is arranged in the upper part of the first chamber 310.

[0193] Illustratively, the first detection assembly 361 in the first chamber 310 is arranged on the upper rear side of the first chamber 310. This arrangement allows that, when the cleaning apparatus is in the lying-down state, if the first detection assembly 361 is triggered by liquid, it indicates that there is a risk of liquid intake of the first suction device 400.

[0194] Illustratively, the first detection assembly 361 in the first chamber 31 is arranged lower than the air suction port 317, such that the first detection assembly 361 can be triggered before the content in the first chamber 310 blocks the air suction port 317.

[0195] Further, the cleaning apparatus 10 may include an indication device (not shown). The indication device is electrically connected to the first detection assembly 361, so that when the amount of dirt in the first chamber 310 and/or the second chamber 320 reaches a preset value or a trigger occurs, the indication device can notify users to replace or clean the first chamber 310 and/or the second chamber 320, thereby reducing the possibility of safety hazards caused by the backflow of liquid in the first chamber 310 and the second chamber 320.

[0196] Illustratively, the control device 600 is connected to the first detection assembly 361 and the first suction device 400 and/or the second suction device 500. When the amount of dirt in the first chamber 310 reaches a preset value or a trigger occurs, the control device 600 may adjust the operating parameter of the first suction device 400, to turn off the first suction device 400 or reduce the suction force of the first suction device 400, thereby reducing the possibility of the liquid in the first chamber 310 entering the first suction device 400.

[0197] When the amount of dirt in the first chamber 310 is relatively large (for example, there is a lot of solid waste in the first chamber 310), it can to some extent make it difficult for the liquid in the first chamber 310 to enter the second chamber 320. In such scenario, the control device 600 may adjust the operating parameter of the second suction device 500 to increase the suction force of the second suction device 500. This allows the second suction device 500 to provide a greater suction power to draw a sufficient amount of liquid from the first chamber 310 into the second chamber 320.

[0198] It should be noted that the first detection assembly 361 detects the amount of dirt in the first chamber 310, including the detection of solid content, viscous content, and liquid content in the first chamber 310. The specific detection methods include, but are not limited to, the detection of the height of accumulated dirt, the weight of dirt, and even the direct acquisition of the amount of dirt through visual means. The present disclosure does not limit the specific detection methods.

[0199] In an embodiment, the cleaning apparatus includes a second detection assembly 362, which is configured to detect information of content accommodated in the second chamber. Illustratively, when the amount of dirt in the second chamber 320 reaches a preset value, the control device 600 may adjust the operating parameter of the second suction device 500, to reduce the suction force of the second suction device 500 or turn off the second suction device 500, thereby reducing the likelihood of the liquid in the second chamber 320 entering the second suction device 500. In this case, in order to reduce the probability of liquid intake of the first suction device 400, when the amount of dirt in the second chamber 320 reaches the preset value, the control device 600 may reduce the suction force of the first suction device 400 or turn off the first suction device 400, to prevent

continuous increase of liquid in the second chamber 320.

[0200] Illustratively, the operating parameters of the first suction device 400 and the second suction device 500 include at least one of the following: an operating power, an operating duration, an operating voltage, and an operating duty cycle current. This allows the control device 600 to control the operating duration and suction force of the first suction device 400 and the second suction device 500 through the operating parameters, such that external liquid can enter the first chamber 310, and the liquid in the first chamber 310 can enter the second chamber 320. Moreover, under the control of the control device 600, the operating parameters of the first suction device 400 and the second suction device 500 can be flexibly adjusted according to the current state of the cleaning apparatus 10, or based on the amount of dirt in the first chamber 310 and/or the second chamber 320. In particular, when the amount of liquid dirt is relatively large, the suction device may be turned off in time or the suction force of the suction device may be reduced (the greater the suction force, the higher the operating power required, and the higher the operating power, the greater the risk of liquid intake of the suction device), to provide timely protection for the first suction device 400 and the second suction device 500.

[0201] Moreover, since the operating parameter of the second suction device 500 can be flexibly adjusted according to the amount of dirt in the first chamber 310, the operating power of the second suction device 500 can be reduced when there is less dirt in the first chamber 310, and the operating power of the second suction device 500 can be increased when there is more dirt in the first chamber 310. By matching the amount of dirt in the first chamber 310 with the operating parameter of the second suction device 500, dynamic adjustment of the operating parameter of the second suction device 500 is achieved, thus prevent the second suction device 500 from always operating at a high power that would result in consistently high noise levels. This reduces the impact of operational noise on users, thereby effectively enhancing the user experience.

[0202] In some other embodiments, the height of the rear side of the outlet 112c of the sewage suction pipeline is higher than the height of the front side. When the main body 100 is tilting and lying down, the rear side of the outlet 112c of the sewage suction pipeline is higher than the front side to form a barrier from the rear to the front at the outlet, which effectively reduces the risk of the liquid in the first chamber 310 from flowing back from the front side of the outlet 112 closer to the liquid level.

[0203] It can be understood that the outlet 112c of the sewage suction pipeline is obliquely arranged, which can change the direction of the air flow or liquid flow exiting the outlet 112 of the sewage suction pipeline, preventing the air flow or liquid flow from directly impacting the top plate of the first chamber 310.

[0204] In the embodiments of the present disclosure, in case the first housing 310a is nested in the second housing 320, the first chamber 310 and the second chamber 320 need to be independent of each other to ensure that the air suction device can concentrate its suction force on the liquid leakage structure 312 as much as possible, so there need be the least gaps between the first housing 310a and the second housing 320 as much as possible. However, a gap is inevitably defined between the sewage suction pipeline 112 and the first housing 310a, since the sewage suction pipeline 112 which is configured to collect the dirt generated by the cleaning apparatus needs to pass through the second housing first and then communicate to the first chamber 310, and the first housing 310a needs to be detachably arranged to facilitate the disposal of dirt. In order to reduce the influence of the gap, the embodiments of the present disclosure propose the following solutions.

[0205] In one embodiment, as shown in Figs. 44-53, the sewage suction pipeline 112 further includes a sewage inlet pipe 112b arranged in the second housing 320a and a sewage suction pipe 112a connected with the sewage inlet pipe 112b, the sewage suction pipe 112a is configured to suction the dirt and sewage on the ground into the sewage inlet pipe 112b, the sewage inlet pipe 112b is communicated with the first chamber 310, and a sealing member is arranged at the joints of the sewage inlet pipe 112b and the first housing 310a, so the gap between the first housing 310a and the sewage inlet pipe 112b is filled to ensure that the second suction device 500 can apply and concentrate its suction force on the liquid leakage structure 312.

[0206] In one embodiment, the first housing 310a is provided with a dirt anti-leakage pipe 319, and the sewage inlet pipe 112b passes through the dirt anti-leakage pipe 319. In case the first housing 310a is removed, the dirt anti-leakage pipe 319 can prevent the dirt in the first chamber 310 from falling out from the opening which is communicated with the sewage inlet pipe 112b. Further, a sixth sealing member 930 may be provided between the dirt anti-leakage pipe 319 and the sewage inlet pipe 112b to isolate the sewage inlet pipe 112b from the second chamber 320. The sixth sealing member 930 may be disposed at the top of the dirt anti-leakage pipe 319 or the upper part of the inner side wall of the dirt anti-leakage pipe 319, which can reduce the friction force between the sewage inlet pipe 112b and the dirt anti-leakage pipe 319 brought by the sealing member during picking or placing the first housing 310a, allowing the picking and placing of the first housing 310a being smoother. The sixth sealing member 930 may also be arranged at the bottom of the dirt anti-leakage pipe 319, such that the sixth sealing member 930 can be installed from the opening of the dirt anti-leakage pipe 319 located at the bottom of the first housing 310a, which facilitates the assembly of the sixth sealing member 930.

[0207] In one embodiment, as shown in Fig. 52, the inner wall of the dirt anti-leakage pipe 319 is provided with a convex edge 319a along the circumference of the dirt anti-leakage pipe 319, the end face of the sewage inlet

pipe 112b is abutted with the convex edge 319a, and the sixth sealing member 930 is located between the end face of the sewage inlet pipe 112b and the convex edge 319a. In case the sewage inlet pipe 112b is inserted into the dirt anti-leakage pipe 319 and is in place, the two will apply axial pressure to the sixth sealing member 930. During loading and disassembly of the two, the sixth sealing member 930 is not in contact with the other, which eliminates the frictional resistance brought by the sealing member, allowing the loading or disassembly of the first housing 310a being smooth. Further, since the first housing 310a and the second housing 320 are interference fit, the relative position between the first housing 310a and the second housing 320 is stabilized, which may further ensure the sealing performance of the sealing member.

[0208] In one embodiment, the first housing 310a is provided with a sewage inlet pipe hole 310n, the sewage inlet pipe 112b is inserted into the sewage inlet pipe hole 310n, and the sixth sealing member 930 is arranged on an outside of the sewage inlet pipe 112b or on an inner wall of the sewage inlet pipe hole 310n. When the sewage inlet pipe 112b is inserted into the sewage inlet pipe hole 310n, the sewage inlet pipe 112b is sealed with the sewage inlet pipe hole 310n by way of the circumferential surfaces of the both. Compared with the end face sealing in which the sealing effect may be reduced brought by the sewage inlet pipe 112b not installing in place, there is less possibility of affecting to the sealing effect in this embodiment.

[0209] In the present disclosure, the first chamber 310 and the second chamber 320 are configured to hold the dirt generated during the cleaning process of the cleaning apparatus 10. However, an excessive amount of dirt would affect the normal operation of the cleaning apparatus 10, and even worse, it may cause damage to the cleaning apparatus 10. For example, if sewage enters the first suction device 400 or the second suction device 500, the cleaning apparatus 10 may be damaged. To reduce the possibility of such anomalies, the present disclosure provides solutions as follows.

[0210] In an embodiment, as shown in Fig. 7, Fig. 9, Fig. 57, and Fig. 58, the cleaning apparatus 10 further includes a content detection assembly 360. The content detection assembly 360 includes a first detection assembly 361 and a second detection assembly 362, which are respectively configured to detect information of content accommodated in the first chamber 310 and information of content accommodated in the second chamber 320. This realizes simultaneous detection of the content in the first chamber 310 and the second chamber 320. The content information may include an amount of solid waste, a liquid level, information on presence or absence of liquid, and the like.

[0211] Illustratively, a filter screen is arranged in the first chamber 310. The first chamber 310 may define separated solid and liquid chambers, and the first detection assembly 361 may be configured to detect the amount of the solid waste. The second chamber 320 is mainly configured to store liquid, and the second detection assembly 362 may be configured to detect the liquid level inside the second chamber 320. When either chamber is full, users will be notified to maintain the cleaning apparatus 10, thus improving reliability. If only one chamber is detected, and the other chamber becomes full without the user's knowledge, continuing to use the cleaning apparatus 10 could cause potential damage to the cleaning apparatus 10, or cause leakage that would affect the cleaning effect.

[0212] In an embodiment, as shown in Fig. 57 and Fig. 58, the first detection assembly 361 is connected in parallel with the second detection assembly 362. The first detection assembly 361 is arranged in the first chamber 310, and the second detection assembly 362 is arranged in the second chamber 320. Herein, the term "connected in parallel" refers to that an indication is generated when either the first detection assembly 361 or the second detection assembly 362 is triggered. There may be more than one first detection assemblies 361, which are located at different positions of the first chamber 310. These first detection assemblies 361 are connected in parallel.

[0213] In an embodiment, the first detection assembly 361 is located in the first chamber 310, and the second detection assembly 362 is located in the second chamber 320. Illustratively, the first detection assembly 361may be located on the inner side wall of the first chamber 310 or at the center of the cavity of the first chamber 310.

[0214] Further, the cleaning apparatus 10 includes an electrical connector 364, which is connected to the first detection assembly 361 and the second detection assembly 362 (as shown in Fig. 57). The electrical connector 364 is configured to guide a signal out. Illustratively, the first detection assembly 361 or the second detection assembly 362 may be a photoelectric detector, a capacitive detector, or an electrode detector.

[0215] In some other embodiments, as shown in Fig. 58, the first detection assembly 361 and the second detection assembly 362 are formed by parts of the electrical connector 364. Illustratively, the electrical connector 364 itself has conductivity and can also be used as electrodes. Therefore, as shown in Fig. 58, the electrical connector 364 is arranged in the wall of the first chamber 310, and a connection hole 367 is defined in the wall for coupling the space inside the chamber with the electrical connector 364, such that the electrical connector 364 can be directly used as the detection assembly, which simplifies the manufacturing process. The detection assembly may be integrally formed with a signal transmission component, improving the reliability.

[0216] In some embodiments, as shown in Fig. 57 and Fig. 58, the electrical connector 364 may be arranged on the wall surface of the first chamber 310, namely, on the first housing 310a. Illustratively, the electrical connector 364 is arranged on the surface of the first housing 310a; or, the first housing 310a is defined with a mounting groove or a mounting hole extending along the up-down

direction, and the electrical connector 364 is located in the mounting groove or mounting hole. The electrical connector 364 further includes a contact 365, which is configured to output the signal of the electrical connector 364. The contact 365 is connected with the control device 600 of the cleaning apparatus 10. When the water tank 300 is installed in place, the contact 365 is connected with the control device 600 for signal transmission; when the water tank 300 is removed, the contact 365 is disconnected from the control device 600. The contact 365 is located on the outer side wall of the first housing 310a. When the first housing 310a is nested in the second housing 320a, the contact 365 is located on the outer side wall of the first housing 310a and is exposed outside the second housing 320a.

[0217] Illustratively, the bottom of the electrical connector 364 extends into the second chamber 320 to form the second detection assembly 362. The wall of the first chamber 310 is defined with a connection hole 367 communicated with the mounting groove (or the mounting hole) and the first chamber 310. The middle of the electrical connector 364 is communicated with the first chamber 310 through the connection hole to form the first detection assembly 361.

[0218] In an embodiment, the second detection assembly 362 is arranged at the upper part of the second chamber 320; and/or, the first detection assembly 361 is arranged on the inner side wall 310c of the first chamber 310, and the second detection assembly 362 may be arranged at the bottom of the second housing 320a for removing together with the second housing 320a, and may also be arranged on the inner side wall 310c of the first chamber 310, which is not limited herein.

[0219] In an embodiment, there are two electrical connectors 364. The first detection assembly 361 includes a first electrode 3611 and a second electrode 3612, which are respectively connected to the two electrical connectors 364. The first electrode 3611 and the second electrode 3612 are both located in the first chamber 310.

[0220] Since the triggering condition of the first detection assembly 361 requires the first electrode 3611 and the second electrode 3612 to be conductive, the positions of the first electrode 3611 and the second electrode 3612 need to be designed to prevent false triggering.

[0221] The heights of the first electrode 3611 and the second electrode 3612 are different, and the height difference is utilized to minimize the formation of a water film.

[0222] At least one of the first electrode 3611 and the second electrode 3612 is located at the top of the first chamber 310, to ensure that a trigger occurs once the first chamber 310 is full. At least one of the first electrode 3611 and the second electrode 3612 is located at the bottom of the first chamber 310.

[0223] At least one of the first electrode 3611 and the second electrode 3612 extends downward from the top wall of the first chamber 310 and forms a gap with the side wall of the first chamber 310. This arrangement helps to reduce the formation of a water film between the first electrode 3611 and the second electrode 3612, thereby preventing false triggering.

[0224] The first electrode 3611 and the second electrode 3612 are arranged on two sides of the first chamber 310. Illustratively, the first electrode 3611 and the second electrode 3612 are arranged on two sides of the sewage suction pipeline 112, such that the two electrodes are separated by the sewage suction pipeline 112, thereby reducing the probability of formation of a water film. Moreover, this configuration takes into account the space within the first chamber 310, to prevent accumulation of the content all on one side of the first chamber 310 while the other side still has space, which could otherwise lead to false triggering.

[0225] Illustratively, at least one of the first electrode 3611 and the second electrode 3612 is arranged at the top or in the middle of the first chamber 310. When the amount of the content in the first chamber 310 is substantial and the content comes into contact with the top electrode, the two electrodes are conductive due to the content, to trigger a signal indicating that the level of the content in the first chamber 310 has reached a detection position.

[0226] In an embodiment, one of the first electrode 3611 and the second electrode 3612 is arranged at the top of the first chamber 310, and the other one of the first electrode 3611 and the second electrode 3612 is arranged at the bottom of the first chamber 310.

[0227] In an embodiment, there are two electrical connectors 364, and the second detection assembly 362 includes a third electrode and a fourth electrode, which are respectively connected to the two electrical connectors 364. One of the third electrode and the fourth electrode is arranged on the bottom surface of the first chamber 310. At least one of the third electrode and the fourth electrode may also extend downward from the bottom wall of the first chamber 310 and form a gap with the side wall of the second chamber 320, to reduce the formation of a water film between the third electrode and the fourth electrode. By arranging the third electrode and the fourth electrode in the first housing 310a, the structure and processing of the second housing 320a are simplified. By arranging the second detection assembly 362 at the bottom of the first housing 310a, when the first housing 310a is installed in place, the second detection assembly 362 plays a role in detecting the content in the second housing 320a.

[0228] In an embodiment, the bottom surface of the first chamber 310 is provided with a support protrusion. The lower edge of the third electrode and/or the fourth electrode is higher than the bottom of the support protrusion, to allow the support protrusion to provide support after the first chamber 310 is removed. This prevents the third electrode and/or the fourth electrode from coming into contact with or colliding with the placement surface, protecting the third electrode and/or the fourth electrode, and also allowing the first chamber 310 to stand upright

after being removed.

[0229] In an embodiment, referring to Fig. 60, the cleaning apparatus 10 further includes a third detection assembly 363. The third detection assembly 363 includes a fifth electrode 3631 and a sixth electrode 3632. The second chamber 320 is further communicated with the second suction channel 321, and at least one of the fifth electrode 3631 and the sixth electrode 3632 is arranged in the second suction channel 321. When liquid enters the second suction channel 321, the electrode located in the second suction channel 321 is conductive to the other electrode. That is, the third detection assembly 363 can function to detect the entry of liquid into the second suction channel.

[0230] In an embodiment, as shown in Fig. 60, the fifth electrode 3631 and/or the sixth electrode 3632 located in the second suction channel 321 form the separation plates 321c in the second suction channel 321. That is, in addition to that the fifth electrode 3631 and/or the sixth electrode 3632 in the second suction channel can detect the state of liquid entering the suction channel, the third electrode and/or fourth electrode, served as the separation plates, can directly prevent the liquid from entering the suction channel.

[0231] In an embodiment, multiple separation plates 321c are staggered in the second suction channel 321, and the third electrode and/or the fourth electrode in the suction channel are staggered with the multiple separation plates 321c to form a curved path for the air flow, which blocks the liquid while allowing the gas to pass through smoothly, further preventing the liquid from being directly drawn into the air suction device.

[0232] In an embodiment, the first detection assembly 361 is arranged at the front part of the first chamber 310, to prevent the liquid from contacting the first detection assembly 361 when the first chamber 310 is in the lying-down state, thereby avoiding any misjudgment by the first detection assembly 361.

[0233] In an embodiment, the first detection assembly 361 is arranged on the upper rear side of the first chamber 310, and is capable to detect the backflow of the liquid in the first chamber 310 when the cleaning apparatus 10 is lying down, thus can be triggered timely.

[0234] In an embodiment, the second detection assembly 362 is arranged on the front side of the second chamber 320, to prevent the liquid from contacting the second detection assembly 362 when the second chamber 320 is in the lying-down state, thereby avoiding any misjudgment by the second detection assembly 362. The first detection assembly 361 and/or the second detection assembly 362 are arranged on the front side, and when the main body 100 is lying down, the distance between the respective first detection assembly 361 and the second detection assembly 362 on the front side and the liquid level is the maximum, which helps to avoid the triggering of the first detection assembly 361 and/or the second detection assembly 362 due to changes in the liquid level when the cleaning apparatus is lying down. Moreover, the first detection assembly 361 and/or the second detection assembly 362 are located on the same side as the air suction port 317 and the first suction channel 311 as well as the second suction channel 321. When the liquid level rises to affect the operation of the air suction port 317, the first detection assembly 361 and/or the second detection assembly 362 can perform synchronous detection.

[0235] In an embodiment, a retaining edge structure is provided around the outer side of the first detection assembly 316 arranged on the wall of the first chamber 310, and/or, a retaining edge structure is provided around the outer side of the second detection assembly 362 arranged on the wall of the second chamber 320. The retaining edge structure can prevent a liquid film formed on the inner wall of the first chamber 310 or on the inner wall of the second chamber 320 due to the surface tension from communicating with the first detection assembly 361 and/or the second detection assembly 362, thus avoiding any misjudgment by the first detection assembly 361 or the second detection assembly 362 that might be caused by liquid running along the wall of the first chamber 310 or the wall of the second chamber 320.

[0236] In an embodiment, the first detection assembly 361, the second detection assembly 362, and/or the third detection assembly 363 are photodetectors. That is, the first detection assembly 361, the second detection assembly 362, and the third detection assembly 363 may be electrode-type detectors or photoelectric-type detectors, and they can be combined freely as needed.

[0237] Illustratively, in the present disclosure, the first to the sixth sealing members may all be sealing rings.

[0238] As shown in Figs. 54-56, according to a second aspect of the present disclosure, a cleaning apparatus 10 is provided. The cleaning apparatus 10 includes a chassis 200, a main body 100, a first chamber 310, a second chamber 320, and a first suction device 400. The main body 100 is rotatably connected with the chassis 200, the first chamber 310 is arranged on the main body 100, the second chamber 320 is communicated with the first chamber 310. The first suction device 400 is communicated with the first chamber 310 through a first suction channel 311 to provide power to drive external liquid to enter the first chamber 310. The first suction device 400 is also communicated with the second chamber 320 through a second suction channel 321 to provide power to drive liquid in the first chamber 310 to enter the second chamber 320. As such, a first suction device 400 is shared to provide power to drive the external liquid into the first chamber 310 and to provide power to drive the liquid in the first chamber 310 into the second chamber 320. The first suction device 400 performs suction to the first chamber 310 and the second chamber 320 through respective the independent first suction channel 311 and the second suction channel 321. In case external liquid is suctioned into the first chamber 310, air in the first chamber 310 is pumped out through the first suction channel 311, and the liquid is then pumped into the second

chamber 320 through the liquid leakage structure 312 which is communicated with the first chamber 310 and the second chamber 320. As such, liquid in the first chamber 310 is always less, so the first chamber 310 would not be full filled with liquid, and the liquid in the first chamber 310 would not enter the first suction device 400 when the cleaning apparatus 10 is shaking, tilting, or lying down. Further, the first suction device 400 can also perform suction to the liquid leakage structure 312, so liquid in the second chamber 320 may be prevented from flowing back into the first chamber 310. The whole structure is simple and utility. Compared with the solutions as shown in Figs. 4-6, this exemplary embodiment uses only the first suction device 400 as a power source to realize suction and collecting of the external liquid, and the first suction device 400 simultaneously has a lower probability of water intake, which is cost saving.

[0239] In one embodiment, the cleaning apparatus 10 includes a sewage suction pipeline 311, the sewage suction pipeline 311 is communicated with the first chamber 310 and the outside. The first suction channel 311 includes an air suction port 317 arranged in the first chamber 310, and the first suction device 400 is communicated with the first chamber 310 through the air suction port 317 to allow negative pressure being generated in the first chamber 310, such that external liquid is suctioned to enter the first chamber 310 through the sewage suction pipeline 311.

[0240] In one embodiment, the second suction channel 321 is provided wholly or partially on a side wall 310c of the first housing 310a, the first suction device 400 is communicated with the second chamber 320 through the second suction channel 321 to allow negative pressure be generated in the second chamber 320. This can enable the liquid in the first chamber 310 to not only enter the second chamber 320 under gravity, but also utilize the suction power of the first suction device 400 to assist the liquid in the first chamber 310 in accelerating its entry into the second chamber 320.

[0241] In one embodiment, the cross-sectional area of the first suction channel 311 is smaller than the cross-sectional area of the second suction channel 321, so that a negative pressure difference may be formed between the first chamber 310 and the second chamber 320 by way of only one suction device, which facilitates the liquid in the first chamber 310 entering the second chamber 320.

[0242] In one embodiment, the negative pressure in the second chamber 320 is greater than the negative pressure in the first chamber 310, which facilitates the liquid in the first chamber 310 entering the second chamber 320.

[0243] Referring to Fig. 1 to Fig. 56, according to a third aspect of the present disclosure, a water tank 300 is provided. The water tank 300 is configured to be installed on the main body 100 of the cleaning apparatus 10, and the main body 100 is rotatably connected with the chassis 200 of the cleaning apparatus 10. The water tank 300 includes a first chamber 310 and a second chamber 320, the first chamber 310 is arranged on the main body 100, the first chamber 310 is capable of communicating with the first suction device 400, and the first suction device 400 provides power to drive external liquid entering into the first chamber 310. The second chamber 320 is communicated with the first chamber 310 and is capable of communicating with the second suction device 500, and the second suction device 500 provides power to drive the liquid in the first chamber 310 entering into the second chamber 320.

[0244] Referring to Fig. 1 to Fig. 56, according to a fourth aspect of the present disclosure, a water tank 300 is provided. The water tank 300 is configured to be installed on the main body 100 of the cleaning apparatus 10, and the main body 100 is rotatably connected to the chassis 200 of the cleaning apparatus 10. The water tank 300 includes a first chamber 310 and a second chamber 320, the first chamber 310 is arranged on the main body 100, and the second chamber 320 is communicated with the first chamber 310. The cleaning apparatus 10 includes a first suction device 400, the first suction device 400 is communicated with the first chamber 310 through the first suction channel 311, and the first suction device 400 provides power to drive external liquid entering into the first chamber 310. The first suction device 400 is also communicated with the second chamber 320 through the second suction channel 321, and the first suction device 400 provides power to drive liquid in the first chamber 310 to enter into the second chamber 320.

[0245] The embodiments of the present disclosure reduce the probability of water intake into the first suction device 400 in communication with the first chamber 310 by providing two independent first chamber 310 and second chamber 320 for the cleaning apparatus 10 or the water tank 300, and by providing the second chamber 320 with an additional power to drive the liquid in the first chamber 310 to enter into the second chamber 320.

[0246] The above are only embodiments of the present disclosure but are not to limit the protection scope of the present disclosure. One person skilled in the art can easily think of various equivalent modifications or replacements within the scope disclosed in the present disclosure, and these modifications or replacements all fall within the protection scope of the present disclosure. Therefore, the protection scope of the present disclosure should be based on the protection scope of the claims.

Claims

1. A cleaning apparatus comprising:

a chassis;
a main body rotatably connected to the chassis;
a first chamber arranged on the main body;
a second chamber communicated with the first chamber;

a first suction device communicated with the first chamber, the first suction device being configured to provide power to drive external liquid into the first chamber; and

a second suction device communicated with the second chamber, the second suction device being configured to provide power to drive liquid in the first chamber entering the second chamber.

2. The cleaning apparatus according to claim 1, further comprising:

a posture detection device, the posture detection device being configured to detect a current motion state parameter of the cleaning apparatus; and

a control device, connected to the posture detection device, and connected to the first suction device and/or the second suction device, and configured to adjust an operating parameter of the first suction device and/or the second suction device according to the current motion state parameter of the cleaning apparatus detected by the posture detection device.

3. The cleaning apparatus according to claim 1, further comprising:

a first detection assembly arranged in the first chamber, the first detection assembly being configured to detect information of content accommodated in the first chamber; and

a control device, connected to the first detection assembly, and connected to the first suction device and/or the second suction device, and configured to adjust an operating parameter according to dirt information detected by the first detection assembly.

4. The cleaning apparatus according to claim 1, wherein

the operating parameter of the first suction device and the second suction device comprises at least one of an operating power, an operating duration, an operating voltage, and an operating duty cycle.

5. The cleaning apparatus according to claim 2, wherein

the motion state parameter detected by the posture detection device comprises at least one of an inclination angle of the main body relative to a ground, an inclination angular velocity of the main body relative to the ground, an inclination angular acceleration of the main body relative to the ground, a motion acceleration of the main body, a motion speed of the main body, or a height of the first chamber relative to the ground.

6. The cleaning apparatus according to claim 1, wherein

the first suction device is configured to suction dirt outside the cleaning apparatus into the first chamber.

7. The cleaning apparatus according to claim 1, wherein

the second chamber is arranged on the main body; or, the second chamber is arranged on the chassis.

8. The cleaning apparatus according to claim 1, wherein

the first chamber and the second chamber are communicated through a liquid leakage structure, allowing liquid in the first chamber to be discharged into the second chamber.

9. The cleaning apparatus according to claim 8, wherein

the liquid leakage structure is arranged at a rear side of the first chamber.

10. The cleaning apparatus according to claim 9, wherein

the liquid leakage structure is arranged at a lower part of the first chamber.

11. The cleaning apparatus according to claim 8, wherein

a maximum size of the liquid leakage structure in a front-rear direction is smaller than a minimum size of the liquid leakage structure in a left-right direction; and/or

a cross-sectional area of the liquid leakage structure is less than 1/4 of an area of a bottom surface of the first chamber.

12. The cleaning apparatus according to claim 1, wherein

the first suction device is communicated to the first chamber through a first suction channel, and the second suction device is communicated to the second chamber through a second suction channel.

13. The cleaning apparatus according to claim 12, wherein

the second suction device comprises an air suction device;

the air suction device is configured to suction air in the second chamber to allow a negative pressure generating in the second chamber; and/or,

a flow rate of the air suction device is less than a flow rate of the first suction device; and/or,

the first chamber and the second chamber are communicated through a liquid leakage structure, and a cross-sectional area of a suction port

of the air suction device is similar to a cross-sectional area of the liquid leakage structure.

14. The cleaning apparatus according to claim 13, wherein
a negative pressure of the first chamber is smaller than a negative pressure of the second chamber during the first suction device and the air suction device are working.

15. The cleaning apparatus according to claim 13, wherein
the second suction channel comprises an air inlet communicated with the second chamber and an air outlet communicated with the air suction device.

16. The cleaning apparatus according to claim 15, wherein
the second chamber is arranged on the main body, and the air inlet of the second suction channel is located at a front side of the second chamber.

17. The cleaning apparatus according to claim 15, wherein the air inlet of the second suction channel is located at a top of the second chamber.

18. The cleaning apparatus according to claim 15, wherein the second chamber is arranged on the main body, and a maximum size of the air inlet and/or the second suction channel in a front-rear direction of the main body is smaller than a minimum size of the air inlet and/or the second suction channel in a left-right direction of the main body.

19. The cleaning apparatus according to claim 15, wherein a cross-sectional area of the second suction channel gradually decreases in a direction from the air inlet to the air outlet.

20. The cleaning apparatus according to claim 15, wherein the second suction channel comprises at least one guiding wall, the guiding wall is configured to guide air flow in the second suction channel to flow from the air inlet to the air outlet along a curved path.

21. The cleaning apparatus according to claim 20, wherein

the second suction channel is provided with a plurality of staggered separation plates arranged at intervals along a suction direction, and the separation plates extend substantially along a left-right direction of the main body; and the separation plates form the at least one guiding wall, and the separation plates are further configured to prevent liquid in the second chamber from flowing into the air outlet through the second suction channel.

22. The cleaning apparatus according to claim 21, wherein
a flow guiding port is defined in each separation plate, or a flow guiding port is defined between each separation plate and an inner wall of the second suction channel, at least two flow guiding ports are provided and are staggered, and the flow guiding ports and the separation plates are configured to guide the air flow along the curved path.

23. The cleaning apparatus according to claim 22, wherein

openings are defined in the separation plates, and the openings form the flow guiding outlets; or
one end of each separation plate is connected to the inner wall of the second suction channel, and a gap is defined between the other end of the separation plate and the inner wall of the second suction channel, gaps are staggered, and the gaps form the flow guiding outlets.

24. The cleaning apparatus according to claim 22, wherein
the flow guiding port of one separation plate of two adjacent separation plates is located at a left end of the one separation plate, and the flow guiding port of the other one separation plate of the two adjacent two separation plates is located at a right end of the other one separation plate.

25. The cleaning apparatus according to claim 22, wherein

at least one separation plate is defined with at least one first opening, and the at least one first opening is arranged in a middle of the separation plate or at two ends of the separation plate; and at least another separation plate is defined with at least two second openings, and the at least two second openings are staggered with the at least one first opening;
wherein the at least one first opening and the at least two second openings define the flow guiding ports.

26. The cleaning apparatus according to claim 22, wherein
each separation plate is obliquely arranged, and the flow guiding port is arranged at a lowest part of the separation plate.

27. The cleaning apparatus according to claim 21, wherein
a unit air flow channel is defined between every two adjacent separation plates, and a cross-sectional area of each unit air flow channel gradually de-

creases along a direction of the air flow.

28. The cleaning apparatus according to claim 27, wherein
a minimum cross-sectional area of one of every two adjacent unit air flow channels that is closer to the air inlet is smaller than a maximum cross-sectional area of the other one.

29. The cleaning apparatus according to claim 21, wherein
a unit air flow channel is defined between every two adjacent separation plates, and sizes of cross-sectional areas of unit air flow channels periodically change along a direction of the air flow.

30. The cleaning apparatus according to claim 27, wherein
the separation plates comprise a first separation plate and a second separation plate that are staggered along a suction direction, the second suction channel comprises a first side wall and a second side wall facing each other along a left-right direction, the first separation plate is arranged on the first side wall of the second suction channel and inclined downward toward the second side wall, and the second separation plate is arranged on the second side wall of the second suction channel and inclined downward toward the first side wall.

31. The cleaning apparatus according to claim 21, wherein
the separation plates are provided with a baffle, and the baffle is arranged at an included angle with a direction of the air flow.

32. The cleaning apparatus according to claim 30, wherein
an extension direction of the baffle is substantially perpendicular to the direction of the air flow.

33. The cleaning apparatus according to claim 21, wherein

the separation plates are detachably connected to an inner wall of the second suction channel; and/or,
a separation rack is detachably mounted on the second suction channel, and the separation plates are arranged on the separation rack.

34. The cleaning apparatus according to claim 13, wherein the cleaning apparatus comprises a third detection assembly for detecting whether water enters the second suction channel.

35. The cleaning apparatus according to claim 34, wherein
the third detection assembly comprises two detection electrodes;
wherein the two detection electrodes are arranged in the second suction channel; or
one of the two detection electrodes is arranged in the second suction channel, and the other one is arranged at an upper part of the second chamber.

36. The cleaning apparatus according to claim 34, further comprising:

a control device, connected to the third detection assembly;
wherein the control device is configured to control an on-off state of the air suction device according to information detected by the third detection assembly regarding whether liquid has entered the second suction channel.

37. The cleaning apparatus according to claim 15, wherein a second detection assembly is provided in the second chamber for detecting a liquid level in the second chamber.

38. The cleaning apparatus according to claim 37, wherein

an installation position of the second detection assembly is lower than the air inlet of the second suction channel; and/or,
an installation position of the second detection assembly is located behind the air inlet of the second suction channel.

39. The cleaning apparatus according to claim 38, further comprising:

a control device, connected to the second detection assembly;
wherein the control device is configured to control an on-off state of the air suction device according to the liquid level detected by the second detection assembly.

40. The cleaning apparatus according to claim 15, wherein

the cleaning apparatus comprises a first housing and a second housing, the first housing defines the first chamber, and the second housing defines the second chamber;
the first housing is fixed to an outside of the second housing by means of assembly; or,
the first housing is arranged on the main body, and the second housing is arranged on the chassis;
the second suction channel is arranged on a wall

surface of the second housing.

41. The cleaning apparatus according to claim 15, wherein

the cleaning apparatus comprises a first housing and a second housing, at least part of the first housing is nested in the second housing; part of an inner wall of the second housing and part of an outer wall of the first housing define the second chamber;
the first housing defines the first chamber,
or, part of an inner wall of the first housing and part of an inner wall of the second housing together define the first chamber;
the second suction channel is arranged on a wall surface of the first housing or a wall surface of the second housing, or, a part of the second suction channel is arranged on a wall surface of the first housing and is isolated from the first chamber, and the other part of the second suction channel is defined by a part of an outer wall of the first housing and a part of an inner wall of the second housing.

42. The cleaning apparatus according to claim 40, wherein an air outlet of the second suction channel is provided on a wall surface of the second housing.

43. The cleaning apparatus according to claim 41, wherein

the air outlet of the second suction channel is arranged on the wall surface of the second housing; or,
the first housing is partially nested in the second housing, and the air outlet is provided on a wall surface of the first housing and is located at a portion of the first housing exposed from the second housing.

44. The cleaning apparatus according to claim 42 or 43, wherein the first housing or the second housing is detachably connected to the main body, and the air outlet is sealingly coupled to a suction port of an air suction device arranged on the main body.

45. The cleaning apparatus according to claim 41, wherein
a part of the second suction channel is located on a wall surface of the first housing, and the remaining part of the second suction channel is defined by an outer wall of the first housing and an inner wall of the second housing.

46. The cleaning apparatus according to claim 45, further comprising a first sealing portion for sealing the other part of the second suction channel which is defined by the outer wall of the first housing and the inner wall of the second housing.

47. The cleaning apparatus according to claim 12, wherein

the second suction device comprises a liquid suction device located in the second suction channel;
the second suction channel comprises a liquid inlet and a liquid outlet, the liquid inlet is communicated with a liquid suction end of the liquid suction device, and the liquid outlet is communicated with a liquid outlet of the liquid suction device.

48. The cleaning apparatus according to claim 1, wherein

the cleaning apparatus comprises a first housing and a second housing, the first housing defines the first chamber, and the second housing defines the second chamber;
the first housing is fixed to an outside of the second housing by means of assembly; or,
the first housing is arranged on the main body, and the second housing is arranged on the chassis.

49. The cleaning apparatus according to claim 1, wherein

the cleaning apparatus comprises a first housing and a second housing, at least part of the first housing is nested in the second housing; part of an inner wall of the second housing and part of an outer wall of the first housing define the second chamber;
the first housing defines the first chamber,
or, partial inner wall of the first housing and partial inner wall of the second housing together define the first chamber.

50. The cleaning apparatus according to claim 49, wherein

an outer wall of the second housing is provided with a holder, and a side wall of the first housing is provided with an opening;
the opening is arranged towards the holder.

51. The cleaning apparatus according to claim 49, wherein a first sealing member is provided between the first housing and the second housing, and the first sealing member is squeezed between the first housing and the second housing to provide circumferential sealing between the first housing and the second housing.

52. The cleaning apparatus according to claim 51, wherein

the side wall of the first housing is defined with an air leakage section;
a second sealing member is further provided between the first housing and the second housing;
the first sealing member and the second sealing member are arranged at intervals along a height direction of the first housing, and the first sealing member is located above the second sealing member;
the air leakage section is located between the first sealing member and the second sealing member.

53. The cleaning apparatus according to claim 52, wherein

the opening of the first housing defines the air leakage section;
and/or, filtering holes provided on the side wall of the first housing defines the air leakage section;
and/or, the first housing comprises at least one movable member, the movable member at least forms a side wall of the first housing, a gap is defined between the movable members or defined between the movable member and the side wall of the first housing, the gap is located on the side wall of the first housing, and the gap defines the air leakage section.

54. The cleaning apparatus according to claim 53, wherein the first housing comprises at least one movable member movable with respect to the first housing, and the at least one movable member is slidably or rotatably connected with the side wall of the first housing.

55. The cleaning apparatus according to claim 52, wherein

a part of the outer wall of the first housing and a part of the inner wall of the second housing coenclose at least part of the second suction channel;
the second sealing member comprises a first sealing portion and a second sealing portion, the first sealing portion surrounds the outside of the second suction channel, the second sealing portion surrounds the first housing in a circumferential direction of the first housing, and the first sealing portion and the second sealing portion are connected.

56. The cleaning apparatus according to claim 51, wherein

the first housing comprises a first body and a second body, the first body is moveably assembled on an upper part of the second body, a third sealing member is arranged between the first body and the second body, and the third sealing member is configured for circumferential sealing between the first body and the second body;
or, the first body and the second body are arranged in the second housing at intervals, a fourth sealing member is provided for circumferential sealing between the first body and the second housing, and a fifth sealing member is provided for circumferential sealing between the second body and the second housing.

57. The cleaning apparatus according to claim 52, wherein

the liquid leakage structure is arranged on a bottom wall of the first housing, and the second sealing member is arranged around the liquid leakage structure; or
an outer side wall of the first housing is provided with a liquid leakage notch, the liquid leakage notch defines the liquid leakage structure with the interior of the second housing, the second sealing member is provided with a sealing strip notch, and the position of the sealing strip notch corresponds to the position of the liquid leakage notch.

58. The cleaning apparatus according to claim 51, wherein
a radial contraction portion is arranged around the inner wall of the second housing along a circumferential direction, an inner diameter corresponding to the radial contraction portion is smaller than an inner diameter corresponding to an inner wall of an area above the radial contraction portion, and a lower part of the first housing abuts against the radial contraction portion.

59. The cleaning apparatus according to claim 58, wherein

the second housing comprises a first inner wall and a second inner wall;
wherein the first inner wall is located above the second inner wall, an inner diameter corresponding to the second inner wall is smaller than an inner diameter corresponding to the first inner wall, and the first inner wall is connected to the second inner wall through the radial contraction portion.

60. The cleaning apparatus according to claim 58, wherein

the inner diameter of the radial contraction portion gradually decreases along an installation direction of the first housing.

61. The cleaning apparatus according to claim 59, wherein

a sealing member is provided between the first housing and the second housing;
wherein the sealing member is configured to seal a gap between the first housing and the second housing along the circumferential direction, and the radial contraction portion abuts against the sealing member.

62. The cleaning apparatus according to claim 61, wherein

the sealing member is arranged on the first housing; and
the sealing member comprises a sealing body and a sealing lip;
wherein the sealing lip extends radially outward from the sealing body, and the sealing lip abuts against the radial contraction portion.

63. The cleaning apparatus according to claim 62, wherein

the sealing lip is one of multiple sealing lips; and/or,
the sealing lip is one of multiple sealing lips, lengths of the multiple sealing lips extending away from the seal body gradually decrease along an installation direction of the first housing; and/or,
the sealing lip is one of multiple sealing lips, thicknesses of the multiple sealing lips gradually decrease along an installation direction of the first housing; and/or,
the sealing lip is inclined on the seal body, with an inclination direction toward a removal direction of the first housing; and/or,
a thickness of the sealing lip gradually decreases from the seal body toward a direction away from the seal body; and/or,
a cross-section of the sealing lip is triangular; and/or
a length of the sealing lip extending outward is greater than a gap between the first housing and the second inner wall, and less than a gap between the first housing and the first inner wall.

64. The cleaning apparatus according to claim 49, wherein
the first housing is detachably connected to the second housing, and a handle is mounted on the first housing.

65. The cleaning apparatus according to claim 64, wherein
the handle is rotatably arranged on the first housing, and the handle has a first position where the handle is received on the first housing and a second position for a user to hold.

66. The cleaning apparatus according to claim 65, wherein

a side wall of the first housing is defined with an opening communicated with the first chamber, and the handle is rotatable from the first position to the second position along a side of the first housing having the opening; and/or,
an angle is formed between the handle in the second position and an end face of the first housing.

67. The cleaning apparatus according to claim 65 or 66, wherein
an in-position indication device is arranged on the first housing and/or the handle, to generate an in-position indication when the handle is rotated to the first position and/or the second position relative to the first housing.

68. The cleaning apparatus according to claim 67, wherein

the cleaning apparatus is provided with the in-position indication device;
the handle is in a stored state when the handle is in the first position, and the handle is in an extended state when the handle is in the second position;
wherein the in-position indication device comprises:

an in-position protrusion; and
an in-position groove fitting the in-position protrusion;
wherein the in-position protrusion and the in-position groove are respectively arranged on the handle and the first housing; or
a rotational resistance when the handle is in the first position and/or the second position is different from a rotational resistance when the handle is located between the first position and the second position.

69. The cleaning apparatus according to claim 66, wherein
an included angle between the handle in the second position and a front-end face of the first housing is greater than or equal to 90°.

70. The cleaning apparatus according to claim 65, wherein
a rotational resistance when the handle is in the first position and/or the second position is greater than a rotational resistance when the handle is located between the first position and the second position.

71. The cleaning apparatus according to claim 65, wherein
the first housing and/or the second housing is provided with a limiting portion, and the limiting portion is configured to prevent the handle from continuing to rotate forward, to allow the handle to stay in the second position.

72. The cleaning apparatus according to claim 64, wherein

an abutment portion is arranged at a rotation connection of the handle;
the second housing comprises a first contact surface, and in a process of the handle rotating from the first position to the second position, the abutment portion is rotated to abut against the first contact surface of the second housing, to allow the first housing to detach from the second housing;
and/or,
the second housing comprises a second contact surface, and in a process of the handle rotating from the second position to the first position, the abutment portion is rotated to abut against the second contact surface of the second housing, to allow the first housing to be installed into the second housing.

73. The cleaning apparatus according to claim 72, wherein
the second housing is defined with an accommodation groove for accommodating the abutment portion of the handle, a bottom wall of the accommodation groove forms the first contact surface, and a top wall of the accommodation slot forms the second contact surface, wherein the bottom wall faces the top wall.

74. The cleaning apparatus according to claim 72, wherein

the abutment portion comprises an abutment surface, and a first surface and a second surface located on two sides of the abutment surface; a distance from the abutment surface to a center of a rotating shaft of the handle is greater than a distance from the first surface to the center of the rotating shaft;
the first surface faces the first contact surface when the handle is in the first position;
the abutment surface abuts against the first contact surface when the handle is in the second position;
and/or
there is a gap between the second surface and the second contact surface when the handle is in the second position, and the second surface abuts against the second contact surface when the handle is in the first position.

75. The cleaning apparatus according to claim 72, wherein the abutment portion is in a shape of a cam or an elongated arm.

76. The cleaning apparatus according to claim 74, wherein,

the first housing is in an interference fit with the second housing;
the handle is rotated from the first position to the second position, and a displacement of the first housing along a removal direction is greater than an interference fit stroke of the first housing and the second housing along the removal direction; and/or
the abutment portion is in tangential contact with the second contact surface when the handle is in the first position.

77. The cleaning apparatus according to claim 76, wherein the first housing is in the interference fit with the second housing by a sealing member and/or a radial contraction portion.

78. The cleaning apparatus according to claim 45 or 46, further comprising a sewage suction pipeline, wherein the sewage suction pipeline is configured to suction dirt on a surface to be cleaned into the first chamber, and an outlet of the sewage suction pipeline is communicated with the first chamber.

79. The cleaning apparatus according to claim 78, wherein

a filter screen is arranged in the first chamber, and the filter screen is arranged between the liquid leakage structure and the outlet of the sewage suction pipeline;
a space between the outlet of the sewage suction pipeline and the filter screen in the first chamber defines a solid waste chamber for receiving solid waste.

80. The cleaning apparatus according to claim 79, wherein the filter screen is located at a bottom of the first chamber.

81. The cleaning apparatus according to claim 80, wherein the filter screen is rotatably arranged in

the first chamber.

82. The cleaning apparatus according to claim 81, wherein

the filter screen is rotatably mounted in the first chamber by a revolute pair; and
a rotation axis of the revolute pair is arranged in a substantially horizontal direction or in a substantially vertical direction.

83. The cleaning apparatus according to claim 82, wherein
a side surface of the first chamber is configured as an opening, a rotational mounting portion is arranged at a lower part of the opening of the first chamber, and the revolute pair is mounted on the rotational mounting portion.

84. The cleaning apparatus according to claim 83, wherein
the side surface of the first chamber is configured as the opening, the rotational mounting portion is arranged on a side of the opening of the solid waste chamber, and the revolute pair is mounted on the rotational mounting portion.

85. The cleaning apparatus according to claim 83, wherein
the filter screen comprises a first filter screen and a second filter screen that are rotatable toward each other, the side surface of the first chamber is configured as the opening, the first filter screen is rotatably mounted on a left side of the solid waste chamber, and the second filter screen is rotatably mounted on a right side of the solid waste chamber.

86. The cleaning apparatus according to claim 80, wherein
the filter screen comprises a filter screen bottom plate and a filter screen side plate connected to an edge of the filter screen bottom plate, the filter screen is provided with filtering holes defined in the filter screen bottom plate and/or the side screen plate, to allow sewage from the solid waste chamber to flow into the second chamber through the liquid leakage structure.

87. The cleaning apparatus according to claim 86, wherein
a height of the filter screen side plate is adapted to match a height of the first chamber.

88. The cleaning apparatus according to claim 80, wherein
the filter screen is detachably connected to the first chamber.

89. The cleaning apparatus according to claim 80, wherein

the filter screen is provided with a filter screen holding portion, configured to remove the filter screen from the first chamber; and/or
the filter screen is detachably mounted at a lower end of the first chamber; and/or
the filter screen has a three-dimensional structure.

90. The cleaning apparatus according to claim 45 or 46, wherein
the first housing is defined with an air suction port, and the air suction port is configured to communicate the first suction device with the first chamber.

91. The cleaning apparatus according to claim 90, wherein
the first housing comprises a top wall and a side wall, the air suction port is located on the top wall, and there is a spacing between an edge of the air suction port and the side wall.

92. The cleaning apparatus according to claim 90, wherein
a liquid-blocking structure is provided on the top wall of the first housing, and the liquid-blocking structure is configured to prevent liquid from entering the air suction port.

93. The cleaning apparatus according to claim 92, wherein

the liquid-blocking structure comprises a first liquid-blocking portion, and the liquid-blocking portion is located on a rear side of the air suction port; and/or
the first housing comprises a top wall and a side wall, the liquid-blocking structure comprises a second liquid-blocking portion, the second liquid-blocking portion is located between the air suction port and the side wall of the first housing, and there is a spacing between the second liquid-blocking portion and the side wall of the first housing; and/or
the outlet of the sewage suction pipeline is connected to the first chamber, the liquid-blocking structure comprises a third liquid-blocking portion, and the third liquid-blocking portion is located between the air suction port and the outlet of the sewage suction pipeline.

94. The cleaning apparatus according to claim 90, wherein
the air suction port is located at a front side of the first chamber.

95. The cleaning apparatus according to claim 90, further comprising:

a sewage suction pipeline;
wherein an outlet of the sewage suction pipeline is communicated to the first chamber, the air suction port is one of two air suction ports, and the two air suction ports are respectively located on left and right sides of the outlet of the sewage suction pipeline in a left-right direction.

96. The cleaning apparatus according to claim 93, wherein the outlet of the sewage suction pipeline is located at a front side of the first chamber.

97. The cleaning apparatus according to claim 96, wherein the outlet of the sewage suction pipeline is located above a lower edge of the third liquid-blocking portion.

98. The cleaning apparatus according to claim 97, wherein the third liquid-blocking portion is in a shape of a circular ring, a rectangular frame, or a polygonal frame, and the third liquid-blocking portion is arranged around the air suction port.

99. The cleaning apparatus according to claim 98, wherein a distance between a left side of the third liquid-blocking portion and the sewage suction pipeline is less than a distance between a rear side of the third liquid-blocking portion and the sewage suction pipeline, and a distance between a right side of the third liquid-blocking portion and the sewage suction pipeline is less than the distance between the rear side of the third liquid-blocking portion and the sewage suction pipeline.

100.
The cleaning apparatus according to claim 78, wherein

a height of a front side of the outlet of the sewage suction pipeline is higher than a height of a rear side of the outlet; or
a height of a rear side of the outlet of the sewage suction pipeline is higher than a height of a front side of the outlet.

101.
The cleaning apparatus according to claim 100, wherein the outlet of the sewage suction pipeline is obliquely arranged.

102.
The cleaning apparatus according to claim 89, wherein

the sewage suction pipeline further comprises a sewage inlet pipe arranged on the second housing and a sewage suction pipe connected to the sewage inlet pipe, and the sewage suction pipe is configured to suction dirt on the ground into the sewage inlet pipe;
the sewage inlet pipe is communicated with the first chamber; a sixth sealing member is provided at a connection between the sewage inlet pipe and the first housing for filling a gap between the first housing and the sewage inlet pipe.

103.
The cleaning apparatus according to claim 102, wherein

the first housing is provided with a dirt anti-leakage pipe, and the sewage suction pipeline is penetrated in the dirt anti-leakage pipe; the sixth sealing member is arranged on a top or an inner side wall of the dirt anti-leakage pipe; and/or,
an inner wall of the dirt anti-leakage pipe is provided with a convex edge along a circumference of the dirt anti-leakage pipe, an end face of the sewage inlet pipe is abutted against the convex edge, and the sixth sealing member is provided between the end face of the sewage suction pipeline and the convex edge.

104.
The cleaning apparatus according to claim 102, wherein the first housing is provided with a sewage suction pipe hole, the sewage inlet pipe is penetrated in the sewage suction pipe hole, and the sixth sealing member is arranged on an outside of the sewage inlet pipe or on an inner wall of the sewage suction pipe hole.

105.
The cleaning apparatus according to claim 1, further comprising:
a content detection assembly, comprising a first detection assembly and a second detection assembly, which are respectively configured to simultaneously detect information of content accommodated in the first chamber and information of content accommodated in the second chamber.

106.
The cleaning apparatus according to claim 105, wherein

the first detection assembly and the second detection assembly are connected in parallel; and/or
the first detection assembly is arranged in the first chamber, and the second detection assembly is arranged in the second chamber.

107.
The cleaning apparatus according to claim 106, further comprising:

an electrical connector, the electrical connector being connected to the first detection assembly and the second detection assembly; and/or
an electrical connector, the first detection assembly and/or the second detection assembly being formed by part of the electrical connector.

108.
The cleaning apparatus according to claim 107, further comprising:

a first housing and a second housing, at least part of the first housing being nested in the second housing, and the first housing being located at an upper part of the second housing; part of an inner wall of the second housing and part of an outer wall of the first housing forming the second chamber; the first housing forming the first chamber, or, part of an inner wall of the first housing and part of an inner wall of the second housing together forming the first chamber; and the electrical connector being located on the first housing; and
the electrical connector comprising a contact, and the contact is located on a part of the first housing exposed outside the second housing.

109.
The cleaning apparatus according to claim 108, wherein

a side wall of the first housing is defined with a mounting groove or a mounting hole extending in an up-down direction, and the electrical connector is at least partially located in the mounting groove or the mounting hole; and/or
the electrical connector is one of two electrical connectors, the first detection assembly comprises a first electrode and a second electrode that are respectively connected to the two electrical connectors, and the first electrode and the second electrode are located inside the first chamber;
a height of the first electrode is different from a height of the second electrode; and/or
at least one of the first electrode and the second electrode is arranged at a top of the first chamber; and/or
one of the first electrode and the second electrode is arranged at a bottom of the first chamber; and/or
at least one of the first electrode and the second electrode extends downward from a top wall of the first chamber, and defines a gap with a side wall of the first chamber; and/or
the first electrode and the second electrode are located on two sides of the first chamber.

110.
The cleaning apparatus according to claim 108, wherein

the electrical connector is one of two electrical connectors, the second detection assembly comprises a third electrode and a fourth electrode that are respectively connected to the two electrical connectors, and the third electrode and the fourth electrode are located inside the second chamber;
at least one of the third electrode and the fourth electrode extends downward from a bottom wall of the first chamber, and defines a gap with a side wall of the second chamber; and/or
one of the third electrode and the fourth electrode is arranged at a bottom of the second chamber; and/or
the third electrode and the fourth electrode are located on two sides of the first chamber.

111. The cleaning apparatus according to claim 110, wherein
a bottom wall of the first chamber is provided with a support protrusion, and a lower edge of the third electrode and/or the fourth electrode is arranged higher than a bottom of the support protrusion.

112.
The cleaning apparatus according to claim 105, further comprising:

a second suction channel and a third detection assembly;
wherein the second suction channel is communicated the second chamber with the air suction device, and is configured to provide a power to drive liquid from the first chamber into the second chamber; and the third detection assembly is arranged in the second suction channel.

113.
The cleaning apparatus according to claim 112, wherein

the third detection assembly is connected in parallel with the first detection assembly and the second detection assembly; and/or
the third detection assembly is a photoelectric detector.

114.
The cleaning apparatus according to claim 112, further comprising:

an electrical connector;
wherein the electrical connector is respectively connected to the first detection assembly, the second detection assembly, and the third detection assembly; or
the first detection assembly, the second detec-

tion assembly, and the third detection assembly are formed by the electrical connector.

115.
The cleaning apparatus according to claim 112, wherein the third detection assembly comprises a fifth electrode and a sixth electrode, and at least one of the fifth electrode and the sixth electrode is arranged in the second suction channel.

116.
The cleaning apparatus according to claim 115, wherein

the third electrode and/or the fourth electrode arranged in the second suction channel form a separation plate in the second suction channel; and/or
separation plates are staggered in the second suction channel, and the third electrode and/or the fourth electrode in the second suction channel are staggered with the separation plates.

117.
The cleaning apparatus according to claim 105, wherein

the second detection assembly is arranged at an upper part of the second chamber; and/or
the first detection assembly is arranged on an inner side wall of the first chamber; and/or
the first detection assembly is arranged on a front side of the first chamber; and/or
the first detection assembly is arranged on a rear upper side of the first chamber; and/or
the second detection assembly is arranged on a front side of the second chamber; and/or
a retaining edge structure is provided around an outer side of the first detection assembly arranged on a wall of the first chamber, and/or, a retaining edge structure is provided around an outer side of the second detection assembly arranged on a wall of the second chamber.

118.
The cleaning apparatus according to claim 105, wherein

the first detection assembly and/or the second detection assembly is a photoelectric sensor; and/or
the first detection assembly is configured to detect a height of solid waste and/or a height of a liquid level in the first chamber, and the second detection assembly is configured to detect a water level in the second chamber.

119.
A cleaning apparatus, comprising:

a chassis;
a main body rotatably connected to the chassis;
a first chamber arranged on the main body;
a second chamber communicated to the first chamber;
a first suction device communicated with the first chamber through a first suction channel, the first suction device being configured to provide power to drive external liquid into the first chamber, the first suction device also being communicated with the second chamber through a second suction channel, the first suction device being configured to provide power to drive liquid in the first chamber entering the second chamber.

120.
The cleaning apparatus according to claim 119, wherein

the cleaning apparatus comprises a sewage suction pipeline configured to communicate the first chamber and the outside;
the first suction channel comprises an air suction port arranged in the first chamber, and the first suction device is communicated with the first chamber through the air suction port to provide negative pressure for the first chamber; and/or, the second suction channel is all or part arranged on a side wall of the first chamber, and the first suction device is communicated with the second chamber through the second suction channel to provide negative pressure for the second chamber.

121.
The cleaning apparatus according to claim 120, wherein a cross-sectional area of the first suction channel is smaller than a cross-sectional area of the second suction channel.

122.
The cleaning apparatus according to claim 120, wherein a negative pressure of the second chamber is greater than a negative pressure of the first chamber.

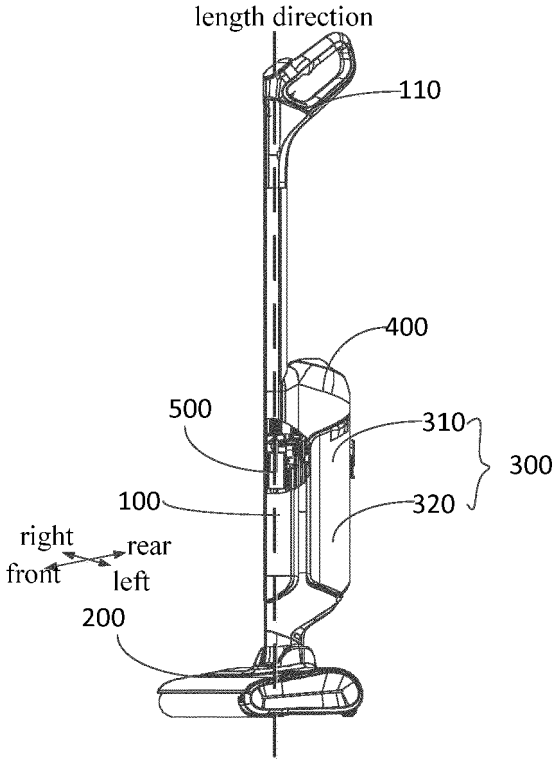
123.
A water tank, configured to be installed on a main body of a cleaning apparatus, the main body being rotatably connected to a chassis of the cleaning apparatus, wherein the water tank comprises:

a first chamber arranged on the main body, the first chamber being capable of communicating with a first suction device, the first suction device being configured to provide power to drive external liquid into the first chamber;
a second chamber communicated with the first chamber; the second chamber being capable of communicating with a second suction device,

the second suction device being configured to provide power to drive liquid in the first chamber entering the second chamber;
wherein the first suction device and the second suction device are arranged on the main body.

124.
A water tank, configured to be installed on a main body of a cleaning apparatus, the main body being rotatably connected to a chassis of the cleaning apparatus, wherein the water tank comprises:

a first chamber arranged on the main body;
a second chamber communicated to the first chamber;
a first suction device communicated with the first chamber through a first suction channel, the first suction device providing power to drive external liquid into the first chamber, the first suction device also communicating with the second chamber through a second suction channel, the first suction device providing power to drive liquid in the first chamber entering the second chamber.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100
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rear
front
left
200

Fig. 1

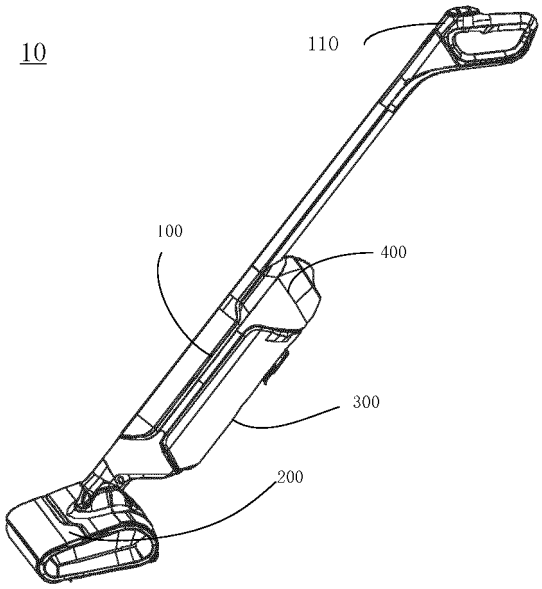
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Fig. 2

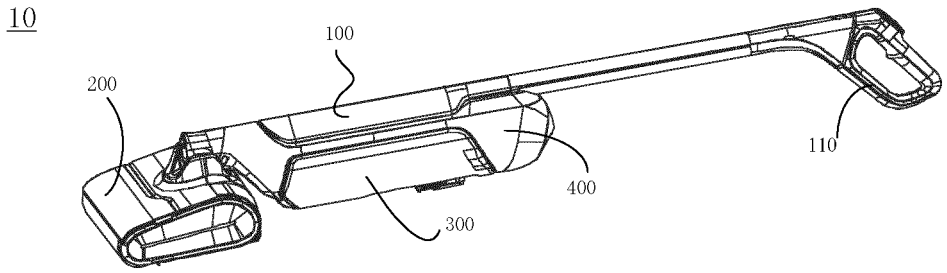
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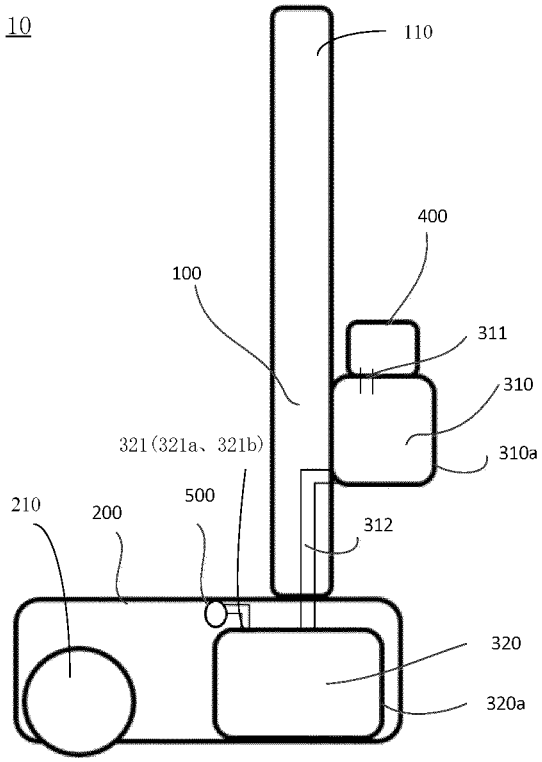
Fig. 3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320a

Fig. 4

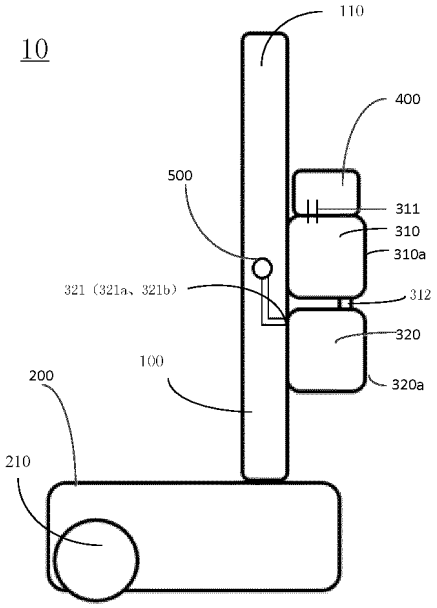
10
110
400
500
311
310
310a
321 (321a、321b)
312
320
100
320a
200
210

Fig. 5

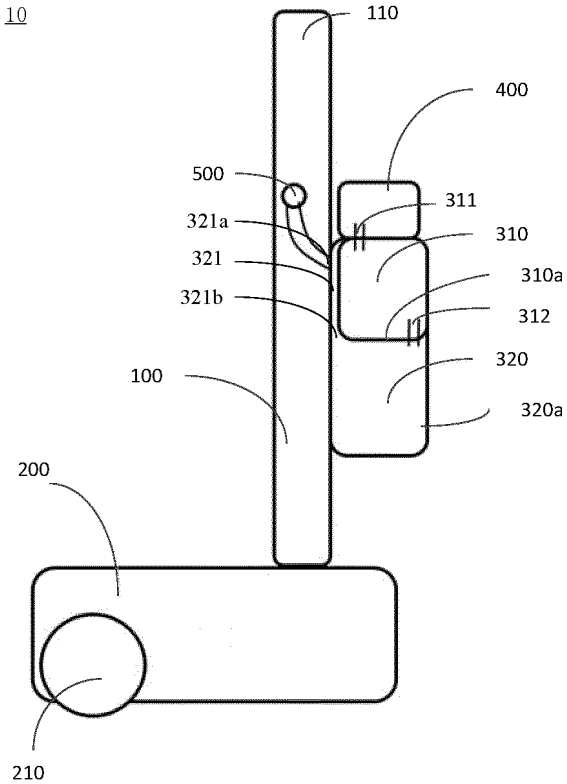
10
110
400
500
311
321a
310
321
310a
321b
312
320
100
320a
200
210

Fig. 6

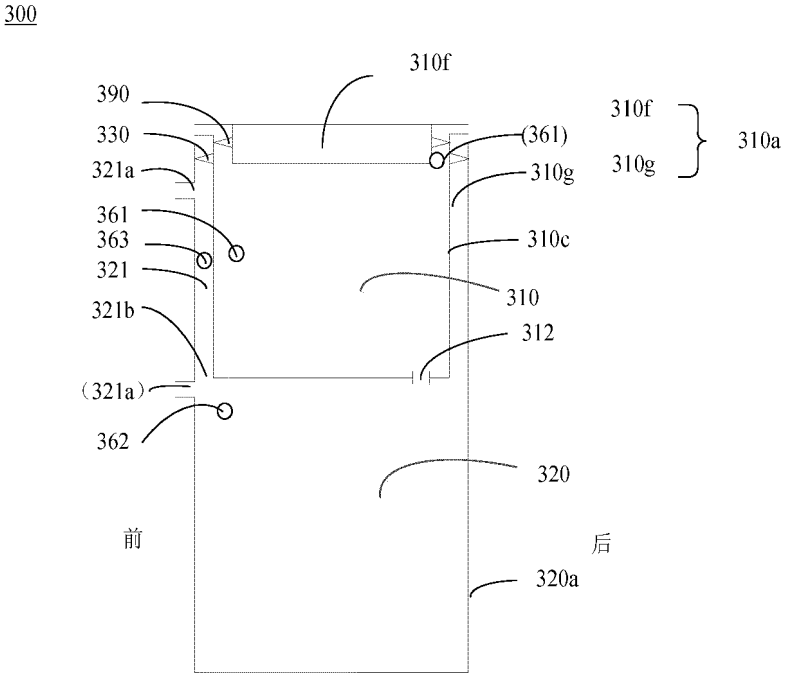
300
310f
390
330
321a
361
363
321
321b
(321a)
362
(361)
310g
310c
310
312
320
320a
前
后
310f
310g
310a

Fig. 7

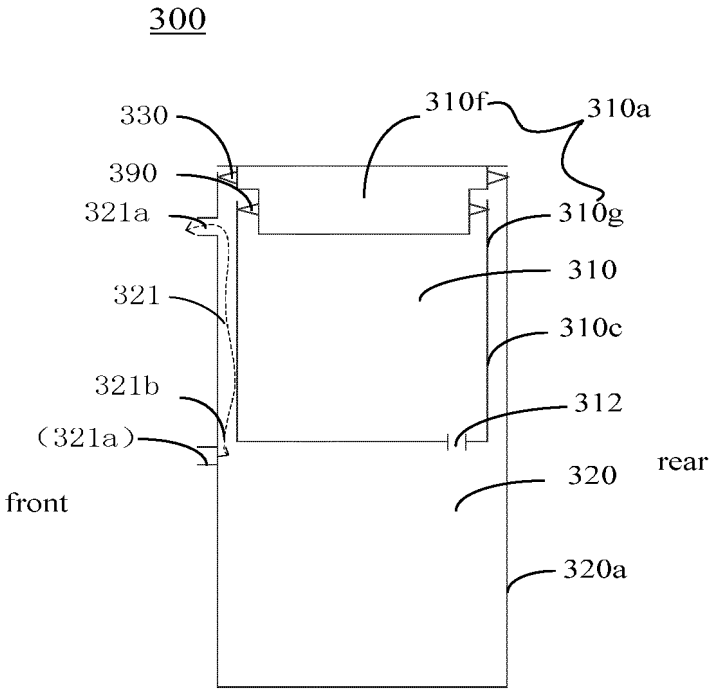
300
330
390
321a
321
321b
(321a)
310f
310a
310g
310
310c
312
320
320a
front
rear

Fig. 8

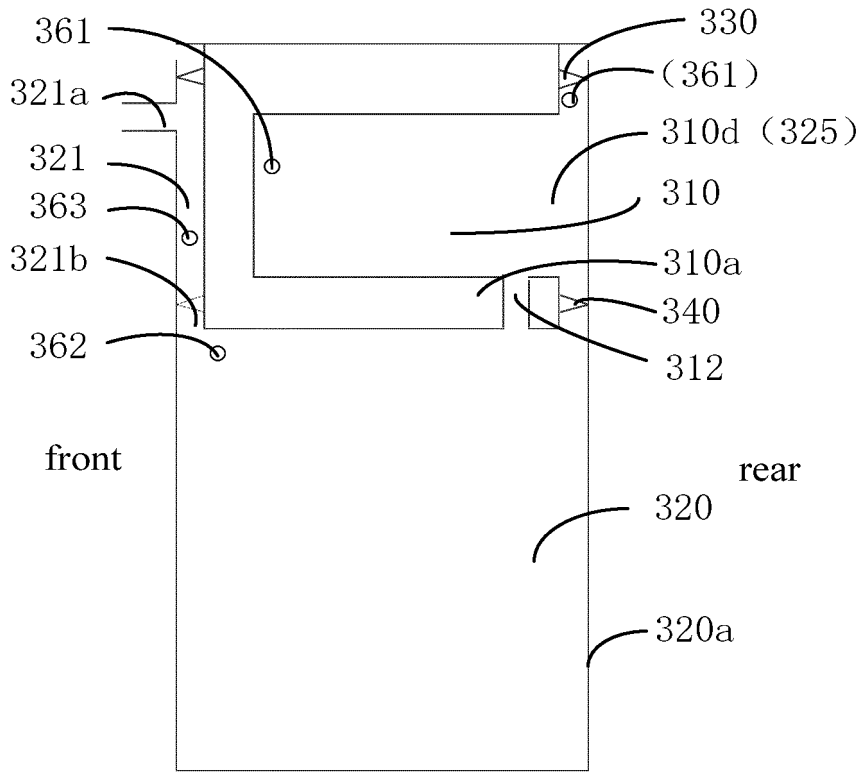
361
321a
321
363
321b
362
front
330
(361)
310d (325)
310
310a
340
312
rear
320
320a

Fig. 9

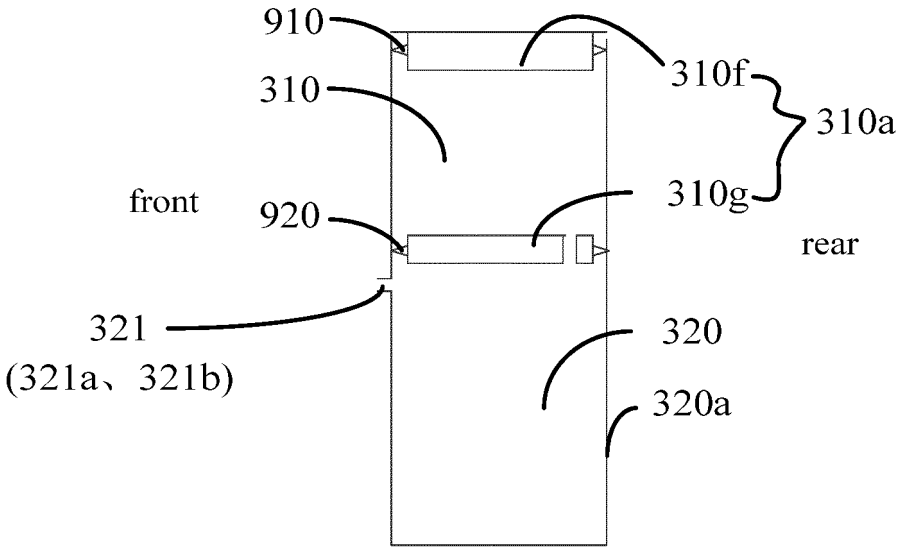
910
310
front
920
321
(321a、321b)
310f
310a
310g
rear
320
320a

Fig. 10

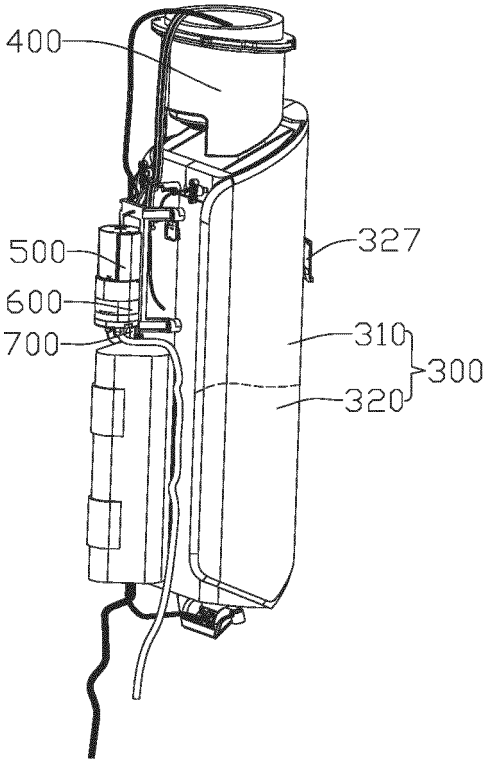
400
500
600
700
327
310
300
320

Fig. 11

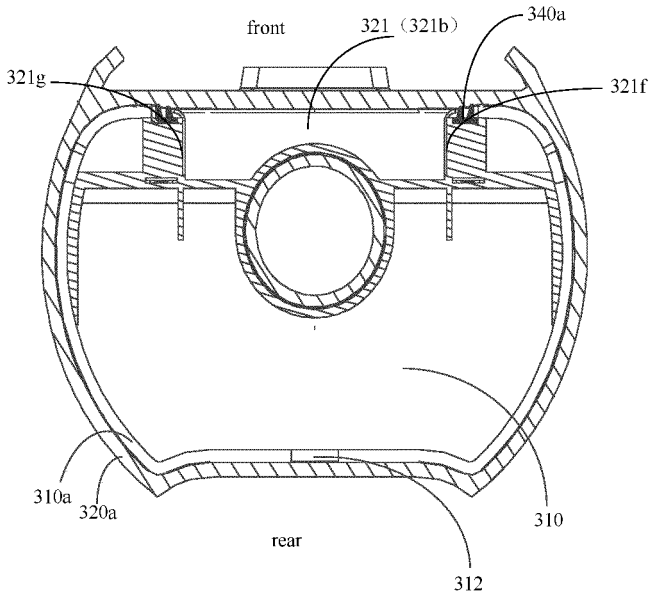
front
321 (321b)
340a
321g
321f
310a
320a
310
rear
312

Fig. 12

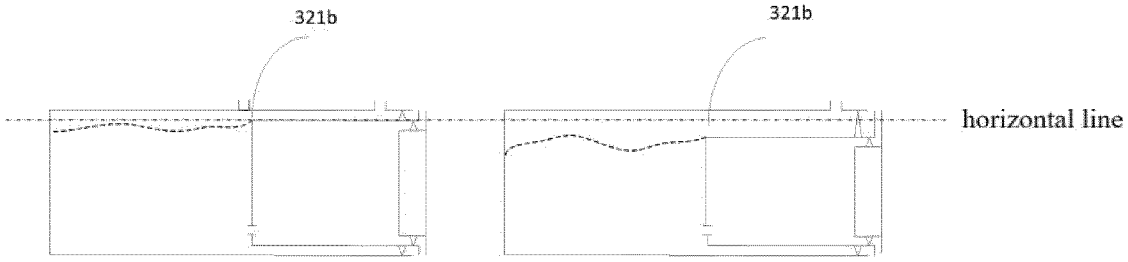
321b
321b
horizontal line

Fig. 13

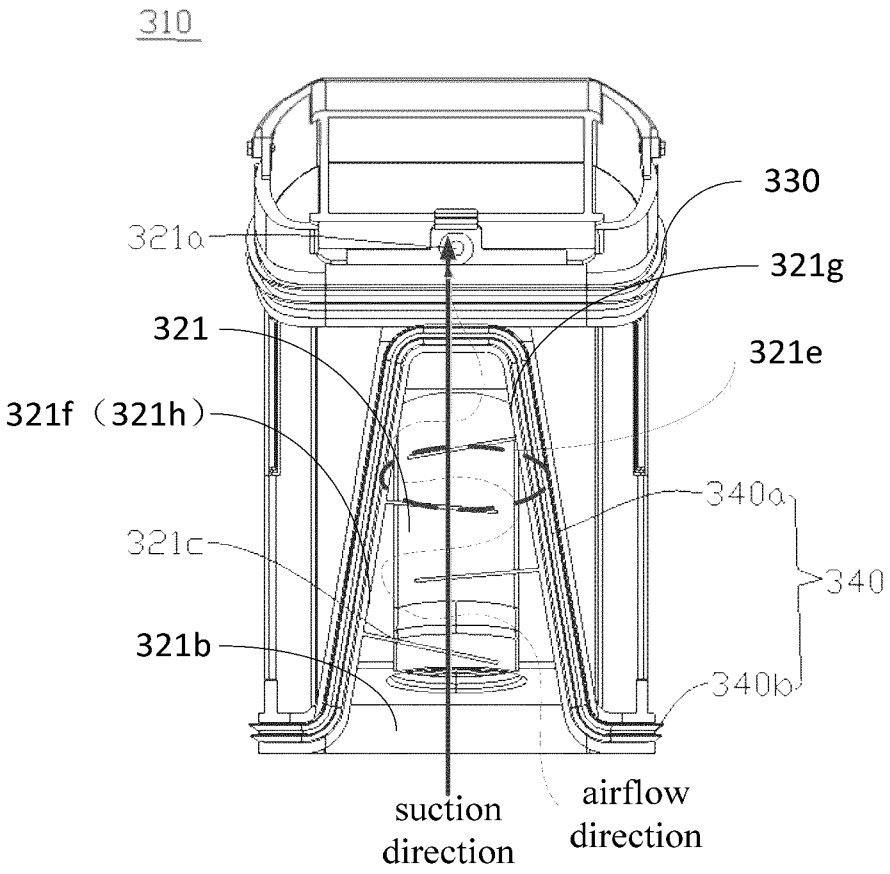
310
330
321a
321g
321
321e
321f（321h）
340a
340
321c
321b
340b
suction direction
airflow direction

Fig. 14

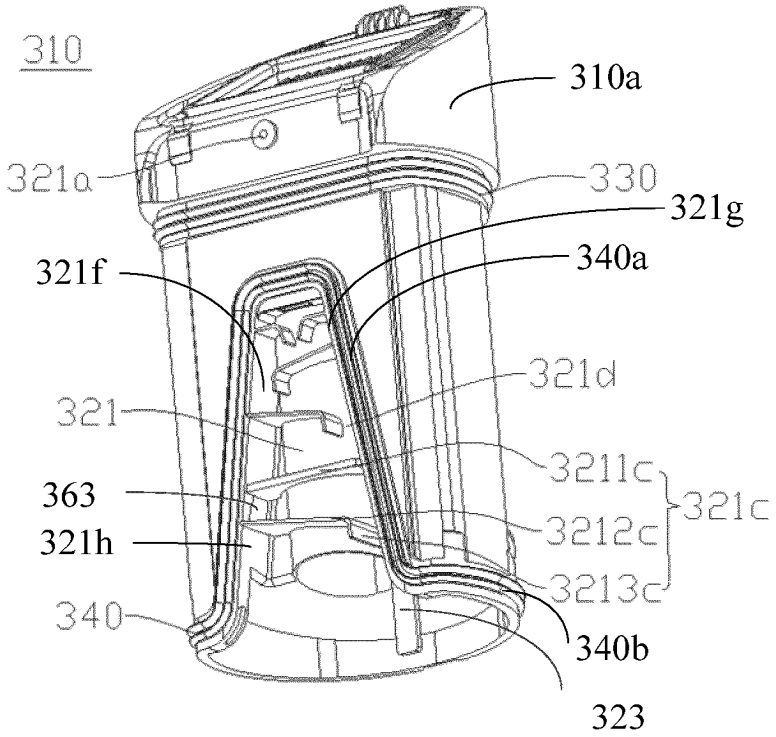
310
310a
321a
330
321g
321f
340a
321d
321
3211c
321c
363
3212c
321h
3213c
340
340b
323

Fig. 15

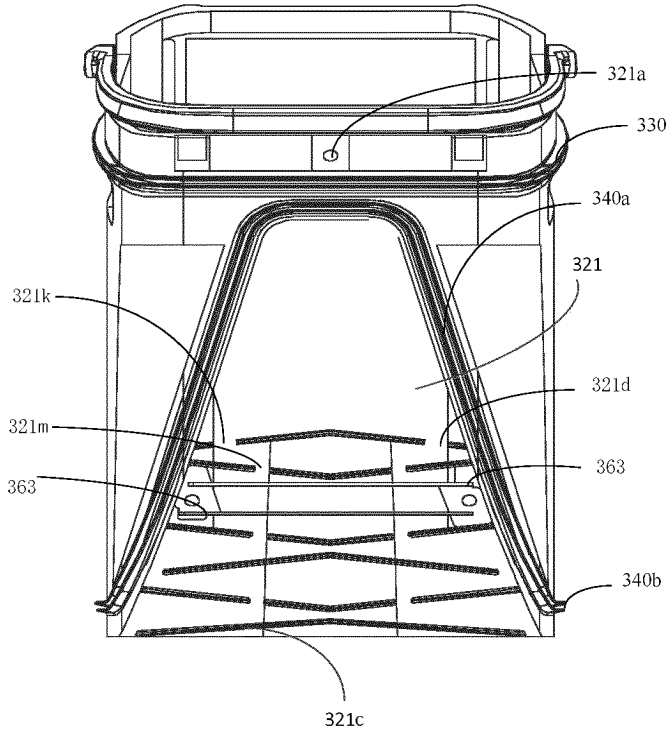
321a
330
340a
321
321k
321d
321m
363
363
340b
321c

Fig. 16

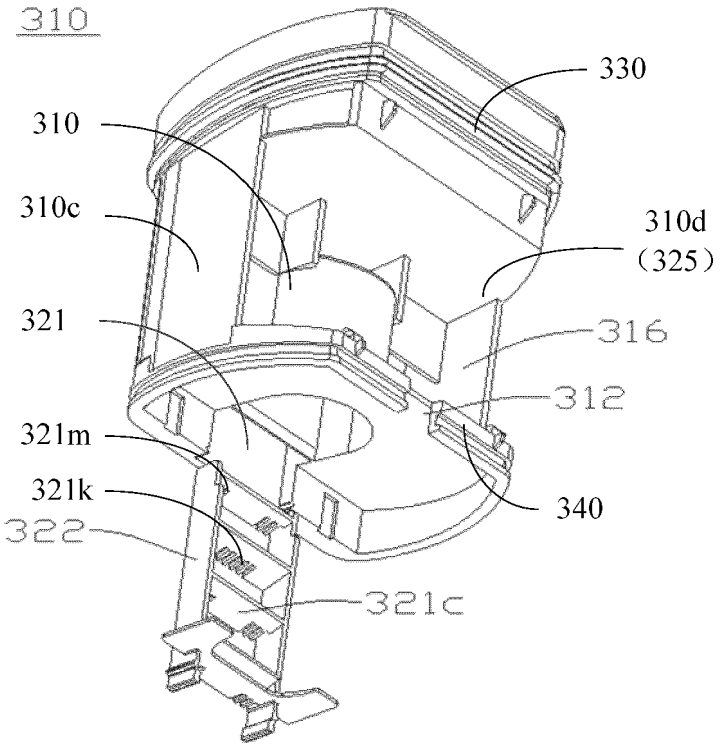

Fig. 17

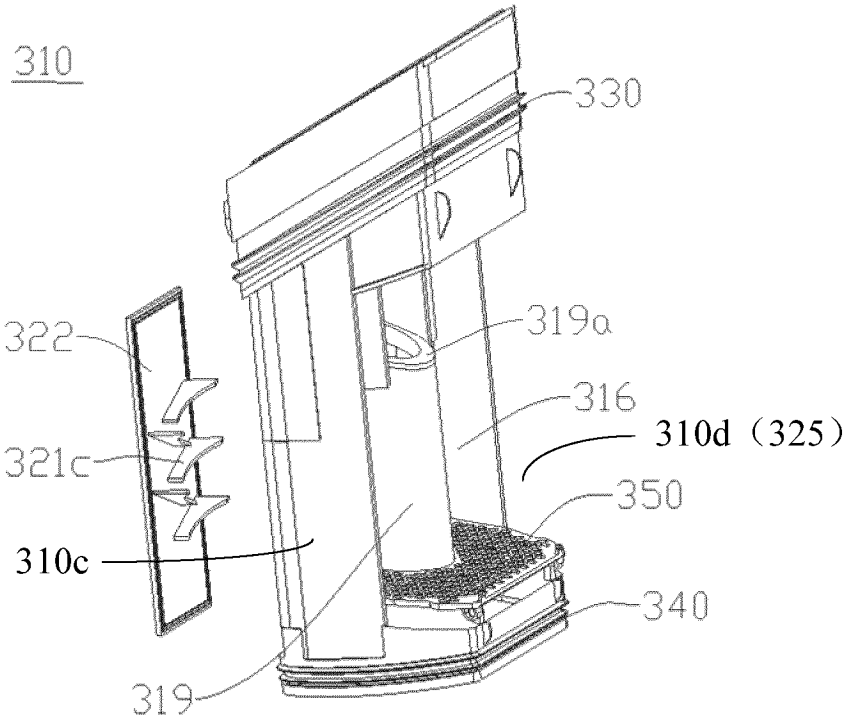
310
330
322
319a
316
321c
310d（325）
350
310c
340
319

Fig. 18

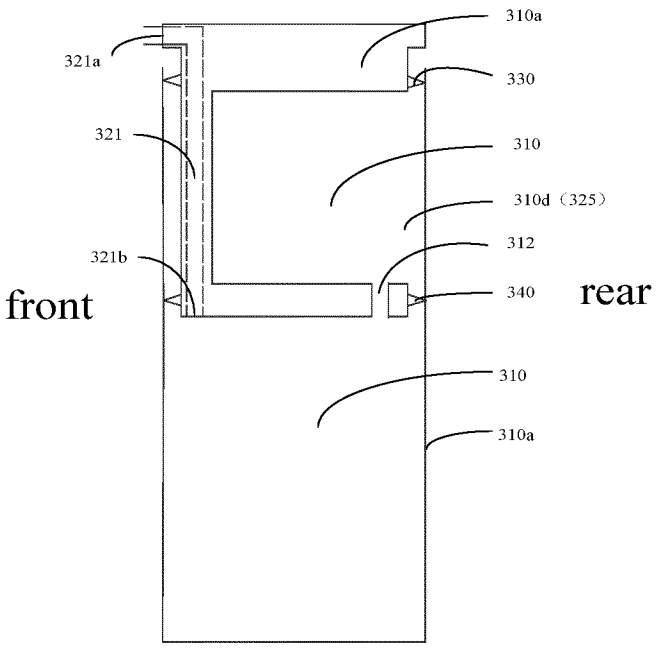
310a
321a
330
321
310
310d（325）
312
321b
front
340
rear
310
310a

Fig. 19

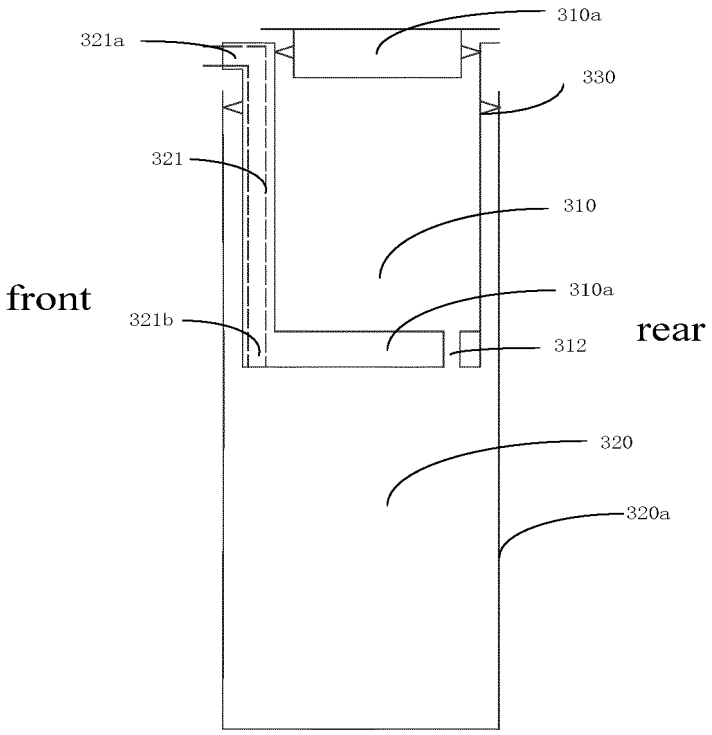
310a
321a
330
321
310
front
310a
321b
312
rear
320
320a

Fig. 20

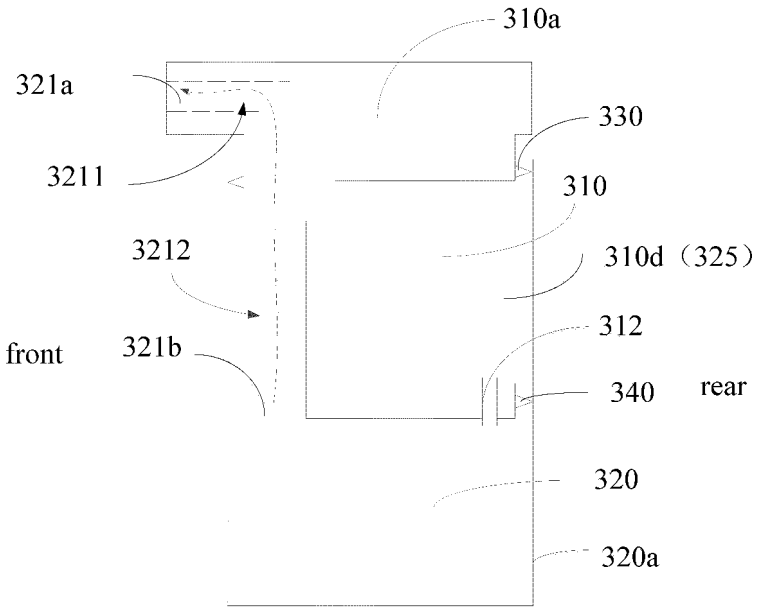
310a
321a
330
3211
310
3212
310d（325）
312
front
321b
340
rear
320
320a

Fig. 21

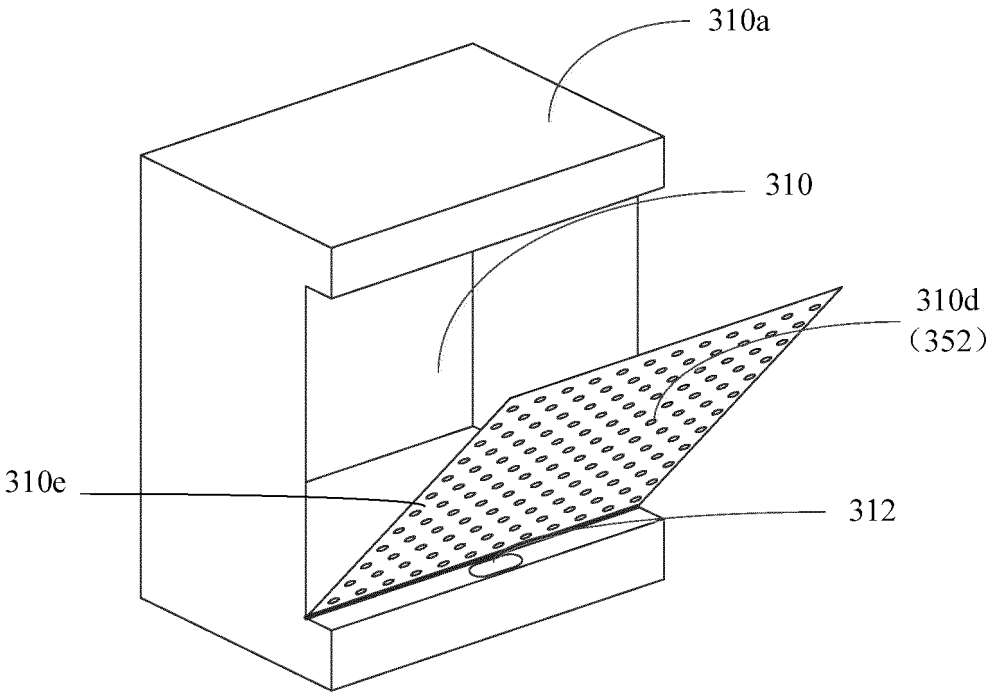
310a
310
310d
(352)
310e
312

Fig. 22

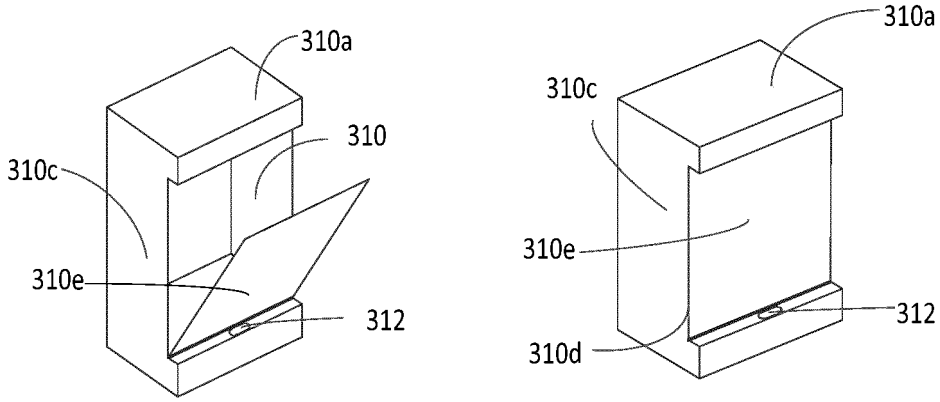
310a
310
310c
310e
312
310a
310c
310e
312
310d

Fig. 23

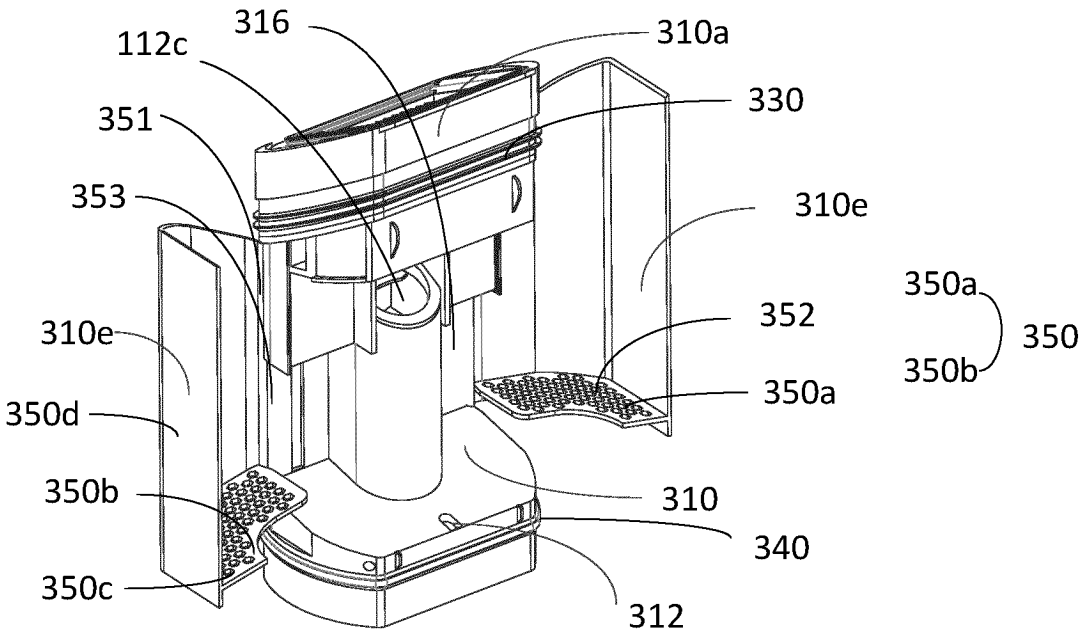
316
112c
310a
330
351
353
310e
350a
352
350
350b
310e
350a
350d
350b
310
340
350c
312

Fig. 24

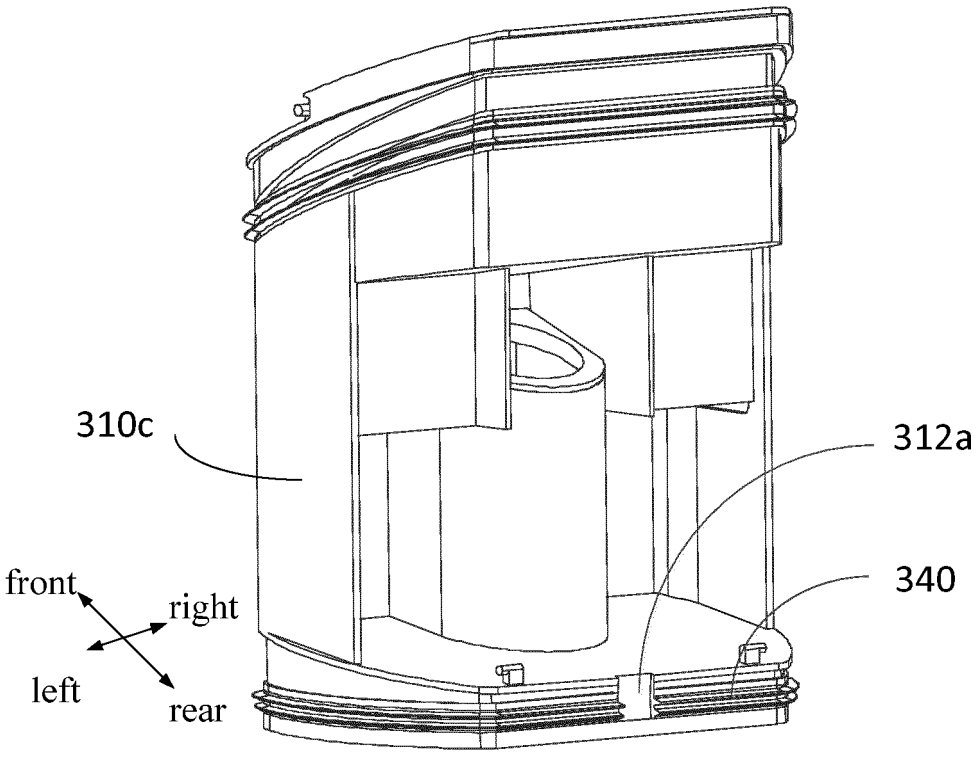

Fig. 25

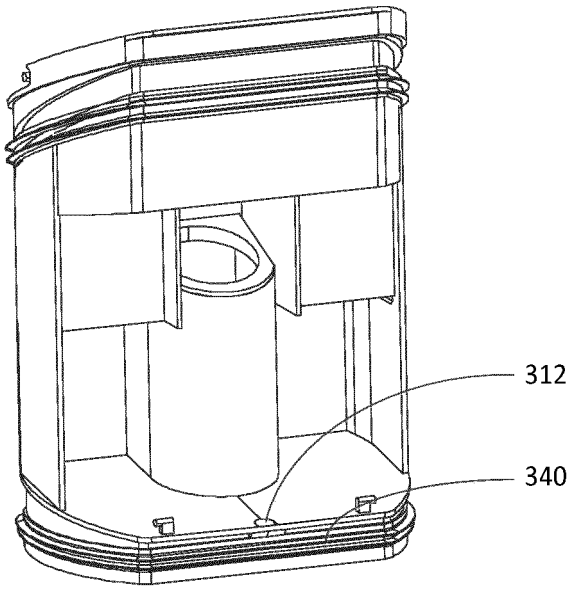

Fig. 26

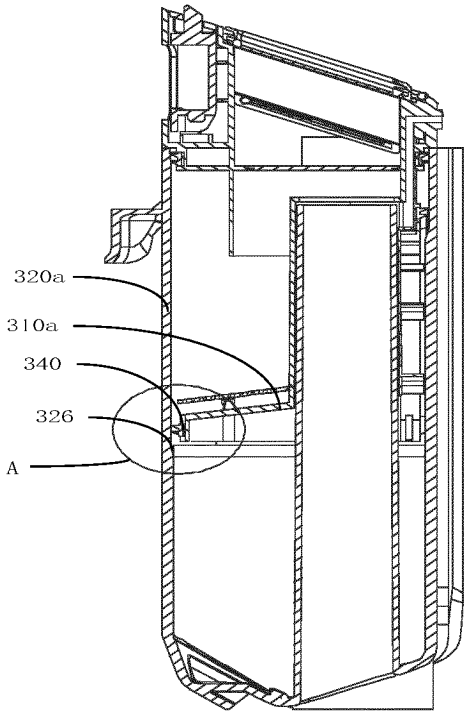

Fig. 27

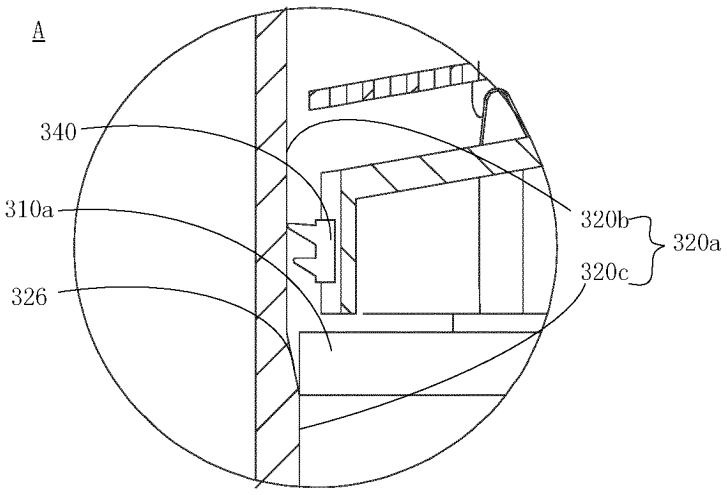

Fig. 28

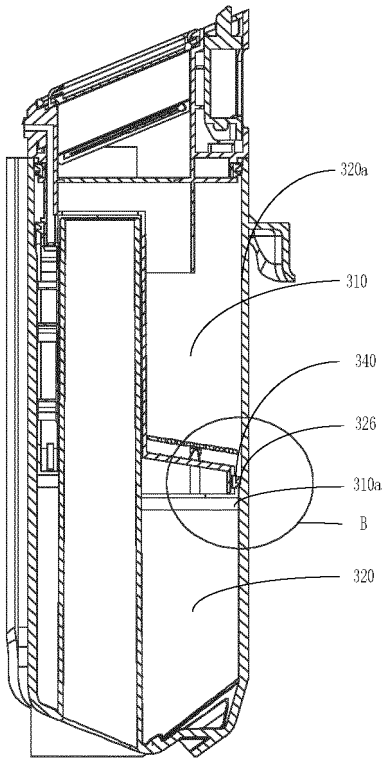
320a
310
340
326
310a
B
320

Fig. 29

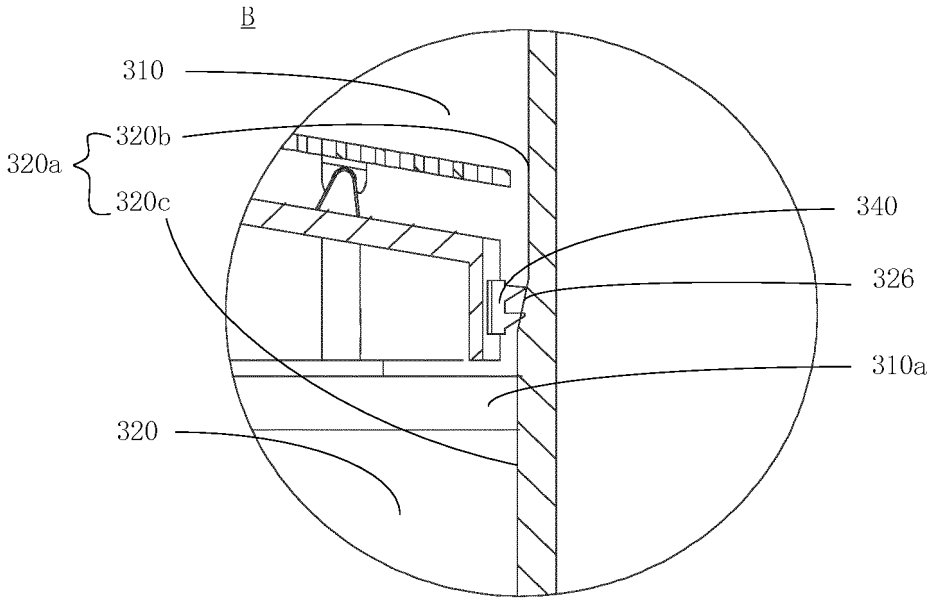
B
310
320a
320b
320c
340
326
310a
320

Fig. 30

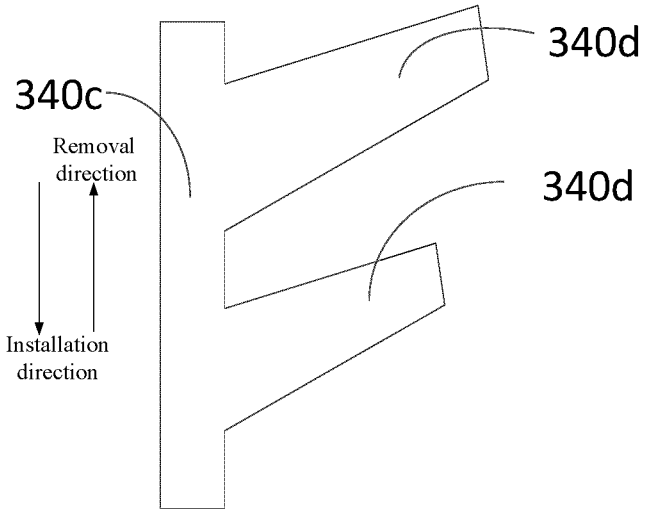
340d
340c
Removal direction
340d
Installation direction

Fig. 31

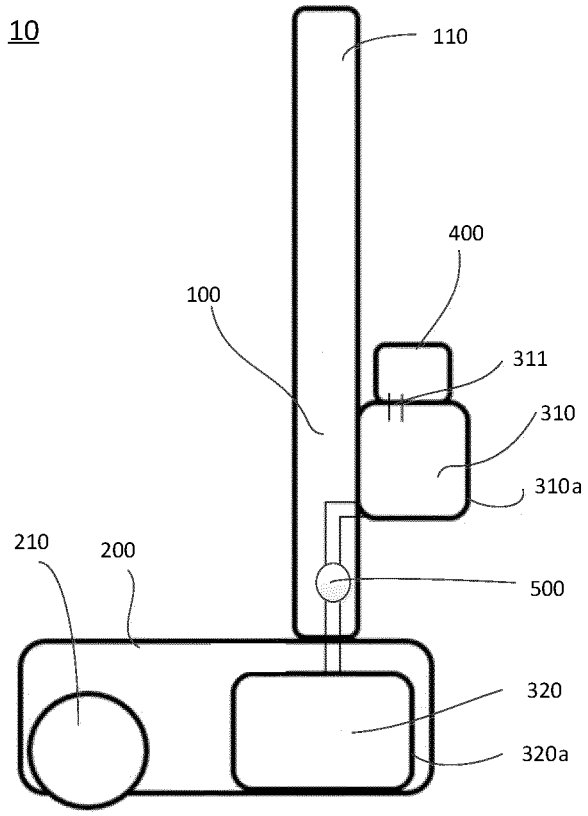
10
110
400
100
311
310
310a
210
200
500
320
320a

Fig. 32

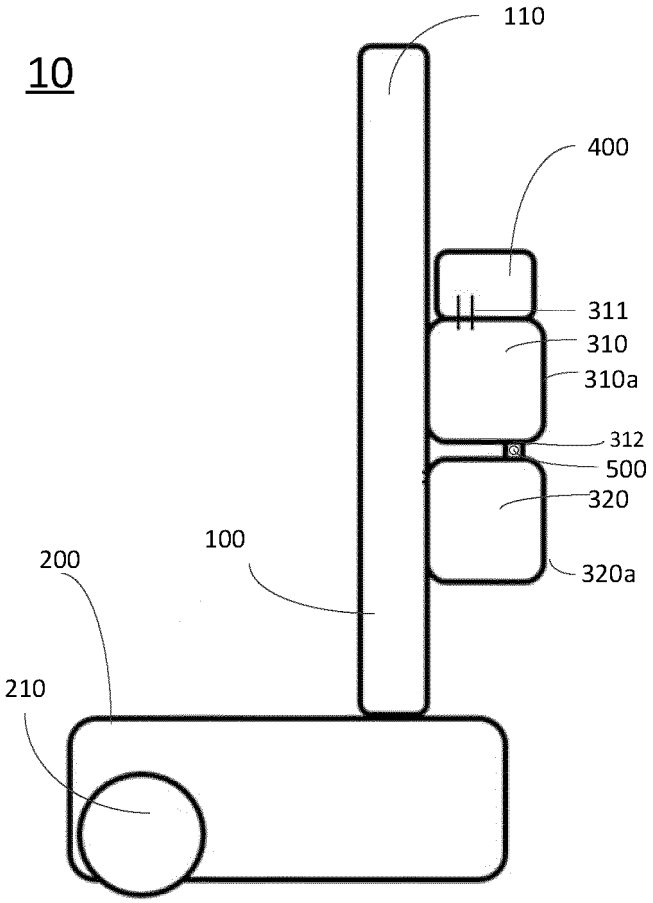

Fig. 33

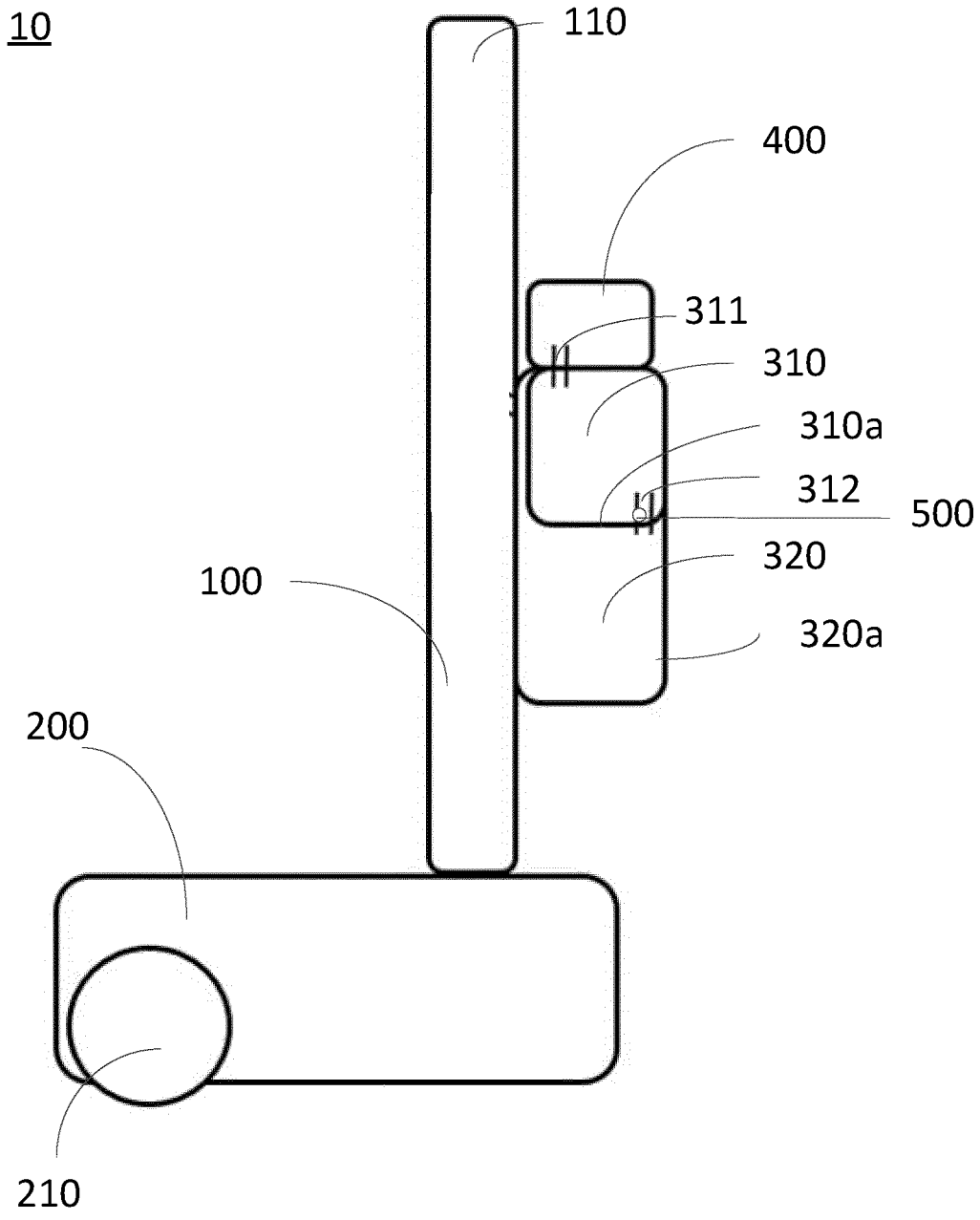

Fig. 34

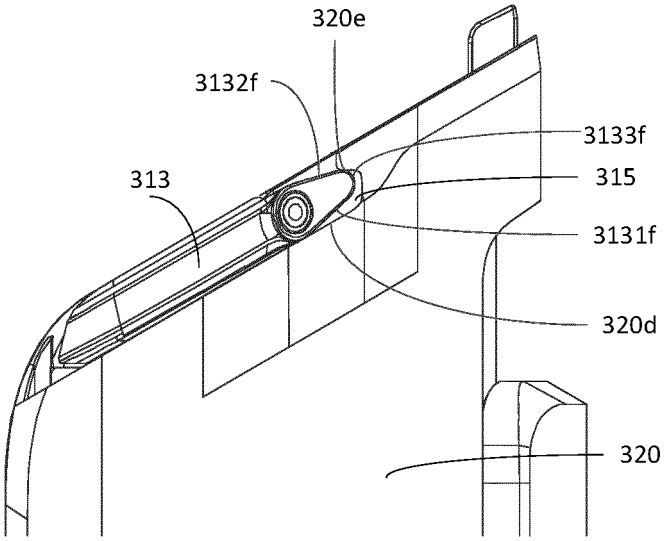
320e
3132f
3133f
313
315
3131f
320d
320

Fig. 35

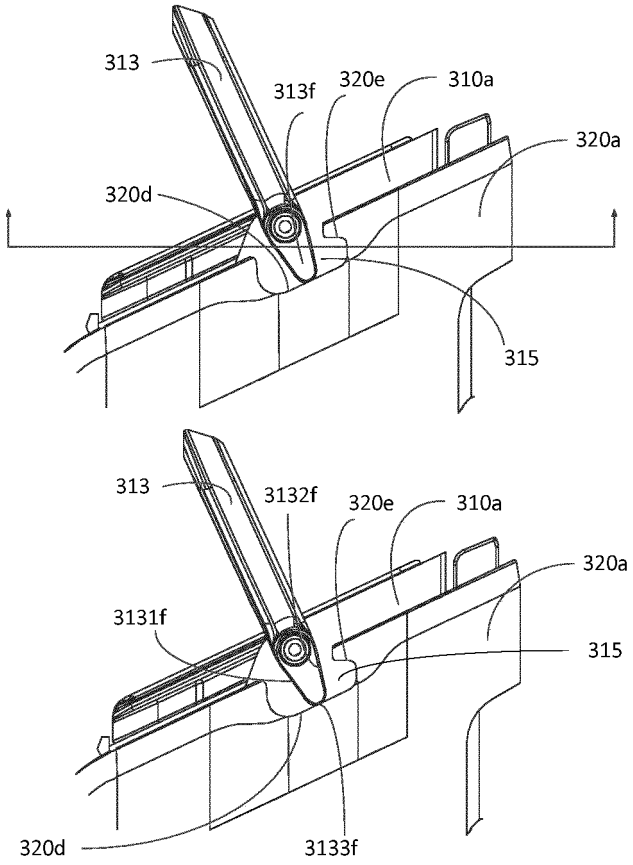
313
313f
320e
310a
320a
320d
315
313
3132f
320e
310a
320a
3131f
315
320d
3133f

Fig. 36

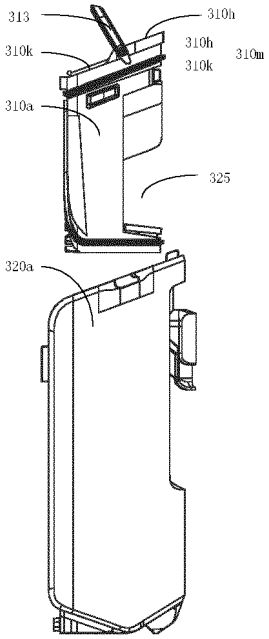
313
310h
310h
310k
310m
310k
310a
325
320a

Fig. 37

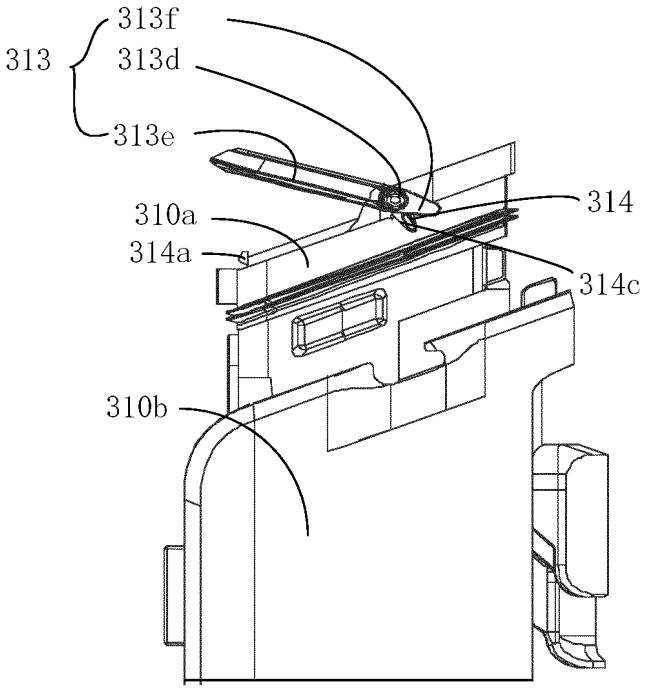
313f
313
313d
313e
314
310a
314a
314c
310b

Fig. 38

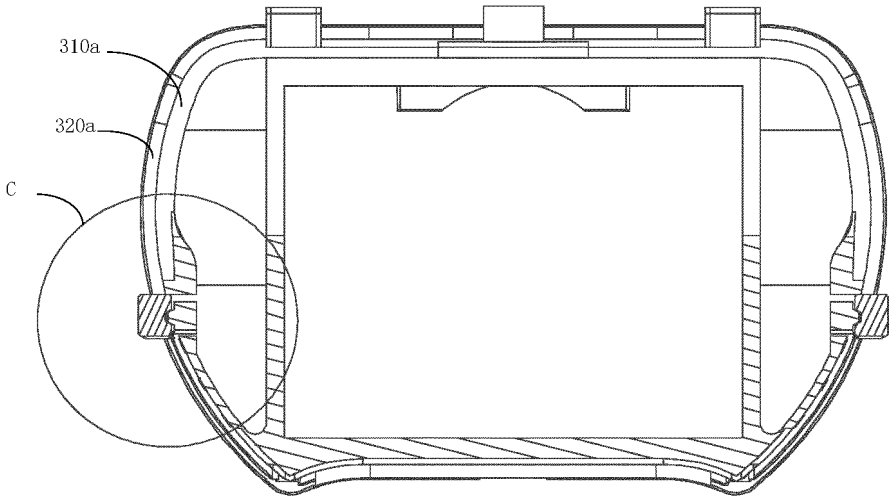

Fig. 39

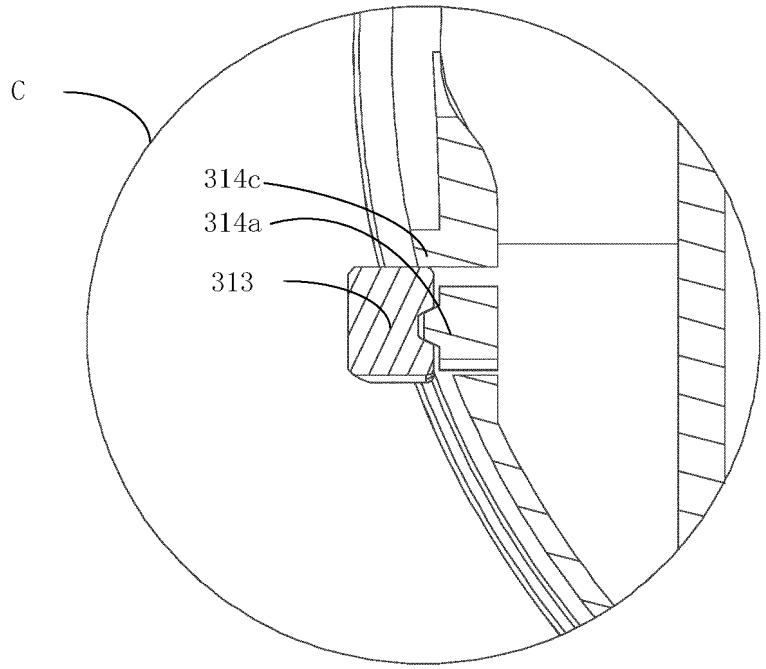

Fig. 40

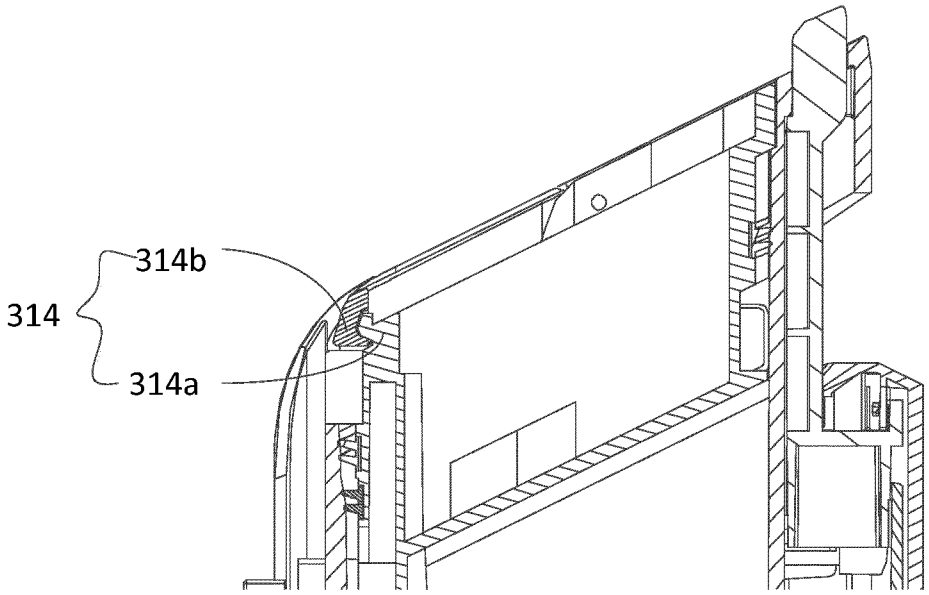

Fig. 41

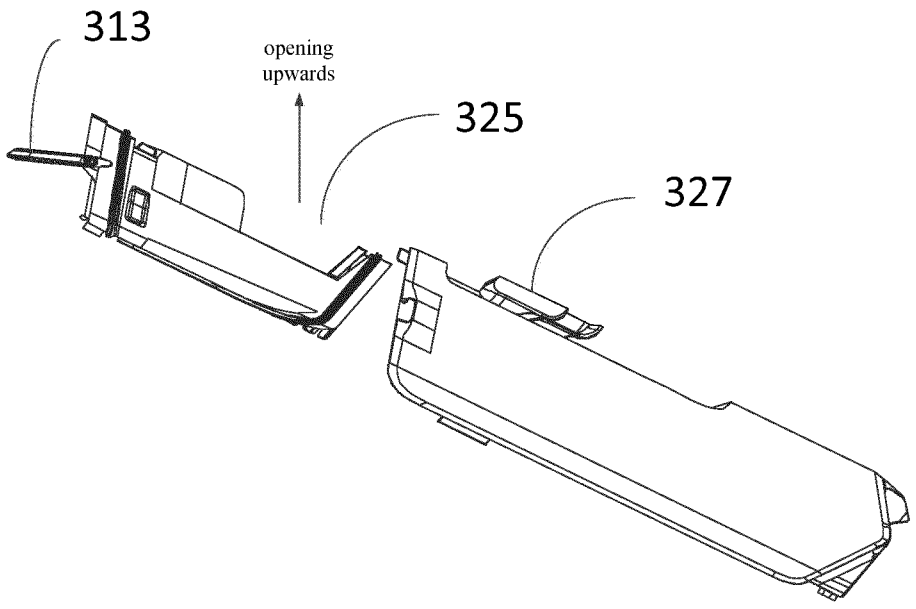

Fig. 42

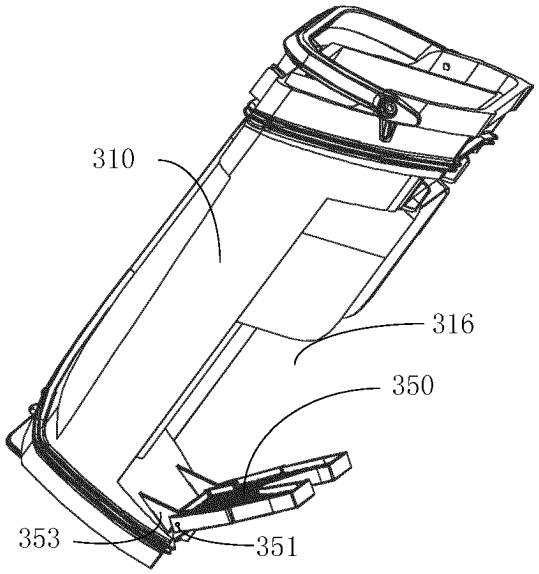

Fig. 43

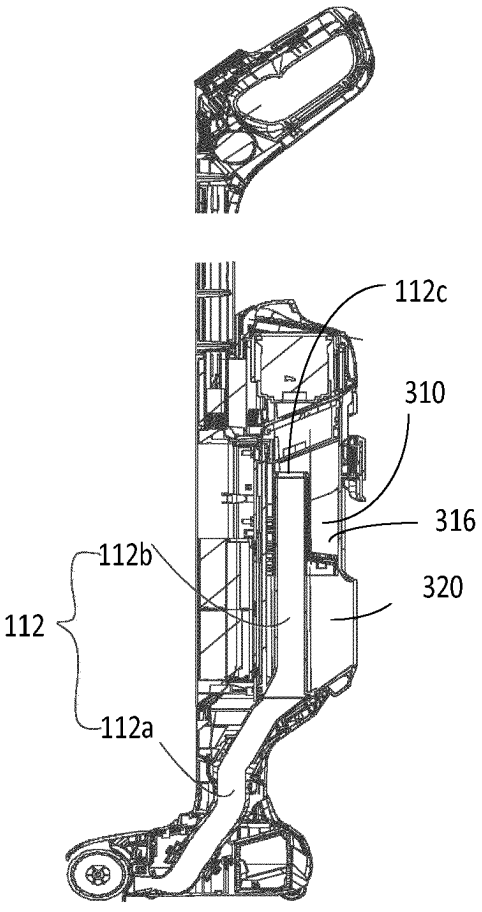

Fig. 44

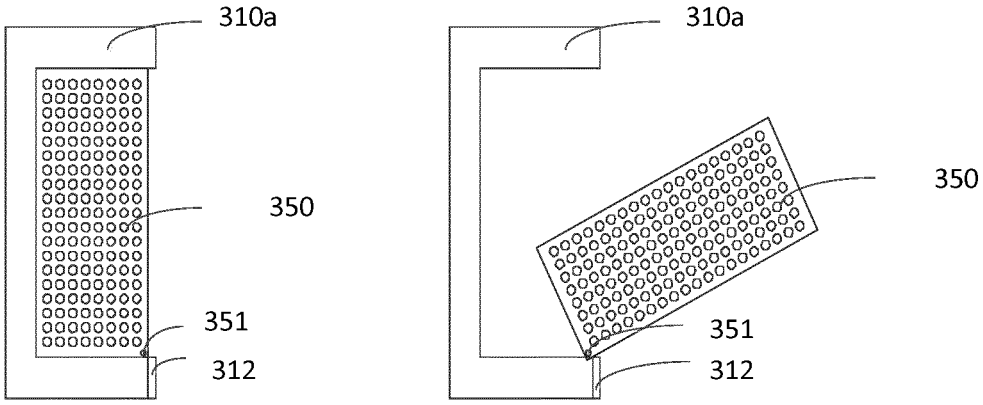
310a
350
351
312
310a
350
351
312

Fig. 45

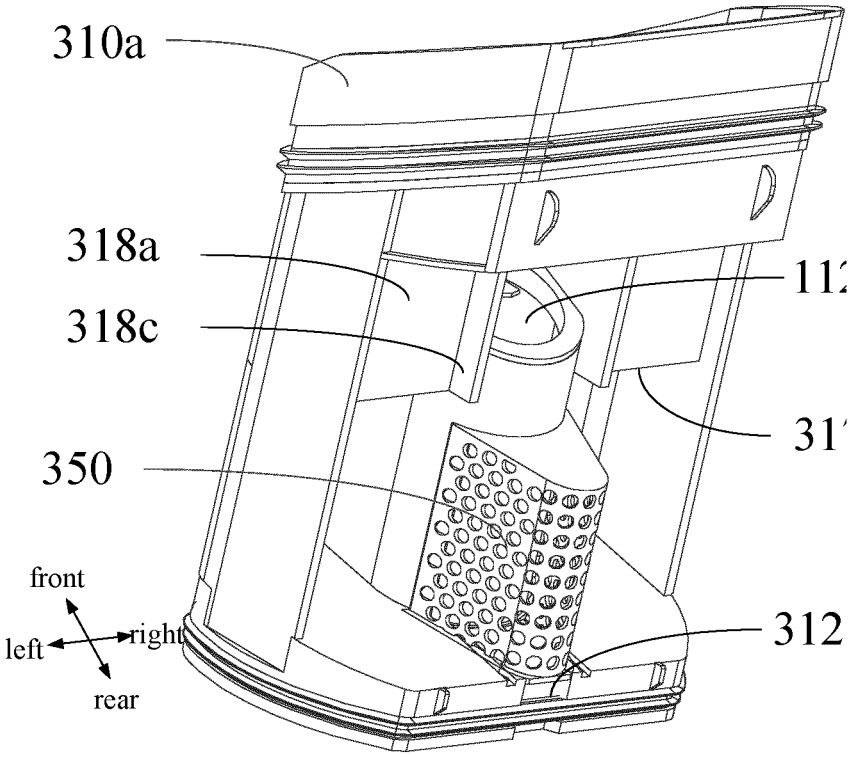
310a
318a
318c
350
front
left
right
rear
312

Fig. 46

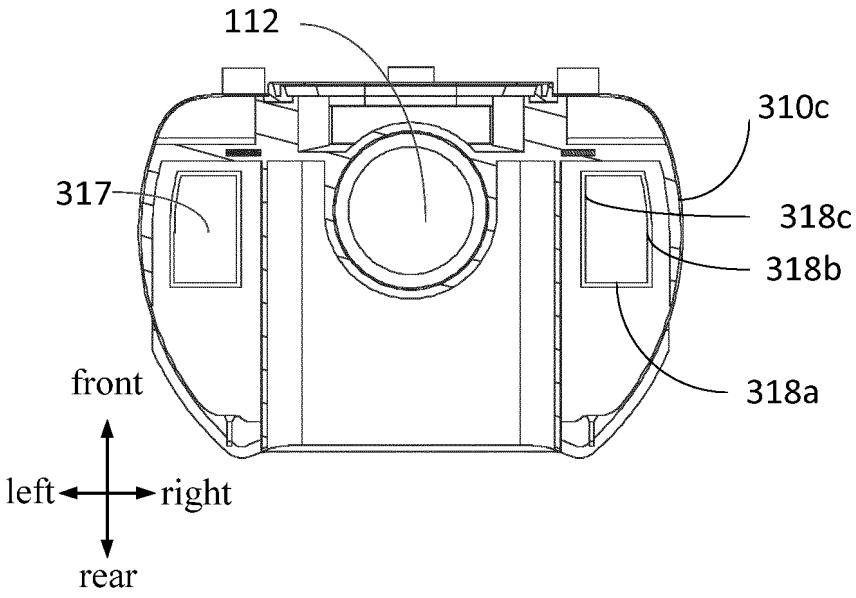

Fig. 47

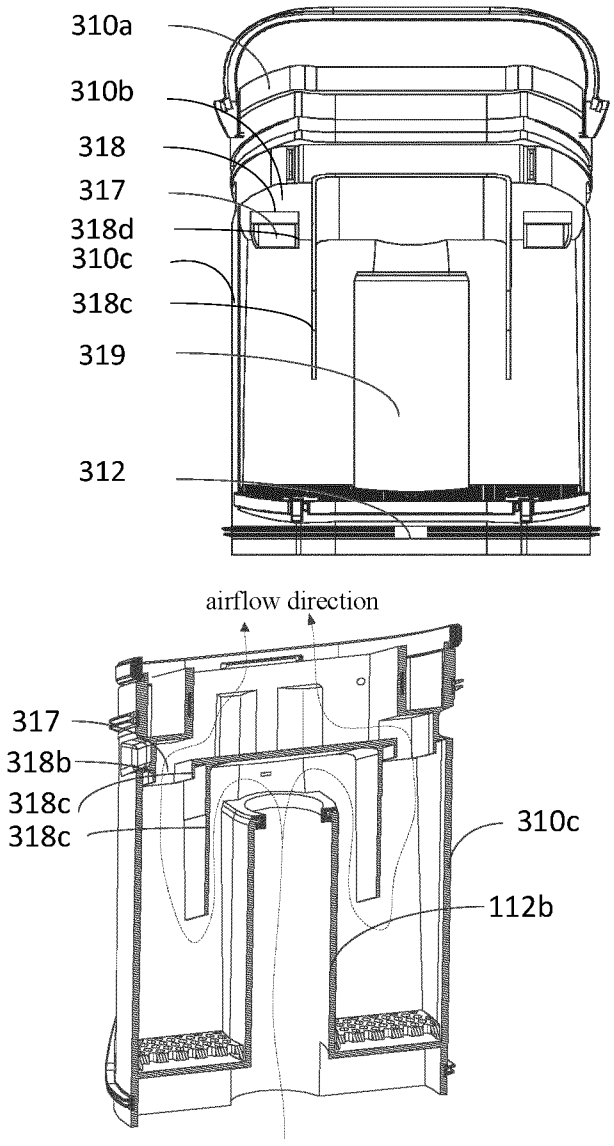
310a
310b
318
317
318d
310c
318c
319
312
airflow direction
317
318b
318c
318c
310c
112b

Fig. 48

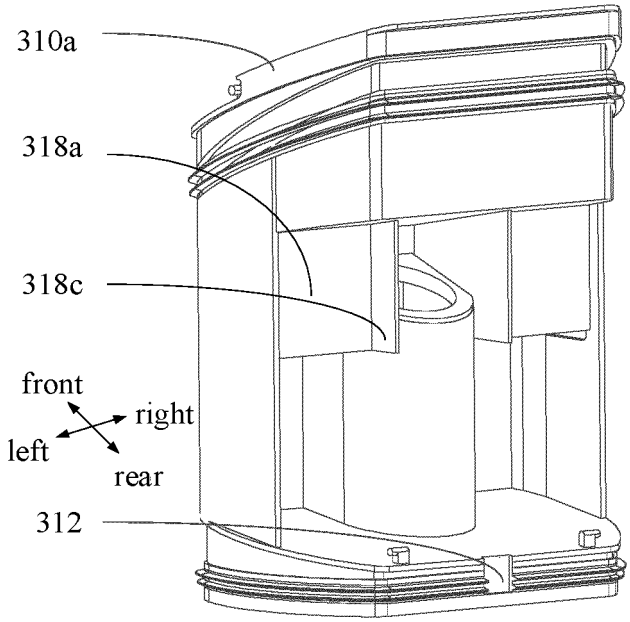
310a
318a
318c
front
right
left
rear
312

Fig. 49

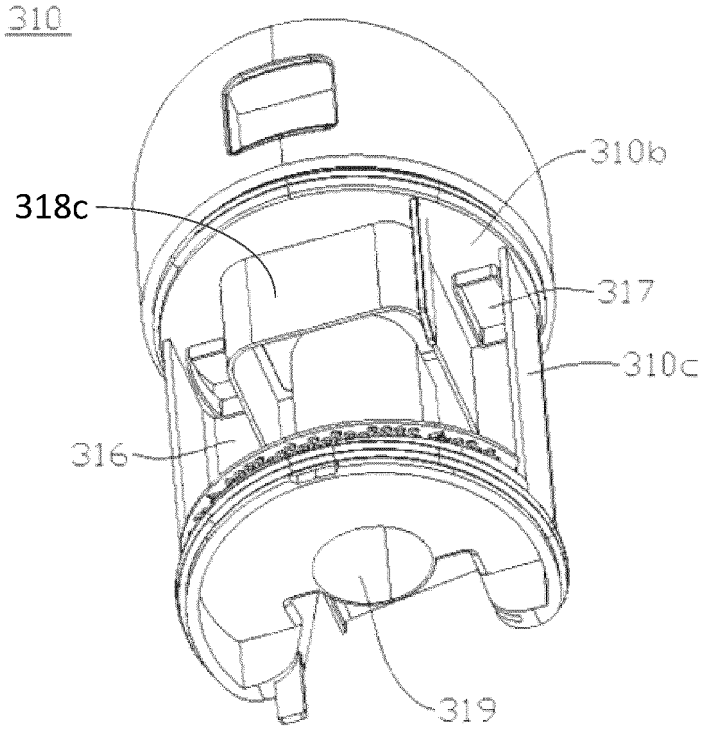
310
310b
318c
317
310c
316
319

Fig. 50

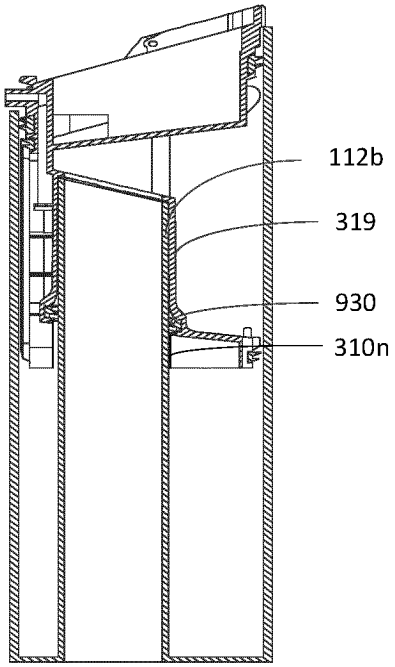

Fig. 51

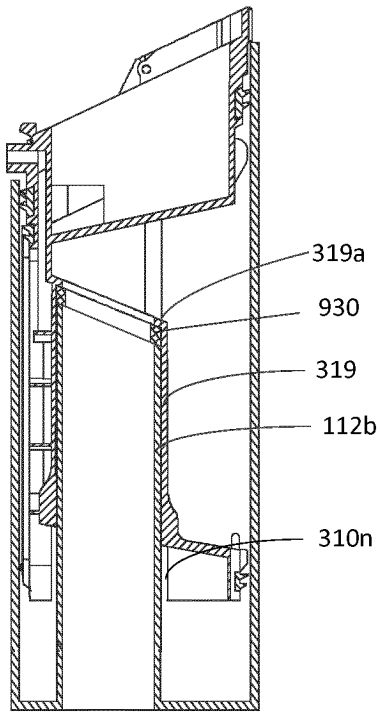

Fig. 52

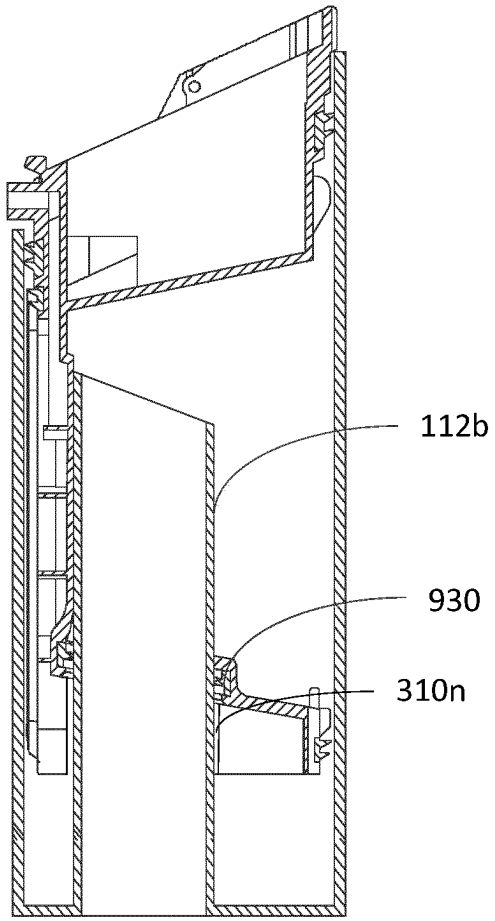

Fig. 53

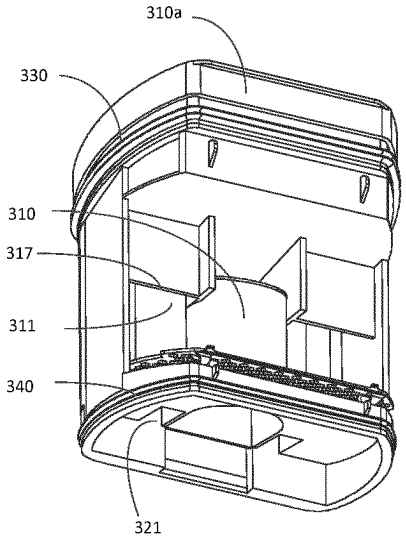

Fig. 54

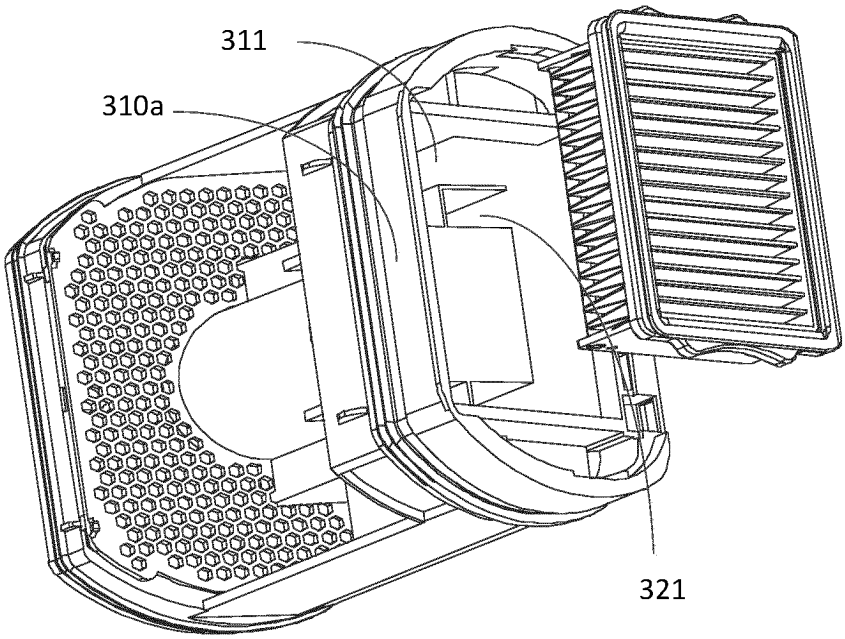

Fig. 55

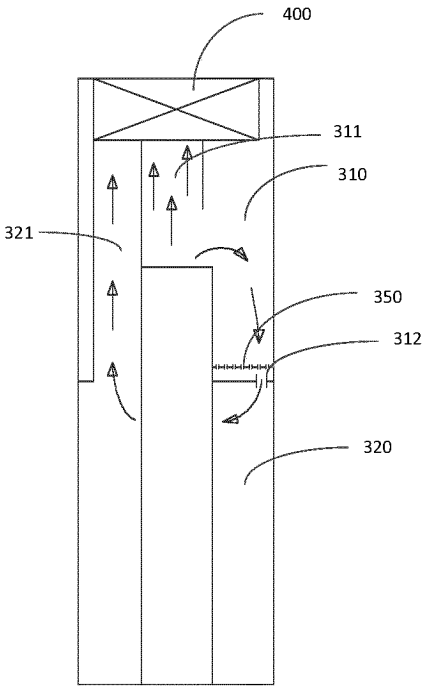

Fig. 56

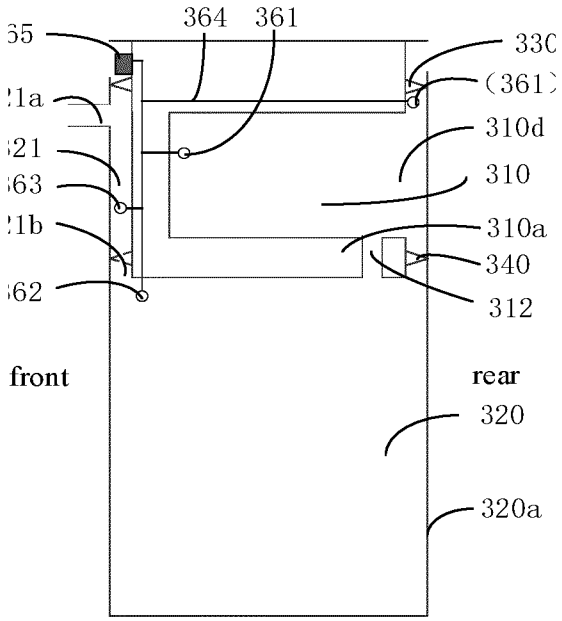
364
361
330
(361)
310d
310
310a
340
312
front
rear
320
320a

Fig. 57

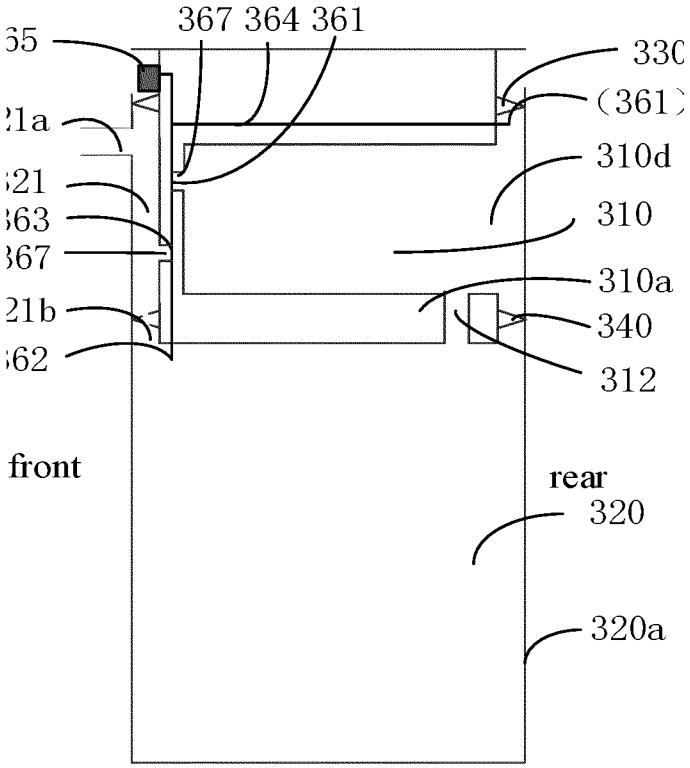
367 364 361
330
(361)
310d
310
310a
340
312
front
rear
320
320a

Fig. 58

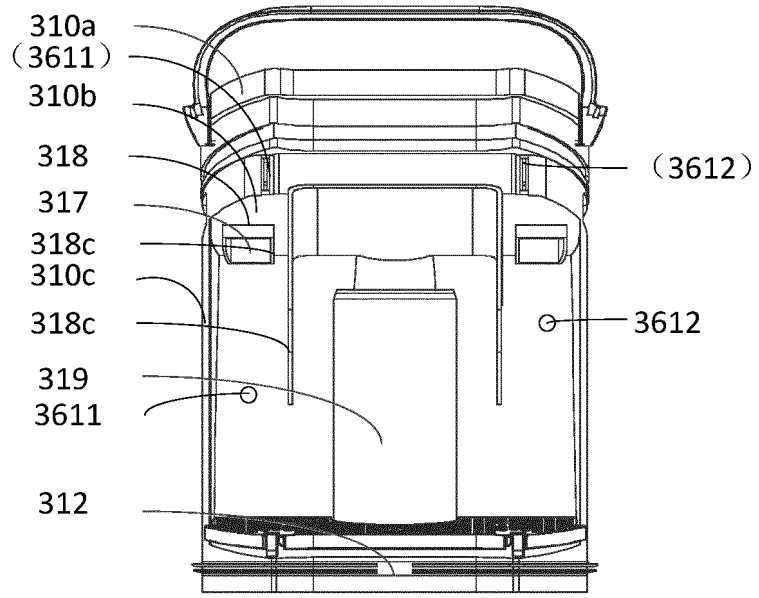
310a
（3611）
310b
318
317
318c
310c
318c
319
3611
312
（3612）
3612

Fig. 59

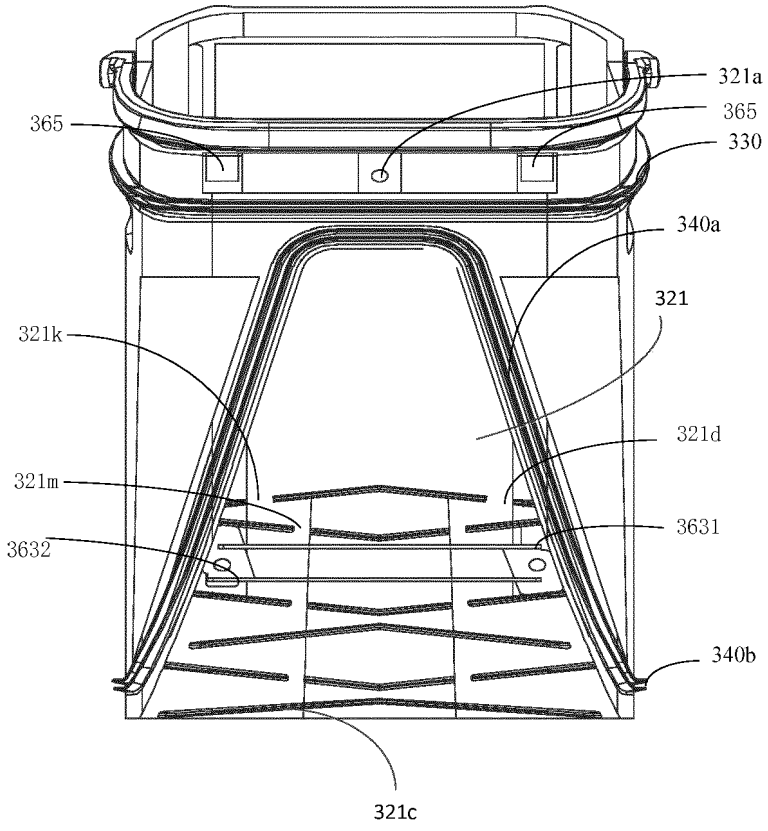
321a
365
365
330
340a
321
321k
321d
321m
3631
3632
340b
321c

Fig. 60

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/113165

A. CLASSIFICATION OF SUBJECT MATTER

A47L 11/30(2006.01)i; A47L 11/40(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)

A47L

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)

CNTXT; CNABS; CNKI; ENTXT; ENTXTC; VEN: 云鲸, 旋转, 转动, 风机, 抽吸, 负压, 抽风, 回流, 手持, 手握, 手柄, 污水, 污液, 废水, 废液, 脏水, 脏液, 盒, 箱, 筒, 罐, 室, 仓, 桶, 角度, 倾角, 倾斜, hand+, rotat+, fan?, waste, liquid, water, angul+, angle

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 217162003 U (YUNJING(NARWAL)INTELLIGENCE TECHNOLOGY (DONGGUAN) CO., LTD. et al.) 12 August 2022 (2022-08-12) description, paragraphs [0004]-[0095]	1, 6-40, 47, 48, 105, 123
PX	CN 217162004 U (YUNJING(NARWAL)INTELLIGENCE TECHNOLOGY (DONGGUAN) CO., LTD. et al.) 12 August 2022 (2022-08-12) description, paragraphs [0004]-[0119]	1, 6-40, 47, 48, 105, 123
PY	CN 217162003 U (YUNJING(NARWAL)INTELLIGENCE TECHNOLOGY (DONGGUAN) CO., LTD. et al.) 12 August 2022 (2022-08-12) description, paragraphs [0004]-[0095]	2-5, 106, 107, 112-118
Y	US 2019082903 A1 (OMACHRON INTELLECTUAL PROPERTY INC.) 21 March 2019 (2019-03-21) description, paragraphs [0833]-[0840]	2-5, 106, 107, 112-118
A	CN 205181250 U (HIZERO TECHNOLOGIES CO., LTD.) 27 April 2016 (2016-04-27) description, paragraphs [0004]-[0089]	1-124
A	CN 1768665 A (LG ELECTRONICS INC.) 10 May 2006 (2006-05-10) entire document	1-124

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

* Special categories of cited documents:
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"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
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"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
13 October 2022	**31 October 2022**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/113165

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 3772314 A1 (LEIFHEIT AG.) 10 February 2021 (2021-02-10) entire document	1-124

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/113165

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
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