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(54)

A POOL CLEANER

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A pool cleaning robot having cleaning capabilities, the pool cleaning robot includes a housing that comprises a housing bottom, the housing bottom comprises a main fluid inlet in fluid communication with a filtering unit of the pool cleaning robot, wherein the pool cleaning robot is characterized by further comprising: a housing bottom fluid jet outlet formed in the housing bottom; a bottom fluid jet unit that comprises a fluid pump that is located within the housing, and a fluid conduit that fluidly couples the fluid pump with the bottom fluid jet outlet; and a controller that controls an output of a bottom fluid jet from the bottom jet outlet.

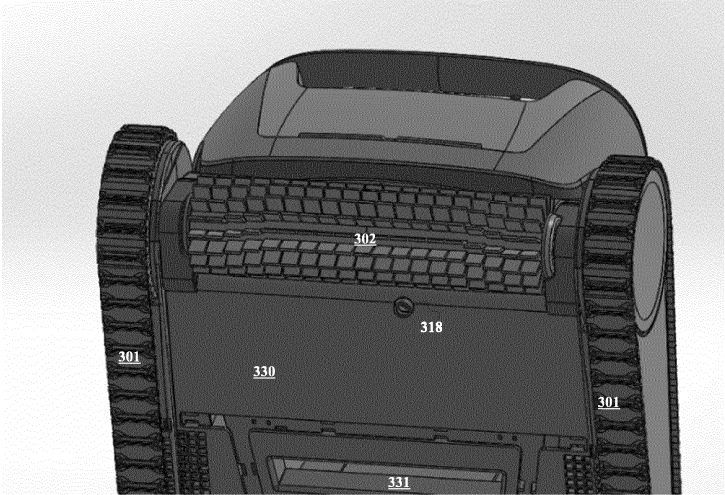


FIG. 14

Description**CROSS REFERENCE**

[0001] This application claims priority from IL patent application 302953 filing date May 15, 2023 that is incorporated herein in its entirety.

BACKGROUND

[0002] A pool cleaning robot (PCR) may include a jet propulsion unit for maneuvering the PCR within a pool. A jet propulsion unit may include multiple apertures.

[0003] There is a growing need to provide an effective solution for distributing the fluid between the multiple apertures.

SUMMARY

[0004] There may be provided a fluid jet control unit of a pool related platform.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] The subject matter regarded as the invention is particularly pointed out and distinctly claimed in the concluding portion of the specification. The invention, however, both as to organization and method of operation, together with objects, features, and advantages thereof, may best be understood by reference to the following detailed description when read with the accompanying drawings in which:

FIG. 1 illustrates an example of a fluid jet control unit;
 FIG. 2 illustrates an example of a fluid jet control unit and a valve;
 FIG. 3 illustrates an example of a fluid jet control unit;
 FIG. 4 illustrates an example of a fluid jet control unit and a part of a housing of a distributing nozzle;
 FIG. 5 illustrates an example of a fluid jet control unit, a distributing nozzle and additional fluid flow elements;
 FIG. 6 illustrates an example of a method;
 FIGs. 7 and 8 are examples of parts of a prototype illustrating various components; and
 FIGs. 9 and 10 are examples of output flow direction setting units;
 FIGs. 11-20 illustrate examples of a pool cleaning robots or parts of a pool cleaning robot.

[0006] It will be appreciated that for simplicity and clarity of illustration, elements shown in the figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements may be exaggerated relative to other elements for clarity. Further, where considered appropriate, reference numerals may be repeated among the figures to indicate corresponding or analogous elements.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0007] In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be understood by those skilled in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, and components have not been described in detail so as not to obscure the present invention.

[0008] The subject matter regarded as the invention is particularly pointed out and distinctly claimed in the Summary of the invention of the specification.

[0009] The invention, however, both as to organization and method of operation, together with objects, features, and advantages thereof, may best be understood by reference to the following detailed description when read with the accompanying drawings.

[0010] It will be appreciated that for simplicity and clarity of illustration, elements shown in the figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements may be exaggerated relative to other elements for clarity. Further, where considered appropriate, reference numerals may be repeated among the figures to indicate corresponding or analogous elements.

[0011] The term "and/or" is additionally or alternatively.

[0012] The terms "control unit", "remote control device", "control device" and "mobile computer" are used in an interchangeable manner.

[0013] Any reference in the specification to a pool cleaning robot should be applied mutatis mutandis to a method that can be executed by the pool cleaning robot and to a computer readable medium that stores instructions to be executed by the pool cleaning robot.

[0014] Any reference in the specification to a mobile computer should be applied mutatis mutandis to a method that can be executed by the mobile computer and to a computer readable medium that stores instructions to be executed by the mobile computer.

[0015] Any reference in the specification to method should be applied mutatis mutandis to a pool cleaning robot and/or to a mobile computer that execute the method and/or to a computer readable medium that stores instructions that once executed result in an execution of the method.

[0016] Any reference in the specification to a non-transitory computer readable medium should be applied mutatis mutandis to a pool cleaning robot and/or a mobile computer capable of executing the instructions stored in the non-transitory computer readable medium and should be applied mutatis mutandis to method that may be executed by a pool cleaning robot and/or a mobile computer that reads the instructions stored in the non-transitory computer readable medium.

[0017] Because the illustrated embodiments of the present invention may for the most part, be implemented using electronic components, touch screens and circuits

known to those skilled in the art, details will not be explained in any greater extent than that considered necessary as illustrated above, for the understanding and appreciation of the underlying concepts of the present invention and in order not to obfuscate or distract from the teachings of the present invention.

[0018] Any reference in the specification to a method should be applied mutatis mutandis to a system capable of executing the method and should be applied mutatis mutandis to a non-transitory computer readable medium that stores instructions that once executed by a computer result in the execution of the method.

[0019] A PRP is any platform that may perform an operation related to a liquid of a pool - cleaning, changing chemical composition, monitoring, and the like. Examples of a PRP include a pool robot that differs from a pool cleaning robot (PCR), a PCR, a floating unit, a skimmer, and the like. Any example related a PCR may be applied mutatis mutandis, to any other PRP.

[0020] There is provided a PRP, a fluid jet control unit of a PRP and a method for flow control.

[0021] The flow control unit may facilitate a distribution of fluid between different fluid jet outputs. One or more of the fluid jet outputs may be used for navigation. One or more other fluid jet outputs may be used for cleaning. For example - a fluid jet output located at the bottom of the PRP may be used to clean pool elements such as stairs - or at least participate in the cleaning of the pool elements (such as stairs) - by directing a cleaning fluid jet towards upper surfaces of the stairs.

[0022] Figure 1 illustrates examples of a fluid jet control unit of a PRP. Figure 1 illustrates fluid that propagates along a path 70 that leads to the fluid jet control unit.

[0023] The fluid jet control unit includes:

- a. A fluid control element (FCE) 31 that may move between a first position and at a second position. The FCE is configured to direct fluid through first fluid conduit 71 and towards a first fluid jet output 61 of the PRP when positioned in the first position (see - top of figure 1). The FCE is configured to direct the fluid through second fluid conduit 72 and towards a second fluid jet output 62 of the PRP when positioned in the other position (see the bottom of page 1).
- b. A positioning unit 41 that is configured to impact a positioning of the FCE, based on a position of a distribution nozzle that is upstream to the positioning unit. The distribution nozzle is denoted 80 in figures 4 and 5.

[0024] The FCE 31 is configured to rotate about axis 32 and include an upstream end 34 and a downstream end 35. In figure 1 the FCE 31 includes a weight 33 or spring or any other mechanical arrangement that forces the FCE to be positioned at the second position - when there is no flow of fluid (see the middle of figure 1). When the flow of fluid is resumed - and while the FCE is not locked (not locked - is not prevented from moving towards

the first position)- the FCE 31 will resume to the first position. In figure 1 the axis and the FCE 31 (when in the open position) are located above the first fluid conduit 71.

[0025] The FCE 31 is configured to rotate about axis 32 and include an upstream end 34 and a downstream end 35. In figure 1 the FCE 31 includes a weight 33 that forces the FCE to be positioned at the second position - when there is no flow of fluid (see the middle of figure 1). When the flow of fluid is resumed - and while the FCE is not locked - the FCE 31 will resume to the first position. In figure 1 the axis and the FCE 31 (when in the open position) are located above the first fluid conduit 71.

[0026] Accordingly - the positioning unit is prevented from locking the FCE when the FCE directs the flow of fluid towards the first fluid jet output of the PRP.

[0027] The positioning unit 41 is illustrated as including a bar that ends with a locking element 43. The positioning unit 41 rotates about axis 42 between an unlocking position (see the top and middle of figure 1) and a locking position (see the bottom of figure 1) in which the locking element 43 locks the FCE 31- and maintain the FCE from rotating (due to the flow of fluid) in the second position.

[0028] In order to lock the FCE - there should be a stop in the flow of fluid - so that the FCE may enter the second positions without being forced, by the flow of fluid- to return to the first position.

[0029] Control element 51 may cause the positioning unit 41 to rotate upwards or downwards. The position of the control element 51 may represent the location of the distribution nozzle. The control element 51 may be mechanically coupled to the distribution nozzle. For example - the control element 51 may be a part of an envelope or other structural element (denoted 81 in figures 4 and 5) that extends from one side or both sides of the distribution nozzle (denoted 80 in figures 4 and 5).

[0030] Figure 2 illustrates examples of a fluid jet control unit of a PRP and a valve 89. Valve 89 may be positioned at a closed position - thereby preventing fluid to reach the second fluid jet output 62 - when the FCE is in the first position. Valve 89 may be positioned at an open position - thereby allowing fluid to reach the second fluid jet output 62 - when the FCE is in the second position. The pressure asserted by the fluid on valve when FCE is in the first position may be lower than a threshold pressure required to open the valve 89. The pressure asserted by the fluid on valve when FCE is in the second position may exceed the threshold pressure required to open the valve 89.

[0031] Figure 2 also illustrates a non-return valve 82 located within second fluid conduit - and is configured to prevent suction of fluid from the second opening - when a direction of a flow of fluid is reversed - for example when an impeller rotates at a direction opposite than the direction of rotation that causes fluid to exit the first fluid jet output 61. The PRP may include only one valve out of non-return valve 82 and valve 89.

[0032] Figure 3 illustrates another example of a fluid jet control unit of a PRP.

[0033] The fluid jet control unit of a PRP of figure 3 differs from the fluid jet control unit of a PRP by the spatial relationship between the FCE and the first fluid conduit, and by the operation of the positioning unit.

[0034] In figure 3, the FCE closes the first fluid conduit when in the first position (see the top of figure 3). The flow of fluid passes above the FCE and does not cause the FCE to elevate.

[0035] In figure 3 the positioning movement induces the FCE to enter the second position by elevating an upstream part of the FCE - and allowing the fluid to elevate (by rotation) the FCE to enter the second position.

[0036] Figure 4 illustrates an example of a fluid jet control unit of a PRP, a distribution nozzle 80 and a structural element 81 that extends to the left of the distribution nozzle 80.

[0037] The structural element 81 mechanically couples the positioning unit 41 to the distribution nozzle 80 - so that the positioning unit 41 has its locking element 43 elevated when the distribution nozzle 80 (and accordingly the structural element 81) turns to the left. The positioning unit 41 has its locking element 43 lowered when the distribution nozzle 80 (and accordingly the structural element 81) turns to the right - or is directed upwards.

[0038] The locking element 43 may lock the FCE when the elevation of the locking element is executed when the FCE is not lifted by the flow of fluid.

[0039] When the FCE is already lifted by the flow of fluid - the movement of the locking element 43 does not impact the FCE.

[0040] Figure 4 also illustrates the positioning unit 41 as including a spring 44 that forces the positioning unit 41 to rotate downwards (or maintain in a downwards position in which the locking element 43 does not lock the FCE) - unless the positioning unit 41 is forced to move upwards by the control element 51.

[0041] Figure 5 illustrates an example of a fluid jet control unit, a distributing nozzle 80 and additional fluid flow elements such as pump motor 86, and impeller 85. In figure 5 there are four first fluid jet outputs - first fluid jet output 61 (located to the left of the distributing nozzle 80), second fluid jet output 62 (located at the bottom of the PRP), a third fluid jet output 63 (located above the distributing nozzle 80), and a fourth fluid jet output 64 (located to the right of the distributing nozzle 80).

[0042] Figure 5 illustrates an example (top of figure 5) where the distributing nozzle 80 directs fluid to the left, and the FCE directs the fluid towards the second fluid jet output 62.

[0043] It should be noted that the distributing nozzle 80 may be tilted to the left and the FCE may direct the fluid towards the first fluid jet output 61 - for example by allowing fluid to elevate the FCE while the FCE is not locked to the second position.

[0044] Figure 5 also illustrates another example (bottom of figure 5) where the distributing nozzle 80 directs fluid upwards - towards the third fluid jet output 63 - and an unlocked FCE is located at a second position.

[0045] Figure 5 also illustrates a controller 111 (can be a hardware controller - for example an integrated circuit) for controlling the operation of the fluid jet control unit. The controller may control any of the fluid jet control unit illustrated in the application and/or may control the output flow direction setting unit 99, and the like.

[0046] Figure 6 illustrates an example of method 100.

[0047] Method 100 may include step 110 of positioning a fluid control element (FCE) at a first position; wherein the positioning is executed by a positioning unit and is based on a position of a distribution nozzle that is upstream to the positioning unit.

[0048] Step 110 may be followed by step 120 of directing fluid towards a first fluid jet output of the PRP, while the FCE is in the first position.

[0049] Method 100 may include step 130 of positioning the FCE at a second position; wherein the positioning is executed by the positioning unit and is based on the position of a distribution nozzle that is upstream to the positioning unit. In the example of figure 1 - the positioning may include stopping the flow of fluid, allow the FCE to enter the second position, and then locking the FCE.

[0050] Step 130 may be followed by step 140 of directing fluid towards a second fluid jet output of the PRP, while the FCE is in the second position.

[0051] Figure 7 and 8 are examples of parts of a prototype illustrating various components such as second fluid conduit 72, positioning unit 41, FCE 31, first shutter 101, first fluid conduit 71, distribution nozzle 80 and structural element 81.

[0052] Figure 9 and 10 illustrates that the direction of fluid that exits the second fluid conduit 72 can be determined by an output flow direction setting unit 99. The direction can be set once, the direction may be set multiple times. The direction may be set manually. The direction can be set by using mechanical elements such as motors, and the like. The direction may change according to any pattern - for example have one or more scan patterns - and the like.

[0053] Figure 9 illustrates an output flow direction setting unit 99 that include segments or slats that can be positioned at different angles in relation to the second fluid conduit - whereas figure 9 illustrates two different angles resulting two different directions of output of fluid. There may be any number of different angles. The different angles can be set manually or by mechanical elements such as motors.

[0054] Figure 10 illustrates examples of the output flow direction setting unit 99 - (i) a nozzle 99-3 that is rotatable about axis 99-2, (ii) shutters 99-1 that rotate about axes 99-2 - for example by a motor 99-3.

[0055] FIGs. 11-20 illustrate examples of a pool cleaning robots or parts of a pool cleaning robot.

According to an embodiment

[0056] FIGs. 11-20 illustrate examples of a pool cleaning robots or parts of a pool cleaning robot.

[0057] There is provided a pool cleaning robot and a bottom fluid jet unit for cleaning pool surfaces such as stairs of a pool that are difficult to clean using only brushing elements. Using a fluid jet ejected from the bottom of the pool is highly effective as the jet can reach locations that are not reachable by the brushing wheels when stairs that may be narrower than the pool cleaning robot are cleaned.

[0058] Figures 11-20 illustrate an example of a pool cleaning robot having cleaning capabilities.

[0059] According to an embodiment, the pool cleaning robot (300) includes a housing (303) that includes a housing bottom (330), the housing bottom includes (i) a main fluid inlet (331) in fluid communication with a filtering unit (353) of the pool cleaning robot, and a housing bottom fluid jet outlet (338-1); a bottom fluid jet unit that includes a fluid pump (311) that is located within the housing, and a fluid conduit (316) that fluidly couples the fluid pump with the bottom fluid jet outlet; and a controller (351) the controls an output of a bottom fluid jet from the bottom jet outlet.

[0060] According to an embodiment, the fluid conduit is connected between a seal adaptor (314) and a bottom jet unit nozzle (318).

[0061] According to an embodiment, the bottom jet unit nozzle extends from the housing bottom fluid jet outlet.

[0062] According to an embodiment, the pool cleaning robot includes an inner housing (307) having a detachable cover (306) for storing electrical components and one or more motors, wherein the bottom fluid jet unit includes a mechanical adaptor (312) for attaching the pump to the inner housing.

[0063] According to an embodiment, the pool cleaning robot includes an inner housing that includes a bottom surface (335-1) and legs (334) that extend from the bottom surface to the housing bottom, wherein at least a portion of the fluid conduit and the bottom fluid jet outlet are located between the bottom surface and the housing bottom.

[0064] According to an embodiment, the inner housing further includes a bottom protrusion (335), wherein the fluid conduit follows a non-linear path within a space formed by the housing bottom, the bottom protrusion and the bottom surface.

[0065] According to an embodiment, the fluid conduit includes a first segment (316-1), a second segment (316-2) that is downstream to the first segment and a third segment (316-3) that is downstream to the second segment, wherein the third segment is curved and has an outlet that is lower than the first segment and the second segment.

[0066] According to an embodiment, the pool cleaning robot includes a fluid pump float located above the fluid pump.

[0067] According to an embodiment, the pool cleaning robot includes an additional float (321) located at an opposite side (in relation to the fluid pump) to the inner housing. According to an embodiment the pool cleaning robot

includes a further float (339) in connection with the bottom of the bottom protrusion (335).

[0068] According to an embodiment, the pool cleaning robot includes a sensor (352) for sensing that the pool cleaning robot goes downstairs and wherein the controller is configured to control an outputting of the fluid jet from the bottom jet outlet when the pool cleaning robot goes downstairs. The sensor may be a visual sensor, an inclination sensor, an orientation sensor, an accelerometer, and the like.

[0069] According to an embodiment, the fluid pump includes a fluid inlet at a top of the fluid pump.

[0070] According to an embodiment, the fluid pump includes an additional fluid jet generation and distribution unit for generating one or more another fluid jets and outputting the one or more other fluid jets from locations that differ from the bottom of the housing.

[0071] According to an embodiment, additional fluid jet generation and distribution unit is independent from the bottom fluid jet unit - in the sense that it is independently controlled and/or uses other pumps and/or components than the bottom fluid jet unit.

[0072] According to an embodiment, the additional fluid jet generation and distribution unit is configured to selectively output the one or more other fluid jets from opening located at an upper portion of the pool cleaning robot - such as rear top opening (341) and side openings (342, 343).

[0073] According to an embodiment, the additional fluid jet generation and distribution unit includes a rotating nozzle (304) configured to distribute the one or more other fluid jets through additional fluid outlets. The rotating nozzle is moved by a nozzle rotation unit (305).

[0074] According to an embodiment, the additional fluid jet generation and distribution unit is configured to propel the pool cleaning unit using the one or more other fluid jets.

[0075] Figures 11-21 also illustrate the pool cleaning robot as including tracks 302, cleaning element such as brushes 302 and 302-1, a space 308 for receiving the filtering unit, a top 335 of housing, a toothed element 336 that is a part of propulsion unit of the pool cleaning robot (for eventually rotating the tracks, a fluid pump connector 342 connected to fluid pump plug 345, the fluid pump connector 342 is for receiving power cords 343, and fluid pump plug interface 341 for fastening the fluid pump connector 342 to interior of the inner housing).

[0076] According to an embodiment, the fluid pump 311 may receive fluid from any inlet - for example from pump fluid inlet (such as 313 or 319) - for receiving fluid that flows within the pool cleaning robot (the fluid may be sucked into the pool cleaning robot using the main fluid inlet (331) and a fluid control unit that may include an impeller and a pump motor (not shown)).

[0077] Any reference to any term of "including" or "comprising" or "having" may be applied mutatis mutandis to any one of "consisting" and "consisting essentially of". For example- any method may include at

least the steps included in the figures and/or in the specification, only the steps included in the figures and/or the specification. The same applies to the pool cleaning robot and the mobile computer.

[0078] It will be appreciated that for simplicity and clarity of illustration, elements shown in the figures have not necessarily been drawn to scale. For example, the dimensions of some of the elements may be exaggerated relative to other elements for clarity. Further, where considered appropriate, reference numerals may be repeated among the figures to indicate corresponding or analogous elements.

[0079] In the foregoing specification, the invention has been described with reference to specific examples of embodiments of the invention. It will, however, be evident that various modifications and changes may be made therein without departing from the broader spirit and scope of the invention as set forth in the appended claims.

[0080] Moreover, the terms "front," "back," "top," "bottom," "over," "under" and the like in the description and in the claims, if any, are used for descriptive purposes and not necessarily for describing permanent relative positions. It is understood that the terms so used are interchangeable under appropriate circumstances such that the embodiments of the invention described herein are, for example, capable of operation in other orientations than those illustrated or otherwise described herein.

[0081] Those skilled in the art will recognize that the boundaries between logic blocks are merely illustrative and that alternative embodiments may merge logic blocks or circuit elements or impose an alternate decomposition of functionality upon various logic blocks or circuit elements. Thus, it is to be understood that the architectures depicted herein are merely exemplary, and that in fact many other architectures can be implemented which achieve the same functionality.

[0082] Any arrangement of components to achieve the same functionality is effectively "associated" such that the desired functionality is achieved. Hence, any two components herein combined to achieve a particular functionality can be seen as "associated with" each other such that the desired functionality is achieved, irrespective of architectures or intermedial components. Likewise, any two components so associated can also be viewed as being "operably connected," or "operably coupled," to each other to achieve the desired functionality.

[0083] Furthermore, those skilled in the art will recognize that boundaries between the above described operations are merely illustrative. The multiple operations may be combined into a single operation, a single operation may be distributed in additional operations and operations may be executed at least partially overlapping in time. Moreover, alternative embodiments may include multiple instances of a particular operation, and the order of operations may be altered in various other embodiments.

[0084] However, other modifications, variations and alternatives are also possible. The specifications and draw-

ings are, accordingly, to be regarded in an illustrative rather than in a restrictive sense.

[0085] In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. The word 'comprising' does not exclude the presence of other elements or steps than those listed in a claim. Furthermore, the terms "a" or "an," as used herein, are defined as one as or more than one. Also, the use of introductory phrases such as "at least one" and "one or more" in the claims should not be construed to imply that the introduction of another claim element by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim element to inventions containing only one such element, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an." The same holds true for the use of definite articles. Unless stated otherwise, terms such as "first" and "second" are used to arbitrarily distinguish between the elements such terms describe. Thus, these terms are not necessarily intended to indicate temporal or other prioritization of such elements the mere fact that certain measures are recited in mutually different claims does not indicate that a combination of these measures cannot be used to advantage.

[0086] Any system, apparatus or device referred to this patent application includes at least one hardware component.

[0087] While certain features of the invention have been illustrated and described herein, many modifications, substitutions, changes, and equivalents will now occur to those of ordinary skill in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

Claims

1. A pool cleaning robot having cleaning capabilities, the pool cleaning robot comprises:

a housing that comprises a housing bottom, the housing bottom comprises a main fluid inlet in fluid communication with a filtering unit of the pool cleaning robot, wherein the pool cleaning robot is **characterized by** further comprising:

a housing bottom fluid jet outlet formed in the housing bottom;
a bottom fluid jet unit that comprises a fluid pump that is located within the housing, and a fluid conduit that fluidly couples the fluid pump with the bottom fluid jet outlet; and
a controller that controls an output of a bottom fluid jet from the bottom jet outlet.

2. The pool cleaning robot according to claim 1, wherein the fluid conduit is connected between a seal adaptor and a bottom jet unit nozzle.
3. The pool cleaning robot according to claim 2, wherein the bottom jet unit nozzle extends from the housing bottom fluid jet outlet.
4. The pool cleaning robot according to any of the previous claims, comprising an inner housing for storing electrical components and one or more motors, wherein the bottom fluid jet unit comprises a mechanical adaptor for attaching the fluid pump to the inner housing.
5. The pool cleaning robot according to claim 4, wherein the bottom fluid jet unit comprises a mechanical adaptor for attaching the fluid pump to the inner housing, wherein the mechanical adaptor is detachably coupled to the fluid pump.
6. The pool cleaning robot according to any of claims 4-5, wherein the inner housing comprises a bottom surface and legs that extend from the bottom surface to the housing bottom, wherein at least a portion of the fluid conduit and the bottom fluid jet outlet are located between the bottom surface and the housing bottom.
7. The pool cleaning robot according to any of claims 4-6, wherein the inner housing further comprises a bottom protrusion, wherein the fluid conduit follows a non-linear path within a space formed by the housing bottom, the bottom protrusion and the bottom surface.
8. The pool cleaning robot according to any of the previous claims, wherein the fluid conduit comprises a first segment, a second segment that is downstream to the first segment and a third segment that is downstream to the second segment, wherein the third segment is curved and has an outlet that is lower than the first segment and the second segment.
9. The pool cleaning robot according to any of the previous claims, comprising a fluid pump float located above the fluid pump.
10. The pool cleaning robot according to claim 9, comprising an additional float.
11. The pool cleaning robot according to any of the previous claims, comprising a sensor for sensing that the pool cleaning robot goes downstairs and wherein the controller is configured to control an outputting of the fluid jet from the bottom jet outlet when the pool cleaning robot goes downstairs.
12. The pool cleaning robot according to any of the previous claims, wherein the fluid pump comprises a fluid inlet at a top of the fluid pump.
13. The pool cleaning robot according to any of the previous claims, wherein the fluid pump comprises an additional fluid jet generation and distribution unit for generating one or more other fluid jets and outputting the one or more other fluid jets from locations that differ from the bottom of the housing.
14. The pool cleaning robot according to any of the previous claims, wherein additional fluid jet generation and distribution unit is independent from the bottom fluid jet unit.
15. A method for operating a pool cleaning robot as claimed in claim 1, the method comprises cleaning a pool surface using the fluid jet.

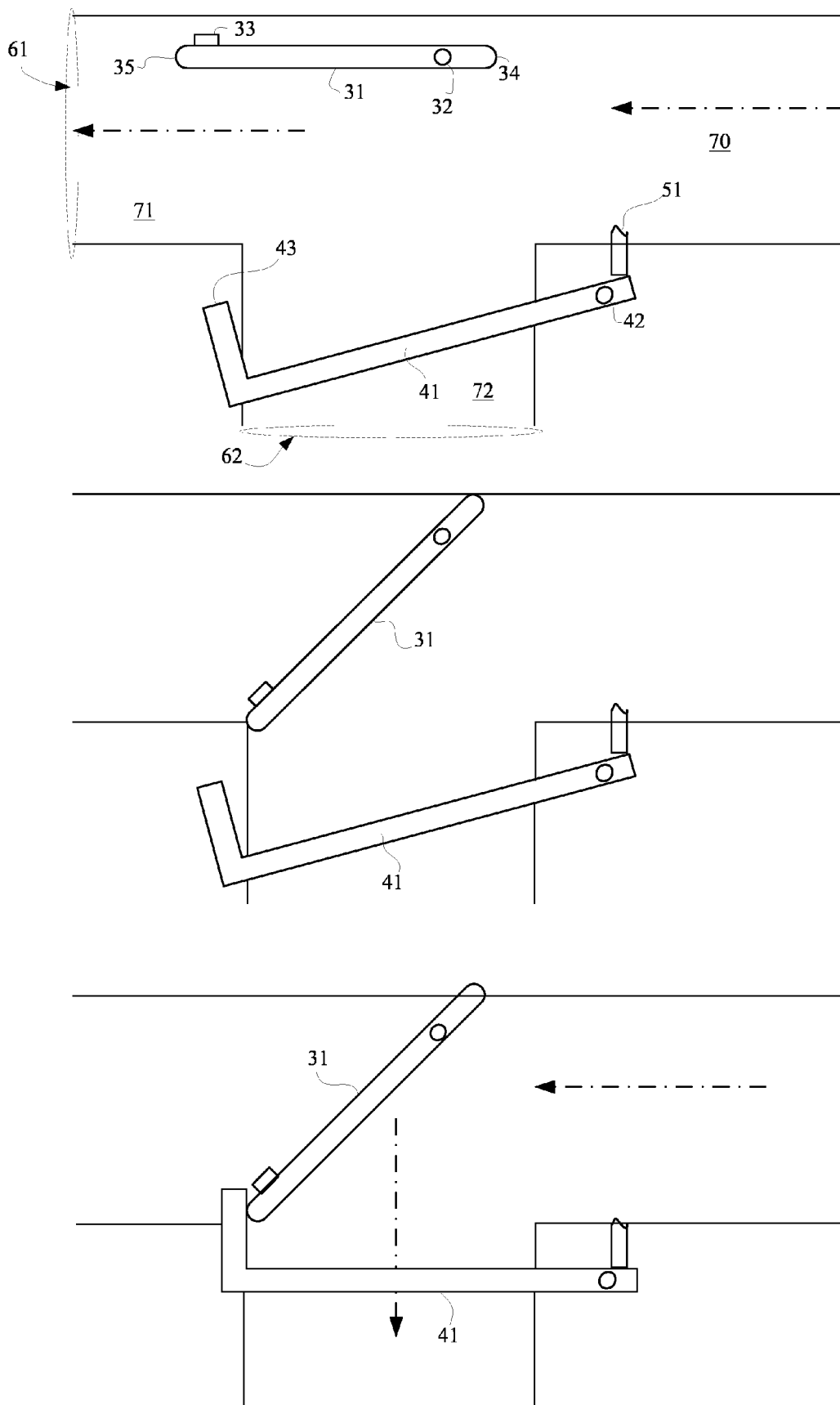


FIG. 1

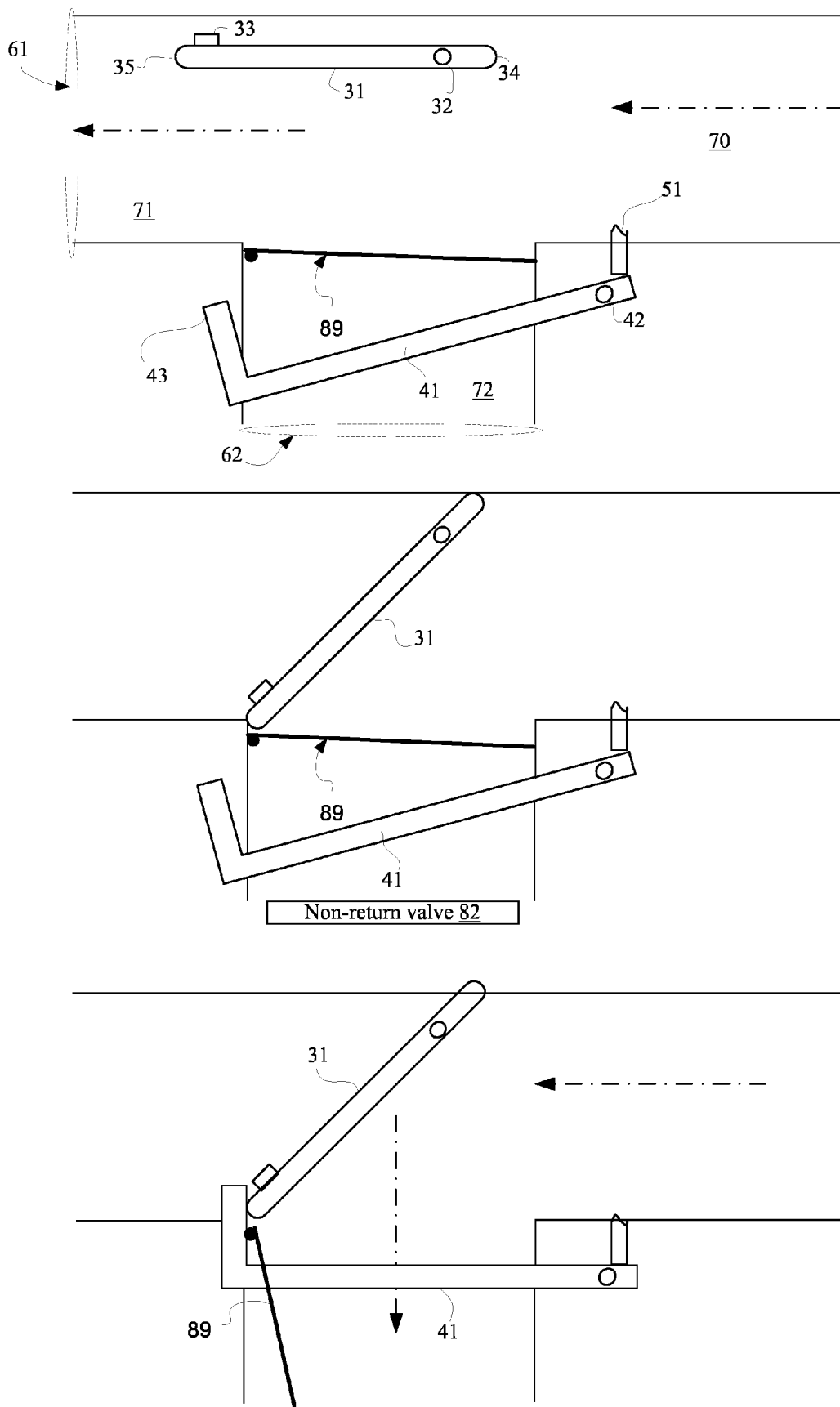


FIG. 2

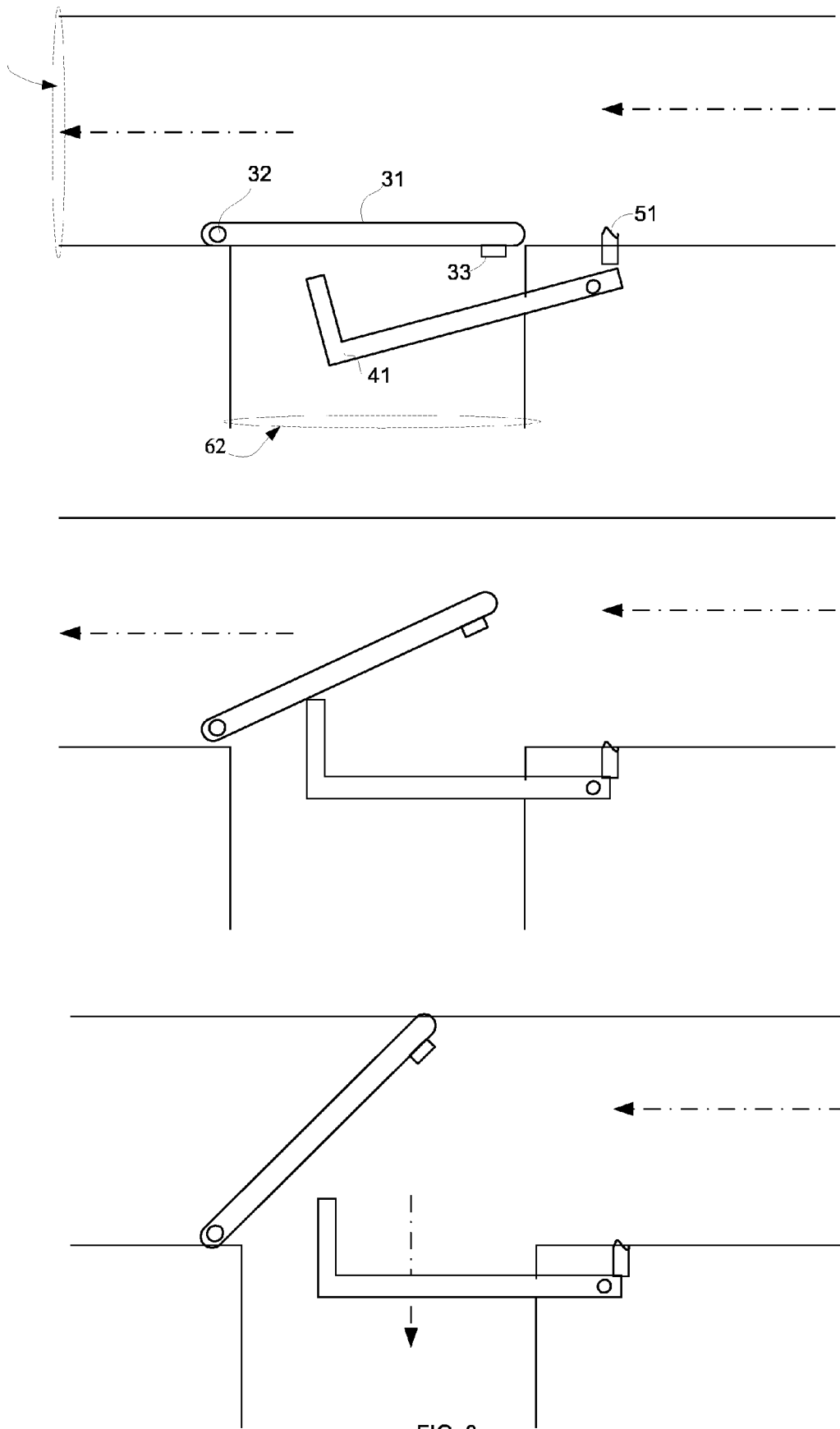


FIG. 3

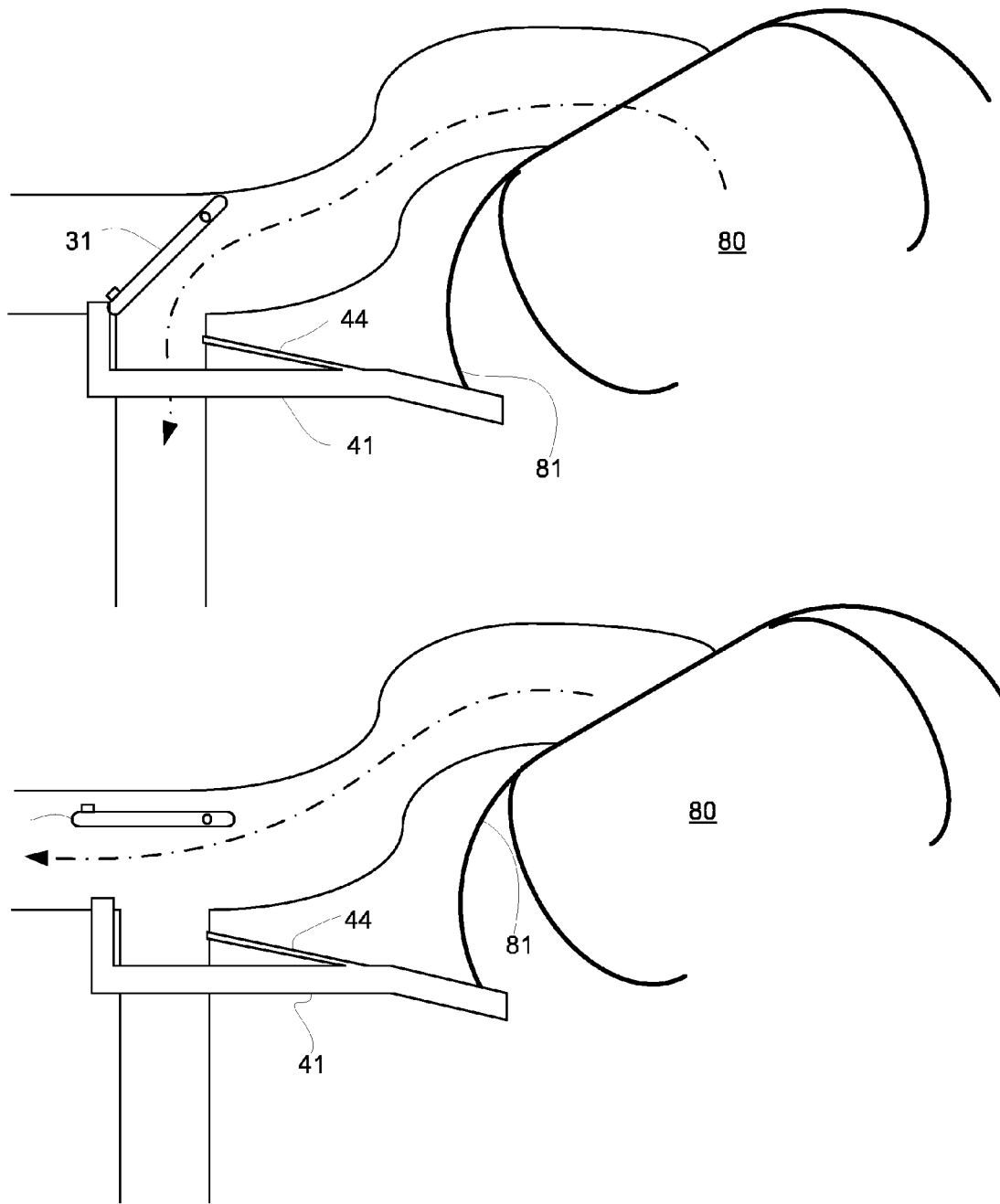


FIG. 4

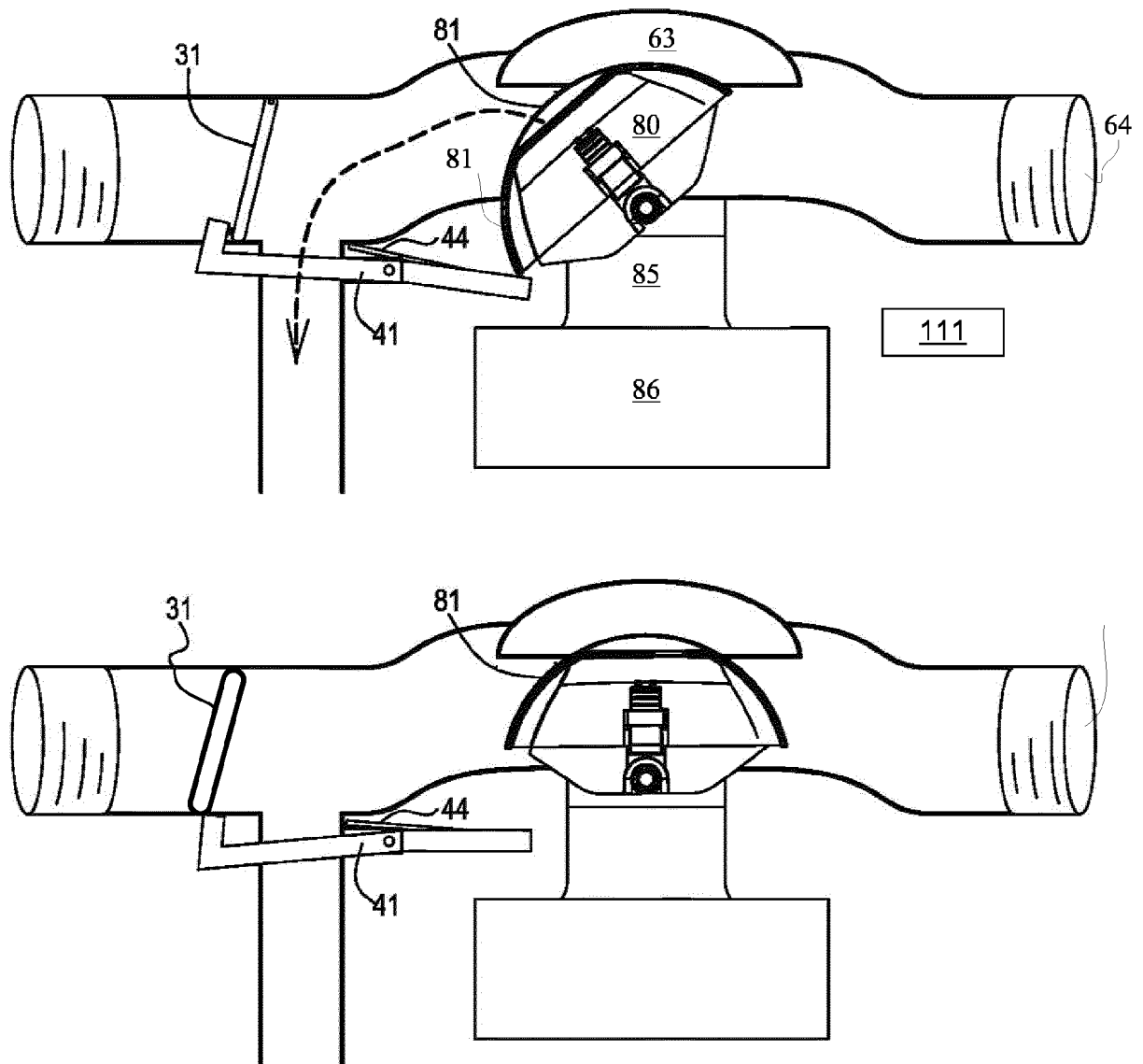
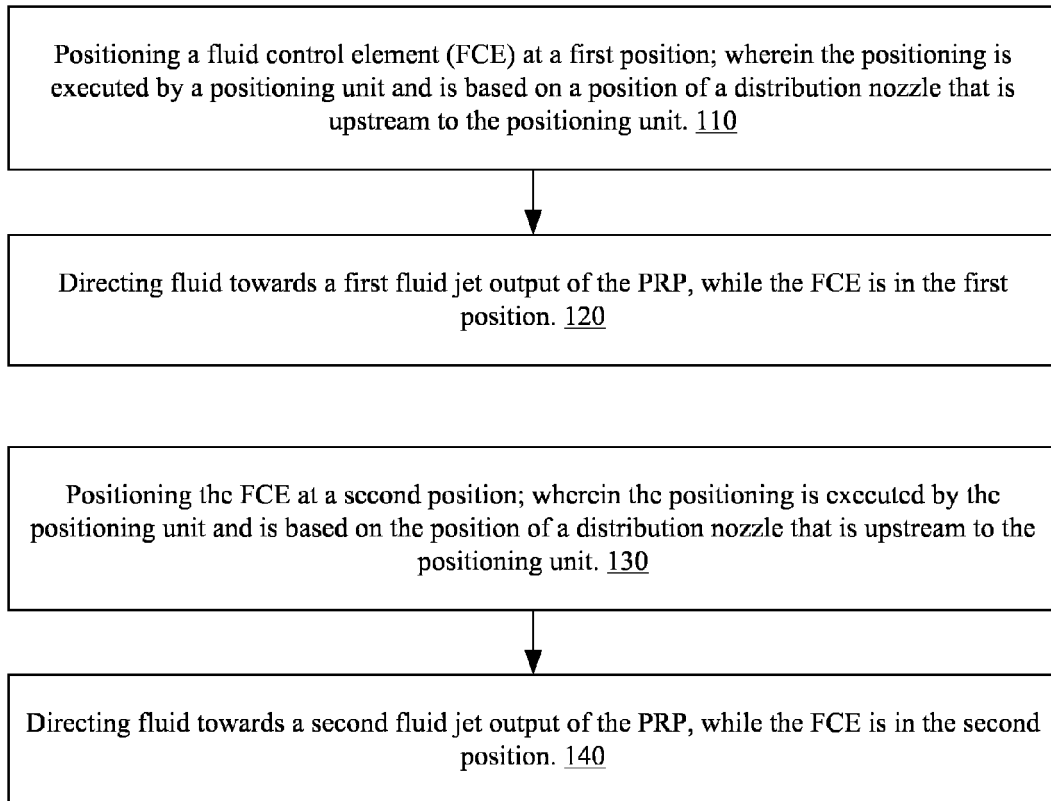


FIG. 5



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FIG. 6

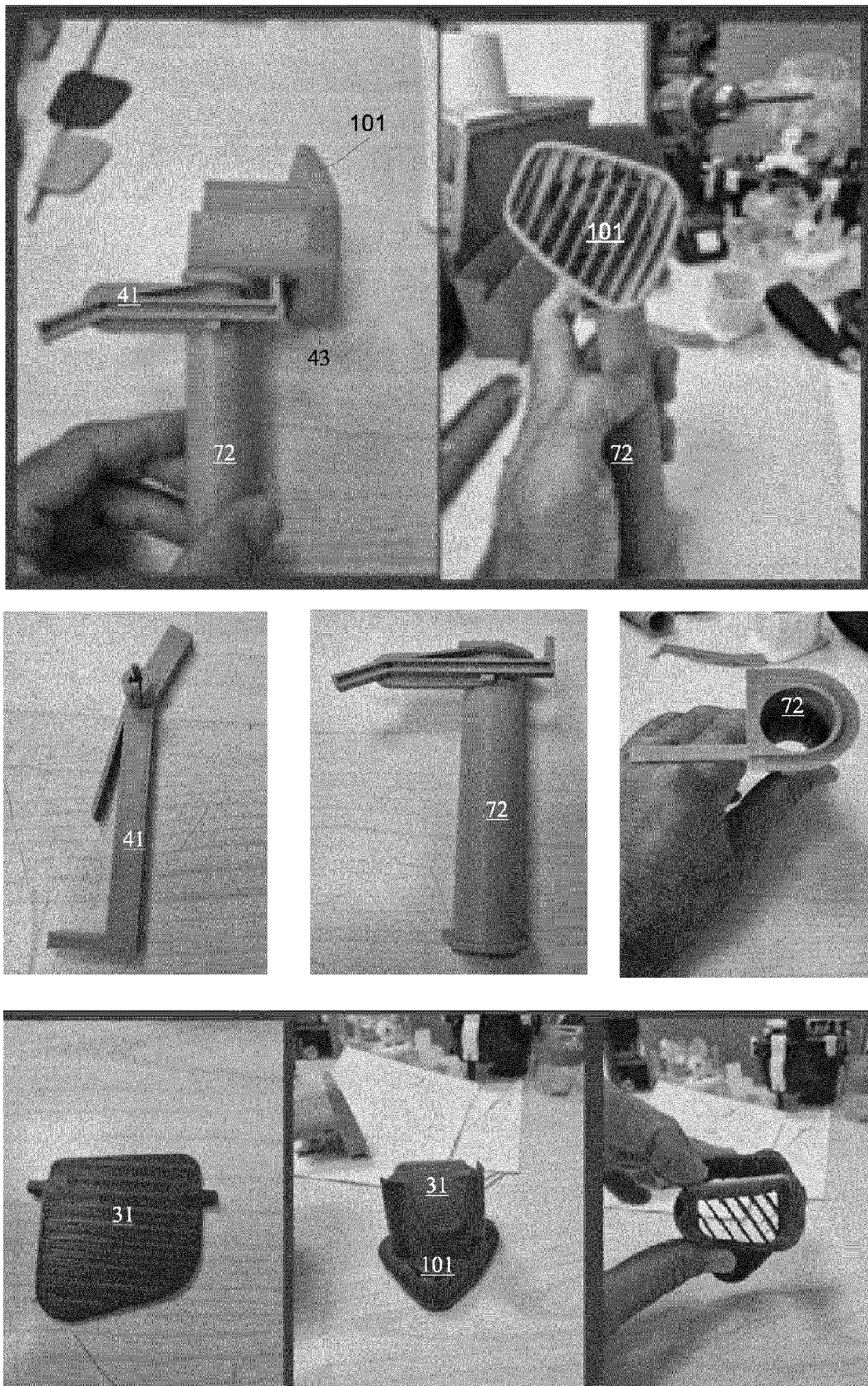


FIG. 7

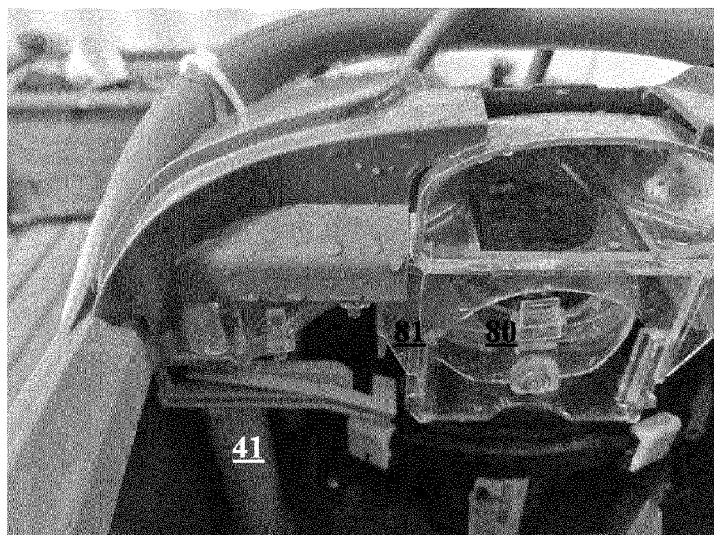
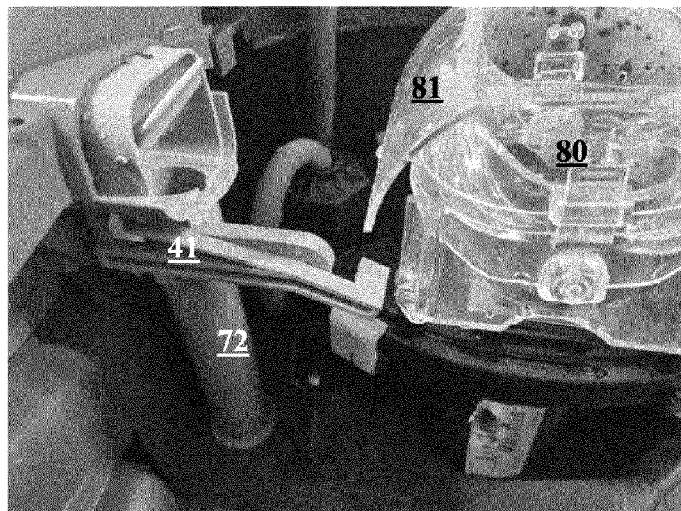
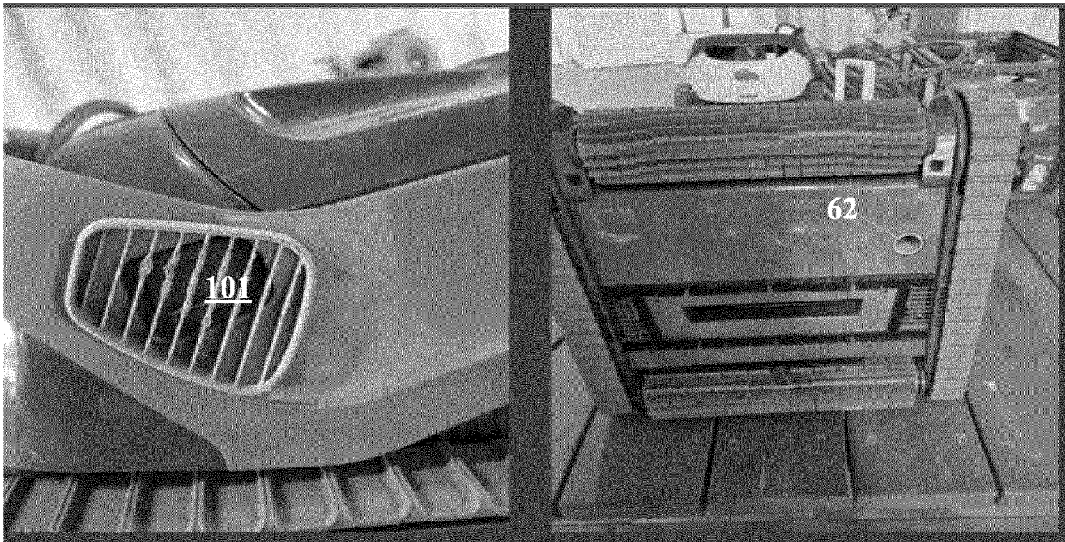


FIG. 8

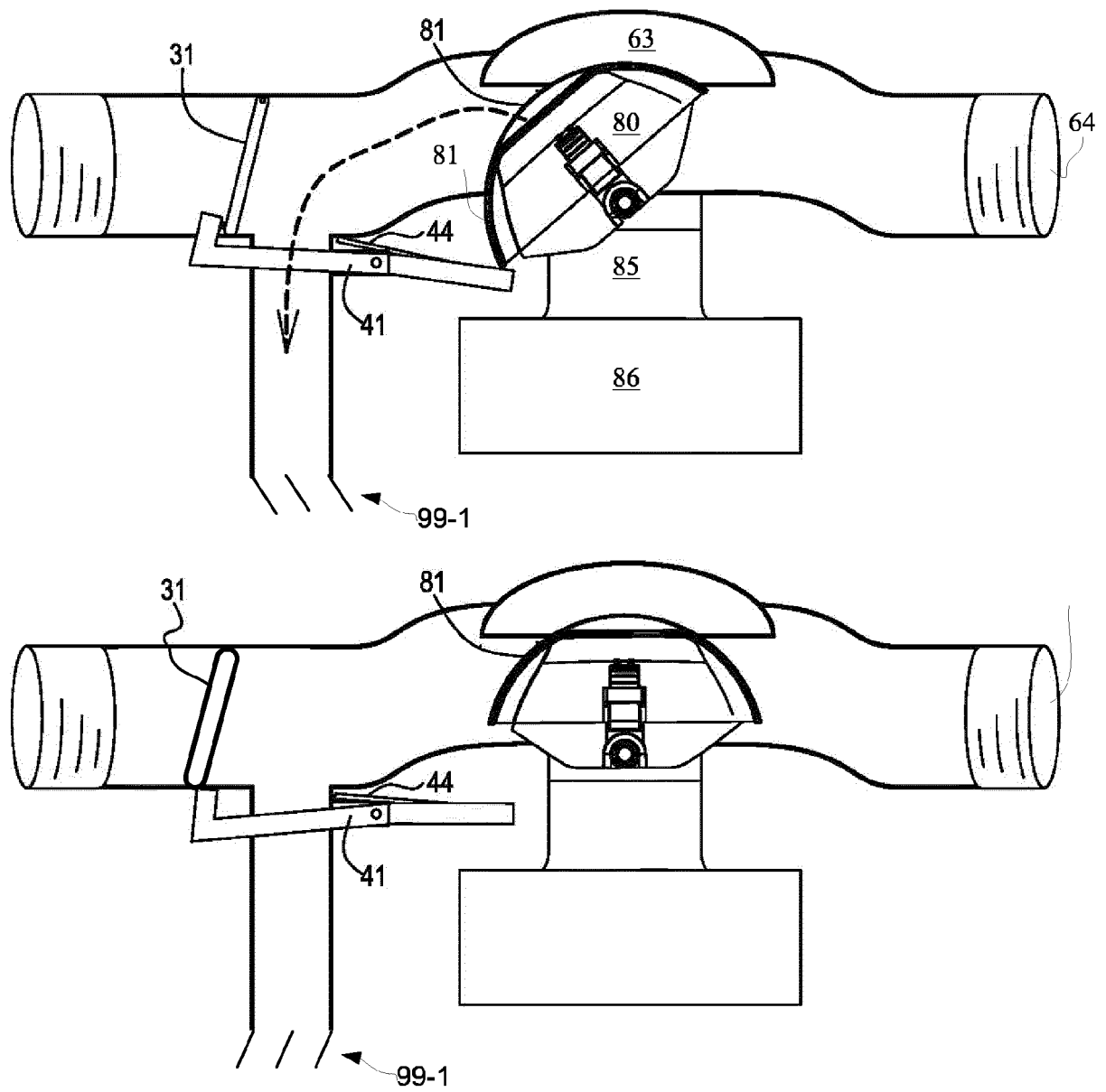


FIG. 9

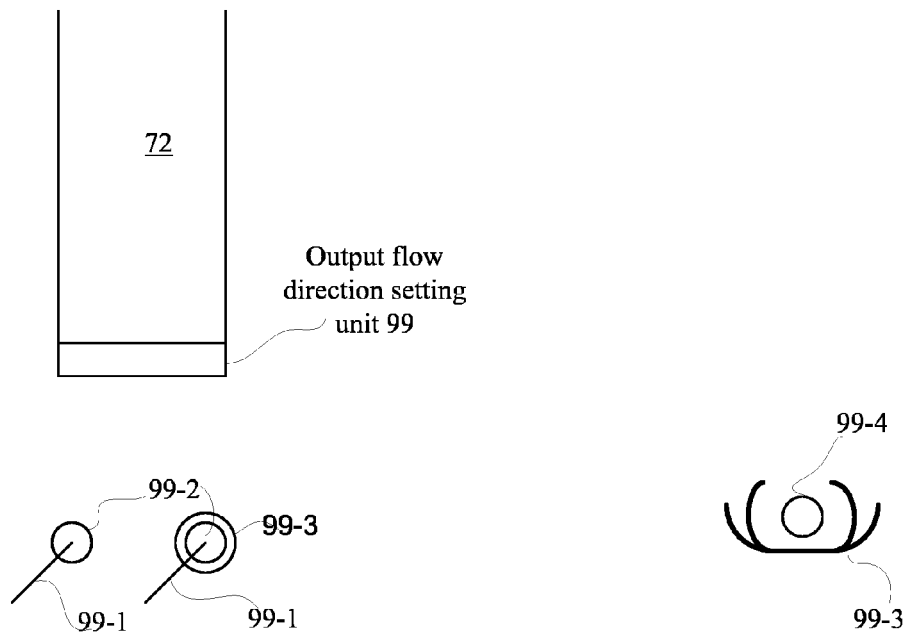
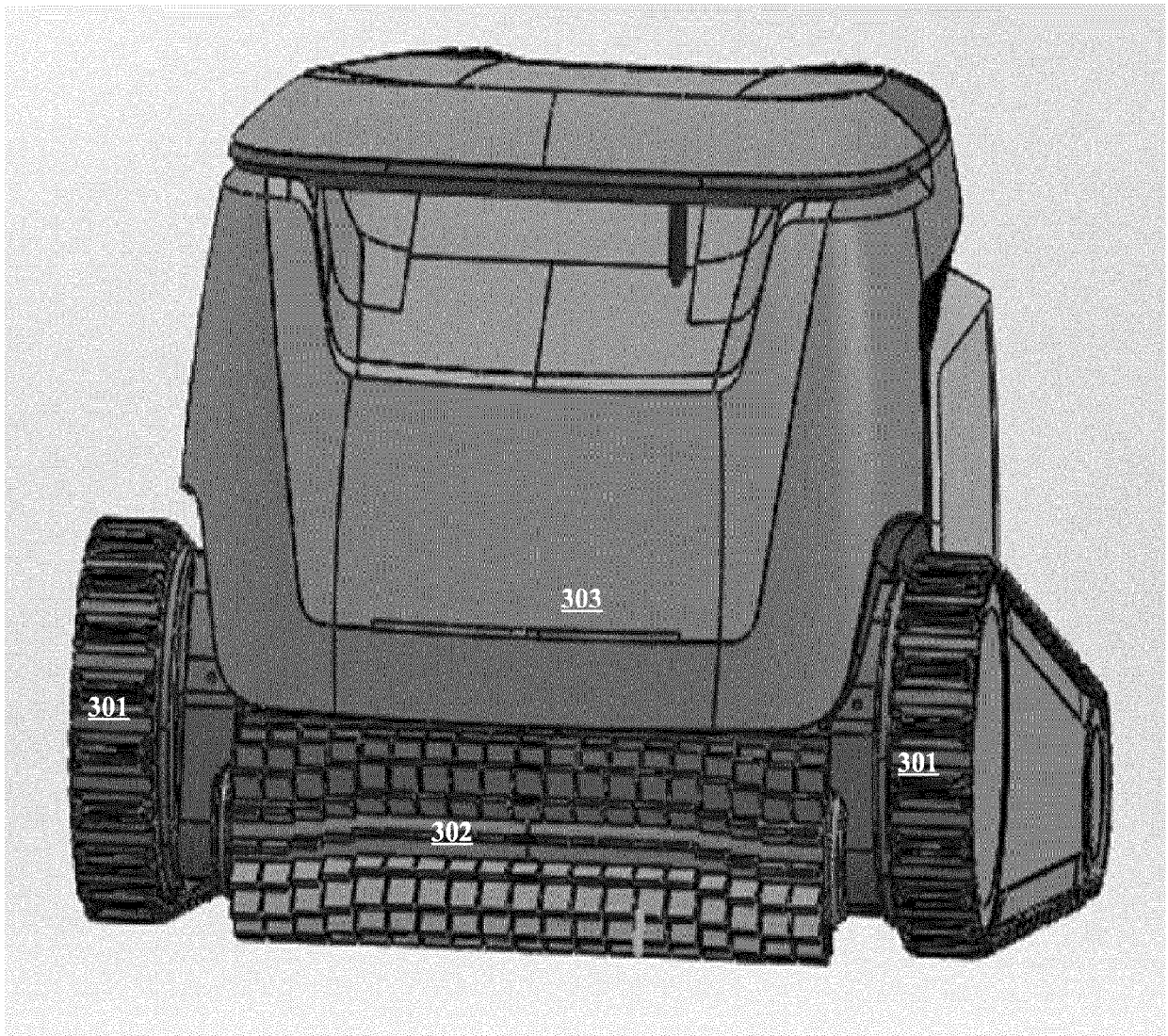


FIG. 10



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FIG. 11

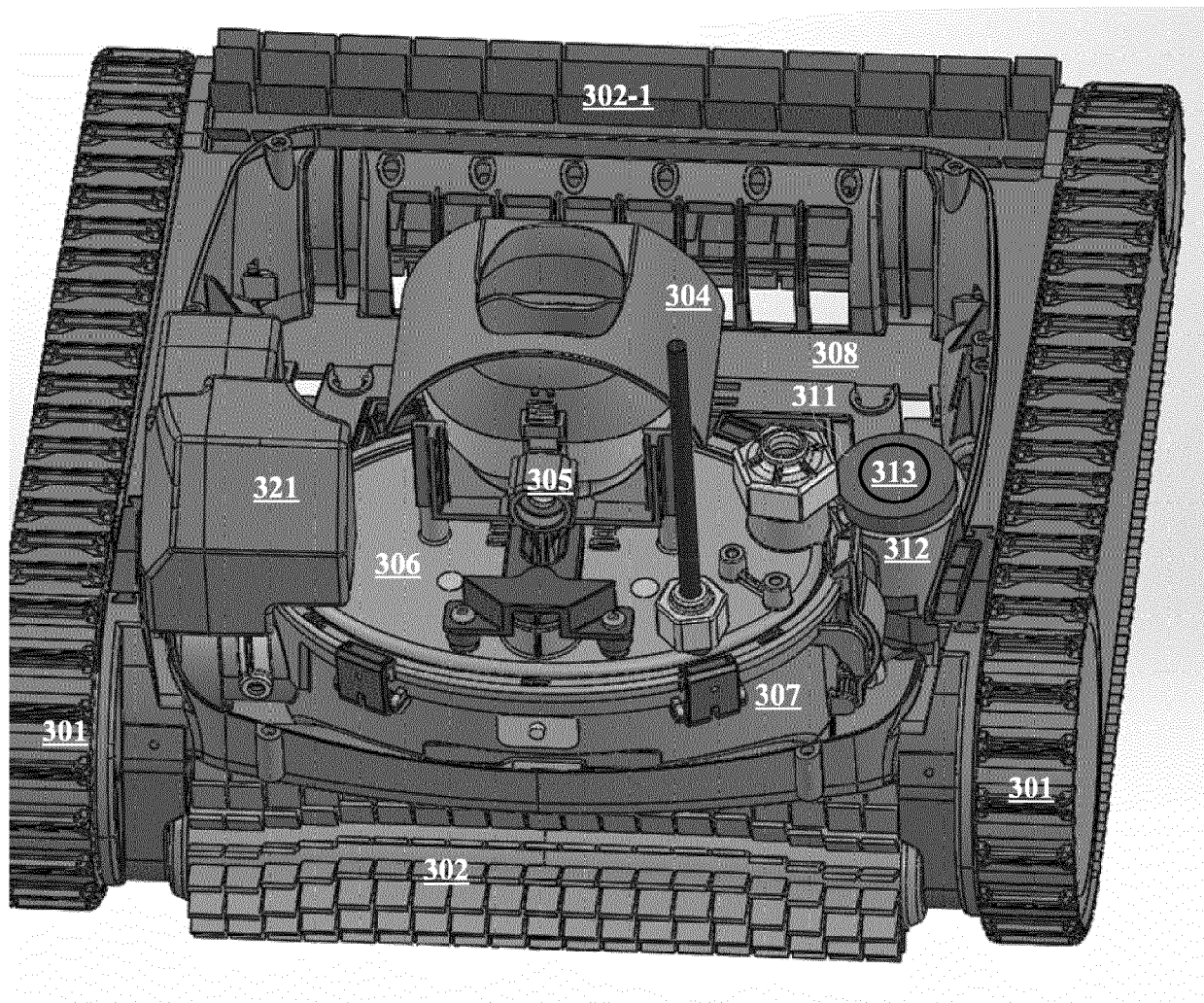


FIG. 12

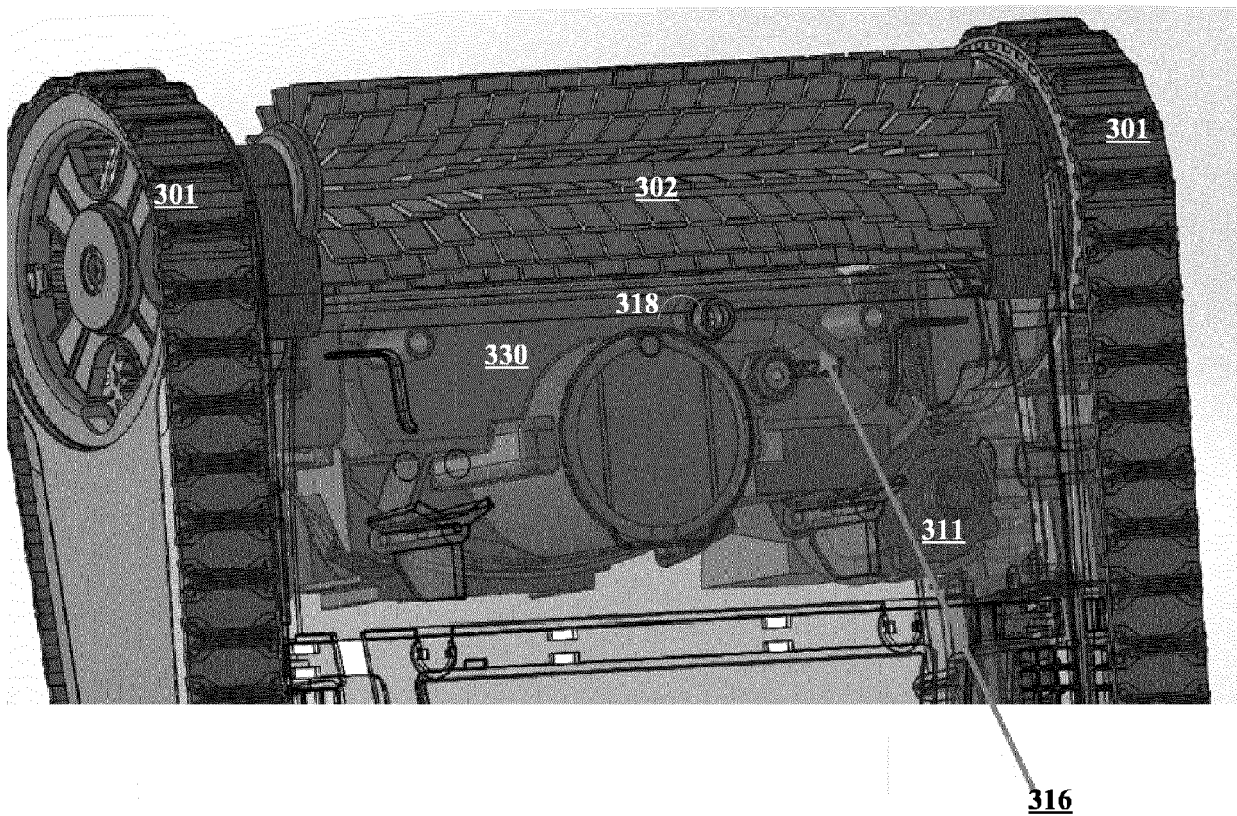
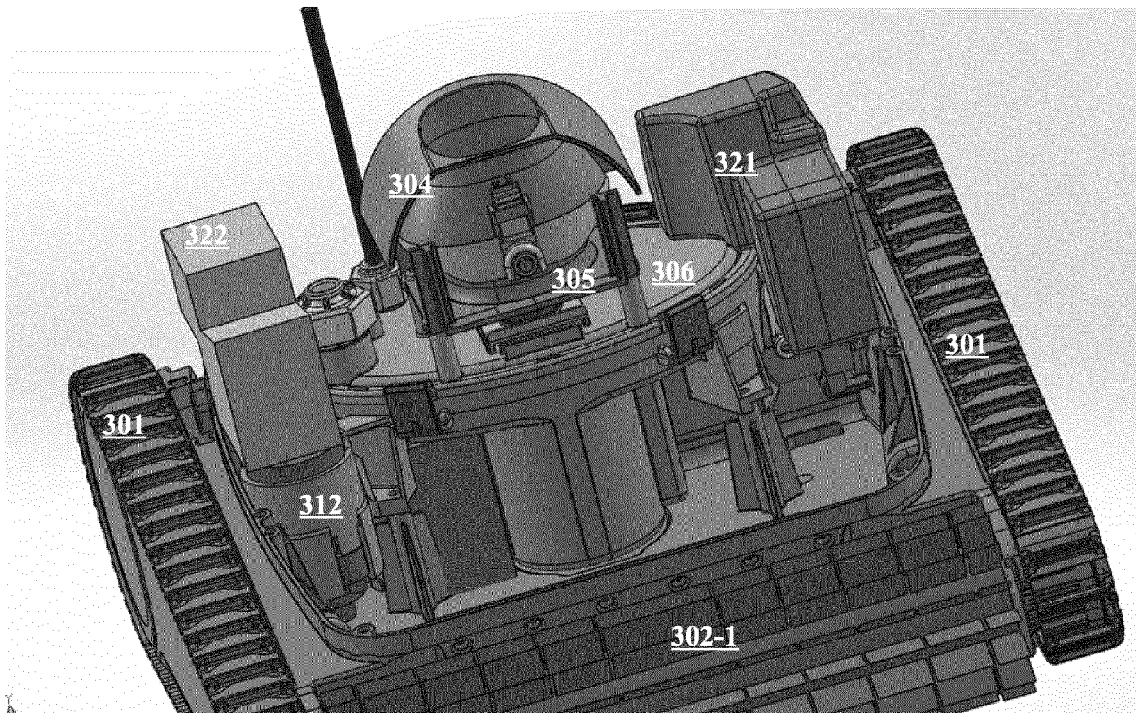


FIG. 13

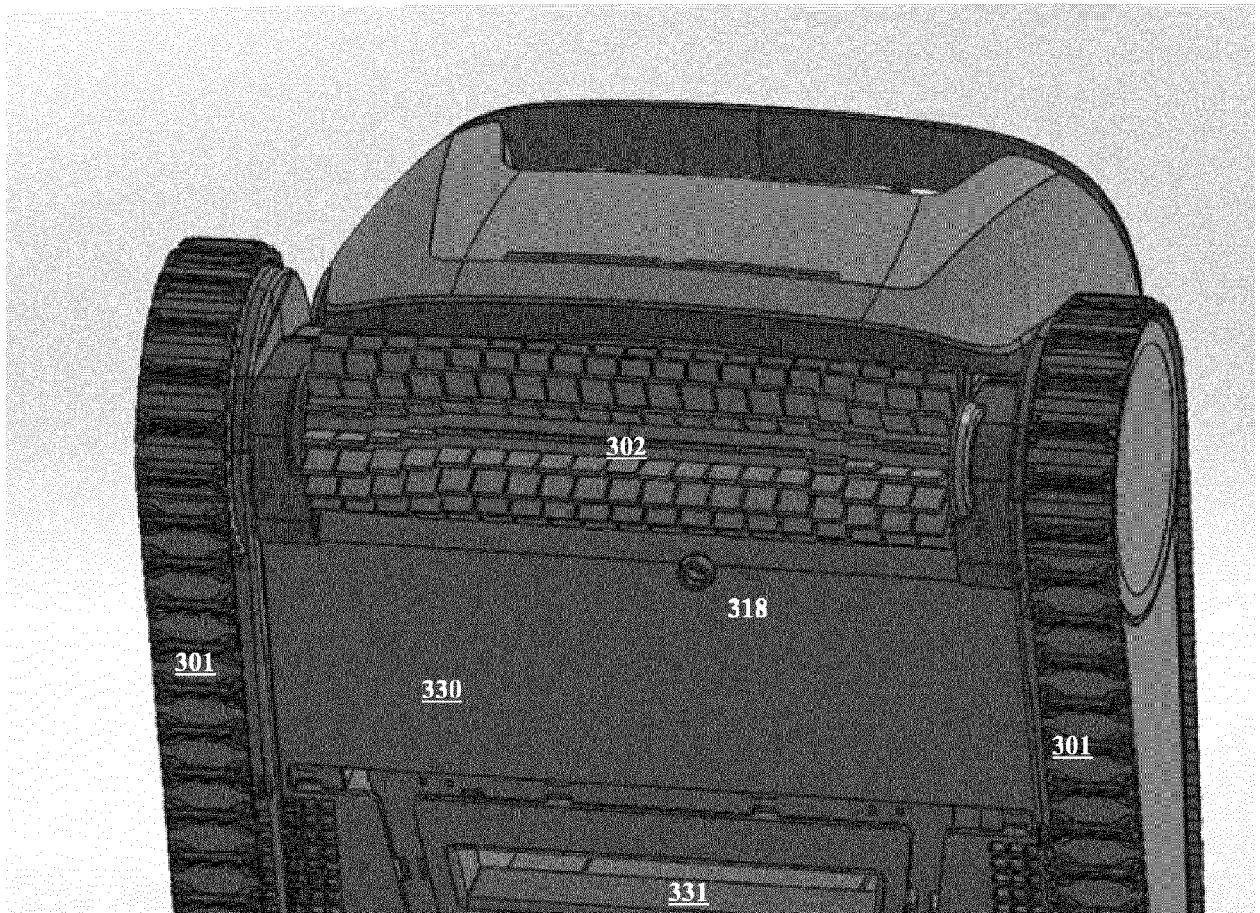


FIG. 14

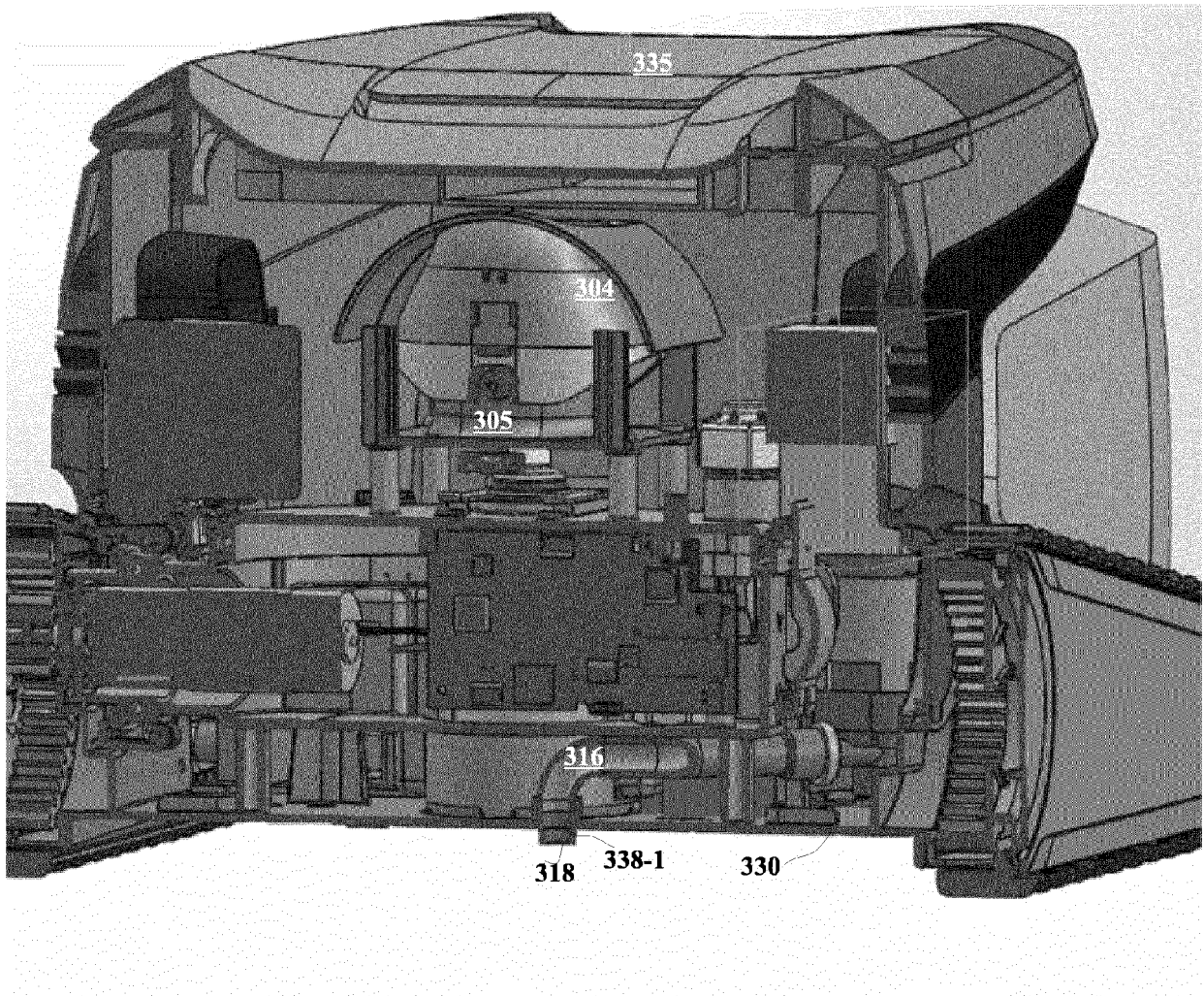


FIG. 15

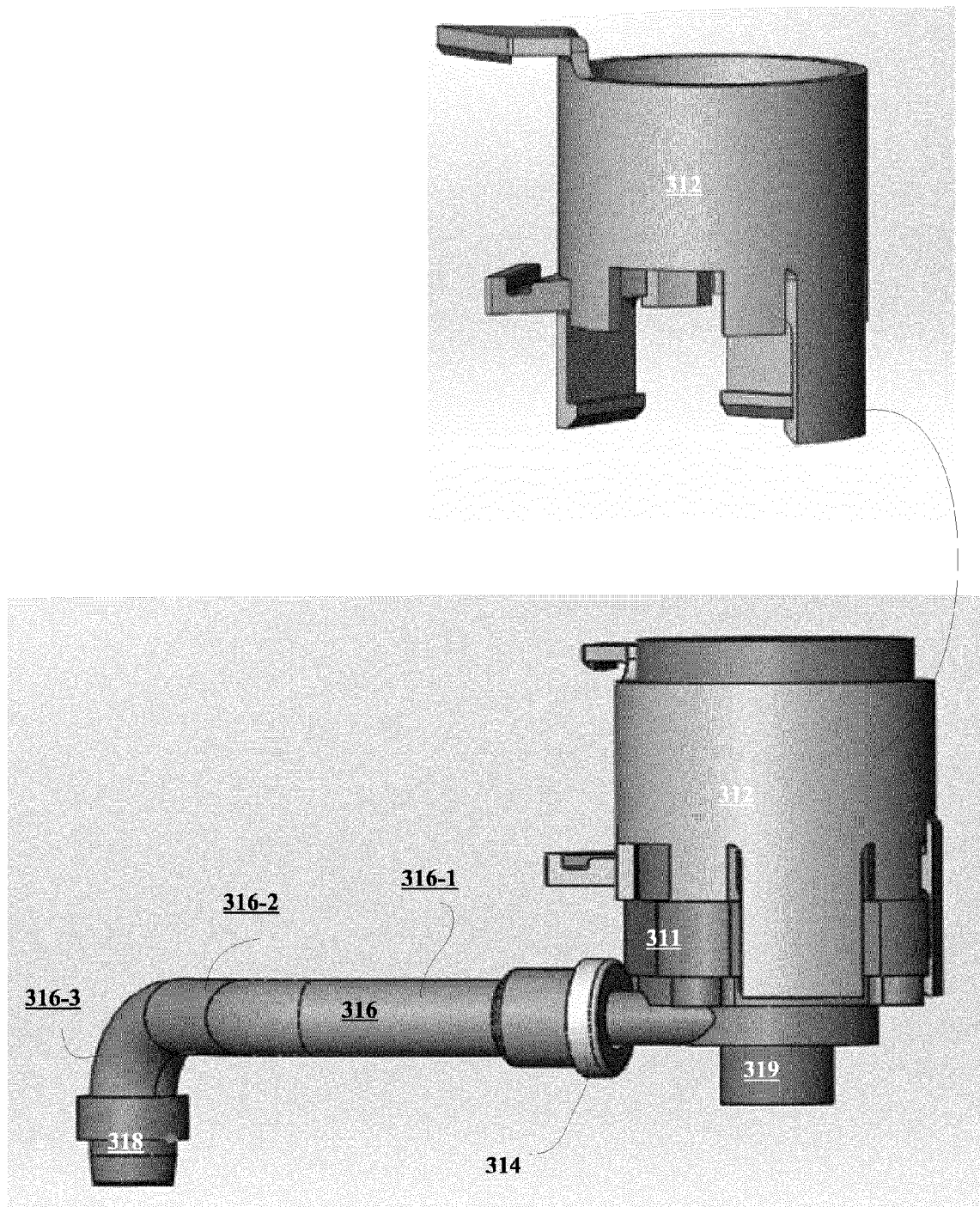


FIG. 16

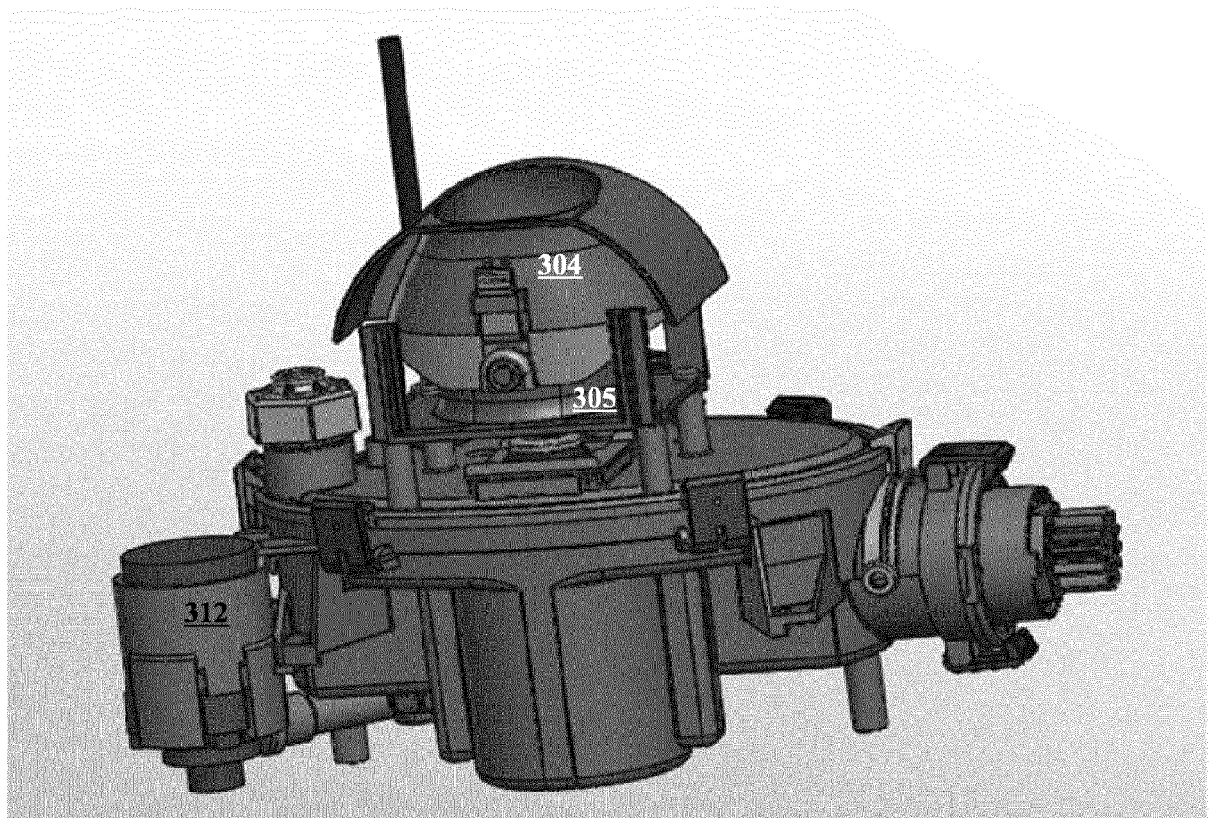
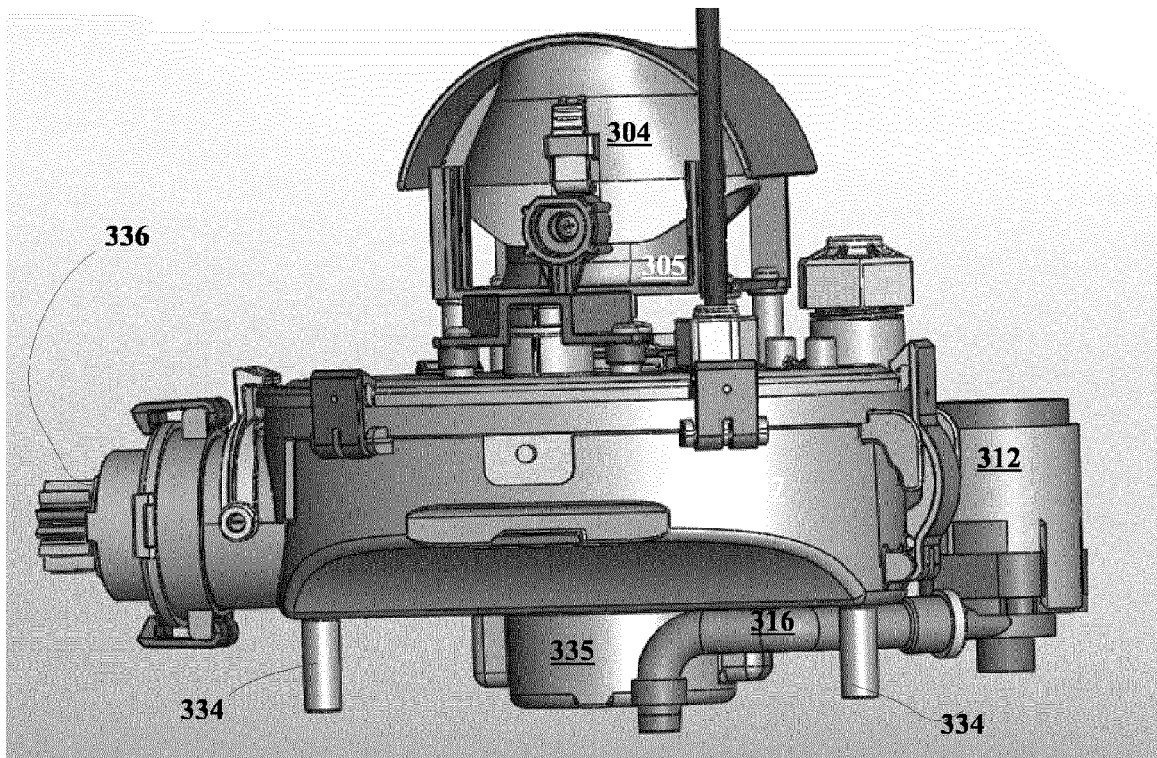


FIG. 17

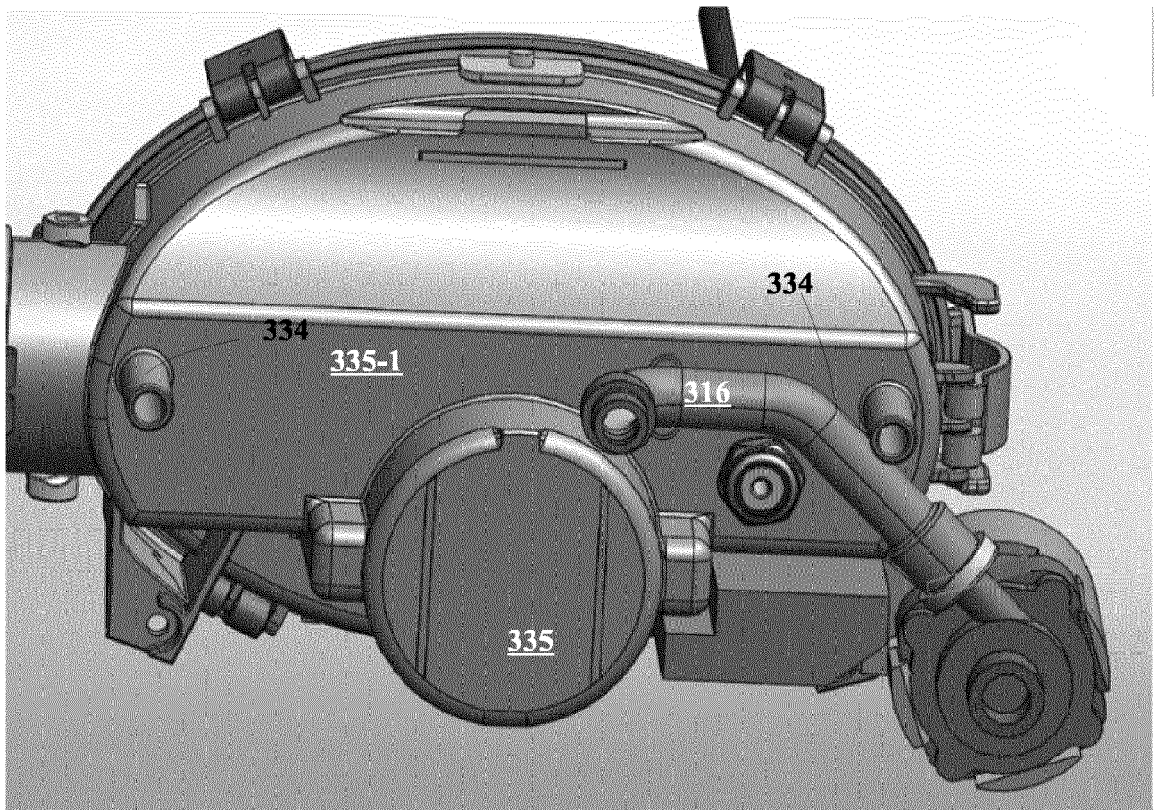


FIG. 18

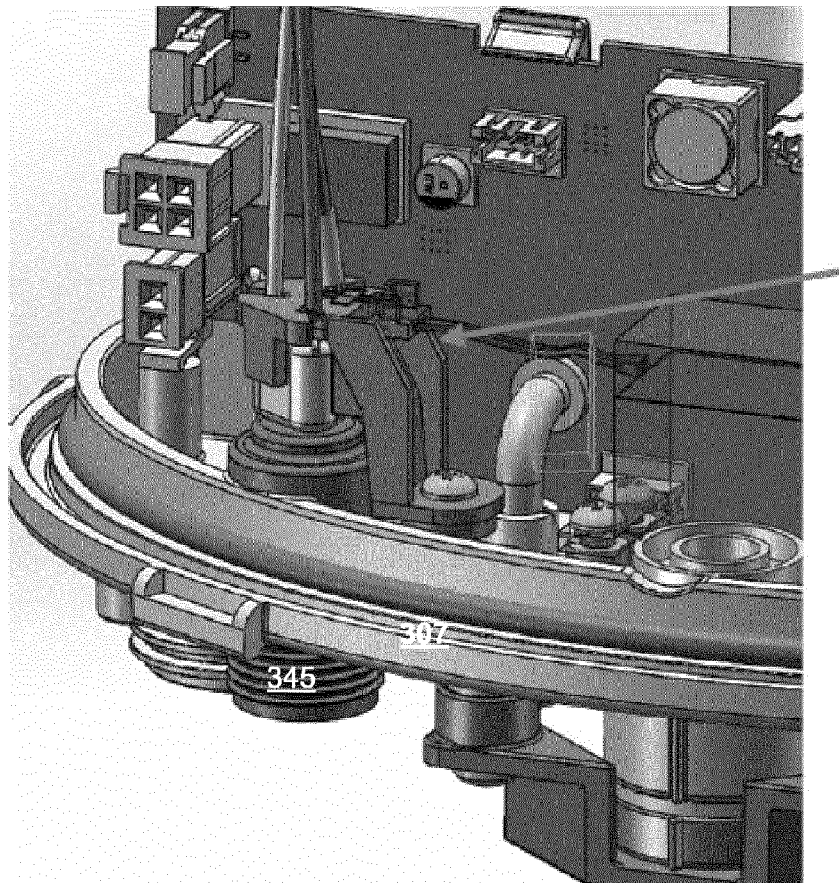
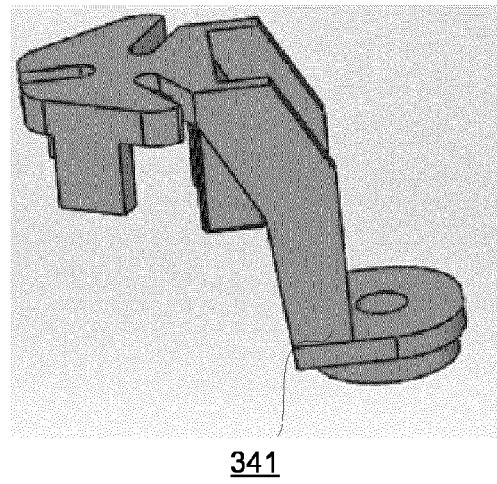
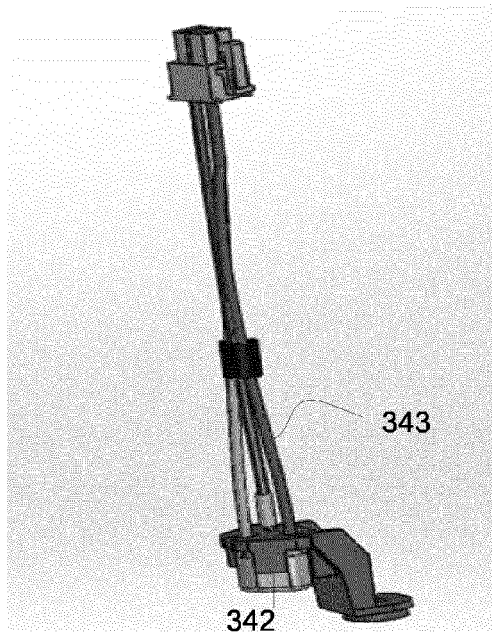


FIG. 19

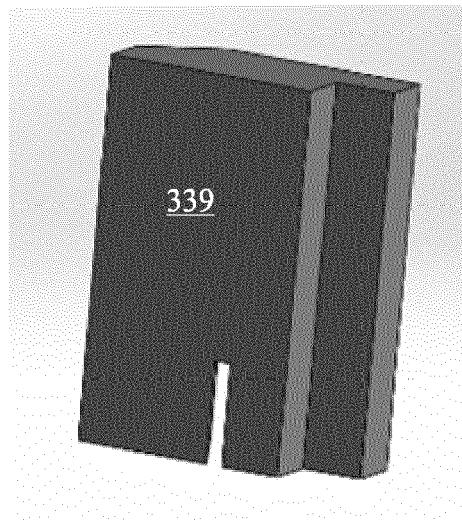
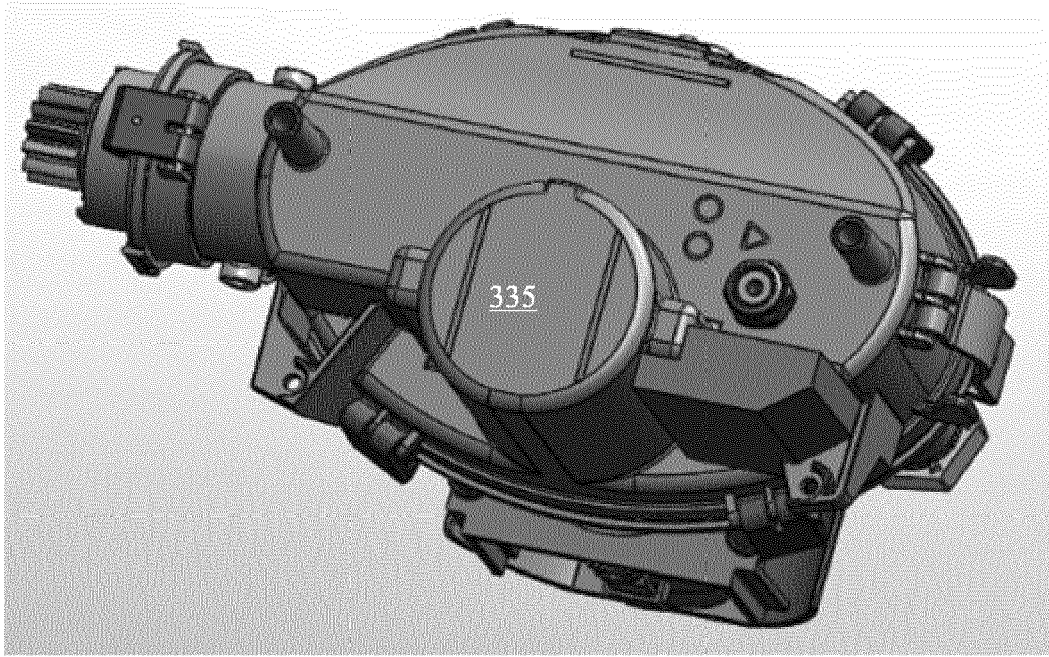


FIG. 20

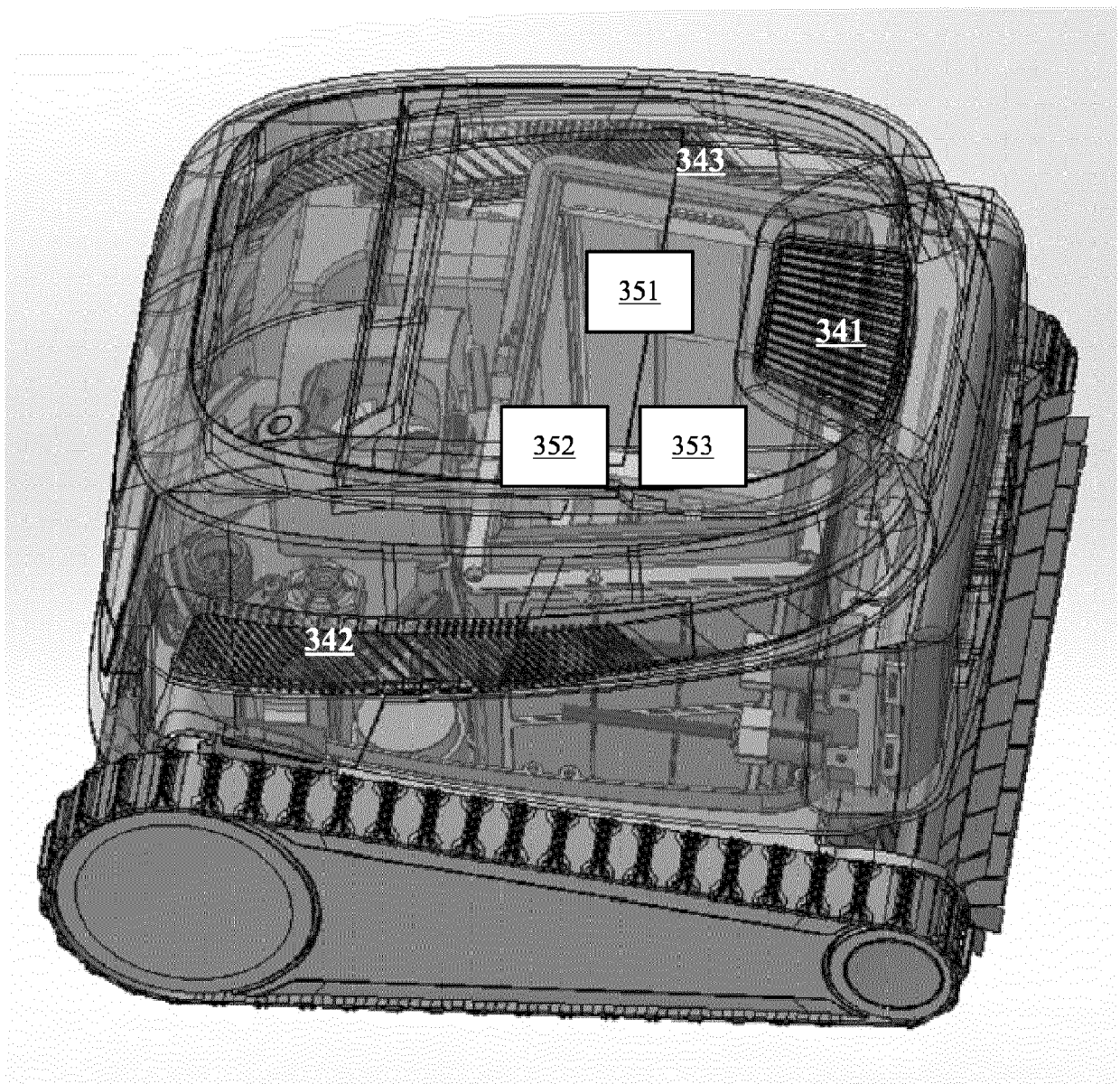


FIG. 21



EUROPEAN SEARCH REPORT

Application Number

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Y	* column 5, lines 6-17; figures 1,5,13 * * column 5, line 6 - column 6, line 59 * * column 8, lines 34-43 * * column 1, lines 18-21 * -----	11	
X	US 2008/235887 A1 (HORVATH TIBOR [US] ET AL) 2 October 2008 (2008-10-02)	1-5,7, 9-11, 13-15	
Y	* column 0065 - column 0071; figure 1 * -----	11	
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Y	* column 0040; figures 6,7 * -----	11	
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Place of search Munich		Date of completion of the search 4 October 2024	Examiner Valenta, Ivar
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