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(54) LIQUID EXTRACTION APPARATUS AND METHOD

FLÜSSIGKEITSEXTRAKTIONSVORRICHTUNG UND -VERFAHREN

APPAREIL ET PROCÉDÉ D'EXTRACTION DE LIQUIDE

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Description**BACKGROUND**

[0001] Device manufacturers and service providers are continually challenged to develop cleaning systems capable of providing value and convenience to consumers. Conventional floor cleaning systems are often intimidating to consumers and offer limited flexibility. Examples of such devices are described in US2011/0119861 and EP3102082.

BRIEF DESCRIPTION OF THE DRAWINGS

[0002] Aspects of the present disclosure are best understood from the following detailed description when read with the accompanying figures. It is noted that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the dimensions of the various features may be arbitrarily increased or reduced for clarity of discussion.

Figure 1 is a perspective view of an apparatus, in accordance with some embodiments.

Figure 2 is a bottom-side perspective view of the apparatus, in accordance with some embodiments.

Figure 3 is a side view of the apparatus, in accordance with some embodiments.

Figure 4 is a top-side perspective view of the apparatus with the tanks removed, in accordance with some embodiments.

Figure 5 is a top-side perspective view of the apparatus with the tanks and the nozzle removed, in accordance with some embodiments.

Figure 6 is a perspective view of a cleaning fluid tank, in accordance with some embodiments.

Figure 7 is a perspective view of a recovery tank, in accordance with some embodiments.

Figure 8 is a side view of a carpet cleaning nozzle, in accordance with some embodiments.

Figure 9 is a side view of a hard surface nozzle, in accordance with some embodiments.

Figure 10 is a perspective view of an accessory attachment, in accordance with some embodiments.

Figure 11 is a schematic diagram of a control system, in accordance with some embodiments.

Figure 12 is a diagram of a fluid flow system, in accordance with some embodiments.

Figure 13 is a flowchart of a method, in accordance with some embodiments.

Figure 14 is a functional block diagram of a computer or processor-based system upon which or by which an embodiment is implemented.

DETAILED DESCRIPTION

[0003] The following disclosure provides many different embodiments, or examples, for implementing different features of the provided subject matter. Specific examples of components and arrangements are described below to simplify the present disclosure. These are, of course, merely examples and are not intended to be limiting. For example, the location of a first feature over or on a second feature in the description that follows may include embodiments in which the first and second features are in direct contact, and may also include embodiments in which additional features may be between the first and second features, such that the first and second features may not be in direct contact. In addition, the present disclosure may repeat reference numerals and/or letters in the various examples. This repetition is for the purpose of simplicity and clarity and does not in itself dictate a relationship between the various embodiments and/or configurations discussed.

[0004] Further, spatially relative terms, such as "beneath," "below," "lower," "above," "upper" and the like, may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. The spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. The apparatus may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein may likewise be interpreted accordingly.

[0005] Conventional liquid extraction devices are often large, bulky, and otherwise intimidating cleaning systems that consumers usually have difficulty operating and handling. Conventional cleaning systems are often limited as to how the components of the cleaning system can be manipulated by a consumer, making transport and service difficult.

[0006] Figure 1 is a perspective view of an apparatus 100, in accordance with some embodiments. Apparatus 100 comprises a body 101, a nozzle 103, a handle 105, a cleaning fluid tank 107, and a recovery tank 109. Apparatus 100 is a liquid extraction cleaning system. In some embodiments, apparatus 100 is configured to clean a surface over which apparatus 100 is positioned. Apparatus 100 is shown in an assembled state.

[0007] Body 101 comprises one or more sidewalls defining a front side 101a, a back side 101b, a top side 101c and a bottom side 101d. A first fluid output 201 (FIG. 2)

is on the bottom side 101d of the body 101. Body 101 includes a first air passage 111 and a second air passage 113 communicatively coupled with the first air passage 111. In some embodiments, first passage 111 and second air passage 113 are openings at ends of a coupler 115 having a channel connecting the first air passage 111 and the second air passage 113. Coupler 115 is removably attached to one or more sidewalls of the body 101. In some embodiments, coupler 115 is shaped such that the first air passage 111 is closer to the bottom side 101d of the body 101 than the second air passage 113. A third air passage 117 is on the top side 101c of the body 101.

[0008] Nozzle 103 is removably attached to the front side 101a of the body 101. The nozzle 103 comprises a fourth air passage 119 proximate the bottom side 101d of the body 101 and a fifth air passage 121 proximate the top side 101c of the body 101. The fifth air passage 121 is communicatively coupled with the fourth air passage 119 by a channel within nozzle 103. The nozzle 103 is attached to the body 101 such that the first air passage 111 and the fifth air passage 121 are substantially aligned. In some embodiments, nozzle 103 is attached to the body 101 such that the first air passage 111 and the fifth air passage 121 are communicatively coupled to facilitate airflow from nozzle 103 into coupler 115.

[0009] In some embodiments, the nozzle 103 comprises a skid portion 803 (FIG. 8) adjacent to the fourth air passage 119 and at least one wheel 805 (FIG. 8) on a side of the nozzle 103 opposite to the skid portion 803, with the fourth air passage 119 being between the skid portion 803 and the at least one wheel 805. In some embodiments, the nozzle 103 comprises a squeegee 903 (FIG. 9) surrounding the fourth air passage 119, wherein the nozzle 103 has a plurality of structures 909 (FIG. 9) extending from a base of the squeegee 903 in a direction away from the fourth air passage 119. In some embodiments, the nozzle 103 is one of a first nozzle or a second nozzle included in a set of nozzles configured to be individually attached to the body 101. In some embodiments, one nozzle of the set of nozzles is a carpet cleaning nozzle such as nozzle 801 (FIG. 8) and another nozzle of the set of nozzles is a hard surface nozzle such as nozzle 901 (FIG. 9). In some embodiments, apparatus 100 makes it possible to selectively attach a particular nozzle 103 such as nozzle 801 or nozzle 901 based on a type of surface opposite the bottom side 101a of body 101 to increase an ability of apparatus 100 to effectively clean the surface opposite the bottom side 101a of body 101.

[0010] Handle 105 is coupled with body 101. In some embodiments, handle 105 is rotatably coupled with body 101 such that handle 105 is capable of being in a substantially upright position with respect to body 101 or in another position between the substantially upright position with respect to body 101 and a surface over which body 101 is positioned.

[0011] Handle 105 comprises a base portion 123, a shaft 125 and a grip portion 127. Base portion 123 com-

prises a first fluid coupling 401 (FIG. 4) communicatively coupled with the first fluid output 201 (FIG. 2). Shaft 125 is coupled with the base portion 123. A grip portion 127 is at an end of the shaft 125 opposite the base portion 123.

[0012] Handle 105 is configured to rotate with respect to the body 101 about a first axis 129 and to rotate about a second axis 131 substantially perpendicular to the first axis 129. In some embodiments, first axis 129 and second axis 131 are in different planes displaced from one another along a length of the handle 105 extending from a point at which the handle 105 is coupled with the body 101 and the grip portion 127 of handle 105. By rotating about two distinct axes, the handle 105 makes it possible to steer the apparatus 100 while the apparatus 100 is moving by tilting the handle 105.

[0013] In some embodiments, body 101 includes a handle locking mechanism configured to fix the handle 105 with respect to the body 101 in a storage position. In some embodiments, the storage position is substantially upright such that the handle 105 is substantially perpendicular to a surface over which the apparatus 100 is positioned. In some embodiments, the handle locking mechanism is configured to prevent the handle 105 from rotating about the first axis 129 and the second axis 131 in the storage position. In some embodiments, handle locking mechanism is configured to allow the handle 105 to rotate about the first axis 129 and the second axis 131 when the handle 105 is released from the storage position.

[0014] In some embodiments, grip portion 127 includes a trigger 133. Shaft 125 has a mechanical linkage 135 extending from the trigger 133 to the base portion 123 of the handle 105. A fluid pump 137 is communicatively coupled with the first fluid coupling 401, the first fluid output 201, and an actuator within handle 105. In some embodiments, fluid pump 137 is housed within base portion 123 of handle 105. In some embodiments, fluid pump 137 is housed within body 101. Mechanical linkage 135 is configured to contact the actuator based on an actuation of the trigger 133. The fluid pump 137 is configured to cause fluid to be supplied to the first fluid output 201 based on the actuation of the trigger 133 and the contact between the mechanical linkage 135 and the actuator. In some embodiments, mechanical linkage 135 comprises a shaft capable of moving internally along a linear length of shaft 125 such that actuation of trigger 133 causes the mechanical linkage 135 to move along the linear length of shaft 125 to contact the actuator. In some embodiments, trigger 133 is communicatively coupled with the actuator or with fluid pump 137 by way of an electrical connection to cause the fluid pump 137 to supply fluid to the first fluid output 201 based on the actuation of trigger 133.

[0015] Each of the cleaning fluid tank 107 and the recovery tank 109 is communicatively coupled with a corresponding portion of body 101. The cleaning fluid tank 107 is over the base portion 123. Cleaning fluid tank 107 comprises a cleaning fluid tank vessel 139 configured to

accommodate a fluid and a second fluid coupling 601 (FIG. 6) configured to be communicatively coupled with the first fluid coupling 401.

[0016] The recovery tank 109 is over the body 101. Recovery tank 109 comprises a recovery tank vessel 141 separated from the cleaning fluid tank vessel 139. Recovery tank 109 also includes a sixth air passage 701 (FIG. 7) configured to be communicatively coupled with the second air passage 113 and a seventh air passage 703 (FIG. 7) configured to be communicatively coupled with the third air passage 117.

[0017] A vacuum motor 143 is in the base portion 123 of the handle 105. The vacuum motor 143 has an inlet communicatively coupled with the third air passage 117 and an outlet that vents to one or more of a side of the base portion 123 or a vent in body 101. In some embodiments, the inlet of the vacuum motor 143 is communicatively coupled with the third air passage 117 by way of a hose extending from base portion 123 to body 101, and the first fluid coupling 401 is communicatively coupled with the first fluid output 201 by way of a tube inside the hose. In some embodiments, the first fluid coupling 401 is communicatively coupled with the first fluid output 201 by way of a tube outside the hose coupling vacuum motor 143 and third air passage 117. In some embodiments, the the hose coupling vacuum motor 143 and third air passage 117 is substantially internal to handle 105 and body 101 such that the hose coupling vacuum motor 143 and third air passage 117 is limited from exposure and protected from external elements that could damage the hose coupling vacuum motor 143 and third air passage 117.

[0018] A controller 145 is included in the body 101. Controller 145 is communicatively coupled with the vacuum motor 143 and the fluid pump 137. The controller 145 is configured to activate the fluid pump 137 to cause fluid contained in the cleaning fluid tank 107 to be supplied to the first fluid output 201, and to activate the vacuum motor 143 to draw one or more of air, debris, a liquid or a portion of the fluid into the recovery tank 109 by way of the first air passage 111. In some embodiments, controller 145 is housed inside the body 101. In some embodiments, the controller 145 is outside the body 101. In some embodiments, the controller 145 is housed within base portion 123.

[0019] Controller 145 comprises a chipset having a processor and a memory (e.g., chipset 1400, Figure 14). Controller 145 is communicatively coupled with one or more of the fluid pump 137 or the vacuum motor 143. In some embodiments, the memory included in the controller 145 has computer executable instructions stored thereon that, when executed by the processor of controller 145, cause the fluid pump 137 and/or the vacuum motor 143 to turn on or off. In a default operative state, the vacuum motor 143 is configured to draw air into the inlet of the vacuum motor 143 and exhaust air from the outlet of the vacuum motor 143. In some embodiments, the controller 145 is configured to cause the vacuum motor

143 to run in reverse such that the vacuum motor 143 draws air into the outlet of the vacuum motor 143 and exhausts air from the inlet of the vacuum motor 143.

[0020] Body 101 optionally comprises a headlight 147 communicatively coupled with the controller 145. If body 101 includes headlight 147, controller 145 is configured to cause the headlight 147 to be on or off based on an actuation of a system power switch, a light control switch, a fluid release or agitator control switch, or other suitable switch, or one or more of the controller 145, vacuum motor 143 or other suitable component of apparatus 100 being turned on.

[0021] Apparatus 100 includes a fluid control switch 149 that is configured to be in one of a plurality of selectable positions. The controller 145 is configured to cause fluid contained in the cleaning fluid tank 107 to be supplied to the first fluid output 201 at a rate based on the position of the fluid control switch 149. For example, if the fluid control switch is in a first position, controller 145 causes fluid pump 137 to supply cleaning fluid at a first flow rate measured in gallons per minute (GPM) or some other suitable unit. If the fluid control switch is in a second position, controller 145 causes fluid pump 137 to supply cleaning fluid at a second flow rate measured in gallons per minute (GPM) or some other suitable unit greater than the first flow rate. If the fluid control switch is in a third position, controller 145 causes fluid pump 137 to supply cleaning fluid at a third flow rate measured in gallons per minute (GPM) or some other suitable unit greater than the first flow rate and greater than the second flow rate. In some embodiments, the selected flow rate corresponds to an operation mode of apparatus 100. In some embodiments, the first flow rate is associated with a hard surface mode, the second flow rate is associated with a quick drying carpet cleaning mode, and the third flow rate is associated with a deep clean carpet cleaning mode. In some embodiments, a lower flow rate results in a lesser amount of fluid which is expelled from first fluid output 201 onto a surface opposite the bottom side 101d of body 101. The amount of fluid expelled has an effect on the dry time or the amount that the surface opposite the bottom side 101d of body 101 is soaked by cleaning fluid expelled from first fluid output 201.

[0022] In some embodiments, the fluid control switch 149 is on the top side 101c of body 101. In some embodiments, the fluid control switch 149 is on base portion 123 or grip portion 127 of handle 105.

[0023] In some embodiments, body 101 has a second fluid output 509 (FIG. 5) communicatively coupled with the first fluid coupling 401. In some embodiments, the second fluid output 509 is on the front side 101a of body 101 in a position that is covered by nozzle 103 if nozzle 103 is attached to body 101. Second fluid output 509 is exposed if the nozzle 103 is detached from the body 101. The first air passage 111 and the second fluid output 509 are configured to mate with an accessory connector 1001 (FIG. 10) comprising an accessory fluid coupling and an accessory connector air passage.

[0024] Cleaning fluid tank 107 has a cleaning fluid tank locking mechanism 151 on a top portion of the cleaning fluid tank vessel 139. In some embodiments, the cleaning fluid tank locking mechanism 151 comprises a latch, hook, or other suitable fastener configured to removably secure the cleaning fluid tank 107 to base portion 123 and shaft 125. Shaft 125 has a lock hook 153 configured to mate with a portion of cleaning fluid tank locking mechanism 151. Cleaning fluid tank locking mechanism 151 includes a button, switch or other suitable structure configured to release cleaning fluid tank locking mechanism 151 to allow removal of the cleaning fluid tank 107 from a secured position between base portion 123 and shaft 125.

[0025] In some embodiments, a height of a portion of body 101 over which the recovery tank 109 is positioned is minimized to reduce an overall height of body 101 and recovery tank 109. The reduced height improves a user's ability to maneuver the apparatus 100 around and under objects such as furniture. In some embodiments, one or more of the fluid pump 137, the vacuum motor 143, the controller 145, or some other suitable component of apparatus 100 is housed in base portion 123 of handle 105 to minimize the overall height of body 101 and recovery tank 109. In some embodiments, one or more of the fluid pump 137, the vacuum motor 143, the controller 145, or some other suitable component of apparatus 100 is positioned in body 101 as close to the back side 101b as possible to minimize the height of the portion of body 101 over which the recovery tank 109 is positioned.

[0026] In use, one or more components of body 101 are configured to cause cleaning fluid accommodated within cleaning fluid tank 107 to be expelled onto a surface over which the body 101 is positioned, and to cause one or more of air, debris, a liquid or a portion of the fluid to be drawn from the surface over which the body 101 is positioned into the recovery tank 109.

[0027] The various embodiments discussed herein improve user confidence in the ability to one or more of operate, transport or operate a liquid extraction apparatus such as apparatus 100. In some embodiments, the apparatus 100 additionally provides a user with flexibility to use the apparatus 100 to clean different types of surfaces by easily reconfiguring the apparatus 100 to a combination of nozzle 103, operating mode, accessory attachment and/or fluid flow rate that corresponds to the user's desired cleaning depth and drying time, as well as the type of surface that is to be cleaned using apparatus 100.

[0028] FIG. 2 is a bottom-side perspective view of apparatus 100, in accordance with some embodiments. One or more first fluid output 201 are on the bottom side 101d of body 101. The one or more first fluid outputs 201 comprise a jet, a spray nozzle, or some other suitable structure through which a fluid is capable of being expelled. The first fluid output 201 is communicatively coupled with the first fluid coupling 401 (FIG. 4) by way of a fluid flow path extending from the first fluid coupling 401

to the first fluid output 201. The first fluid output 201 is configured to output cleaning fluid received from cleaning fluid tank 107 to facilitate distribution of a cleaning fluid stored in cleaning fluid tank 107 onto a surface external to the body 101.

[0029] An agitator 203 is on the bottom side 101d of body 101. An agitator motor 205 is communicatively coupled with the controller 145 (FIG. 1) and configured to cause the agitator 203 to move based on an instruction received from the controller 145.

[0030] At least two wheels 207a-207d (collectively referred to as "wheel(s) 207") are rotatably coupled with the body 101. Wheels 207 are configured to support at least a portion of the bottom side 101d of body 101 above a surface in contact with at least one of the at least two wheels 207.

[0031] Agitator 203 is communicatively coupled with the agitator motor 205. Agitator 203 is a rotary brush. In some embodiments, agitator 203 is a spin-brush, other suitable type brush, or some other suitable structure capable of disturbing, sweeping or agitating a surface beneath the bottom side 101d of body 101 in contact with agitator 203. In some embodiments, agitator 203 comprises a plurality of bristles, a squeegee, one or more blades, or other suitable topography or material. Agitator motor 205 is configured to cause the agitator 203 to rotate or move, based on one or more of a type of agitator 203, power caused to be supplied to the agitator motor 205 or an instruction output by the controller 145. In some embodiment agitator motor 205 is configured to cause agitator 203 to rotate in a direction toward the fourth air passage 119. In some embodiments, agitator motor 205 is configured to cause agitator 203 to rotate in a direction opposite to a direction of movement of body 101.

[0032] In some embodiments, the apparatus 100 is configured to improve user operability by facilitating forward and backward cleaning of a surface beneath the apparatus 100. In some embodiments, one or more of controller 145 or agitator motor 205 is configured to cause the agitator 203 to move in a first direction based on a determination that cleaning fluid is not being expelled from first fluid output 201 and in a second direction different from the first direction based on a determination that cleaning fluid is being expelled from first fluid output 201, increasing the operability and cleaning performance capabilities of the apparatus 100.

[0033] In some embodiments wheels 207c and 207d are configured to maximize an amount that agitator 203 is in contact with a surface beneath the body 101. In some embodiments, the controller 145 is configured to cause the height of the wheels 207c and 207d to be adjusted based on the type of surface beneath the body 101. In some embodiments, the controller 145 is configured to determine whether the agitator 203 should penetrate deeply into the surface beneath the body 101, lightly contact the surface beneath the body 101, or be free from contacting the surface beneath the body 101, based on the detected type of surface beneath the body 101.

[0034] In some embodiments, the agitator motor 205 is configured to adjust the height of the agitator 203 with respect to the bottom side 101d of body 101. In some embodiments, the controller 145 is configured to one or more of cause the agitator motor 205 to adjust the height of the agitator 203 with respect to the bottom side 101d of body 101 or cause the agitator motor 205 to not cause the agitator 203 to rotate based on a detected type of surface beneath the body 101. In some embodiments, the height of agitator 203 with respect to the bottom side 101d of body 101 is configured to be manually adjusted. In some embodiment, the height of one or more of agitator 203 or wheels 207c and 207d with respect to the bottom side 101d of body 101 is fixed.

[0035] In some embodiments, a movement sensor 209 is communicatively coupled with controller 145. The movement sensor 209 is configured to detect a direction the body 101 moves. In some embodiments, movement sensor 209 comprises one or more of a rotation sensor configured to detect a rotation direction of at least one of wheels 207, a gps unit, a gyroscope, or other suitable sensor configured to collect data upon which the controller 145 is capable of determining the direction of movement of body 101 based on data received from the movement sensor 209. In some embodiments, controller 145 is configured to cause the agitator motor 205 to cause the agitator 203 to rotate in a direction opposite to the direction of movement of the body 101. In some embodiments, controller 145 is configured to cause the agitator motor 205 to cause the agitator 203 to rotate in a direction opposite to a rotation direction of wheels 207. In some embodiments, controller 145 is configured to cause the agitator motor 205 to cause the agitator 203 to rotate in a direction toward the front side 101a of body 101 if the body 101 is moving in a forward direction and in a direction toward the rear side 101b of body 101 if the body 101 is moving in a backward direction, based on the detected direction of movement of body 101.

[0036] The bottom side 101d of body 101 has an agitator cavity 211 defined by one or more sidewalls of body 101. The agitator cavity 211 is configured to accommodate the agitator 203 such that a first portion of the agitator 203 is within the agitator cavity 211 and a second portion of the agitator 203 is exposed in a direction away from the body 101. In some embodiments, the first fluid output 201 is inside the agitator cavity 211. In some embodiments first fluid output 201 is positioned inside the agitator cavity 211 such that the agitator 203 is between the first fluid output 201 and a surface beneath the body 101. In some embodiments, first fluid output 201 is positioned inside the agitator cavity 211 to wet the agitator 203 with cleaning fluid expelled from the first fluid output 201. In some embodiments, first fluid output 201 is positioned inside the agitator cavity 211 in a location to facilitate direct application of the cleaning fluid expelled from first fluid output 201 onto a surface beneath the body 101. In some embodiments, the first fluid output 201 is positioned outside the agitator cavity 211 in a location to facilitate

direct application of the cleaning fluid expelled from first fluid output 201 onto a surface beneath the body 101. In some embodiments, body 101 has more than one first fluid output 201 positioned in one or more locations on body 101.

[0037] The agitator cavity 211 is free from including the fourth air passage 119 or an air passage through a sidewall of body 101 defining the agitator cavity 211 in communication with first air passage 119 or a nozzle flow path within nozzle 103.

[0038] In some embodiments, if agitator 203 is a rotary brush, agitator 203 is configured to be mounted in agitator cavity 211 by way of at least one brush roll cover 213. Brush roll cover 213 is configured to be removably attached to body 101. Brush roll cover 213 is configured to support the agitator 203 in a manner that allows the agitator 203 to rotate within the agitator cavity 211. In some embodiments, brush roll cover 213 is configured to support the agitator 203 in a manner that allows the agitator 203 to rotate within the agitator cavity 211 such that the agitator 203 is free from having an axle passing through the agitator 203 or around which the agitator 203 is configured to rotate.

[0039] Each of the wheels 207a-207d is independently coupled with body 101 so that each wheel 207 is free to rotate about a corresponding axis of rotation. In some embodiments, at least wheels 207a and 207b are independently coupled with body 101 by a corresponding axle 215a, 215b and pin fastener 217a, 217b. In some embodiments, wheels 207a and 207b are each attached to a single axle that extends from wheel 207a to wheel 207b. In some embodiments, if attached to a single axle, each of wheels 207a and 207b is configured to rotate independently around the single axle. In some embodiments, at least wheels 207c and 207d are each attached to a single corresponding axle that extends from wheel 207c to wheel 207d. In some embodiments, if attached to a single axle, each of wheels 207c and 207d is configured to rotate independently around the single axle.

[0040] Wheels 207a and 207b are larger in diameter than wheels 207c and 207d. Wheels 207a and 207b are configured to separate the bottom side 101d of body 101 away from a surface beneath the body 101 that is in contact with at least one of wheels 207a or 207b to promote movement of the body 101 over the surface and contact between agitator 203 and the surface beneath body 101. In some embodiments, wheels 207c and 207d have a diameter configured to facilitate contact between a portion of nozzle 103 surrounding fourth air passage 119 and a surface beneath the body 101. In some embodiments, the one or more axles around which wheels 207c and 207d are each configured to rotate is coupled with at least one height adjuster 219. Height adjuster 219 is configured to raise or lower wheels 207c and 207d with respect to the bottom side 101d of body 101. In some embodiments, the at least one height adjuster 219 is a manual adjustment member configured to be manipulated to move and lock the wheels 207c and 207d into one

of at least two predetermined positions. In some embodiments, the at least one height adjuster 219 is a motor communicatively coupled with controller 145. In some embodiments, controller 145 is configured to cause the at least one height adjuster 219 to move the wheels 207c and 207d based on a selected one of at least two preset positions with respect to the bottom side 101d of body 101.

[0041] In some embodiments, a surface detection sensor 221 is on the bottom side 101d of body 101 communicatively coupled with controller 145. The surface detection sensor 221 comprises one or more of a distance sensor configured to detect a distance between the bottom side 101d of body 101 and a surface beneath the body 101. In some embodiments, the surface detection sensor 221 is a location sensor configured to detect a geographic position of the body 101, and the controller 145 is configured to determine a type of surface beneath the body 101 based on the detected location of the body 101. In some embodiments, the surface detection sensor 221 is a photo-eye; a light sensor; a floor-type detector configured to identify if the surface beneath the body 101 is a hard surface or a carpet, and one or more of a type of hard surface (e.g., hardwood, ceramic, linoleum, laminate flooring, or other suitable material), or a pile height of a carpet, or a weave-type of a carpet; or some other suitable type of sensor capable of collecting data based upon which a type of surface beneath the body 101 is capable of being identified. In such an embodiment, the controller 145 is configured to one or more of cause the height adjuster 219 to change the position of wheels 207c and 207d based on the type of surface determined based on data collected from the surface detection sensor 221, cause an alert to be output indicating the type of surface beneath the body 101, cause a status of the height of the wheels 207c and 207d to be output indicating that the height of wheels 207c and 207d is acceptable for the detected type of surface beneath body 101 or that the height of wheels 207c and 207d should be adjusted based on the detected type of surface beneath the body 101, or cause a status of the type of nozzle 103 attached to body 101 be output indicating that the type of nozzle 103 is acceptable for the detected type of surface beneath body 101 or that the type of nozzle 103 should be changed based on the detected type of surface beneath the body 101.

[0042] In some embodiments, one or more sides of the body 101 comprise one or more quick-release panels to facilitate easy access for a user to service the apparatus 100. In some embodiments, at least one of the one or more quick-release panels is coupled with another portion of body 101 by one or more fasteners. In some embodiments, the one or more fasteners are capable of being tightened and loosened using a conventional screwdriver, a flathead screwdriver, a Philips head screwdriver, a hex-head screw driver, a torx-head screw driver, or other suitable type of screwdriver head. In some embodiments, all of the quick-release panels that are coupled

with the body 101 by a fastener are coupled by a same type of fastener to facilitate ease of access to the body 101 and the components housed therein.

[0043] Figure 3 is a side view of apparatus 100, in accordance with some embodiments. A mode selection switch 301 is communicatively coupled with the controller 145 (FIG. 1). If the mode selection switch 301 is in a first position, and power is supplied to the controller 145, the controller 145 is configured to cause the agitator 203 to move and to cause cleaning fluid to be supplied to the first fluid output 201 (FIG. 2) at a flow rate based on the position of the fluid control switch 149 (FIG. 1). If the mode selection switch 301 is in a second position, and power is supplied to the controller 145, the controller 145 is configured to cause the agitator 203 to be stationary and cleaning fluid to be supplied to the second fluid output 501 (FIG. 5) at a predetermined flow rate independent of the position of the fluid control switch 301. In some embodiments, the mode selection switch 301 is movable to one of three selectable positions. If the mode selection switch 301 is moved to any of the first position, the second position, or a third position other than the first position or the second position, the controller 145 is configured to delay the activation of fluid pump 137 (FIG. 1) by a predetermined quantity of time. For example, in some embodiments, the controller 145 is configured to delay the activation of fluid pump 137 by a period in a range of one second to ten seconds, or some other suitable delay, to prevent cleaning fluid from being drawn from cleaning fluid tank 107 if a user inadvertently moved the mode selection switch 301 to the first position or the second position.

[0044] In some embodiments, a magnet 303 is inside the cleaning fluid tank 107. The magnet 303 is configured to float based on a quantity of fluid accommodated within the cleaning fluid tank 107. In some embodiments, the magnet 303 is inside a float cage 305. In some embodiments, magnet 303 has complete freedom of movement within the cleaning fluid tank 107. Base portion 123 includes a sensor 413 (FIG. 4) configured to detect a distance between the magnet 303 and the sensor 413 based on a magnetic field associated with the magnet 303. The controller 145 is configured to determine a quantity of cleaning fluid accommodated within cleaning fluid tank 107 based on the distance between the magnet 303 and sensor 413. In some embodiments, the controller 145 is configured to cause an alert to be output based on a determination that the quantity of the cleaning fluid accommodated within the cleaning fluid tank 107 is below of predetermined quantity.

[0045] In some embodiments, handle 105 includes hooks 309a and 309b around which an optional power cord is capable of being wrapped. At least one of the hooks 309a or 309b is rotatably attached to handle 105 to cause a cord wrapped around the hooks 309a and 309b to fall toward the ground based on a position of hook 309a or 309b.

[0046] Handle 105 is rotatably coupled with body 101

by a U-joint, rocker, ball, or other suitable coupling that allows for multi-axial rotation of the handle 105 with respect to body 101. In some embodiments, handle 105 is configured to rotate about a single axis with respect to body 101.

[0047] Handle 105 comprises a handle locking mechanism configured to secure the handle 105 in a fixed position with respect to the body 101. In some embodiments, the handle locking mechanism comprises a slot configured to cooperate with a detent lock, pin, ring or other suitable structure on body 101 configured to at least temporarily restrict the rotation of handle 105 about first axis 129 and/or second axis 131 with respect to body 101. In some embodiments, the handle locking mechanism comprises a detent lock, pin, ring or other suitable structure configured to cooperate with a slot or other suitable locking member on the body 101 to at least temporarily restrict the rotation of handle 105 about first axis 129 and/or second axis 131 with respect to body 101.

[0048] In some embodiments, pulling on the handle 105 with at least a predetermined amount of force causes the handle 105 to be released from a locked-state with respect to body 101. In some embodiments, the handle locking mechanism is configured to release the handle 105 from the locked-state if an end of the handle 105 is pulled in a direction away from body 101 by a force in a range of about 5 lbf to about 25 lbf. In some embodiments, the handle locking mechanism comprises a release pedal, switch, button, or other suitable device configured to release the handle 105 from the locked-state with respect to body 101.

[0049] In some embodiments, handle 105 has a carry handle 311 between base portion 123 and a point at which handle 105 is coupled with the back side 101b of the body 101. In some embodiments, handle 105 has an upper portion 315 and a lower portion 317. Upper portion 315 of handle 105 includes mechanical linkage 135. In some embodiments, each of upper portion 315 and lower portion 317 of handle 105 includes at least a part of mechanical linkage 135. In some embodiments, at least upper portion 315 of handle 105 is free from including any electrical components or electrical connections with lower portion 317 or any other component of apparatus 100 outside of upper portion 315. In some embodiments, one of lower portion 317 or base portion 123 includes an actuator 319 communicatively coupled with fluid pump 137 (FIG. 1). Actuator 319 is configured to interact with mechanical linkage 135 or with an electrical connection between trigger 133 and actuator 319 to cause fluid pump 137 to supply cleaning fluid to the first fluid output 201.

[0050] In some embodiments, handle 105 has an auxiliary hook 321 on the upper portion 315. The auxiliary hook 321 is configured to hold a portion of a power cord associated with the apparatus 100 along handle 105. Holding the power cord along the upper portion 315 of handle 105 helps to improve a user's ability to operate the apparatus 100 by preventing tangling of the power cord or a user from tripping over the power cord, for ex-

ample.

[0051] In some embodiments, body 101 has one or more side brushes 323 attached to one or more sidewalls of body 101 adjacent agitator cavity 211 (FIG. 2). Optional side brushes 323 are configured to help loosen debris on a surface opposite the bottom side 101d of body 100. In some embodiments, one or more of the side brushes 323 are stationary. In some embodiments, one or more of the side brushes 323 are configured to one or more of move, rotate, or extend away from body 101. In some embodiments, controller 145 is configured to cause one or more of the side brushes 323 to extend away from body 101 and/or more or rotate based on a selected operation mode. A movable or extendable side brush 323, for example, helps a user operate apparatus 100 in hard-to-reach places such as under furniture, corners in a room, along floor boards, under cabinetry, or other difficult to access locations.

[0052] Figure 4 is a top side perspective view of apparatus 100, with cleaning fluid tank 107 (FIG. 1) and recovery tank 109 (FIG. 1) removed, in accordance with some embodiments. First fluid coupling 401 is on a top side of base portion 123. Base portion 123 includes a first tank seat 403 configured to accommodate cleaning fluid tank 107. The first tank seat 403 includes first fluid coupling 401. Handle 105 comprises one or more lock hooks 405 configured to mate with the cleaning fluid tank locking mechanism 151 (FIG. 1).

[0053] In some embodiments, body 101 has one or more lights 407 on an exterior of the body 101. The lights 407 are communicatively coupled with the controller 145. In some embodiments, an alert output by the controller 145 causes one or more of lights 407 to turn on based on a determination that the quantity of the fluid accommodated within the cleaning fluid tank 107 is below a predetermined quantity. In some embodiments, an alert output by the controller 145 causes one or more of lights 407 to turn on based on a determination that the quantity of the fluid accommodated within the recovery tank 109 is above a predetermined quantity. In some embodiments, an alert output by the controller 145 causes one or more of lights 407 to turn on based on a determination that agitator 203 (FIG. 2) is jammed. In some embodiments, the controller 145 is configured to cause the vacuum motor 143 (FIG. 1) to stop based on a determination that the actuator 203 is jammed.

[0054] The fluid pump 137 (FIG. 1) is communicatively coupled with the first fluid coupling 401 by a tube 409. A bridge 411 around which the tube 409 extends is inside body 101. The bridge 411 is a three-dimensional structure having a size and shape configured to maintain a minimum radius around which the tube 409 curves between the fluid pump 137 and the first fluid coupling 401, independent of a position of the handle 105. By maintaining the minimum radius of curvature of tube 409, the bridge 411 prevents kinking in the tube 409 which could otherwise cut off fluid flow through tube 409.

[0055] First fluid coupling 401 comprises a cup-shaped

receptacle within which the second fluid coupling 601 (FIG. 6) of cleaning fluid tank 107 is configured to be placed upon assembly. In some embodiments, first fluid coupling 401 includes a nipple or other suitable structure configured to be inserted into, or mate with, the second fluid coupling 601 of cleaning fluid tank 107 to communicatively couple the cleaning fluid tank 107 with the fluid pump 137. In some embodiments, first fluid coupling 401 includes a pin configured to be inserted into the second fluid coupling 601 of cleaning fluid tank 107 to cause a valve within the second fluid coupling 601 of cleaning fluid tank 107 to open and cause a cleaning fluid accommodated within the cleaning fluid tank 107 to flow out of the cleaning fluid tank 107 into first fluid coupling 401.

[0056] In some embodiments, a pin included in the first fluid coupling 401 is an electrical contact that projects upward from a bottom surface of first fluid coupling 401 such that the electrical contact is capable of mating with the second fluid coupling 601 of cleaning fluid tank 107. In some embodiments, a second electrical contact projects upward from the bottom surface of the first fluid coupling 401 and extends to a height that is less than a height of the pin with respect to the bottom surface of the first fluid coupling 401 such that the second electrical contact is configured to be outside an area of the second fluid coupling 601 of cleaning fluid tank 107 with which the pin is configured to mate. In some embodiments, controller 145 is configured to determine a quantity of cleaning fluid in the cleaning fluid tank 107 based on a capacitance in the cleaning fluid tank 107 or in the first fluid coupling 401 detected using one or more of the pin or the second electrical contact. In some embodiments, the controller 145 is configured to determine the cleaning fluid tank 107 is empty based on a determination that an electrical connection between the pin and the second electrical contact, made by way of cleaning fluid in the space between the pin and the second electrical contact, is broken.

[0057] In some embodiments, base portion 123 includes a sensor 413. Sensor 413 is configured to detect a distance between a magnet included in cleaning fluid tank 107 such as magnet 303 (FIG. 3) based on a magnetic field associated with the magnet included in cleaning fluid tank 107. The controller 145 is configured to determine a quantity of cleaning fluid accommodated within cleaning fluid tank 107 based on the distance between the magnet 303 and sensor 413.

[0058] Body 101 includes a second tank seat 415 configured to accommodate recovery tank 109. Second tank seat 415 is a region on the top side 101c of body 101 that includes third air passage 117. In some embodiments, second tank seat 415 is a recessed region on the top side of body 101 within which the recovery tank 109 is configured to be at least partially accommodated to facilitate the communicative coupling between recovery tank 109, second air passage 113 and third air passage 117.

[0059] Figure 5 is a top-side perspective view of the

apparatus 100 with the cleaning fluid tank 107 (FIG. 1), the recovery tank 109 (FIG. 1), and the nozzle 103 (FIG. 1) removed, in accordance with some embodiments. Body 101 includes a nozzle reception area 501 on the front side 101a of the body 101. The nozzle reception area 501 includes one or more recesses 503 configured to mate with a portion of nozzle 103 if nozzle 103 is attached. In some embodiments, the one or more recesses 503 are configured to receive upward-facing hooks included on a back-side of nozzle 103. If the nozzle 103 is attached to body 101, the one or more recesses 503 are configured to engage the hooks on the back-side of nozzle 103 such that if the apparatus 100 is moved in a forward or backward direction, the nozzle 103 is fixed to the front side 101a of body 101.

[0060] In some embodiments, front-side 101a of body 101 includes locking recesses 505 configured to receive movable hooks that are included in a nozzle locking mechanism of nozzle 103. In some embodiments, the locking recesses 505 are over the first air passage 111. In some embodiments, the locking recesses 505 are in a different position on body 101. If over the first air passage 111, for example, the one or more recesses 503, locking recesses 505 and nozzle 103 are configured to facilitate an attachment of the nozzle 103 to the body 101 such that if the hooks on the back side of nozzle 103 are first installed in the one or more recesses 503, the nozzle 103 is capable of rotating toward the locking recesses 505 until the movable hooks of nozzle 103 are inserted into the locking recesses 505 to secure nozzle 103 to body 101.

[0061] In some embodiments, the front side 101a has one or more openings 507 that are each configured to receive a wheel on the back-side of nozzle 103 if nozzle 103 includes a wheel. For example, nozzle 801 (FIG. 8) includes wheels 807 (FIG. 8) on a back side thereof that, when nozzle 801 is attached to body 101, align with openings 507.

[0062] In some embodiments, body 101 includes a second fluid output 509 on the front side 101a of body 101. The second fluid output 509 is communicatively coupled with the first fluid coupling 401 by way of a fluid flow path extending from the first fluid coupling 401 to the second fluid output 509. The second fluid output 509 is configured to be sealed unless an accessory attachment such as accessory attachment 1001 (FIG. 10) is coupled with the second fluid output 509.

[0063] In some embodiments, the first air passage 111 and the second fluid output 509, together, define an accessory receptacle configured to receive an accessory attachment coupler such as accessory attachment coupler 1003 (FIG. 3) to facilitate the provision of cleaning fluid and suction to an attached accessory. In some embodiments, one or more of first air passage 111 or second fluid output 509 are configured to receive and hold an accessory attachment coupler in place by way of a friction fitting. In some embodiments, the front side 101a of body 101 has sidewalls that are configured to interact with an

accessory attachment locking mechanism such as accessory attachment locking mechanism 7007 (FIG. 7) to detachably fix the accessory attachment to the first air passage 111 and second fluid output 509.

[0064] In some embodiments, the accessory attachment receptacle defined by first air passage 111 and second fluid output 509 is configured to receive a single-plug-type accessory attachment coupler to facilitate simple coupling of an attached accessory. In some embodiments, body 101 includes an accessory electrical contact 511 configured to mate with a corresponding electrical coupling included in, or connected to, an accessory attachment coupler to facilitate the provision of power to an attached accessory.

[0065] Figure 6 is perspective view of cleaning fluid tank 107, in accordance with some embodiments. Cleaning fluid tank 107 comprises cleaning fluid tank vessel 139 configured to accommodate cleaning fluid, a second fluid coupling 601, a cap 603, cleaning fluid tank locking mechanism 151 and a grip cover 605.

[0066] Cleaning fluid tank vessel 139 comprises one or more sidewalls defining a cavity therein. Cleaning fluid tank vessel 139 is configured to hold a predetermined volume of cleaning fluid comprising one or more of a liquid, a solid, water, a detergent, a gas, or some combination thereof. The one or more sidewalls of cleaning fluid tank vessel 139 comprise one or more of a polymer, a metal, glass, a composite material, or some other suitable material capable of holding the predetermined volume of cleaning fluid. In some embodiments, at least one sidewall of the one or more sidewalls of cleaning fluid tank vessel 139 comprises a transparent material. In some embodiments, at least one sidewall of the one or more sidewalls of cleaning fluid tank vessel 139 comprises an opaque material. In some embodiments, at least one sidewall of the one or more sidewalls of cleaning fluid tank vessel 139 comprises a translucent material capable of hiding waste material within the cleaning fluid tank vessel 139 from plain view while allowing some light to pass through the cleaning fluid tank vessel 139 such that a volume of cleaning fluid accommodated therein is viewable from outside the cleaning fluid tank vessel 139.

[0067] The second fluid coupling 601 is configured to be communicatively coupled with first fluid coupling 401 (FIG. 4) on base portion 123 (Figure 1). The second fluid coupling 601 is configured to mate with the first fluid coupling 401 on base portion 123 to facilitate flow of cleaning fluid from the cleaning fluid tank 107 into the first fluid coupling 401 of base portion 123. In some embodiments, second fluid coupling 601 is configured to be inserted into the first fluid coupling 401 of base portion 123. Second fluid coupling 601 is on a side of cleaning fluid tank vessel 139 opposite grip cover 605. In some embodiments, second fluid coupling 601 extends away from the cleaning fluid tank vessel 139.

[0068] Cap 603 is removably attached to cleaning fluid tank vessel 139. Second fluid coupling 601 is included in cap 603. Cap 603 is configured to close an opening in

cleaning fluid tank vessel 139 through which cleaning fluid is input into vessel 139.

[0069] The second fluid coupling 601 is configured to prevent cleaning fluid from flowing out of the cleaning fluid tank vessel 139 unless the second fluid coupling 601 is coupled with the first fluid coupling 401 of base portion 123. In some embodiments, second fluid coupling 601 comprises a valve that is configured to open upon coupling with the first fluid coupling 401. In some embodiments, the second fluid coupling 601 comprises a different suitable type of valve or seal that is capable of being opened upon connection with the first fluid coupling on base portion 123.

[0070] Cleaning fluid tank 601 comprises cleaning fluid tank locking mechanism 151 configured to detachably fix cleaning fluid tank 107 to base portion 123 and shaft 125 (FIG. 1). In some embodiments, grip cover 605 is a plate attached to an upper-side of cleaning fluid tank vessel 139. The grip cover 605 is over a portion of cleaning fluid tank locking mechanism 151 and is positioned such that the plate of grip cover 605 is spaced apart from cleaning fluid tank vessel 139, leaving a gap that is capable of being grabbed by a user holding cleaning fluid tank 107.

[0071] Figure 7 is a perspective view of recovery tank 109, in accordance with some embodiments. Recovery tank 109 comprises recovery tank vessel 141 configured to accommodate a composition comprising one or more of a liquid, a solid, a gas, or a portion of the cleaning fluid output from the cleaning fluid tank 107 (FIG. 1). Recovery tank 109 includes a sixth air passage 701 configured to be communicatively coupled with the second air passage 113 (FIG. 1) and a seventh air passage 703 configured to be communicatively coupled with the third air passage 117 (FIG. 1).

[0072] Recovery tank vessel 141 comprises one or more sidewalls defining a cavity therein. Recovery tank vessel 141 is configured to hold a predetermined volume of the composition comprising one or more of the liquid, solid, gas, or portion of the cleaning fluid. The one or more sidewalls of recovery tank vessel 141 comprise one or more of a polymer, a metal, glass, a composite material, or some other suitable material capable of holding the predetermined volume of composition comprising one or more of the liquid, solid, gas, or portion of the cleaning fluid. In some embodiments, at least one sidewall of the one or more sidewalls of recovery tank vessel 141 comprises a transparent material. In some embodiments, at least one sidewall of the one or more sidewalls of recovery tank vessel 141 comprises an opaque material. In some embodiments, at least one sidewall of the one or more sidewalls of recovery tank vessel 141 comprises a translucent material capable of hiding waste material within the recovery tank vessel 141 from plain view while allowing some light to pass through the recovery tank vessel 141 such that a volume of the composition accommodated therein is viewable from outside the recovery tank vessel 141.

[0073] Recovery tank 109 comprises an air conduit 705

extending from the sixth air passage 701 to an internal portion of the recovery tank vessel 141. The air conduit 705 comprises a first flow path 707 that branches into a second flow path 709 and a third flow path 711 that each communicatively couple the internal portion of the recovery tank vessel 141 with the sixth air passage 701.

[0074] First flow path 707, second flow path 709 and third flow path 711 are defined by one or more sidewalls of recovery tank vessel 141 that are internal to recovery tank vessel 141. In some embodiments, the second flow path 709 and the third flow path 711 each end facing an inner sidewall of the recovery tank vessel 141. The inner sidewall of the recovery tank vessel 141 at which each of the second flow path 709 and the third flow path 711 ends, diverts a direction of flow of the liquid, solid, gas or portion of the fluid drawn into the recovery tank vessel 141 by way of the second flow path 709 and the third flow path 711. By ending in a direction that is away from a center portion of the interior of the recovery tank vessel 141, the second flow path 709 and the third flow path 711 are configured to prevent or reduce an amount of foam generated inside the recovery tank vessel 141 as the liquid, solid, gas or portion of the fluid is drawn into the recovery tank vessel 141 by directing the flow away from the center portion of the interior of recovery tank vessel 141. In some embodiments, the one or more sidewalls that define the first flow path 707, second flow path 709 and third flow path 711 split air flow 712 received from first flow path 707 into two separate flow quantities to reduce the amount of air flowing into a single region of the recovery tank vessel 141 to prevent or reduce an amount of foam generated inside the recovery tank 109.

[0075] In some embodiments, recovery tank 109 includes a stopper 713 inside the recovery tank vessel 141. The stopper 713 is configured to at least substantially seal the seventh air passage 703, or a conduit leading to seventh air passage to prevent flow of air to seventh air passage 703, based, at least in part, on a volume of the liquid, solid, gas or portion of the fluid composition accommodated by the recovery tank vessel 141. In some embodiments, the stopper 713 comprises a flotation device that is configured to move along a column 715 toward or away from an opening 717 at an end of column 715. Opening 717 is communicatively coupled with seventh air passage 703 by a channel 719 internal to column 715. Stopper 713 is configured to rise toward opening 717 based on a volume of the liquid, solid, gas or portion of the fluid composition accommodated by the recovery tank vessel 141. In some embodiments, stopper 713 comprises some other suitable structure configured to substantially seal one or more of opening 717 or seventh air passage 703 based on one or more of a depth of the composition accommodated by recovery tank vessel 141 or a suction of air through seventh air passage 703 by vacuum motor 143 (FIG. 1).

[0076] In some embodiments, stopper 713 comprises a depth indicator detectable by controller 145 (FIG. 1). The depth indicator of stopper 713 comprises one or

more of a sensor, an electrical contact, or other suitable device configured to be communicatively coupled with the controller 145 to sense whether the stopper 713 is in position to substantially seal the seventh air passage 703, or a predetermined distance away from a bottom of recovery tank vessel 141, indicative of a depth of the composition accommodated within recovery tank vessel 141.

[0077] In some embodiments, the controller of the body 101 is configured to determine the recovery tank is full based on a determination that the stopper 713 is in position to substantially seal the seventh air passage 703 or if the stopper 713 is a predetermined distance away from the bottom of the recovery tank vessel 141. In some embodiments, the controller 145 is configured to cause the vacuum motor 143 to turn off or an alert to be output indicating that the recovery tank 109 is full.

[0078] In some embodiments, one or more of stopper 713 or column 715 is removable by way of a cap 721 on the bottom side of recovery tank vessel 141. The seventh air passage 703 is through cap 721. Cap 721 is configured to mate with a recessed region surrounding third air passage 117 to facilitate the communicative coupling of seventh air flow passage 703 with third air passage 117 if recovery tank 109 is in second tank seat 415 (FIG. 4).

[0079] Recovery tank 109 comprises a drain cap 723 configured to close a drain opening on the top side of recovery tank 109 defined by one or more sidewalls of recovery tank vessel 141.

[0080] Recovery tank 109 comprises a handle 725 attached to recovery tank vessel 141. In some embodiments, handle 725 is integrally formed with recovery tank vessel 141.

[0081] Figure 8 is a side view of a carpet cleaning nozzle 801, in accordance with some embodiments. Nozzle 801 is usable as nozzle 103 (FIG. 1). Nozzle 801 comprises fourth air passage 119, fifth air passage 121, a skid portion 803, at least one wheel 805, nozzle hooks 807 and a nozzle locking mechanism 809. Fourth air passage 119 is communicatively coupled with fifth air passage 121 by way of a channel 811 inside nozzle 801.

[0082] Nozzle locking mechanism 809 comprises movable hooks 813 that are configured to engage locking recesses 505 (FIG. 5). Movable hooks 813 are one or more of deformable or spring-loaded to facilitate insertion, locking, and unlocking of nozzle 801 upon attachment to body 101 (FIG. 1). Nozzle locking mechanism 809 includes a release member on a top side of nozzle 801 to cause movable hooks 813 to deform or retract from an extended position to facilitate the unlocking and removal of nozzle 801 from body 101.

[0083] The skid portion 803 and the one or more wheels 805 are configured to promote movement of the nozzle 801 and the body 101 over a carpeted surface to facilitate extraction of fluid and/or debris from the carpeted surface into fourth air passage 119 to fifth air passage 121 and into the recovery tank 109 (FIG. 1).

[0084] Figure 9 is a side view of a hard surface nozzle

901, in accordance with some embodiments. Nozzle 901 is usable as nozzle 103 (FIG. 1). Nozzle 901 comprises fourth air passage 119, fifth air passage 121, a squeegee 903, nozzle hooks 905 and a nozzle locking mechanism 907. In some embodiments, squeegee 903 comprises a plurality of structures 909 extending from a base portion of squeegee 903 in a direction away from fourth air passage 119. Fourth air passage 119 is communicatively coupled with fifth air passage 121 by way of a channel 911 inside nozzle 801.

[0085] Nozzle locking mechanism 907 comprises movable hooks 913 that are configured to engage locking recesses 505 (FIG. 5). Movable hooks 913 are one or more of deformable or spring-loaded to facilitate insertion, locking, and unlocking of nozzle 901 upon attachment to body 101 (FIG. 1). Nozzle locking mechanism 909 includes a release member on a top side of nozzle 901 to cause movable hooks 913 to deform or retract from an extended position to facilitate the unlocking and removal of nozzle 901 from body 101.

[0086] The squeegee 903 and the structures 909 extending away from the fourth air passage 119 are configured to promote a drawing or pushing of cleaning fluid and/or debris on a hard surface over which apparatus 100 is positioned toward fourth air passage 119 to facilitate extraction of fluid and/or debris from the hard surface into fourth air passage 119 to fifth air passage 121 and into the recovery tank 109 (FIG. 1).

[0087] Figure 10 is a perspective view of an accessory attachment 1001, in accordance with some embodiments. Accessory attachment 1001 comprises an accessory coupler 1003 and a brush head 1005 communicatively coupled with the accessory coupler 1003 by way of a vacuum hose 1007 and a fluid line internal to the vacuum hose 1007. In some embodiments, the fluid line is external to the vacuum hose 1007. Accessory coupler 1003 is configured to be inserted into first air passage 111 (FIG. 5) and second fluid output 501 (FIG. 5). Accessory coupler 1003 includes an accessory air passage 1009 and an accessory fluid coupling 1011 configured to mate with the first air passage 111 and the second fluid output 501, respectively. In some embodiments, accessory coupler 1003 is configured to be attached to first air passage 111 and/or second fluid output 501 by way of a press-fit. In some embodiments, accessory coupler 1003 includes an accessory locking mechanism 1013 configured to removably attach the accessory coupler 1003 to body 101. Accessory locking mechanism 1013 comprises movable hooks 1015 that are configured to engage corresponding recesses or sidewalls surrounding or near first air passage 111. Movable hooks 1015 are one or more of deformable or spring-loaded to facilitate insertion, locking, and unlocking of accessory coupler 1003 upon attachment to body 101 (FIG. 1). Accessory locking mechanism 1013 includes at least one release member on a sidewall of accessory coupler 1003 to cause movable hooks 1015 to deform or retract from an extended position to facilitate the unlocking and re-

moval of accessory attachment 1001 from body 101.

[0088] In use, if the mode selection switch 301 (FIG. 3) is in a position corresponding to a mode associated with using accessory attachment 1001, and accessory attachment coupler 1003 is coupled with second fluid output 501, fluid is supplied to accessory attachment 1001. Fluid is input into the fluid line that is internal or external to vacuum hose 1007. Brush head 1005 has a fluid release valve communicatively coupled with an accessory trigger 1017 that, when the accessory trigger 1009 is actuated, and cleaning fluid is in the fluid line, cleaning fluid is caused to be expelled from an accessory fluid output 1019 in the brush head 1005.

[0089] Brush head 1005 comprises bristles 1021. In some embodiments, bristles 1021 are stationary. In some embodiments, accessory attachment 1001 comprises a motor configured to cause bristles 1021 to move. In some embodiments, accessory coupler 1003 includes an accessory electrical contact electrically coupled with the motor that is configured to be coupled with optional electrical contact 511 (FIG. 5) to supply power to the motor in brush head 1005. In some embodiments, brush head 1005 includes a spin brush in addition to, or in place of, bristles 1021.

[0090] Figure 11 is a schematic diagram of a control system 1100, in accordance with some embodiments. Control system 1100 is included in apparatus 100 (FIG. 1). In control system 1100, controller 145 is communicatively coupled with fluid pump 137, vacuum motor 143, optional headlight 147, fluid control switch 149, agitator motor 205, mode selection switch 301, one or more indicator lights 407, optional accessory electrical contact 511, and a sensor package 1101.

[0091] Controller 145 is configured to turn the vacuum motor 143 on or off based on a position of mode selection switch 301. Mode selection switch 301 is configured to be in one of at least two positions. In some embodiments, mode selection switch 301 is configured to be in one of at least three positions. In some embodiments, apparatus 100 include a power switch that is separate from mode selection switch 301. In some embodiments, mode selection switch 301 is configured to be used as a power switch in addition to a switch for designating an operation mode of apparatus 100.

[0092] Controller 145 is configured to one or more of cause power to be supplied to the agitator motor 205 or output an instruction to the agitator motor 205 based on the position of the mode selection switch 301. In some embodiments, actuator 319 (FIG. 3) is communicatively coupled with controller 145 such that when the trigger 133 (FIG. 1) is actuated, controller 145 causes the agitator motor 145 to move agitator 203 (FIG. 2).

[0093] In some embodiments, the controller 145 is configured to cause power to be supplied to the optional accessory electrical contact 511 based on the position of the mode selection switch 301.

[0094] In some embodiments, mode selection switch 301 is configured to be in one of three positions. In a first

position, apparatus 100 is off. In a second position, the vacuum motor 143 is turned on, the agitator motor 205 is capable of being turned on, and the fluid pump 137 is caused to supply cleaning fluid to the first fluid output 201 (FIG. 2) based on a position of the fluid control switch 149. In a third position, the vacuum motor 143 is turned on, the agitator motor 205 is turned off, and the fluid pump 137 is caused to supply cleaning fluid to the second fluid output 501 at a predetermined rate independent of the position of the fluid control switch 149..

[0095] In some embodiments, controller 145 is configured to cause fluid to flow from the cleaning fluid tank 107 (FIG. 1) to the first fluid output 201 by way of the first fluid coupling 401 based on a position of the mode selection switch 301 and an actuation of trigger 133 included in handle 105. Based on the actuation of the trigger 133, with the mode selection switch in a corresponding position, controller 145 is configured to cause fluid pump 137 to draw cleaning fluid from cleaning fluid tank 107.

[0096] In some embodiments, indicator lights 407 comprise an agitator status indicator communicatively coupled with the controller 145. The agitator motor 205 comprises an agitator movement sensor communicatively coupled with the controller 145. Controller 145 is configured to determine whether the agitator 203 is moving based on data received from the agitator movement sensor. In some embodiments, the controller 145 is configured to one or more of cause power to stop being supplied to the agitator motor 205, cause the agitator status indicator to be activated based on a determination the agitator 203 is not moving, or cause power to stop being supplied to the vacuum motor 143.

[0097] In some embodiments, indicator lights 407 comprise a cleaning fluid tank status indicator communicatively coupled with the controller 145. Controller 145 is configured to determine a volume of cleaning fluid in the cleaning fluid tank 107 based on one or more of data received from sensor 413 (FIG. 4) or a conduction of electricity through the cleaning fluid in the cleaning fluid tank 107 by way of the first fluid coupling 401. Controller 145 is configured to cause the tank status indicator to be activated based on the volume of cleaning fluid included in the cleaning fluid tank 107. In some embodiments, if the volume of cleaning fluid in cleaning fluid tank 107 is less than a predetermined threshold, the controller 145 is configured to cause the tank status indicator light to turn on. In some embodiments, if the volume of cleaning fluid in cleaning fluid tank 107 is less than a predetermined threshold, the controller 145 is configured to cause the tank status indicator light to turn off.

[0098] In some embodiments, indicator lights 407 comprise a recovery tank status indicator communicatively coupled with the controller 145. Controller 145 is configured to determine a volume of fluid and/or debris in the recovery tank 109 based on data received from a sensor included in stopper 713 (FIG. 7) or on a determination that the vacuum motor 143 is under stress, indicating a clog or that the stopper 713 has at least substantially

sealed seventh air passage 703 (FIG. 7). Controller 145 is configured to cause the recovery tank status indicator to be activated based on the volume of fluid and/or debris included in the recovery tank 109. In some embodiments, if the volume of fluid and/or debris included in recovery tank 109 is greater than a predetermined threshold, the controller 145 is configured to cause the tank status indicator light to turn on. In some embodiments, if the volume of fluid and/or debris included in recovery tank 109 is greater than a predetermined threshold, the controller 145 is configured to cause the tank status indicator light to turn off.

[0099] Indicator lights 407 are positioned on apparatus 100 such that a user operating the apparatus 100 is able to quickly and easily identify a problem or operating status of the apparatus 100, increasing a user's confidence in the user's ability to operate the apparatus 100, and increasing a user's confidence in identifying whether the apparatus 100 should be filled with cleaning fluid, emptied, serviced, or some other suitable operation capable of being instigated by way of an indicator light.

[0100] Sensor package 1101 comprises one or more of sensor 413, a position sensor, a gps, a gyroscope, or other sensor suitable for collecting data indicative of a location or a direction of movement of the apparatus to be processed by controller 145.

[0101] Figure 12 is a diagram of a fluid flow system 1200, in accordance with some embodiments. Fluid flow system 1200 includes a plurality of fluid flow paths 1201a-1201g that communicatively couple the first fluid coupling 401, the fluid pump 137, the first fluid output 201, and the second fluid output 501.

[0102] By way of example, fluid flow paths 1201a-1201g communicatively couple first fluid coupling 401, a three-way connector 1205, fluid pump 137, first fluid output 201, second fluid output 501, and a check valve 1215. Each fluid flow path 1201a-1201g comprises one or more of a tube, a hose, a pipe, a nozzle, a valve, a fluid coupler, or some other suitable via through which fluid is capable of moving.

[0103] Fluid pump 137 is communicatively coupled with controller 145 (FIG. 1). In use, fluid pump 137 causes cleaning fluid to be drawn from fluid flow path 1201b. The cleaning fluid drawn from fluid flow path 1201b comprises one or more of cleaning fluid directly drawn from cleaning fluid tank 107 (FIG. 1) by way of first fluid coupling 401, fluid flow path 1201a, and three-way connector 1205, or cleaning fluid that was drawn from cleaning fluid tank 107, circulated through fluid flow paths 1201b, 1201c, 1201e, 1201f and 1201g, and received by three-way connector 1205.

[0104] The cleaning fluid drawn from cleaning fluid tank 107 is drawn into an inlet of fluid pump 137 and output to fluid flow path 1201c from an outlet of fluid pump 137.

[0105] In a first operation mode, the controller 145 is configured to cause fluid pump 137 to supply fluid to fluid supply line 1201c at a rate based on a position of flow control switch 149. In a second operation mode, the con-

troller 145 is configured to cause fluid pump 137 to supply fluid to fluid supply line 1201c at a rate independent of a position of flow control switch 149.

[0106] In some embodiments, fluid flow system 1200 includes an optional fluid diverter 127 at a junction between fluid flow path 1201c and fluid flow paths 1201d and 1201e. If included, the fluid diverter 1217 is communicatively coupled with controller 145 to cause fluid to flow to fluid flow path 1201d such that the cleaning fluid output by fluid pump 137 is expelled from first fluid output 201 in the first operation mode, and to cause fluid to flow to fluid flow path 1201e such that the cleaning fluid output by fluid pump 137 is supplied to the second fluid output 501 in the second operation mode.

[0107] In some embodiments, fluid flow system 1200 includes an optional controllable valve 1219 communicatively coupled with controller 145 and positioned between fluid pump 137 and first fluid output 201. If included, controllable valve 1219 is configured to open or close fluid flow passage 1201d to cause fluid output by fluid pump 137 to flow in fluid supply line 1201e such that fluid is supplied to the first fluid output 201 in the first operation mode and cut off from being supplied to the first fluid output 201 in the second operation mode.

[0108] An inlet 1213a of second fluid output 501 is communicatively coupled with fluid flow path 1201e. A fluid system outlet 1213b of second fluid output 501 is communicatively coupled with fluid flow path 1201f. In use, if the second fluid output 501 is not coupled with an external accessory, the second fluid output 501 is configured to cause cleaning fluid to flow from fluid flow path 1201e to fluid flow path 1201f. If the second fluid output 501 is coupled with an external accessory, the second fluid output 501 is configured to allow cleaning fluid to flow out of the second fluid output 501 and into an accessory attachment coupler such as accessory attachment coupler 1003 (FIG. 10) that is coupled with body 101 by way of second fluid output 501.

[0109] An inlet of check valve 1215 is communicatively coupled with fluid system outlet 1213b by way of fluid flow path 1201f. An outlet of check valve 1215 is communicatively coupled with three-way connector 1205 by way of fluid flow path 1201g. In use, if the second fluid output 501 free from being coupled with an accessory attachment, and the fluid diverter 1217 is diverting flow to fluid flow path 1201e or the controllable valve 1219 is cutting off fluid flow to the first fluid output 201, cleaning fluid output by fluid pump 137 is caused to flow into fluid flow path 1201f. If pressure builds in fluid flow path 1201f to a point that a threshold pressure is breached, the check valve 1215 will open to cause cleaning fluid to flow into fluid flow path 1201g.

[0110] In some embodiments, if the second fluid output 501 is coupled with an accessory, check valve 1215 is configured to allow pressure to build within fluid flow path 1201f to a point that second fluid output 501 causes cleaning fluid to flow into an attached accessory coupler by way of second fluid output 501. If the attached acces-

sory is in a state in which cleaning fluid is not being output by the accessory, pressure continues to build in fluid flow path 1201f until the threshold pressure is reached. Upon reaching the threshold pressure with the accessory attached to the accessory fluid coupling, check valve 1215 will open to cause cleaning fluid to flow into fluid flow path 1201g.

[0111] Three-way connector 1205 is configured to receive cleaning fluid from fluid flow path 1201a and fluid flow path 1201g. In some embodiments, three-way connector is configured to output fluid received from fluid flow path 1201a, fluid flow path 1201g or a mixture thereof to fluid flow path 1201b. In some embodiments, three-way connector 1205 is a valve. In some embodiments, three-way connector is reliant on pressure in fluid flow path 1201g resulting from fluid pump 137, for example, or pressure in fluid flow path 1201a caused by the relative height of the cleaning fluid in cleaning fluid tank 107 with respect to three-way connector 1205, for example, to facilitate whether fluid pump 137 will receive cleaning fluid directly drawn from cleaning fluid tank 107, recirculated cleaning fluid that was drawn from cleaning fluid tank 107, or some combination thereof.

[0112] In some embodiments, check valve 1215 is included in three-way connector 1205, and fluid flow paths 1201f and 1201g are a continuous path free from having an intermediary component between second fluid output 501 and three-way connector 1205.

[0113] In some embodiments, second fluid output 501 comprises a fluid diverter, valve or other suitable structure configured to direct fluid flow from the inlet 1213a to the second fluid output 501 based on the second fluid output 501 being coupled with an accessory such that the flow of fluid into the attached accessory coupler is free from being reliant on back pressure from check valve 1215. In some embodiments, fluid pump 137 is configured to turn off if a fluid pressure in at least fluid flow path 1201c is greater than a predetermined threshold.

[0114] In some embodiments, fluid flow system 1200 is free from including a recirculation loop. In some embodiments, fluid flow system 1200 is free from including fluid flow paths 1201b, 1201f and 1201g, three-way connector 1205, fluid system output 1213b and check valve 1215, and first fluid coupling 401 is connected to fluid pump 137 by fluid flow path 1201a.

[0115] Figure 13 is a flowchart of a method 1300, in accordance with some embodiments. In some embodiments, one or more steps of method 1300 is implemented by apparatus 100 (Figure 1) or a processor included in chipset 1400 (FIG. 14).

[0116] In step 1301, a controller causes power to be supplied to a vacuum motor based on a mode selection switch being in a first operation position, a second operation position or a third operation position.

[0117] In step 1303, a fluid accommodated by a first tank is drawn from the first tank based on the switch being in the second operation position or the third operation position. In some embodiments, an indicator light is

caused to turn on if the quantity of fluid accommodated in the first tank is less than a predetermined threshold value.

[0118] In step 1305, fluid drawn from the first tank is output by a fluid pump at a rate corresponding to a position of a fluid flow control switch and/or the position of the mode selection switch.

[0119] In step 1307, the fluid drawn from the first tank is expelled from a first fluid output communicatively coupled with the first tank if the mode selection switch is in the second position. In some embodiments, an agitator motor communicatively coupled with the controller and configured to cause an agitator to move is activated if the mode selection switch is in the second position. In some embodiments, the controller causes the agitator motor to move the agitator if the mode selection switch is in the second position and a fluid release trigger is actuated. In some embodiments, the controller detects whether the agitator motor is capable of causing the agitator to move, for example if the agitator is jammed, while the agitator motor is activated and the mode selection switch is in the second position. If the agitator is incapable of moving, the controller causes one or more of the agitator motor, the vacuum motor or the fluid pump that draws the fluid from the first tank to be inactivated while the mode selection switch is in the second position. In some embodiments, the controller causes an indicator light to turn on based on the detection that the agitator motor is incapable of causing the agitator to move.

[0120] In step 1309 the fluid drawn from the first tank is expelled from a second fluid output communicatively coupled with the first tank if the mode selection switch is in the third position. In some embodiments, the second fluid output is closed unless an accessory coupler is attached to the second fluid output. In some embodiments, power is supplied to an electrical contact associated with the second fluid output based on a determination the fluid coupling is attached to the second fluid output and/or the mode selection switch is in the third position.

[0121] In step 1311, fluid drawn from the first tank is optionally recirculated to a first tank side of fluid pump if the mode selection switch is in the third position and the second fluid output is closed.

[0122] In step 1313 the vacuum motor causes one or more of air, debris, a liquid or a portion of the fluid to be drawn into a second tank separate from the first tank.

[0123] Figure 14 is a functional block diagram of a computer or processor-based system 1400 upon which or by which an embodiment is implemented.

[0124] Processor-based system 1400 is programmed to cause a fluid extraction system such as apparatus 100 to operate as described herein, and includes, for example, bus 1401, processor 1403, and memory 1405 components.

[0125] In some embodiments, the processor-based system 1400 is implemented as a single "system on a chip." Processor-based system 1400, or a portion thereof, constitutes a mechanism for performing one or more

steps of operating a liquid extraction system.

[0126] In some embodiments, the processor-based system 1400 includes a communication mechanism such as bus 1401 for transferring information and/or instructions among the components of the processor-based system 1400. Processor 1403 is connected to the bus 1401 to obtain instructions for execution and process information stored in, for example, the memory 1405. In some embodiments, the processor 1403 is also accompanied with one or more specialized components to perform certain processing functions and tasks such as one or more digital signal processors (DSP), or one or more application-specific integrated circuits (ASIC). A DSP typically is configured to process real-world signals (e.g., sound) in real time independently of the processor 1403. Similarly, an ASIC is configurable to perform specialized functions not easily performed by a more general purpose processor. Other specialized components to aid in performing the functions described herein optionally include one or more field programmable gate arrays (FPGA), one or more controllers, or one or more other special-purpose computer chips.

[0127] In one or more embodiments, the processor (or multiple processors) 1403 performs a set of operations on information as specified by a set of instructions stored in memory 1405 related to operating a liquid extraction system. The execution of the instructions causes the processor to perform specified functions.

[0128] The processor 1403 and accompanying components are connected to the memory 1405 via the bus 1401. The memory 1405 includes one or more of dynamic memory (e.g., RAM, magnetic disk, writable optical disk, etc.) and static memory (e.g., ROM, CD-ROM, etc.) for storing executable instructions that when executed perform the steps described herein to operate a liquid extraction system. The memory 1405 also stores the data associated with or generated by the execution of the steps.

[0129] In one or more embodiments, the memory 1405, such as a random access memory (RAM) or any other dynamic storage device, stores information including processor instructions for operating a liquid extraction system. Dynamic memory allows information stored therein to be changed by system 1400. RAM allows a unit of information stored at a location called a memory address to be stored and retrieved independently of information at neighboring addresses. The memory 1405 is also used by the processor 1403 to store temporary values during execution of processor instructions. In various embodiments, the memory 1405 is a read only memory (ROM) or any other static storage device coupled to the bus 1401 for storing static information, including instructions, that is not changed by the system 1400. Some memory is composed of volatile storage that loses the information stored thereon when power is lost. In some embodiments, the memory 1405 is a non-volatile (persistent) storage device, such as a magnetic disk, optical disk or flash card, for storing information, including in-

structions, that persists even when the system 1400 is turned off or otherwise loses power.

[0130] The term "computer-readable medium" as used herein refers to any medium that participates in providing information to processor 1403, including instructions for execution. Such a medium takes many forms, including, but not limited to computer-readable storage medium (e.g., non-volatile media, volatile media). Non-volatile media includes, for example, optical or magnetic disks. Volatile media include, for example, dynamic memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, a hard disk, a magnetic tape, another magnetic medium, a CD-ROM, CDRW, DVD, another optical medium, punch cards, paper tape, optical mark sheets, another physical medium with patterns of holes or other optically recognizable indicia, a RAM, a PROM, an EPROM, a FLASH-EPROM, an EEPROM, a flash memory, another memory chip or cartridge, or another medium from which a computer can read. The term computer-readable storage medium is used herein to refer to a computer-readable medium.

[0131] An aspect of this description is related to an apparatus comprising a body, a nozzle, a handle, a first tank, a second tank, a vacuum motor, a fluid pump and a controller. The body comprises one or more sidewalls defining a front side, a back side, a top side and a bottom side of the body. The body also comprises a first fluid output, a first air passage, a second air passage communicatively coupled with the first air passage, and a third air passage. The nozzle is removably attached to the front side of the body. The nozzle comprises a fourth air passage proximate the bottom side of the body and a fifth air passage proximate the top side of the body. The fifth air passage is communicatively coupled with the fourth air passage. The nozzle is attached to the body such that the first air passage and the fifth air passage are substantially aligned. The handle is coupled with the body. The handle comprises a base portion comprising a first fluid coupling communicatively coupled with the first fluid output, a shaft coupled with the base portion, and a grip portion at an end of the shaft opposite the base portion. The first tank is over the base portion. The first tank comprise a first vessel configured to accommodate a fluid, and a second fluid coupling communicatively coupled with the first fluid coupling. The second tank is over the body. The second tank comprises a second vessel separated from the first vessel, a sixth air passage communicatively coupled with the second air passage, and a seventh air passage communicatively coupled with the third air passage. The vacuum motor is in the base portion of the handle. The vacuum motor has an inlet communicatively coupled with the third air passage. The fluid pump is in the body. The fluid pump is communicatively coupled with the first fluid coupling and the first fluid output. The controller is in the body. The controller is communicatively coupled with the vacuum motor and the fluid pump. The controller is configured to activate the fluid pump to cause fluid contained in the first tank to be supplied to

the first fluid output. The controller is also configured to activate the vacuum motor to draw one or more of air, debris, a liquid or a portion of the fluid into the second tank by way of the first air passage.

[0132] Another aspect of this description is related to an apparatus comprising a body, a nozzle, a handle, a first tank, a second tank, a vacuum motor, a fluid pump and a controller. The body comprises a housing, a first fluid output, a first air passage, a second air passage communicatively coupled with the first air passage, and a third air passage. The nozzle is removably attached to the housing. The nozzle comprises a fourth air passage and a fifth air passage. The fifth air passage is communicatively coupled with the fourth air passage. The nozzle is attached to the housing such that the first air passage and the fifth air passage are substantially aligned. The handle is coupled with the body. The handle comprises a base portion comprising a first fluid coupling communicatively coupled with the first fluid output, a shaft coupled with the base portion, and a grip portion at an end of the shaft opposite the base portion. The first tank is over the base portion. The first tank comprises a first vessel configured to accommodate a fluid, and a second fluid coupling communicatively coupled with the first fluid coupling. The second tank is over the body. The second tank comprises a second vessel separated from the first vessel. The second tank also comprises a sixth air passage communicatively coupled with the second air passage, and a seventh air passage communicatively coupled with the third air passage. The vacuum motor has an inlet communicatively coupled with the third air passage. The fluid pump is communicatively coupled with the first fluid coupling and the first fluid output. The controller is communicatively coupled with the vacuum motor and the fluid pump. The controller is configured to activate the fluid pump to cause fluid contained in the first tank to be supplied to the first fluid output. The controller is also configured to activate the vacuum motor to draw one or more of air, debris, a liquid or a portion of the fluid into the second tank by way of the first air passage. The second tank comprises an air conduit extending from the sixth air passage to an internal portion of the second vessel of the second tank. The air conduit comprises a first flow path that branches into a second flow path and a third flow path that each communicatively couple the internal portion of the second vessel of the second tank with the sixth air passage.

[0133] A further aspect of this description is related to an apparatus, comprising a body, a nozzle, a handle, a first tank, a second tank, a vacuum motor, a fluid pump and a controller. The body a housing, a first fluid output, a first air passage, a second air passage communicatively coupled with the first air passage, and a third air passage. The nozzle is removably attached to the housing. The nozzle comprises a fourth air passage and a fifth air passage. The fifth air passage is communicatively coupled with the fourth air passage. The nozzle is attached to the housing such that the first air passage and

the fifth air passage are substantially aligned. The handle is coupled with the body. The handle comprises a base portion comprising a first fluid coupling communicatively coupled with the first fluid output, a shaft coupled with the base portion, and a grip portion at an end of the shaft opposite the base portion. The first tank is over the base portion. The first tank comprises a first vessel configured to accommodate a fluid, and a second fluid coupling communicatively coupled with the first fluid coupling. The second tank is over the body. The second tank comprises a second vessel separated from the first vessel, a sixth air passage communicatively coupled with the second air passage, and a seventh air passage communicatively coupled with the third air passage. The vacuum motor has an inlet communicatively coupled with the third air passage. The fluid pump is communicatively coupled with the first fluid coupling and the first fluid output. The controller is communicatively coupled with the vacuum motor and the fluid pump. The controller is configured to activate the fluid pump to cause fluid contained in the first tank to be supplied to the first fluid output, and to activate the vacuum motor to draw one or more of air, debris, a liquid or a portion of the fluid into the second tank by way of the first air passage. The apparatus additionally comprises an agitator and an agitator motor communicatively coupled with the controller. The agitator motor is configured to cause the agitator to move based on an instruction received from the controller. The apparatus further comprises a mode selection switch communicatively coupled with the controller. If the mode selection switch is in a first position, and power is supplied to the controller, the controller is configured to cause the agitator to move and to cause the flow of the fluid to be based on the position of the fluid control switch. If the mode selection switch is in a second position, and power is supplied to the controller, the controller is configured to cause the agitator to be stationary and fluid to be supplied to the second fluid output at a predetermined rate independent of the position of the fluid control switch.

Claims

1. An apparatus (100), comprising:

a body (101) comprising:

one or more sidewalls defining a front side (101a), a back side (101b), a top side (101c) and a bottom side (101d) of the body (101);
a first fluid output (201);
a first air passage (111);
a second air passage (113) communicatively coupled with the first air passage (111);
and
a third air passage (117);

a nozzle (103) removably attached to the front

side (101a) of the body (101), the nozzle (103) comprising a fourth air passage (119) proximate the bottom side (101d) of the body (101) and a fifth air passage (121) proximate the top side (101c) of the body (101), the fifth air passage (121) being communicatively coupled with the fourth air passage (119), the nozzle (103) being attached to the body (101) such that the first air passage (111) and the fifth air passage (121) are substantially aligned;
a handle (105) coupled with the body (101), the handle (105) comprising:

a base portion (123) comprising a first fluid coupling (401) communicatively coupled with the first fluid output (201);
a shaft (125) coupled with the base portion (123); and
a grip portion (127) at an end of the shaft (125) opposite the base portion (123);

a first tank (107) over the base portion (123), the first tank (107) comprising:

a first vessel (139) configured to accommodate a fluid; and
a second fluid coupling (601) communicatively coupled with the first fluid coupling (401);

a second tank (109) over the body (101), the second tank (109) comprising:

a second vessel (141) separated from the first vessel (139);
a sixth air passage (701) communicatively coupled with the second air passage (113);
and
a seventh air passage (703) communicatively coupled with the third air passage (117);

a vacuum motor (143) in the base portion (123) of the handle (105) having an inlet communicatively coupled with the third air passage (117);
a fluid pump (137) in the body (101) communicatively coupled with the first fluid coupling (401) and the first fluid output (201); and
a controller (145) in the body (101) communicatively coupled with the vacuum motor (143) and the fluid pump (137), the controller (145) being configured to activate the fluid pump (147) to cause fluid contained in the first tank (107) to be supplied to the first fluid output (201), and to activate the vacuum motor (143) to draw one or more of air, debris, a liquid or a portion of the fluid into the second tank (109) by way of the first air passage (111),

- wherein the handle (105) is configured to rotate with respect to the body (101) about a first axis (129) and to rotate about a second axis (131) substantially perpendicular to the first axis (129).
2. The apparatus of claim 1, further comprising:
- a fluid control switch (149) configured to be in one of a plurality of selectable positions, wherein the controller (145) is configured to cause fluid contained in the first tank (107) to be supplied to the first fluid output (201) at a rate based on the position of the fluid control switch (149).
3. The apparatus of claim 2, further comprising:
- a second fluid output (509) communicatively coupled with the first fluid coupling (401), wherein,
- the first air passage (111) and the second fluid output (509) are configured to mate with an accessory connector (1001) comprising an accessory fluid coupling and an accessory connector air passage.
4. The apparatus of claim 3, wherein the second fluid output (509) is located on the front side (101a) of the body (111) such that the second fluid output (509) is exposed if the nozzle (103) is detached from the body (101).
5. The apparatus of claim 3, further comprising:
- an agitator (203);
- an agitator motor (205) communicatively coupled with the controller (145) and configured to cause the agitator (203) to move based on an instruction received from the controller (145); and
- a mode selection switch (301) communicatively coupled with the controller (145), wherein
- if the mode selection switch (301) is in a first position, and power is supplied to the controller, the controller (145) is configured to cause the agitator (203) to move and to cause the flow of the fluid to be based on the position of the fluid control switch, and
- if the mode selection switch (301) is in a second position, and power is supplied to the controller (145), the controller (145) is configured to cause the agitator (203) to be stationary and fluid to be supplied to the second fluid output (501) at a predetermined rate independent of the position of the fluid control switch (301).
6. The apparatus of claim 5, wherein the controller (145) is configured to cause the vacuum motor (143) to stop based on a determination that the actuator (203) is jammed.
7. The apparatus of claim 1, further comprising a handle locking mechanism configured to fix the handle (105) with respect to the body (101).
8. The apparatus of claim 1, further comprising:
- a trigger (133);
- a mechanical linkage (135) inside the shaft (125) extending from the trigger (133) to the base portion (123) of the handle (105);
- a fluid pump (137) communicatively coupled with the first fluid coupling (401); and
- an actuator communicatively coupled with the fluid pump,
- wherein the mechanical linkage (135) is configured to contact the actuator based on an actuation of the trigger (133), and the fluid pump (137) is configured to cause fluid to be supplied to the first fluid output (401) based on the actuation of the trigger (133) and the contact between the mechanical linkage (135) and the actuator.
9. The apparatus of claim 1, wherein the second tank (109) comprises an air conduit (705) extending from the sixth air passage (701) to an internal portion of the second vessel (141) of the second tank (109), and the air conduit (705) comprises a first flow path (707) that branches into a second flow path (709) and a third flow path (711) that each communicatively couple the internal portion of the second vessel (141) of the second tank (109) with the sixth air passage.
10. The apparatus of claim 1, wherein the nozzle (103) comprises a skid portion (803) adjacent to the fourth air passage (119) and at least one wheel (805) on a side of the nozzle (103) opposite to the skid portion (803) with the fourth air passage (119) being between the skid portion (803) and the at least one wheel (805).
11. The apparatus of claim 1, wherein the nozzle (103) comprises a squeegee (903) surrounding the fourth air passage (119), the nozzle (103) having a plurality of structures (909) extending from a base of the squeegee (903) in a direction away from the fourth air passage (119).
12. The apparatus of claim 1, wherein
- the nozzle (103) is one of a first nozzle or a second nozzle included in a set of nozzles config-

ured to be individually attached to the body (101),
the first nozzle comprises a skid portion adjacent to the fourth air passage and at least one wheel on a side of the nozzle opposite to the skid portion with the fourth air passage being between the skid portion and the at least one wheel, and the second nozzle comprises a squeegee surrounding the fourth air passage, the nozzle having a plurality of structures extending from a base of the squeegee in a direction away from the fourth air passage.

13. The apparatus of claim 1, further comprising:

a fluid pump (137) in the body (101) communicatively coupled with the first fluid coupling (401) by a tube (409); and
a bridge (411) around which the tube (409) extends,
wherein the bridge (411) is configured to maintain a minimum radius around which the tube (409) curves between the fluid pump (137) and the first fluid coupling (401) independent of a position of the handle (105).

14. The apparatus of claim 1, further comprising:

a magnet (303) inside the vessel of the first tank (107), the magnet (303) being configured to float based on a quantity of the fluid accommodated within the vessel of the first tank (107); and
a sensor (413) inside the base portion (123) of the handle (105), the sensor being configured to detect a distance between the magnet (303) and the sensor (413) based on a magnetic field associated with the magnet (303),
wherein the controller (145) is configured to cause an alert to be output based on the quantity of the fluid accommodated within the vessel of the first tank (107) being below of predetermined quantity.

15. The apparatus of claim 14, further comprising:

a light on an exterior of the body (101) communicatively coupled with the controller (145), wherein the alert comprises causing the light to turn on based on a determination that the quantity of the fluid accommodated within the vessel of the first tank (107) is below a predetermined quantity.

16. The apparatus of claim 1, wherein the inlet of the vacuum motor (143) is communicatively coupled with the third air passage (117) by way of a hose, and the first fluid coupling (401) is communicatively coupled with the first fluid output (201) by way of a

tube inside the hose.

17. The apparatus of claim 1, a wherein the first air passage (111) and the second air passage (113) are on ends of a coupler (115) removably attached to one or more sidewalls (101a-d) of the body (101).

10 Patentansprüche

1. Vorrichtung (100), umfassend:

einen Körper (101), umfassend:

eine oder mehrere Seitenwände, die eine Vorderseite (101a), eine Rückseite (101b), eine obere Seite (101c) und eine untere Seite (101d) des Körpers (101) definieren, einen ersten Fluidausgang (201), einen ersten Luftdurchgang (111), einen zweiten Luftdurchgang (113), der kommunikativ mit dem ersten Luftdurchgang (111) gekoppelt ist, und einen dritten Luftdurchgang (117),

eine Düse (103), die entferntbar an der Vorderseite (101a) des Körpers (101) angebracht ist, wobei die Düse (103) einen vierten Luftdurchgang (119) in der Nähe der unteren Seite (101d) des Körpers (101) und einen fünften Luftdurchgang (121) in der Nähe der oberen Seite (101c) des Körpers (101) umfasst, wobei der fünfte Luftdurchgang (121) kommunikativ mit dem vierten Luftdurchgang (119) gekoppelt ist, wobei die Düse (103) so an dem Körper (101) angebracht ist, dass der erste Luftdurchgang (111) und der fünfte Luftdurchgang (121) im Wesentlichen aufeinander ausgerichtet sind, einen Griff (105), der mit dem Körper (101) gekoppelt ist, wobei der Griff (105) Folgendes umfasst:

einen Basisabschnitt (123), der eine erste Fluidkopplung (401) umfasst, die kommunikativ mit dem ersten Fluidausgang (201) gekoppelt ist, einen Schaft (125), der mit dem Basisabschnitt (123) gekoppelt ist, und einen Griffabschnitt (127) an einem Ende des Schafts (125) gegenüber dem Basisabschnitt (123),

einen ersten Tank (107) über dem Basisabschnitt (123), wobei der erste Tank (107) Folgendes umfasst:

ein erstes Behältnis (139), das zur Aufnah-

- me eines Fluids ausgestaltet ist, und eine zweite Fluidkopplung (601), die kommunikativ mit der ersten Fluidkopplung (401) gekoppelt ist,
- einen zweiten Tank (109) über dem Körper (101), wobei der zweite Tank (109) Folgendes umfasst:
- ein zweites Behältnis (141), das von dem ersten Behältnis (139) getrennt ist, einen sechsten Luftdurchgang (701), der kommunikativ mit dem zweiten Luftdurchgang (113) gekoppelt ist, und einen siebten Luftdurchgang (703), der kommunikativ mit dem dritten Luftdurchgang (117) gekoppelt ist,
- einen Saugmotor (143) in dem Basisabschnitt (123) des Griffs (105) mit einem kommunikativ mit dem dritten Luftdurchgang (117) gekoppelten Einlass,
- eine Fluidpumpe (137) in dem Körper (101), die kommunikativ mit der ersten Fluidkopplung (401) und dem ersten Fluidausgang (201) gekoppelt ist, und
- eine Steuerung (145) in dem Körper (101), die kommunikativ mit dem Saugmotor (143) und der Fluidpumpe (137) gekoppelt ist, wobei die Steuerung (145) dazu ausgestaltet ist, die Fluidpumpe (147) zu aktivieren, um zu veranlassen, dass in dem ersten Tank (107) enthaltenes Fluid dem ersten Fluidausgang (201) zugeführt wird, und den Saugmotor (143) zu aktivieren, um über den ersten Luftdurchgang (111) Luft und/oder Schmutz und/oder eine Flüssigkeit und/oder einen Teil des Fluids in den zweiten Tank (109) zu saugen, wobei der Griff (105) dazu ausgestaltet ist, sich bezüglich des Körpers (101) um eine erste Achse (129) zu drehen und sich um eine zweite Achse (131) zu drehen, die im Wesentlichen senkrecht zu der ersten Achse (129) verläuft.
- 2.** Vorrichtung nach Anspruch 1, ferner umfassend:
- einen Fluidsteuerschalter (149), der dazu ausgestaltet ist, in einer einer Vielzahl von wählbaren Positionen zu sein, wobei die Steuerung (145) dazu ausgestaltet ist zu veranlassen, dass in dem ersten Tank (107) enthaltenes Fluid dem ersten Fluidausgang (201) mit einer Rate zugeführt wird, die auf der Position des Fluidsteuerschalters (149) beruht.
- 3.** Vorrichtung nach Anspruch 2, ferner umfassend:
- einen zweiten Fluidausgang (509), der kommunika-
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- nikativ mit der ersten Fluidkopplung (401) gekoppelt ist, wobei der erste Luftdurchgang (111) und der zweite Fluidausgang (509) dazu ausgestaltet sind, mit einem Zubehörverbinder (1001) zu koppeln, der eine Zubehörf Fluidkopplung und einen Zubehörverbinderluftdurchgang umfasst.
- 4.** Vorrichtung nach Anspruch 3, wobei der zweite Fluidausgang (509) an der Vorderseite (101a) des Körpers (111) angeordnet ist, so dass der zweite Fluidausgang (509) freiliegt, wenn die Düse (103) von dem Körper (101) abgelöst ist.
- 5.** Vorrichtung nach Anspruch 3, ferner umfassend:
- einen Agitator (203), einen Agitatormotor (205), der kommunikativ mit der Steuerung (145) gekoppelt und dazu ausgestaltet ist zu veranlassen, dass sich der Agitator (203) auf der Grundlage einer von der Steuerung (145) erhaltenen Anweisung bewegt, und einen Moduswahlschalter (301), der kommunikativ mit der Steuerung (145) gekoppelt ist, wobei wenn der Moduswahlschalter (301) in einer ersten Position ist und die Steuerung mit Energie versorgt wird, die Steuerung (145) dazu ausgestaltet ist zu veranlassen, dass sich der Agitator (203) bewegt und veranlasst, dass die Strömung des Fluids auf der Position des Fluidsteuerschalters beruht, und wenn der Moduswahlschalter (301) in einer zweiten Position ist und die Steuerung (145) mit Energie versorgt wird, die Steuerung (145) dazu ausgestaltet ist zu veranlassen, dass der Agitator (203) stillsteht und Fluid dem zweiten Fluidausgang (501) mit einer vorbestimmten Rate unabhängig von der Position des Fluidsteuerschalters (301) zugeführt wird.
- 6.** Vorrichtung nach Anspruch 5, wobei die Steuerung (145) dazu ausgestaltet ist, auf der Grundlage einer Bestimmung, dass der Aktuator (203) blockiert ist, zu veranlassen, dass der Saugmotor (143) stoppt.
- 7.** Vorrichtung nach Anspruch 1, ferner umfassend einen Griffverriegelungsmechanismus, der dazu ausgestaltet ist, den Griff (105) bezüglich des Körpers (101) zu fixieren.
- 8.** Vorrichtung nach Anspruch 1, ferner umfassend:
- einen Auslöser (133), eine mechanische Verknüpfung (135) in dem Schaft (125), die sich von dem Auslöser (133) zu dem Basisabschnitt (123) des Griffs (105) er-

- streckt,
eine Fluidpumpe (137), die kommunikativ mit
der ersten Fluidkopplung (401) gekoppelt ist,
und
einen kommunikativ mit der Fluidpumpe gekop- 5
pelter Aktuator,
wobei die mechanische Verknüpfung (135) da-
zu ausgestaltet ist, den Aktuator auf der Grund-
lage einer Betätigung des Auslösers (133) zu 10
kontaktieren, und die Fluidpumpe (137) dazu
ausgestaltet ist zu veranlassen, dass Fluid auf
der Grundlage der Betätigung des Auslösers
(133) und des Kontakts zwischen der mechani-
schen Verknüpfung (135) und dem Aktuator
dem ersten Fluidausgang (401) zugeführt wird. 15
9. Vorrichtung nach Anspruch 1, wobei der zweite Tank
(109) eine Luftleitung (705) umfasst, die sich von
dem sechsten Luftdurchgang (701) zu einem inner- 20
en Abschnitt des zweiten Behältnisses (141) des
zweiten Tanks (109) erstreckt, wobei die Luftleitung
(705) einen ersten Strömungsweg (707) umfasst,
der sich in einen zweiten Strömungsweg (709) und
einen dritten Strömungsweg (711) verzweigt, die je- 25
weils den inneren Abschnitt des zweiten Behältnis-
ses (141) des zweiten Tanks (109) kommunikativ mit
dem sechsten Luftdurchgang koppeln.
10. Vorrichtung nach Anspruch 1, wobei die Düse (103)
einen Kufenabschnitt (803), der dem vierten Luft- 30
durchgang (119) benachbart ist, und mindestens ein
Rad (805) an einer dem Kufenabschnitt (803) ge-
genüberliegenden Seite der Düse (103) umfasst,
wobei der vierte Luftdurchgang (119) zwischen dem 35
Kufenabschnitt (803) und dem mindestens einen
Rad (805) liegt.
11. Vorrichtung nach Anspruch 1, wobei die Düse (103)
einen Abquetscher (903) umfasst, der den vierten 40
Luftdurchgang (119) umgibt, wobei die Düse (103)
eine Vielzahl von Strukturen (909) hat, die sich von
einer Basis des Abquetschers (903) in eine von dem
vierten Luftdurchgang (119) weg gehenden Rich-
tung erstrecken. 45
12. Vorrichtung nach Anspruch 1, wobei
die Düse (103) eine einer ersten Düse oder einer
zweiten Düse in einem Satz Düsen ist, die dazu 50
ausgestaltet sind, einzeln an dem Körper (101)
angebracht zu werden,
die erste Düse einen Kufenabschnitt, der dem
vierten Luftdurchgang benachbart ist, und min-
destens ein Rad an einer dem Kufenabschnitt 55
gegenüberliegenden Seite der Düse umfasst,
wobei der vierte Luftdurchgang zwischen dem
Kufenabschnitt und dem mindestens einen Rad
liegt, und
- die zweite Düse einen Abquetscher umfasst, der
den vierten Luftdurchgang umgibt, wobei die
Düse eine Vielzahl von Strukturen hat, die sich
von einer Basis des Abquetschers in eine von
dem vierten Luftdurchgang weg gehenden Rich-
tung erstrecken.
13. Vorrichtung nach Anspruch 1, ferner umfassend:
eine Fluidpumpe (137) in dem Körper (101), die
über ein Rohr (409) kommunikativ mit der ersten
Fluidkopplung (401) gekoppelt ist, und
eine Brücke (411), um die sich das Rohr (409)
erstreckt,
wobei die Brücke (411) dazu ausgestaltet ist,
einen Mindestradius aufrechtzuerhalten, um
den sich das Rohr (409) zwischen der Fluidpum-
pe (137) und der ersten Fluidkopplung (401) un-
abhängig von einer Position des Griffs (105)
krümmt.
14. Vorrichtung nach Anspruch 1, ferner umfassend:
einen Magnet (303) in dem Behältnis des ersten
Tanks (107), wobei der Magnet (303) dazu aus-
gestaltet ist, auf der Grundlage einer Menge des
in dem Behältnis des ersten Tanks (107) unter-
gebrachten Fluids zu schwimmen, und
einen Sensor (413) in dem Basisabschnitt (123)
des Griffs (105), wobei der Sensor dazu ausge-
staltet ist, auf der Grundlage eines dem Magnet
(303) zugeordneten Magnetfelds einen Abstand
zwischen dem Magnet (303) und dem Sensor
(413) zu erfassen,
wobei die Steuerung (145) dazu ausgestaltet ist,
die Ausgabe einer Warnung zu veranlassen,
wenn die Menge des in dem Behältnis des ers-
ten Tanks (107) untergebrachten Fluids unter
einer vorbestimmten Menge liegt.
15. Vorrichtung nach Anspruch 14, ferner umfassend:
eine Leuchte an einer Außenseite des Körpers
(101), die kommunikativ mit der Steuerung (145)
gekoppelt ist,
wobei die Warnung umfasst, dass auf der
Grundlage einer Bestimmung, dass die Menge
des in dem Behältnis des ersten Tanks (107)
untergebrachten Fluids unter einer vorbestim-
mten Menge liegt, das Anschalten der Leuchte
veranlasst wird.
16. Vorrichtung nach Anspruch 1, wobei der Einlass des
Saugmotors (143) über einen Schlauch kommuni-
kativ mit dem dritten Luftdurchgang (117) gekoppelt
ist und die erste Fluidkopplung (401) über ein Rohr
in dem Schlauch kommunikativ mit dem ersten Flu-
idausgang (201) gekoppelt ist.

17. Vorrichtung nach Anspruch 1, wobei sich der erste Luftdurchgang (111) und der zweite Luftdurchgang (113) an Enden eines Kopp-
lers (115) befinden, der entfernt an einer oder
mehrerer Seitenwänden (101a-d) des Körpers (101)
angebracht ist. 5

Revendications

1. Appareil (100), comprenant :

un corps (101) comprenant :

une ou plusieurs parois latérales définissant
un côté avant (101a), un côté arrière (101b),
un côté supérieur (101c) et un côté inférieur
(101d) du corps (101) ;
une première sortie de fluide (201) ;
un premier passage d'air (111) ;
un deuxième passage d'air (113) accouplé
au premier passage d'air (111) de manière
communicante ; et
un troisième passage d'air (117) ;

une buse (103) attachée de manière amovible
au côté avant (101a) du corps (101), la buse
(103) comprenant un quatrième passage d'air
(119) situé à proximité du côté inférieur (101d)
du corps (101) et un cinquième passage d'air
(121) situé à proximité du côté supérieur (101c)
du corps (101), le cinquième passage d'air (121)
étant accouplé au quatrième passage d'air (119)
de manière communicante, la buse (103) étant
attachée au corps (101) de telle sorte que le
premier passage d'air (111) et le cinquième pas-
sage d'air (121) soient essentiellement alignés ;
un manche (105) accouplé au corps (101), le
manche (105) comprenant :

une partie base (123) comprenant un pre-
mier accouplement fluide (401) accou-
plé à la première sortie de fluide (201) de
manière communicante ;
une tige (125) accouplée à la partie base
(123) ; et
une partie de préhension (127) à une extré-
mité de la tige (125) opposée à la partie ba-
se (123) ;

un premier réservoir (107) au-dessus de la par-
tie base (123), le premier réservoir (107)
comprenant :

un premier récipient (139) conçu pour con-
tenir un fluide ; et
un second accouplement fluide (601) ac-
couplé au premier accouplement fluide

(401) de manière communicante ;

un second réservoir (109) au-dessus du corps
(101), le second réservoir (109) comprenant :

un second récipient (141) séparé du pre-
mier récipient (139) ;
un sixième passage d'air (701) accouplé au
deuxième passage d'air (113) de manière
communicante ; et
un septième passage d'air (703) accouplé
au troisième passage d'air (117) de manière
communicante ;

un moteur d'aspiration (143) dans la partie base
(123) du manche (105) comportant une entrée
accouplée au troisième passage d'air (117) de
manière communicante ;
une pompe (137) dans le corps (101) accouplée
au premier accouplement fluide (401) et à la
première sortie de fluide (201) de manière
communicante ; et
un dispositif de commande (145) dans le corps
(101) accouplé au moteur d'aspiration (143) et
à la pompe (137) de manière communicante, le
dispositif de commande (145) étant conçu pour
activer la pompe (147) afin que du fluide présent
dans le premier réservoir (107) soit acheminé à
la première sortie de fluide (201), et pour activer
le moteur d'aspiration (143) de sorte qu'il aspire
une ou plusieurs substances parmi de l'air, des
débris, un liquide et une partie du fluide pour les
amener au second réservoir (109) par le biais
du premier passage d'air (111),
le manche (105) étant conçu pour tourner par
rapport au corps (101) autour d'un premier axe
(129) et pour tourner autour d'un second axe
(131) essentiellement perpendiculaire au pre-
mier axe (129).

2. Appareil selon la revendication 1, comprenant en
outre :

un commutateur de régulation de fluide (149)
conçu pour être dans l'une d'une pluralité de po-
sitions sélectionnables,
dans lequel le dispositif de commande (145) est
conçu pour faire en sorte que du fluide présent
dans le premier réservoir (107) soit acheminé à
la première sortie de fluide (201) à un débit fonc-
tion de la position du commutateur de régulation
de fluide (149).

3. Appareil selon la revendication 2, comprenant en
outre :

une seconde sortie de fluide (509) accouplée au
premier accouplement fluide (401) de maniè-

- re communicante,
dans lequel
le premier passage d'air (111) et la seconde sortie de fluide (509) sont conçus pour s'accoupler avec un raccord d'accessoire (1001) comprenant un accouplement fluide d'accessoire et un passage d'air de raccord d'accessoire. 5
4. Appareil selon la revendication 3, dans lequel la seconde sortie de fluide (509) est située sur le côté avant (101a) du corps (111) de telle sorte que la seconde sortie de fluide (509) soit exposée si la buse (103) est détachée du corps (101). 10
5. Appareil selon la revendication 3, comprenant en outre : 15
- un agitateur (203) ;
un moteur d'agitateur (205) accouplé au dispositif de commande (145) de manière communicante et conçu pour faire en sorte que l'agitateur (203) se mette en mouvement en fonction d'une instruction reçue du dispositif de commande (145) ; et 20
- un commutateur de sélection de mode (301) accouplé au dispositif de commande (145) de manière communicante,
dans lequel 25
- si le commutateur de sélection de mode (301) se trouve dans une première position, et le dispositif de commande est sous alimentation, le dispositif de commande (145) est conçu pour faire en sorte que l'agitateur (203) soit en mouvement et pour faire en sorte que l'écoulement de fluide soit fonction de la position du commutateur de régulation de fluide, et 30
- si le commutateur de sélection de mode (301) se trouve dans une seconde position, et le dispositif de commande (145) est sous alimentation, le dispositif de commande (145) est conçu pour faire en sorte que l'agitateur (203) soit immobile et que du fluide soit acheminé à la seconde sortie de fluide (501) à un débit prédéterminé indépendant de la position du commutateur de régulation de fluide (301). 35 40 45
6. Appareil selon la revendication 5, dans lequel le dispositif de commande (145) est conçu pour faire en sorte que le moteur d'aspiration (143) s'arrête s'il est déterminé que l'actionneur (203) est enrayé. 50
7. Appareil selon la revendication 1, comprenant en outre un mécanisme de blocage de manche conçu pour fixer le manche (105) relativement au corps (101). 55
8. Appareil selon la revendication 1, comprenant en outre :
- un dispositif de déclenchement (133) ;
une tringlerie mécanique (135) à l'intérieur de la tige (125) s'étendant du dispositif de déclenchement (133) à la partie base (123) du manche (105) ;
une pompe (137) accouplée au premier accouplement fluide (401) de manière communicante ; et
un actionneur accouplé à la pompe de manière communicante,
dans lequel la tringlerie mécanique (135) est conçue pour entrer en contact avec l'actionneur en fonction d'un actionnement du dispositif de déclenchement (133), et la pompe (137) est conçue pour faire en sorte que du fluide soit acheminé à la première sortie de fluide (401) en fonction de l'actionnement du dispositif de déclenchement (133) et du contact entre la tringlerie mécanique (135) et l'actionneur.
9. Appareil selon la revendication 1, dans lequel le second réservoir (109) comprend un conduit d'air (705) s'étendant du sixième passage d'air (701) à une partie intérieure du second récipient (141) du second réservoir (109), et le conduit d'air (705) comprend un premier chemin d'écoulement (707) qui se bifurque en un deuxième chemin d'écoulement (709) et un troisième chemin d'écoulement (711) qui accouplent chacun la partie intérieure du second récipient (141) du second réservoir (109) au sixième passage d'air de manière communicante.
10. Appareil selon la revendication 1, dans lequel la buse (103) comprend une partie de glissement (803) adjacente au quatrième passage d'air (119) et au moins une roue (805) sur un côté de la buse (103) opposé à la partie de glissement (803), le quatrième passage d'air (119) étant situé entre la partie de glissement (803) et l'au moins une roue (805).
11. Appareil selon la revendication 1, dans lequel la buse (103) comprend une raclette (903) entourant le quatrième passage d'air (119), la buse (103) comportant une pluralité de structures (909) s'étendant à partir d'une base de la raclette (903) dans une direction s'éloignant du quatrième passage d'air (119).
12. Appareil selon la revendication 1, dans lequel
- la buse (103) est l'une d'une première buse et une seconde buse faisant partie d'un jeu de buses conçues pour être attachées individuellement au corps (101),
la première buse comprend une partie de glissement adjacente au quatrième passage d'air et au moins une roue sur un côté de la buse opposé à la partie de glissement, le quatrième passage d'air étant situé entre la partie de glis-

sement et l'au moins une roue, et la seconde buse comprend une raclette entourant le quatrième passage d'air, la buse comportant une pluralité de structures s'étendant à partir d'une base de la raclette dans une direction s'éloignant du quatrième passage d'air.

13. Appareil selon la revendication 1, comprenant en outre :

une pompe (137) dans le corps (101) accouplée au premier accouplement fluidique (401) de manière communicante par un tube (409) ; et un pont (411) autour duquel le tube (409) s'étend, dans lequel le pont (411) est conçu pour maintenir un rayon minimal autour duquel le tube (409) se courbe entre la pompe (137) et le premier accouplement fluidique (401) indépendamment d'une position du manche (105).

14. Appareil selon la revendication 1, comprenant en outre :

un aimant (303) à l'intérieur du récipient du premier réservoir (107), l'aimant (303) étant conçu pour flotter en fonction d'une quantité du fluide présente à l'intérieur du récipient du premier réservoir (107) ; et un capteur (413) à l'intérieur de la partie base (123) du manche (105), le capteur étant conçu pour détecter une distance entre l'aimant (303) et le capteur (413) en fonction d'un champ magnétique associé à l'aimant (303), dans lequel le dispositif de commande (145) est conçu pour faire en sorte qu'une alerte soit émise si la quantité du fluide présente à l'intérieur du récipient du premier réservoir (107) est inférieure à une quantité prédéterminée.

15. Appareil selon la revendication 14, comprenant en outre :

un voyant lumineux sur une partie extérieure du corps (101) accouplé au dispositif de commande (145) de manière communicante, dans lequel l'alerte comprend le fait de faire en sorte que le voyant lumineux s'allume s'il est déterminé que la quantité du fluide présente à l'intérieur du récipient du premier réservoir (107) est inférieure à une quantité prédéterminée.

16. Appareil selon la revendication 1, dans lequel l'entrée du moteur d'aspiration (143) est accouplée au troisième passage d'air (117) de manière communicante par le biais d'un tuyau, et le premier accouplement fluidique (401) est accouplé à la première sortie de fluide (201) de manière communicante par le biais

d'un tube à l'intérieur du tuyau.

17. Appareil selon la revendication 1, dans lequel le premier passage d'air (111) et le deuxième passage d'air (113) sont situés à des extrémités d'un élément d'accouplement (115) attaché de manière amovible à une ou plusieurs parois latérales (101a-d) du corps (101) .

FIG. 1

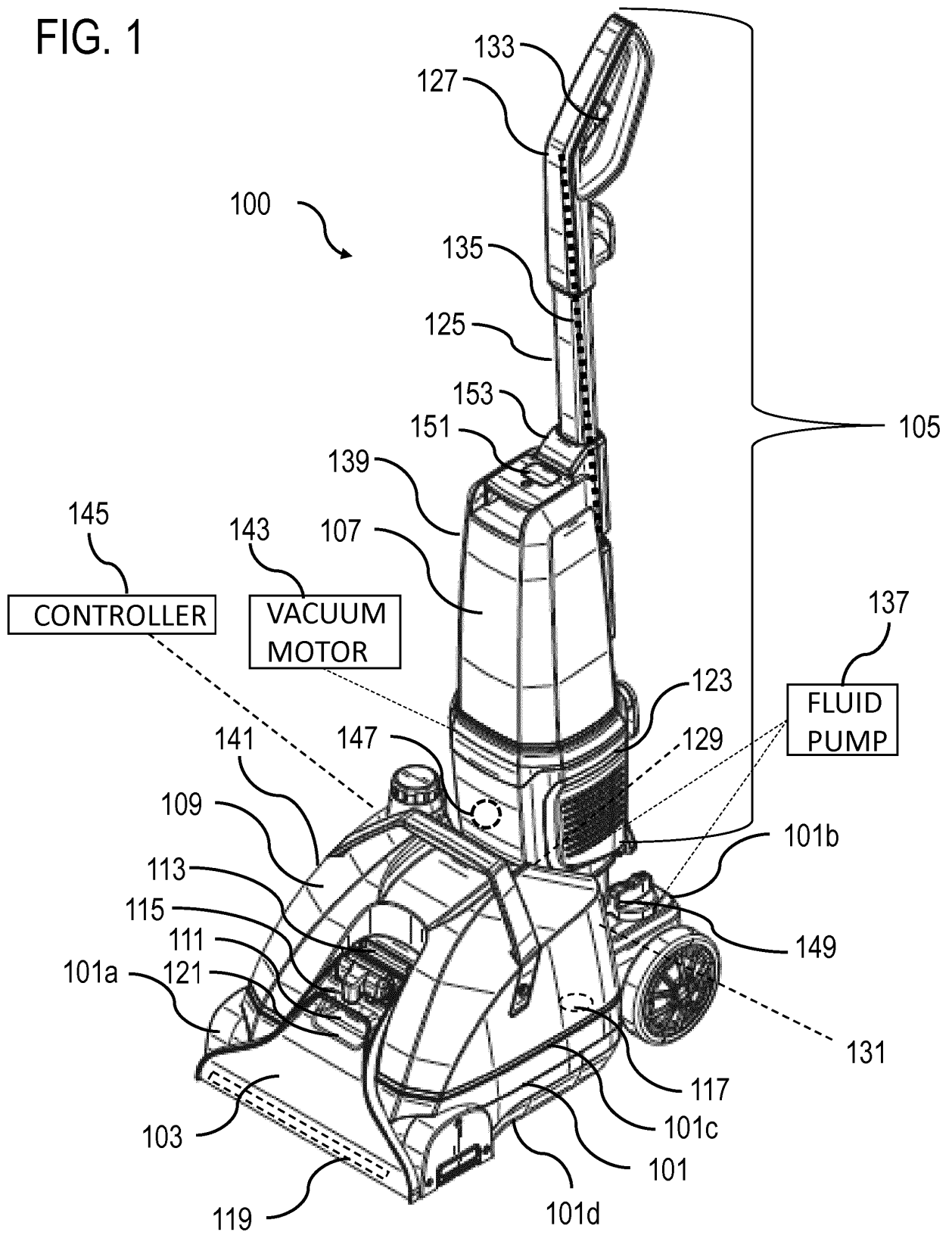


FIG. 2

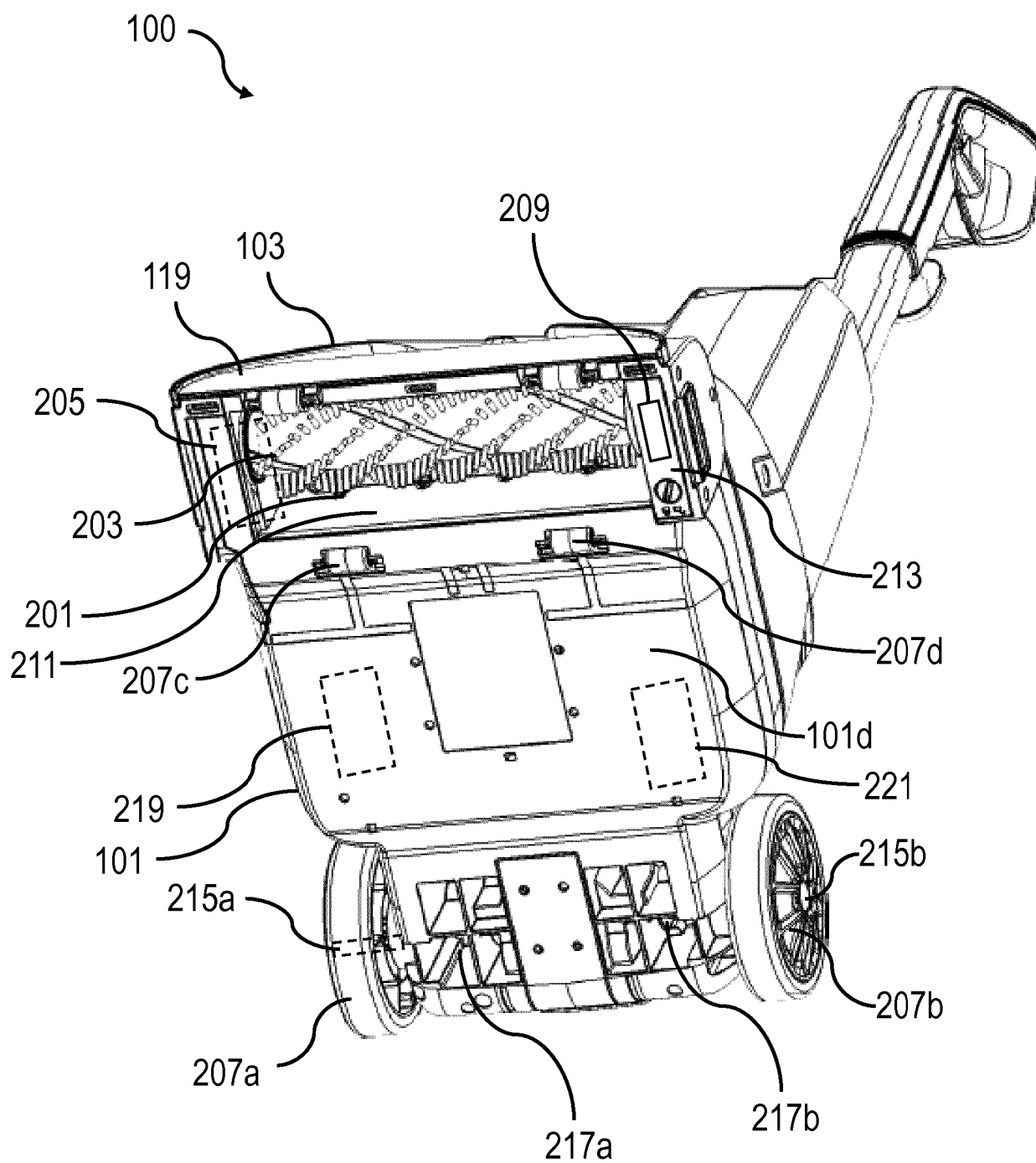


FIG. 3

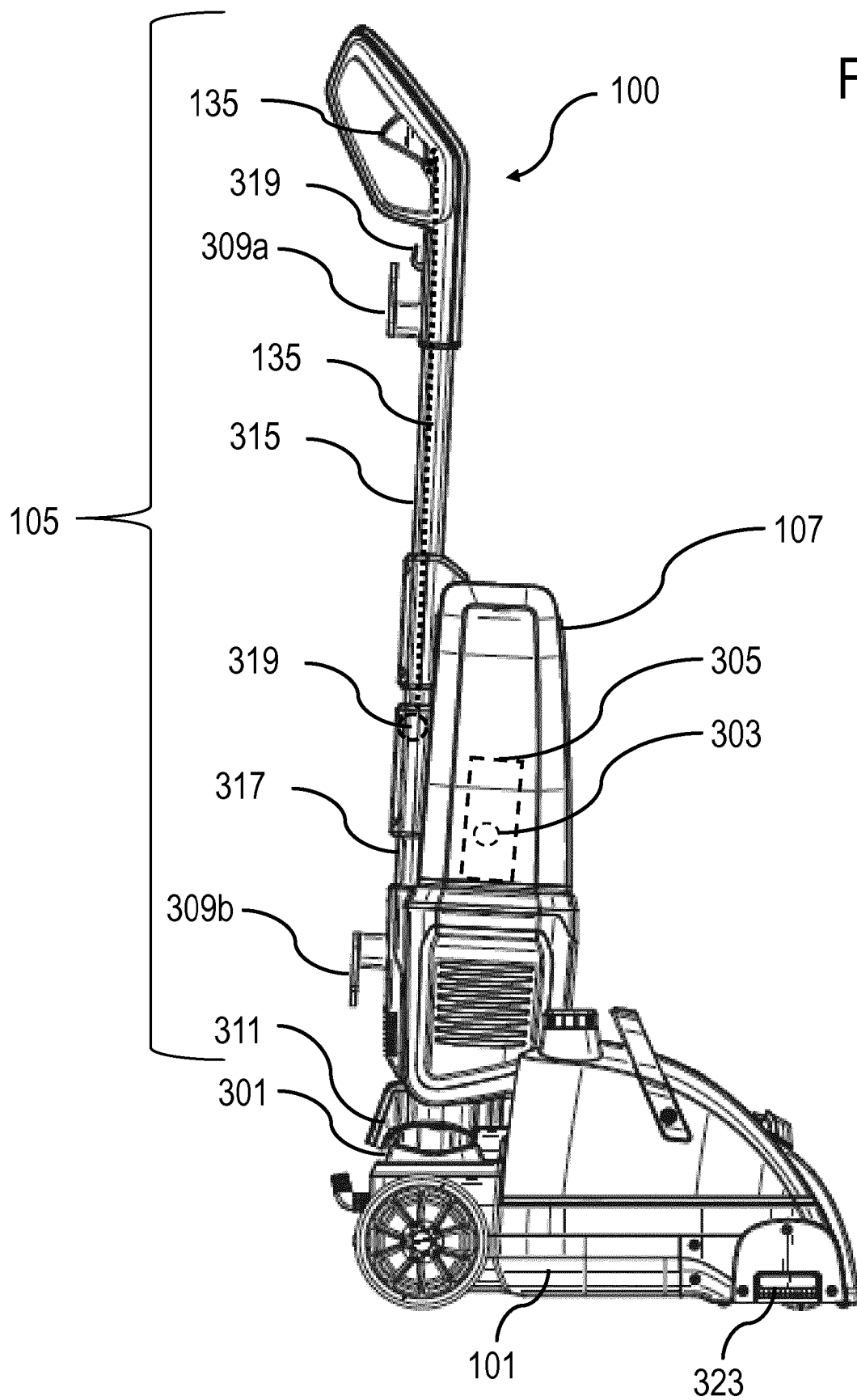


FIG. 4

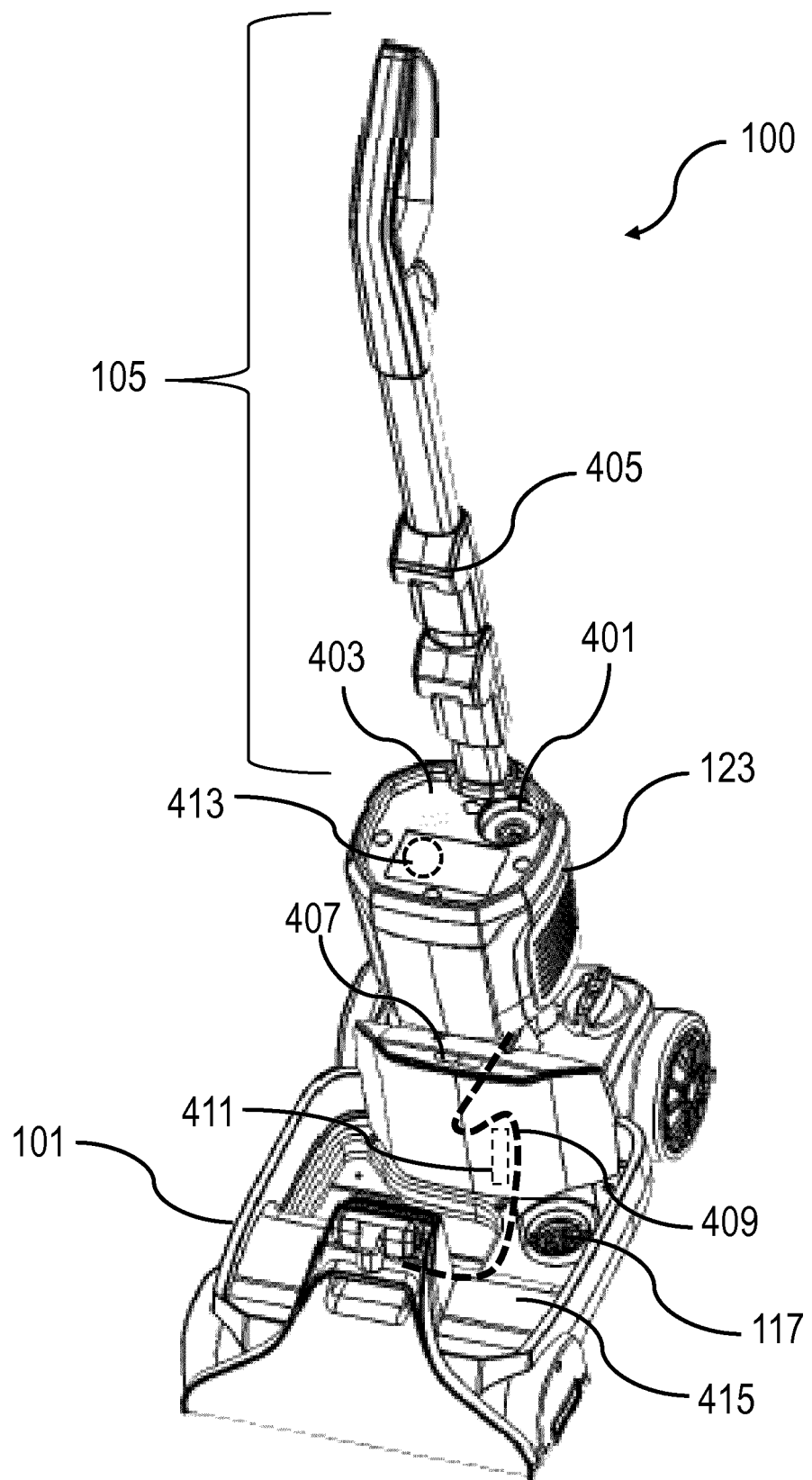


FIG. 5

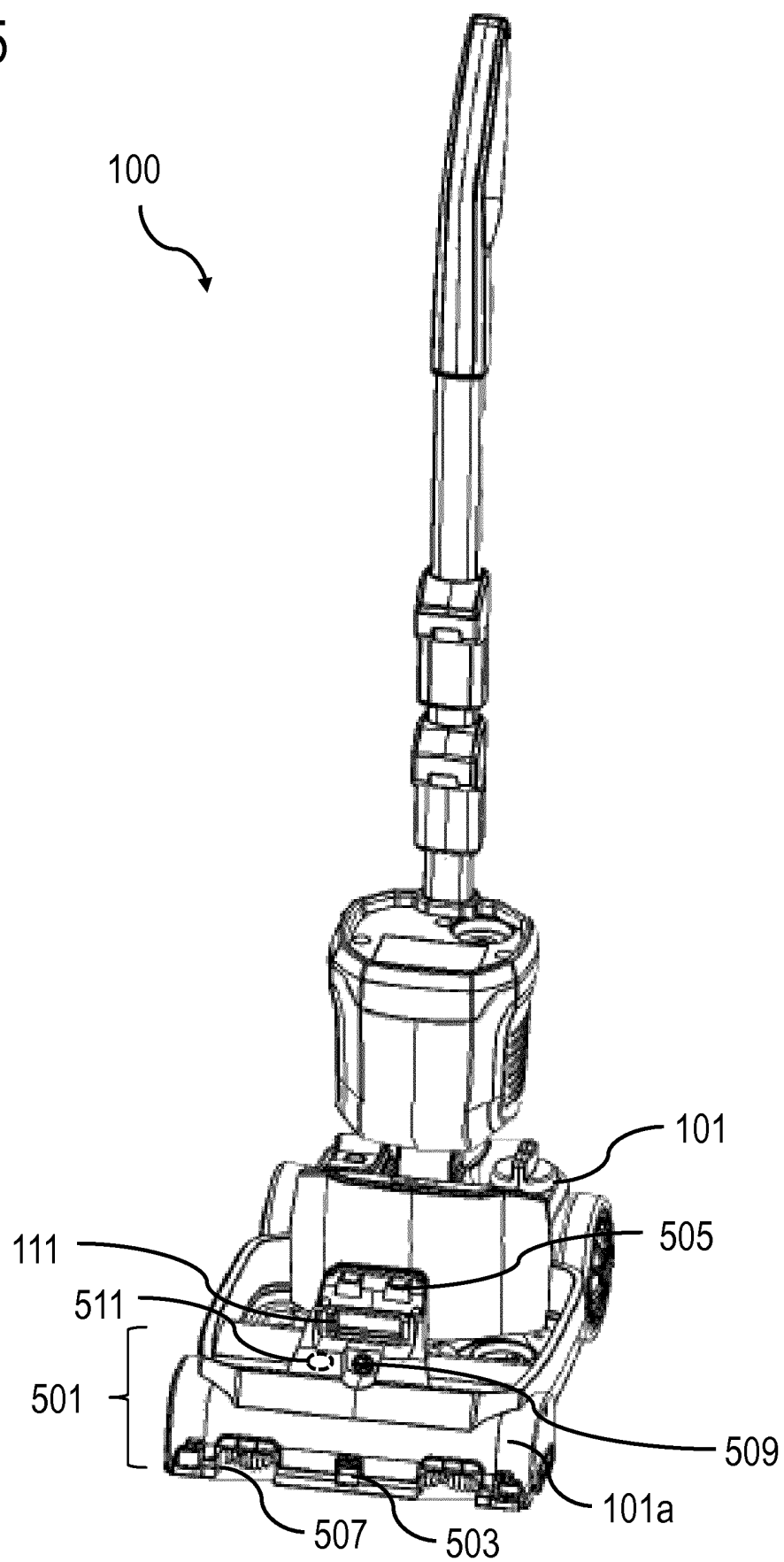


FIG. 6

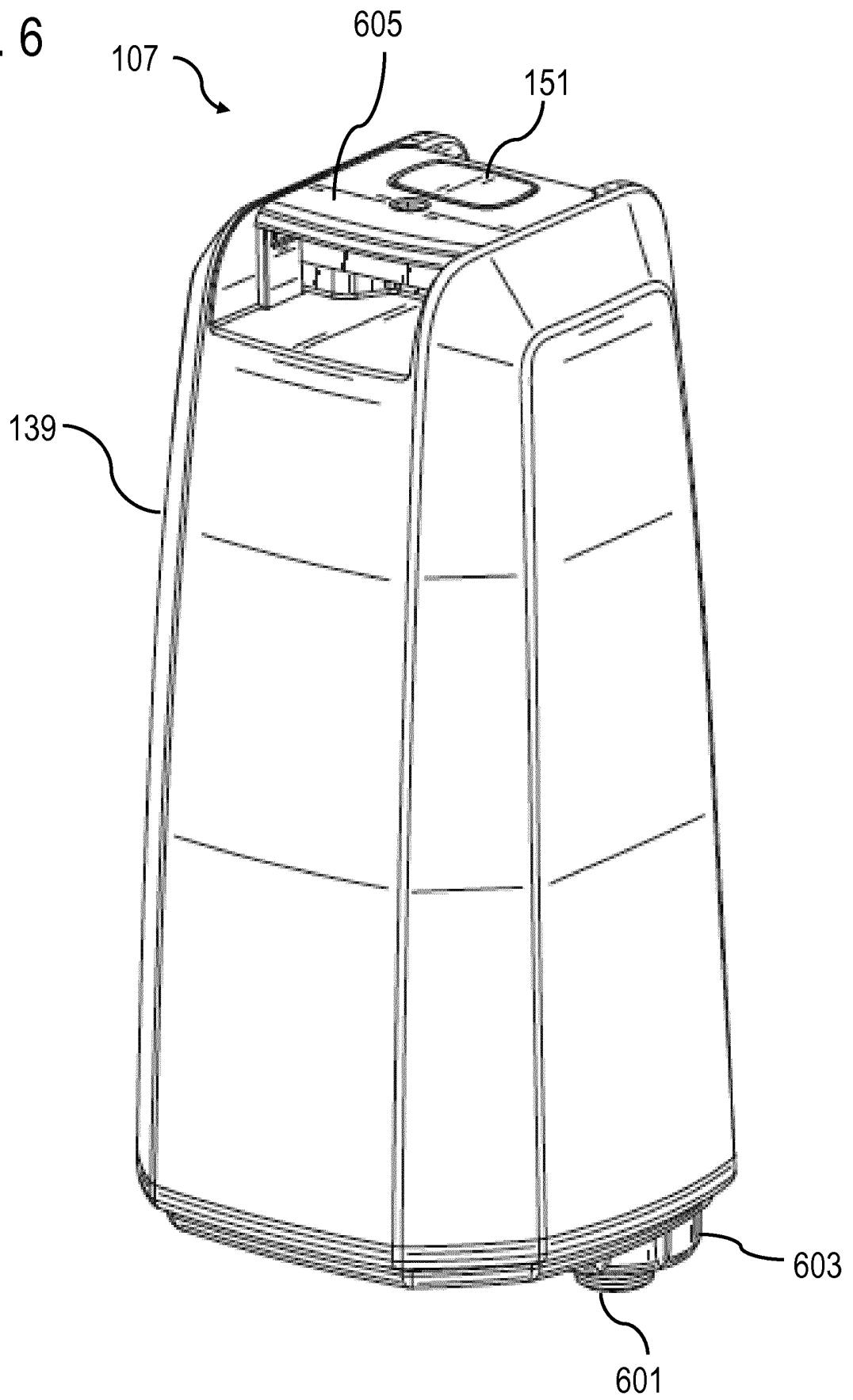


FIG. 7

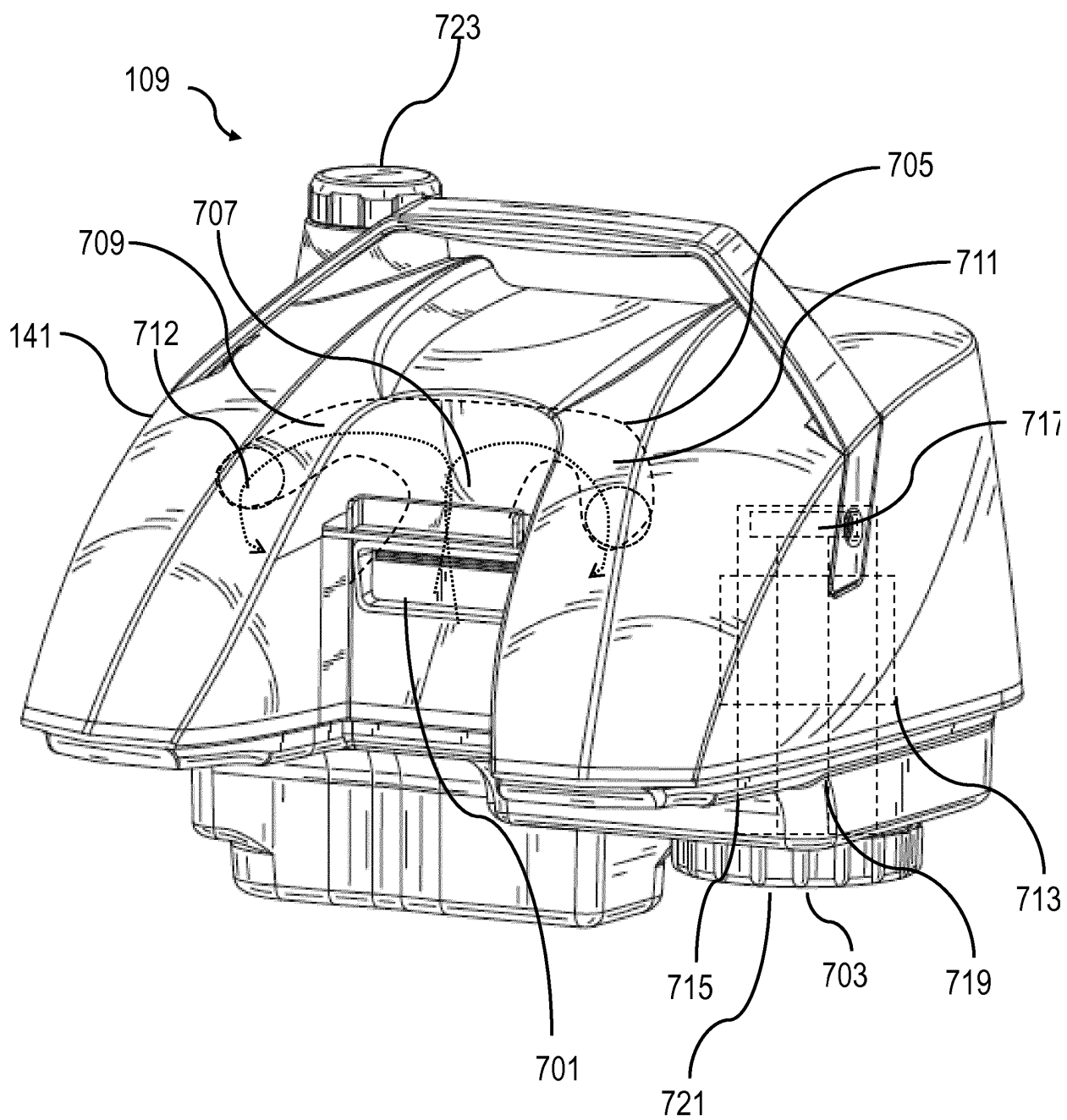


FIG. 8

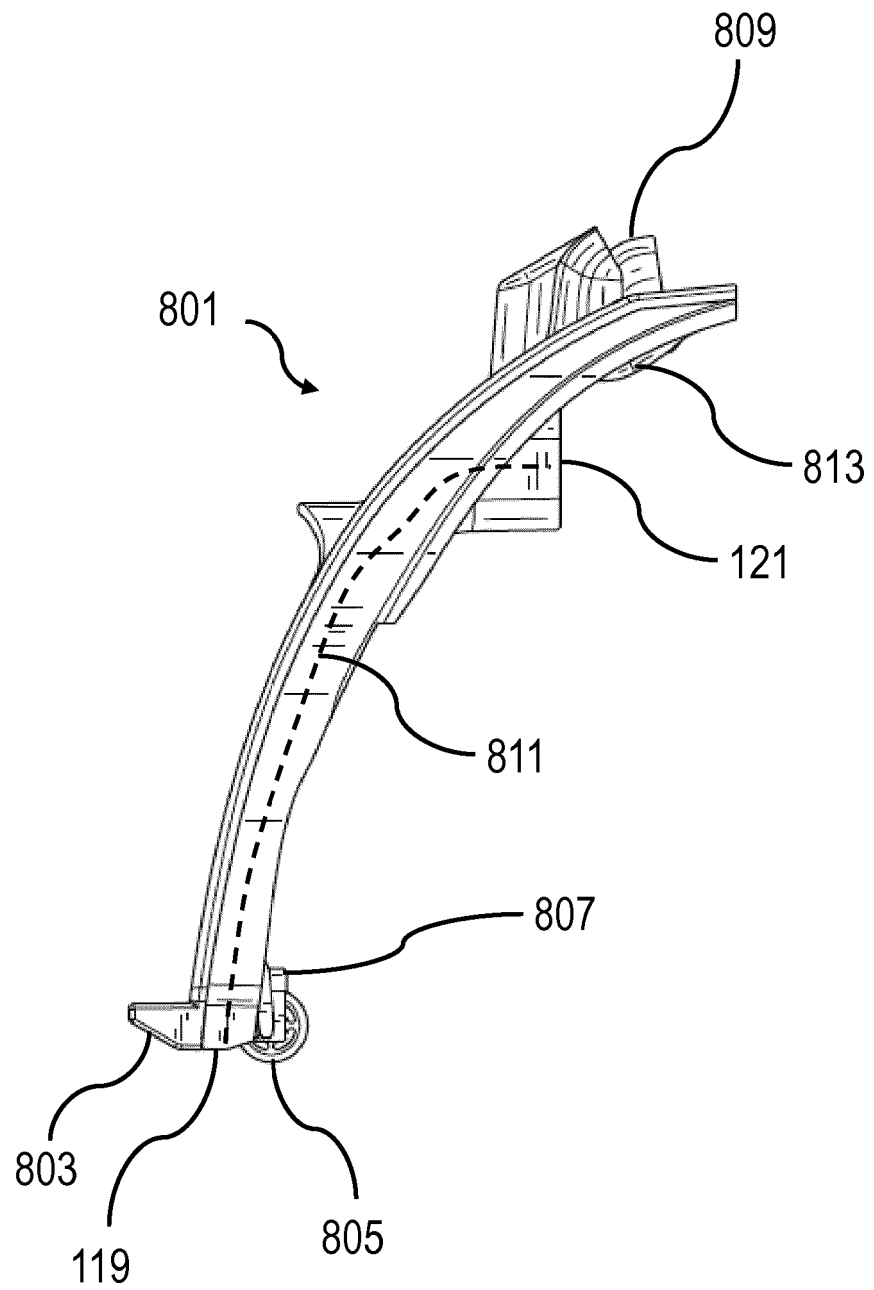


FIG. 9

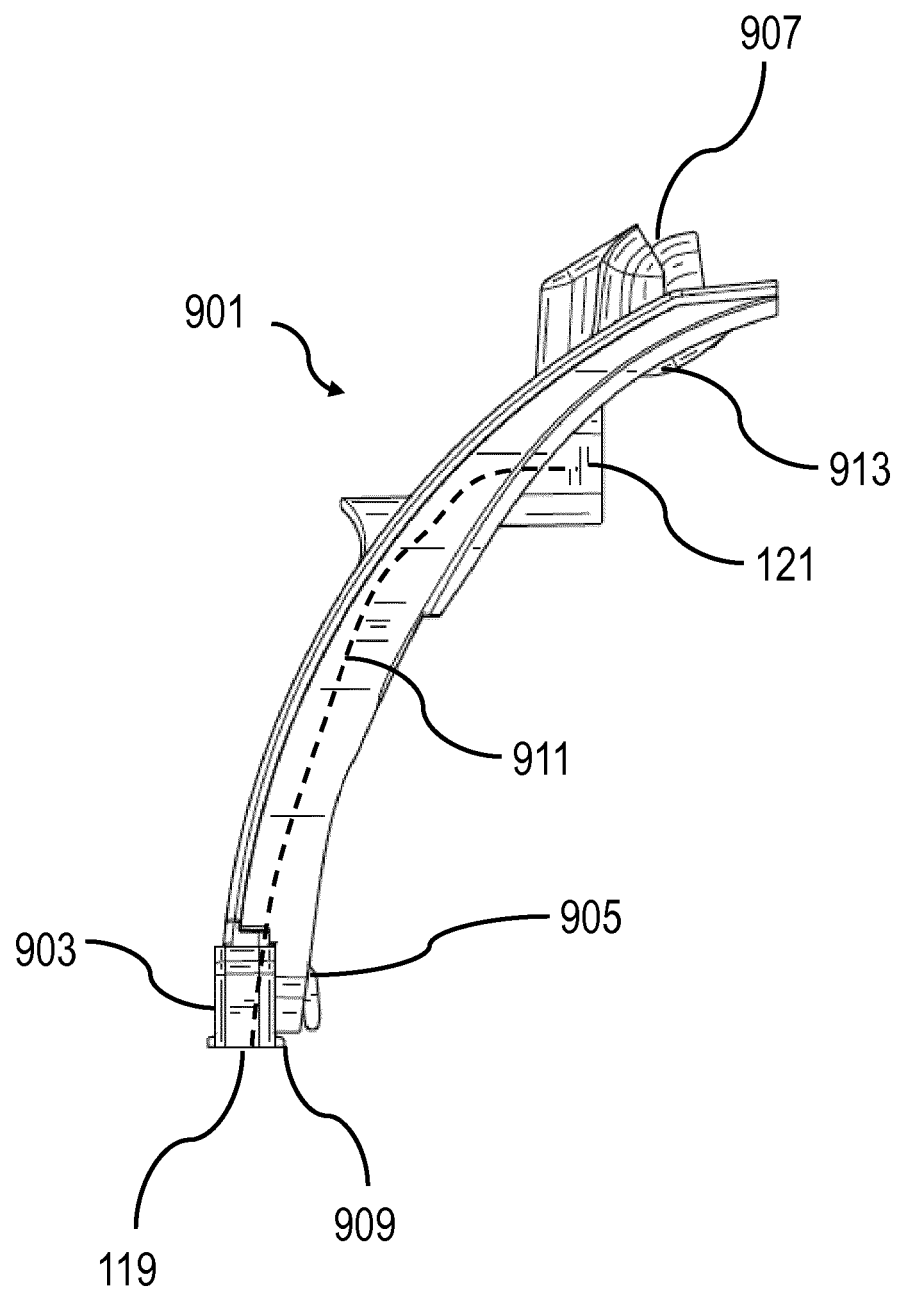


FIG. 10

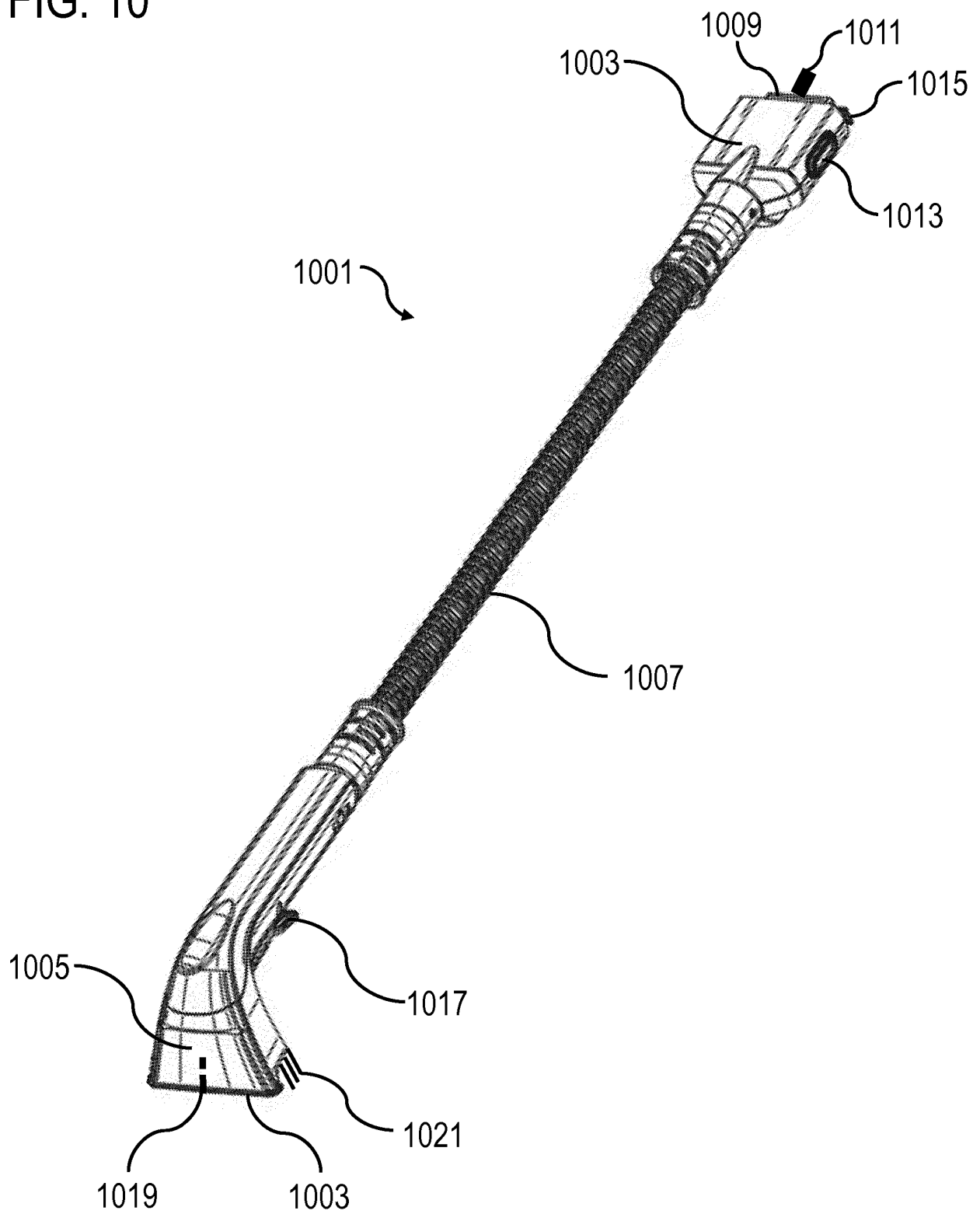


FIG. 11

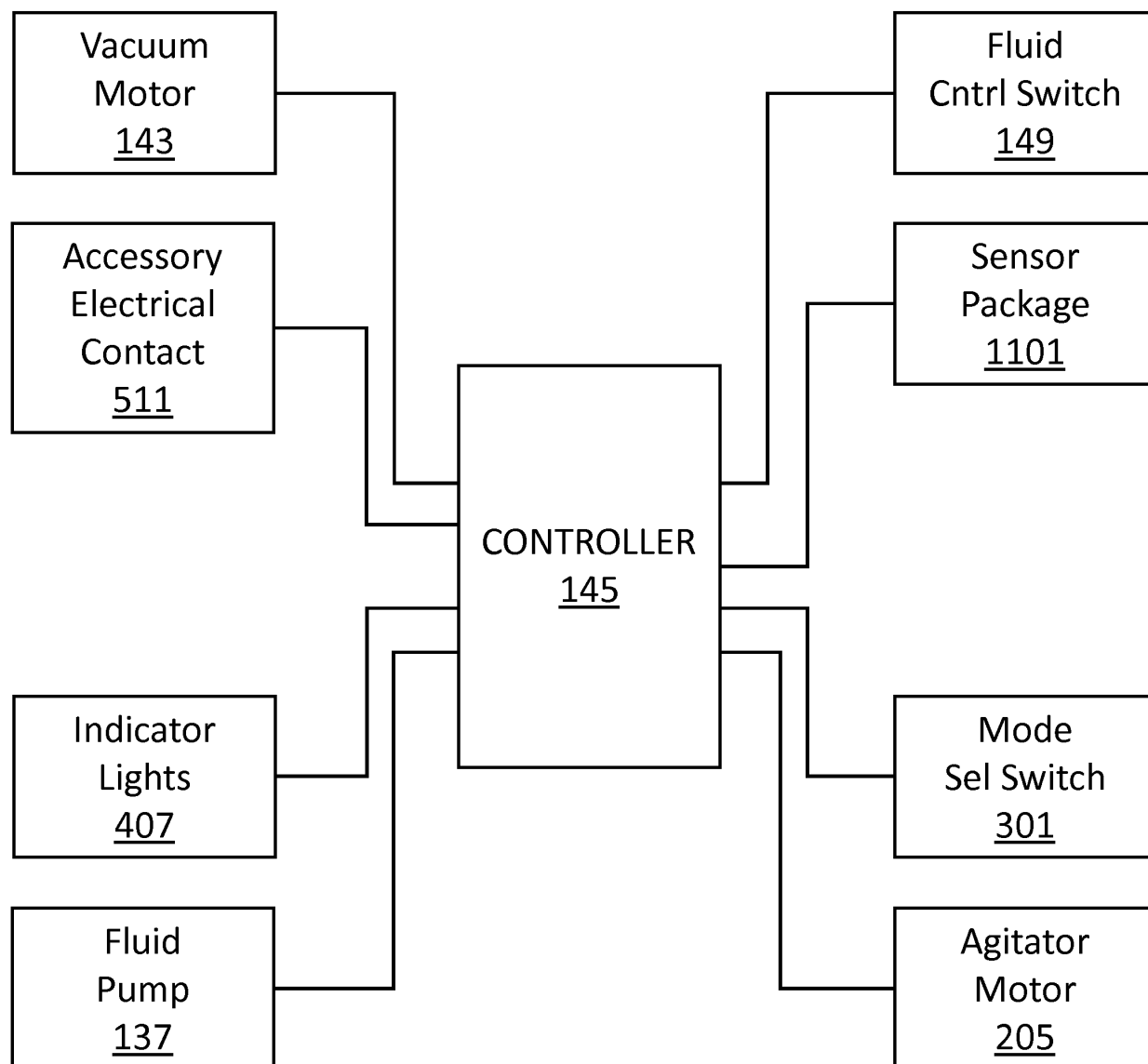


FIG. 12

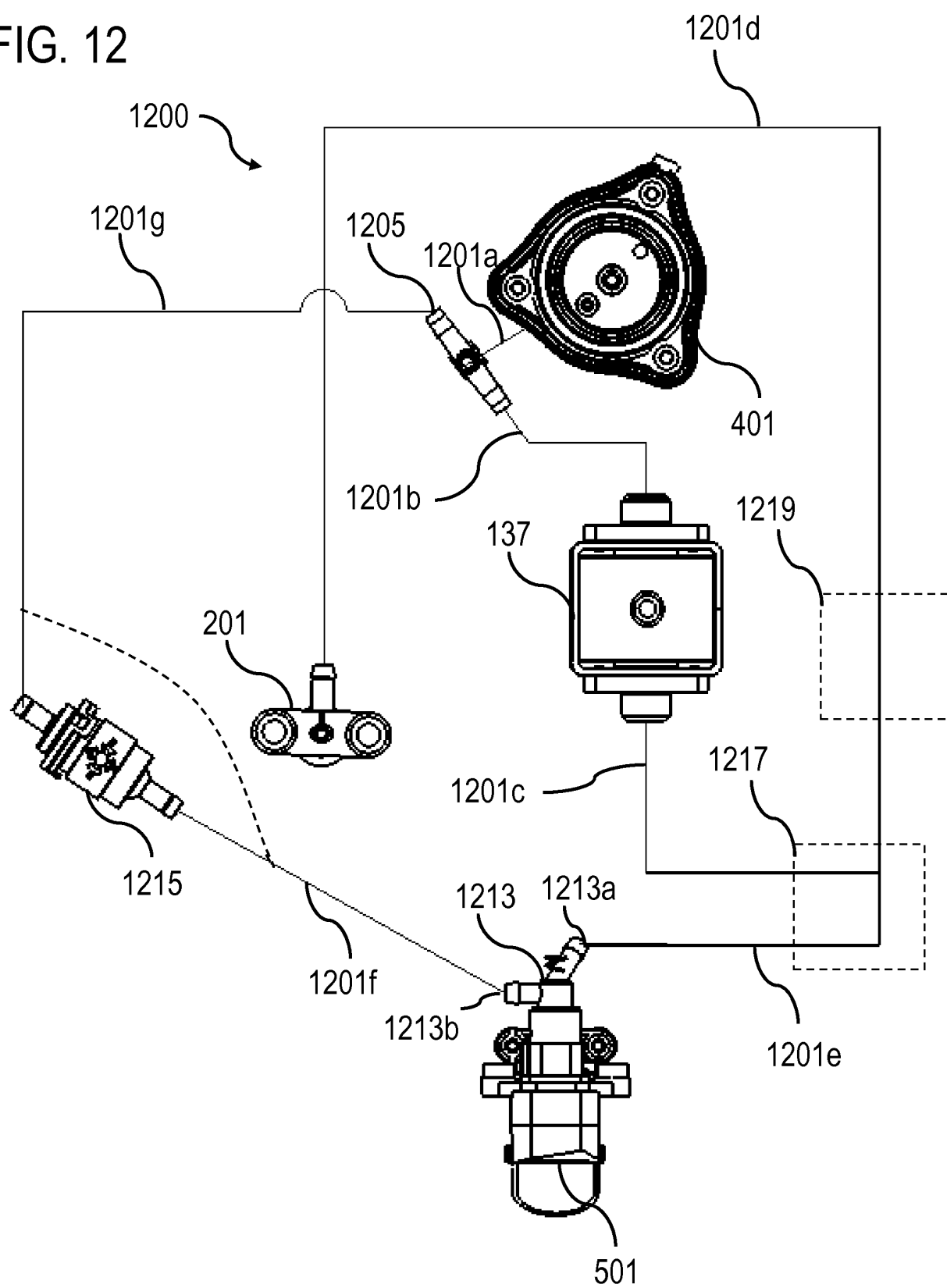


FIG. 13

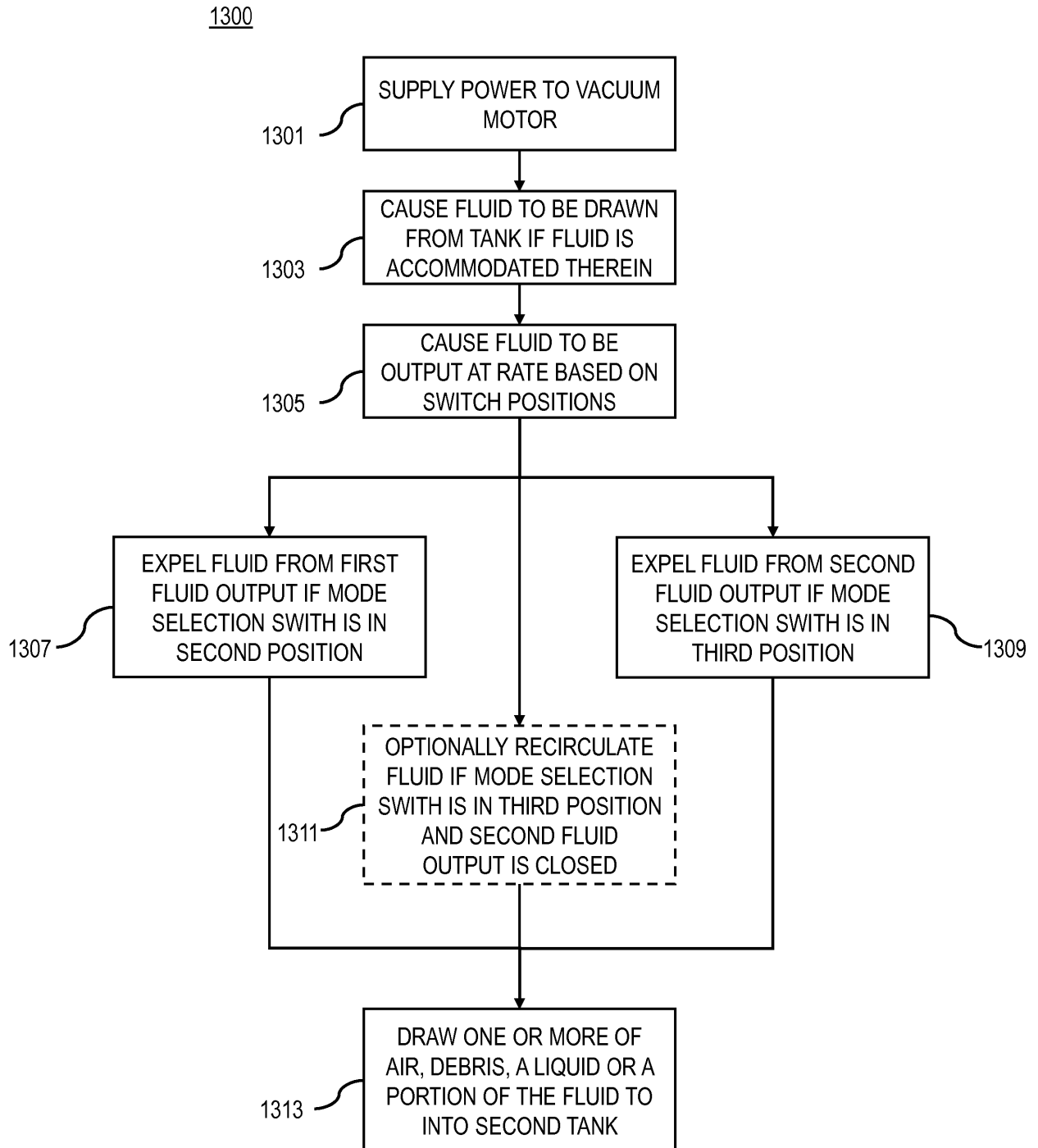
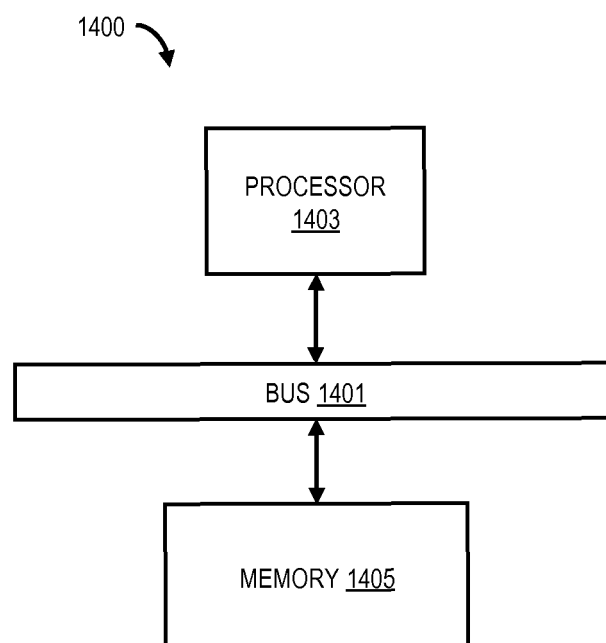


FIG. 14



REFERENCES CITED IN THE DESCRIPTION

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- EP 3102082 A [0001]