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(54) **AUTOMATED HUMAN WASHING SYSTEMS**

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(52) **U.S. Cl.**

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(57) **ABSTRACT**

An automated human washing system includes an enclosure having a base, a midsection, and a top cap. The enclosure has a front door. The system includes liquid dispensing tubes having openings for introducing liquid into the enclosure, and cleaning brushes having lower ends secured to the base. The liquid dispensing tubes are spaced from one another are surround the cleaning brushes. The system has a top cap including first and second top lids. The system has a main water faucet for introducing water into the upper end of the enclosure, a drain for removing liquid from the enclosure, a first engine for pumping liquid through the liquid dispensing tubes into the enclosure, a second engine for moving the elongated cleaning brushes over a top surface of the base, and a control system for operating the human washing system.

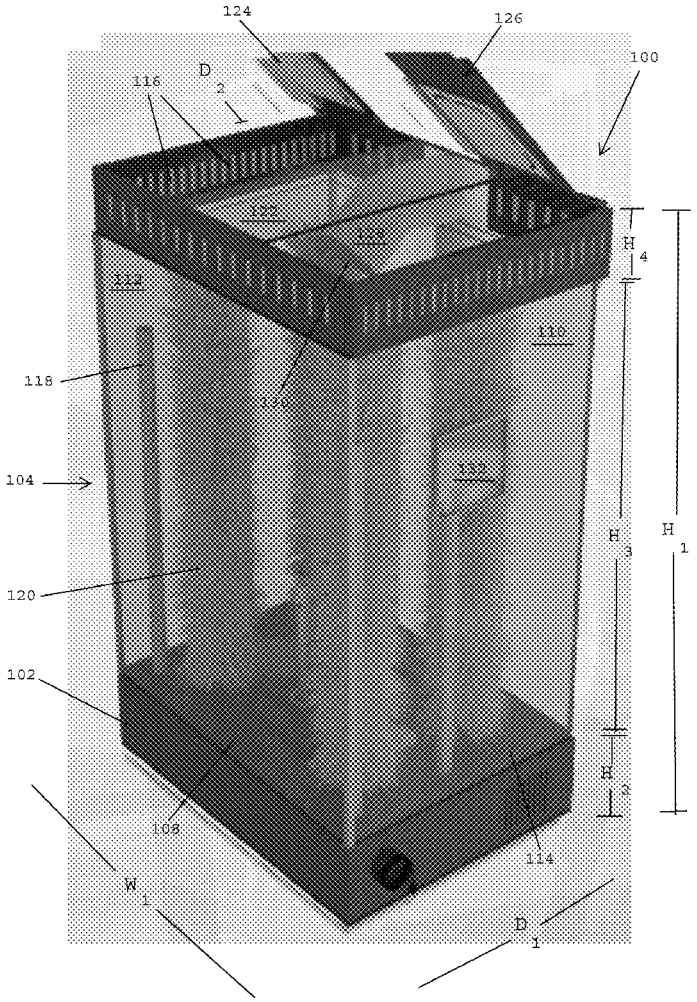
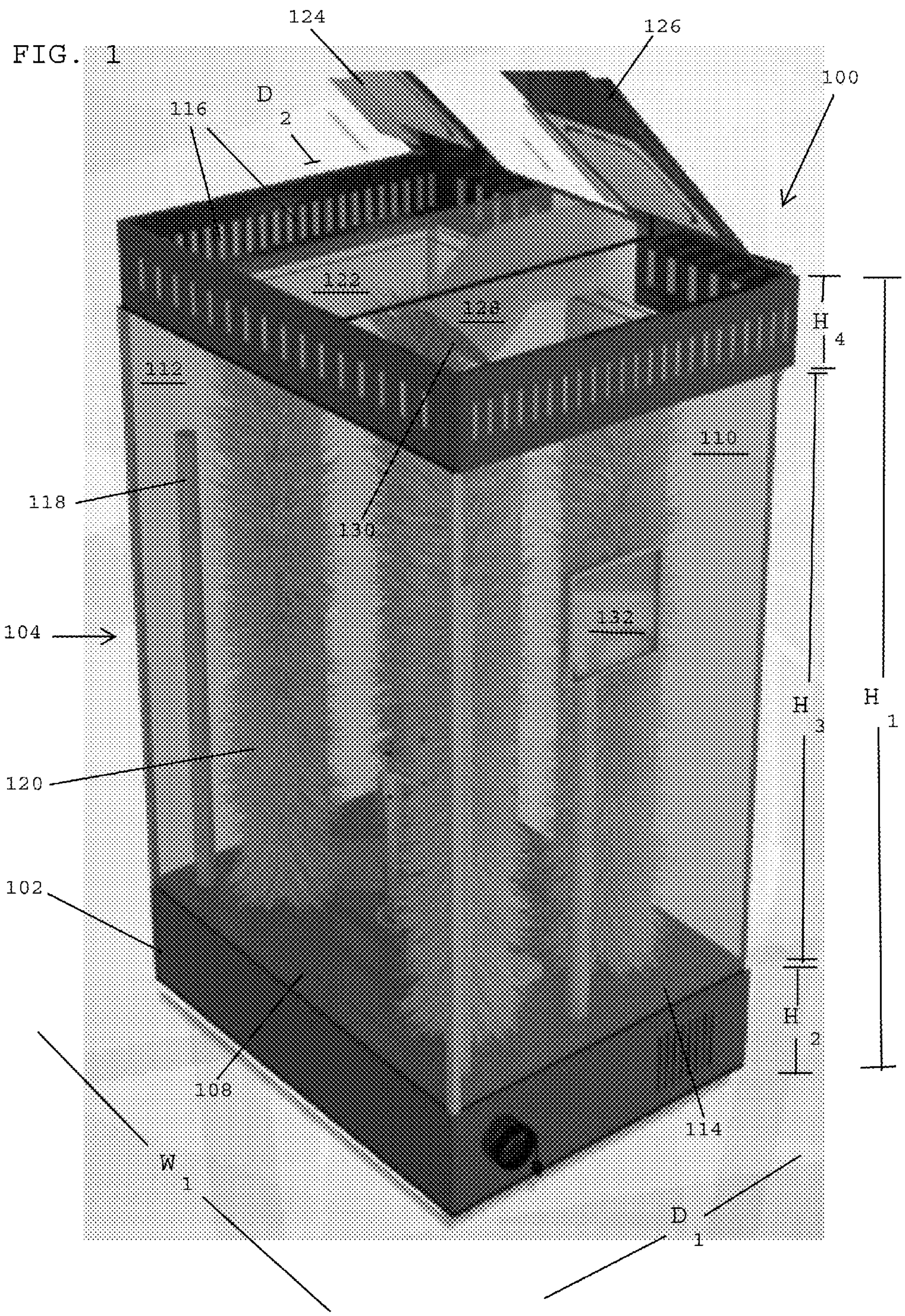


FIG. 1


124
126
100
116
D
2
122
128
112
110
H
4
118
130
132
104
H
3
H
1
120
102
H
2
108
114
W
1
D
1

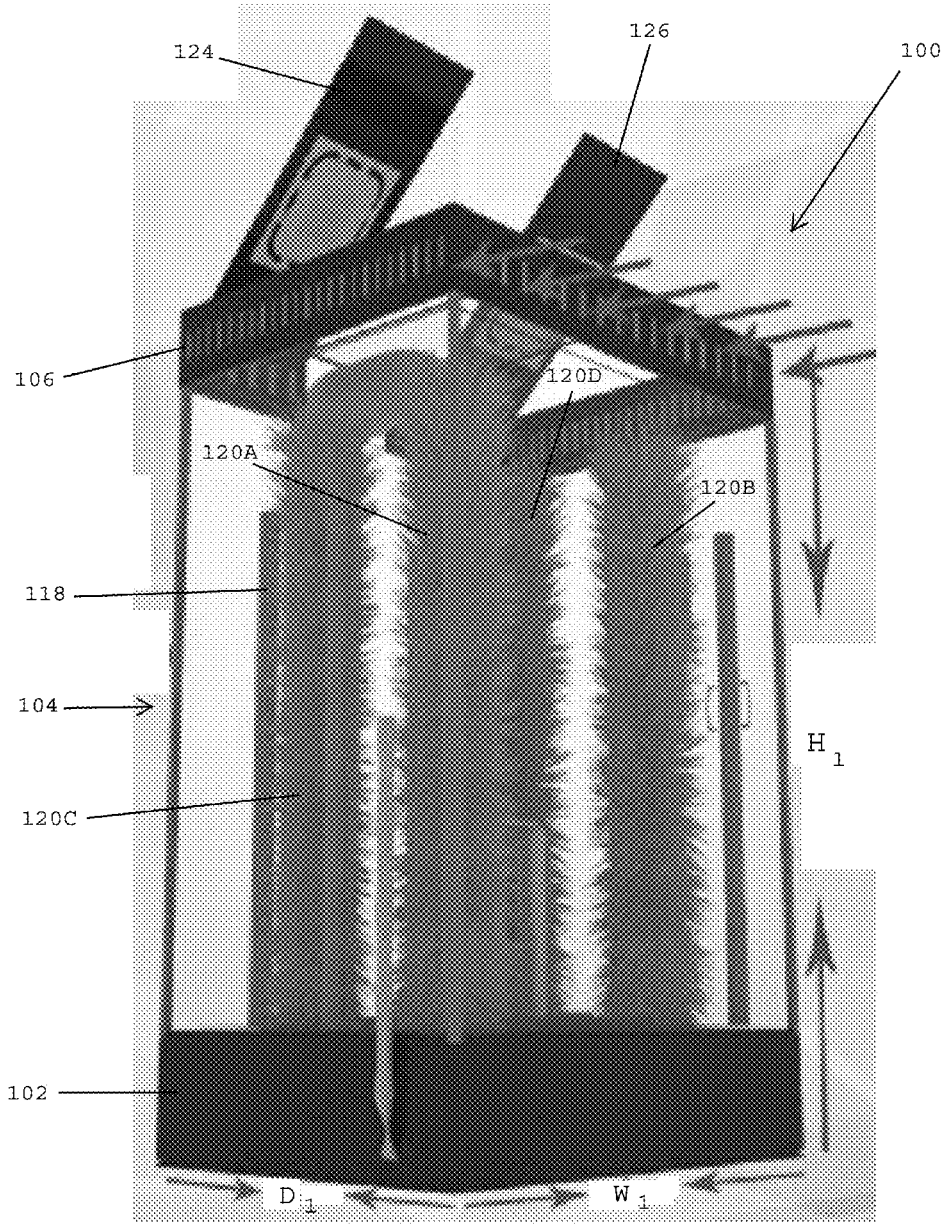


FIG. 2

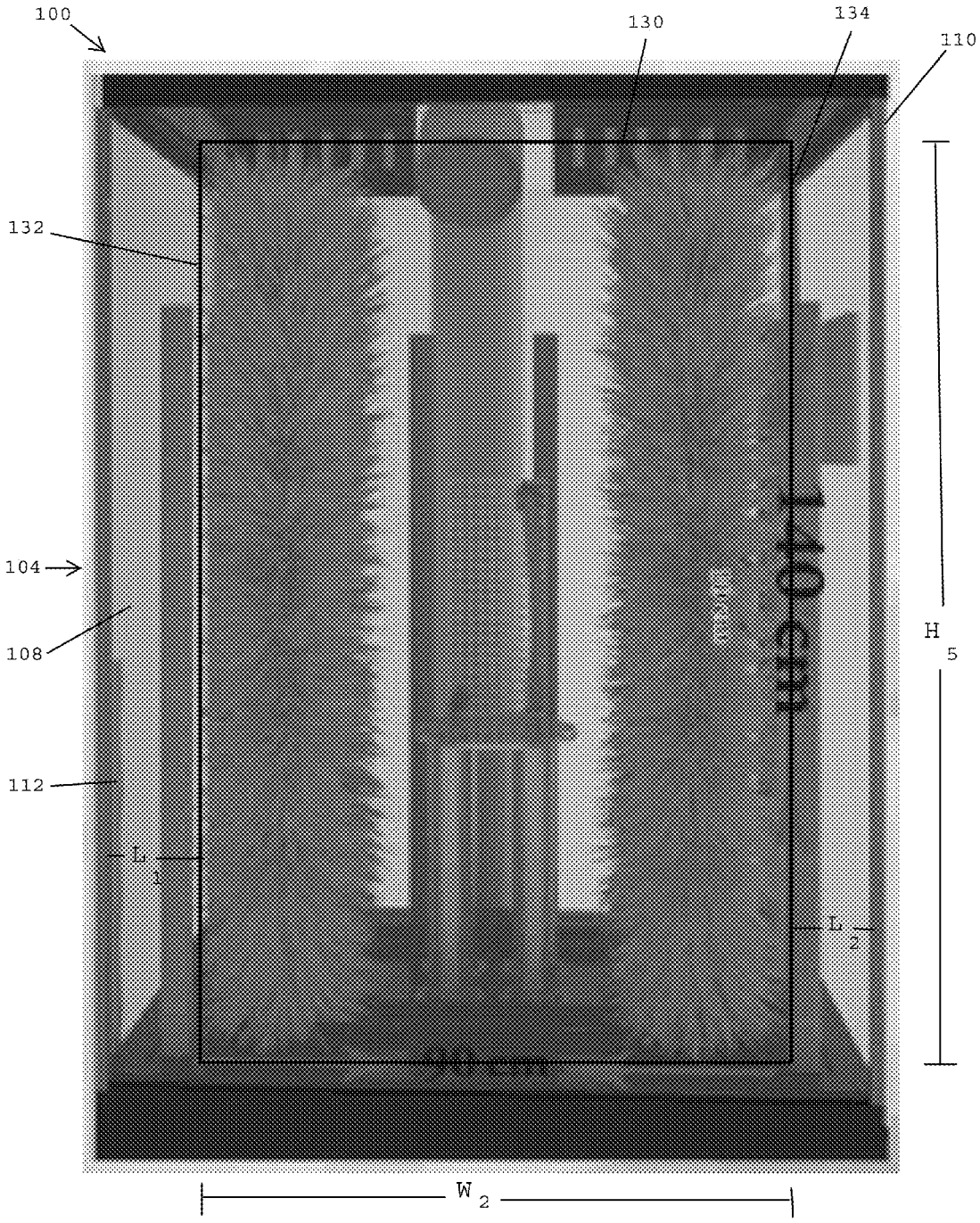


FIG. 3

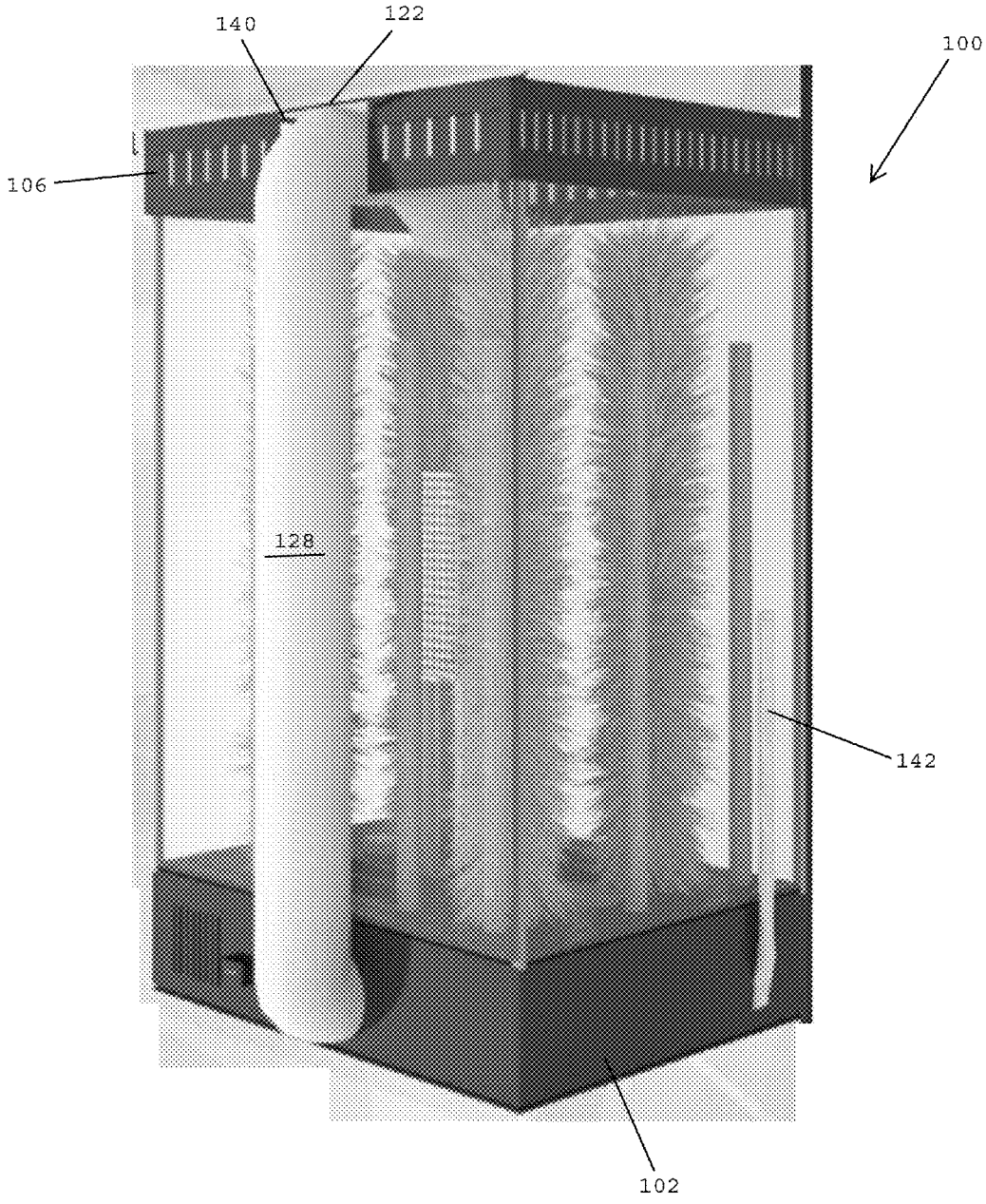


FIG. 4

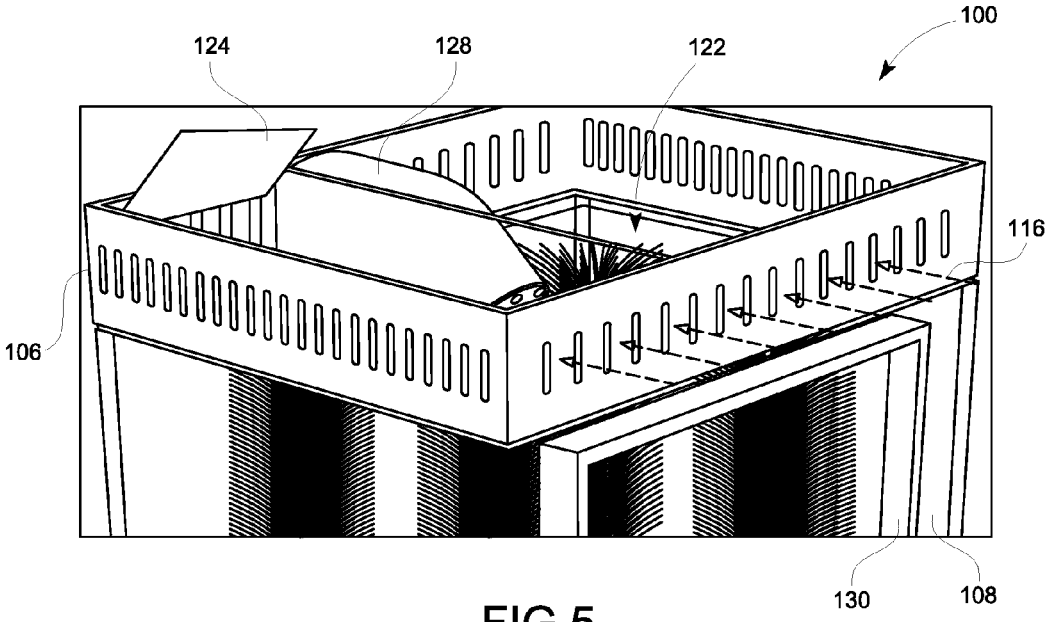


FIG.5

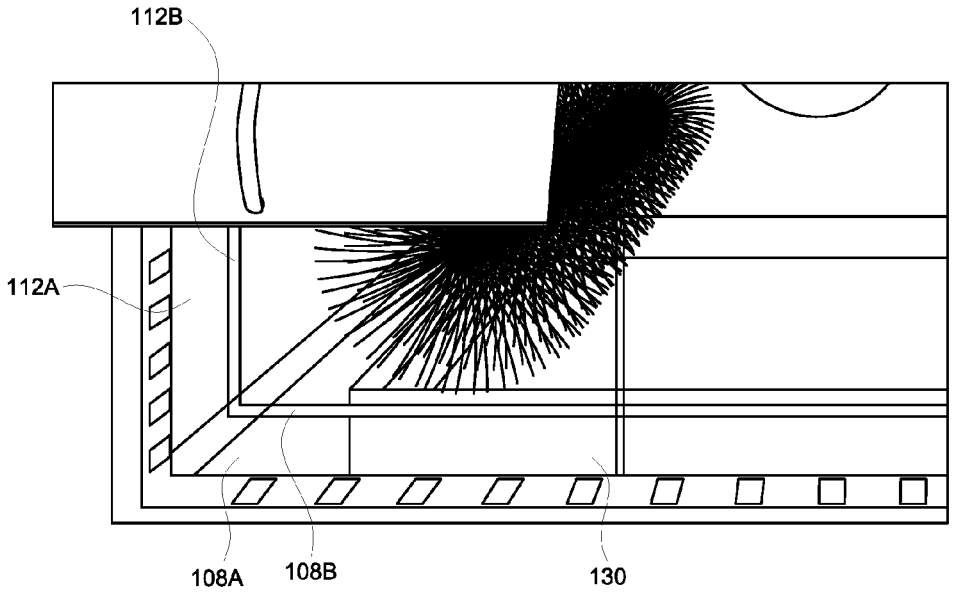


FIG.6

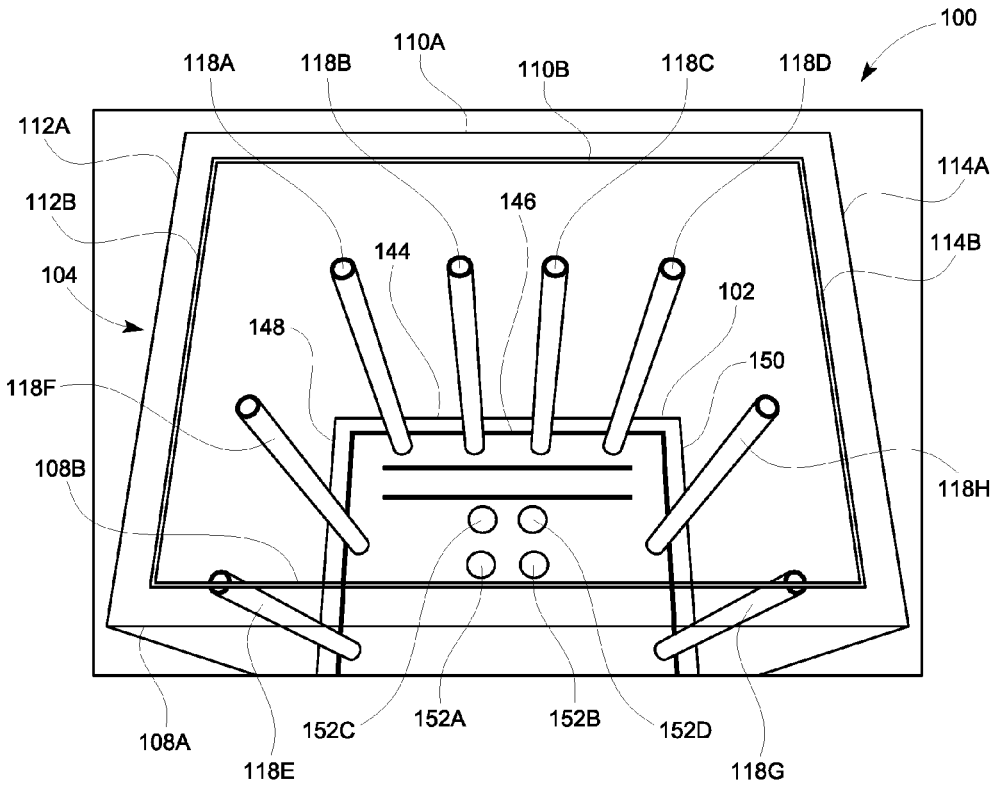

100
110A
118A
118B
110B
118C
118D
112A
114A
112B
146
114B
144
104
102
148
150
118F
118H
108B
108A
152C
152A
152B
152D
118E
118G

FIG.7A

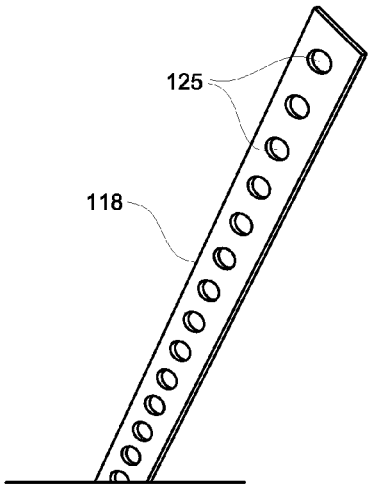

125
118

FIG.7B

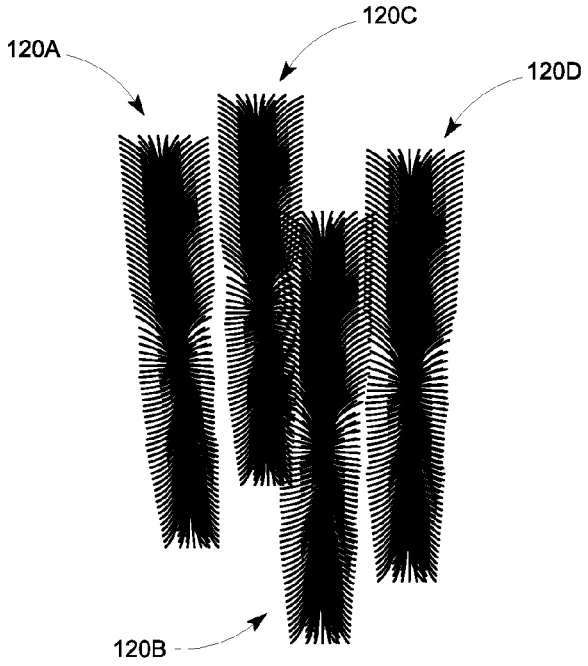


FIG.8

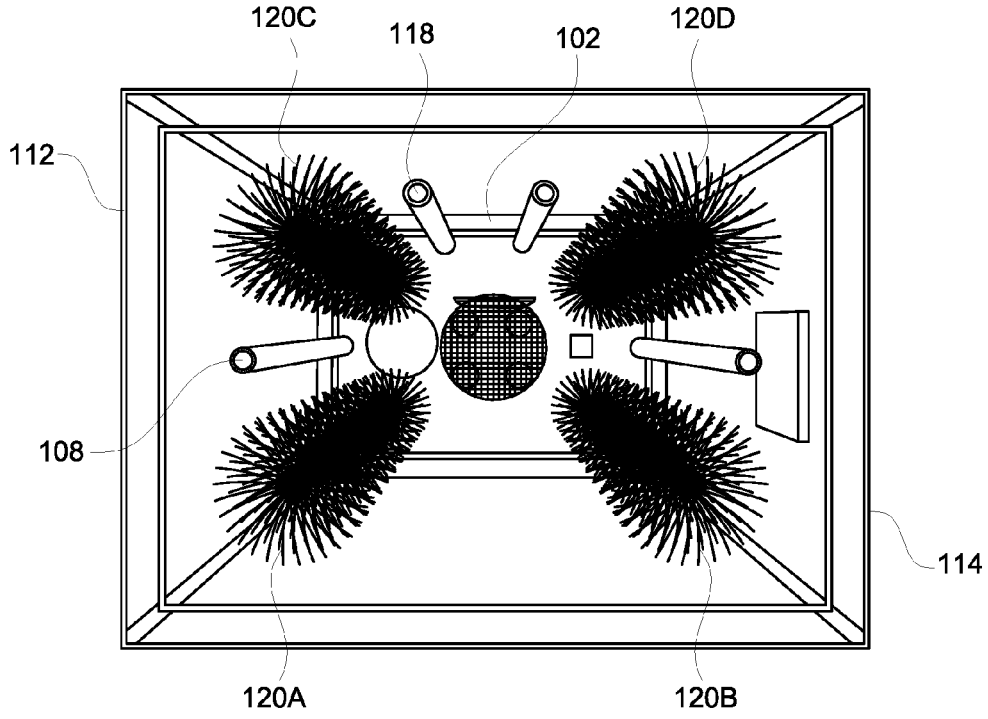


FIG.9

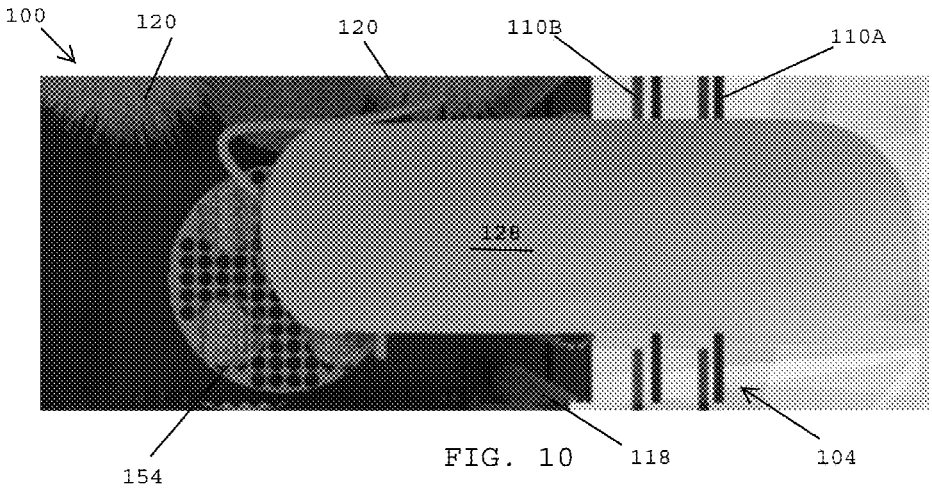

100
120
120
110B
110A
126
154
118
104

FIG. 10

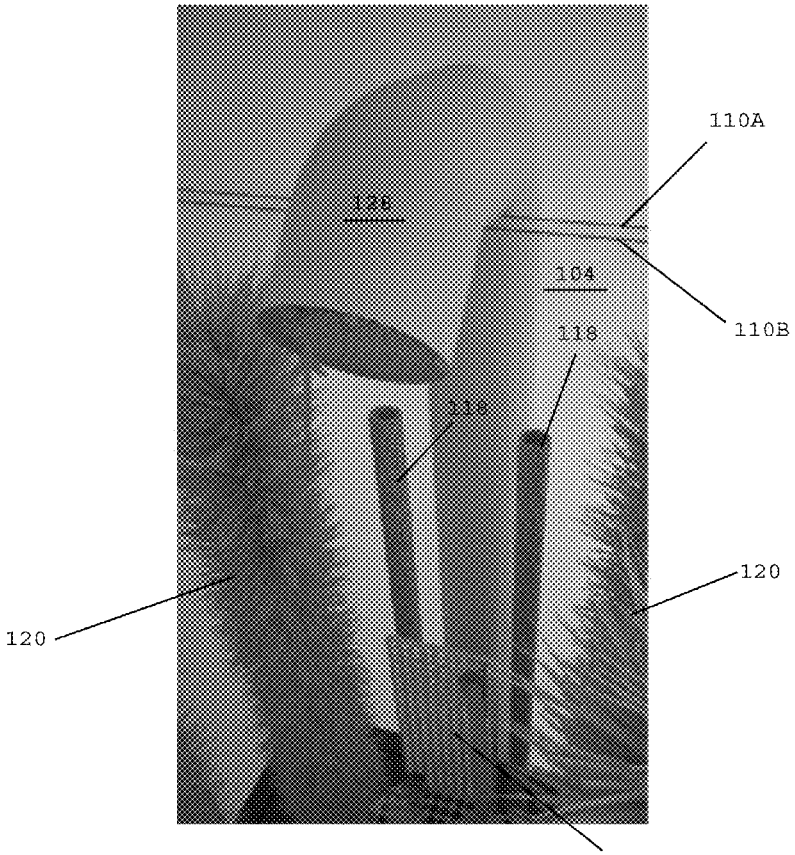

110A
126
104
110B
118
116
120
120
154

FIG. 11

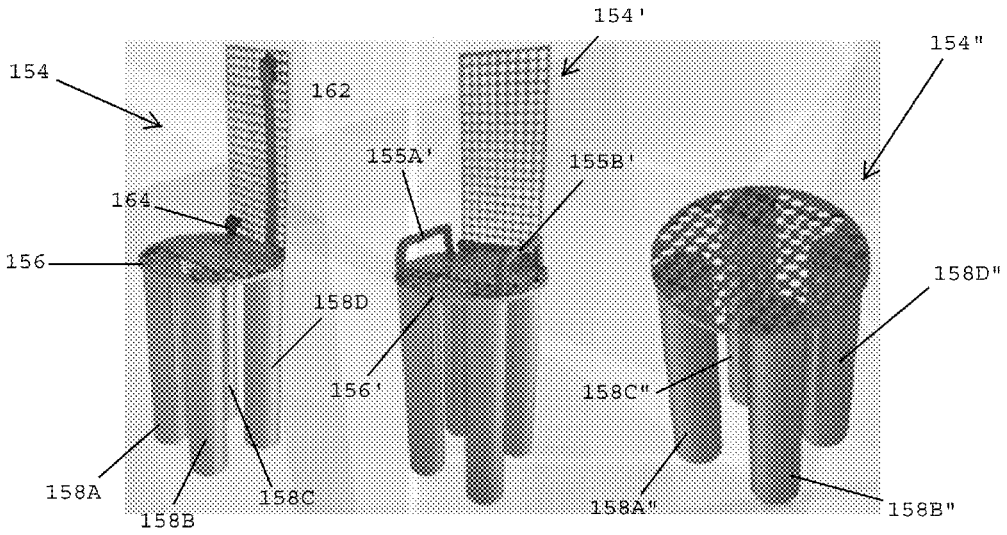


FIG. 12 FIG. 13 FIG. 14

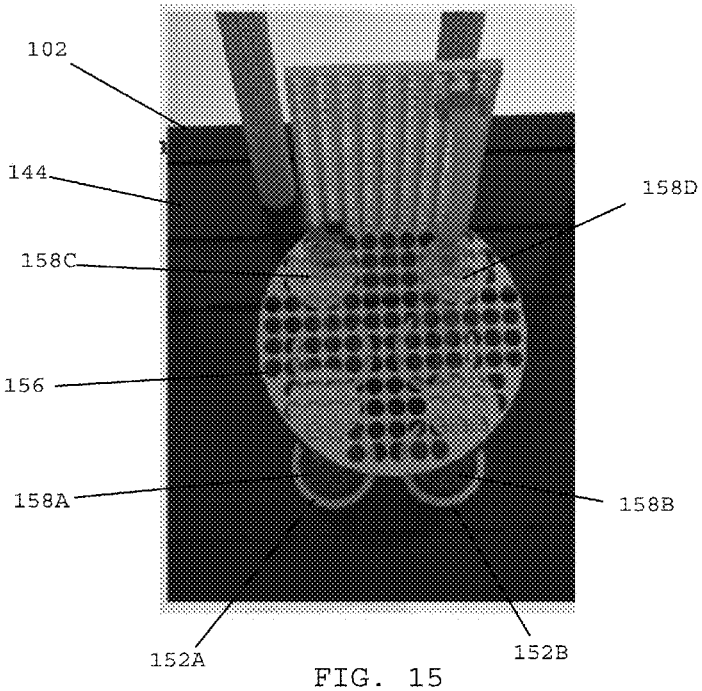


FIG. 15

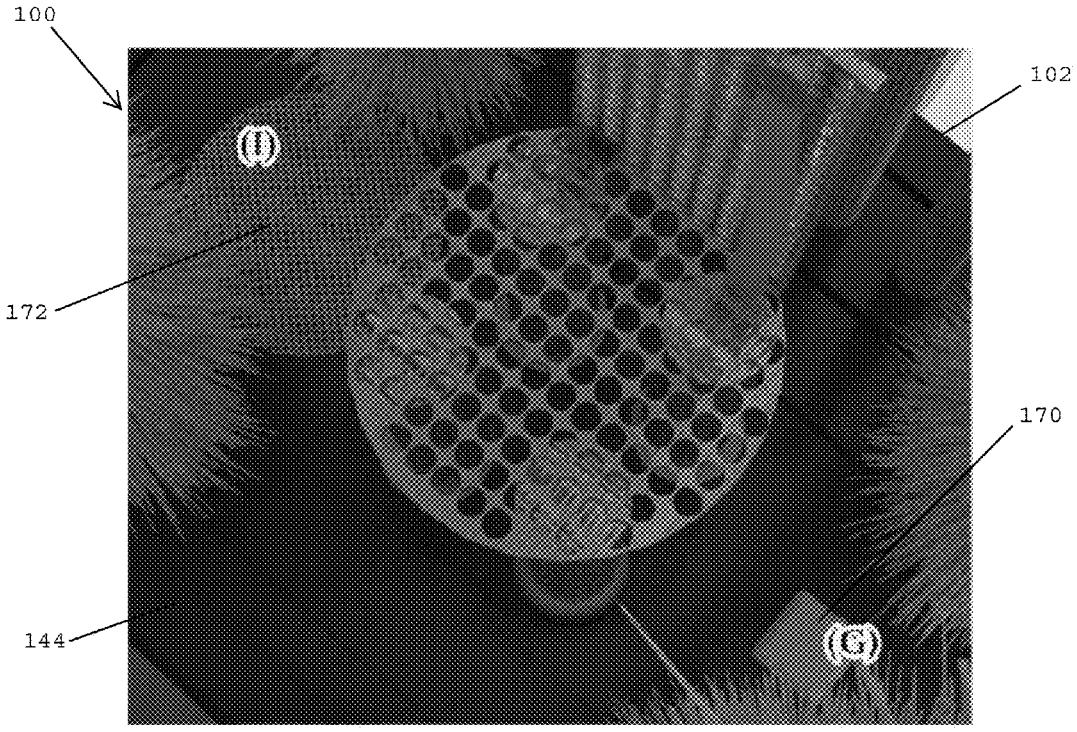


FIG. 16

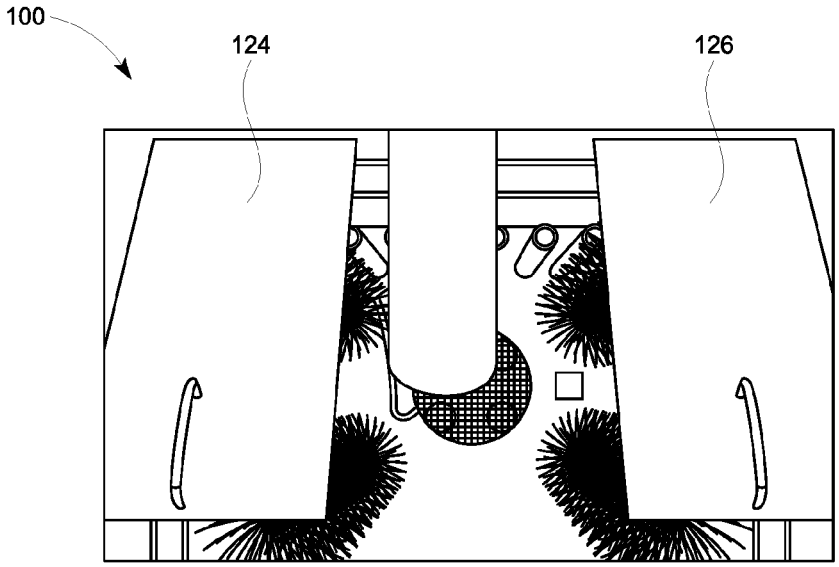


FIG.17A

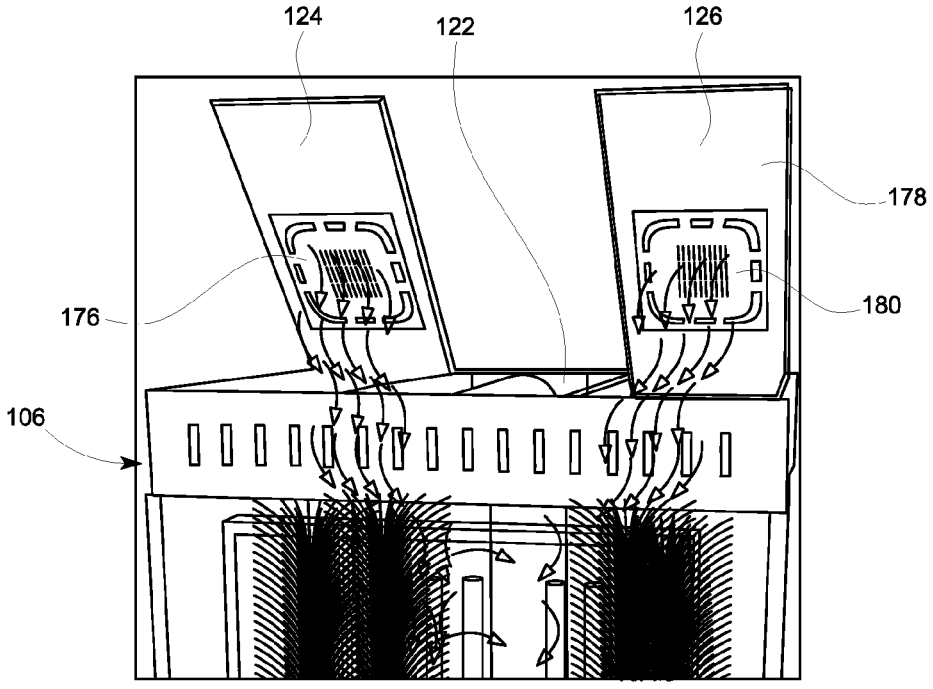


FIG.17B

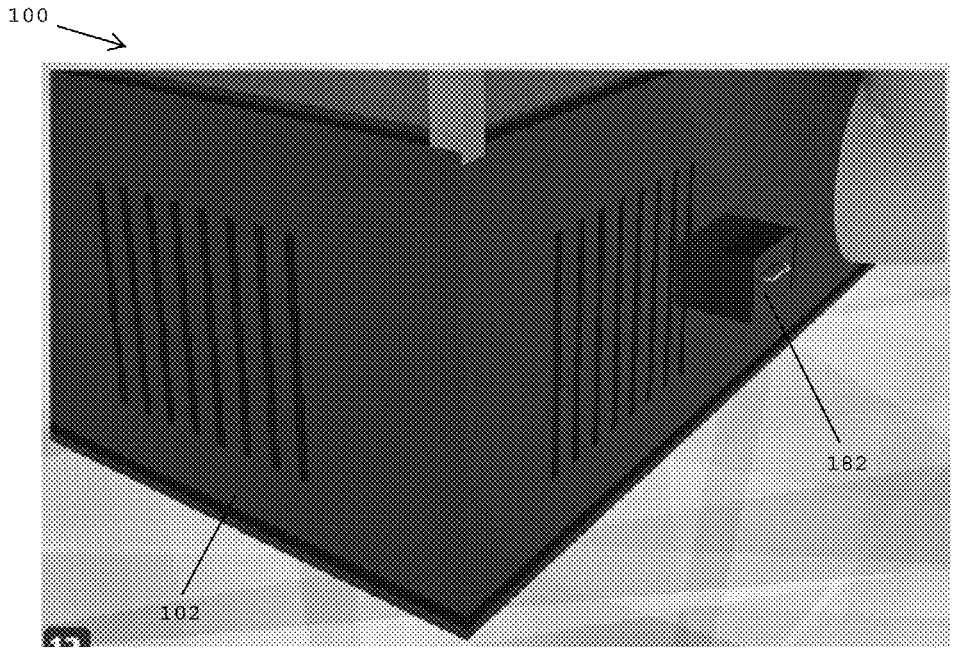


FIG. 18

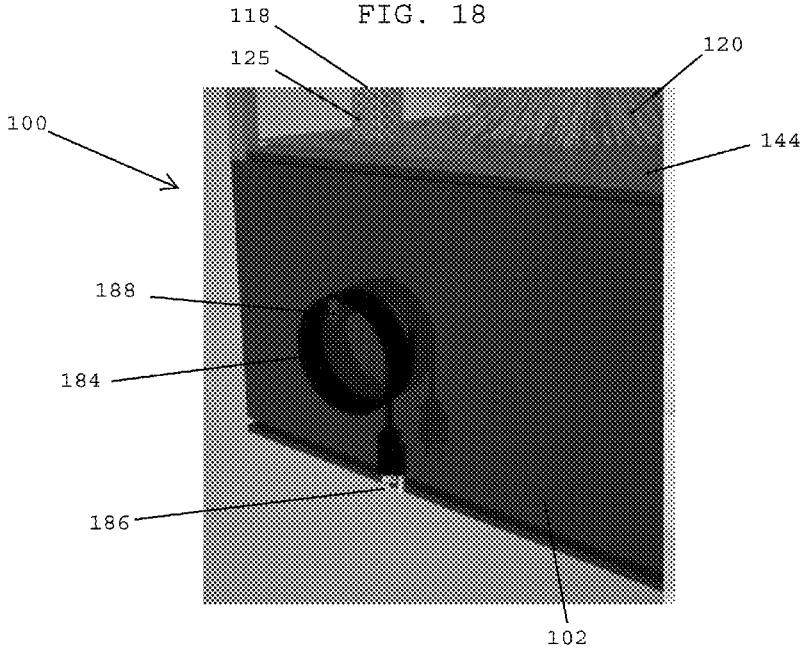


FIG. 19

FIG. 20

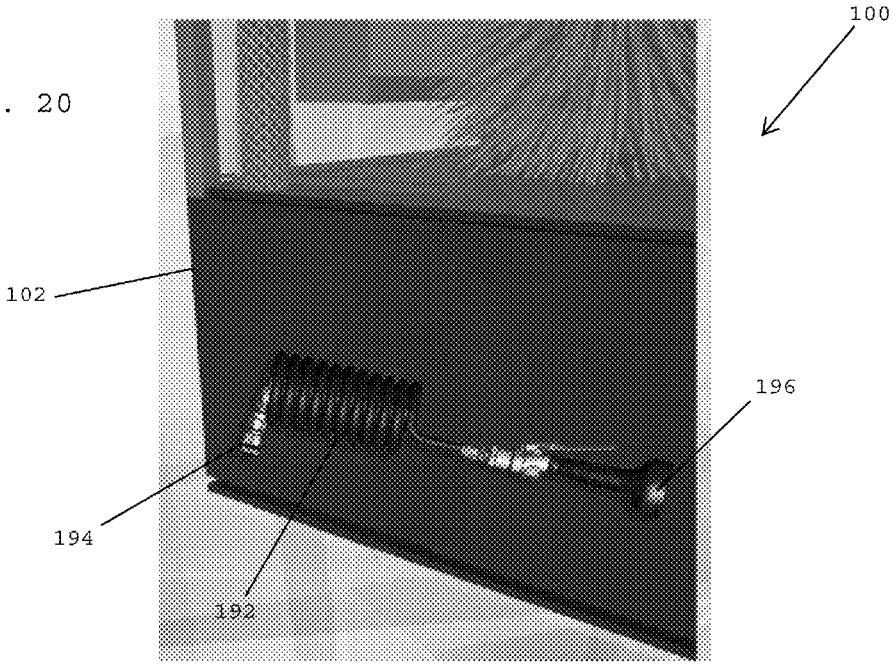
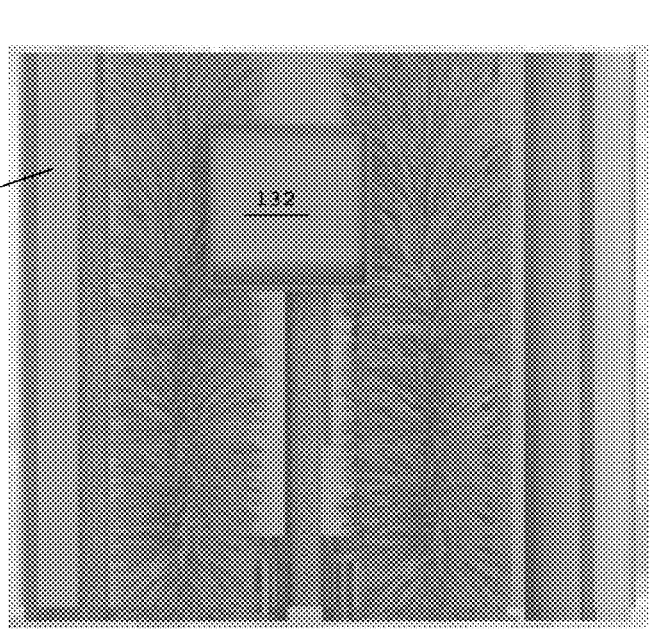


FIG. 21



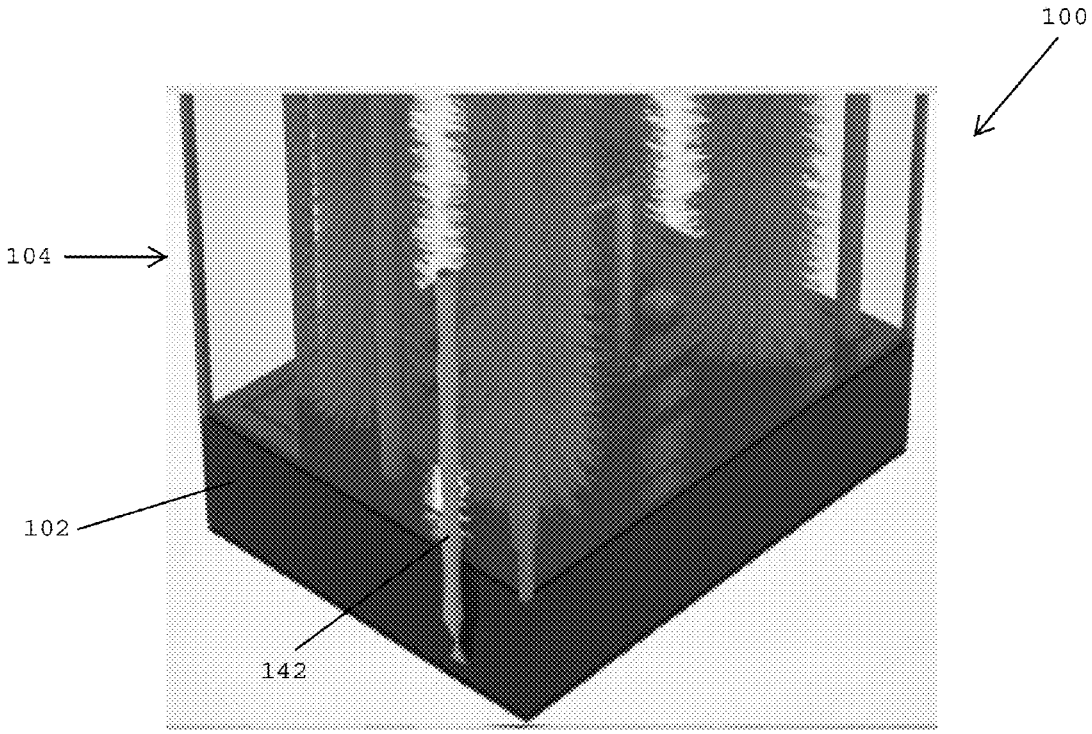


FIG. 22

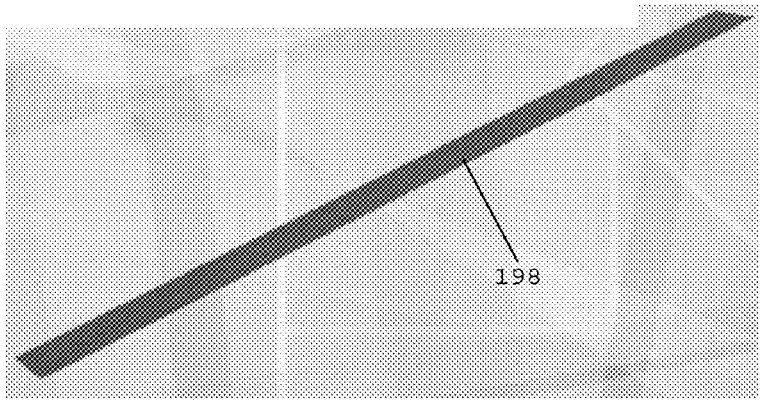


FIG. 23

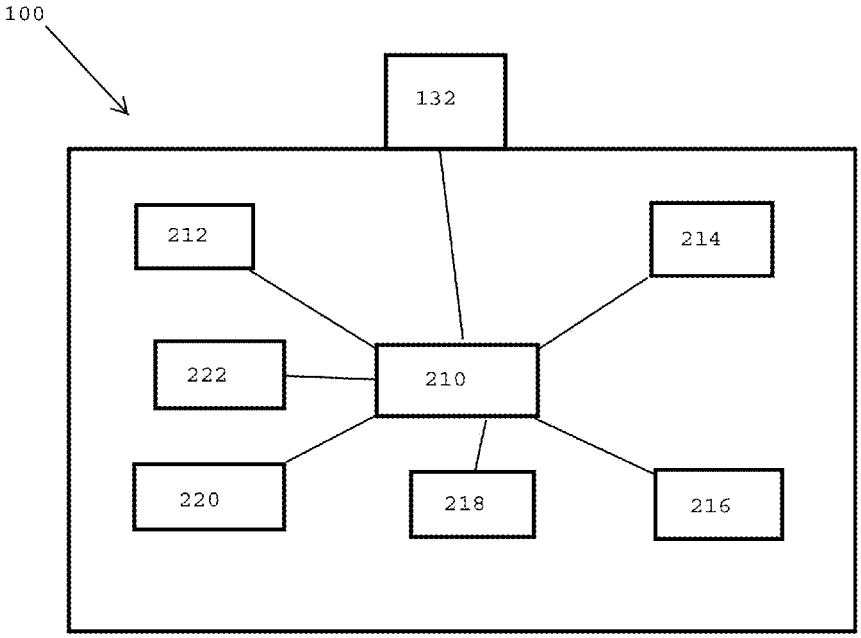


FIG. 24

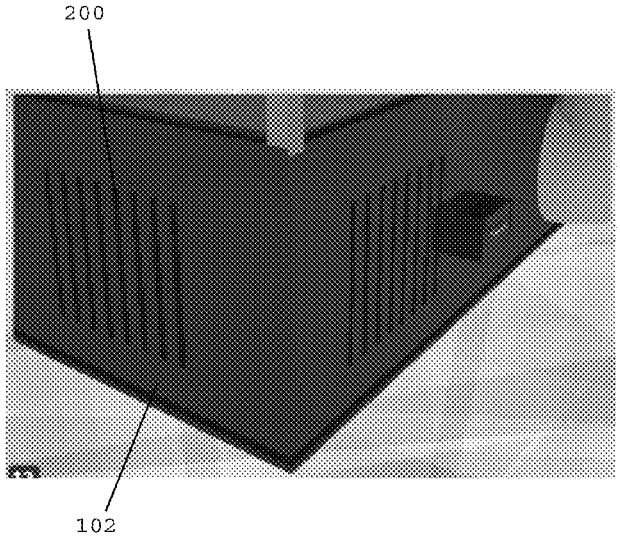


FIG. 25

AUTOMATED HUMAN WASHING SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present patent application claims benefit of U.S. Provisional Application Ser. No. 62/404,845, filed Oct. 6, 2016, the disclosure of which is hereby incorporated by reference herein.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present patent application is generally related to washing and bathing tools for human beings, and is more specifically related to automated systems, devices, and methods for washing and drying human beings.

Description of the Related Art

[0003] There have been a number of developments directed to systems, devices and methods for washing humans and animals. For example, U.S. Pat. No. 5,539,939 to Gesse discloses a bathing apparatus for the infirm or disabled including a portable chair supported on adjustable legs. A depressed intermediate basin portion holds water and can receive the buttocks of a bather. It is provided with a drain at its lowermost portion. One end of the basin portion is connected to an upstanding backrest/headrest. A second end of the basin portion is connected to an elevated horizontal platform which serves as a thigh rest when the buttocks are in the basin in a first mode of operation. In a second mode of operation, the platform serves as a seat so that the user can slide into or out of the basin for less strenuous entry and exit when alone or assisted. A continuous smooth, water resistant surface covers platform, basin and backrest/headrest portions for comfort and ease of maintenance.

[0004] U.S. Pat. No. 7,055,187 to Fields discloses a bathing apparatus for use by disabled bathers, comprises a bathtub and a banister. The bathtub has a ramp and a floor. The ramp descends to the bathtub floor, which slopes gradually toward a drain. The ramp's top is approximately level with the seat of a wheel chair. The banister is coupled to the bathtub and extends over the ramp and floor of the bathtub. The banister has a sloped portion for descending into the bathtub that descends to level portion. The level portion is substantially horizontal for sitting or lying on while bathing. The level portion of the banister is over the floor and its height relative to floor increases as the floor slopes toward the drain. A bather may choose a seat height that is most comfortable by sitting on the level portion farther or closer to the drain. While bathing the bather is stabilized by the banister, feet or knees on the floor of the bathtub.

[0005] US 2017/0099805 to Arab, the disclosure of which is hereby incorporated by reference herein, discloses an automated animal washing system includes a housing having a base, and a wash tub for holding water and an animal cage positioned atop the base. The system has a lid moveable between a closed position for covering an upper end of the wash tub and an open position for providing access to the upper end of the wash tub. The system includes at least one water pipe for introducing water into the wash tub, and a shampoo pipe for introducing shampoo or soap into the wash tub. A rotatable agitator is disposed at the lower end of the wash tub. A drain is also disposed at the lower end of the wash tub for removing water from the wash tub. The animal cage is disposed inside the wash tub. The animal cage has spaced legs that project from a bottom of the cage for spacing the cage away from the rotatable agitator. A control system is disposed in the base for automatically operating the animal washing system.

[0006] In spite of the above advances, there remains a need for improved systems, devices and methods for safely and effectively washing and drying human beings.

SUMMARY OF THE INVENTION

[0007] In one embodiment, an automated human washing system includes an enclosure including a base, a midsection and a top cap. In one embodiment, the enclosure has a front wall having a front door moveable between open and closed positions.

[0008] In one embodiment, the system includes a plurality of liquid dispensing tubes having lower ends secured to the base and upper ends spaced from the base. In one embodiment, each liquid dispensing tube has a plurality of openings adapted for introducing liquid into the enclosure.

[0009] In one embodiment, the system includes a plurality of elongated cleaning brushes having lower ends secured to the base and upper ends spaced from the base.

[0010] In one embodiment, the liquid dispensing tubes are spaced from one another adjacent outer edges of the base, and the elongated cleaning brushes are located inside a perimeter defined by the liquid dispensing tubes.

[0011] In one embodiment, the top cap includes first and second top lids moveable between closed positions for covering an upper end of the enclosure and open positions for providing access to the upper end of the enclosure.

[0012] In one embodiment, the system includes a main water dispensing faucet located between the first and second top lids adjacent an upper end of the enclosure for introducing water into the upper end of the enclosure

[0013] In one embodiment, the system includes a drain located at a lower end of the enclosure for removing liquid from the enclosure.

[0014] In one embodiment, the system has a first engine located in the base for pumping liquid through the liquid dispensing tubes into the enclosure, and a second engine located in the base for moving the elongated cleaning brushes over a top surface of the base.

[0015] In one embodiment, the system has a control system disposed in the base for automatically operating the automated human washing system including controlling the first and second engines.

[0016] In one embodiment, the enclosure has side walls that are transparent. In one embodiment, the enclosure is a double-walled structure. In one embodiment, the lower end of the enclosure forms a water tight seal with the base.

[0017] In one embodiment, the system includes chair leg openings formed in a top surface of the base, and moveable platforms disposed inside the chair leg openings that are configured to move up and down relative to the top surface of the base.

[0018] In one embodiment, the system includes a chair having legs positioned over the top surface of the base. In one embodiment, the legs of the chair are inserted into the chair leg openings, whereby the height of the chair relative

to the top surface of the base is adjustable by moving the moveable platforms up and down within the chair leg openings.

[0019] In one embodiment, the system includes a hot air blower located on an underside of at least one of the first and second top lids. In one embodiment, each top lid has a hot air blower for directing hot, drying air into the enclosure.

[0020] In one embodiment, the first and second top lids open and close independently of one another, whereby the hot air blower has a first hot air blower located on an underside of the first top lid and a second hot air blower located on an underside of the second top lid, and whereby the main water dispensing faucet passes through an opening extending between the first and second top lids.

[0021] In one embodiment, the top cap includes a plurality of spaced vent openings formed in side walls of the top cap.

[0022] In one embodiment, the system includes a water inlet tube coupled with the enclosure and being in communication with the liquid dispensing tubes and the main water dispensing faucet for supplying water to the enclosure. In one embodiment, the system includes a drainage tube coupled with the enclosure and being in communication with a drain for removing water from the enclosure.

[0023] In one embodiment, each liquid dispensing tube extends vertically between the lower and upper ends of the enclosure. In one embodiment, each liquid dispensing tube has a plurality of spaced openings for introducing water into the enclosure.

[0024] In one embodiment, the system includes a solution reservoir located on the base. In one embodiment, the solution reservoir includes at least one of a soap compartment, a shampoo compartment, and a conditioner compartment.

[0025] In one embodiment, the control system includes a central processing unit containing one or more operational protocols for controlling operation of the automated human washing system, one or more memory devices, and circuitry for controlling operation of the automated human washing system.

[0026] In one embodiment, the system has a first engine for controlling movement of the elongated cleaning brushes, a second engine for pumping water into the enclosure of the automated human washing system, and a third engine for pumping solutions selected from the group consisting of soap, shampoo and conditioner into the liquid dispensing tubes of the automated human washing system.

[0027] In one embodiment, the system may include a fourth engine for providing drying hot air and/or high pressure air through the hot air blowers provided on the underside of the first and second top lids. In one embodiment, the system includes a fifth engine including a hydraulic lift for raising and lowering the height of a chair inserted into the chair leg openings provided in the top surface of the base.

[0028] In one embodiment, the system includes cleaning brush slots formed in a top surface of the base. In one embodiment, the lower ends of the elongated cleaning brushes are inserted into the cleaning brush slots, whereby the elongated cleaning brushes are configured to move back and forth over the top surface of the base by moving through the cleaning brush slots. The lower ends of the elongated cleaning brushes may be coupled with a motor for driving the movement of the cleaning brushes over a path. The path may be reciprocating.

[0029] In one embodiment, an automated human washing system preferably includes an enclosure including a base, a midsection and a top cap, the enclosure including a front wall having a front door moveable between open and closed positions.

[0030] In one embodiment, the system includes a plurality vertically extending tubes having lower ends secured to the base, whereby each vertically extending tube has a plurality of openings adapted for introducing liquid into the enclosure.

[0031] In one embodiment, the system includes a plurality of vertically extending, elongated cleaning brushes having lower ends secured to the base, whereby the vertically extending tubes are spaced from one another for defining an outer perimeter, and whereby the vertically extending, elongated cleaning brushes are located inside the outer perimeter defined by the vertically extending tubes

[0032] In one embodiment, the top cap has first and second top lids moveable between closed positions for covering an upper end of the enclosure and open positions for providing access to the upper end of the enclosure.

[0033] In one embodiment, the system has a main water dispensing faucet located between the first and second top lids for introducing water into the upper end of the enclosure, and a drain located at a lower end of the enclosure for removing liquid from the enclosure.

[0034] In one embodiment, the system has an engine located in the base for moving the elongated cleaning brushes over a top surface of the base, and a control system disposed in the base for automatically operating the human washing system including controlling the engine.

[0035] These and other preferred embodiments of the present invention will be described in more detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0036] FIG. **1** shows a perspective view of an automated human washing system, in accordance with one embodiment.

[0037] FIG. **2** shows another perspective view of the automated human washing system of FIG. **1**

[0038] FIG. **3** shows a front view of an automated human washing system, in accordance with one embodiment.

[0039] FIG. **4** shows a rear perspective view of the automated human washing system of FIG. **3**.

[0040] FIG. **5** shows an upper end of an automated human washing system, in accordance with one embodiment.

[0041] FIG. **6** shows a top view of an automated human washing system, in accordance with one embodiment.

[0042] FIG. **7**A shows a top perspective view of an automated human washing system, in accordance with one embodiment.

[0043] FIG. **7**B shows a perspective view of a liquid dispensing tube, in accordance with one embodiment.

[0044] FIG. **8** shows cleaning brushes for an automated human washing system, in accordance with one embodiment.

[0045] FIG. **9** shows the cleaning brushes of FIG. **8** assembled with a base of an automated human washing system, in accordance with one embodiment.

[0046] FIG. **10** shows a top view of a main water faucet for an automated human washing system, in accordance with one embodiment.

[0047] FIG. **11** shows a perspective view of an upper end of a main water faucet for an automated human washing system, in accordance with one embodiment.

[0048] FIG. **12** shows a perspective view of a chair for an automated human washing system, in accordance with one embodiment.

[0049] FIG. **13** shows a perspective view of a second chair for an automated human washing system, in accordance with one embodiment.

[0050] FIG. **14** shows a perspective view of a third chair for an automated human washing system, in accordance with one embodiment.

[0051] FIG. **15** shows a top view of a chair secured to a base of an automated human washing system, in accordance with one embodiment.

[0052] FIG. **16** shows a top view of a chair secured to a base of an automated human washing system, in accordance with one embodiment.

[0053] FIG. **17**A shows a top cap of an automated human washing system having first and second top lids, in accordance with one embodiment.

[0054] FIG. **17**B shows the top cap of the automated human washing system of FIG. **17**A with the first and second top lids in an open position, in accordance with one embodiment.

[0055] FIG. **18** shows a perspective view of a base of an automate human washing system, in accordance with one embodiment.

[0056] FIG. **19** shows another perspective view of the base of the automated human washing system of FIG. **18**.

[0057] FIG. **20** shows a perspective view of a base of an automated human washing system, in accordance with one embodiment.

[0058] FIG. **21** shows a controller for an automated human washing system, in accordance with one embodiment.

[0059] FIG. **22** shows a perspective view of a lower end of an automated human washing system including a drainage tube, in accordance with one embodiment.

[0060] FIG. **23** shows a ramp for an automated human washing system, in accordance with one embodiment.

[0061] FIG. **24** shows a schematic view of a control system including engines for an automated human washing system, in accordance with one embodiment.

[0062] FIG. **25** shows a perspective view of a base at a lower end of a human washing machine, in accordance with one embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0063] Referring to FIG. **1**, in one embodiment, an automated human washing system **100** has a base **102**, a midsection **104** (e.g., an enclosed area occupied by a human for bathing), and a cap **106** that is secured to an upper end of the midsection **104**. In one embodiment, the midsection is a transparent midsection that is clear and/or allows visibility into and out of the automated human washing system. In one embodiment, the automated human washing system **100** preferably defines a rectangular shaped structure having a height H_1 of about 75-80 inches and more preferably about 78.74 inches, a width W_1 of about 45-50 inches and more preferably about 47.24 inches, and a depth D_1 of about 30-40 inches and more preferably 35.43 inches.

[0064] In one embodiment, the base **102** preferably defines a height H_2 of about 10-12 inches and more preferably 11.81 inches. In one embodiment, the transparent midsection **104** has a height H_3 of about 50-60 inches and more preferably about 59.05 inches. In one embodiment, the top cap **106** has a height H_4 of about 7-9 inches and more preferably about 7.87 inches.

[0065] In one embodiment, the base **102** and the top cap **106** are opaque and the transparent midsection **104** is clear so that the interior of the automated human washing system may be observed through the transparent midsection, and so that light may pass through the side walls of the midsection.

[0066] In one embodiment, the automated human washing system **100** preferably includes four transparent walls that extend between the base **102** and the top cap **106**. In one embodiment, the four transparent walls include a front wall **108**, a rear wall **110**, a left side wall **112**, and a right side wall **114**. The four walls **108**, **110**, **112**, **114** preferably are connected together and form a unitary structure that extends between the base **102** and the top cap **106**. In one embodiment, the transparent midsection comprises a double-walled enclosure.

[0067] In one embodiment, the top cap **106** defines a frame that extends around the upper ends of the four walls **108**, **110**, **112**, **114**. In one embodiment, the top cap **106** preferably includes vent openings **116** that extend around the perimeter of the top cap **106** for enabling air to pass into and out of the automated human washing system **100**. In one embodiment, the vent openings extend vertically and are spaced from one another by a distance D_2 of about 1.5-2.5 inches and more preferably about 1.96 inches.

[0068] In one embodiment, the automated human washing system **100** includes a plurality of liquid dispensing tubes **118** that are positioned inside the automated human washing system. In one embodiment, the liquid dispensing tubes **118** extend vertically within the automated human washing system **100** and have a plurality of openings **125** (FIG. **7**B) provided along the length thereof for dispensing liquid such as water and shampoo into the interior of the automated human washing system. The openings in the liquid dispensing tubes may be provided on the sides of the respective tubes that face toward an occupant or may be spaced completely around the outer surfaces of the tubes.

[0069] In one embodiment, the automated human washing system **100** includes cleaning brushes **120** that are located inside the automated human washing system **100** for cleaning a human being. In one embodiment, the cleaning brushes **120** are adapted to move through tracks provided in the base **102** for cleaning a human being. The movement of the cleaning brushes may be driven by a motor located in the base to provide a back and forth scrubbing movement for cleaning a human being disposed inside the automated human washing system.

[0070] In one embodiment, the automated human washing system **100** includes a top panel **122** that extends between a front edge and a rear edge of the top cap **106**. In one embodiment, the top panel **122** is transparent for providing visibility therethrough.

[0071] In one embodiment, the automated human washing system **100** preferably includes a first top lid **124** having a rear edge hingedly connected with the rear of the top cap **106**. The first top lid **124** is adapted to swing between an open position for providing access to the top of the automated human washing system and a closed position for covering the upper end of the top cap **106** of the automated human washing system. In one embodiment, the automated

human washing system **100** includes a second top lid **126** having a rear edge that is hingedly connected with a rear of the top cap **106** for moving between an open position for providing access to the top of the automated human washing system and a closed position for closing the upper end of the top cap **106**.

[0072] In one embodiment, the automated human washing system **100** includes a main water dispensing faucet **128** having an opening **130** that is adapted to dispense liquid, such as water, onto a top of a human being positioned within the automated human washing system **100**.

[0073] In one embodiment, the automated human washing system **100** includes a control panel **132** that may be engaged by an operator for controlling the operation of the automated human washing system **100**.

[0074] Referring to FIG. **2**, in one embodiment, the automated human washing system **100** preferably includes four cleaning brushes **120**A-**120**D having lower ends that are secured within tracks located on the base **102**. The four cleaning brushes **120**A-**120**D are preferably disposed inside the four transparent walls of the transparent midsection **104**. In one embodiment, the four cleaning brushes **120**A-**120**D are disposed inside an outer perimeter defined by the liquid dispensing tubes **118**.

[0075] In one embodiment, the top cap **106** preferably includes a plurality of vent holes **116** for enabling air to pass into and out of the automated human washing system when the first and second top lids **124**, **126** are moved into the closed position.

[0076] Referring to FIG. **3**, in one embodiment, the automated human washing system **100** includes a front door **130** that is formed in the front wall **108** of the transparent midsection **104**. In one embodiment, the front wall **130** is transparent for providing visibility into the interior of the automated human washing system **100**. In one embodiment, the front door **130** has a height H_5 of about 50-60 inches and more preferably about 55.11 inches and a width W_2 of about 30-40 inches and more preferably about 35.43 inches. In one embodiment, the door **130** is hinged on the left side **132** thereof and is adapted to open to the outside of the automated human washing system **100**. In one embodiment, the left side **132** of the door **130** is spaced a length L_1 of about 5-6 inches and more preferably about 5.90 inches from the transparent left wall **112**. In one embodiment, the door **130** has a right side **134** that is spaced a distance L_2 of about 5-6 inches and more preferably about 5.90 inches from the transparent right wall **110** of the automated human washing system **100**. In one embodiment, the door **130** may have handles on the inside and/or the outside of the door for moving the door between open and a closed position.

[0077] Referring to FIG. **4**, in one embodiment, the automated human washing system **100** preferably includes the main water dispensing faucet **128** having a lower end coupled with the base **102** and an upper end that passes through an opening **140** formed in the rear of the top cap **106**. The upper end of the main water dispensing faucet **128** is covered by the top panel **122** (FIG. **1**) that extends between the rear and the front of the top cap **102**.

[0078] In one embodiment, the automated human washing system **100** includes a flexible drainage tube **142** that enables liquid to be drained from the automated human washing system, such as the base of the automated human washing system. In one embodiment, the base includes one or more drains and the water drained through the one or more drains passes through the flexible drainage tube **142**.

[0079] Referring to FIG. **5**, in one embodiment, the front door **130** is preferably hingedly secured to the front transparent wall **108** of the automated human washing system **100**. The top cap **106** covers the upper ends of the four transparent walls **108**, **110**, **112**, **114** (FIG. **1**). The transparent top panel **122** extends between the front and the rear of the top cap **106** for covering the upper end of the main water dispensing faucet **128**. The perimeter of the top cap **106** preferably includes a series of spaced vent openings **116**. The spaced vent openings **116** preferably enable air to pass into and out of the automated human washing system **100** when the first and second top lids **124**, **126** (FIG. **1**) are closed on either side of the transparent top panel **122**.

[0080] Referring to FIG. **6**, in one embodiment, an automated human washing system **100** preferably includes a double walled transparent midsection **104** (FIG. **1**) having four transparent outer walls **108**, **100**, **112**, **114** (FIG. **1**) that surround four transparent inner walls. In FIG. **6**, a front outer transparent wall **108**A is spaced away from a front transparent inner wall **108**B, and a left transparent outer wall **112**A is spaced away from a left transparent inner wall **112**B. A similar structure exists for the right transparent wall and the rear transparent wall of the automated human washing system. In one embodiment, the inner transparent walls of the automated human washing system are spaced a distance L_3 of about 1.5-2.5 inches and more preferably about 1.96 inches from the outer transparent wall associated therewith. In one embodiment, the four inner walls and the four outer walls are joined together in a unitary structure.

[0081] In one embodiment, the automated human washing system **100** preferably includes a front door **130** having a left side **132** that is hingedly secured to the front transparent outer wall **108**A for enabling the front door **130** to swing between open and closed positions.

[0082] Referring to FIG. **7**, in one embodiment, an automated human washing system **100** preferably includes a transparent midsection **104** that extends upwardly from a base **102**. The lower end of the transparent midsection is preferably secured to the base **102**. In one embodiment, the transparent midsection **104** of the automated human washing system **100** preferably defines a double walled container having transparent outer walls **108**A, **110**A, **112**A, and **114**A that surround transparent inner walls **108**B, **110**B, **112**B and **114**B. The transparent outer walls **108**A, **110**A, **112**A and **114**A form a unitary structure having a lower end that is secured to the base **102**. Similarly, the transparent inner walls **108**B, **110**B, **112**B and **114**B form a unitary structure and have lower ends that are secured to the base **102**. The transparent inner walls are spaced inwardly from and surrounded by the transparent outer walls to form the double walled transparent midsection **104** (e.g., a water-tight washing enclosure).

[0083] In one embodiment, the automated human washing system **100** desirably includes liquid dispensing tubes **118**A-**118**D that extend adjacent a rear edge of the base **102**. As described above, the liquid dispensing tubes **118**A-**118**D have lower ends secured to the base **102** and a plurality of openings formed in each of the outer walls thereof for dispensing liquids such as water, shampoo, and/or conditioner into the interior of the automated human washing system **100**. In one embodiment, the automated human washing system **100** preferably includes liquid dispensing

tubes **118**E and **118**F located adjacent the left side of the base **102** and liquid dispensing tubes **118**G and **118**H located adjacent the right side of the base **102**.

[0084] In one embodiment, the base **102** has a top face **144** having cleaning brush tracks **146** formed therein that extend between the left side **148** and the right side **150** of the base **102**. In one embodiment, the cleaning brush tracks **146** are preferably parallel to one another. In one embodiment, the top surface **144** of the base **102** includes spaced chair leg openings **152**A-**152**D that are adapted to receive the lower ends of the legs of a chair placed inside the transparent midsection **104** of the automated human washing system **100**.

[0085] Referring to FIG. **8**, in one embodiment, the automated human washing system **100** (FIG. **1**) may include cleaning brushes **120**A-**120**D. In one embodiment, the cleaning brushes include front cleaning brushes **120**A, **120**B having lower ends that are inserted into the cleaning brush tracks adjacent the front edge of the base, and rear cleaning brushes **120**C, **120**D having lower ends that are inserted into the cleaning brush tracks adjacent the rear edge of the base. In one embodiment, the cleaning brushes **120**A-**120**D have a height H_6 of about 55-65 inches and more preferably about 59.05 inches. In one embodiment, the cleaning brushes have a cylindrical shape. In one embodiment, the cleaning brushes have bristles.

[0086] Referring to FIG. **9**, in one embodiment, the first cleaning brush **120**A has a lower end mounted in a first cleaning brush track adjacent a leading edge of the base **102** and a second cleaning brush **120**B has a lower end inserted into a second cleaning brush track adjacent the front edge of the base **102**. The first and second cleaning brushes are preferably offset from one another and follow different paths when moving. Similarly, a third cleaning brush **120**C has a lower end inserted into a cleaning brush track adjacent a rear edge of the base, and a fourth cleaning brush **120**D has a lower edge inserted into a cleaning brush track adjacent a rear edge of the base **102**. The third and fourth cleaning brushes preferably travel in different paths. In one embodiment, the base **102** contains a cleaning brush motor that moves the respective cleaning brushes **120**A-**120**D from the left side wall **112** to the right side wall **114** by reciprocating the brushes back and forth in the directions designated DIR_1 and DIR_2. In one embodiment, the cleaning brushes **120**A-**120**D are positioned within the perimeter of the vertically extending liquid dispensing tubes **118**. The cleaning brushes may scrub an occupant as they move back and forth for cleaning the occupant.

[0087] Referring to FIGS. **10** and **11**, in one embodiment, the main water dispensing faucet **128** has a curved upper end that passes over the top of the transparent rear outer wall **110**A and the transparent rear inner wall **110**B that defines the double walled transparent midsection **104** (FIG. **1**). The vertically extending liquid dispensing tubes **118**, and the cleaning brushes **120** are preferably located inside the double walled container defining the transparent midsection **104** of the automated human washing system **100**.

[0088] In one embodiment, a chair **154** is preferably positioned inside the transparent midsection **104** of the automated human washing system **100**. The vertically extending liquid dispensing tubes **118** may have heights that extend above the height of the chair **154** (FIG. **11**). The upper end of the main water dispensing faucet **128** is preferably adapted to be in general alignment with the chair **154** for dispensing water atop the chair.

[0089] Referring to FIG. **12**, in one embodiment, a chair **154** includes a horizontally extending seating surface **156** that may be porous and four legs **158**A-**158**D that extend downwardly from an underside of the horizontally extending seating surface **156**. In one embodiment, the chair **154** includes a vertically extending back **160** extending upwardly from the horizontally extending seating surface **156** for supporting the back of a person sitting on the chair **154**. In one embodiment, the vertically extending back **160** is preferably porous for enabling water and/or liquid to pass therethrough. In one embodiment, the chair **154** includes a securing belt **162** and a buckle **164** for securing a person atop the chair **154**.

[0090] Referring to FIG. **13**, in one embodiment, a chair **154'** that is similar to that shown in FIG. **12** includes first and second arm supports **155**A', **155**B' secured to the sides of the horizontally extending seating surface **156'**.

[0091] Referring to FIG. **14**, in one embodiment, a chair **154"** preferably include a horizontally extending seated surface **156"** and four legs **158**A"-**158**D" extending downwardly from an underside of the horizontally extending seating surface **156"**.

[0092] Referring to FIG. **15**, in one embodiment, a chair **154** is positioned inside the double wall transparent midsection **104** (FIG. **1**) of the automated human washing system with the four legs **158**A-**158**D inserted into the chair leg openings **152**A-**152**D (FIG. **7**) formed in the top surface **144** of the base **102**. In one embodiment, the chair leg openings **152**A-**152**D include moveable platforms that are part an elevator mechanism coupled with a motor disposed within the base **102**. The moveable platforms support the lower ends of the chair legs and are configured to selectively move up and down relative to the top surface **144** of the base for selectively moving the chair legs up and down to adjust the height of the chair relative to the top surface **144** of the base **102**. In one embodiment, the height of the chair may be adjusted up and down for accommodating individuals having different heights. In one embodiment, the moveable platforms are located below the top surface of the base so that the lower ends of the chair legs fit within the chair leg openings for preventing horizontal movement of the chair legs relative to the top surface of the base.

[0093] Referring to FIG. **16**, in one embodiment, the automated human washing system **100** preferably includes an emergency pedal **170** that is accessible at the top surface **144** of the base **102**. The emergency pedal **170** may be engaged for automatically halting the operation of the automated human washing system (e.g., stop dispensing liquid, stop dispending shampoo, stop the heater, stop the blowers, open the door, signal an alarm).

[0094] In one embodiment, the automated human washing system **100** preferably includes a drain **172** located on the top surface **144** of the base **102** for draining liquid from the inside of the double walled container of the automated human washing system **100**. Some embodiment may have two or more drains. In one embodiment, the drain **172** includes a hole formed in the top surface **144** of the base **102** having a diameter of about 8-11 inches and more preferably about 9.84 inches to provide for easy drainage of liquids from inside the automated human washing system.

[0095] Referring to FIG. **17**A, in one embodiment, the top cap **106** (FIG.**1**) is covered by the first and second top lids

124, **126**. The first and second top lids **124** are preferably spaced from one another by a width W_3 of about 10-12 inches and more preferably about 11.81 inches. In one embodiment, each of the first and second top lids **124**, **126** has a rectangular shape with a length L_4 of about 45-50 inches and more preferably about 47.24 inches and a width W_4 of about 10-12 inches, and more preferably about 11.81 inches. Referring to FIG. **17**B, in one embodiment, the first top lid **124** has an inside surface **174** that faces toward the inside of the double walled container. The first top lid **124** includes a first hot air blower **176** that blows hot, drying air into the top of the double walled container. Similarly, the second top lid **126** includes an inner surface **178** having a hot air dryer **180** mounted thereto for blowing hot, drying air into the top of the double walled container. The first and second top lids **124**, **126** have rear edges that are hingedly attached to the rear edge of the top cap **106**. The clear top panel **122** preferably extends between the first and second top lids **124**, **126**.

[0096] In one embodiment, in the event of an emergency or a requirement to immediately stop operation of the automated human washing system, an operator or individual inside the double walled container may push either of the first and second top lids **124**, **126** to an up position (e.g., an open position), as shown in FIG. **17**B to immediately halt operation of the automated human washing system. In addition, in one embodiment, an individual may engage and/or press the emergency pedal **170** (FIG. **16**) to immediately halt operation of the automated human washing system.

[0097] Referring to FIG. **18**, in one embodiment, an automated human washing system **100** preferably includes a solution reservoir **182** that is associated with the base **102** thereof. The solution reservoir **182** allows an operator to fill the automated human washing system with shampoo or conditioner similar to inserting a cartridge into a printer. In one embodiment, the solution reservoir preferably includes a first compartment adapted to receive shampoo, a second compartment adapted to receive soap, a third compartment adapted to receive conditioner, and a fourth compartment adapted to receive perfume. In one embodiment, the shampoo, soap, conditioner and perfume are poured into the respective compartments. In one embodiment, the solution reservoir **182** may be refilled with the solutions. In one embodiment, the solution reservoir **182** is similar to an inkjet cartridge receptacle that contains inkjet-like elements containing shampoo, soap, conditioner and/or perfume solution that may be introduced into the wash tub during operation of the automated human washing system.

[0098] Referring to FIG. **19**, in one embodiment, the automated human washing system **100** preferably includes an electronic power cord **184** having a plug **186** that is insertable into an electrical socket for proving power to the automated human washing system. In one embodiment, the base **102** includes a hook **188** for securing the electrical power cord **184** on the side of the base **102**. FIG. **19** shows one of the vertically extending liquid dispensing tubes **118** having a plurality of openings **125** formed therein for dispensing liquid inside the double walled container of the automated human washing system **100**. The liquid dispensing tube **118** has a lower end secured to the top face **144** of the base **102**. The liquid dispensing tube **118** is preferably arrayed in a vertical configuration that extends along an axis that is substantially perpendicular to the top surface **144** of the base **102**. In one embodiment, the automated human washing system **100** also includes one or more cleaning brushes **120** having lower ends secured within cleaning brush tracks provided at the top surface **144** of the base **102**. The base **102** preferably includes a motor for moving the cleaning brushes within the tracks during operation of the automated human washing system. In one embodiment, the base **102** contains another motor for pumping liquids such as water, soap, shampoo, conditioner and/or perfume the plurality of openings **125** formed in the vertically extending liquid dispensing tubes **118**. The motors are preferably powered by the energy obtained using the electrical power cord **184**.

[0099] Referring to FIG. **20**, in one embodiment, the automated human washing system **100** preferably includes a water hose **192** having an attachment end **194** and a dispensing end **196**. In one embodiment, the attachment end **194** may be coupled with a water source for dispensing the water from the dispensing end **196**. In one embodiment, the water hose **192** may be secured to a side of the base **102**. In one embodiment, the water tube **192** has an internal diameter of about 0.5-1.00 inches and more preferably about 0.75 inches. In one embodiment, the water hose **192** has a coiled, elastic structure so that it may be extended or stretched for dispensing water on an individual and then return to its original shape shown in FIG. **20**.

[0100] Referring to FIG. **21**, in one embodiment, the automated human washing system **100** preferably includes a control panel **132** that is in communication with a central processing unit **210** (FIG. **24**) located within the base **102** (FIG. **20**) of the automated human washing system. In one embodiment, the control panel **132** is mounted on an exterior surface of one of the outer transparent side walls of the automated automated human washing system. In one embodiment, the control panel **132** is mounted on the outside of the right side wall **114** of the automated automated human washing system. The control panel preferably functions for controlling water supply, soap, shampoo, conditioner, perfume, a timer, water temperature, and drying temperatures during operation of the machine in accordance with commands entered into the control panel by an operator. In one embodiment, the automated human washing system will desirably commence operation of a washing cycle in approximately three (3) minutes after programming the control panel and/or entering a selected wash cycle into the control panel.

[0101] Referring to FIG. **22**, in one embodiment, an automated automated human washing system **100** preferably includes a water drainage hose **142** that is coupled with the base **102**. When water is drained from inside the double walled container of the automated human washing system, the drained water may be dispensed via the water drainage hose **142**. In one embodiment, the water drainage hose **142** preferably has an internal diameter of about 1-3 inches and preferably about 2 inches. In one embodiment, the water drainage hole may be coupled with any dispensing drain or a hole located inside a room such as a bathroom in order to drain the water from the automated human washing system. In one embodiment, the water drainage hose **142** is stored beneath the transparent midsection **104** and preferably along the side of the base **102**.

[0102] Referring to FIG. **23**, in one embodiment, a ramp **198** may be utilized for providing access to the inside of an automated human washing system. In one embodiment, the

ramp may be placed onto an edge of the base **102** (FIG. **22**) to enable an individual to walk over the ramp for entering the inside of the automated human washing system. The ramp **198** is preferably aligned with the front door of the automated human washing system. In one embodiment, the ramp may enable an individual in a wheelchair to be wheeled inside the automated human washing system. In one embodiment, the slope of the ramp preferably will not exceed 6.25 degrees. In one embodiment, the ramp preferably has a width of about 20-30 inches and more preferably about 23.62 inches. In one embodiment, the ramp is made of rugged wood material and may have a top surface with surface roughenings or gripping features to prevent slipping and to provide traction between an individual and the top surface of the ramp.

[0103] Referring to FIG. **24**, in one embodiment, an automated automated human washing system desirably includes a central processing unit **210** that is in communication with the control panel **132** (FIG. **1**). The control panel **132** enables an operator to program or operate the automated human washing system. The central processing unit **210** is preferably in communication with a first engine **212** for controlling movement of the cleaning brushes, a second engine **214** for pumping water into the automated human washing system, and draining water from the automated human washing system, a third engine **216** for pumping solutions such as soap, shampoo, conditioner and/or perfume into the liquid dispensing tubes of the automated human washing system, a fourth engine **218** for providing drying hot air and/or high pressure air through the hot air blowers provided on the underside of the first and second top lids, a fifth engine **220** including a hydraulic lift for raising and lowering the height of a chair inserted into the chair leg openings provided in the top surface of the base, and a sixth engine **222** that controls a dispensing mechanism for controlling the amount of shampoo, soap, and/or conditioner introduced into the automated human washing system. In one embodiment, all of the engines shown in FIG. **24** are disposed within the base **102** (FIG. **1**) located at the bottom of the automated human washing system. In one embodiment, the base has a height of about 10-12 inches and more preferably about 11.81 inches.

[0104] Referring to FIG. **25**, in one embodiment, the base **102** includes vents **200** for venting the heat generated by the engines from the base **102**.

[0105] While the foregoing is directed to embodiments of the present invention, other and further embodiments of the invention may be devised without departing from the basic scope thereof, which is only limited by the scope of the claims that follow. For example, the present invention contemplates that any of the features shown in any of the embodiments described herein, or incorporated by reference herein, may be incorporated with any of the features shown in any of the other embodiments described herein, or incorporated by reference herein, and still fall within the scope of the present invention.

What is claimed is:

1. An automated human washing system comprising:

an enclosure including a base, a midsection and a top cap;

said enclosure including a front wall having a front door moveable between open and closed positions;

a plurality of liquid dispensing tubes having lower ends secured to said base and upper ends spaced from said base, wherein each said liquid dispensing tube has a plurality of openings adapted for introducing liquid into said enclosure;

a plurality of elongated cleaning brushes having lower ends secured to said base and upper ends spaced from said base, wherein said liquid dispensing tubes are spaced from one another adjacent outer edges of said base, and wherein said elongated cleaning brushes are located inside a perimeter defined by said liquid dispensing tubes;

said top cap including first and second top lids moveable between closed positions for covering an upper end of said enclosure and open positions for providing access to the upper end of said enclosure;

a main water dispensing faucet located between said first and second top lids adjacent an upper end of said enclosure for introducing water into the upper end of said enclosure;

a drain located at a lower end of said enclosure for removing liquid from said enclosure;

a first engine located in said base for pumping liquid through said liquid dispensing tubes into said enclosure;

a second engine located in said base for moving said elongated cleaning brushes over a top surface of said base;

a control system disposed in said base for automatically operating said human washing system including controlling said first and second engines.

2. The system as claimed in claim **1**, wherein said enclosure has side walls that are transparent.

3. The system as claimed in claim **1**, wherein said enclosure is a double-walled structure.

4. The system as claimed in claim **1**, wherein said lower end of said enclosure forms a water tight seal with said base.

5. The system as claimed in claim **1**, further comprising:

chair leg openings formed in a top surface of said base;

moveable platforms disposed inside said chair leg openings that are configured to move up and down relative to the top surface of said base;

a chair having legs positioned over the top surface of said base, wherein said legs of said chairs are inserted into said chair leg openings, wherein the height of said chair relative to the top surface of said base is adjustable by moving said moveable platforms.

6. The system as claimed in claim **1**, further comprising a hot air blower located on an underside of at least one of said first and second top lids.

7. The system as claimed in claim **6**, wherein said first and second top lids open and close independently of one another, wherein said hot air blower comprises a first hot air blower located on an underside of said first top lid and a second hot air blower located on an underside of said second top lid, and wherein said main water dispensing faucet passes through an opening extending between said first and second top lids.

8. The system as claimed in claim **1**, wherein said top cap comprises a plurality of spaced vent openings formed in sides walls of said top cap.

9. The system as claimed in claim **1**, further comprising:

a water inlet tube coupled with said enclosure and being in communication with said liquid dispensing tubes and said main water dispensing faucet for supplying water to said enclosure;

a drainage tube coupled with said enclosure and being in communication with a drain for removing water from said enclosure.

10. The system as claimed in claim **1**, wherein each said liquid dispensing tube extends vertically between the lower and upper ends of said enclosure, and wherein each said liquid dispensing tube has a plurality of spaced openings for introducing water into said enclosure.

11. The system as claimed in claim **1**, further comprising a solution reservoir located on said base, wherein said solution reservoir includes at least one of a soap compartment, a shampoo compartment, and a conditioner compartment.

12. The system as claimed in claim **7**, further comprising:

said control system including a central processing unit containing one or more operational protocols for controlling operation of said automated human washing system, one or more memory devices, and circuitry for controlling operation of said automated human washing system;

a first engine for controlling movement of said elongated cleaning brushes;

a second engine for pumping water into said enclosure of said automated human washing system;

a third engine for pumping solutions selected from the group consisting of soap, shampoo and conditioner into said liquid dispensing tubes of said automated human washing system.

13. The system as claimed in claim **12**, further comprising:

a fourth engine for providing drying hot air and/or high pressure air through said hot air blowers provided on the underside of the first and second top lids; and

a fifth engine including a hydraulic lift for raising and lowering the height of a chair inserted into said chair leg openings provided in the top surface of said base.

14. The system as claimed in claim **1**, further comprising:

cleaning brush slots formed in a top surface of said base;

lower ends of said elongated cleaning brushes being inserted into said cleaning brush slots, wherein said elongated cleaning brushes are configured to move back and forth over the top surface of said base by moving through said cleaning brush slots.

15. An automated human washing system comprising:

an enclosure including a base, a midsection and a top cap;

said enclosure including a front wall having a front door moveable between open and closed positions;

a plurality vertically extending tubes having lower ends secured to said base, wherein each said vertically extending tube has a plurality of openings adapted for introducing liquid into said enclosure;

a plurality of vertically extending, elongated cleaning brushes having lower ends secured to said base, wherein said vertically extending tubes are spaced from one another for defining an outer perimeter, and wherein said vertically extending, elongated cleaning brushes are located inside the outer perimeter defined by said vertically extending tubes;

said top cap including first and second top lids moveable between closed positions for covering an upper end of said enclosure and open positions for providing access to the upper end of said enclosure;

a main water dispensing faucet located between said first and second top lids for introducing water into the upper end of said enclosure;

a drain located at a lower end of said enclosure for removing liquid from said enclosure;

an engine located in said base for moving said elongated cleaning brushes over a top surface of said base;

a control system disposed in said base for automatically operating said human washing system including controlling said engine.

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