

(19)



(11)

EP 2 889 418 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
21.09.2016 Bulletin 2016/38

(51) Int Cl.:
D06F 39/02 ^(2006.01) *D06F 39/08* ^(2006.01)
D06F 39/12 ^(2006.01) *D06F 23/04* ^(2006.01)

(21) Application number: **13199503.7**

(22) Date of filing: **24.12.2013**

(54) **Washing machine**

Waschmaschine

Machine à laver

(84) Designated Contracting States:
**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO RS SE SI SK SM TR**

(43) Date of publication of application:
01.07.2015 Bulletin 2015/27

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Description

[0001] The invention refers to a top-loading laundry washing machine.

Background Art

[0002] Known top-loading laundry washing machines (called also simply top-loading washing machine) generally comprise a substantially parallelepiped-shaped casing, typically built for resting on the floor, a substantially cylindrical hollow washing tub which is suspended in floating manner inside the casing by means of a number of coil springs and shock-absorbers, with the longitudinal reference axis of the washing tub oriented substantially horizontally; and a substantially cylindrical, hollow revolving drum for housing the laundry to be washed, which is housed in axially rotating manner inside the washing tub for rotating about its substantially horizontally-oriented, longitudinal reference axis.

[0003] An electric motor assembly, which is located outside of the washing tub, is typically configured for driving into rotation the revolving drum about its longitudinal reference axis inside the washing tub. In some known top-loading washing machines an additive compartment adapted to be filled with one or more additives (i.e. a washing and/or rinsing products like for example detergent, softener, bleach, etc.) is usually attached to an annular rim of a laundry loading/unloading opening placed at the top of the casing, above a pass-through opening on the lateral wall of the washing tub. A water supply circuit is typically provided, comprising a water inlet connectable to water mains external to the washing machine, and structured for drawing fresh water from the water mains and supplying water into the additive compartment, so as to sweep away into the washing tub the additive(s) (e.g. detergent and/or softener) stored in the compartment. The additive compartment typically comprises two or more chambers adapted to be filled with washing and/or rinsing additives, each chamber having an additives inlet section, i.e. a section from which additive can be poured in the chamber.

[0004] Top-loading washing machines described above commonly comprise a water distributor which is an element that supplies the water coming from the mains to the different chambers of the additive compartment; for this purpose the distributor comprises a plurality of channels, each one being fluidly connected to one or more chambers of the additive compartment. The distributor is typically the latest component before the additive compartment, and it is connected, upstream, to one or more electro-valves (i.e. a plurality of one-way electro-valves and/or one or more electro-valves having a plurality of ways) which are connected, upstream, to the water inlet connectable to external water mains. Such electro-valve(s) are connected, downstream, via a rubber pipe or directly through a fixed pipe departing from electro-valve(s) to the distributor, in such a way to selec-

tively take one or more streams of water coming from the water inlet to one or more of the channels of the distributor. The distributor and injector provide the functionality to lead the water coming from the electro-valve(s) into the respective chambers of the additive compartment.

[0005] For the distributor and injector components, a variety of technical solutions is known, which, among other technical design criteria, depend on the number of compartments that need to be supplied with water. The distributor and injector components are dedicated parts that are assembled on the work top of the washing machine.

[0006] Usually two electro-valves (or one electro-valve having two ways) are used, and the additive department comprises three compartments that need to be supplied with water. The distributor therefore is configured to output three distinct water jets, each directed to a distinct chamber of the additive compartment. To accomplish the task of producing three jets with only two valves (or two ways in case of a single two ways valve) that can supply water, the distributor usually provides a crossing region or point or air-gap region in which two water jets that are coming from two the two electro-valves being switched on can collide and intersect, leading to a third water jet with a direction in between the original two jets. In this way:

- by activating only one electro-valve (or a single way of a two ways electro-valve), distributor outputs a single jet of water directed to a first chamber of the additive compartment,
- by activating only the other electro-valve (or the other single way of a two ways electro-valve), distributor outputs a single jet of water directed to a second chamber of the additive compartment,
- by activating both the electro-valves (or both the ways of a two ways electro-valve), distributor causes the jets of water coming out from the two electro-valves (or two ways) to intersect one another, so as to create, downstream the distributor, a single jet of water directed to a third chamber of the additive compartment.

[0007] The European Patent Application EP 2 604 744 A2 discloses a top-loading laundry machine provided with such an additive compartment (called detergent/softener dispenser).

[0008] The European Patent Application EP 0 125 627 A2 discloses a top-loading laundry washing machine having an additive compartment closed by a cover; said cover comprises several channels for the water flowing from a displacing piston connected to the water mains to several detergent / additive compartments.

[0009] The American Patent Application US 2004/0000177 A1 discloses a top loading washing machine comprising a detachable detergent supply device having an automatic detergent feeding unit.

[0010] The French Patent Application FR 2 959 248

A1 and the European Patent Application EP 2 078 779 A1 disclose a water distributor applied on a top loading washing machine, said distributor comprising two inlets and three outlets in communication with three chambers provided on an additive compartment module suitable for the detergent / softener products; the water distributor is externally associated to the additive compartment module.

[0011] The drawbacks of above mentioned known solutions including water distribution functionality is that they have a complex design and are difficult to assemble.

[0012] The aim of the present invention is to provide a top-loading laundry washing machine with a water distributor that allows accurate control of water flow and leads to a robust design of the dispensing components.

Disclosure of Invention

[0013] This aim is achieved by a top-loading washing machine, comprising:

- a washing tub containing a rotary perforated drum,
- an additive compartment provided with two or more chambers adapted to be filled with washing and/or rinsing additives, said two or more chambers being fluidly connected to said washing tub and to a water inlet, said water inlet being fluidly connectable to water mains external to said machine, said additive compartment comprising a cover associated or associable to said one or more chambers for delimiting their respective additives inlet section,
- a water distributor fluidly connected between said water inlet and said one or more chambers for selectively channeling water received from said water inlet into the respective chamber of said additive compartment, whereby said water distributor is integrated into said cover, wherein the water distributor comprises at least two inlet ducts, each one individually and selectively fluidly connected, upstream, to said water inlet, and each one respectively fluidly connected, downstream, to a crossing region from which at least three outlet ducts branch off, said at least three outlet ducts being selectively fluidly connected to said inlet ducts and wherein one outlet duct among said at least three outlet ducts is fluidly connected to a by-pass line provided in said additive compartment in such a way to take clean water coming from said water inlet into said washing tub by-passing said two or more additive chambers.

[0014] Preferred embodiments of the invention are described in relation to the dependent claims and the description in relation to the enclosed drawings.

[0015] The present invention is based on the consideration that for modern top-loading washing machines, in order to fulfill current and future requirements of energy efficiency, both during the operating and during manufacturing processes, the machine should have a simple

design of components and allow for a precise handling of re-sources, especially of detergents, softeners and water. Therefore, the design of the components that channel water through the chambers and that support the directed and regulated flow of water is especially important. Known dispensers with water distribution functionality of top-loading washing machines are usually difficult to manufacture and do not allow a precise control of water flows or jets, especially when two jets are used to create a third jet.

[0016] Applicant has found that integrating the water distributor directly into the cover of the additive compartment leads to dispensing capabilities that are able to fulfill the above mentioned demands and requirements. A dedicated water distributor component as part of the cover allows on one hand to realize a simpler design of the injector compared to known solutions. On the other hand, a precise flow control of water becomes possible which in turn allows precise dosage of water streams into the various chambers.

[0017] The term "integrated" hereby denotes functional integration. Hence, in terms of material design or construction of the water distributor, it is not necessarily integral part of the cover but can also be an extractable or detachable and re-insertable component. In the present application saying that a first component is "fluidly separated" from a second component means that a fluid, that is especially water, cannot flow from the first component to the second one or vice versa. On the contrary, saying that a first component is "fluidly connected" to a second component means that a fluid can flow from the first component to the second component and vice versa.

[0018] The term top-loading laundry washing machine includes washing machines as such but also combined washing/drying machines that can incorporate both functionalities. Also the terms laundry washing machine and washing machine used interchangeably.

[0019] The expression "detergent/softener" denotes the cases of only detergent, only softener, or both detergent and softener. The term "washing and/or rinsing additives" includes for example detergents and rinsing liquids.

[0020] Advantageously, the cover is structured to be detachable from the additive compartment, which allows easy replacement and cleaning of the cover.

[0021] Advantageously, the additive compartment is structured to be detachable from the washing machine, which allows easy replacement and cleaning of the additive compartment. The additive compartment is preferably structured for being rigidly attached in an easy detachable manner to the washing machine. This can be realized, for instance, by a base compartment which is configured to receive the additive compartment while firmly fixing its position.

[0022] The additive compartment comprises preferably two chambers, whereby the water distributor - when installed - is arranged in correspondence to a region of the additive compartment at least partially between these

two chambers. Such a configuration allows building a compact additive compartment which needs only comparatively little installation place. Additionally, the fluid connections of the water distributor to the injector and to the chambers can be designed with short distances and small bends, allowing a precise control of the water flow and water amount.

[0023] In a preferred embodiment, the water distributor is structured as a detachable component of the cover. This means that the water distributor still is part of the cover but can be detached if needed for cleaning, repair, check, or replacement.

[0024] Advantageously, the water distributor comprises a base or bottom part and a cover or top part structured to engage one another. Such a design allows opening the water distributor for cleaning. The water distributor comprises preferably ducts which are advantageously built by half ducts (essentially shaped with a cross-section of a semi-circle) in each part (top part and bottom part) so that when engaging both parts, a complete duct (with a cross-section of essentially a full circle) is formed.

[0025] The connection between base and cover parts is preferably provided by a clip mechanism, which provides an easy and convenient way to detach and reattach both parts if desired.

[0026] The attachment of the water distributor to the cover is preferably provided by a clip mechanism allowing for either extraction of the water distributor from the remaining cover.

[0027] Alternatively or in combination, a slot is preferably provided in the cover for insertion of the water distributor, which offers a stable but reversible fixation of water distributor and cover.

[0028] In order to allow the use of at least two water jets, the water distributor comprises at least two inlet ducts, each one individually and selectively fluidly connected, upstream, to the water inlet, and each one respectively fluidly connected, downstream, to a crossing region from which at least three outlet ducts branch off, these at least three outlet ducts being selectively fluidly connected to the inlet ducts.

[0029] One of the outlet ducts of these three outlet ducts is fluidly connected to a by-pass line provided in the additive compartment in such a way to take clean water coming from the water inlet into the washing tub, bypassing the two or more additive chambers.

[0030] One or more outlet ducts among the described at least three outlet ducts is preferably fluidly connected to a respective additive chamber, so as to take water coming from the water inlet into the respective additive chamber. For instance, a first outlet duct can be fluidly connected to a first chamber which is designed to hold a washing agent, while a second outlet can be fluidly connected to a second chamber which is designed to hold softener. If, for instance, during a washing procedure washing agent is meant to be supplied to the laundry in the washing tub, water will be channeled from the water inlet via the corresponding outlet duct to the chamber

filled with washing agent.

[0031] The washing machine advantageously comprises an injector positioned between and fluidly connected to the water distributor and the water inlet, the injector being provided with two or more water nozzles each one fluidly connected to one respective inlet duct among the at least two inlet ducts, for providing a jet of water to said respective inlet duct.

[0032] For supplying and providing water if needed, the washing machine preferably comprises a valve arrangement provided between the water inlet and the water distributor and operable to provide water coming from the water inlet selectively to one or more of the two or more inlet ducts.

[0033] This valve arrangement is advantageously provided between the water inlet and the injector and is operable to provide water coming from the water inlet selectively to one or more of the water nozzles.

[0034] The described cover and water distributor are preferably made of a polymeric plastic material, e.g. polyethylene, polycarbonate, polypropylene, etc.

[0035] The advantages of the application are especially as follows.

[0036] Due to the incorporation of the water distributor into the cover, the injector of the washing machine allows a simple and robust construction.

[0037] The design of the water distributor as an extractable part allows its easy replacement and cleaning.

[0038] With a by-pass line allowing supplying the tub with clean water, an energy efficient washing procedure with precise dosage of detergent and/or softener can be achieved.

Brief description of the Drawings

[0039] Further characteristics and advantages of the present invention will be highlighted in greater detail in the following detailed description of some of its preferred embodiments, provided with reference to the enclosed drawings. In said drawings:

FIG. 1 is a perspective view of the upper portion of a top-loading washing machine with its upper door opened made in accordance with the teachings of the present invention;

FIG. 2 shows the washing machine according to FIG. 1 with the upper door closed;

FIG. 3 shows an upper frame of the washing machine according to FIGS. 1 and 2 with a cover attached in a perspective view;

FIG. 4 shows the upper frame of FIG. 3 in a different perspective view;

FIG. 5 shows the upper frame FIG. 4 with the cover removed;

FIG. 6 shows a horizontal section through the upper frame with an inserted cover;

FIG. 7 shows an explosive view of the upper frame and attached components;

FIG. 8 shows the cover in an explosive view;
 FIG. 9 shows the cover in an assembled state in a front view;
 FIG. 10 shows a plane view of the upper portion of a top-loading washing machine according to the invention with some parts removed;
 FIG. 11 is a cross section taken according to plane XI-XI of FIG. 10;
 FIG. 12 shows a plane view of the upper portion of a top-loading washing machine according to the invention with some parts removed, and with the cover removed;
 FIG. 13 is a cross section taken according to plane XIII-XIII of FIG. 11;
 FIG. 14 is a bottom view of the cover of FIG. 9.

Detailed Description of the Invention

[0040] With reference to FIGs. 1 and 2, a top-loading washing machine 2 is displayed in an isomeric view. The washing machine 2 comprises preferably, but not necessarily:

- a substantially parallelepiped-shaped outer boxlike casing 4, which is preferably structured for resting on the floor;
- an upper door 6, preferably comprising a handle 8 for opening, which is advantageously hinged to a top wall or region 10 of casing 2 by one or hinges 10a, 10b so as to rotate to and from a closing position in which the upper door 6 rests, preferably horizontally, on top wall 10 for closing a laundry loading/unloading opening 12 and watertight sealing a cylindrical, hollow washing tub 14 which is arranged inside the casing 2;
- a cylindrical, hollow revolving drum 16 which is structured for housing the laundry to be washed and is housed in an axially rotating manner inside the washing tub 14;
- an elastically-deformable bellows 18 which connects in watertight manner a pass-through opening provided on the upper section of the lateral wall of washing tub 14 to an upper frame or rim (also called hopper) 24 of the superjacent laundry loading/unloading opening 12 provided on the top wall 10 of boxlike casing 2;
- an electric motor assembly (not shown) which is attached to the washing tub 14, outside the latter, and is structured for driving into rotation the revolving drum 16 inside washing tub 14.

[0041] Upper door 6 preferably comprises an engagement hook 20 that engages for holding the upper door in an essentially horizontal closing position with a snap-in hole 22 which is built into upper frame 24; upper frame 24 is preferably detachable from casing 4 and is part of the upper or top wall 10.

[0042] Washing machine 2 also advantageously com-

prises a control panel 26 with a user interface 28 allowing the user to select certain parameters of the laundry procedure such as duration, temperature, and washing/rinsing options. Preferably, optical indicators are provided which indicate the selected laundry routine.

[0043] Washing machine 2 further comprises an additive compartment 34 comprising a cover 30 which is preferably inserted in a rigid and stable, though easily detachable manner in a base compartment 32 which is connected, preferably in a removable way, to the upper frame 24. Thus, the additive compartment 34 comprises both cover 30 and base compartment 32.

[0044] With reference now to FIG. 3, the upper frame 24 is displayed, whereby the cover 30 is detachably inserted in the base compartment 32. A water inlet 38 serves to connect the washing machine 2 to mains water and preferably leads the water to two valves 42, 46 which can be operated or controlled by a control unit (not shown) and which, preferably dependent on the selected washing program, open and close to allow mains water to flow, via the cover 30, into the washing tub 14. Valves 42, 46 are preferably realized as electro-valves (EV).

[0045] In FIG. 4, which again shows upper frame 24, water pipes 50, 54 can be seen which, respectively, advantageously fluidly connect valves 42, 46 to two inlet ports of an injector 58. The connections of pipes 50, 54 to the inlet ports of the injector 58 are preferably achieved by rigid metal clamps 62, 66 or elastic metal clamps.

[0046] FIG. 5, which otherwise corresponds to FIG. 4, shows the upper frame 24 with cover 30 detached from base compartment 32.

[0047] Base compartment 32 advantageously comprises a first basin-like chamber 78 with inlet section 96 configured to be fillable with detergent, and a second basin-like chamber 82 with inlet section 98 configured to be fillable with softener.

[0048] Two tubular sleeves 70, 74 are part of a siphon assembly, which outlets are advantageously fluidly connected to (preferably positioned over) the access opening of washing tub 14, in such a way that the liquid exiting the siphons falls into the washing tub 14; siphon assembly also advantageously comprises a part of cover 30, as will be better explained in the following.

[0049] If water is channeled into chamber 78, once the water level is high enough to prime the respective syphon, the mixture of water and detergent or softener from chamber 78 is forced to flow through sleeve 70 into washing tub 14. Similarly, if water is channeled into chamber 82, once the water level is high enough to prime the respective syphon, the mixture of water and detergent or softener from chamber 82 is forced to flow through sleeve 74 into washing tub 14.

[0050] Advantageously a collector 176 is fixed, preferably in a removable way, to the bottom of the base compartment 32, and it positioned below the outlets of the tubular sleeves 70, 74, so as to collect the liquid exiting the latter and directing it into the access opening of the washing tub 14.

[0051] With reference to FIG. 6, a horizontal cut through the upper frame 24 is displayed. The cover 30 is inserted in or attached to base compartment 32. Located between chambers 78, 82 and functionally integrated into the cover 30, is a water distributor 90, which is advantageously structured to be extractable or detachable from cover 30. Chamber 78 comprises an inner wall 128 which lies adjacent to an outer wall 146 of water distributor 90, and chamber 82 comprises an inner wall 132 lying adjacent to an outer wall 140 of water distributor 90. In this configuration, available installation space is created and used in an optimized way.

[0052] Water distributor 90 comprises two inlet ducts 100, 104 which are fluidly connected to inlet ports 110, 114 of injector 58. Ducts 100, 104 meet in a crossing region 118 from which three outlet ducts 122, 126, 130 branch off. The crossing region 118 is designed in such a way that water jets can cross this region without creating considerable turbulent flow so that a controlled jet of water can be produced. The different ducts 122, 126, 130 are used in the operation of the washing machine as described in the following.

[0053] As shown in Figure 13, outlets of ducts 122 and 126 are advantageously fluidly connected respectively with openings 122a and 126a obtained in the cover 30 which are fluidly connected respectively with chambers 78 and 82 for allowing the water coming from respective duct 122 and 126 to enter respectively chambers 78 and 82.

[0054] If only valve 46 is opened, mains water flows through pipe 54 into inlet port 114 and from there through duct 104, it crosses crossing region 118 and continues through duct 122, from where it is lead into chamber 78 which preferably is configured to receive or contain detergent.

[0055] If water is desired to flow into the other chamber 82 which is configured to receive or contain softener, both valves 42, 46 are opened in order to create water jets of substantially the same strength and/or velocity. These jets going through pipes 50, 54 and ducts 100, 104 and simultaneously collide in the crossing region 118 and form a common jet which enters duct 126 and continues to flow into chamber 82.

[0056] In case only valve 42 is opened, a mains water flows through pipe 50, inlet port 110, duct 100 and outlet duct 130 to an opening 134 fluidly connected to a by-pass line 300 which passes through the additive compartment and which is fluidly separated from the chambers 78 and 82, in such a way to take fresh water coming from the water inlet 38 into the washing tub 14 without mixing this clean water with additive(s). This way, fresh mains water without detergent and/or softener can be fed into the washing tub 14 as desired, for example for obtaining a pre-wetting of the laundry before adding additive(s), which can be advantageous in some washing programs.

[0057] Preferably, one or more of the ducts 122 and 126 are provided with an opening (in advantageous em-

bodiment illustrated in attached figures the only duct 126 is provided with an opening, numbered 126b) provided in a bottom region of their lateral wall; this opening is fluidly connected to the access opening of washing tub 14, in such a way to by-pass chambers 78, 82; when water is taken by purpose in a duct 122 or 126 by opening the respective valve(2), since the pressure of water is high, water directly goes to the outlet of respective duct, without entering opening 126b. If some water accidentally enters one duct when even if the respective valve(s) is(are) not activated, this water, not having high pressure, falls by gravity in the opening provided in the bottom region of the lateral wall of the duct, and goes into the tub without entering chambers 78, 82; this guarantees that detergent or softener contained in a chamber is not accidentally taken into the tub.

[0058] The structural distinction between water distributor 90, the remaining parts of the cover 30 and the injector 58 allows obtaining a robust and simple design of these components and saves costs in the manufacturing and assembling processes. Moreover, since the water distributor 90 can be preferably removed from the cover 30, it can be cleaned from detergent remnants or other substances that could clog the ducts and prevent a controllable water flow into the respective chamber 78, 82.

[0059] Referring to FIG. 7, an exploded view of the upper frame 24 of the washing machine together with attached components for guiding mains water into the cover 30 is shown. As can be seen in this view, pipes 50, 54 are advantageously arranged to be connected to nozzles 138, 142 of valves 42, 46 and advantageously secured by metal clamps 146, 150. Also seen are nozzles 154, 158 of injector 58.

[0060] Cover 30 advantageously comprises sleeves 164, 168, which, when cover 30 is assembled to compartment 32, are positioned in such a way to concentrically enclose respectively sleeve 70 and sleeve 74; sleeves 164, 168 are radially spaced from the latter and from the bottom of respective chambers 78 and 82, so as to define, together with respective sleeve 70 and sleeve 74, siphons assemblies allowing, when a siphon is primed, the water mixed with the detergent or softener contained in respective chamber 78, 82, to be completely (or almost completely) transferred to the washing tub 14 via the respective sleeve 70, 74.

[0061] Referring now to FIG. 8, the cover 30 is shown in an exploded view with the water distributor 90 detached. The cover 30 without the water distributor 90 is essentially a chamber part 196 comprising sleeves 164, 168 and means for attaching the water distributor 90.

[0062] Water distributor 90 advantageously comprises a top part 186, or cover part, and a bottom part 190, or base part, which each advantageously forms partly the ducts, preferably with half-channels with a cross section of essentially a semi-circle such that when both parts 186, 190 are engaged with each other, the full ducts 100, 104, 122, 126, 130 are formed which then preferably have essentially a cross-section of a full circle. Of course, the

cross-section of ducts 100, 104, 122, 126, 130 is not limited to circle-shaped cross-section. Any other shape or form can be used as long as the guiding of water through these ducts 100, 104, 122, 126, 130 is possible in a highly controllable way. Also, the size of the duct cross sections can be chosen in such a way to simultaneously arrange with the available installation space and to allow a large enough water flow when valves 42, 46 are opened. Top part 186 and bottom part 190 build up a distributor chamber 94 of the water distributor 90 which encompasses ducts 100, 104, 122, 126, 130 and crossing region 118.

[0063] For engaging both parts 186, 190 with each other, preferably a clipping mechanism can be provided.

[0064] As can be seen in FIG. 9, both parts 186, 190 building chamber 94 are attached to the cover 30. This can preferably be achieved by a clipping connection. It is also possible that cover 30 provides a slot into which water distributor 90 is inserted. In this case, preferably a snap-fit connection is provided which allows determining when water distributor 90 has reached its final position in the slot. In this view, lids 200, 204 are visible which in case cover 30 is attached on or inserted base compartment 32 build upper delimiters for chambers 78, 82 of base compartment 32.

[0065] While the present invention has been described with reference to the particular embodiments shown in the figures it should be noted that the present invention is not limited to the specific embodiments illustrated and described herein; on the contrary, further variants of the embodiments described herein are within the scope of the present invention as defined in the claims.

Claims

1. Top-loading washing machine (2), comprising:

- a washing tub (14) containing a rotary perforated drum (16),
- an additive compartment (34) provided with two or more chambers (78, 82) adapted to be filled with washing and/or rinsing additives, said two or more chambers (78, 82) being fluidly connected to said washing tub (14) and to a water inlet (38), said water inlet (38) being fluidly connectable to water mains external to said machine (2), said additive compartment (34) comprising a cover (30) associated or associable to said one or more chambers (78, 82) for delimiting their respective additives inlet section (96, 98),
- a water distributor (90) fluidly connected between said water inlet (38) and said one or more chambers (78, 82) for selectively channeling water received from said water inlet (38) into the respective chamber (78, 82) of said additive compartment (34),

wherein

said water distributor (90) is integrated into said cover (30) **characterizing in that**

the water distributor (90) comprises at least two inlet ducts (100, 104), each one individually and selectively fluidly connected, upstream, to said water inlet (38), and each one respectively fluidly connected, downstream, to a crossing region (118) from which at least three outlet ducts (122, 126, 130) branch off, said at least three outlet ducts (122, 126, 130) being selectively fluidly connected to said inlet ducts (100, 104)

and in that

one outlet duct (130) among said at least three outlet ducts (122, 126, 130) is fluidly connected to a bypass line (300) provided in said additive compartment (34) in such a way to take clean water coming from said water inlet (38) into said washing tub (14) by-passing said two or more additive chambers (78, 82).

2. Washing machine (2) according to claim 1, whereby additive compartment (34) is structured to be detachable from said washing machine (2).
3. Washing machine (2) according to claim 1 or 2, whereby said additive compartment (34) comprises two of said chambers (78, 82), and whereby the water distributor (90) is arranged in correspondence to a region of said additive compartment (34) at least partially between these two chambers (78, 82).
4. Washing machine (2) according to one or more of the previous claims, whereby said water distributor (90) is structured as a detachable component of said cover (30).
5. Washing machine (2) according to one or more of the previous claims, whereby said water distributor (90) comprises a base part (190) and a cover part (186) structured to engage one another.
6. Washing machine (2) according to one of the claim 5, whereby the connection between base (190) and cover (186) parts is provided by a clip mechanism.
7. Washing machine (2) according to one of the claims 4 to 6, whereby the attachment of said water distributor (90) to said cover (30) is provided by a clip mechanism.
8. Washing machine (2) according to one or more of the previous claims, whereby a slot is provided in said cover (30) for insertion of said water distributor (90).
9. Washing machine (2) according to claim 1, whereby one or more outlet ducts (122, 126) among said at least three outlet ducts (122, 126, 130) is fluidly con-

nected to a respective additive chamber (78, 82), so as to take water coming from said water inlet (38) into said respective additive chamber (78, 82).

10. Washing machine (2) according to one or more of previous claims, comprising an injector (58) positioned between and fluidly connected to said water distributor (90) and said water inlet (38), said injector (58) being provided with two or more water nozzles (154, 158) each one fluidly connected to one respective inlet duct among said at least two inlet ducts (100, 104), for providing a jet of water to said respective inlet duct.
11. Washing machine (2) according to one or more of previous claims, comprising a valve arrangement (42, 46) provided between said water inlet (38) and said water distributor (90) and operable to provide water coming from said water inlet (38) selectively to one or more of said two or more inlet ducts (100, 104).
12. Washing machine (2) according to claim 11 when depending on claim 10, wherein said valve arrangement (42, 46) is provided between said water inlet (38) and said injector (58) and is operable to provide water coming from said water inlet (38) selectively to one or more of said water nozzles (154, 158).

Patentansprüche

1. Von oben zu beladende Waschmaschine (2), umfassend:
 - eine Waschwanne (14), die eine perforierte Drehtrommel (16) enthält,
 - ein Zusatzmittelfach (34), das mit zwei oder mehr Kammern (78, 82) versehen ist, die dazu ausgelegt sind, mit Wasch- und/oder Spülmitteln gefüllt zu werden, wobei die zwei oder mehr Kammern (78, 82) fließend mit der Waschwanne (14) und einem Wassereinlass (38) verbunden sind, wobei der Wassereinlass (38) fließend mit einer Wasserleitung außerhalb der Maschine (2) verbunden werden kann, wobei das Zusatzmittelfach (34) eine Abdeckung (30) umfasst, die der einen oder den mehreren Kammern (78, 82) zugeordnet ist oder zugeordnet werden kann, um deren jeweiligen Zusatzmittelinlassabschnitt (96, 98) zu begrenzen,
 - einen Wasserverteiler (90), der fließend zwischen dem Wassereinlass (38) und der einen oder den mehreren Kammern (78, 82) angeschlossen ist, um Wasser, das von dem Wassereinlass (38) erhalten wird, selektiv in die jeweilige Kammer (78, 82) des Zusatzmittelfachs (34) zu leiten,

wobei

der Wasserverteiler (90) in die Abdeckung (30) integriert ist,

dadurch gekennzeichnet, dass

der Wasserverteiler (90) zumindest zwei Einlasskanäle (100, 104) umfasst, wovon jeder einzeln und selektiv stromaufwärts fließend mit dem Wassereinlass (38) verbunden ist und jeder jeweils stromabwärts fließend mit einem Kreuzungsbereich (118) verbunden ist, wovon zumindest drei Auslasskanäle (122, 126, 130) abzweigen, wobei die zumindest drei Auslasskanäle (122, 126, 130) selektiv fließend mit den Einlasskanälen (100, 104) verbunden sind, und dadurch, dass ein Auslasskanal (130) unter den zumindest drei Auslasskanälen (122, 126, 130) fließend mit einer Umgehungsleitung (300) verbunden ist, die auf eine solche Weise in dem Zusatzmittelfach (34) bereitgestellt ist, dass sauberes Wasser, das von dem Wassereinlass (38) stammt, unter Umgehung der zwei oder mehr Zusatzmittelkammern (78, 82) in die Waschwanne (14) eingebracht wird.

2. Waschmaschine (2) nach Anspruch 1, wobei das Zusatzmittelfach (34) so gestaltet ist, dass es von der Waschmaschine (2) abnehmbar ist.
3. Waschmaschine (2) nach Anspruch 1 oder 2, wobei das Zusatzmittelfach (34) zwei der Kammern (78, 82) umfasst, und wobei der Wasserverteiler (90) in Übereinstimmung mit einem Bereich des Zusatzmittelfachs (34) eingerichtet ist, der sich zumindest teilweise zwischen diesen beiden Kammern (78, 82) befindet.
4. Waschmaschine (2) nach einem oder mehreren der vorhergehenden Ansprüche, wobei der Wasserverteiler (90) als abnehmbarer Bestandteil der Abdeckung (30) gestaltet ist.
5. Waschmaschine (2) nach einem oder mehreren der vorhergehenden Ansprüche, wobei der Wasserverteiler (90) einen Basisteil (190) und einen Abdeckteil (186) umfasst, die so gestaltet sind, dass sie miteinander eingreifen.
6. Waschmaschine (2) nach Anspruch 5, wobei die Verbindung zwischen dem Basis- (190) und dem Abdeckteil (186) durch einen Clip-Mechanismus bereitgestellt wird.
7. Waschmaschine (2) nach einem der Ansprüche 4 bis 6, wobei die Anbringung des Wasserverteilers (90) an der Abdeckung (30) durch einen Clip-Mechanismus bereitgestellt wird.
8. Waschmaschine (2) nach einem oder mehreren der vorhergehenden Ansprüche, wobei in der Abde-

ckung (30) ein Schlitz zum Einsetzen des Wasserverteilers (90) bereitgestellt ist.

9. Waschmaschine (2) nach Anspruch 1, wobei ein oder mehr Auslasskanäle (122, 126) unter den zumindest drei Auslasskanälen (122, 126, 130) fließend mit einer jeweiligen Zusatzmittelkammer (78, 82) verbunden ist oder sind, um Wasser, das von dem Wassereinlass (38) stammt in die jeweilige Zusatzmittelkammer (78, 82) einzubringen.
10. Waschmaschine (2) nach einem oder mehreren der vorhergehenden Ansprüche, umfassend eine Einspritzvorrichtung (58), die zwischen dem Wasserverteiler (90) und dem Wassereinlass (38) positioniert ist und damit fließend verbunden ist, wobei die Einspritzvorrichtung (58) mit zwei oder mehr Waserdüsen (154, 158) versehen ist, wovon jede fließend mit einem jeweiligen Einlasskanal unter den zumindest zwei Einlasskanälen (100, 104) verbunden ist, um dem Einlasskanal einen Wasserstrahl bereitzustellen.
11. Waschmaschine (2) nach einem oder mehreren der vorhergehenden Ansprüche, umfassend eine Ventilanordnung (42, 46), die zwischen dem Wassereinlass (38) und dem Wasserverteiler (90) bereitgestellt ist und dazu betriebsfähig ist, einem oder mehreren der zwei oder mehr Einlasskanäle (100, 104) selektiv Wasser, das von dem Wassereinlass (38) stammt, bereitzustellen.
12. Waschmaschine (2) nach Anspruch 11, wenn dieser von Anspruch 10 abhängt, wobei die Ventilanordnung (42, 46) zwischen dem Wassereinlass (38) und der Einspritzvorrichtung (58) bereitgestellt ist und dazu betriebsfähig ist, einer oder mehreren der Waserdüsen (154, 158) selektiv Wasser, das von dem Wassereinlass (38) stammt, bereitzustellen.

Revendications

1. Machine à laver à chargement par le dessus (2), comprenant:
 - une cuve de lavage (14) contenant un tambour perforé rotatif (16),
 - un compartiment d'additif (34) comprenant deux ou plus de deux chambres (78, 82) aptes à être remplies avec des additifs de lavage et/ou de rinçage, lesdites deux ou plus de deux chambres (78, 82) étant connectées de façon fluide à ladite cuve de lavage (14) et à une entrée d'eau (38), ladite entrée d'eau (38) pouvant être connectée de façon fluide à un réseau de distribution d'eau extérieur à ladite machine (2), ledit compartiment d'additif (34) comprenant un

capot (30) associé ou pouvant être associé à ladite/auxdites une ou plusieurs chambre(s) (78, 82) afin de délimiter leur section d'entrée d'additif respective (96, 98),

- un distributeur d'eau (90) connecté de façon fluide entre ladite entrée d'eau (38) et ladite/lesdites une ou plusieurs chambre(s) (78, 82) afin de canaliser de façon sélective l'eau reçue en provenance de ladite entrée d'eau (38) dans la chambre respective (78, 82) dudit compartiment d'additif (34),

dans laquelle ledit distributeur d'eau (90) est intégré dans ledit capot (30),

caractérisé en ce que le distributeur d'eau (90) comprend au moins deux conduits d'entrée (100, 104), chacun individuellement et sélectivement connecté de façon fluide, en amont, à ladite entrée d'eau (38), et chacun respectivement connecté de façon fluide, en aval, à une région de croisement (118) à partir de laquelle au moins trois conduits de sortie (122, 126, 130) se ramifient, lesdits au moins trois conduits de sortie (122, 126, 130) étant sélectivement connectés de façon fluide auxdits conduits d'entrée (100, 104),

et **en ce qu'**un conduit de sortie (130) parmi lesdits au moins trois conduits de sortie (122, 126, 130) est connecté de façon fluide à une ligne de dérivation (300) prévue dans ledit compartiment d'additif (34) de manière à laisser l'eau propre qui arrive en provenance de ladite entrée d'eau (38) entrer dans ladite cuve de lavage (14) en contournant lesdites deux ou plus de deux chambres d'additif (78, 82).

2. Machine à laver (2) selon la revendication 1, dans laquelle le compartiment d'additif (34) est conçu de manière à être détachable de ladite machine à laver (2).

3. Machine à laver (2) selon la revendication 1 ou 2, dans laquelle ledit compartiment d'additif (34) comprend deux desdites chambres (78, 82), et dans laquelle le distributeur d'eau (90) est agencé en correspondance avec une région dudit compartiment d'additif (34) au moins partiellement entre ces deux chambres (78, 82).

4. Machine à laver (2) selon une ou plusieurs des revendications précédentes, dans laquelle ledit distributeur d'eau (90) est conçu comme un composant détachable dudit capot (30).

5. Machine à laver (2) selon une ou plusieurs des revendications précédentes, dans laquelle ledit distributeur d'eau (90) comprend une partie de base (190) et une partie de coiffe (186) conçus pour s'engager mutuellement.

6. Machine à laver (2) selon la revendication 5, dans laquelle la connexion entre les parties de base (190) et de coiffe (186) est réalisée par un mécanisme d'attache. 5
7. Machine à laver (2) selon l'une des revendications 4 à 6, dans laquelle la fixation dudit distributeur d'eau (90) audit capot (30) est réalisée par un mécanisme d'attache. 10
8. Machine à laver (2) selon une ou plusieurs des revendications précédentes, dans laquelle une fente est prévue dans ledit capot (30) pour l'insertion dudit distributeur d'eau (90). 15
9. Machine à laver (2) selon la revendication 1, dans laquelle un ou plusieurs conduit(s) de sortie (122, 126) parmi lesdits au moins trois conduits de sortie (122, 126, 130) est (sont) connecté(s) de façon fluide à une chambre d'additif respective (78, 82) de manière à laisser l'eau qui arrive en provenance de ladite entrée d'eau (38) entrer dans ladite chambre d'additif respective (78, 82). 20
10. Machine à laver (2) selon une ou plusieurs des revendications précédentes, comprenant un injecteur (58) qui est positionné entre et qui est connecté de façon fluide audit distributeur d'eau (90) et à ladite entrée d'eau (38), ledit injecteur (58) étant équipé de deux ou plus de deux buses à eau (154, 158) chacune connectée de façon fluide à un conduit d'entrée respectif parmi lesdits au moins deux conduits d'entrée (100, 104), afin de fournir un jet d'eau audit conduit d'entrée respectif. 25
30
11. Machine à laver (2) selon une ou plusieurs des revendications précédentes, comprenant un agencement de valve (42, 46) prévu entre ladite entrée d'eau (38) et ledit distributeur d'eau (90) et actionnable pour fournir l'eau qui arrive en provenance de ladite entrée d'eau (38) de façon sélective à un ou plusieurs desdits deux ou plus de deux conduits d'entrée (100, 104). 35
40
12. Machine à laver (2) selon la revendication 11 lorsqu'elle dépend de la revendication 10, dans laquelle ledit agencement de valve (42, 46) est prévu entre ladite entrée d'eau (38) et ledit injecteur (58) et est actionnable pour fournir l'eau qui arrive en provenance de ladite entrée d'eau (38) de façon sélective à une ou plusieurs desdites buses à eau (154, 158). 45
50

55

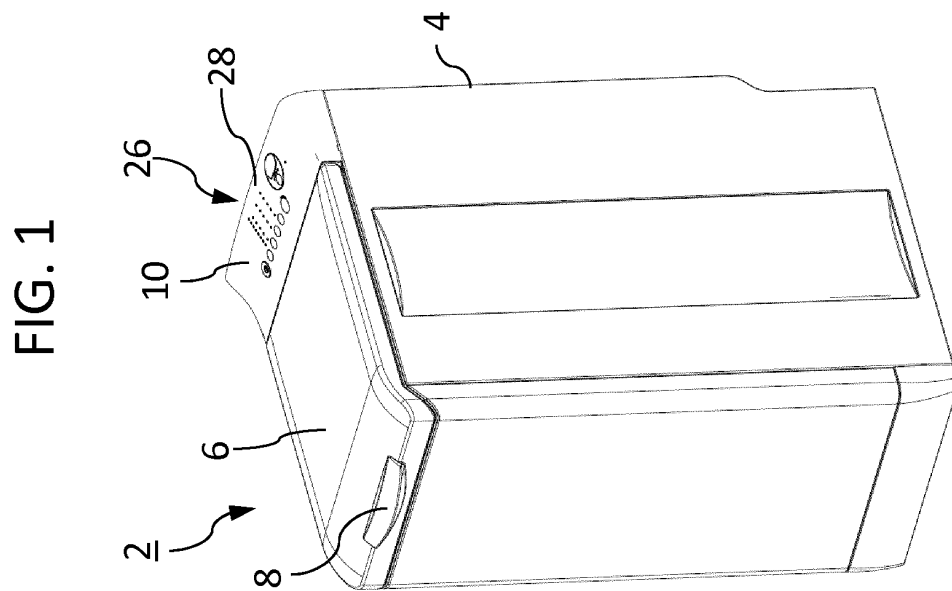
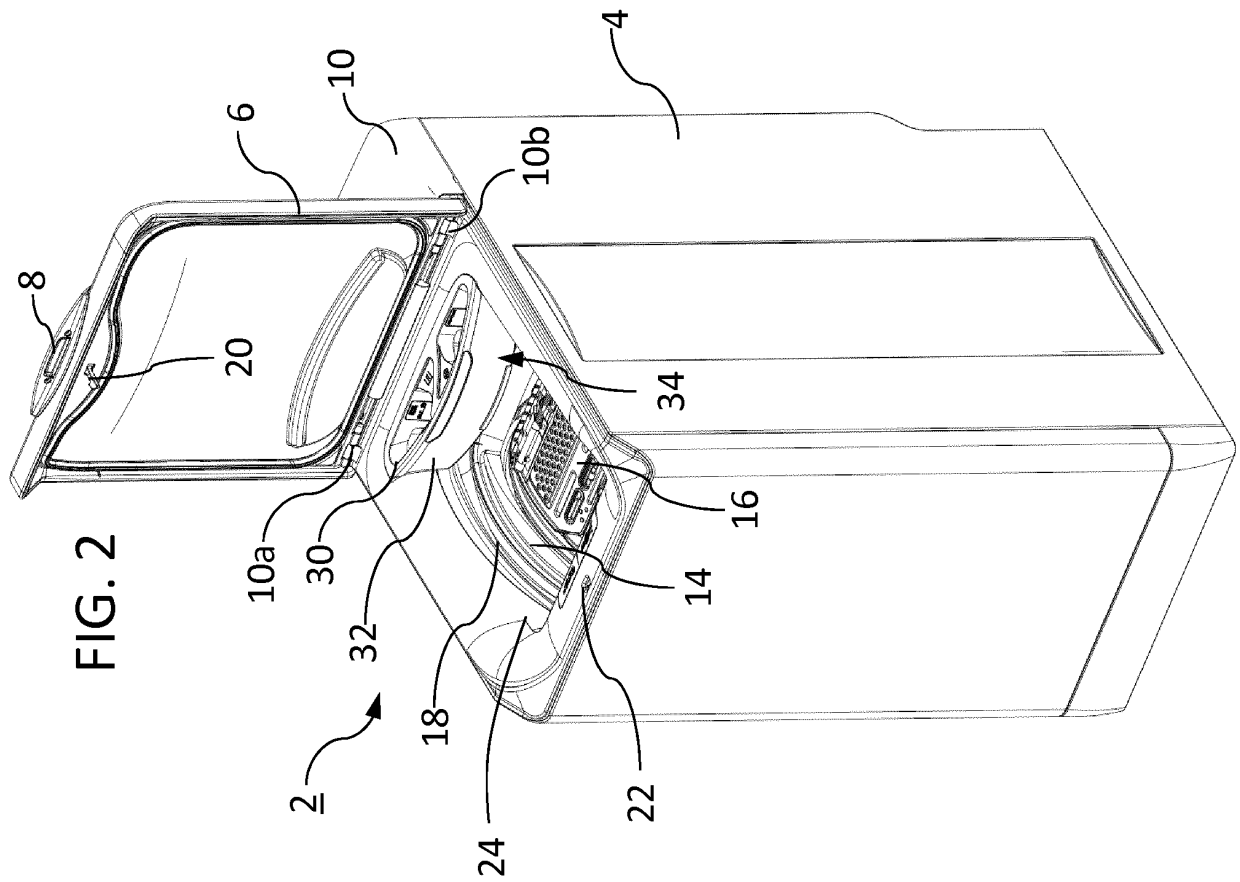


FIG. 3

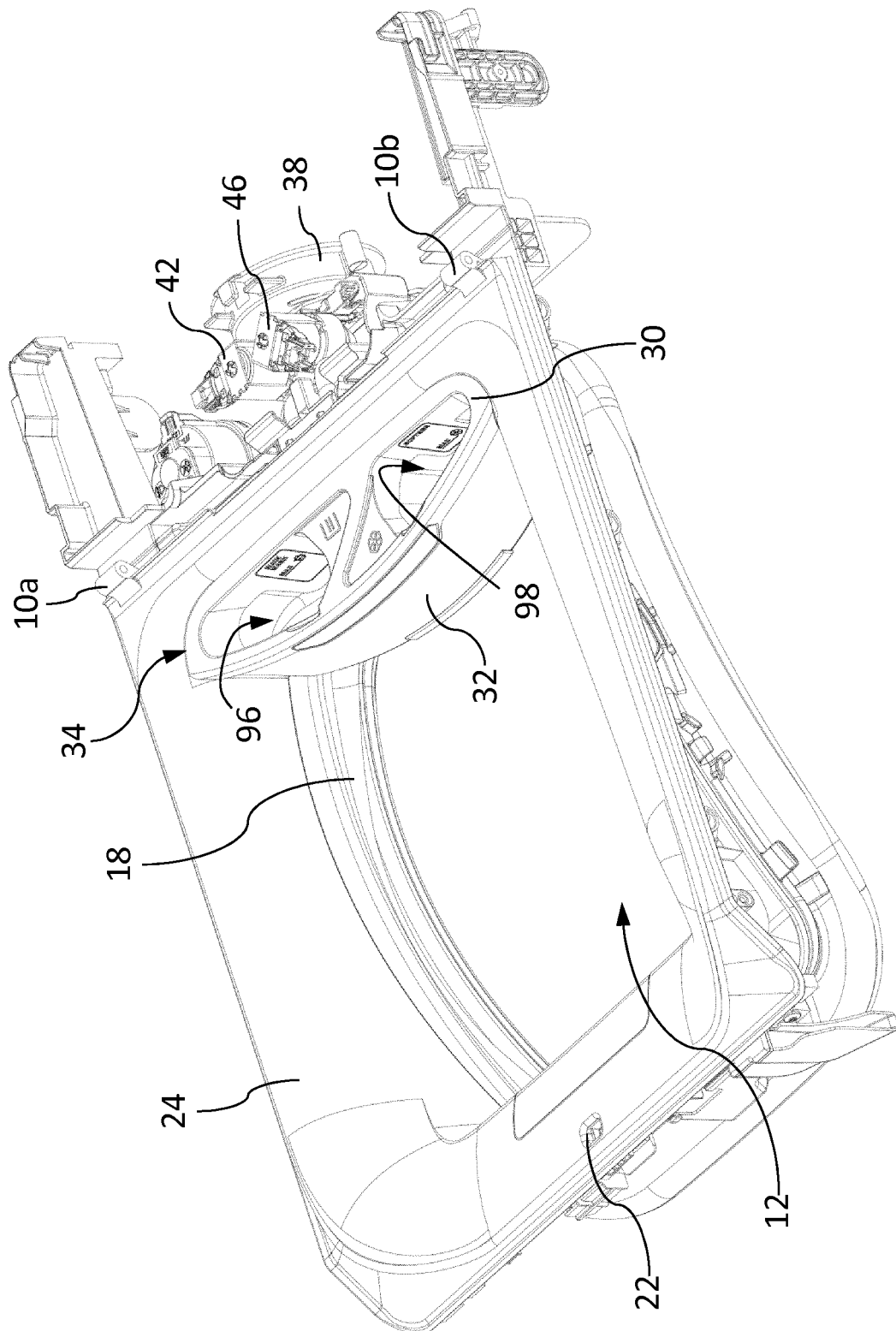
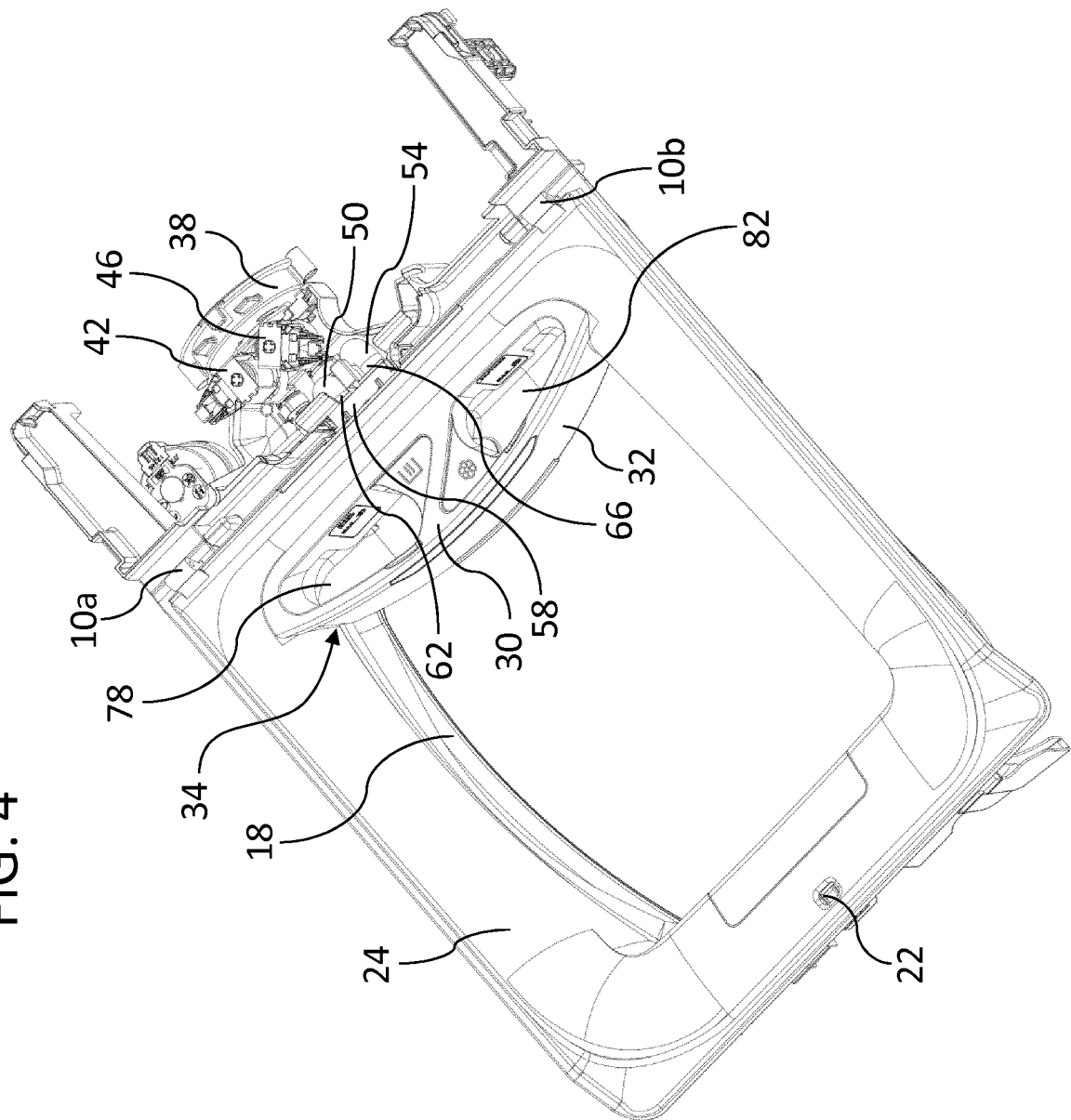
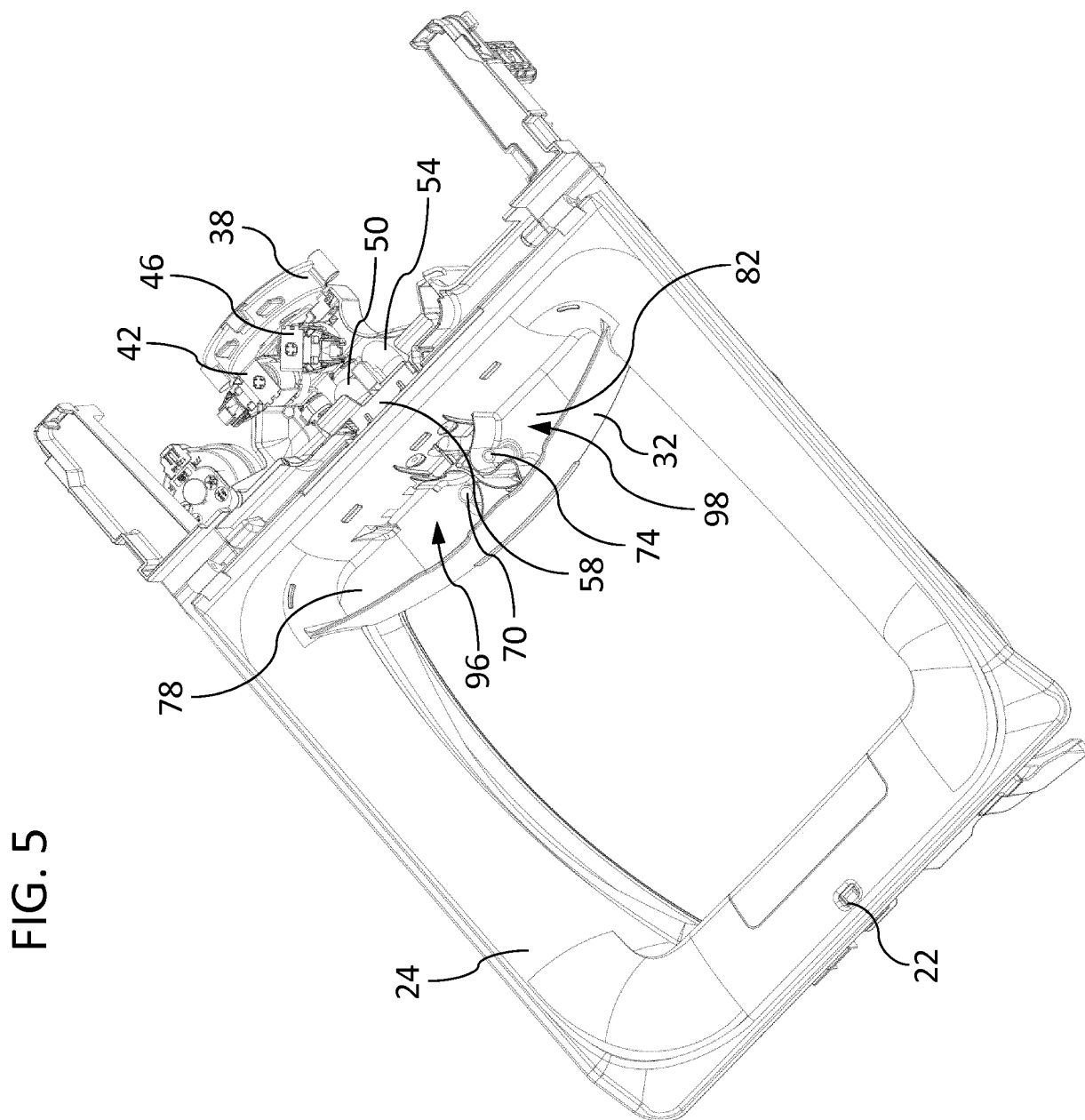


FIG. 4





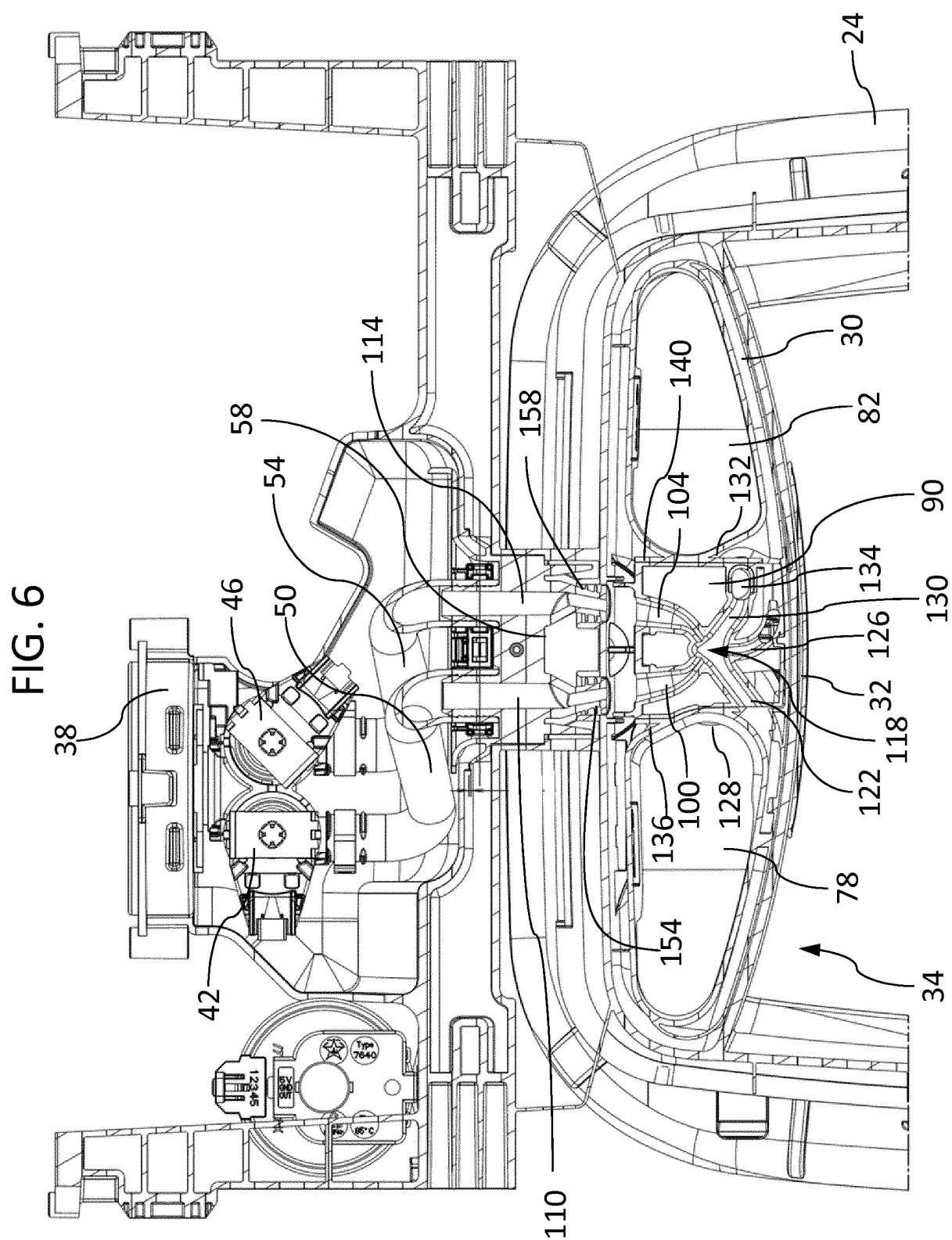


FIG. 7

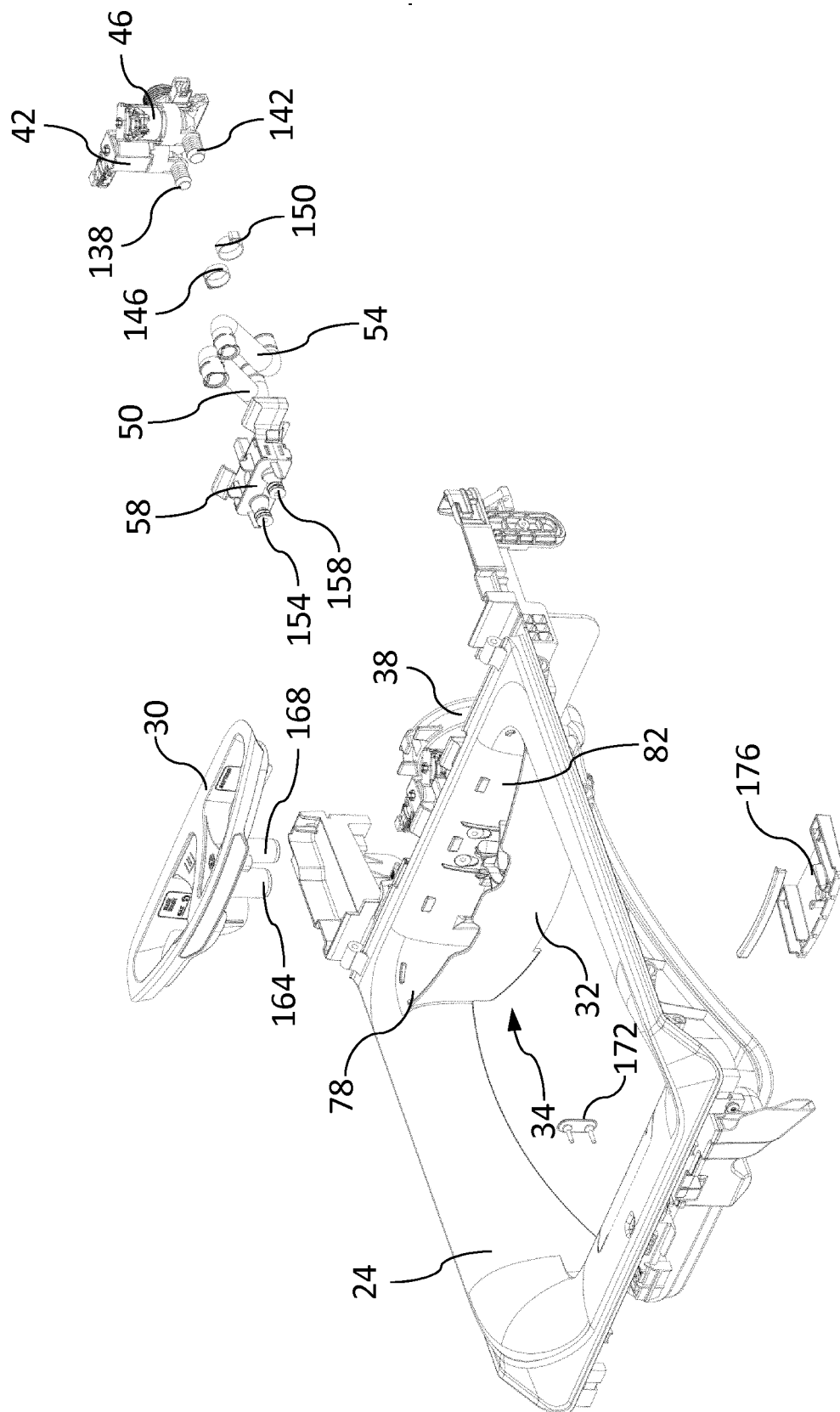


FIG. 8

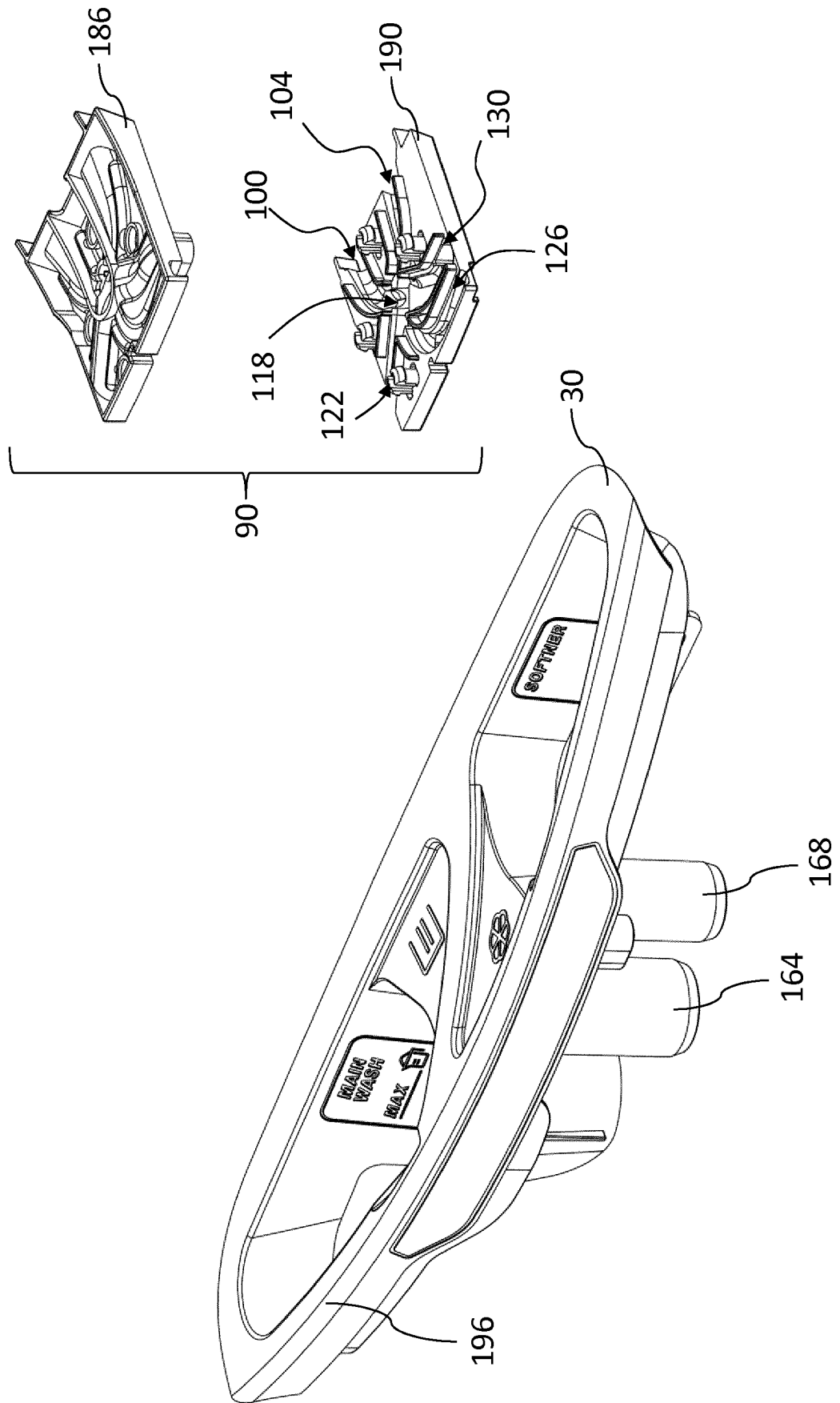
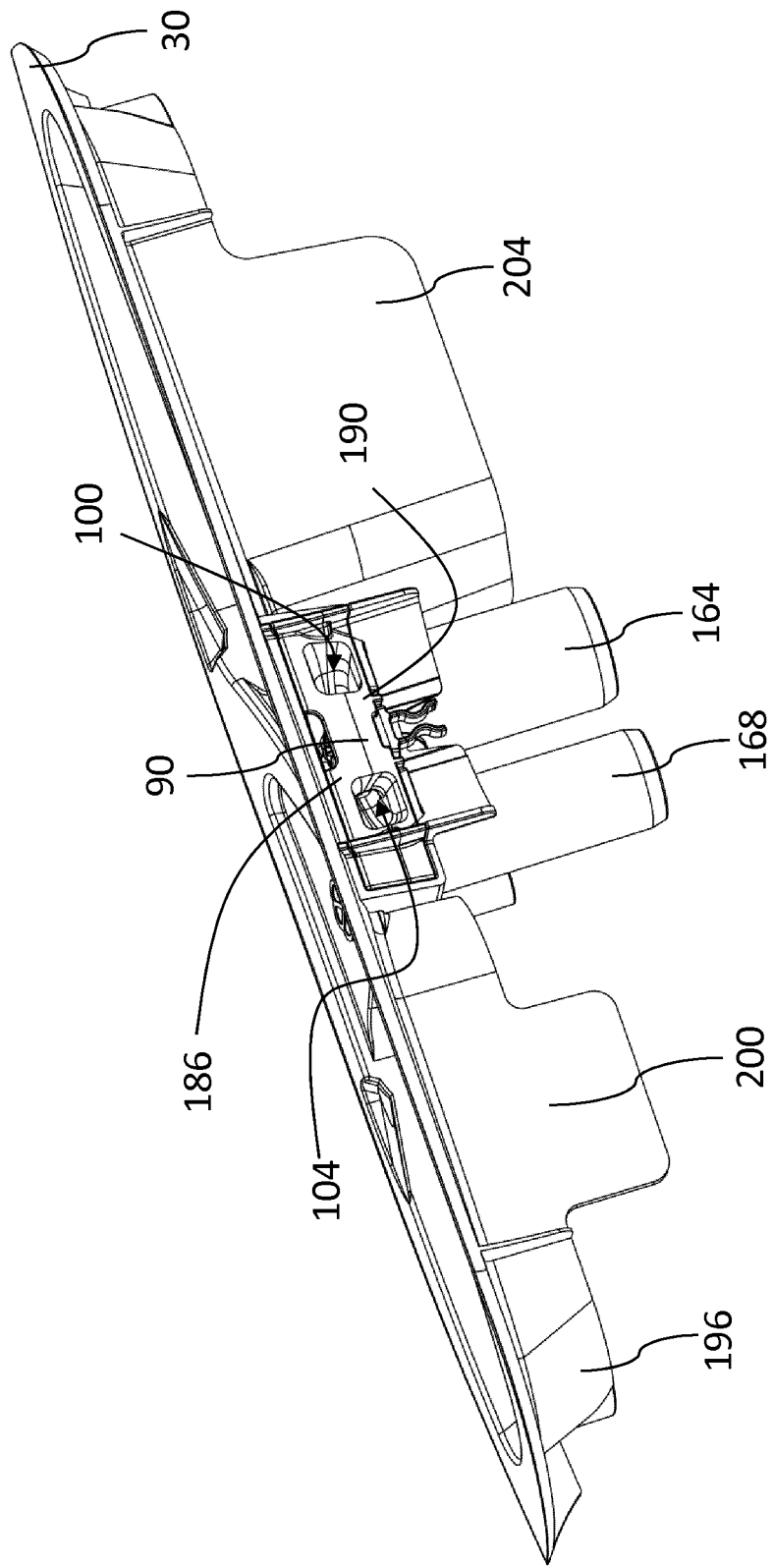


FIG. 9



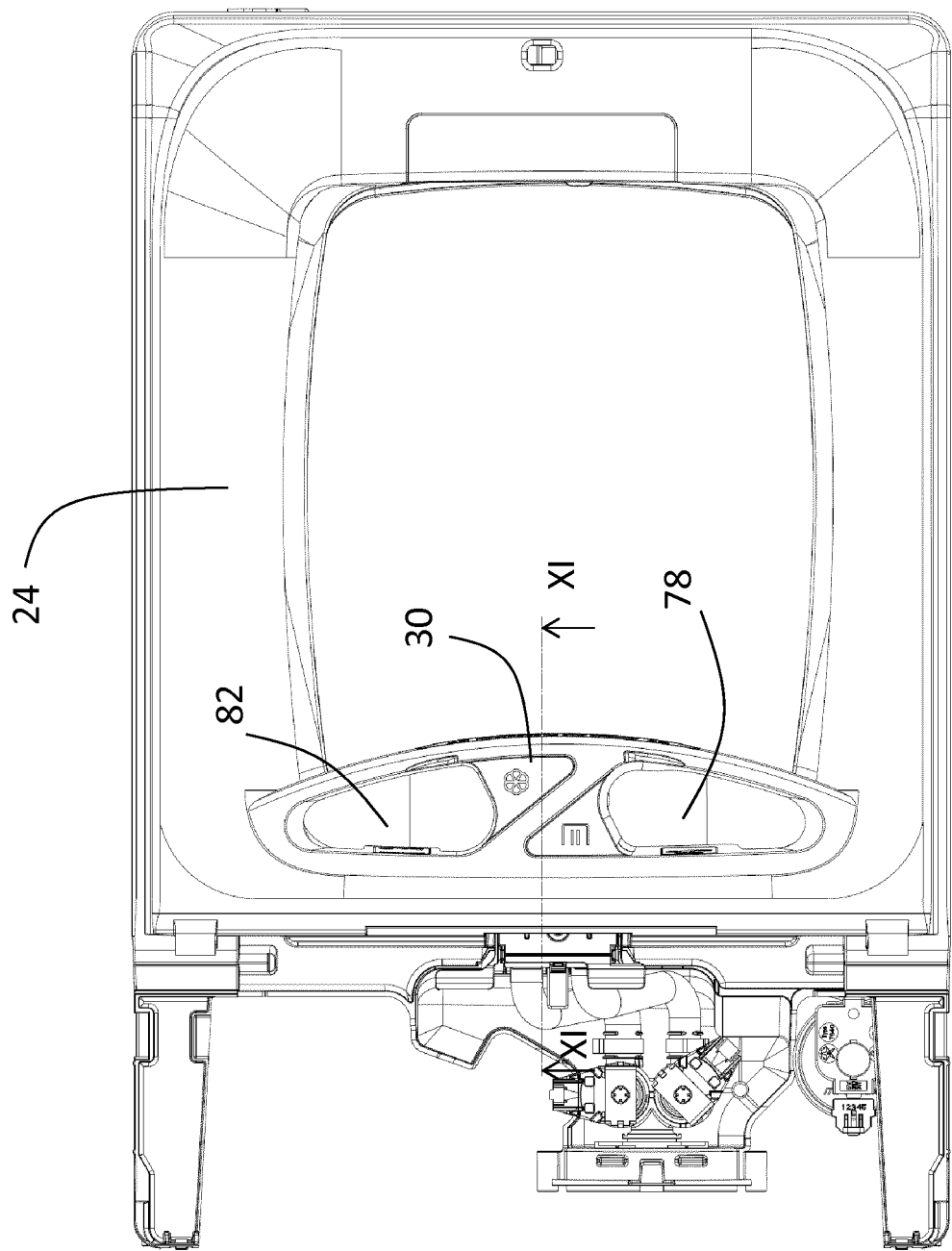


FIG. 10

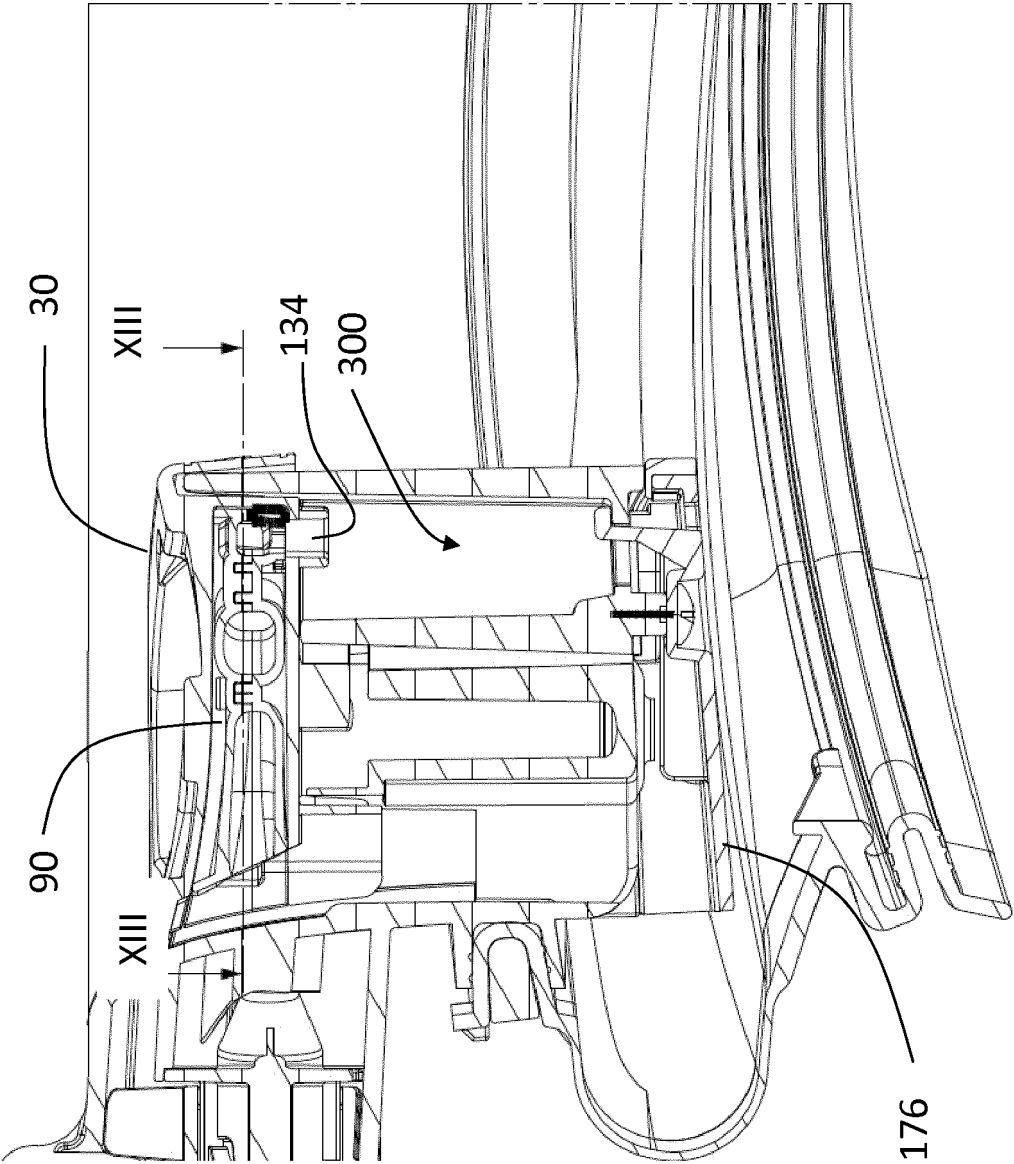


FIG. 11

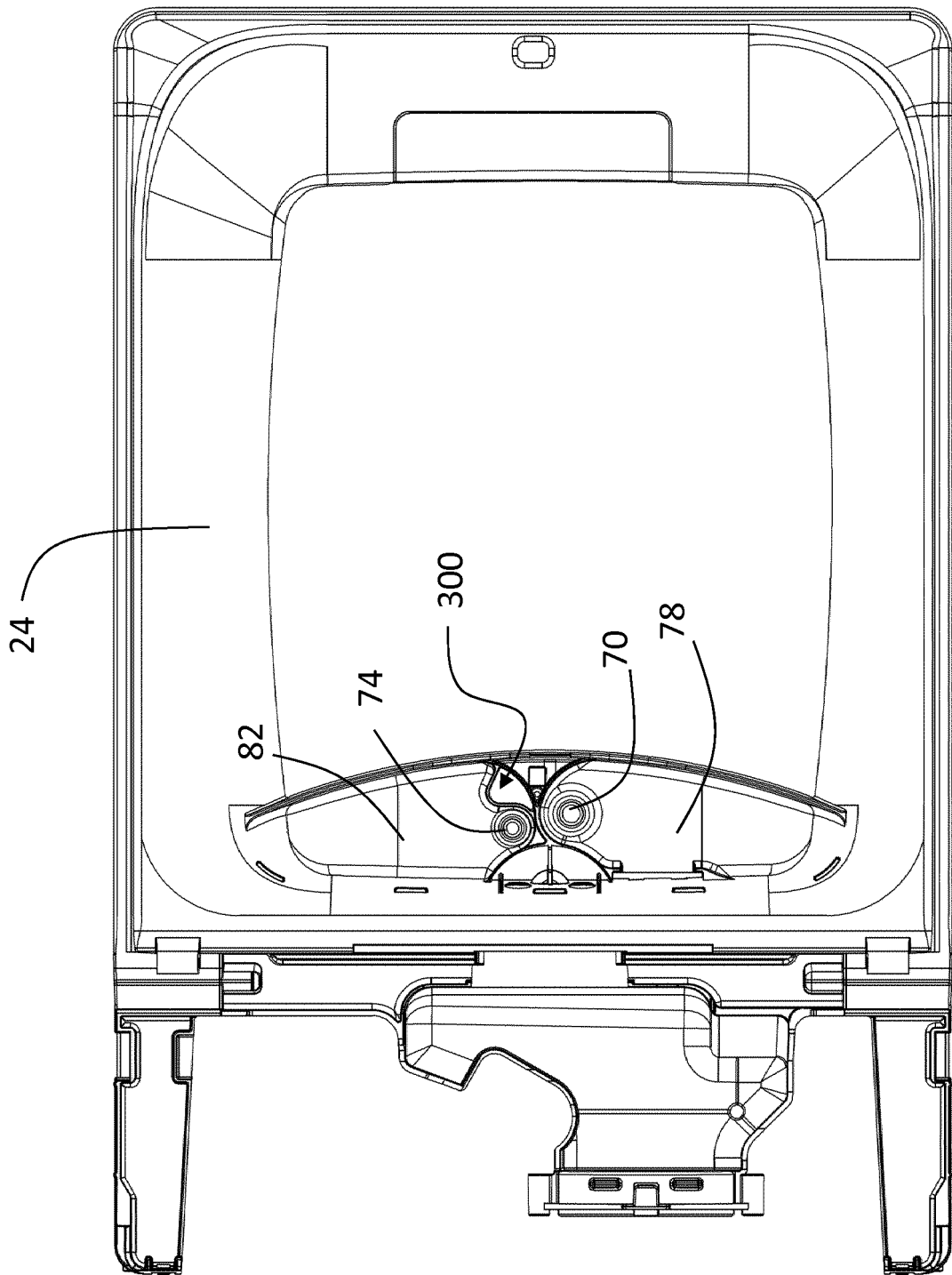
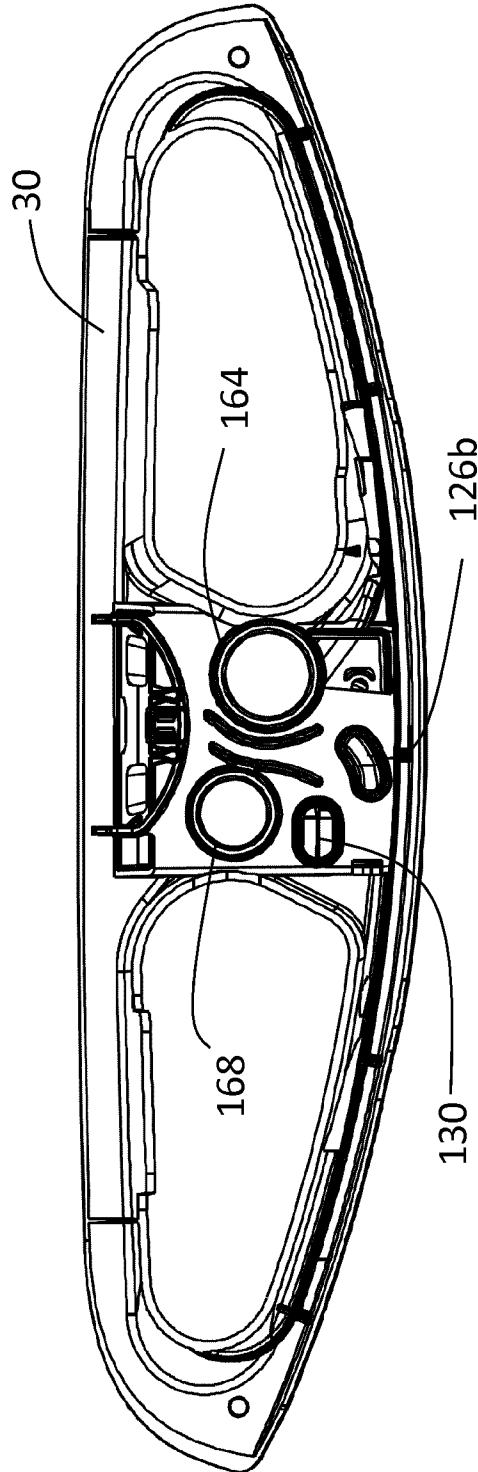
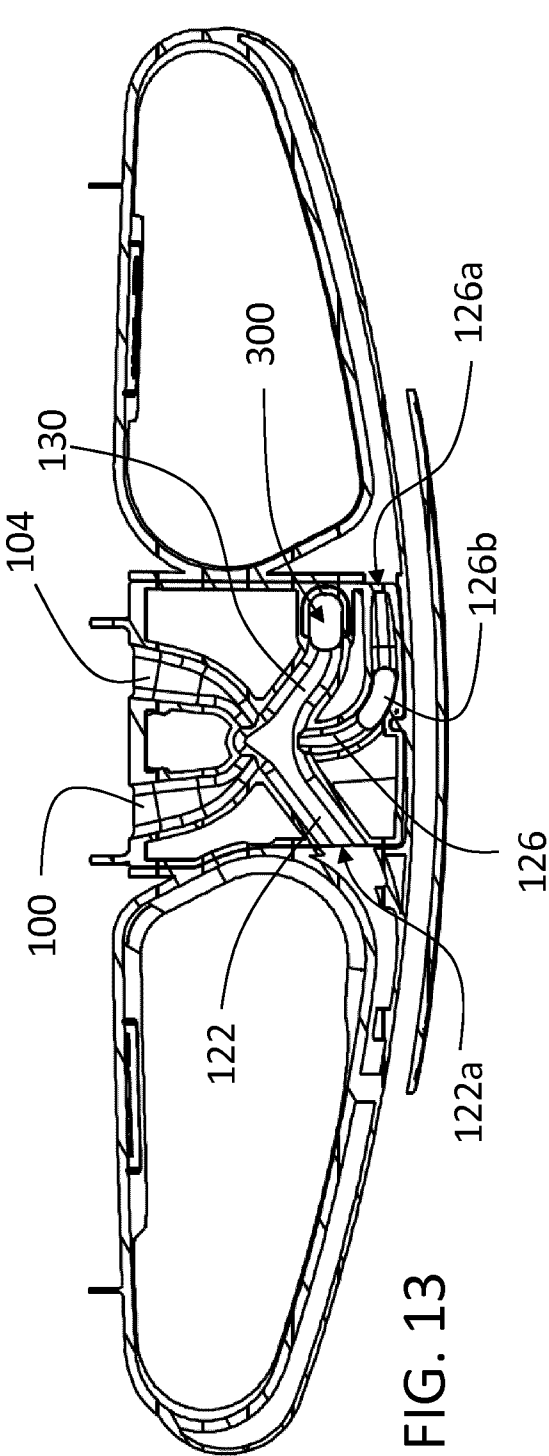


FIG. 12



REFERENCES CITED IN THE DESCRIPTION

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