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(54) **AN ASSEMBLY FOR DISPENSING WASHING AGENTS FOR A WASHING MACHINE, IN PARTICULAR A DISHWASHER**

VORRICHTUNG ZUR ABGABE VON WASCHMITTELN FÜR EINE WASCHMASCHINE, INSBESONDERE EINE GESCHIRRSPÜLMASCHINE

ENSEMBLE POUR DISTRIBUER DES AGENTS DE LAVAGE POUR UNE MACHINE À LAVER, EN PARTICULIER UN LAVE-VAISSELLE

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Description

[0001] The present invention relates to an assembly for dispensing washing agents in the washing chamber of a washing machine, in particular a dishwasher machine.

[0002] EP 3130272 A1 discloses an assembly according to the preamble of claim 1.

[0003] The invention relates to an assembly according to claim 1. More specifically, the object of the invention is an assembly including

> an integrated device for dispensing washing agents, comprising a body intended to be mounted in an opening of a sheet-like wall that delimits the washing chamber, wherein in said body are made at least one receptacle and at least one actuator to dispense a washing agent,
> a reservoir for liquid detergent, said reservoir having a holding chamber for the liquid detergent capable of communicating with the outside of the reservoir through at least one outlet opening for dispensing the liquid detergent into the washing chamber, and
> actuating means for controlling the liquid detergent to be dispensed from the reservoir, said reservoir being distinct from the at least one receptacle and said actuating means being distinct from the at least one actuator,
> the assembly being characterized in that
> the reservoir is removably coupled to the body of the device for dispensing washing agents and is positioned on the side of the device for dispensing washing agents intended to face the washing chamber when the device is mounted in the opening of the sheet-like wall.

[0004] In the assembly according to the invention, the reservoir may be sized with adequate capacities to contain and distribute relative amounts without necessarily having to load it at each washing cycle, as currently occurs with normal commercial dishwashers.

[0005] At the same time, the problems of washability of the entire volume and of the entire surface that come into contact with detergents are overcome. A characteristic of liquid detergents which is of little use in automatic dosing is that, after a certain time of exposure to the air or after disuse, they tend to change their viscosity until they reach the solid state. In this case, having an object with the parts that come into contact with the detergent being completely washable and with an easily accessible internal volume solves the problems of restoring the functions.

[0006] The reservoir is removable, and therefore may be washed in its entirety, for example under a tap of running water, so as to remove any residual liquid detergent which for any reason has solidified therein.

[0007] In this regard, it is particularly advantageous to have a dispensing system inside the reservoir, configured to cause liquid detergent to be dispensed through the outlet opening and controlled without contact by the actuator means, which is removable from the reservoir, for example positioned in a removable cap.

[0008] According to one embodiment, the reservoir may be hingedly connected to the body of the device for dispensing washing agents and, when the reservoir is connected to the body of the device for dispensing washing agents, the reservoir may assume a working position, wherein the reservoir is substantially horizontal with respect to the body of the device for dispensing washing agents and in a raised position.

[0009] Generally, the body of the integrated washing agent dispensing device comprises a receptacle adapted to hold a rinsing agent, and an inlet funnel for loading the rinsing agent, arranged on the front of the body of the integrated washing agent dispensing device. In this case, advantageously, in the working position, the reservoir closes said inlet funnel in the form of a cap.

[0010] According to one particularly preferred embodiment, the reservoir is connectable to the body of the device for dispensing washing agents by means of a pair of opposite side pins arranged on one of said reservoir and body of the device for dispensing washing agents and snap-fittable within corresponding seats formed on the other of said reservoir and body of the device for dispensing washing agents, and by means of a central pin arranged on one of said reservoir and body of the device for dispensing washing agents and snap-fittable within a corresponding seat formed on the other of said reservoir and body of the device for dispensing washing agents.

[0011] The reservoir may comprise a body having a thinner connection part for connection to the device for dispensing washing agents which, in the working position, is superimposed on the body of the device for dispensing washing agents, and a thicker holding part wherein the holding chamber for the liquid detergent is formed.

[0012] In this case, in the working position, the holding part of the body of the reservoir may be intended to be housed in a recess formed on the sheet-like wall of the washing chamber.

[0013] Further features and advantages of this invention will become more apparent from the detailed description that follows, provided purely by way of non-limiting example with reference to the accompanying drawings, wherein:

> figure 1 is a perspective view of a dishwasher machine provided with an assembly for dispensing washing agents according to the present invention;
> figures 2 and 3 are perspective views, essentially from the front, of an assembly installed on the machine of figure 1;
> figure 4 is a perspective view, essentially from the rear, of the assembly of figures 2 and 3;
> figures 5 and 6 are perspective views of the assembly

only, with the reservoir respectively in the working position and in the raised position;
figures 7 and 8 are perspective views, respectively front and rear, of the assembly without the reservoir;
figures 9 and 10 are schematic and sectional views of a reservoir cap, in two different operating positions;
figure 11 is a perspective view of the cap of figures 9 and 10;
figure 12 is a detailed view of the reservoir, with the cap installed;
figures 13 and 14 are perspective views of components of the cap.

[0014] Figure 1 collectively indicates a dishwasher at WD. Such machine comprises a housing A, essentially parallelepiped in shape, provided with a front opening B through which the washing chamber C of the machine may be accessed.

[0015] At the front opening B there is associated a door D oscillatable relative to the housing A of the machine WD about an essentially horizontal axis, indicated at E-E in figure 1.

[0016] On the side facing the washing chamber C, the door D has a sheet-like wall F, typically of sheet metal. In this wall F an opening is made, wherein an assembly for dispensing washing agents is mounted, collectively indicated at 1 in the drawings.

[0017] With reference in particular to figures 2 to 8, the combined unit 1 comprises an integrated device for dispensing washing agents indicated collectively at 2, and a reservoir for liquid detergent indicated collectively at 3.

[0018] In the illustrated embodiment, the integrated dispensing device 2 comprises a body 2a made of molded plastic material, wherein in a manner known per se a first release device 4 is made for dispensing a detergent, in particular in powder form, and an adjacent second release device 5 for dispensing a liquid rinsing agent (see in particular figures 6 and 7).

[0019] The detergent release device 4 comprises a receptacle for the detergent (not shown in the figures) essentially in the form of a basin, to which a cover 7 is associated. Such cover may be rotatably mounted, or movably coupled to the body 2a, or otherwise in a rotary-translatable manner.

[0020] The release device 5 for the rinsing agent is likewise of a type known per se. It comprises a receptacle (not visible in the figures) suitable to receive a quantity of rinsing agent corresponding to a plurality of doses. The figures show an inlet funnel 8 on the front of the integrated dispensing device 2, which serves to top up the rinsing agent in the corresponding receptacle. The dosed dispensing of the rinsing agent to the washing chamber C of the dishwasher machine WD is, in a manner known per se, controlled by means of a normally closed shut-off valve interposed on a duct capable of putting the receptacle in communication with such washing chamber, and opening at an outlet opening 9 (figure 3) on the front of the integrated dispensing device 2.

[0021] The dispensing of the detergent and the rinsing agent may be controlled by means of a single electrically controlled actuator device, indicated collectively at 10 in figures 4 and 8. Such solution is particularly suitable, but the adoption thereof is not limiting: alternatively, solutions of the type with two separate actuators may also be adopted.

[0022] The reservoir 3 is removably coupled to the body 2a of the integrated dispensing device 2. In particular, the reservoir 3 comprises a body 3a made of plastic material hinged to the body 2a of the integrated dispensing device 2. The reservoir 3 may be composed of two parts coupled to one another, for example by means of thermal welding methods, but may also be made in a single part, for example by means of blowing methods.

[0023] The reservoir 3 in the illustrated embodiment is therefore rotatably coupled to the body 2a of the integrated dispensing device 2. In particular, the body 2a of the reservoir 3 has a thinner connection part 3b, for connecting to the device for dispensing washing agents 2, and a thicker holding part 3c, wherein a holding chamber 3d for the liquid detergent (visible in figures 9 and 10) is formed. On the connecting part 3b of the reservoir 3 there is formed a cap formation 3f, the function of which will be described hereinafter.

[0024] The connecting part 3b has two parallel appendages 3e, the distal ends of which have respective recesses adapted to be engaged by respective pegs or pins 2p arranged on the body 2a of the integrated device 2 (visible for example in figure 7). This arrangement is not limiting, since the pins may be arranged on the body of the reservoir and the corresponding recesses may be formed on the body of the integrated device 2.

[0025] The reservoir 3 is therefore capable of assuming, with respect to the integrated dispensing device 2, an angular working position shown in figures 1 and 5, wherein the reservoir 3 is substantially horizontal with respect to the body 2a of the device for dispensing washing agents 2, the connecting part 3b is superimposed on the body 2a of the device for dispensing washing agents 2, and the cap formation 3f of the reservoir 3 closes the inlet funnel 8 for the rinsing agent; and a raised angular position shown in figures 1, 3 and 6, wherein the connecting part 3b of the reservoir 3 is raised with respect to the body 2a of the dispensing device 2. In the raised position of the reservoir 3, it is possible to refill the rinsing agent through the inlet funnel 8.

[0026] According to an alternative embodiment, not shown, the reservoir 3 the cap function for the inlet funnel of the rinsing agent may be absent. In this case it is necessary to provide the inlet funnel of the rinsing agent with its own cap.

[0027] In the working position, the holding part 3c of the body 3a of the reservoir 3 is intended to be housed in a recess F1 formed on the sheet-like wall of the washing chamber, adjacent to the integrated dispensing device 2.

[0028] As shown in figure 7, the pegs or pins 2p are configured to snap-fit in the respective hollows formed on the connection part 3b of the reservoir 3. Such configuration may be made, for example, by providing for the pins 2p to be arranged to slide in respective guides and to be pushed by springs towards the engagement position (in the laterally external direction). Naturally, other configurations are possible.

[0029] On the body 2 of the integrated device 2, a further snap peg or pin 2q may be provided, in a central position, which is adapted to engage a corresponding seat 3q (see fig. 2) to block the reservoir 3 in the horizontal working position. Alternatively, the pin could be arranged on the cover 3 and the respective seat on the body of the integrated dispensing device.

[0030] Although advantageous, the configuration according to which the reservoir 3 is rotatable with respect to the pins 2p is not limiting. For example, the reservoir could be configured for a removable assembly on the body 2a of the integrated device 2, but without being able to rotate with respect to the body of the integrated dispensing device.

[0031] At a filling mouth 3g of the reservoir 3, a removable cap 11 is sealingly mounted, represented in greater detail in figures 9-14. The cap 11 comprises a head 12 and a hollow drum 14, which extends axially from the head 12 into the holding chamber 3d. A gasket 15 is arranged on the side of the cap 11 facing the drum 14 adapted to be compressed between the head 12 of the cap 11 and a wall of the reservoir 3 around the mouth 3g when the cap is mounted on the reservoir. Through the head 12 of the cap, a plurality of outlet openings or through-holes 12b are formed. The closure of the cap may be made by screw or by bayonet as in the illustrated example, by means of radial projections 12a formed on the perimeter of the head 12 of the cap which engage with corresponding grooves formed on the perimeter of the filling mouth 3g of the reservoir 3.

[0032] The drum 14 comprises a radially outer tubular wall 14a, on which a pair of diametrically opposed longitudinal slots 14b are formed, and a radially inner tubular wall 14c, coaxial with the radially outer tubular wall 14a and having a longitudinal extension lower with respect thereof. The cavity inside the radially inner tubular wall 14c is in communication with the outlet openings 12b formed on the head 12 of the cap 11.

[0033] The end of the drum 14 far from the head 12 of the cap is inserted in a centering collar formation 3h made in the bottom of the reservoir 3.

[0034] Inside the drum 14 a piston 16 is mounted in a guided manner. The piston 16 comprises a guide part 16a, slidably inserted inside the radially outer tubular wall 14a of the drum 14 and provided with guide protrusions 16b inserted in the slots 14b, and a piston end portion 16c provided with longitudinal grooves 16d on the side surface thereof. At the top of the piston end portion 16c is positioned a diaphragm 17 made of a deformable material, e.g. elastomeric material. The diaphragm 17 is fixed to the piston end portion 16c at its center, while it is free to flex peripherally.

[0035] At an advanced end-of-stroke position of the piston 16, the piston end portion 16c is designed to abut against a seat 14d formed on the inner side of the radially inner tubular wall 14c. The seat 14d is positioned at a predetermined distance from the free end of the radially inner tubular wall 14c. Between the seat 14d and the free end of the radially inner tubular wall 14c, a chamber 14e is thus defined as being surrounded by a continuous wall, i.e. without side openings.

[0036] A permanent magnet 18 is fixed to the piston 16, positioned in such a way as to have a polarity oriented parallel to the direction of movement of the piston 16.

[0037] The permanent magnet 18 is designed to interact without contact with a pair of permanent control magnets 21, 22 arranged outside the reservoir 3, on the other side of the bottom wall thereof when the reservoir 3 is mounted in the working position. Other systems based on force transmission without contact are conceivable, in particular, systems based on electromagnets.

[0038] The control magnets 21, 22 are arranged in such a way as to have a polarity oriented parallel to the direction of movement of the piston 16. One of them, 21, hereinafter referred to as the retracting magnet, points towards the magnet 18 a pole opposite the pole which the magnet 18 directs towards the magnet 21. The other, 22, hereinafter referred to as the advancing magnet, directs towards the magnet 18 a pole with an identical sign as that of the pole which the magnet 18 directs towards the magnet 22.

[0039] As can be seen in figures 7 and 8, the control magnets 21, 22 are carried by a support member 23 rotatable about an axis y orthogonal to the disposition plane of the device 2. With respect to this support member 23, the magnets 21 and 22 occupy angularly distinct positions, in particular, diametrically opposed. However, such provision is not limiting, as a configuration is also foreseeable wherein the magnets may be alternately translated.

[0040] Preferably, the support member 23 is mounted on a structure integrally formed with the body of the integrated device 2. The support member 23 receives the motion from an actuator 24, for example, by means of gearing between a sprocket keyed on an output shaft of the actuator and a peripheral toothing of the support member 23. However, such arrangement is not limiting, as a configuration is also foreseeable wherein the actuator is a linear actuator. Also, the actuator 24 is supported by a structure made integrally with the body of the integrated device 2.

[0041] A unidirectional non-return valve device 30 is positioned at the head 12 of the cap. This device 30 is positioned in the cavity delimited by the radially inner side wall 14c, between the seat 14d and the outlet openings 12b. The non-return valve device 30 is conventionally provided with resilient means which stress the shutter into a closed position. The valve device 30 is therefore

configured to be open or closed when the difference between a fluid pressure upstream thereof (i.e. in the chamber 14e) and a fluid pressure downstream thereof (i.e. at the outlet openings 12b) is respectively greater than or less than a predetermined value (substantially determined by the resilient means).

[0042] In the retracted end-of-stroke position shown in figure 9, the piston 16 is substantially resting against the bottom wall of the reservoir 3 and is held in such position by the magnetic attraction between the magnet 18 of the piston 16 and the retracting magnet 21 which are positioned opposite each other.

[0043] As a result of a control signal sent by a control unit to the actuator 24, the actuator 24 controls the rotation of the support member 23 so as to bring the advancing magnet 22 in front of the magnet 18 of the piston 16 (figure 10).

[0044] Because of the magnetic repulsion between the magnet 18 of the piston 16 and the advancing magnet 22, the piston 16 advances towards the seat 14d with the diaphragm 17. When the diaphragm 17 starts to engage the free end of the radially inner tubular wall 14c, the compression of the liquid detergent inside the chamber 14e causes the opening of the non-return valve device 30 and therefore the dispensing of the liquid detergent into the washing chamber C of the machine. The movement of the piston ends when the diaphragm 17 reaches the seat 14d. At the end of the piston's advancement, the non-return valve 30 is closed, determined by its resilient means. Overall, a volume of liquid detergent is then dispensed substantially equal to the maximum volume of the chamber 14e upstream of the seat 14d (determined by the distance between the seat 14d and the free end of the radially inner tubular wall 14c).

[0045] As a result of another control signal sent by a control unit to the actuator 24, the actuator 24 controls the rotation of the support member 23 so as to bring the retracting magnet 21 in front of the magnet 18 of the piston 16 (figure 9).

[0046] Due to the magnetic attraction between the magnet 18 of the piston 16 and the retracting magnet 21, the piston 16 retracts with the diaphragm 17 towards the retracted end-of-stroke position. The closure of the non-return valve device 30, which occurred at the end of the advancement phase of the piston, prevents the water circulating in the washing chamber C of the machine from penetrating into the reservoir 3; at the same time, it prevents the piston from sucking into the reservoir the detergent pushed forward by the previous movement. At the beginning of the retracting movement, the diaphragm 17 flexes peripherally as a result of contact with the radially inner tubular wall 14c and/or the thrust of the liquid into the grooves 16d on the piston end portion 16c, allowing the liquid detergent present in the holding chamber 3d to reach the chamber 14e adjacent to the seat 14d. The diaphragm 17 returns to its undeformed configuration when the piston 16 is retracted by an amount such as to bring the diaphragm 17 out of the chamber 14e adjacent to the seat 14d. The movement of the piston 16 ends when the bottom wall of the reservoir is reached. To prevent the piston from impacting the bottom wall of the reservoir in a noisy manner, a chamber 3m is provided at the bottom of the reservoir (delimited at the top by a dotted line in figure 9) inside of which the liquid resists the retraction of the piston. This is ensured by a side wall around the chamber 3m (in this case provided by one end of the drum), wherein calibrated passages (not shown in the figure) are formed, which allow the liquid in the chamber 3m, compressed by the piston 16 during the retracting movement of the latter, to escape into the holding chamber 3d of the reservoir.

[0047] With the retraction of the piston, a new quantity of liquid detergent is loaded into the chamber 14e ready to be dispensed in a subsequent movement.

[0048] Generally, the volume of detergent needed for a machine cycle may reach 40/50 cm^3, so the movement of the piston which, at each cycle, dispenses only a small part of the volume (for example 2/3 cm^3) must be repeated in a series of pulses until the expected quantity is reached.

[0049] Although advantageous for the washability of the reservoir, the configuration wherein the piston and the valve device are positioned inside the removable cap is not limiting. For example, it is possible to conceive of an embodiment wherein such components are partially or completely positioned outside the cap. The function of supporting the components being provided in this case by the parts formed in the body of the reservoir, the cap would only maintain the closing function.

[0050] Naturally, without altering the principle of the invention, the embodiments and the details of construction may vary widely with respect to those described and illustrated purely by way of non-limiting example, without thereby departing from the scope of the invention as defined in the appended claims.

Claims

1. Assembly (1) for dispensing washing agents into a washing chamber (C) of a washing machine, in particular a dishwasher machine (WD), including
an integrated device for dispensing washing agents (2), comprising a body (2a) intended to be mounted in an opening of a sheet-like wall (F) that delimits the washing chamber (C), wherein in said body are arranged at least one receptacle and at least one actuator (10) to dispense a washing agent,
a reservoir (3) for liquid detergent, said reservoir (3) having a holding chamber (3d) for the liquid detergent capable of communicating with the outside of the reservoir (3) through at least one outlet opening (12b) for dispensing the liquid detergent, and
actuating means (21, 22, 23, 24) for controlling the liquid detergent to be dispensed from the reservoir (3), said reservoir (3) being distinct from the at least

one receptacle and said actuating means being distinct from the at least one actuator,
the assembly (1) being **characterized in that**
the reservoir (3) is removably coupled to the body (2a) of the device for dispensing washing agents (2), and is positioned on the side of the device for dispensing washing agents (2) intended to face towards the washing chamber (C) when the device (2) is mounted in the opening of the sheet-like wall (F).

2. Assembly according to claim 1, wherein the reservoir (3) is hingedly connected to the body (2a) of the device for dispensing washing agents (2) and, when the reservoir is connected to the body (2a) of the device for dispensing washing agents (2), the reservoir is capable of assuming a working position, wherein the reservoir is substantially horizontal with respect to the body (2a) of the device for dispensing washing agents (2), and a raised position.

3. Assembly according to claim 2, wherein the body (2a) of the device for dispensing washing agents (2) comprises a receptacle for collecting a rinsing agent, and an inlet funnel (8) for loading the rinsing agent arranged on a front of the body (2a) of the device for dispensing washing agents (2), and wherein in the working position the reservoir (3) closes said inlet funnel (8) as a cap.

4. Assembly according to claim 2 or 3, wherein the reservoir (3) is connectable to the body (2a) of the device for dispensing washing agents (2) by means of a pair of opposite side pins (2p) arranged on one of said reservoir (3) and body (2a) of the device for dispensing washing agents (2) and snap-fittable within corresponding seats formed on the other of said reservoir (3) and body (2a) of the device for dispensing washing agents (2), and by means of a central pin (2q) arranged on one of said reservoir (3) and body (2a) of the device for dispensing washing agents (2) and snap-fittable within a corresponding seat formed on the other of said reservoir (3) and body (2a) of the device for dispensing washing agents (2).

5. Assembly according to any of claims 2 to 4, wherein the reservoir (3) comprises a body (3a) having a thinner connection part (3b) for connection to the device for dispensing washing agents (2) which in the working position is superimposed to the body (2a) of the device for dispensing washing agents (2), and a thicker holding part (3c) in which the holding chamber (3d) for the liquid detergent is formed.

6. Assembly according to claim 5, wherein in the working position the holding part (3c) of the body (3a) of the reservoir (3) is intended to be received in a recess (F1) formed on the sheet-like wall (F) of the washing chamber (C).

7. Assembly according to any of the preceding claims, comprising a removable cap (11) mounted on the reservoir (3), said outlet opening (12b) being formed through the cap (11).

8. Assembly according to any of the preceding claims, further comprising dispensing means (16, 30) arranged within the reservoir (3) and configured to cause the liquid detergent to be dispensed out through the outlet opening (12b), said dispensing means (16) being controlled by contactless force transmission by the actuating means (21, 22, 23, 24).

9. Assembly according to claim 8, wherein the dispensing means (16, 30) may be removed from the reservoir (3), and in particular they are positioned in a removable cap (11) of the reservoir (3).

10. Assembly according to claim 8 or 9, wherein said dispensing means comprise
a piston (16) movable within the holding chamber (3d) of the reservoir (3) and capable of assuming an advanced end-of-stroke position, in which the piston (16) engages a seat (14d) formed at the outlet opening (12b) and blocks fluid communication between the holding chamber (3d) and the outside of the holding chamber (3d), and a retracted end-of-stroke position, in which the piston (16) is removed from the seat, wherein a variable volume working chamber (14e) capable of communicating with the holding chamber (3d) is defined between the piston (16) and the seat (14d); and
non-return valve means (30) arranged at the outlet opening (12b) and downstream of the seat (14d), said non-return valve means (30) being open or closed when the difference between a fluid pressure upstream thereof and a fluid pressure downstream thereof is higher or lower than a predetermined value, respectively;
wherein during the stroke of the piston (16) from the advanced end-of-stroke position to the retracted end-of-stroke position the liquid flows from the holding chamber (3d) to the working chamber (14e), and during the stroke of the piston (16) from the retracted end-of-stroke position to the advanced end-of-stroke position the liquid is dispensed out from the working chamber (14e) through the outlet opening (12b).

Patentansprüche

1. Anordnung (1) zur Abgabe von Reinigungsmitteln in eine Spülkammer (C) einer Reinigungsmaschine, insbesondere einer Geschirrspülmaschine (WD), aufweisend
eine integrierte Vorrichtung (2) zur Abgabe von Reinigungsmitteln, aufweisend ein Gehäuse (2a), das dazu bestimmt ist, in einer Öffnung einer plattenar-

tigen Wand (F), welche die Spülkammer (C) begrenzt, montiert zu werden, wobei in dem Gehäuse mindestens ein Aufnahmebehälter und mindestens ein Betätigungselement (10) zur Abgabe eines Reinigungsmittels angeordnet sind,
einen Vorratsbehälter (3) für flüssiges Reinigungsmittel, wobei der Vorratsbehälter (3) eine Speicherkammer (3d) für das flüssige Reinigungsmittel aufweist, welche durch mindestens eine Auslassöffnung (12b) zur Abgabe von flüssigem Reinigungsmittel mit dem Außenbereich des Vorratsbehälters (3) in Verbindung steht, und
Betätigungsmittel (21, 22, 23, 24) zur Regulierung des aus dem Vorratsbehälter (3) abzugebenden flüssigen Reinigungsmittels, wobei der Vorratsbehälter (3) ein anderer als der mindestens eine Aufnahmebehälter ist und die Betätigungsmittel andere als das mindestens eine Betätigungselement sind,
wobei die Anordnung (1) **dadurch gekennzeichnet ist, dass**
der Vorratsbehälter (3) lösbar mit dem Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln verbunden ist und an der Seite der Vorrichtung (2) zur Abgabe von Reinigungsmitteln angeordnet ist, die dazu bestimmt ist, der Spülkammer (C) zugewandt zu sein, wenn die Vorrichtung (2) in der Öffnung der plattenartigen Wand (F) montiert ist.

2. Anordnung nach Anspruch 1, wobei der Vorratsbehälter (3) schwenkbar mit dem Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln verbunden ist und der Vorratsbehälter, wenn er mit dem Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln verbunden ist, zur Einnahme einer Arbeitsposition, in welcher der Vorratsbehälter im Wesentlichen horizontal zu dem Gehäuse (2a) der Vorrichtung zur Abgabe von Reinigungsmitteln (2) ist, und einer erhöhten Position ausgelegt ist.

3. Anordnung nach Anspruch 2, wobei das Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln einen Aufnahmebehälter zur Aufnahme eines Spülmittels/Klarspülers und einen an einer Vorderseite des Gehäuses (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln angeordneten Einlauftrichter (8) zum Einfüllen des Spülmittels aufweist, und wobei in der Arbeitsposition der Vorratsbehälter (3) den Einlauftrichter (8) als Kappe verschließt.

4. Anordnung nach Anspruch 2 oder 3, wobei der Vorratsbehälter (3) mittels eines Paares von gegenüberliegenden Seitenstiften (2p), welche auf dem Vorratsbehälter (3) oder dem Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln angeordnet sind und in entsprechende Sitze einrastbar sind, welche auf dem anderen von Vorratsbehälter (3) und Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln ausgebildet sind, und mittels eines Mittelstifts (2q), der auf dem Vorratsbehälter (3) oder dem Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln angeordnet ist und in einen entsprechenden Sitz einrastbar ist, welcher auf dem anderen von Vorratsbehälter (3) und Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln ausgebildet ist, mit dem Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln verbindbar ist.

5. Anordnung nach einem der Ansprüche 2 bis 4, wobei der Vorratsbehälter (3) ein Gehäuse (3a) mit einem schmaleren Verbindungsteil (3b) zum Verbinden mit der Vorrichtung (2) zur Abgabe von Reinigungsmitteln, welches in der Arbeitsposition über das Gehäuse (2a) der Vorrichtung (2) zur Abgabe von Reinigungsmitteln gestülpt wird, und einem breiteren Speicherteil (3c), in welchem die Speicherkammer (3d) für das flüssige Reinigungsmittel ausgebildet ist, aufweist.

6. Anordnung nach Anspruch 5, wobei das Speicherteil (3c) des Gehäuses (3a) des Vorratsbehälters (3) in der Arbeitsstellung dazu bestimmt ist, in einer an der plattenförmigen Wand (F) der Spülkammer (C) ausgeformten Aussparung (F1) aufgenommen zu werden.

7. Anordnung nach einem der vorangehenden Ansprüche, aufweisend eine an dem Vorratsbehälter (3) angebrachte abnehmbare Kappe (11), wobei die Ausgangsöffnung (12b) durch die Kappe (11) hindurch ausgebildet ist.

8. Anordnung nach einem der vorangehenden Ansprüche, weiter aufweisend eine innerhalb des Vorratsbehälters (3) angeordnete Abgabeeinrichtung (16, 30), die dazu ausgelegt ist, die Abgabe des flüssigen Reinigungsmittels durch die Ausgangsöffnung (12b) zu bewirken, wobei die Abgabeeinrichtung (16) durch kontaktlose Kraftübertragung durch die Betätigungseinrichtung (21, 22, 23, 24) gesteuert wird.

9. Anordnung nach Anspruch 8, wobei die Abgabeeinrichtung (16, 30) aus dem Vorratsbehälter (3) entnommen werden kann und insbesondere in einer abnehmbaren Kappe (11) des Vorratsbehälters (3) angeordnet ist.

10. Anordnung nach Anspruch 8 oder 9, wobei die Abgabeeinrichtung umfasst:

einen Kolben (16), der innerhalb der Speicherkammer (3d) des Vorratsbehälters (3) beweglich ist und der eine vorgeschobene Endlageposition, in welcher der Kolben (16) in einen an der Ausgangsöffnung (12b) ausgebildeten Sitz

(14d) eingreift und die Flüssigkeitsübertragung zwischen der Speicherkammer (3d) und dem Außenbereich der Speicherkammer (3d) blockiert, und eine zurückgezogene Endlageposition, in welcher der Kolben (16) aus dem Sitz herausgezogen ist, einnehmen kann, wobei eine Arbeitskammer (14c) variablen Volumens, die mit der Speicherkammer (3d) in Verbindung kommen kann, zwischen dem Kolben (16) und dem Sitz (14d) definiert ist; und

ein Rückschlagventil (30), das an der Ausgangsöffnung (12b) und in Abwärtsströmrichtung des Sitzes (14d) angeordnet ist, wobei das Rückschlagventil (30) geöffnet oder geschlossen ist, wenn der Unterschied zwischen einem vorgelagerten Flüssigkeitsdruck bzw. einem nachgelagerten Flüssigkeitsdruck größer oder geringer als ein vorbestimmter Wert ist;

wobei die Flüssigkeit während des Hubs des Kolbens (16) von der vorgeschobenen Endlageposition zu der zurückgezogenen Endlageposition von der Speicherkammer (3d) zur Arbeitskammer (14e) strömt und die Flüssigkeit während des Hubs des Kolbens (16) von der zurückgezogen Endlageposition zu der vorgeschobenen Endlageposition von der Arbeitskammer (14e) aus durch die Ausgangsöffnung (12b) abgegeben wird.

Revendications

1. Ensemble (1) pour distribuer des agents de lavage dans une chambre de lavage (C) d'une machine à laver, en particulier un lave-vaisselle (WD), incluant un dispositif intégré de distribution d'agents de lavage (2), comprenant un corps (2a) destiné à être monté dans une ouverture d'une paroi de type feuille (F) qui délimite la chambre de lavage (C), dans lequel dans ledit corps sont agencés au moins un réceptacle et au moins un actionneur (10) pour distribuer un agent de lavage,

un réservoir (3) pour détergent liquide, ledit réservoir (3) comportant une chambre de retenue (3d) pour le détergent liquide capable de communiquer avec l'extérieur du réservoir (3) par le biais d'au moins une ouverture de sortie (12b) pour distribuer le détergent liquide, et

des moyens d'actionnement (21, 22, 23, 24) pour commander le détergent liquide à distribuer depuis le réservoir (3), ledit réservoir (3) étant distinct de l'au moins un réceptacle et lesdits moyens d'actionnement étant distincts de l'au moins un actionneur, l'ensemble (1) étant **caractérisé en ce que**

le réservoir (3) est accouplé de manière amovible au corps (2a) du dispositif de distribution d'agents de lavage (2), et est positionné sur le côté du dispositif de distribution d'agents de lavage (2) destiné à être tourné vers la chambre de lavage (C) lorsque le dispositif (2) est monté dans l'ouverture de la paroi de type feuille (F).

2. Ensemble selon la revendication 1, dans lequel le réservoir (3) est relié de manière articulée au corps (2a) du dispositif de distribution d'agents de lavage (2) et, lorsque le réservoir est relié au corps (2a) du dispositif de distribution d'agents de lavage (2), le réservoir est capable d'adopter une position de travail, dans laquelle le réservoir est sensiblement horizontal par rapport au corps (2a) du dispositif de distribution d'agents de lavage (2), et une position surélevée.

3. Ensemble selon la revendication 2, dans lequel le corps (2a) du dispositif de distribution d'agents de lavage (2) comprend un réceptacle pour collecter un agent de rinçage, et un entonnoir d'entrée (8) pour charger l'agent de rinçage agencé sur un devant du corps (2a) du dispositif de distribution d'agents de lavage (2), et dans lequel dans la position de travail le réservoir (3) ferme ledit entonnoir d'entrée (8) en tant que bouchon.

4. Ensemble selon la revendication 2 ou 3, dans lequel le réservoir (3) peut être relié au corps (2a) du dispositif de distribution d'agents de lavage (2) à l'aide d'une paire de broches latérales (2p) opposées agencées sur l'un parmi ledit réservoir (3) et ledit corps (2a) du dispositif de distribution d'agents de lavage (2) et pouvant d'emboîter dans des emplacements correspondants formés sur l'autre parmi ledit réservoir (3) et ledit corps (2a) du dispositif de distribution d'agents de lavage (2), et à l'aide d'une broche centrale (2q) agencée sur l'un parmi ledit réservoir (3) et ledit corps (2a) du dispositif de distribution d'agents de lavage (2) et pouvant d'emboîter dans un emplacement correspondant formé sur l'autre parmi ledit réservoir (3) et ledit corps (2a) du dispositif de distribution d'agents de lavage (2).

5. Ensemble selon l'une quelconque des revendications 2 à 4, dans lequel le réservoir (3) comprend un corps (3a) comportant une partie de liaison plus mince (3b) pour liaison au dispositif de distribution d'agents de lavage (2) qui dans la position de travail est superposé sur le corps (2a) du dispositif de distribution d'agents de lavage (2), et une partie de retenue plus épaisse (3c) dans laquelle est formée la chambre de retenue (3d) pour le détergent liquide.

6. Ensemble selon la revendication 5, dans lequel dans la position de travail la partie de retenue (3c) du corps (3a) du réservoir (3) est destinée à être reçue dans un évidement (F1) formée sur la paroi de type feuille (F) de la chambre de lavage (C).

7. Ensemble selon l'une quelconque des revendications précédentes, comprenant un bouchon amovible (11) monté sur le réservoir (3), ladite ouverture de sortie (12b) étant formée à travers le bouchon (11).

8. Ensemble selon l'une quelconque des revendications précédentes, comprenant en outre des moyens de distribution (16, 30) agencés dans le réservoir (3) et conçus pour amener le détergent liquide à être distribué à travers l'ouverture de sortie (12b), lesdits moyens de distribution (16) étant commandés par une transmission de force sans contact par les moyens d'actionnement (21, 22, 23, 24).

9. Ensemble selon la revendication 8, dans lequel les moyens de distribution (16, 30) peuvent être retirés du réservoir (3), et en particulier ils sont positionnés dans un bouchon amovible (11) du réservoir (3).

10. Ensemble selon la revendication 8 ou 9, dans lequel lesdits moyens de distribution comprennent
un piston (16) mobile dans la chambre de retenue (3d) du réservoir (3) et capable d'adopter une position de fin de course avancée, dans laquelle le piston (16) vient en prise avec un emplacement (14d) formé au niveau de l'ouverture de sortie (12b) et bloque la communication fluidique entre la chambre de retenue (3d) et l'extérieur de la chambre de retenue (3d), et une position de fin de course rétractée, dans laquelle le piston (16) est retiré de l'emplacement, dans lequel une chambre de travail à volume variable (14e) capable de communiquer avec la chambre de retenue (3d) est définie entre le piston (16) et l'emplacement (14d) ; et
un moyen formant clapet de non-retour (30) agencé au niveau de l'ouverture de sortie (12b) et en aval de l'emplacement (14d), ledit moyen formant clapet de non-retour (30) étant ouvert ou fermé lorsque la différence entre une pression de fluide en amont de celui-ci et une pression de fluide en aval de celui-ci est supérieure ou inférieure à une valeur prédéterminée, respectivement ;
dans lequel durant la course du piston (16) depuis la position de fin de course avancée vers la position de fin de course rétractée le liquide s'écoule depuis la chambre de retenue (3d) vers la chambre de travail (14e), et durant la course du piston (16) depuis la position de fin de course rétractée vers la position de fin de course avancée le liquide est distribué depuis la chambre de travail (14e) à travers l'ouverture de sortie (12b).

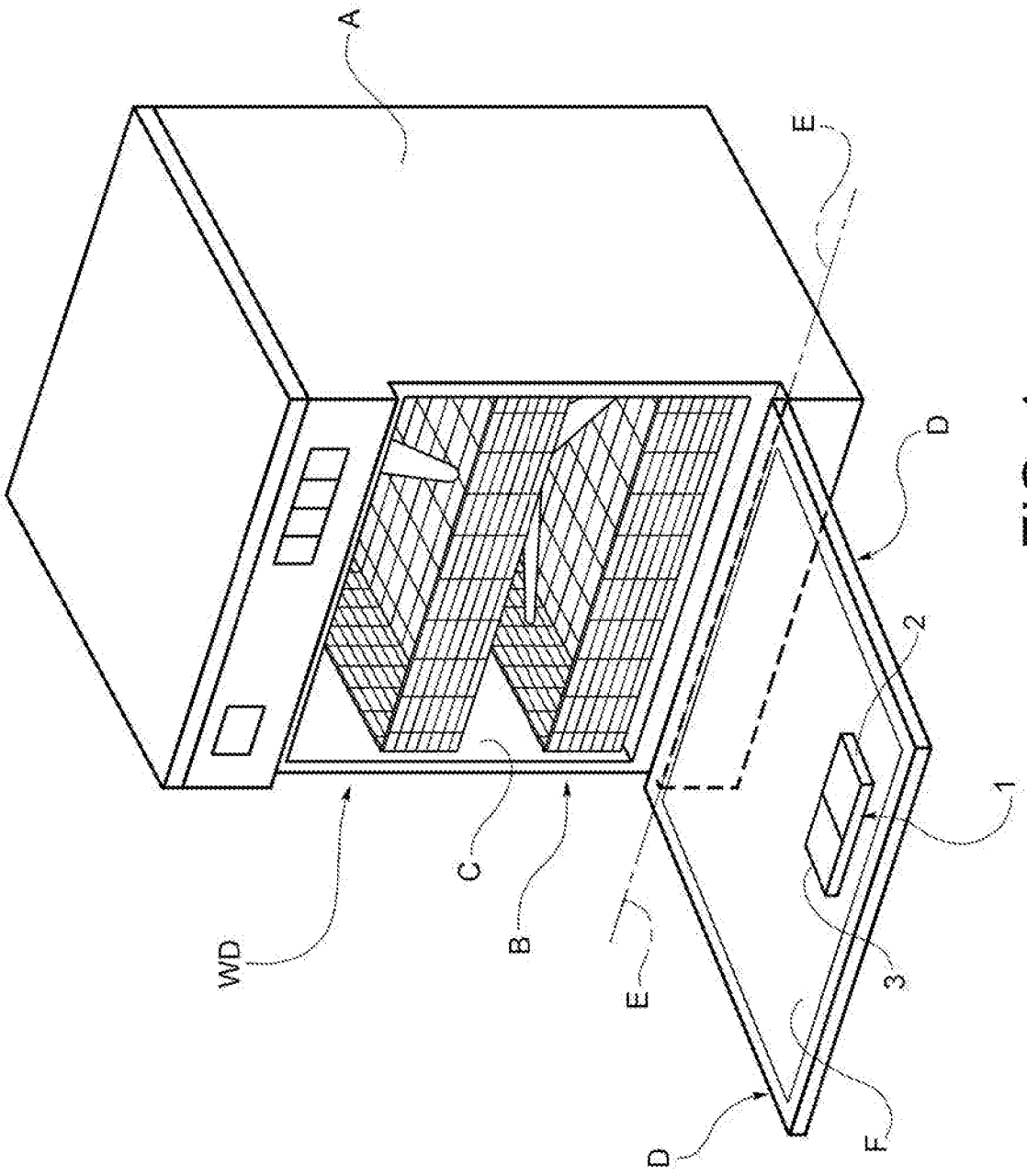

FIG. 1

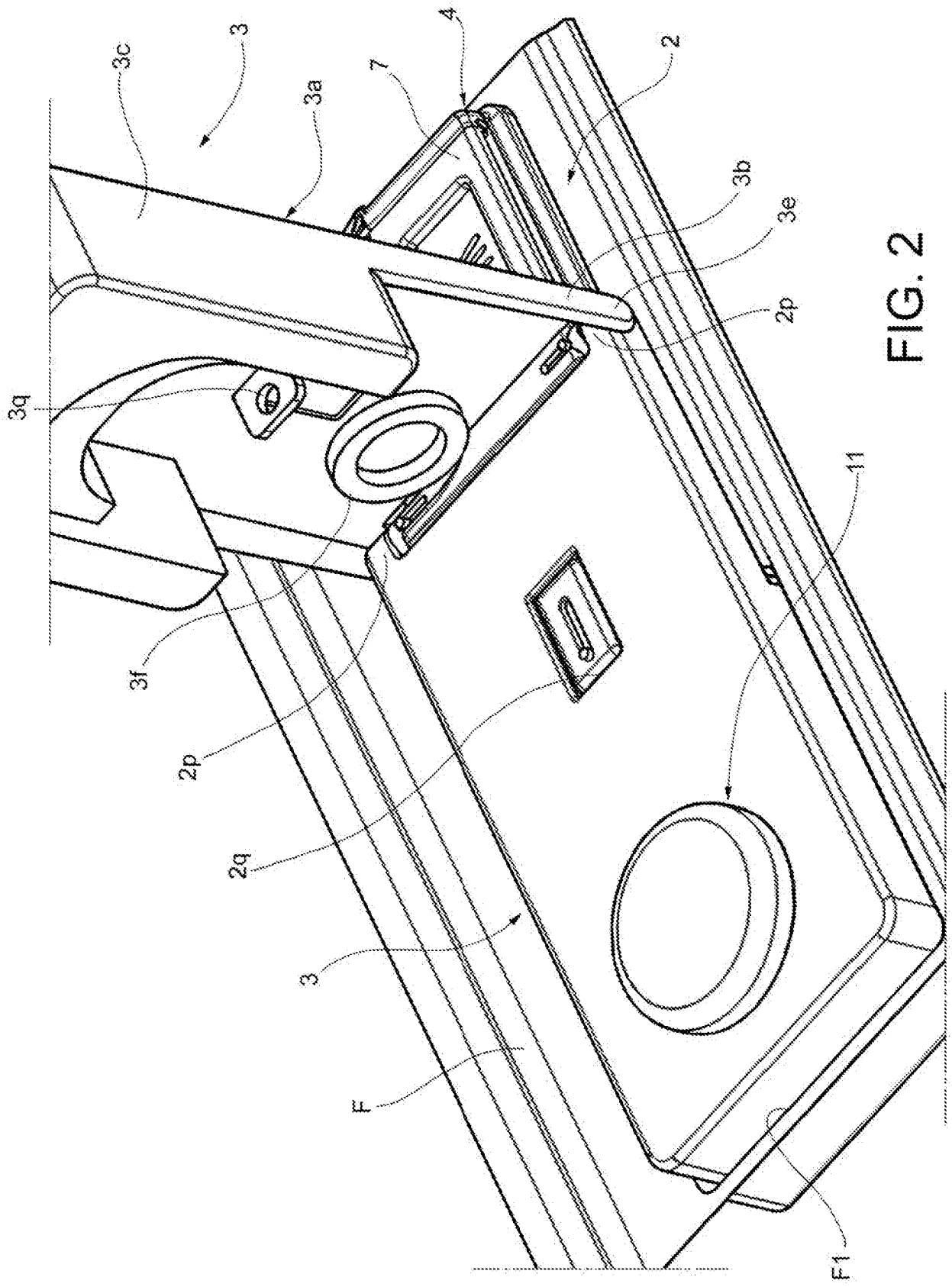

FIG. 2

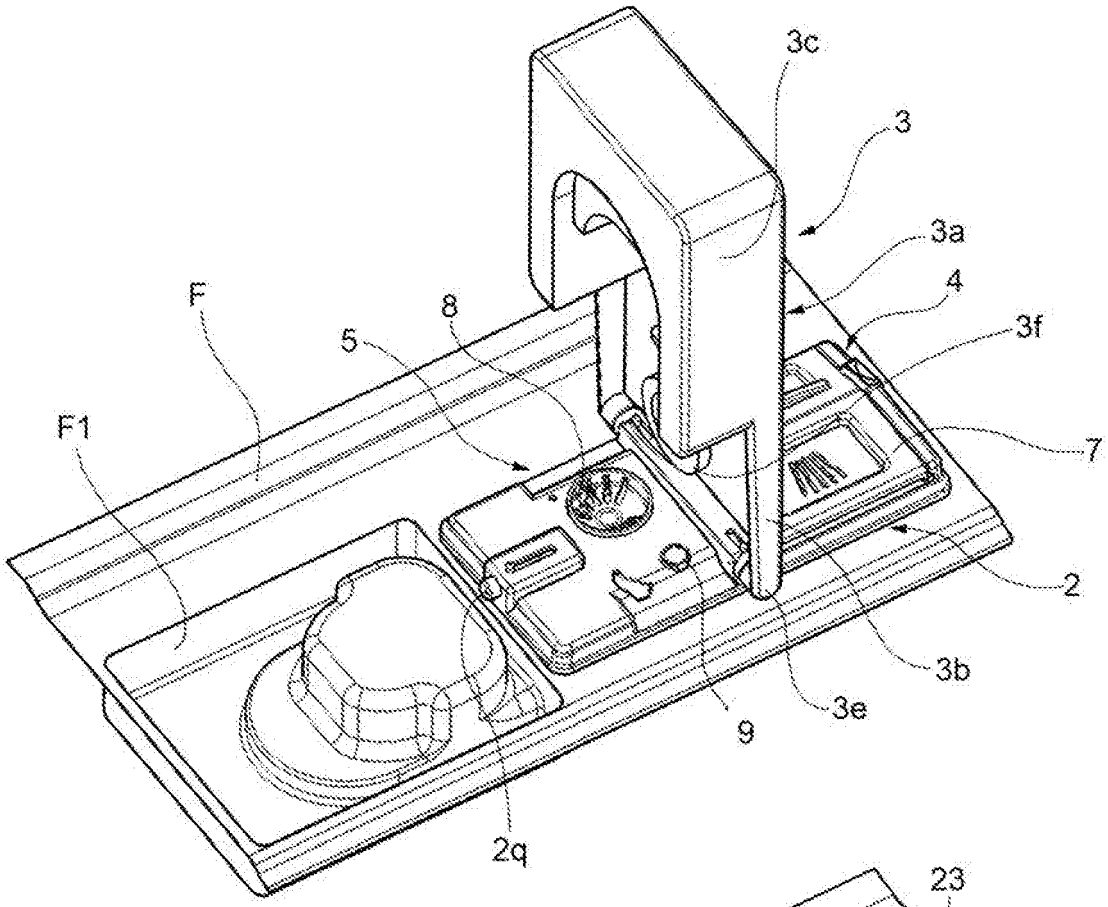

FIG. 3

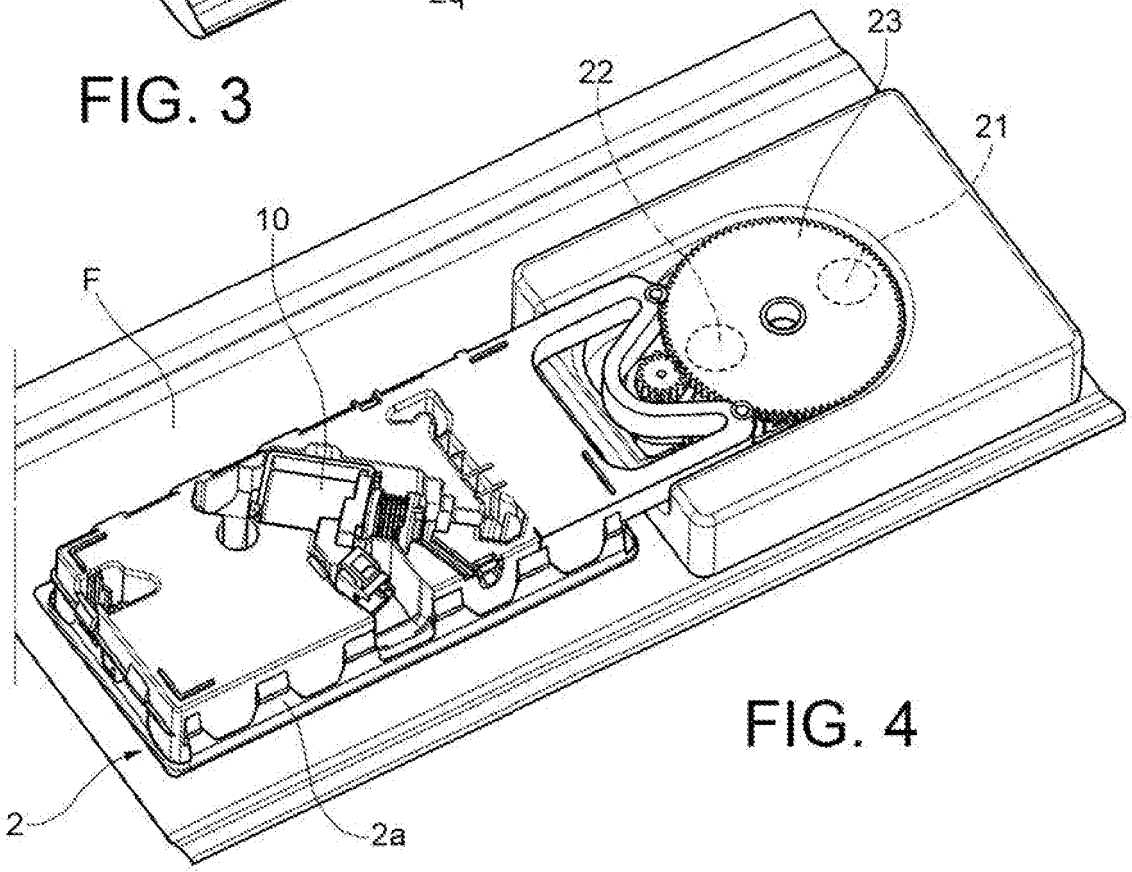

FIG. 4

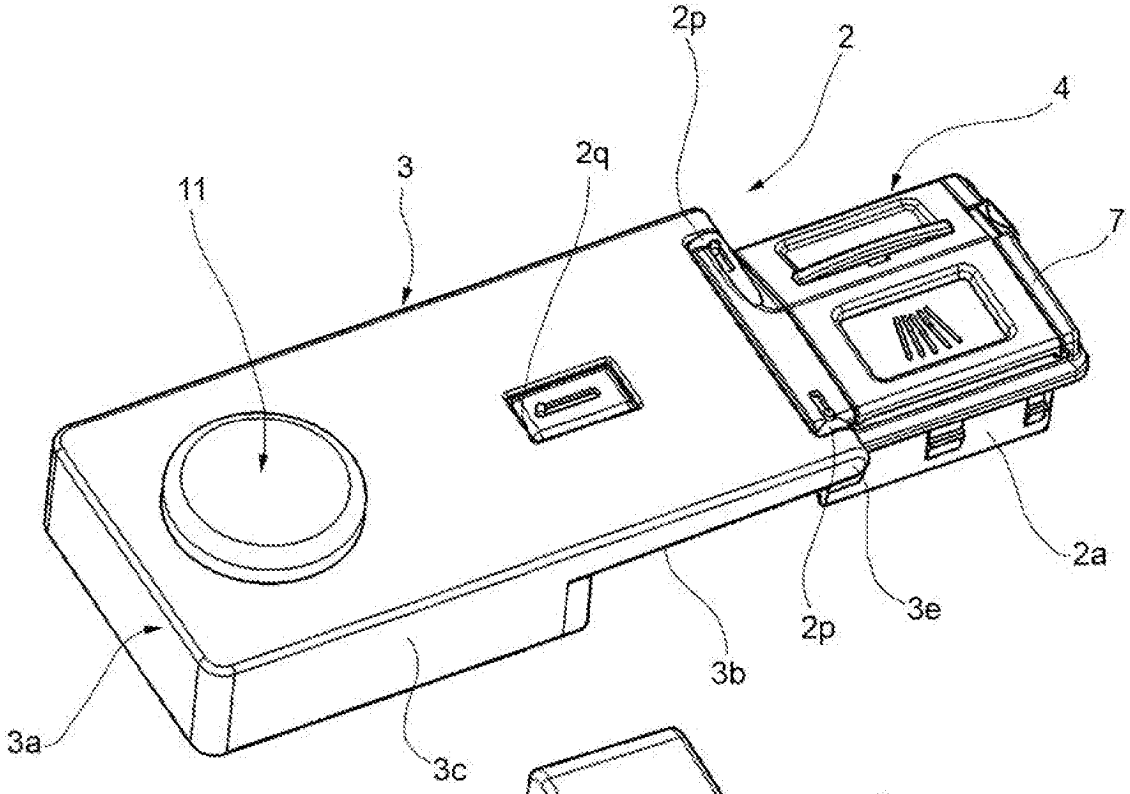

FIG. 5

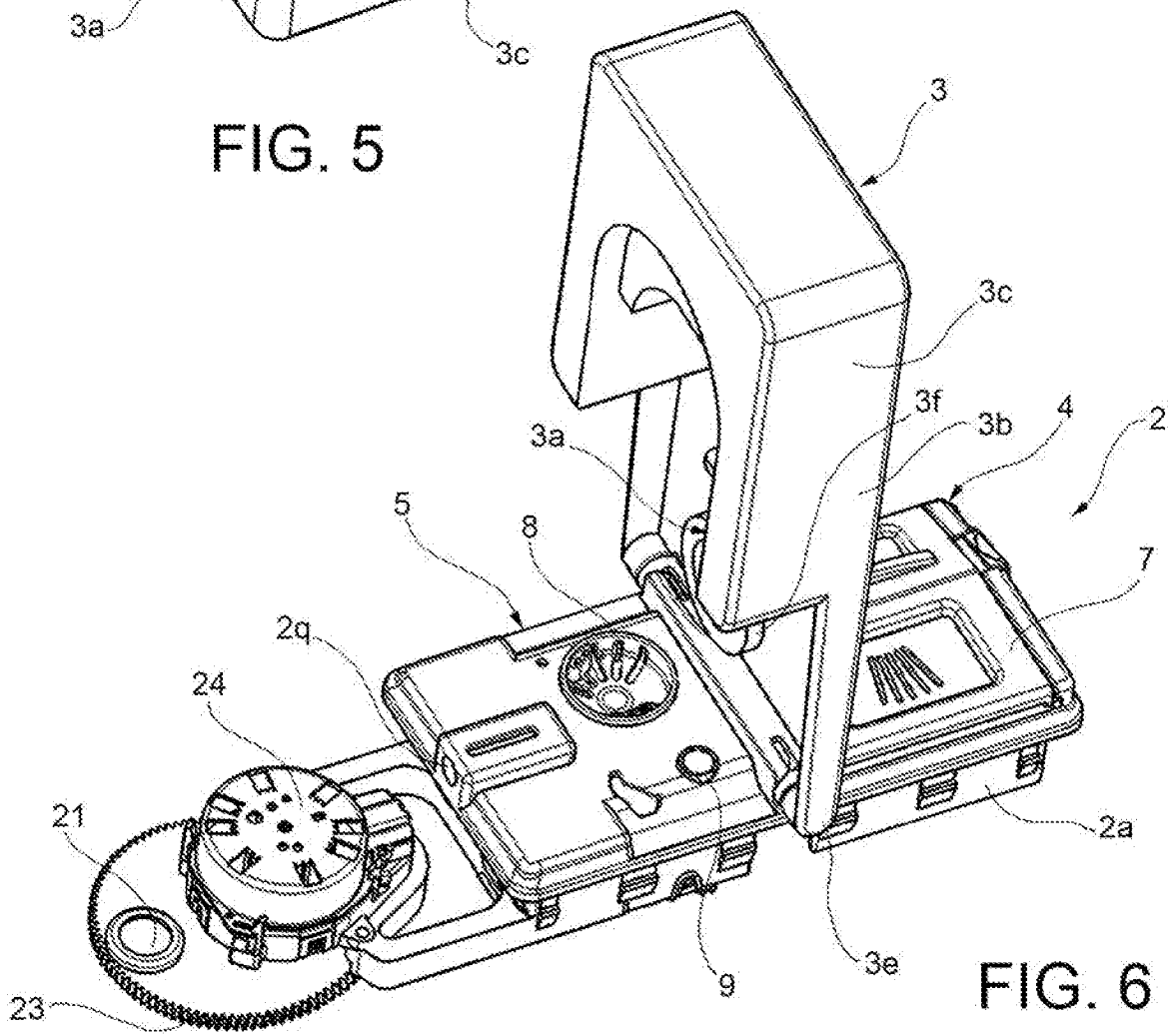

FIG. 6

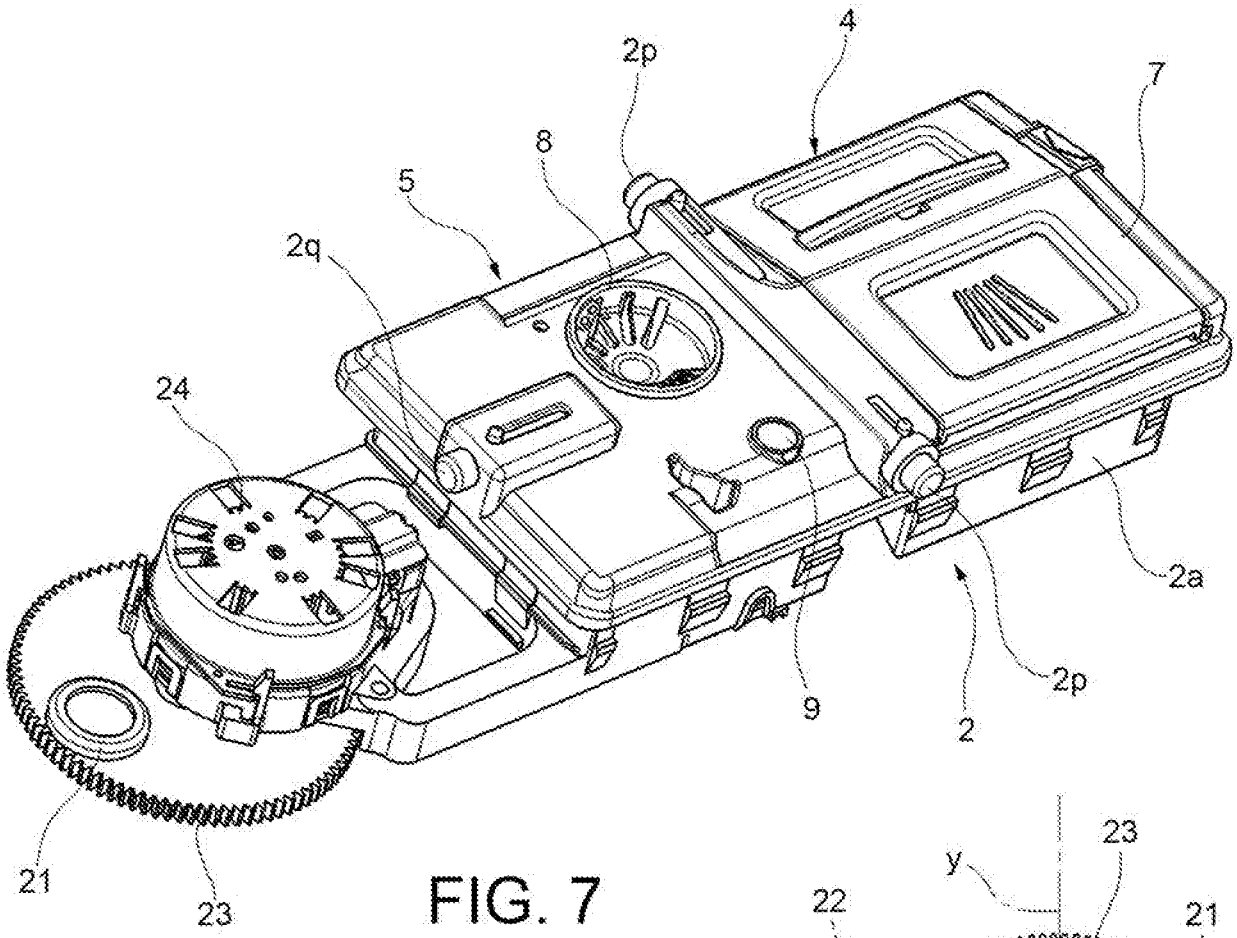

FIG. 7

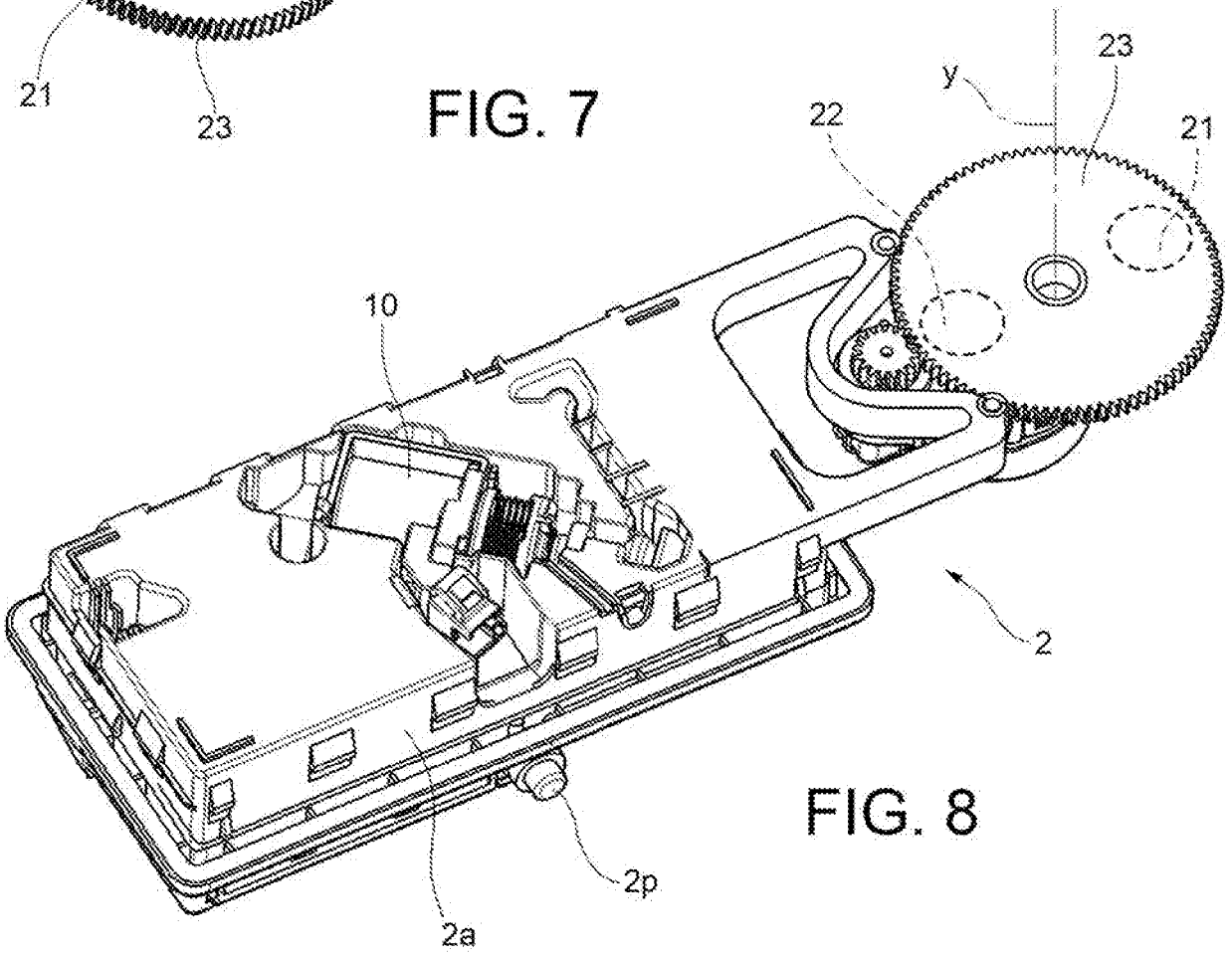

FIG. 8

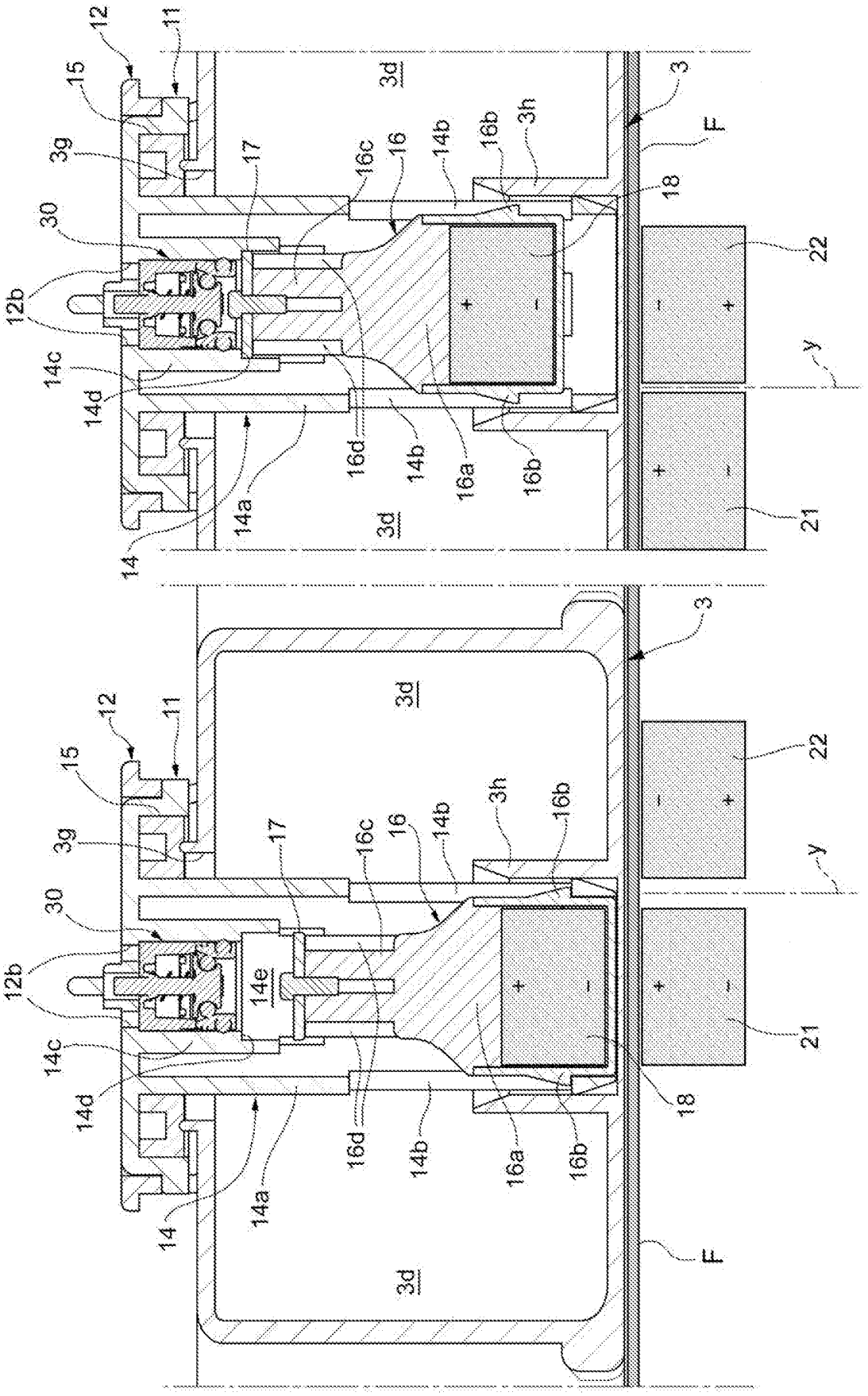
12
11
15
3g
30
12b
14c
14d
14
17
16c
16
14b
16b
3h
3d
3
F
18
22
21
y
14a
16d
16a
14e

FIG. 10

FIG. 9

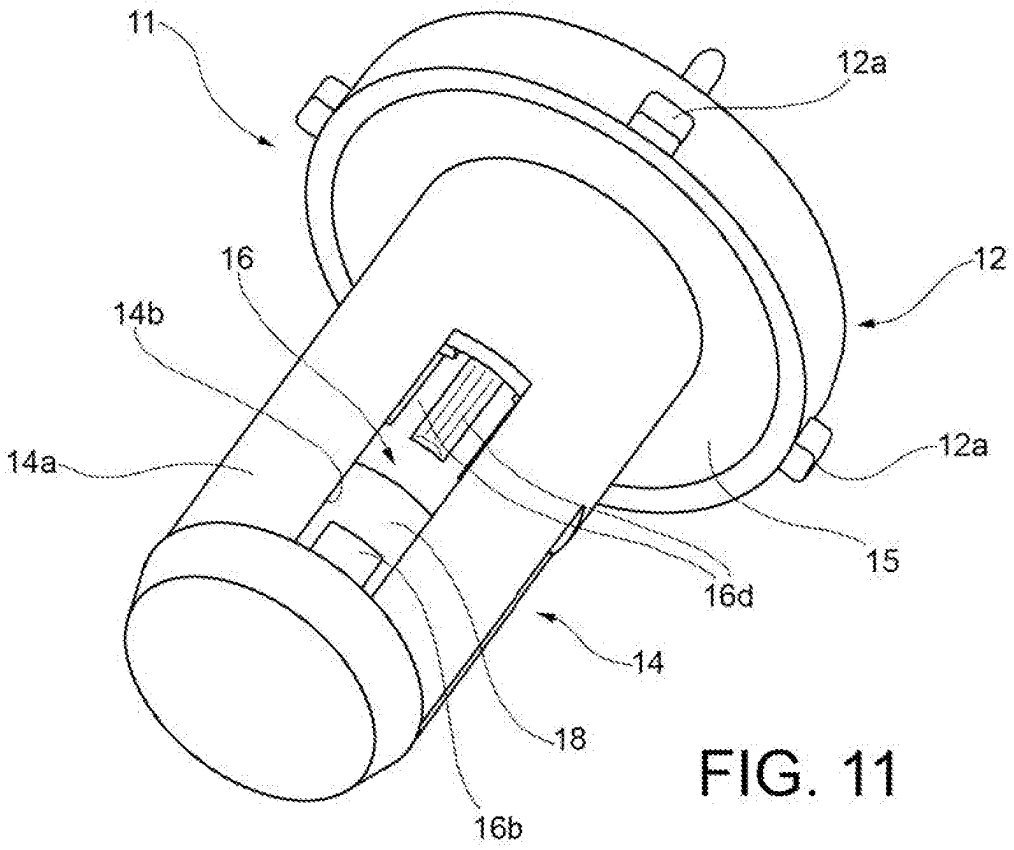

FIG. 11

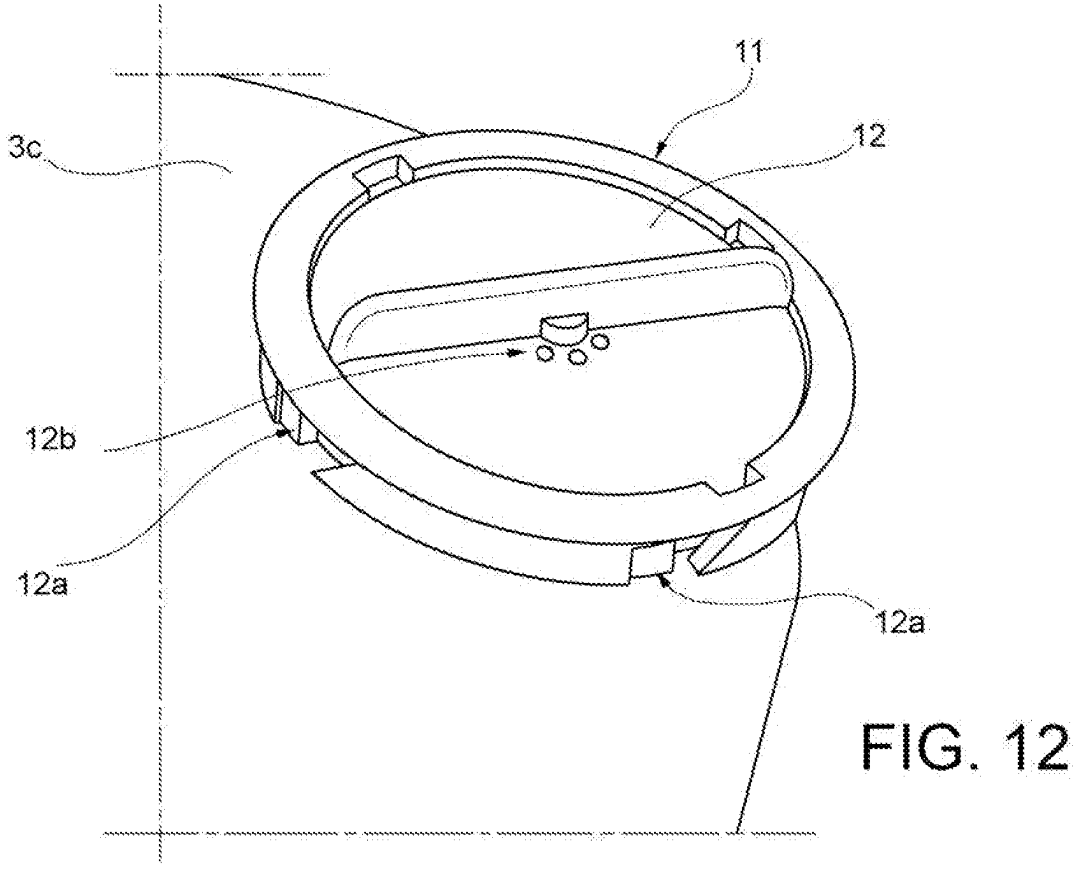

FIG. 12

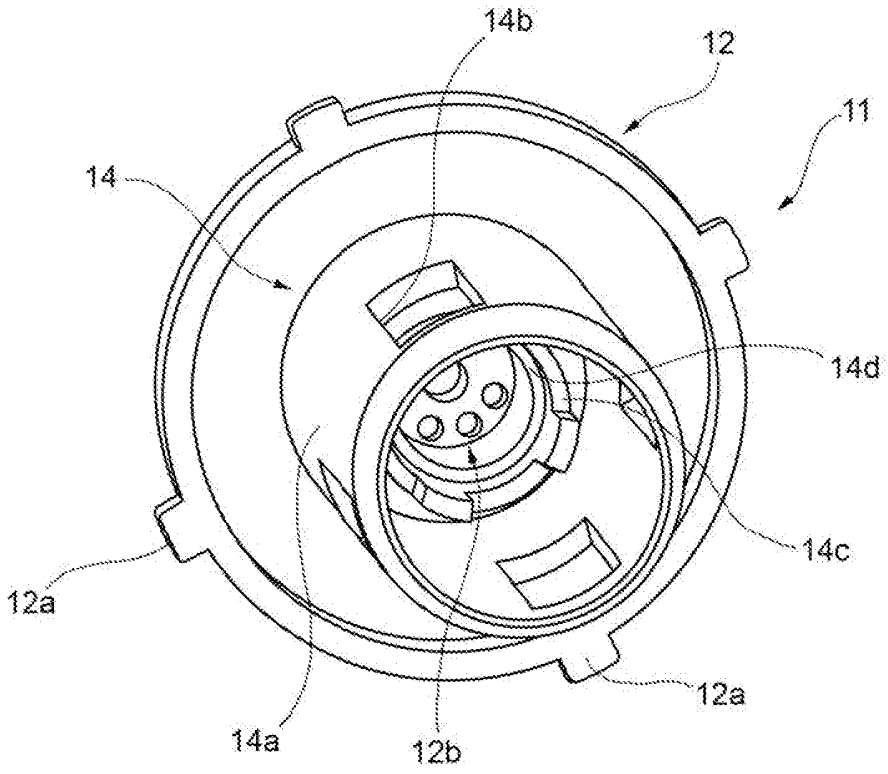
14b
12
11
14
14d
14c
12a
12a
14a
12b

FIG. 13

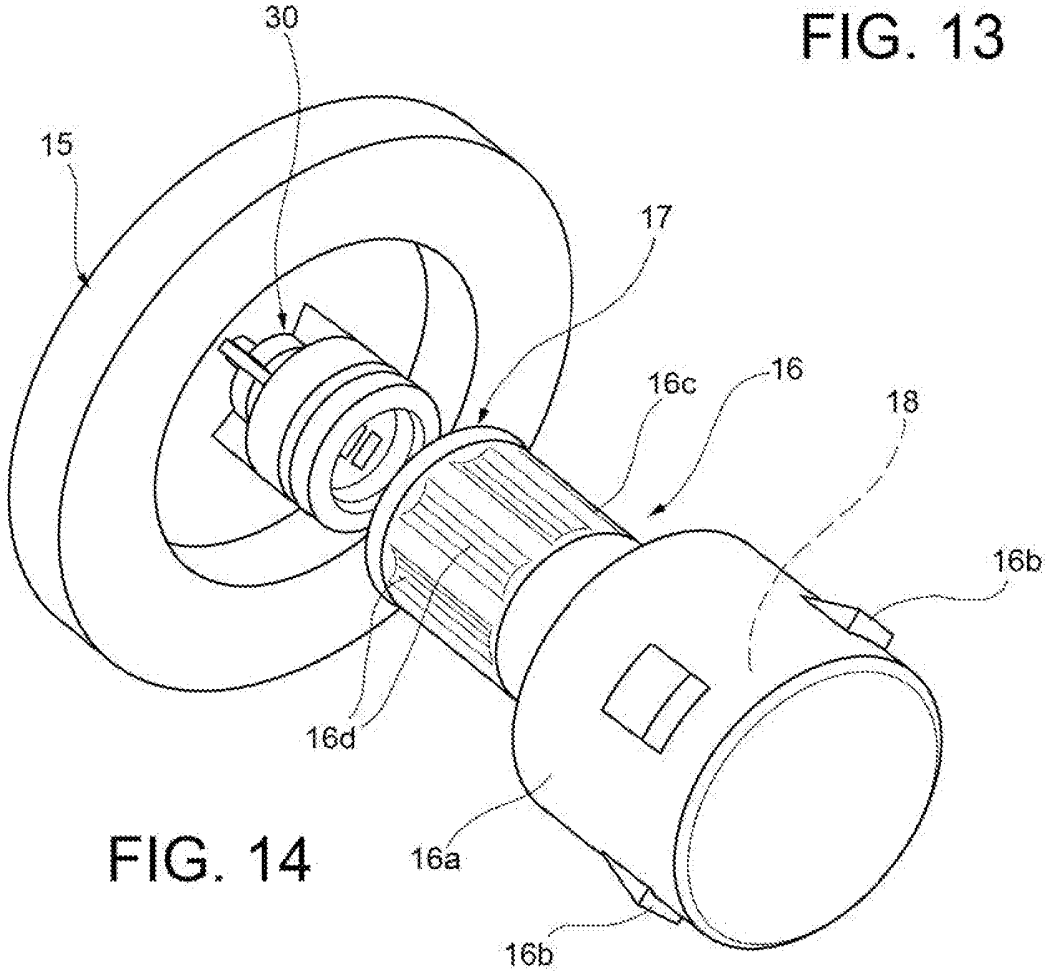
30
15
17
16c
16
18
16b
16d
16a
16b

FIG. 14

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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