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**(54) Dishwasher including detergent dispenser**

Geschirrspülmaschine mit Reinigungsmittelspender

Lave-vaisselle avec distributeur de détergent

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## Description

**[0001]** The present invention relates to dishwashing machines, and in particular to a detergent dispenser in which the tray containing the detergent is provided with means for the active dispensing of the detergent.

**[0002]** It is well known that a dishwasher typically includes inside the door a dispenser substantially consisting of a tray which is closable by a cover that engages a latch, said cover being biased open by a spring. When the door is open in the horizontal position, the tray is loaded by the user with the detergent required for the washing cycle and then the cover is manually closed by overcoming the resistance of the spring. In this way it is possible to close the dishwasher door without the detergent falling out of the tray, which will then be opened at the right moment in the cycle by unlocking the cover latch by means of an actuator.

**[0003]** A typical example of a dispenser provided with a cover that slides linearly is described in EP 0780087, but the cover can also be hinged to the tray along one side thereof so as to rotate about an axis disposed in the plane of the door, as illustrated in US 2012/090463 and EP 2478819, or the cover can rotate in the plane of the door being keyed on a shaft perpendicular thereto, as shown in US 4149657 and JP 2000 300498A. In the present description specific reference will be made to a dispenser with a sliding cover of the first type mentioned above, but it is clear that what is being said is applicable with obvious modifications to a dispenser with a cover of any other type.

**[0004]** Regardless of the type of mechanism used to displace the cover and open the detergent tray placing it in communication with the wash tank, in prior art dishwashers said tray is invested passively by at least one jet of water coming from a nozzle specially dedicated to washing off the detergent from the tray (alternatively DE 4344205 provides a wash-away chamber closed by a grid, a detergent tablet being dropped in the chamber from a reservoir). This jet of water typically comes from a nozzle of the upper sprayer, mounted under the upper rack of the dishwasher, and must have a vertical extension sufficient to be effective throughout the range of vertical adjustment of the basket.

**[0005]** Consequently, during all the time of rotation of the upper sprayer there is this jet of water that invests not only the tray, even when it is still closed or is already empty, but also areas of the door and of the wash tank that do not need to be sprayed. This generates the double drawback of an unnecessary consumption of water and an increase in noise.

**[0006]** An alternative provided by the fifth embodiment of the above-mentioned JP 2000 300498A is a static nozzle mounted on the wash tank ceiling and dedicated to flushing the tray. The jet of water delivered by such a nozzle does not invest areas outside the tray but has the significant drawback of requiring a specific duct and possibly a dedicated valve if it is intended to flush the tray

only at a specific time in order to prevent a waste of water. Otherwise the water loading duct can be used but in that case the jet of water is available only at specific times in the wash cycle and in an amount that might not be sufficient for a proper flushing of the tray.

**[0007]** Note that the use of this tray washing jet is made necessary by the fact that powder detergents tend to compact and stick to the tray due to the conditions of temperature, vibration and humidity in which they are stored in the tray in the initial stages of the cycle before releasing the latch. It may also happen that the user loads the detergent in the tray long before the start of the wash cycle, so that environmental humidity has time to cause the adhesion of the detergent to the tray being the detergent strongly hygroscopic. On the other hand, it is not advisable to use liquid detergents in dishwashers because they have the disadvantage of not providing the same washing performance as powders, since certain essential components cannot be liquefied and/or do not remain in suspension.

**[0008]** Other embodiments of the above-mentioned JP 2000 300498A provide the use of a vibrator mounted on the tray bottom, or the latter being made of a shape memory alloy material such as to change from a flat to a convex configuration when heated by the washing water, or the tray being mounted on springs to amplify the vibrations caused by the water jets emitted by the sprinklers.

**[0009]** The first embodiment implies a second separate actuator with consequent increase in cost and complexity, whereas the other two simpler embodiments are poorly effective since the convex bottom remains well within the tray and is not washed by the washing water jets (as shown in Fig.3c of this prior art document), which moreover are unsuitable to provide a sufficiently strong vibration of the spring-mounted tray.

**[0010]** JP S63 83164U1 discloses another arrangement that makes use of shape memory alloy materials that are combined with springs to actuate the tray cover to open/close the tray as well as to actuate the tray bottom when the tray is open in order to push out the detergent. Also in this case, two separate actuators are required with an increase in cost and complexity, particularly considering that the shape memory alloy used to actuate the tray bottom is embedded in the detergent and therefore not easily reached by the warm water and thus possibly requiring a heating device to guarantee a proper transformation.

**[0011]** Another solution is that of using cleaning tablets which however on average cost 30% more than powder detergents due to the additional processes to which they are subjected, being no more than powders with the addition of binders and pressed in molds. Despite the higher cost, a tablet of detergent has substantially the same drawbacks of the powder detergent since prior to use it must be removed from its moisture-proof wrapping, necessary to prevent the disintegration of the tablet during storage, and then once inserted into the dispenser it can crumble and stick to the tray.

**[0012]** Finally it should be taken into account that the dishwasher must be able to operate with any type of detergent, depending on the choice of the user, ensuring the same degree of washing effectiveness and using completely the dose of detergent loaded into the dispenser.

**[0013]** The purpose of the present invention is therefore to provide a dishwasher with a detergent dispenser that is free from said drawbacks. Said object is achieved by means of a dishwasher with a dispenser in which the tray is provided with means for the active dispensing of the detergent, whereby it is not necessary for the tray to be exposed to the washing action of the sprayer as in traditional dispensers, with the advantageous feature of the use of a single actuator for both the unlocking of the latch and the activation of the further means for the active dispensing of the detergent.

**[0014]** The first great advantage of the present dishwasher is thus to reduce its water consumption its noise, it being able to do without the water jet dedicated to washing the tray.

**[0015]** A second significant advantage of this dishwasher is that of having a higher reliability, because even if the detergent compacts and sticks to the tray the mechanism for the active dispensing is not affected and the dispenser is able to introduce the detergent in the washing liquid, which is not always the case with the traditional tray washing jet if the jet is not strong enough.

**[0016]** A further advantage of said dishwasher derives from the fact that the upper sprayer is simpler and can dedicate all its nozzles to washing the dishes with even stronger water jets, since it does not have a nozzle dedicated to washing the tray.

**[0017]** Still another advantage of this type of dishwasher resides in the possibility of placing the dispenser in different positions in the door, since it is no longer necessary to place it in correspondence of the upper sprayer to be reached by the dedicated tray washing jet.

**[0018]** Note also that such a dishwasher maintains the advantage of being usable with any type of detergent (powder, liquid or tablets) and that the dispenser size does not vary significantly thus allowing to fit the dispenser in the dishwasher door as a traditional dispenser. It follows that it is easily applicable to any model of dishwasher without requiring special modifications to the machine structure and/or to the arrangement of its components, since any small changes required affect only the door.

**[0019]** Further advantages and characteristics of the dishwasher according to the present invention will become apparent to those skilled in the art from the following detailed description of two embodiments thereof with reference to the attached drawings in which:

Fig.1 is a front perspective view from above of a first embodiment of a dispenser included in a dishwasher according to the invention, ready to dispense with the cover in the closed position;

Fig.2 is a rear view of the dispenser of Fig.1 with a part of the body removed to show some internal components;

Fig.3 is an enlarged rear perspective view of the components shown in Fig.2, with the body of the dispenser represented in transparency to show other details; Fig.4 is a rear perspective view of one of the components shown in Fig.3;

Fig.5 is a sectional view along line A-A of Fig.2;

Fig.6 is a perspective view similar to Fig.1, with the cover in the open position and the tray in communication with the wash tank;

Fig.7 is a rear view similar to Fig.2, with the components in the position corresponding to the condition of Fig.6;

Fig.8 is a sectional view along line A-A of Fig.7;

Fig.9 is a rear view similar to Fig.7, with the components in the position corresponding to the activation of the further means for the active dispensing of the detergent;

Fig.10 is a sectional view along line A-A of Fig.9;

Fig.11 is a perspective view similar to Fig.6, with the cover in the open position and the tray in the condition corresponding to Fig.10;

Fig.12 is a rear view similar to Fig.9, with the components in the rest position after activation of the further means for the active dispensing of the detergent;

Fig.13 is a cross-sectional view along line A-A of Fig.12, indicating the user's manual intervention for the restoration of the further means for the active dispensing of the detergent;

Fig.14 is a rear view same as Fig.12, but with the components in the position corresponding to the restoration phase of the further means for the active dispensing of the detergent;

Fig.15 is a sectional view along line B-B of Fig.14;

Fig.16 is a perspective view similar to Fig.1 of a second embodiment of a dispenser included in a dishwasher according to the invention, ready to dispense with the cover in the closed position;

Fig.17 is a rear view of the dispenser of Fig.16 with a part of the body removed to show some internal components;

Fig.18 is a sectional view along line C-C of Fig.17;

Fig.19 is a sectional view along line D-D of Fig.17;

Fig.20 is a perspective view similar to Fig.16, with the cover in the open position and the tray in communication with the wash tank;

Fig.21 is a rear view similar to Fig.17, with the components in the position corresponding to the condition of Fig.20;

Fig.22 is a sectional view along line C-C of Fig.21;

Fig.23 is a sectional view along line D-D of Fig.21;

Fig.24 is a rear view similar to Fig.21, with the components in the position corresponding to the initial stage of activation of the further means for the active dispensing of the detergent;

Fig.25 is a sectional view along line C-C of Fig.24;  
 Fig.26 is a sectional view along line D-D of Fig.24;  
 Fig.27 is a rear view similar to Fig.24, with the components in the position corresponding to the complete activation of the further means for the active dispensing of the detergent;  
 Fig.28 is a sectional view along line C-C of Fig.27; and  
 Fig.29 is a sectional view along line D-D of Fig.27.

**[0020]** Referring to Figures 1 to 5, there is seen that a dispenser included in a dishwasher according to the invention conventionally includes a body 1 at one end of which there is inserted a tray 2 for the load of the detergent which is closable by a sliding cover 3 that is pushed open by a spring (not shown) when an actuator 4 unlocks a latch (not shown) that holds it in the closed position. Typically, actuator 4 does not act directly on the latch but rather on a rotating lever 5 pivoted to body 1 through a pin 6 so as to rotate in the plane of the dishwasher door. A return spring 7 is arranged between body 1 and lever 5 to operate in contrast to actuator 4, so as to bring lever 5 back to the initial rest position when actuator 4 is turned off (spring 7 is only shown schematically in Fig.2 and is omitted in Fig.3).

**[0021]** A first aspect of the present dishwasher, as mentioned above, lies in the presence on tray 2 of further means for the active dispensing of the detergent which essentially consist of a pusher 8, externally fixed on the bottom of tray 2, and a spring 9 compressed between body 1 and said pusher 8 so as to push it outwards in the direction perpendicular to the plane of the door.

**[0022]** More specifically, as better shown in Fig.4, pusher 8 is formed by a rectangular plate 8a shaped and dimensioned for attachment to the bottom of tray 2, by perpendicular uprights 8b that extend from the short sides of plate 8a and are provided with pegs 8c whose longitudinal axes are parallel to plate 8a, and by an L-shaped hook 8d which extends perpendicularly from the center of plate 8a on the same side of uprights 8b.

**[0023]** Pusher 8 is slidably mounted in body 1, as better shown in Fig.3, through pegs 8c which slide along guides formed by pairs of ribs 1a perpendicular to the plane of the door, while hook 8d passing through a corresponding hole 1b protrudes to the rear of a wall 1c that supports spring 9. The purpose of hook 8d is to act as a latch for the activation of the further means for the active dispensing of the detergent, since once disengaged it allows spring 9 to push outwards pusher 8 and with it tray 2 which is formed by a flexible membrane fixed to body 1 only along its own perimeter.

**[0024]** In a second aspect of the present invention, the locking of hook 8d in its rest position and its subsequent release are achieved using the same rotating lever 5 moved by actuator 4 and spring 7. In this way, it is not necessary to add other electrical components for the activation of the further means for the active dispensing of the detergent since use is made of the same components

already present for the release of cover 3. To this purpose, lever 5 extends up to hook 8d with an L-shaped arm 5a, whose end engages hook 8d thus keeping spring 9 compressed between wall 1c and plate 8a.

**[0025]** In the light of the description above, the simple and effective operation of the present dishwasher is readily understood with the aid of figures 6 to 15. When the dishwasher door is open in a horizontal position with the dispenser open and empty, the user pours in tray 2 the detergent powder or liquid (or inserts a tablet of detergent without its protective wrapping), and then closes cover 3, thus obtaining the initial condition shown in Fig.1, in the same way that with a traditional dispenser.

**[0026]** Once closed the dishwasher door, in the established phase of the wash cycle the control unit of the machine activates actuator 4 to release cover 3 thus putting tray 2 in communication with the wash tank (Fig. 6). To this purpose, actuator 4 pushes lever 5 making it rotate around pin 6 against the resistance of spring 7, and in these first few millimeters of travel actuator 4 causes the unlocking of the latch of cover 3 that slides sideways under the push of its spring as it normally occurs in traditional dispensers. Note that at the end of this first release phase arm 5a still engages hook 8d (Fig.7), as is also evident from Fig.8 that differs from Fig.5 only for the absence of cover 3.

**[0027]** Continuing in its travel, actuator 4 performs a second release phase by continuing to rotate lever 5 until arm 5a disengages from hook 8d (Fig.9) and thus releases plate 8a which kept spring 9 compressed. At this point spring 9 can push plate 8a outwards (Fig. 10) and with it the bottom of tray 2, so that the flexible membrane that acts as a detergent container is turned inside out allowing the complete emptying of the detergent (Fig.11). The linear and balanced movement of pusher 8 under the action of spring 9 is guaranteed by pegs 8c which slide in the guides of body 1 defined by ribs 1a, ensuring a smooth passage of hook 8d through hole 1b of wall 1c.

**[0028]** Note that at this stage tray 2 is not only reversed from concave to convex, but it also protrudes toward the inside of the wash tank and is therefore subject to a certain washing action by water jets that bounce off from the dishes and by streams of water dripping down the door.

**[0029]** At the end of its operating phase, actuator 4 is deactivated and returns to its rest position, together with lever 5, under the push of the return spring 7 (Fig. 12) as normally occurs in traditional dispensers. This position of the components 4, 5 and 7 corresponds to the initial position shown in Fig.2, but in this condition arm 5a does not engage hook 8d which is on the other side of wall 1c. To restore the actual initial condition and be able to reload the detergent in tray 2 for the next wash cycle, the user must press on the bottom of tray 2 (Fig. 13) pushing consequently pusher 8 which, thanks to pegs 8c, slides in guides 1a compressing spring 9 until it arrives in contact with arm 5a which is positioned in front of hole 1b in correspondence with the hooking portion of hook 8d (Fig. 14).

**[0030]** Continuing the compression of spring 9, by means of a coupling between two corresponding slanted surfaces formed on the faces of components 8d and 5a that come into contact in this phase, as shown in Fig.15 where tray 2 is omitted, the push of the user on pusher 8 also causes the rotation of lever 5 against the resistance of spring 7 allowing the passage of hook 8d. Once the hooking portion of hook 8d has passed beyond arm 5a, the return spring 7 brings lever 5 back to its rest position so that arm 5a returns to engage hook 8d as in the initial position of Fig.2. In this condition, tray 2 is back to a concave shape and can accommodate detergent again, so that the user can reload the dispenser and manually close cover 3 as it normally occurs in traditional dispensers.

**[0031]** Referring now to figures 16 to 19, there is illustrated a second embodiment of a dispenser included in a dishwasher according to the invention which differs from the first embodiment in the tray with the related means for the active dispensing of the detergent. There is no change in the operation of the spring-loaded sliding cover 3, Fig.16 being equal to Fig.1 only seen from another angle, and of actuator 4 which unlocks the latch thereof by acting on lever 5 which rotates around pin 6, with the return spring 7 arranged between body 1 and lever 5 to return the latter to its initial position when actuator 4 is turned off (Fig. 17).

**[0032]** In this second embodiment the means for the active dispensing of the detergent essentially consist of a scraper 10 shaped and dimensioned to extend along half of the perimeter of tray 2'. The ends of scraper 10 are pivoted to tray 2' so that scraper 10 can rotate 180° around an axis X arranged in the plane of the door. In the path from a semi-perimeter to the other, scraper 10 scrapes the entire inner surface of tray 2' thus removing the detergent that may have stuck to it.

**[0033]** Note that tray 2' will therefore have a semicircular shape in a section along a plane perpendicular to the axis of rotation X (Fig. 18), but it can have any shape in a section along a plane perpendicular to said plane of section. In fact, tray 2' shown in the drawings occupies the same space of the rectangular tray 2 of the first embodiment, therefore it does not have a hemispherical shape which however it could have if it were wider.

**[0034]** Also in this embodiment the rotation of scraper 10 is achieved by using the same rotating lever 5 moved by actuator 4 and spring 7, so as not to require other electrical components for the activation of the means for the active dispensing of the detergent. To this purpose, lever 5 is provided on its front face with a protrusion 5b which engages with play a toothed sector 11, in correspondence of a cavity 11a, which is pivoted to body 1 through a pin 12 so as to rotate in a plane perpendicular to the dishwasher door (Fig.19). This toothed sector 11 engages in turn a toothed wheel 13 coaxial with the axis of rotation X and integral with a shaft (not shown) on which is keyed the inner end of scraper 10. A return spring 14 is also preferably arranged between body 1 and the

toothed sector 11 to help spring 7 return the toothed sector 11 to the initial position when actuator 4 is turned off.

**[0035]** In the light of the description above, the simple and effective operation of the second embodiment of the present dishwasher is readily understood with the aid of figures 20 to 29.

**[0036]** When the control unit of the machine activates actuator 4 to release cover 3, actuator 4 pushes lever 5 making it rotate around pin 6 against the resistance of spring 7. In these first few millimeters of travel, actuator 4 causes the unlocking of the latch of cover 3 that slides sideways under the push of its spring as it normally occurs in traditional dispensers (Fig.20). Note that at the end of this release phase (Fig.21) protrusion 5b has moved only within cavity 11a and has not yet caused any rotation of the toothed sector 11 (Fig.23), as is also evident from Fig.22 that differs from Fig.18 only for the position of cover 3.

**[0037]** Continuing in its travel, actuator 4 continues to rotate lever 5 (Fig.24) so that projection 5b drives into rotation the toothed sector 11 around pin 12 against the resistance of the return spring 14. This rotation of the toothed sector 11, clockwise in the view of Fig.26, in turn causes an opposite rotation (counterclockwise in Fig.26) of the toothed wheel 13 around axis X which results in a corresponding rotation of scraper 10 in tray 2' (Fig.25). With a suitable calculation of the transmission ratio between the toothed sector 11 and the toothed wheel 13, when actuator 4 has completed its travel (Fig.27) scraper 10 has completed its 180° rotation (Fig.28), thus acting on the entire inner surface of tray 2' in order to ensure the dispensing of the detergent.

**[0038]** At the end of its operating phase, actuator 4 is deactivated and returns to its rest position, together with lever 5, under the push of the return spring 7 as it normally occurs in traditional dispensers. Consequently, also projection 5b returns to its rest position of Fig.19 causing, with the aid of spring 14 which has reached the maximum extension (Fig.29), the reverse rotation of the toothed sector 11 and toothed wheel 13 which in turn brings scraper 10 back to its rest position of Fig.18. Therefore also the return travel of scraper 10 is useful for scraping tray 2' in the opposite direction, to better guarantee the total removal of the detergent from the inner surface thereof.

**[0039]** It is clear that the embodiments of the dishwasher according to the invention described and illustrated above are just examples susceptible of various modifications. In particular, the shape, size and arrangement of the tray for the load of the detergent can be varied according to the needs, as well as the means for moving cover 3 and for the activation of the further means for the active dispensing of the detergent. For example, there could be provided a specific mechanical component for said activation, such as a second lever driven by actuator 4. Moreover, actuator 4 rather than unlocking the latch of the spring-loaded cover 3 might directly control the movement of cover 3, which would therefore not be

spring-loaded.

### Claims

1. Dishwasher including a detergent dispenser, the detergent dispenser comprising a body (1), in which there is arranged a tray (2; 2'; 2'') for the load of the detergent, a cover (3) and an actuator (4), wherein said tray (2; 2'; 2'') is closable by said cover (3), wherein the cover (3) is arranged to be movable under the action of said actuator (4) between a closed position and an open position of the tray (2; 2'; 2'') in which it is in communication with the wash tank of the dishwasher, the tray (2; 2'; 2'') being provided with active detergent dispensing means for the active dispensing of the detergent, which essentially consist of a pusher (8) fixed externally on the bottom of the tray (2) or of a scraper (10) shaped and dimensioned to extend along half of the perimeter of the tray (2'), wherein said active detergent dispensing means are operatively and mechanically connected to the actuator (4) so as to be activated by said actuator (4) after it has caused the displacement of the cover (3) to the open position of the tray (2; 2'; 2'').
2. Dishwasher including a detergent dispenser according to claim 1, **characterized in that** the active detergent dispensing means essentially consist of a pusher (8), fixed externally on the bottom of the tray (2) and slidably mounted in the body (1), and a spring (9) compressed between a wall (1c) of the body (1) and said pusher (8) so as to push it outwards in the direction perpendicular to the plane of the door, the tray (2) being formed by a flexible membrane fixed to the body (1) only along its own perimeter in order to be able to be turned inside out passing from concave to convex.
3. Dishwasher including a detergent dispenser according to the preceding claim, **characterized in that** the pusher (8) is formed by a rectangular plate (8a) shaped and dimensioned for attachment to the bottom of the tray (2), by perpendicular uprights (8b) that extend from the short sides of said plate (8a) and are provided with pegs (8c) whose longitudinal axes are parallel to the plate (8a), and by an L-shaped hook (8d) that extends perpendicularly from the center of the plate (8a) on the same side of said perpendicular uprights (8b), the pusher (8) being slidably mounted in the body (1) by means of said pegs (8c) which slide along guides formed by pairs of ribs (1a) perpendicular to the plane of the door, said hook (8d) passing through a corresponding hole (1b) so as to protrude to the rear of the wall (1c) that supports the spring (9) in order to act as a latch to hold the active detergent dispensing means in the rest position.
4. Dishwasher including a detergent dispenser according to the preceding claim, **characterized in that** in the rest position the hook (8d) is engaged by an arm (5a) which extends from a lever (5) rotating in the plane of the door under the action of the actuator (4) that overcomes the resistance of a return spring (7), the faces of the hook (8d) and of said arm (5a) opposite to the faces in contact in said engagement condition being shaped as two corresponding slanted surfaces suitable to convert a push on the pusher (8) in the direction perpendicular to the plane of the door into a rotation of the lever (5) against the resistance of said spring (7) until the restoration of the engagement condition.
5. Dishwasher including a detergent dispenser according to claim 1, **characterized in that** the active detergent dispensing means essentially consist of a scraper (10) shaped and dimensioned to extend along half of the perimeter of the tray (2'), the ends of said scraper (10) being pivoted to the tray (2') so that the scraper (10) can rotate 180° around an axis of rotation (X) disposed in the plane of the door, the tray (2') having a semicircular shape at least in the section along a plane perpendicular to said axis of rotation (X).
6. Dishwasher including a detergent dispenser according to the preceding claim, **characterized in that** it includes a lever (5) rotating in the plane of the door under the action of the actuator (4) that overcomes the resistance of a return spring (7), said lever (5) being provided on its front face with a projection (5b) which engages with play a toothed sector (11) hinged to the body (1) so as to rotate in a plane perpendicular to the dishwasher door, said toothed sector (11) engaging in turn a toothed wheel (13) integral with a shaft on which is keyed one end of the scraper (10).
7. Dishwasher including a detergent dispenser according to the preceding claim, **characterized in that** it further comprises a return spring (14) arranged between the body (1) and the toothed sector (11) so as to bring it back to the initial position when the actuator (4) is turned off.

### Patentansprüche

1. Geschirrspülmaschine mit einem Reinigungsmittelspender, wobei der Reinigungsmittelspender ein Gehäuse (1) umfasst, in welchem eine Schale (2; 2'; 2'') zum Einfüllen des Reinigungsmittels, ein Deckel (3) sowie ein Aktuator (4) angeordnet sind, wobei die besagte Schale (2; 2'; 2'') von dem besagten Deckel (3) verschließbar ist, wobei der Deckel (3) derart angeordnet ist, dass er unter der Wirkung des besagten Aktuators (4) bewegbar ist zwischen einer

- geschlossenen Position und einer offenen Position der Schale (2; 2'; 2''), in der er mit dem Waschbehälter der Geschirrspülmaschine kommuniziert, wobei die Schale (2; 2'; 2'') zum aktiven Dosieren des Reinigungsmittels mit einer aktiven Dosiervorrichtung für das Reinigungsmittel versehen ist, welche im Grunde aus einem außen an dem Boden der Schale (2) befestigten Schieber (8) besteht oder aus einem Schaber (10), welcher derart geformt und dimensioniert ist, dass er sich über die Hälfte des Umfangs der Schale (2') erstreckt, wobei die aktive Dosiervorrichtung für das Reinigungsmittel wirkungstechnisch und mechanisch an dem Aktuator (4) angeschlossen ist, um von dem besagten Aktuator (4) aktiviert zu werden, nachdem die Verschiebung des Deckels (3) in die offene Position der Schale (2; 2'; 2'') veranlasst wurde.
2. Geschirrspülmaschine mit einem Reinigungsmittelspender gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die aktive Dosiervorrichtung für das Reinigungsmittel hauptsächlich aus einem Schieber (8) besteht, der außen an dem Boden der Schale (2) befestigt und verschiebbar an dem Gehäuse (1) festgelegt ist, und aus einer Feder (9), die zwischen einer Wand (1c) des Gehäuses (1) und dem Schieber (8) zusammengepresst ist, um diesen nach außen zu drücken in der Richtung senkrecht zur Türebene, wobei die Schale (2) aus einer flexiblen Membran geformt ist, die an dem Gehäuse (1) ausschließlich entlang ihres eigenen Umfangs befestigt ist, um in der Lage zu sein, umgetülpelt zu werden unter Übergang von konkav nach konvex.
  3. Geschirrspülmaschine mit einem Reinigungsmittelspender gemäß dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** der Schieber (8) durch eine rechteckige Platte (8a) geformt ist, welche gestaltet und dimensioniert ist zur Befestigung an dem Boden der Schale (2) mittels rechtwinkliger Stützen (8b), die sich von den kurzen Seiten der Platte (8a) weg erstrecken und mit Stiften (8c) ausgestattet sind, deren Längsachsen parallel zu der Platte (8a) sind, und mittels eines L-förmigen Hakens (8d), der an der selben Seite der Stützen (8b) von dem Zentrum der Platte (8a) weg ragt, wobei der Schieber (8) in dem Gehäuse (1) gleitfähig gelagert ist mittels der besagten Stifte (8c), die entlang von durch Paare von zu der Ebene der Tür rechtwinkligen Rippen gebildeten Führungen gleiten, wobei der besagte Haken (8d) durch das betreffende Loch (1b) hindurchtritt, so dass er an der Rückseite der Wand (1c), welche die Feder (9) unterstützt, herausragt, um als Verriegelung zum Halten der aktiven Dosiervorrichtung für das Reinigungsmittel in der Ruhelage zu fungieren.
  4. Geschirrspülmaschine mit einem Reinigungsmittel-
- spender gemäß dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** in der Ruhelage ein Arm (5a) in den Haken (8d) eingreift, wobei der Arm (5a) sich von einem Hebel aus erstreckt, der in der Türebene rotiert unter der Wirkung des Aktuators (4), welcher den Widerstand einer Rückstellfeder (7) überwindet, wobei die Flächen des Hakens (8d) und des besagten Arms (5a), welche den in der besagten Eingriffsposition in Kontakt stehenden Flächen gegenüber liegen, als zwei korrespondierende Schrägflächen geformt sind, die dazu geeignet sind, einen Druck auf den Schieber (8) in der Richtung senkrecht zu der Türebene in eine Rotation des Hebels (5) gegen den Widerstand der Feder (7) umzuwandeln, bis zur Wiederherstellung des Eingriffszustands.
5. Geschirrspülmaschine mit einem Reinigungsmittelspender gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die aktive Dosiervorrichtung für das Reinigungsmittel im Grunde aus einem Schaber (10) besteht, welcher derart geformt und dimensioniert ist, dass er sich über die Hälfte des Umfangs der Schale (2') erstreckt, wobei die Enden des besagten Schabers (10) an der Schale (2') drehbar angelenkt sind, so dass der Schaber (10) um 180° rotieren kann um eine Rotationsachse (X), die sich in der Türebene befindet, wobei die Schale (2') zumindest im Bereich entlang einer Ebene, die senkrecht zur Rotationsachse (X) ist, eine halbrunde Form aufweist.
  6. Geschirrspülmaschine mit einem Reinigungsmittelspender gemäß dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** sie einen Hebel (5) aufweist, der unter der Wirkung des Aktuators (4), welcher den Widerstand der Rückstellfeder (7) überwindet, innerhalb der Türebene rotiert, wobei der besagte Hebel (5) auf seiner Vorderseite mit einem Vorsprung (5b) versehen ist, der mit Spiel in einen verzahnten Bereich (11) eingreift, welcher gelenkig an dem Gehäuse (1) gelagert ist, um innerhalb einer Ebene senkrecht zu der Geschirrspülmaschinentür zu rotieren, wobei der besagte verzahnte Bereich (11) seinerseits mit einem verzahnten Rad (13) kämmt, das integral mit einem Schaft ausgebildet ist, an welchem ein Ende des Schabers (10) angeschlossen ist.
  7. Geschirrspülmaschine mit einem Reinigungsmittelspender gemäß dem vorhergehenden Anspruch, **dadurch gekennzeichnet, dass** sie ferner eine Rückstellfeder umfasst, die zwischen dem Gehäuse (1) und dem verzahnten Bereich (11) angeordnet ist, um ihn wieder in die Ausgangsposition zurück zu stellen, wenn der Aktuator (4) ausgeschaltet ist.

## Revendications

1. Lave-vaisselle comprenant un distributeur de détergent, le distributeur de détergent comprenant un corps (1), dans lequel on agence un plateau (2 ; 2' ; 2'') pour la charge du détergent, un couvercle (3) et un actionneur (4), dans lequel ledit plateau (2 ; 2' ; 2'') peut être fermé par ledit couvercle (3), dans lequel le couvercle (3) est agencé pour être mobile sous l'action dudit actionneur (4) entre une position fermée et une position ouverte du plateau (2 ; 2' ; 2'') dans laquelle il est en communication avec le réservoir de lavage du lave-vaisselle, le plateau (2 ; 2' ; 2'') étant prévu avec des moyens de distribution de détergent actifs pour la distribution active du détergent, qui se composent essentiellement d'un poussoir (8) extérieurement fixé sur le fond du plateau (2) ou d'un racloir (10) formé et dimensionné pour s'étendre le long de la moitié du périmètre du plateau (2'), dans lequel :  
lesdits moyens de distribution de détergent actifs sont raccordés de manière opérationnelle et mécanique à l'actionneur (4) afin qu'il soit activé par ledit actionneur (4) après qu'il a provoqué le déplacement du couvercle (3) dans la position ouverte du plateau (2 ; 2' ; 2'').
2. Lave-vaisselle comprenant un distributeur de détergent selon la revendication 1, **caractérisé en ce que** les moyens de distribution de détergent actifs se composent essentiellement d'un poussoir (8) extérieurement fixé au fond du plateau (2) et monté, de manière coulissante, dans le corps (1), et un ressort (9) comprimé entre une paroi (1c) du corps (1) et ledit poussoir (8) afin de le pousser vers l'extérieur dans la direction perpendiculaire au plan de la porte, le plateau (2) étant formé par une membrane flexible fixée sur le corps (1) uniquement le long de son propre périmètre afin de pouvoir être retourné en passant de concave à convexe.
3. Lave-vaisselle comprenant un distributeur de détergent selon la revendication précédente, **caractérisé en ce que** le poussoir (8) est formé par une plaque rectangulaire (8a) formée et dimensionnée pour la fixation au fond du plateau (2), par des montants perpendiculaires (8b) qui s'étendent à partir des côtés courts de ladite plaque (8a) et sont prévus avec des chevilles (8c) dont les axes longitudinaux sont parallèles à la plaque (8a), et par un crochet en forme de L (8d) qui s'étend perpendiculairement à partir du centre de la plaque (8a) sur le même côté desdits montants perpendiculaires (8b), le poussoir (8) étant monté, de manière coulissante, dans le corps (1) au moyen desdits chevilles (8c) qui coulisent le long des guides formés par des paires de nervures (1a) perpendiculaires au plan de la porte, ledit crochet (8d) passant par un trou correspondant (1b) afin de faire saillie vers l'arrière de la paroi (1c) qui supporte le ressort (9) afin de servir de verrou pour maintenir les moyens de distribution de détergent actifs dans la position de repos.
4. Lave-vaisselle comprenant un distributeur de détergent selon la revendication précédente, **caractérisé en ce que**, dans la position de repos, le crochet (8d) est mis en prise par un bras (5a) qui s'étend à partir d'un levier (5) tournant dans le plan de la porte sous l'action de l'actionneur (4) qui surmonte la résistance d'un ressort de rappel (7), les faces du crochet (8d) et dudit bras (5a) opposées aux faces en contact dans ladite condition de mise en prise étant formées comme deux surfaces inclinées correspondantes appropriées pour convertir une poussée sur le poussoir (8) dans la direction perpendiculaire au plan de la porte en une rotation du levier (5) contre la résistance dudit ressort (7) jusqu'au rétablissement de la condition de mise en prise.
5. Lave-vaisselle comprenant un distributeur de détergent selon la revendication 1, **caractérisé en ce que** les moyens de distribution de détergent actifs se composent essentiellement d'un racloir (10) formé et dimensionné pour s'étendre le long de la moitié du périmètre du plateau (2'), les extrémités dudit racloir (10) étant pivotées par rapport au plateau (2') de sorte que le racloir (10) peut tourner à 180° autour d'un axe de rotor (X) disposé dans le plan de la porte, le plateau (2') ayant une forme semi-circulaire au moins dans la section le long du plan perpendiculaire audit axe de rotation (X).
6. Lave-vaisselle comprenant un distributeur de détergent selon la revendication précédente, **caractérisé en ce qu'il** comprend un levier (5) tournant dans le plan de la porte sous l'action de l'actionneur (4) qui surmonte la résistance d'un ressort de rappel (7), ledit levier (5) étant prévu sur sa face avant avec une saillie (5b) qui vient en prise, avec du jeu, avec un secteur denté (11) articulé par rapport au corps (1) afin de tourner dans un plan perpendiculaire à la porte de lave-vaisselle, ledit secteur denté (11) venant, à son tour, en prise, avec une roue dentée (13) solidaire avec un arbre sur lequel est clavetée une extrémité du racloir (10).
7. Lave-vaisselle comprenant un distributeur de détergent selon la revendication précédente, **caractérisé en ce qu'il** comprend en outre un ressort de rappel (14) agencé entre le corps (1) et le secteur denté (11) afin de le ramener dans la position initiale lorsque l'actionneur (4) est arrêté.



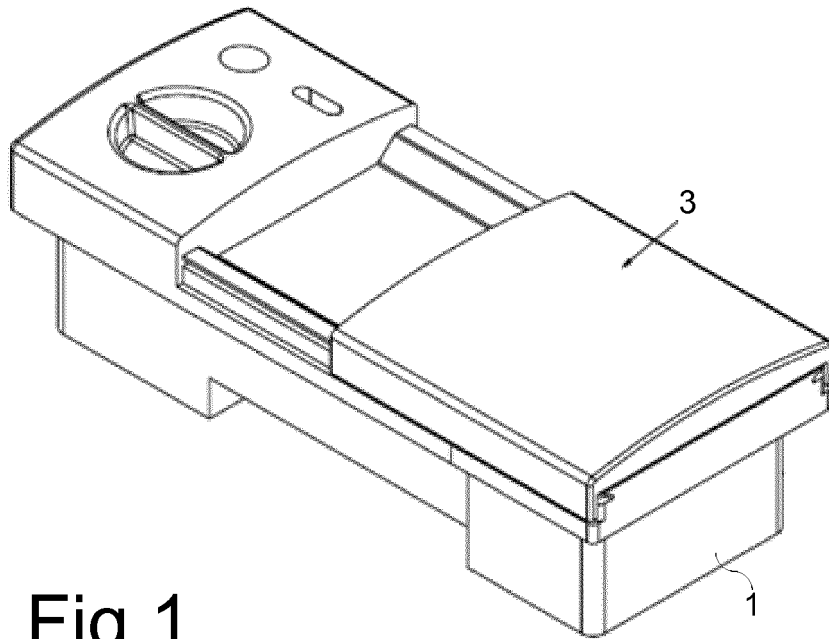


Fig.1

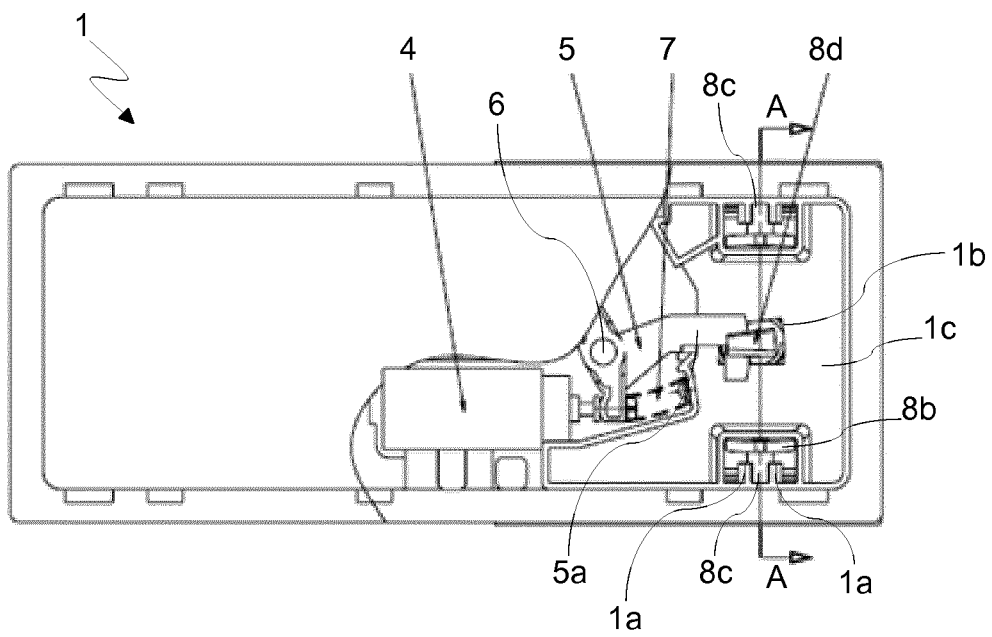


Fig.2

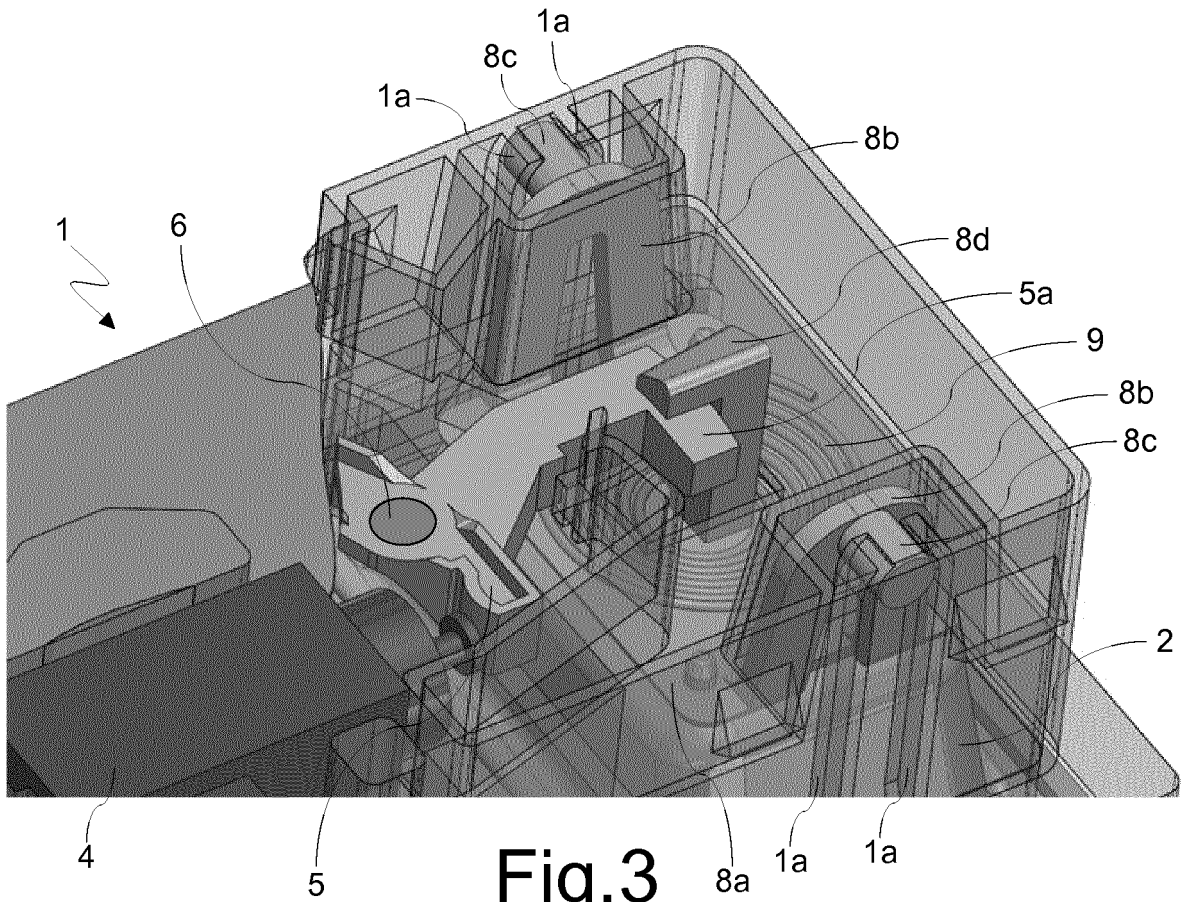


Fig.3

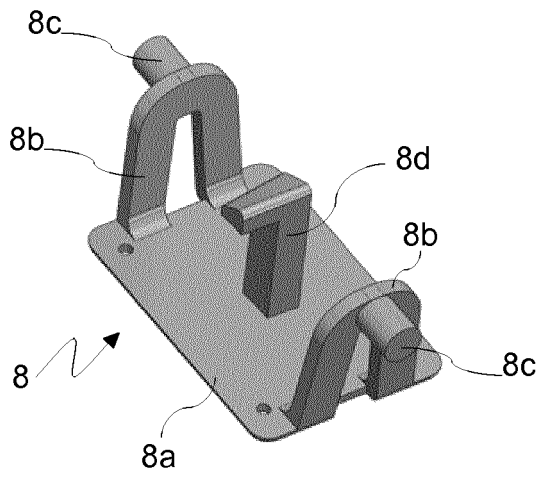


Fig.4

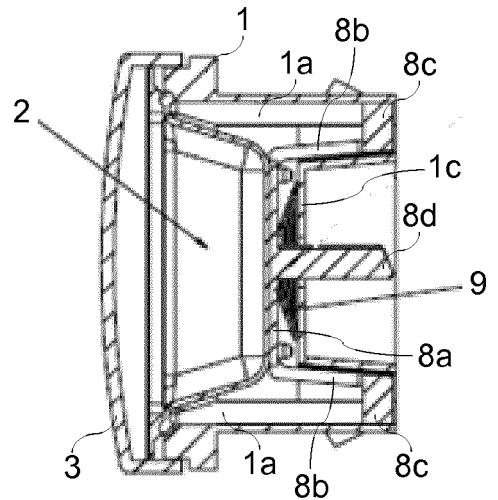


Fig.5

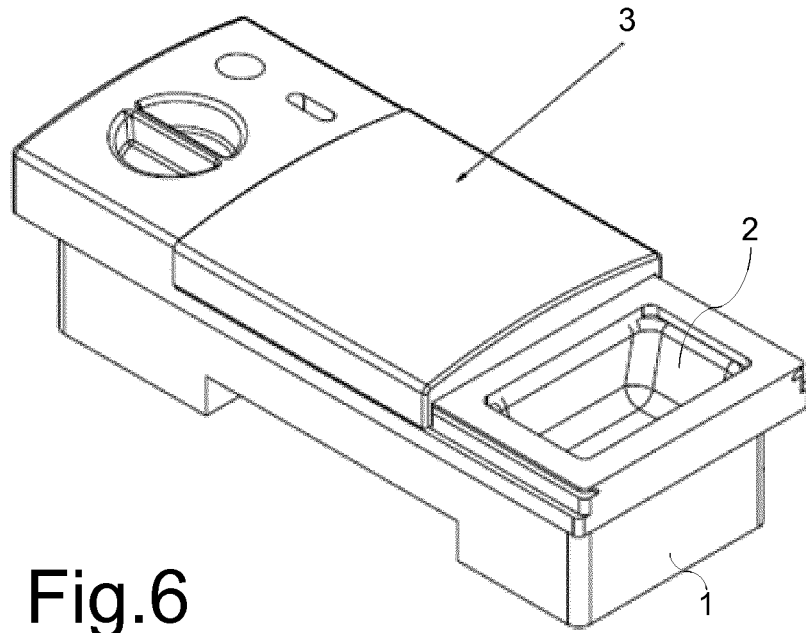


Fig.6

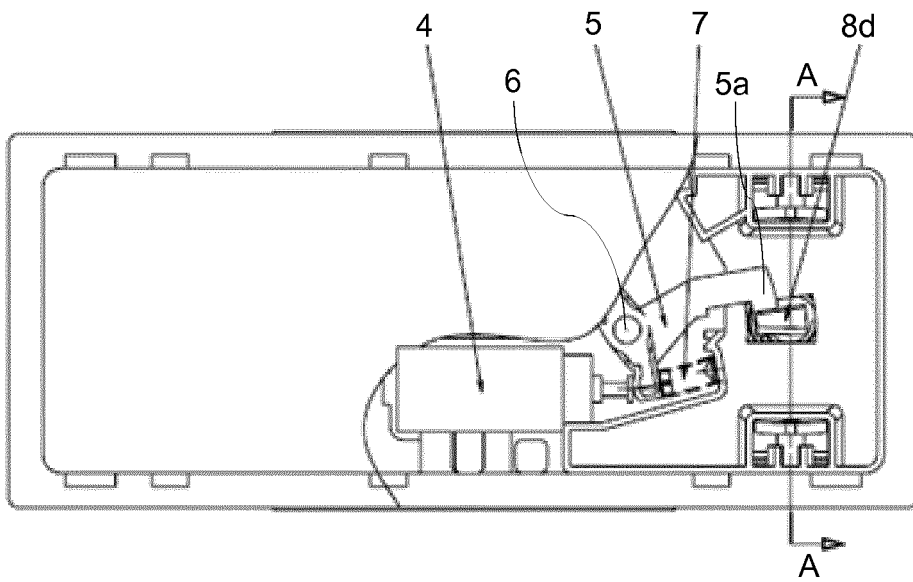


Fig.7

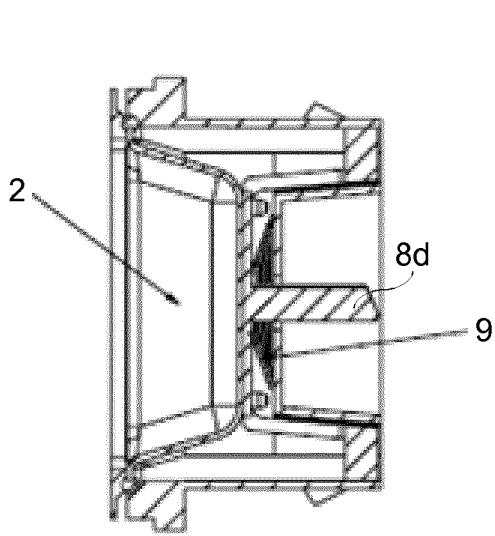


Fig. 8

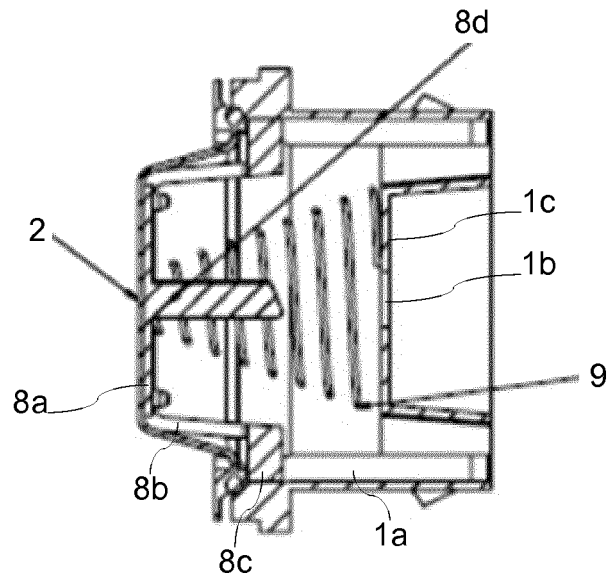


Fig. 10

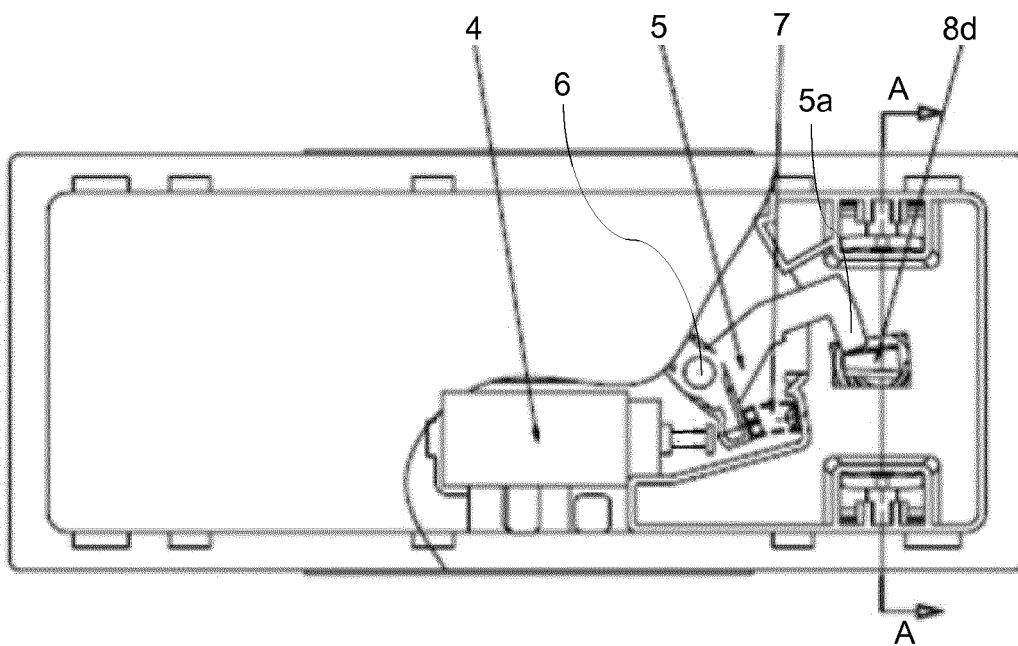


Fig. 9

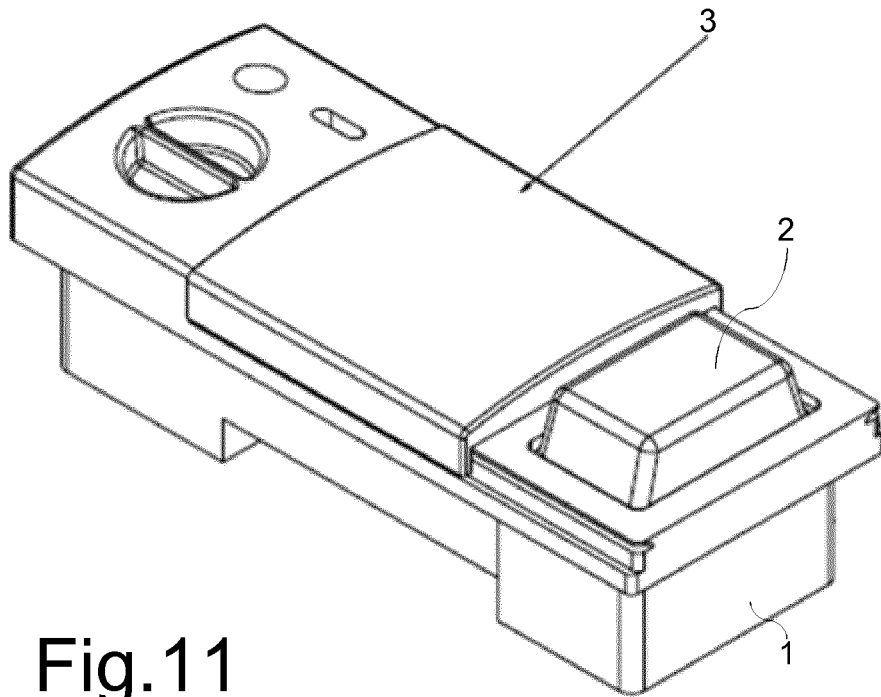


Fig. 11

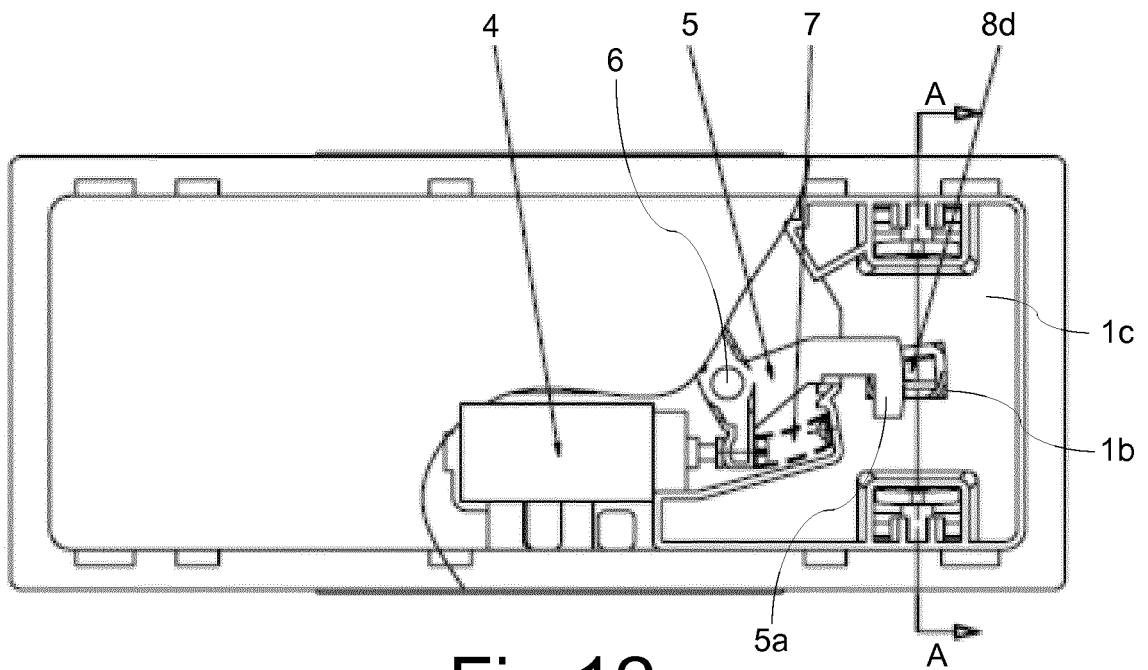


Fig. 12

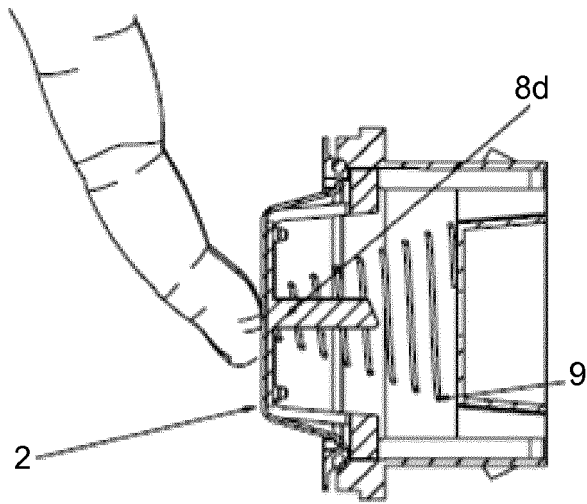


Fig. 13

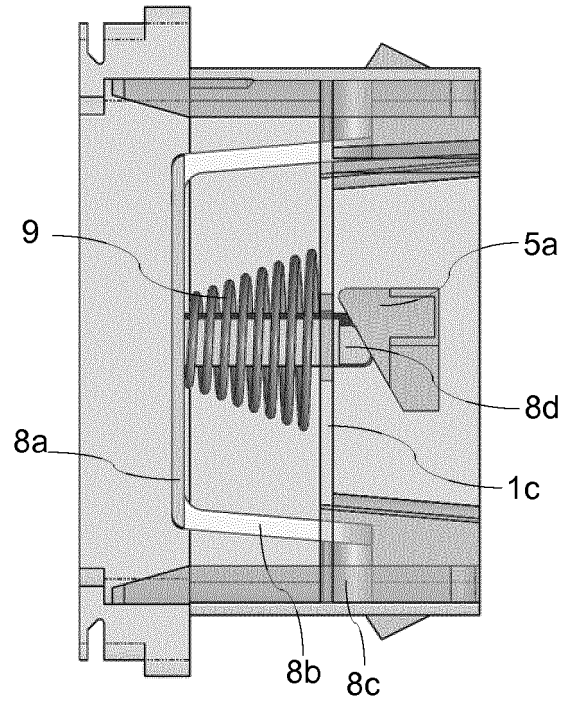


Fig. 15

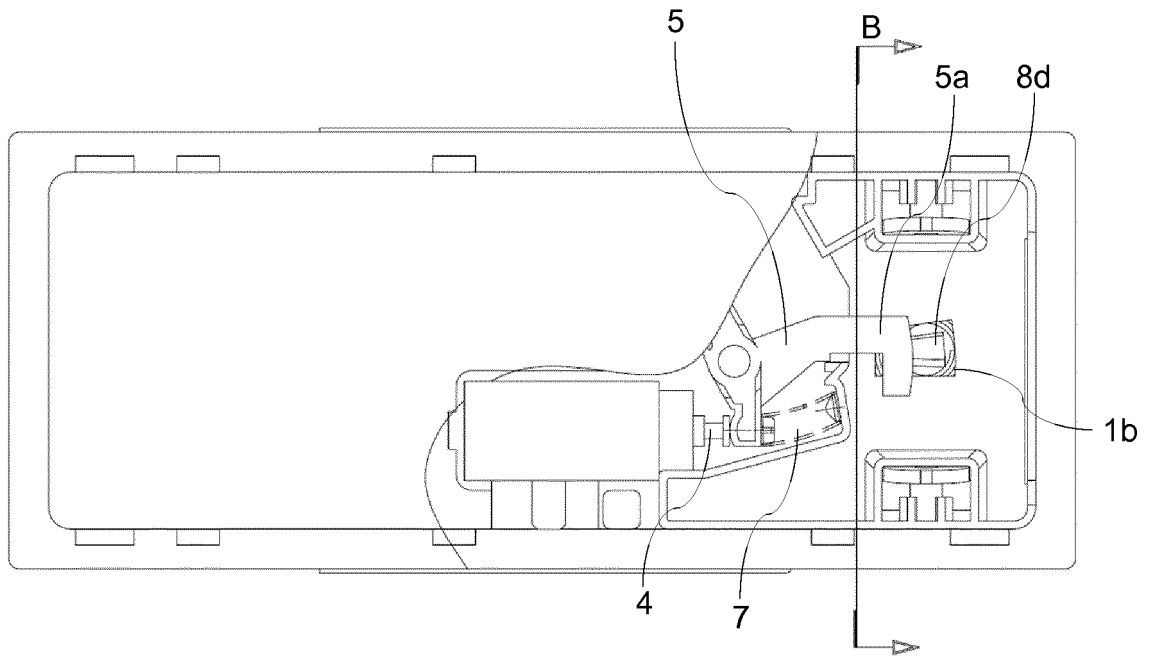


Fig. 14

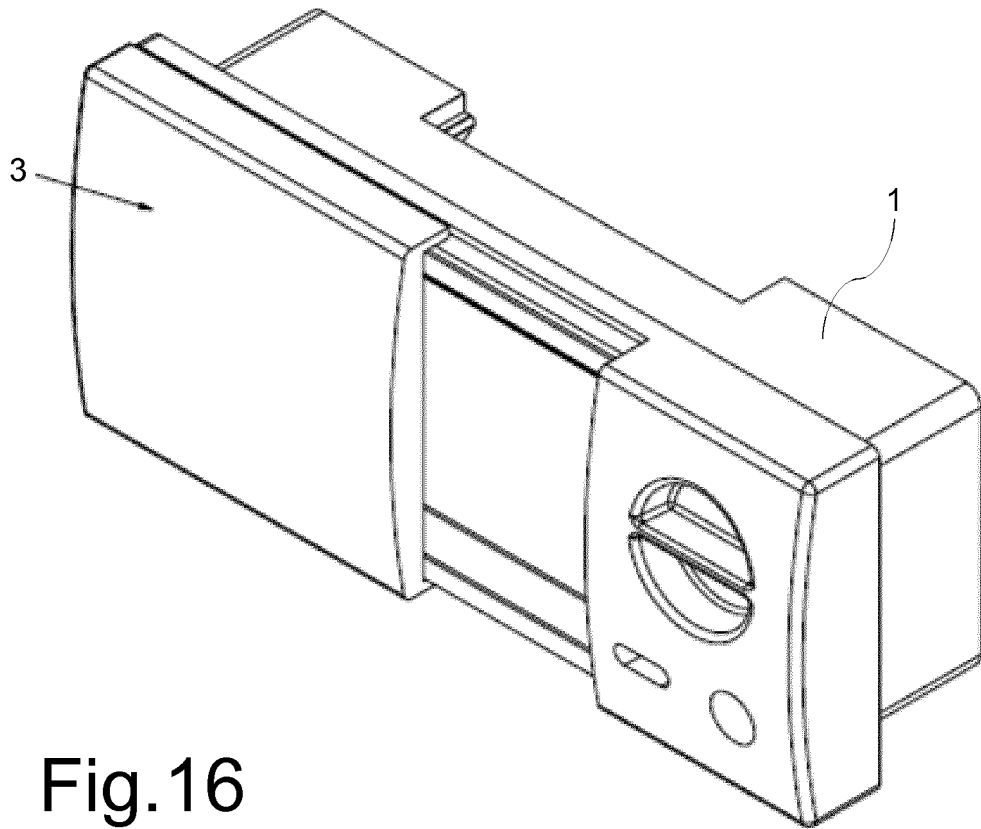


Fig. 16

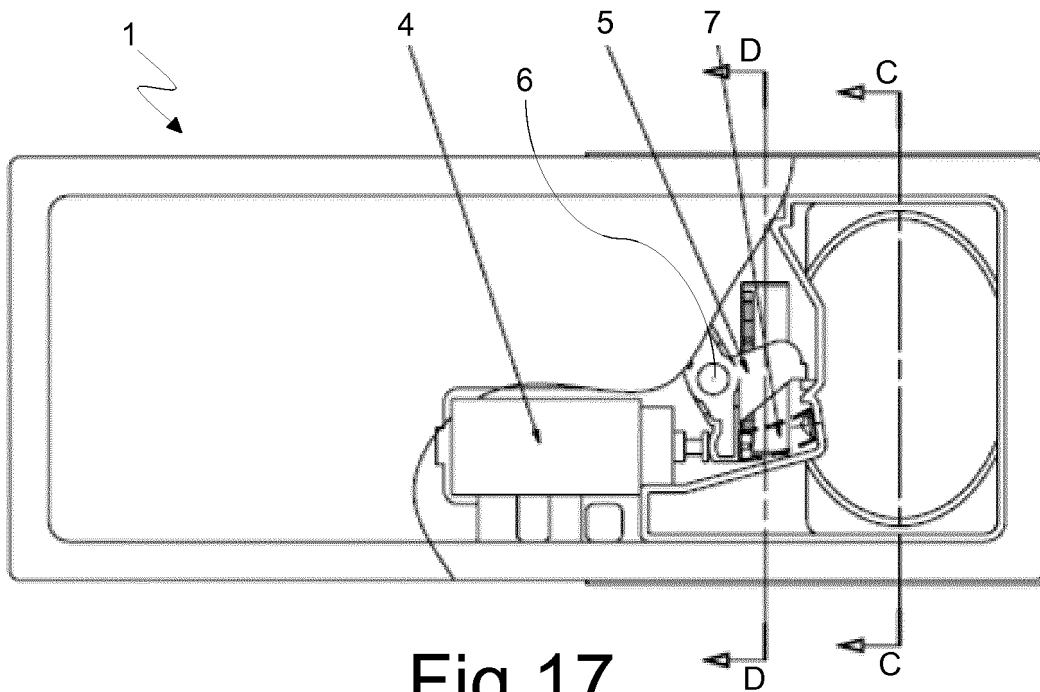


Fig. 17

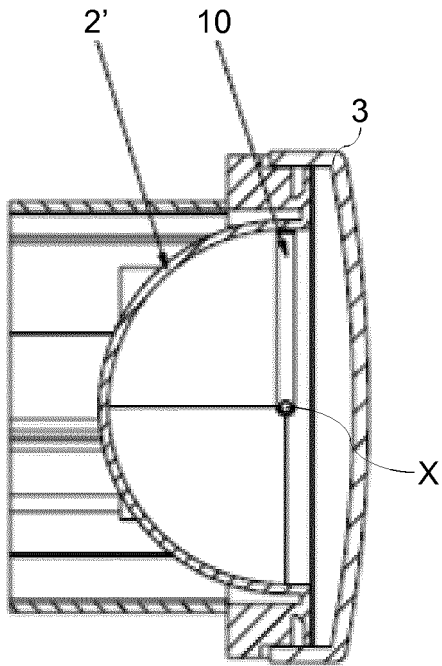


Fig.18

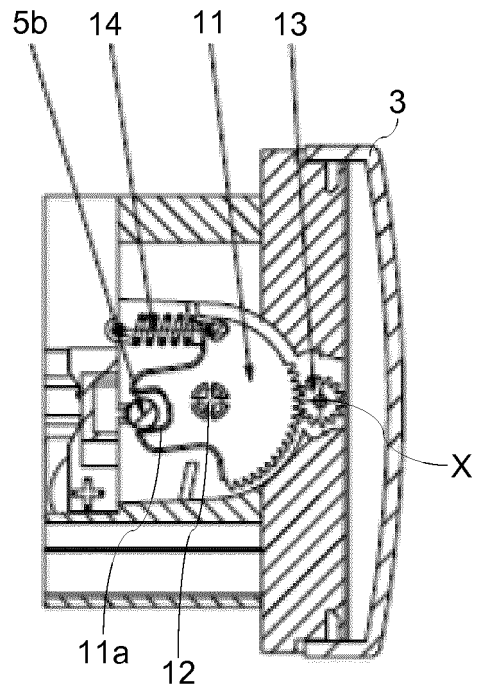


Fig.19

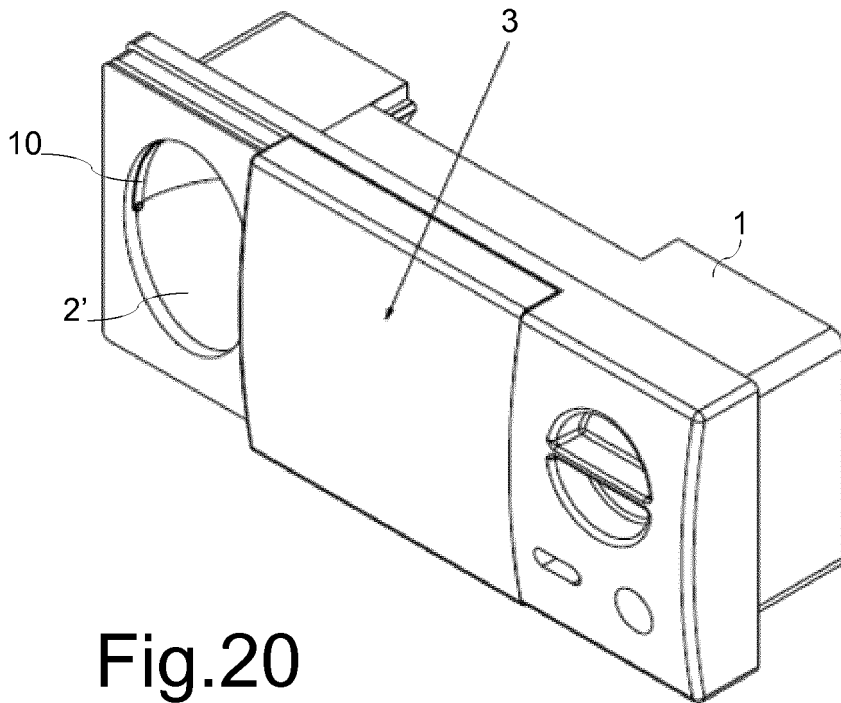


Fig.20



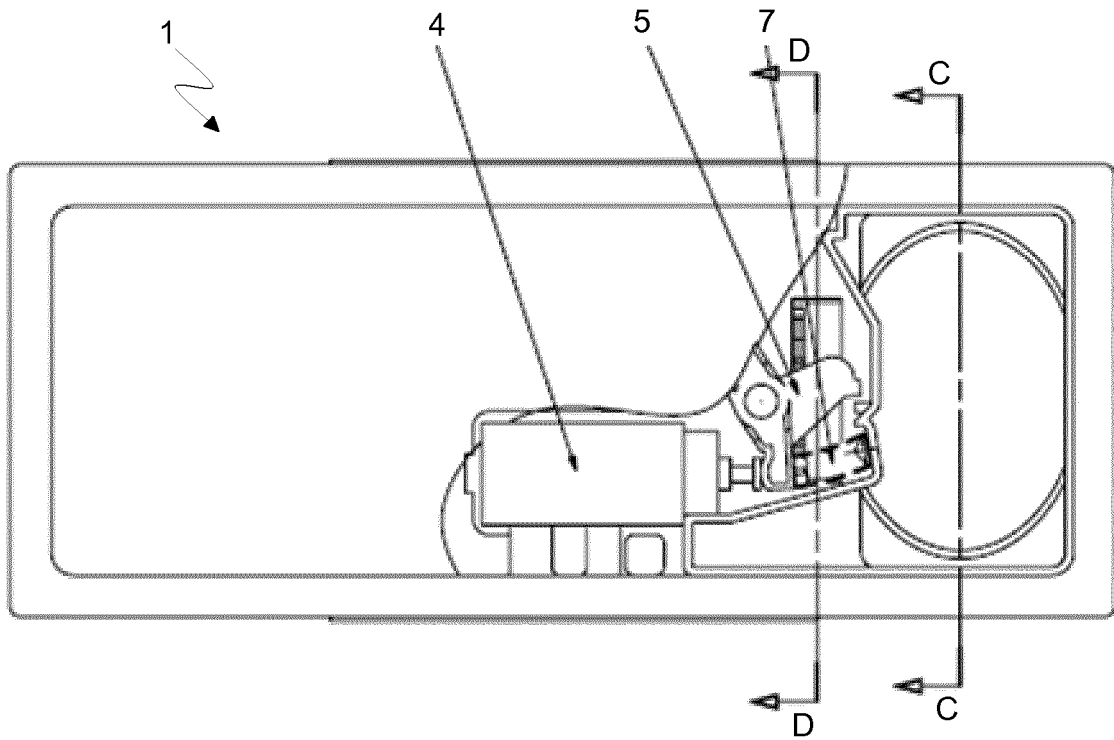


Fig.21

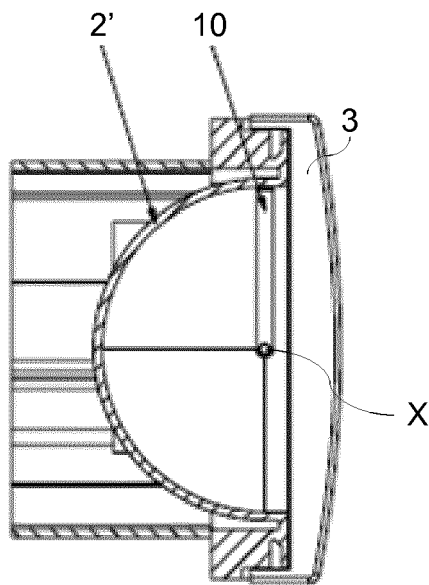


Fig.22

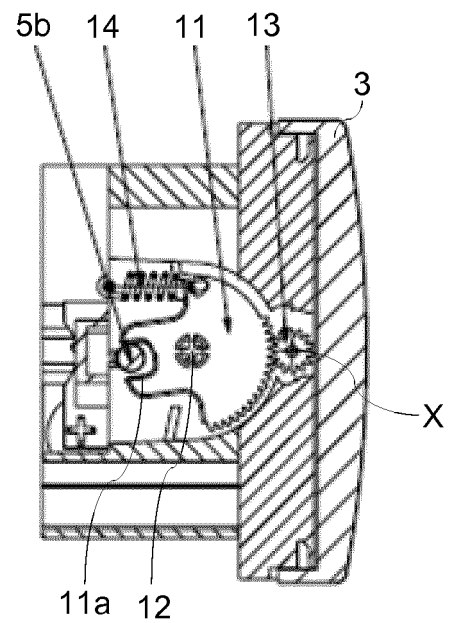


Fig.23

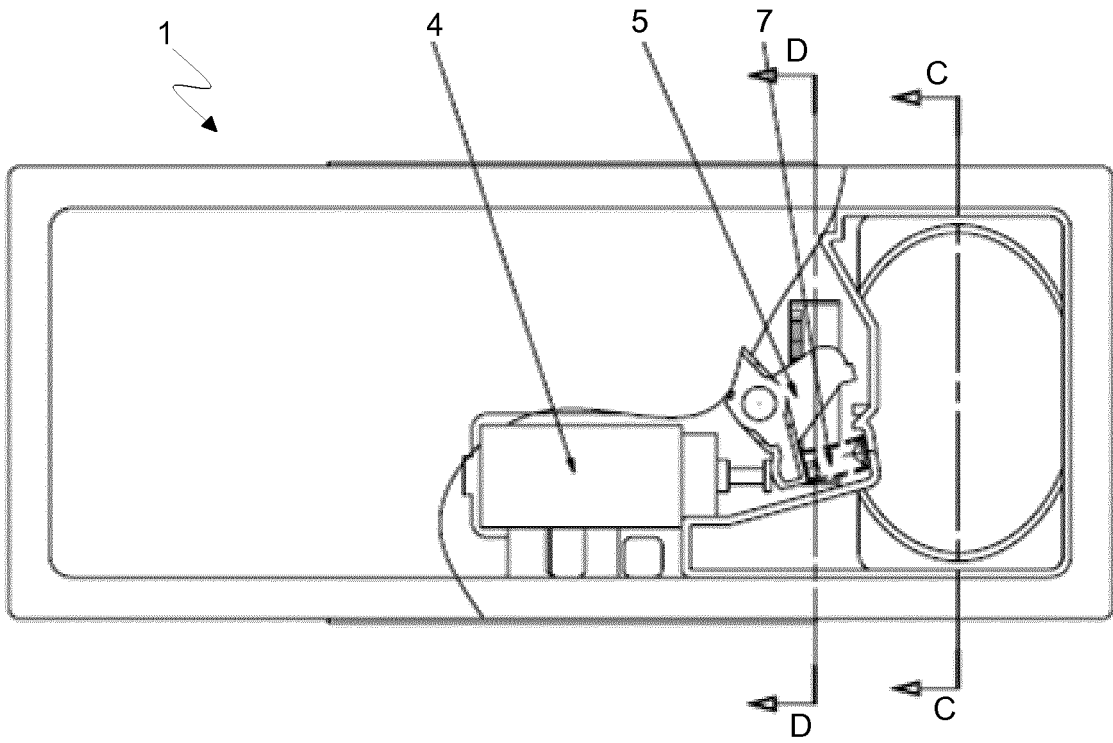


Fig.24

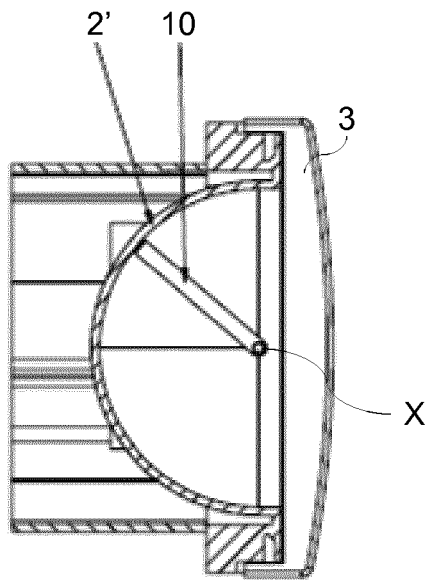


Fig.25

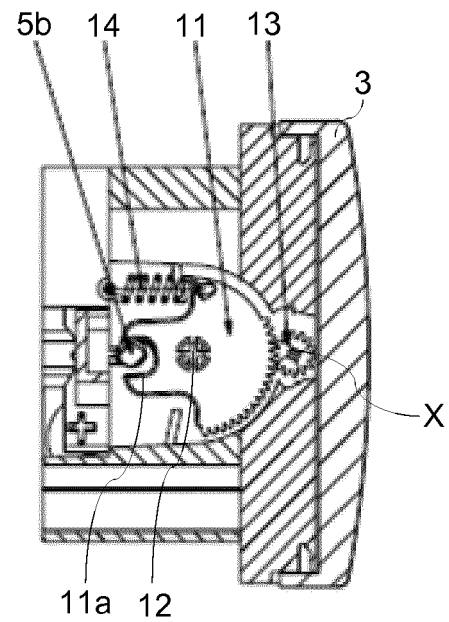


Fig.26

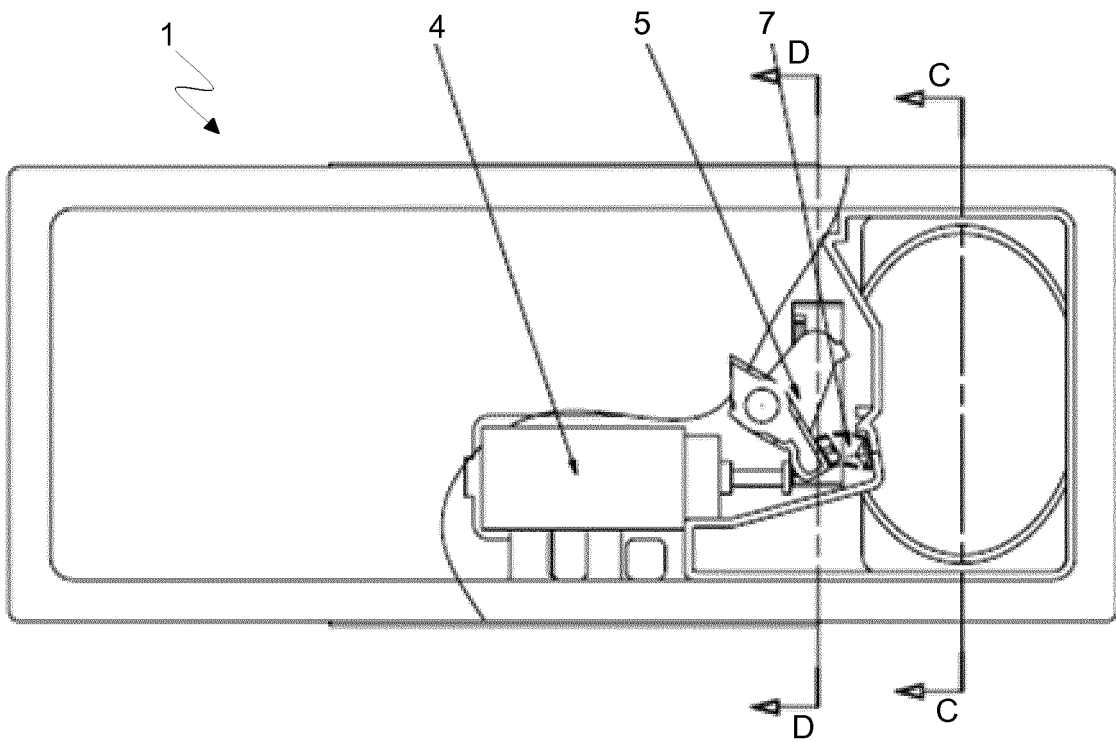


Fig.27

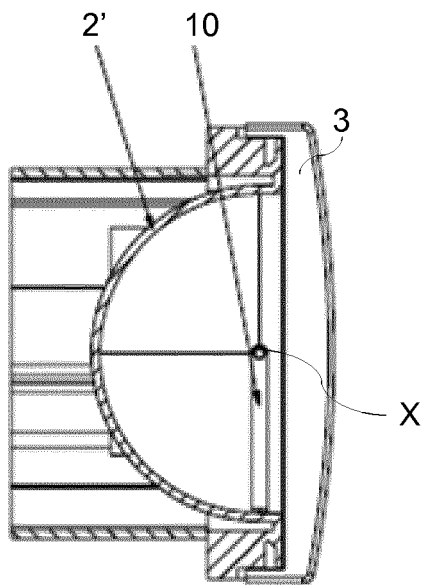


Fig.28

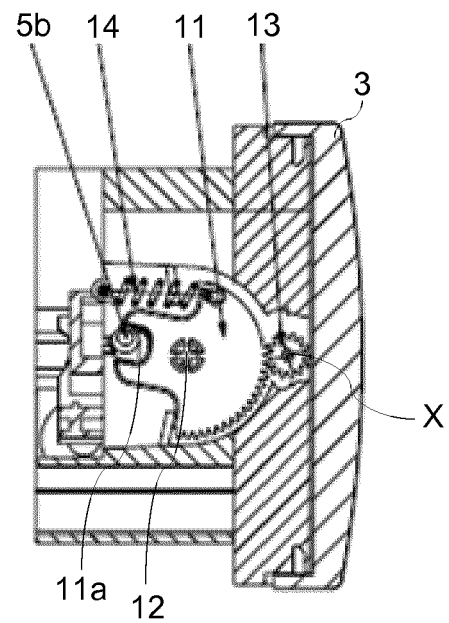


Fig.29

**REFERENCES CITED IN THE DESCRIPTION**

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