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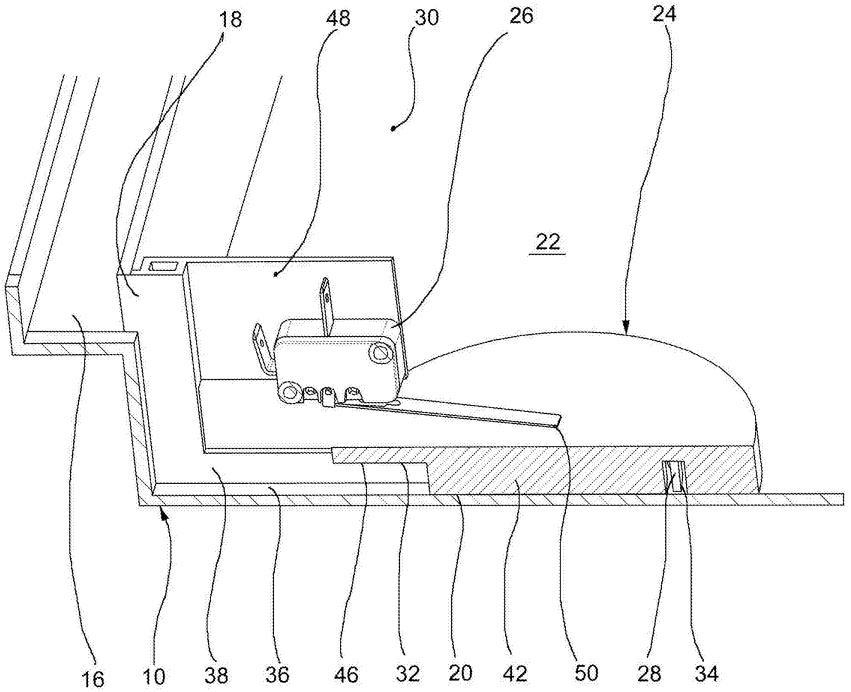
## (54) Anti-flood safety system for a dishwasher

(57) The safety system comprises: a collection chamber (20) for water leaks, having an opening (32) for the inflow of water and a narrow opening (34) for the outflow of water into an auxiliary chamber (22); a member (24) located in the collection chamber (20) and capable of floating on the water collecting therein; and a switch (26) located over said floating member (24) and capable of being actuated by the latter when the water reaches a predetermined level inside the chamber (20), thus causing the floating member (24) to rise. The collection chamber (20) is stationary, whereas the floating member (24) is a single member and is also capable of floating on the water collecting in the auxiliary chamber (22), thus causing the switch (26) to be actuated when the water reaches a predetermined level inside the auxiliary chamber (22).

FIG.4

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## Description

**[0001]** The present invention relates to an anti-flood safety system for a dishwasher.

**[0002]** In more detail, this system comprises:

- a collection chamber for water leaks, having an opening for the inflow of said water and a narrow opening for the outflow of said water into an auxiliary chamber,
- a member located in said collection chamber and capable of floating on the water collecting therein, and
- a switch located over said floating member and capable of being actuated by said floating member when the water reaches a predetermined level inside said chamber, thus causing the floating member to rise.

**[0003]** Patent application PCT WO-02/07 581 discloses a safety system of this kind. In this known system the collection chamber is created on top of a second floating member which is in turn capable of floating on the water collecting in the auxiliary chamber. The two floating members are thus fitted one on top of the other and the collection chamber is mobile.

**[0004]** When only the first floating member rises or the two floating members rise together, the switch is actuated and, in turn, it starts up a discharge pump and/or stops the supply of water from the main or otherwise prevents the dishwasher from performing further operations.

**[0005]** The first floating member is able to rapidly actuate the switch even following a minor water leak because its chamber is of small volume and therefore fills quickly with water, thus causing the first floating member to rise to the critical level, whereas the second floating member remains virtually stationary. The water which caused the first floating member to rise is then gradually discharged from the collection chamber and disappears by evaporation with time. As a consequence, the safety system discontinues its shutoff action and it automatically reverts back to its initial state without the need for external intervention, thus being ready to be activated in case of a future emergency situation.

**[0006]** On the other hand, in case of a major water leak, the switch is actuated by both floating members rising together. In this case, the shutoff action performed by the safety system is irreversible and an external intervention is therefore required in order to revert the system back to its original state and restore functionality of the dishwasher.

**[0007]** Therefore, the known safety system has two modes of activation, each mode being different according to the severity of the leak. Moreover, this system is complicated in terms of construction due to two floating members being fitted one on top of the other.

**[0008]** The object of the present invention is therefore to provide a safety system which, whilst retaining the feature of having two modes of activation, is free from the abovementioned drawback.

**[0009]** According to the invention, this object is achieved by a device of the type indicated at the beginning of the present description and characterized in that said collection chamber is stationary and said floating member is a single member and is also capable of floating on the water collecting in the auxiliary chamber, thus causing the switch to be actuated when the water reaches a predetermined level inside said auxiliary chamber.

**[0010]** The safety system of the invention has therefore a single mobile floating member and a collection chamber for water leaks which is stationary in all operating conditions, thus being more simple in terms of construction.

**[0011]** A further object of the present invention is a dishwasher comprising an anti-flood safety system of the type described above.

**[0012]** Further advantages and features of the present invention will emerge from the following detailed description which is given with reference to the accompanying drawings provided purely by way of a non-limiting example, in which:

Figure 1 is a perspective view of a dishwasher base in which a safety system of the invention is housed and in which some components have been removed for the sake of clarity,

Figure 2 is a perspective view similar to Figure 1 but from a different angle,

Figure 3 is a diagrammatic view on an enlarged scale of the safety system of the invention housed in the base of a dishwasher,

Figure 4 is a perspective view in section on IV-IV as marked in Figure 3, and

Figure 5 is a perspective from below of a floating member which is part of the safety system of the invention.

**[0013]** A dishwasher comprises (Figs 1 and 2) a base formed by a lower hollow part 10 in the shape of a substantially parallelepiped box and an upper part 12, for example a plastic or steel part, which closes the lower part 10 at the top as a cover and whose upper face serves as the bottom of the washing tank. Substantially vertical channels 14 are integral with the respective edges of the front side of the lower part 10, said channels being intended for drainage of water leaking from the gap between the access door to the washing tank and its front side. The vertical channels 14 lead into another channel 16 which extends all the way across the width of the base and has a passage 18 in its central portion for discharging water.

**[0014]** An anti-flood safety system is located (fig. 3 and 4) inside the cavity of the lower part 10 of the base, said system comprising: a collection chamber 20 for water leaks, an auxiliary chamber 22, a single floating member 24 and a switch 26.

**[0015]** The collection chamber 20 is delimited by an

annular wall 28 rising from the bottom 30 of the lower part 10 of the base, and in which a water inlet opening 32 and outlet opening 34 are created diametrically opposite each other. The inlet opening 32 communicates with a conduit 36 delimited by walls 38 also rising from the bottom 30 of the lower part 10 of the base, the conduit being in turn fed by the discharge passage 18 of the channel 16 extending across the width of the base. The outlet opening 34 is narrow and communicates with the auxiliary chamber 22 which is level with the collection chamber 20 and surrounds it completely, thus virtually occupying the remaining part of the bottom 30 of the lower part 10 of the base.

**[0016]** The floating member 24 is in the shape of a disc having in its lower face (Fig. 5) a circular groove 40 with a diameter equivalent to that of the annular wall 28 and into which the upper edge of the latter is inserted. Thus, the groove 40 has a circular region 42 of the floating member 24 in its interior, said region being located in the collection chamber 20, and has an annulus 44 of the floating member 24 around its outside, said annulus being located in the auxiliary chamber 22. The annulus 44 has a hollow section 46 which is located in a position corresponding to that of the water inlet opening 32. The floating member 24 may be a one-piece or a multi-piece member.

**[0017]** The switch 26 is fitted onto a bracket 48 which is integral with the front portion of the lower part 10 of the base and has a control lever 50 protruding above the floating member 24.

**[0018]** When an occasional leak occurs from the access door to the washing tank, the water seeping from the edge of said door is conveyed through the vertical channels 14, the channel 16 extending across the width of the base and the conduit 36 extending into the collection chamber 20. Since the latter is of small volume and has a narrow outlet opening 34, the level of water therein rises rapidly and causes the floating member 24 to rise rapidly, thus striking the lever 50 and actuating the switch 26. In a manner known per se, the switch 26 starts up a discharge pump and stops the supply of water from the main or the like, thus avoiding water spillages from the dishwasher to the exterior. Subsequently, the water collecting in the chamber 20 flows out into the auxiliary chamber 22 at a reduced flow rate due to the narrowing of the outlet opening 34. Therefore, since the leak is temporary, the water level in the collection chamber 20 decreases in such a way that the floating member 24 also lowers and, except in the case of a major leak, it disengages from the switch 26 which is therefore able to revert back to its original position. Functionality of the safety system is therefore restored and the system is ready to be activated in case of a future emergency. External intervention is not required since functionality is restored automatically and the water, having finally reached an equal, low level in the two chambers 20, 22, is lost by evaporation.

**[0019]** However, in the case of a constant leak or an occasional major leak, the safety system works in a different way. Persistent water leaks, for example through the bottom of the washing tank, which is the upper face of the part 12 of the base, drip directly into the auxiliary chamber 22, thus causing the floating member 24 to rise gradually, said member then striking the lever 50 and causing the switch 26 to be activated. Due to the persistent flowing of the water leak, the water level cannot subsequently decrease unaided and external intervention is therefore required in order to restore not only functionality of the safety system, but also that of the dishwasher. However, it is more than justified to intervene in this case, since a persistent leak is potentially very dangerous and obviously must be stopped. In the rare case of a temporary leak of high severity, water likewise reaches an ultimate equal level in the chambers 20, 22 such that the switch 26 is constantly engaged. As a consequence, external intervention is also required in this case in order to not only restore functionality of the safety system, but also that of the dishwasher.

**[0020]** The safety system of the invention has therefore two modes of action, with the advantage that it does not require external intervention to restore it following actuations caused by minor temporary leaks. At the same time, this system proves to be reliable and economical due to its simple structure which provides two chambers 20, 22, both stationary, and a single floating member 24.

**[0021]** It is also to be noted that the dishwasher base of the invention uses integral means - such as the channels 14 and 16 - to convey the water leaking from the front side of the dishwasher to the safety system. This structure is highly advantageous in terms of construction and, in principle, may be combined with any anti-flood safety system housed in the base.

**[0022]** Obviously, without departing from the principle of the invention, the constructional details and embodiments may vary considerably from those described purely by way of example, without thereby departing from the scope claimed. In particular, the lower part 10 of the base may in turn be a two-part piece: one part forms the bottom of the base in which integral walls 28, 38 are created and in which said walls define the chambers 20, 22 and the conduit 36, and the other part forms the lateral walls of the base in which channels 14 and 16 are created.

## Claims

**1.** Anti-flood safety system for a dishwasher, comprising:

- a collection chamber (20) for water leaks, having an opening (32) for the inflow of said water and a narrow opening (34) for the outflow of said water into an auxiliary chamber (22),
- a member (24) located in said collection chamber (20) and capable of floating on the water collecting therein, and
- a switch (26) located over said floating member

(24) and capable of being actuated by said floating member (24) when the water reaches a predetermined level inside said chamber (20), thus causing the floating member (24) to rise,

said system being **characterized in that** said collection chamber (20) is stationary and said floating member (24) is a single member and is also capable of floating on the water collecting in the auxiliary chamber (22), thus causing the switch (26) to be actuated when the water reaches a predetermined level inside said auxiliary chamber (22).

**2.** Safety system according to Claim 1, **characterized in that** said collection chamber (20) is delimited by a substantially annular wall (28) in which said water inlet and outlet openings (32, 34) are created.

**3.** Safety system according to Claim 2, **characterized in that** said floating member (24) is in the shape of a disc having in its lower face a circular groove (40) with a diameter equivalent to that of said annular wall (28) and into which the upper edge of said annular wall (28) is inserted, said groove (40) having a circular region (42) in its interior and an annulus (44) around its outside, said annulus having a hollow section (46) located in a position corresponding to that of said water inlet opening (32).

**4.** Dishwasher comprising an anti-flood safety system according to any of the preceding claims.

**5.** Dishwasher according to Claim 4, comprising a base in which said safety system is located, said base being suitable for conveying the water leaking from the front side of the dishwasher to said safety system.

**6.** Dishwasher according to Claim 5, in which said base is formed by a lower hollow part (10) in the shape of a box and by an upper part (12) which closes the lower part (10) at the top as a cover, substantially vertical respective channels (14) for drainage of the water leaking from the front side of the dishwasher being created on the edges of the front side of said lower part (10), said channels (14) leading into another channel (16) which has a passage (18) for discharging water.

**7.** Dishwasher according to Claim 6, in which said discharge passage (18) communicates with a conduit (36) enclosed by walls (38) rising from the bottom (30) of said base, said conduit leading into said inlet opening (32) of the collection chamber (20).

**8.** Dishwasher according to any of the preceding Claims 4 to 7, in which said collection chamber (20) is delimited by a wall (28) rising from the bottom (30) of said base and in which said water inlet and outlet openings (32, 34) are created.

**9.** Dishwasher according to Claim 8, in which said wall (28) is annular and said water inlet and outlet openings (32, 34) are created diametrically opposite each other.

**10.** Dishwasher according to any of the preceding Claims 4 to 9, in which said auxiliary chamber (22) is level with said collection chamber (20) and virtually completely surrounds the latter.

**11.** Dishwasher according to any of the preceding Claims 6 to 10, in which said switch (26) is fitted onto a bracket (48) which is integral with the front portion of said lower part (10) of the base and has a control lever (50) protruding above said floating member (24).

**12.** Dishwasher according to any of the preceding Claims 6 to 11, in which said lower part (10) of the base is in turn formed by a two-part piece, of which one part forms the bottom of the base and the other part forms the lateral walls of the base.

**13.** Dishwasher comprising a base in which an anti-flood safety system is located, integral means being produced with said base in order to convey water leaking from the front side of the dishwasher to the safety system.

FIG.1

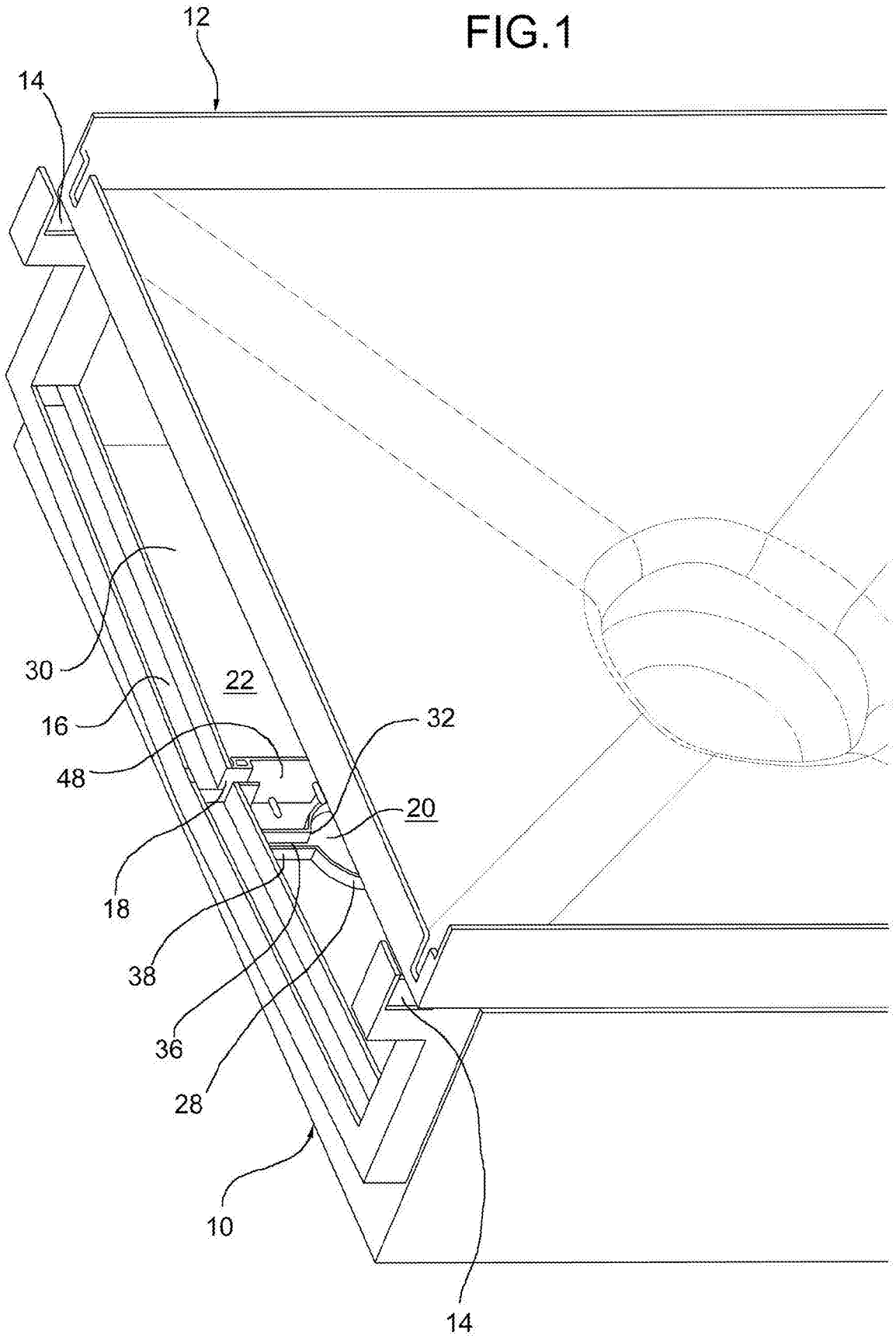


FIG.2

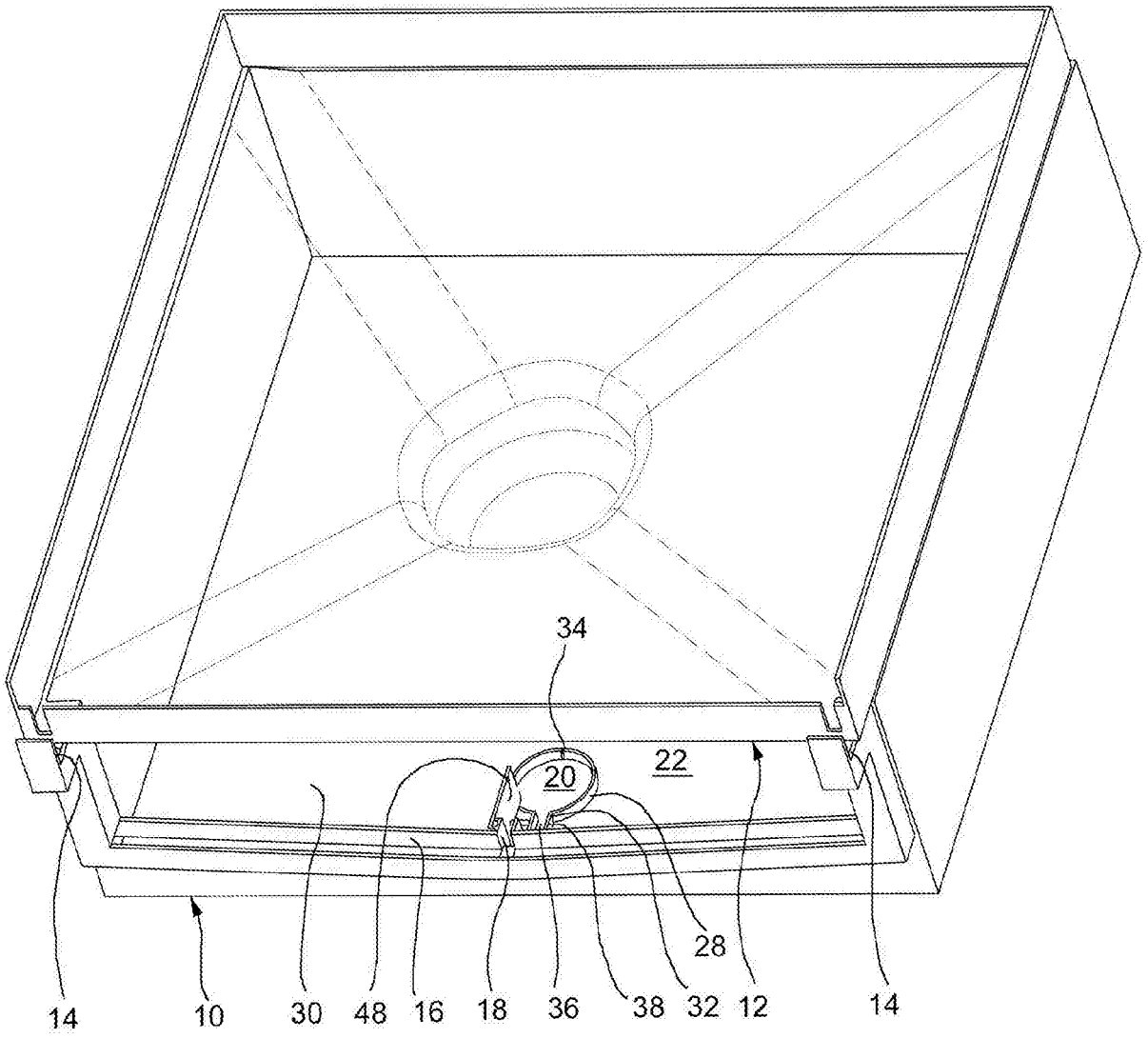


FIG.3

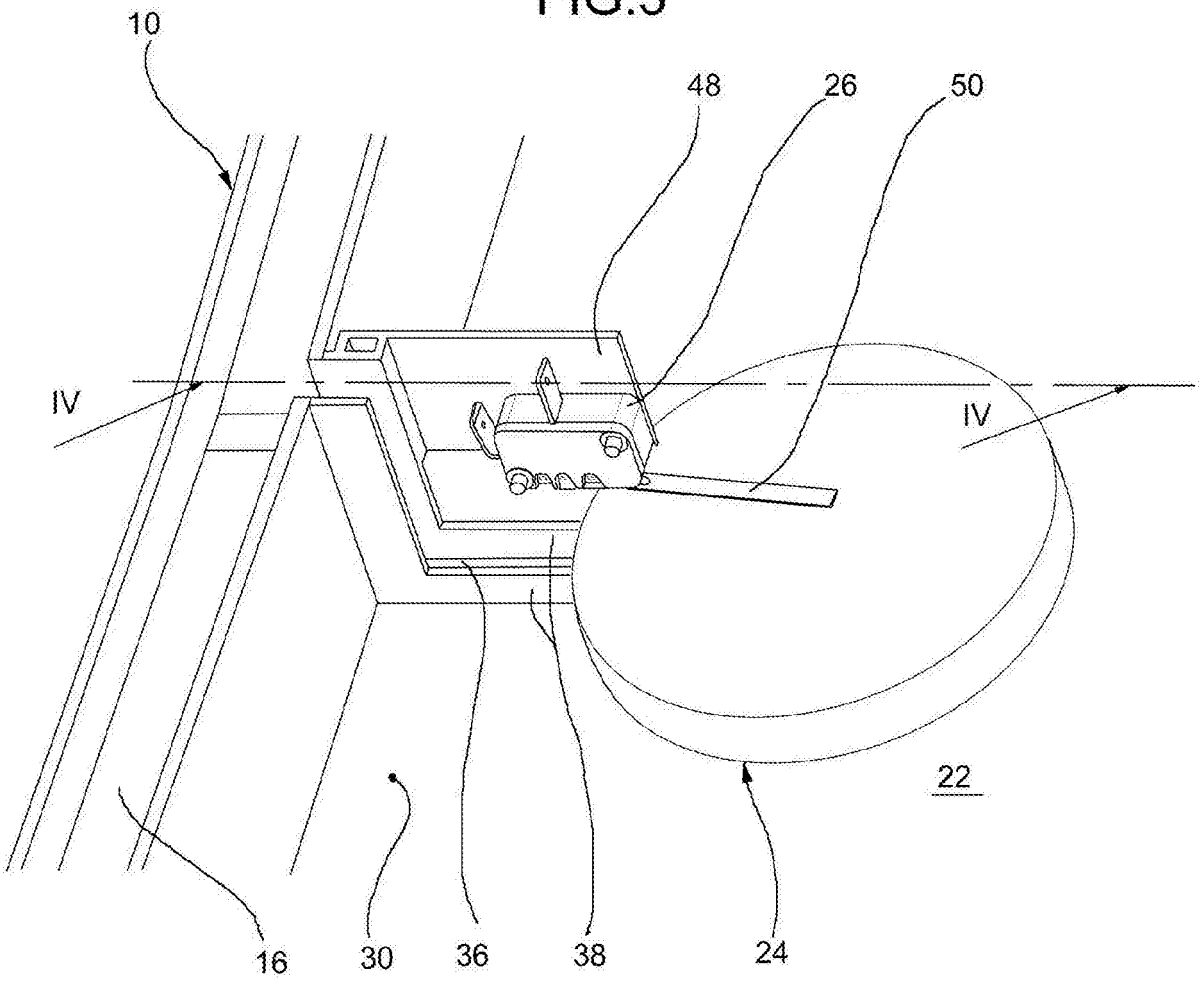


FIG.4

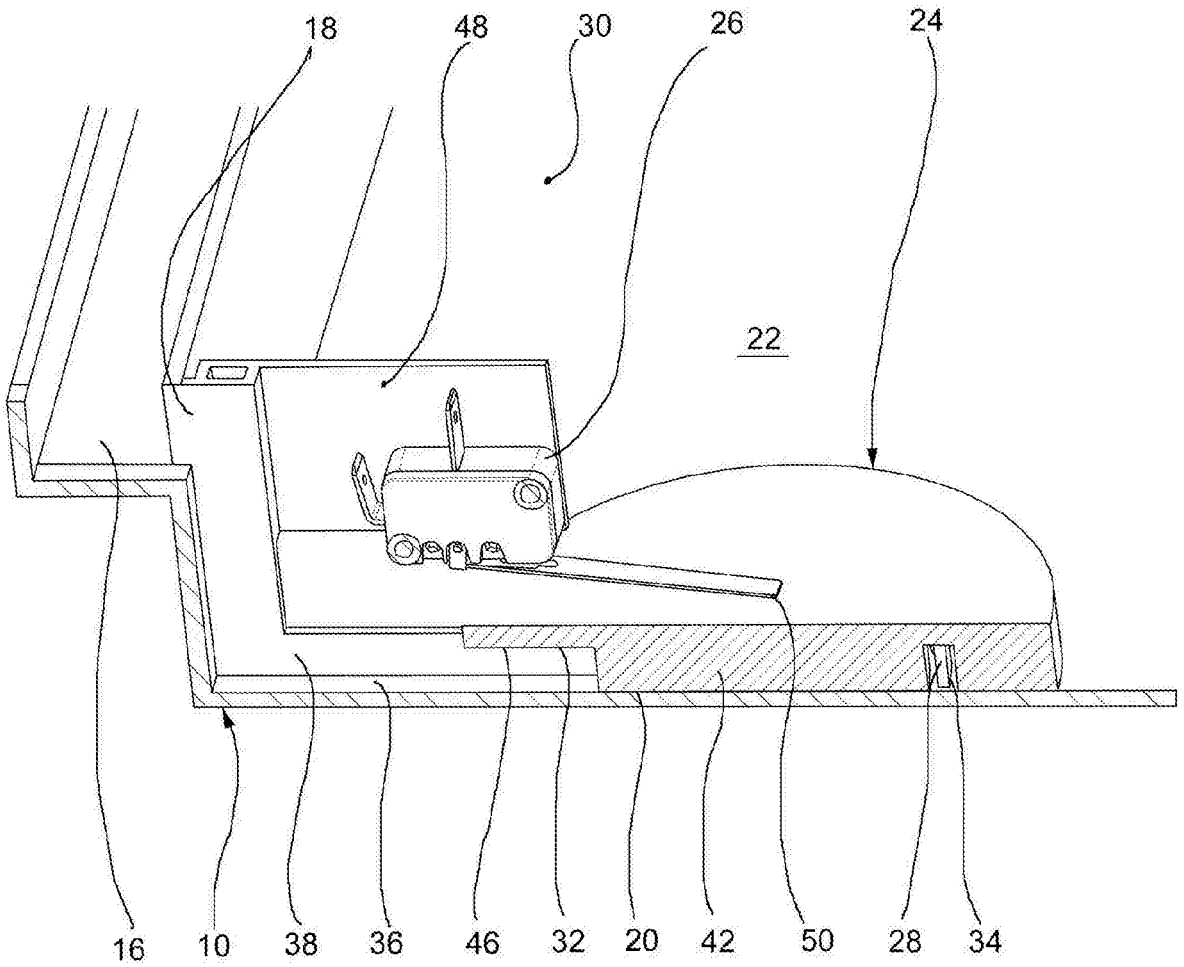
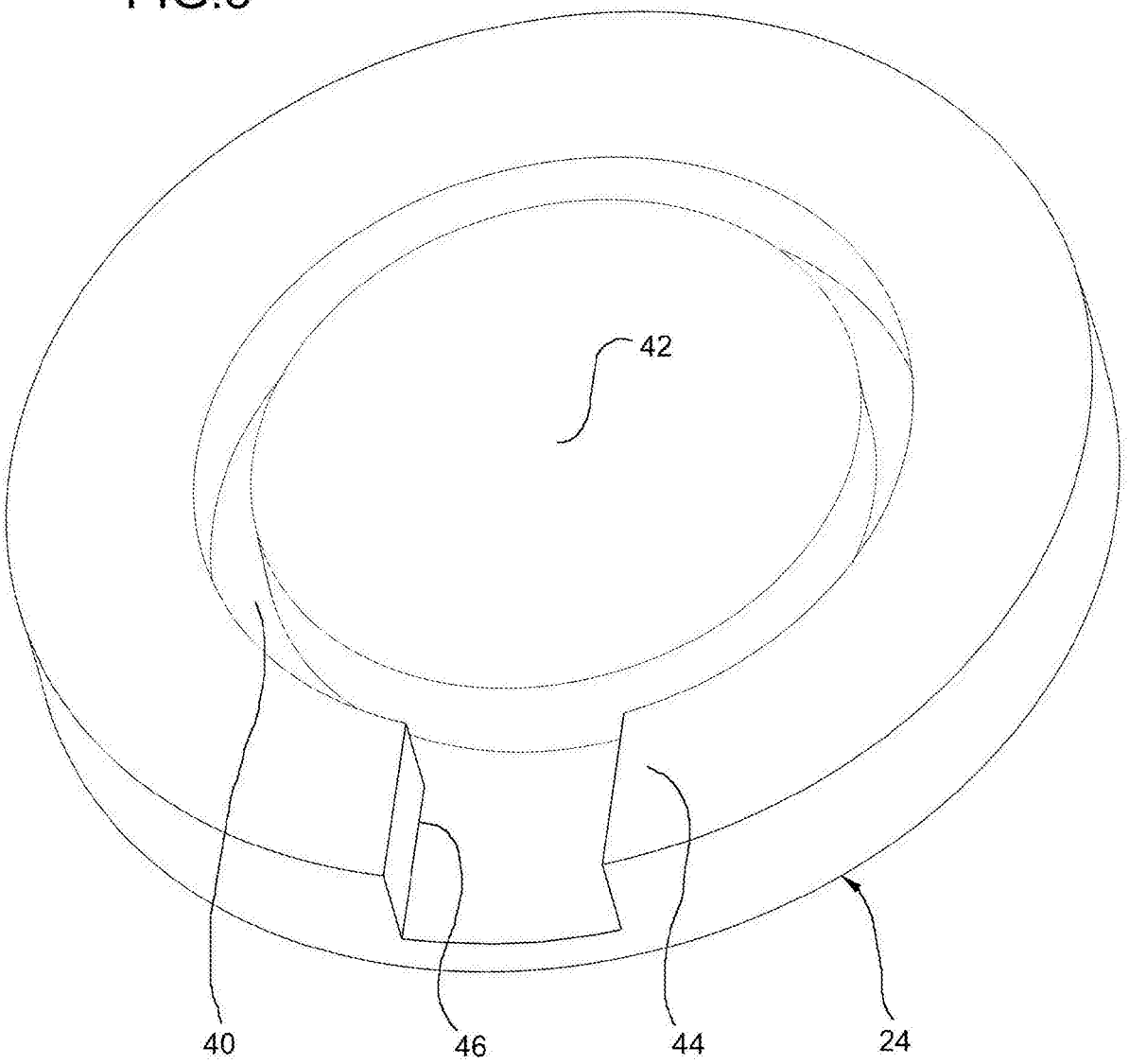


FIG.5



## REFERENCES CITED IN THE DESCRIPTION

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### Patent documents cited in the description


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