



(11) **EP 3 347 517 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
06.11.2019 Bulletin 2019/45

(21) Application number: **16760573.2**

(22) Date of filing: **05.08.2016**

(51) Int Cl.:
D06F 39/00 (2006.01)

(86) International application number:
PCT/TR2016/050269

(87) International publication number:
WO 2017/044058 (16.03.2017 Gazette 2017/11)

(54) **HOUSEHOLD APPLIANCE WHEREIN LIQUID LEAKAGE INTO THE CONTROL UNIT IS PREVENTED**

HAUSHALTSGERÄT MIT VERHINDERUNG VON FLÜSSIGKEITSAUSLAUF IN DIE STEUEREINHEIT

APPAREIL ÉLECTROMÉNAGER DANS LEQUEL UNE FUITE DE LIQUIDE DANS L'UNITÉ DE COMMANDE EST EMPÊCHÉE

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

(30) Priority: **08.09.2015 TR 201511133**

(43) Date of publication of application:
18.07.2018 Bulletin 2018/29

(73) Proprietor: **Arçelik Anonim Sirketi**
34445 Istanbul (TR)

(72) Inventors:
• **YILDIRIM, Salih**
34950 Tuzla/Istanbul (TR)
• **USTUNER VARDAR, Sevim**
34950 Tuzla/Istanbul (TR)

(56) References cited:
WO-A1-2006/067764 WO-A1-2015/180851
DE-A1- 3 823 813

EP 3 347 517 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The present invention relates to a household appliance comprising a knob that wherein the liquid spilled from the panel onto the region where the control unit is located is eliminated.

[0002] Household appliances, for example cooking devices, dishwashers and washers/dryers, comprise a panel, a control unit and one or more than one knob that enable the functions thereof to be monitored and controlled by the user. The knobs are directly attached to the shafts that are mechanically fastened to the switches on the control unit behind the panel by means of the housings on the panel or by means of an intermediate piece from the front of the panel. As the knobs are moved, the shafts that are connected to the knobs also move and the functions at predetermined positions depending on the user preferences, for example functions like in which program the laundries should be washed, at which rpm the spin-drying should be performed or at which temperature the wash water should be used, are enabled to be selected.

[0003] In the state of the art, the knobs are mounted on the shaft that is connected to the control unit behind the panel from the front side of the panel for ease of production. In this state of the art embodiment, while the knob is mounted on the panel by means of clawed structures, some tolerances are needed to be taken into consideration in order that the shaft and the knob can be easily borne to each other. Therefore, a gap should be left around the clawed structures. While facilitating the rotation of the knobs, these gaps decrease the strength of the knob against impacts from outside, furthermore in the case liquid, especially water, liquid detergent etc. is spilled on the household appliance from the region the knob is mounted on the panel, the liquid leaks around the knob and reaches the control unit and cause important unfavorable situations. In the case liquid is spilled on the household appliance and the liquid leaks around the knob and reaches the control unit, short circuit may occur and this can result in unrecoverable damages. Therefore, liquid entering to the region of the control unit should be prevented or the leaked liquid should be directed away from the region where the control unit is located.

[0004] In the state of the art European Patent Application No. EP1829071, a household appliance is disclosed, that comprises a knob mounted to the panel.

[0005] In the state of the art British Patent Application No. GB2040396, a control knob is disclosed, that is fixed to the shaft in a safe manner.

[0006] Further, document WO 2006/067764 A1 discloses a household appliance comprising a panel enabling the user to monitor and control the functions of the household appliance, a control unit disposed behind the panel, a shaft that is connected to the control unit and that enables user preferences to be transmitted to the control unit, a knob that actuates the shaft, a housing that

is disposed on the panel and wherein the knob is placed, a guiding member having a flange that is mounted on the shaft that has a diameter larger than the diameter of the housing and that remains behind the panel and a sheath that extends on the flange and that surrounds the shaft.

[0007] Document WO 2015/180851 A1 discloses an extension that is integrated with the light barrier disposed between the front panel and the printed circuit board and that partially covers the switch. When liquid leaks into the household appliance from around the knob, it drops onto the extension that remains in front of the panel.

[0008] The aim of the present invention is the realization of a household appliance comprising a knob wherein liquids spilled from outside such as water, detergent etc. is enabled to be moved away before reaching the control unit.

[0009] The household appliance realized in order to attain the aim of the present invention, explicated in the first claim and the respective claims thereof, comprises a flange that is mounted to the shaft mechanically connected to the control unit from behind the panel and a guiding member that extends on the said flange and that has a sheath surrounding the shaft.

[0010] By means of the present invention, the liquid trickling over the panel and leaking from inside the housing to behind the panel is prevented from passing to the control unit. Furthermore, in the case the knob is dislodged for any reason, direct access to the control unit is prevented.

[0011] The flange has a circular configuration and the guiding member comprises a wall that surrounds the flange all around.

[0012] The sheath is fitted on the shaft snap-fittingly and the shaft is enabled to be borne to the guiding member.

[0013] An intermediate piece is fitted over the sheath and the guiding member that is mounted on the shaft snap-fittingly is enabled to be mounted on the intermediate piece.

[0014] By means of the present invention, the liquid that may leak from the front of the panel through the housing where the knob is mounted, is enabled to be held and moved away by the flange before reaching the control unit. Moreover, in the case the knob is dislodged due to any load, direct access to the control unit is prevented by means of the guiding member by the flange completely closing the housing from behind the panel.

[0015] A household appliance realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is the general front view of the panel of a household appliance.

Figure 2 - is the cross-sectional perspective view of the panel, the control unit, the guiding member and the shaft.

Figure 3 - is the view of detail A in Figure 2.

Figure 4 - is the cross-sectional view of the control unit, the shaft and the guiding member that are fixed on the panel.

Figure 5 - is the exploded cross-sectional view of the panel, the control unit, the shaft and the guiding member when the intermediate piece and the knob are fixed on the panel.

Figure 6 - is the cross-sectional view of the guiding member, the intermediate piece, the shaft, the control unit and the knob that are fixed on the panel.

[0016] The elements illustrated in the figures are numbered as follows:

1. Household appliance
2. Panel
3. Control unit
4. Shaft
5. Knob
6. Handle
7. Intermediate piece
8. Body
9. Base
10. Claw
11. Auxiliary claw
12. Bearing
13. Second bearing
14. Housing
15. Barrier
16. Guide
17. Protrusion
18. Decorative element
19. Groove
20. Fixed end

21. Free end

22. Guiding member

5 23. Flange

24. Sheath

25. Wall
10

[0017] The household appliance (1), for example the laundry washer/dryer, comprises a panel (2) enabling the user to monitor and control the functions of the household appliance (1), a control unit (3) disposed behind the panel (2), a shaft (4) that is connected to the control unit (3) and that enables user preferences to be transmitted to the control unit (3), a knob (5) that actuates the shaft (4), a housing (14) that is disposed on the panel (2) and wherein the knob (5) is placed, and a guiding member (22) having

- a flange (23) that is mounted on the shaft (4), that has a diameter larger than the diameter of the housing (14) and that remains behind the panel (2), and
- a sheath (24) that extends on the flange (23) and that surrounds the shaft (4) (Figure 1, Figure 2).

[0018] The guiding member (22) is mounted freely on the shaft (3) situated on the control unit (3). While the control unit (3) is mounted on the panel (2), the guiding member (22) is fitted over the knob (5) and provides the connection between the knob (5) and the shaft (4).

[0019] The flange (23) preferably has a circular configuration and is surrounded by a wall (25). When the assembly of the knob (5) to the panel (2) is completed, the said wall (25) surrounding the flange (23) bears against the rear side of the panel (2). When the assembly operation is completed, the surface of the flange (23) and the panel (2) are parallel to one another (Figure 3).

[0020] The sheath (24) has a configuration matching that of the shaft (4) and preferably has a stepped structure. The sheath (24) is fitted over the shaft (4) snap-fittingly and the shaft (4) is borne in the guiding member (22) (Figure 4).

[0021] In the preferred embodiment of the present invention, the household appliance (1) comprises an intermediate piece (7) disposed between the guiding member (22) and the knob (5). The intermediate piece (7) comprises a base (9), a body (8) that extends on the base (9) and surrounds the guiding member (22), a bearing (12) that is disposed in the body (8) and wherein the sheath (24) and hence the guiding member (22) enter and are supported, and at least two claws (10) having a fixed end (20) that is disposed on the body (8), that is fixed to the body (8) and that first passes from the housing (14) while being mounted and a free end (21) that stretches while passing through the housing (14) by getting

close to the body (8), that resumes its initial position after passing through the housing (14) and that compresses the panel (2) between itself and the base (9) by bearing against the panel (2).

[0022] The knob (5) is mounted to the household appliance (1) in the following manner. First, the intermediate piece (7) is inserted into the housing (14) from behind the panel (2) and the intermediate piece (7) is moved inside the housing (14) until the base (9) bears against the rear wall of the panel (2). Meanwhile, the free ends (21) of the claws (10) stretch and get close towards the body (8). When the claws (10) go past the housing (14), the free ends (21) this time stretch in the reverse direction and move away from the body (8), resume their initial positions and bear against the front side of the panel (2). In this situation, the panel (2) is squeezed between the claws (10) and the base (9) and the intermediate piece (7) is fixed on the panel (2) so as to move only in a radial direction. Afterwards, the shaft (4) and the guiding member (22) mounted thereon are seated in the bearing (12) and the panel (2) with the intermediate piece (7) thereon is fixed on the household appliance (1). The knob (5) is mounted on the part of the body (8) that passes through the housing (14) to the front side of the panel (2) and the assembly of the knob (5) on the intermediate piece (7), hence on the panel (2) of the household appliance (1) is completed. By means of the guiding member (22), liquid leakages that may occur from the housing (14) towards the control unit (3) are prevented and the liquid leaking from the housing (14) is prevented from reaching the control unit (3) by the flange (3) and is enabled to be moved away from the control unit (3). Furthermore, by means of the guiding member (22), direct access from outside to the control unit (3) is prevented in case the knob (5) is dislodged due to any reason. In the case the knob (5) is dislodged, direct access to the control unit (3) from the front side of the panel (2) through the housing (14) is prevented by means of the flange (23) that completely covers the housing (14) from the rear side of the panel (2) (Figure 5 and Figure 6).

[0023] The intermediate piece (7) is preferably a cylindrical element and comprises at least two guides (16) that extend on the inner surface of the bearing (12) along the axis of the bearing (12) and that prevent the intermediate piece (7) from moving relative to the shaft (4) and the guiding member (22), and a peripheral barrier (15) that forms the ceiling of the body (8). The base (9) on the intermediate piece (7) corresponds to the region between the claws (10) on the body (8) and therefore two bases (9) are situated between two opposite claws (10).

[0024] The knob (5) comprises a handle (6) that enables the user to actuate the knob (5) by holding, a second bearing (13) that surrounds the intermediate piece (7) and at least two auxiliary claws (11) with one end fixed on the second bearing (13) and the other end being free. The auxiliary claws (11) are formed by cutting out the surface of the second bearing (13). While the knob (5) is mounted on the intermediate piece (7), the auxiliary claw

(11) corresponds to the claws (10) on the intermediate piece (7). While the knob (5) is being mounted on the intermediate piece (7) fixed secured on the panel (2), the intermediate piece (7) is moved forward in the second bearing (13) and the two auxiliary claws (11) stretch and move on the claws (10) to bear against the barrier (15) and the knob (5) can no longer move forward. Since the portions of the auxiliary claws (11) fixed on the second bearing (13) bear against the claws (10) on the intermediate piece (7), this prevents the said claws (10) from moving and stretching outwards further. In this case, the assembly of the knob (5) on the intermediate piece (7) and hence on the panel (2) is completed. Forces that are exerted from the outside in the same direction as the axis of the shaft (4) try to separate the claws (10) from the barrier (15) but the claws (10) stretch towards each other due to the said force and bear against the barrier (15) in a safer manner. Therefore, the knob (5) is prevented from separating from the panel (2) also as a result of the tensile force exerted on the knob (5).

[0025] The panel (2) comprises a circular groove (19) that surrounds the housing (14) all around and a circular protrusion (17) disposed on the said groove (19). In the preferred embodiment of the present invention, the free end (21) of the claw (10) of the intermediate piece (7) bearing against the panel (2) is seated on the said protrusion (17).

[0026] In an embodiment of the present invention, the household appliance (1) comprises a decorative element (18) mounted on the knob (5). The decorative element (18) can be produced as a single piece with the knob (5) or can be produced separately. In the case being produced separately, the decorative element (18) is mounted on the knob (5) by using various mechanical methods.

Claims

1. A household appliance (1) comprising a panel (2) enabling the user to monitor and control the functions of the household appliance (1), a control unit (3) disposed behind the panel (2), a shaft (4) that is connected to the control unit (3) and that enables user preferences to be transmitted to the control unit (3), a knob (5) that actuates the shaft (4), a housing (14) that is disposed on the panel (2) and wherein the knob (5) is placed, a guiding member (22) having

- a circular flange (23) that is mounted on the shaft (4), that has a diameter larger than the diameter of the housing (14) and that remains behind the panel (2) and
- a sheath (24) that extends on the flange (23) and that surrounds the shaft (4) **characterized by**
- the guiding member (22) comprising the flange (23) that is surrounded by a wall (25) and
- the wall (25) that bears against the rear side

of the panel (2) when the assembly of the knob (5) to the panel (2) is completed.

2. A household appliance (1) as in any one of the above claims, **characterized by** the panel (2) that is parallel to the surface of the flange (23).
3. A household appliance (1) as in Claim 1, **characterized by** the sheath (24) having a stepped configuration.
4. A household appliance (1) as in any one of the above claims, **characterized by** the sheath (24) that is mounted on the shaft (4) snap-fittingly.

Patentansprüche

1. Ein Haushaltsgerät (1) umfasst einen Paneel (2), die es dem Benutzer ermöglicht, die Funktionen des Haushaltsgeräts (1) zu überwachen und zu steuern, eine hinter dem Paneel (2) angeordnete Steuereinheit (3), einen Schaft (4), die mit der Steuereinheit (3) verbunden ist und die Übertragung von Benutzerpräferenzen an die Steuereinheit (3) ermöglicht; einen Knopf (5), der den Schaft (4) betätigt, ein Gehäuse (14), das an dem Paneel (2) angeordnet ist und in dem der Knopf (5) angeordnet ist, ein Führungselement (22), dass

- einen kreisförmigen Flansch (23), der auf dem Schaft (4) montiert ist und einen Durchmesser hat, der größer als der Durchmesser des Gehäuses (14) ist und der hinter dem Paneel (2) verbleibt; und
- eine Hülle (24), die sich auf dem Flansch (23) erstreckt und den Schaft (4) umgibt, **gekennzeichnet ist es dadurch,**
- dass das Führungselement (22) den Flansch (23) aufweist, der von einer Wand (25) umgeben ist und
- dass die Wand (25), dann an der Rückseite des Paneels (2) anliegt, wenn der Zusammenbau des Knopfes (5) mit dem Paneel (2) abgeschlossen ist.

aufweist.

2. Ein Haushaltsgerät (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** das Paneel (2) parallel zu der Oberfläche des Flansches (23) ist.
3. Ein Haushaltsgerät (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** die Hülle (24) eine abgestufte Konfiguration aufweist.
4. Ein Haushaltsgerät (1), wie in einem der vorherigen

Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** die Hülle (24) auf dem Schaft (4) schnappend gelagert ist.

Revendications

1. Un appareil électroménager (1) comprenant un panneau (2) permettant à l'utilisateur de surveiller et de contrôler les fonctions de l'appareil électroménager (1), une unité de commande (3) disposée derrière le panneau (2), une tige (4) qui est connectée à l'unité de commande (3) et qui permet de transmettre les préférences de l'utilisateur à l'unité de commande (3), un bouton (5) actionnant la tige (4), un boîtier (14) disposé sur le panneau (2) et sur lequel est placé le bouton (5), un élément de guidage (22) ayant

- une bride circulaire (23) qui est montée sur la tige (4), dont le diamètre est supérieur au diamètre du boîtier (14) et qui reste derrière le panneau (2) et
- une gaine (24) qui s'étend sur la bride (23) et couvre la tige (4) **caractérisée par**
- l'élément de guidage (22) comprenant la bride (23) qui est entourée d'une paroi (25) et
- la paroi (25) qui s'appuie contre la face arrière du panneau (2) lorsque l'assemblage du bouton (5) avec le panneau (2) est terminé.

2. Un appareil électroménager (1) selon l'une des revendications ci-dessus, **caractérisé par** le panneau (2) qui est parallèle à la surface de la bride (23).
3. Un appareil électroménager (1) selon la Revendication 1, **caractérisé par** la gaine (24) ayant une configuration échelonnée.
4. Un appareil électroménager (1) selon l'une des revendications ci-dessus, **caractérisé par** la gaine (24) qui est montée sur la tige (4) par encliquetage.

Figure 1

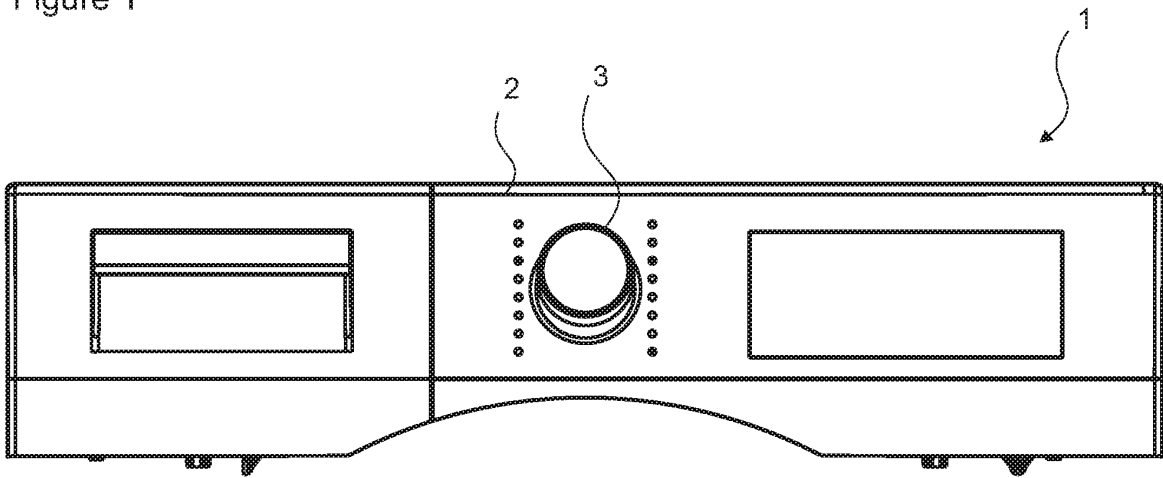


Figure 2

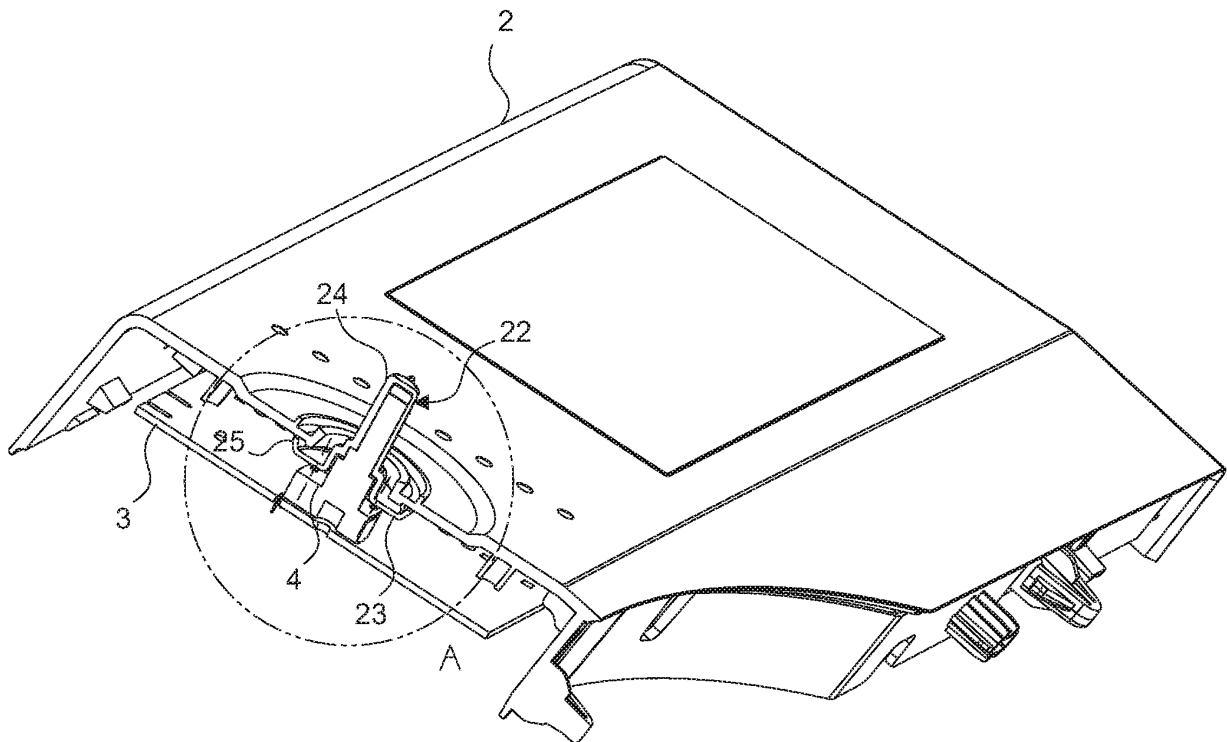


Figure 3

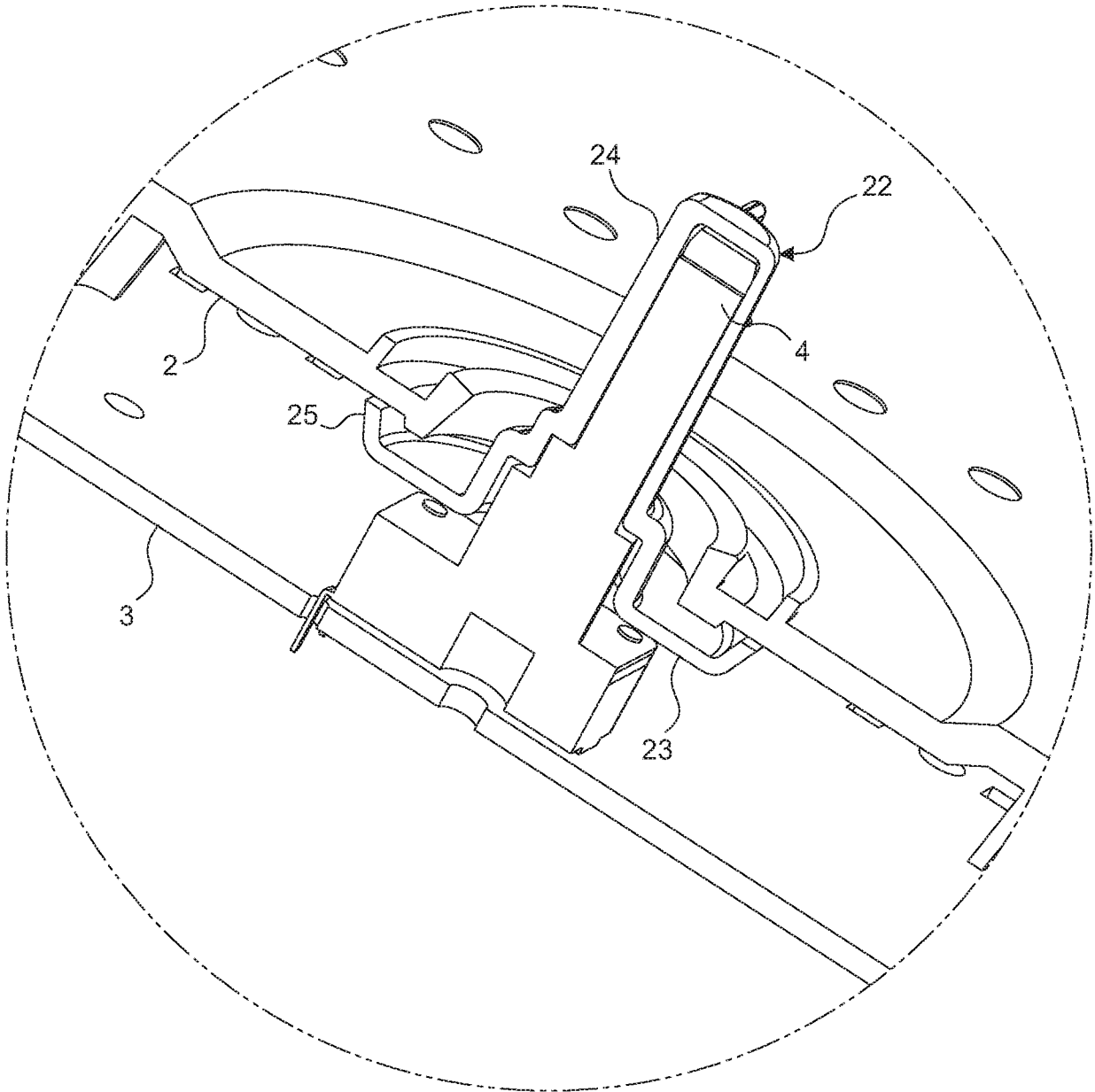


Figure 4

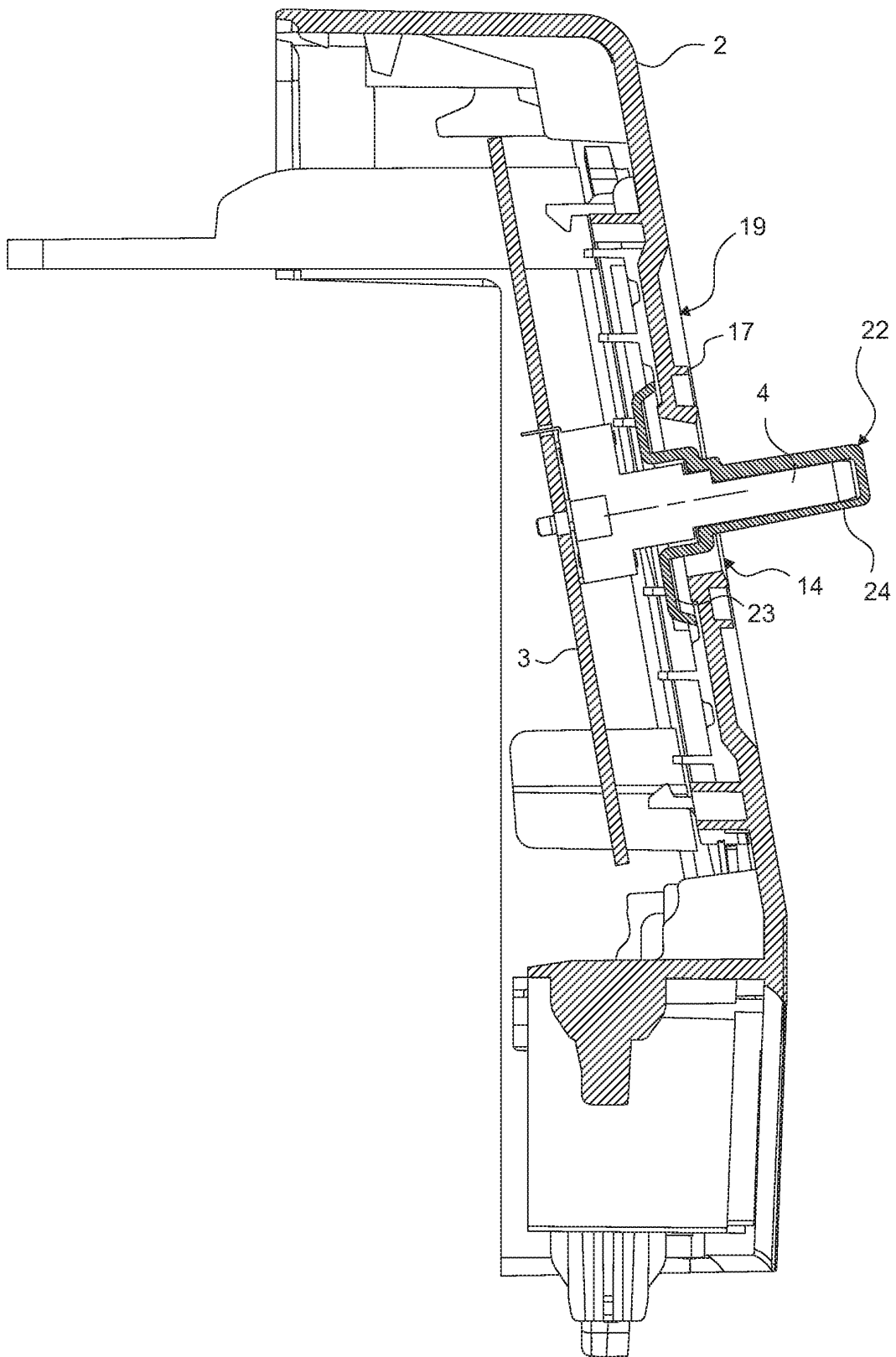


Figure 5

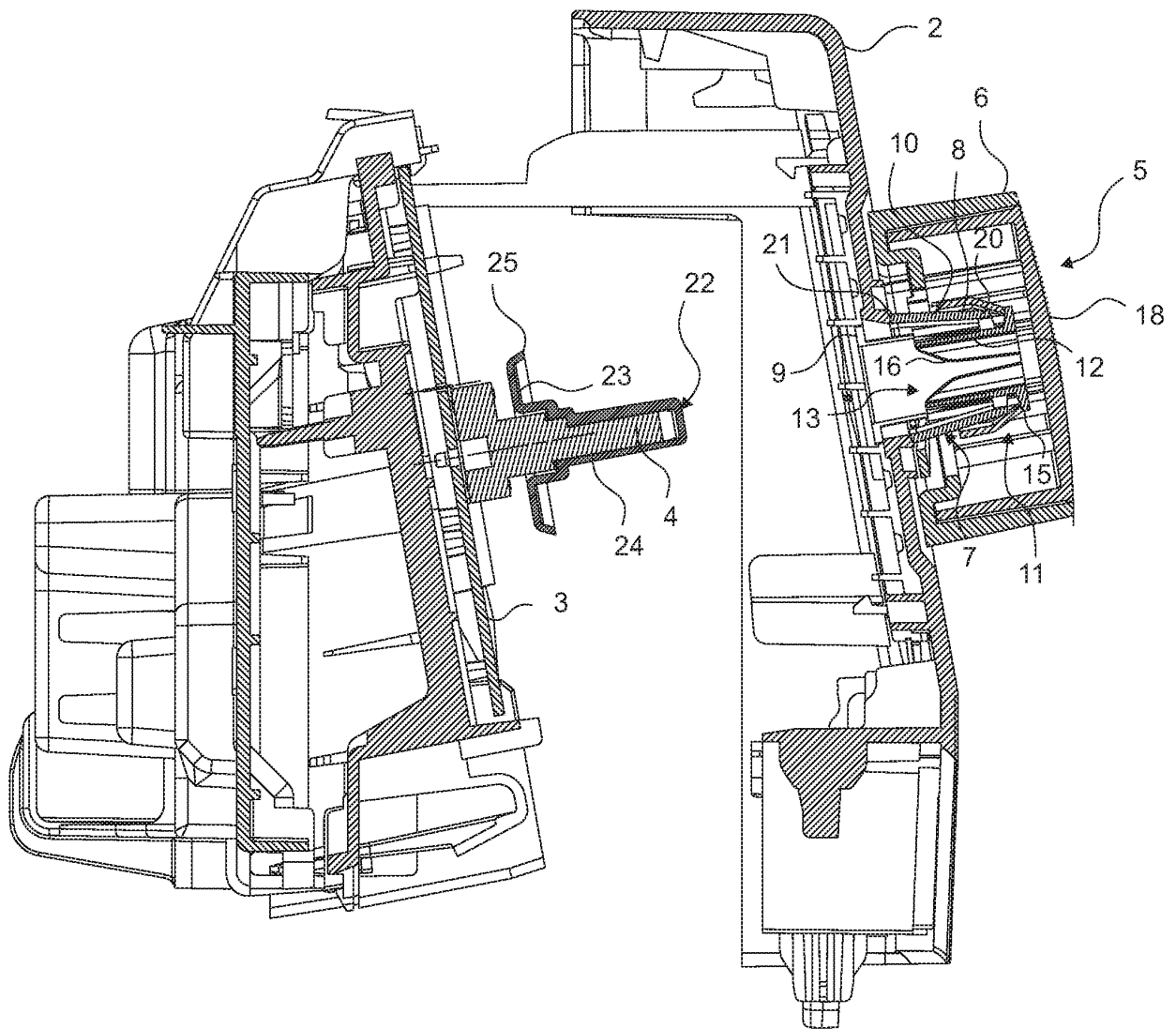
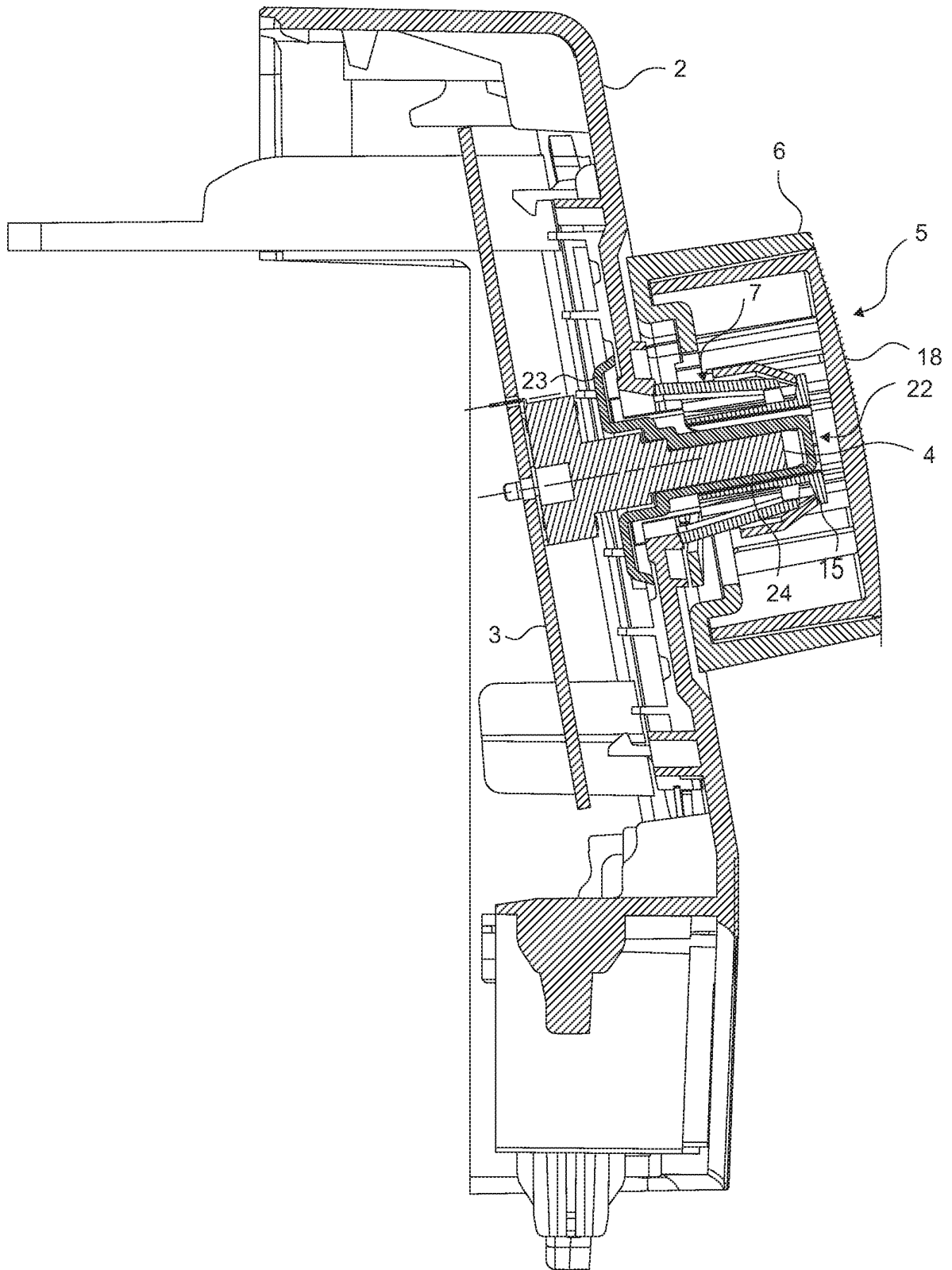


Figure 6



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1829071 A **[0004]**
- GB 2040396 A **[0005]**
- WO 2006067764 A1 **[0006]**
- WO 2015180851 A1 **[0007]**