



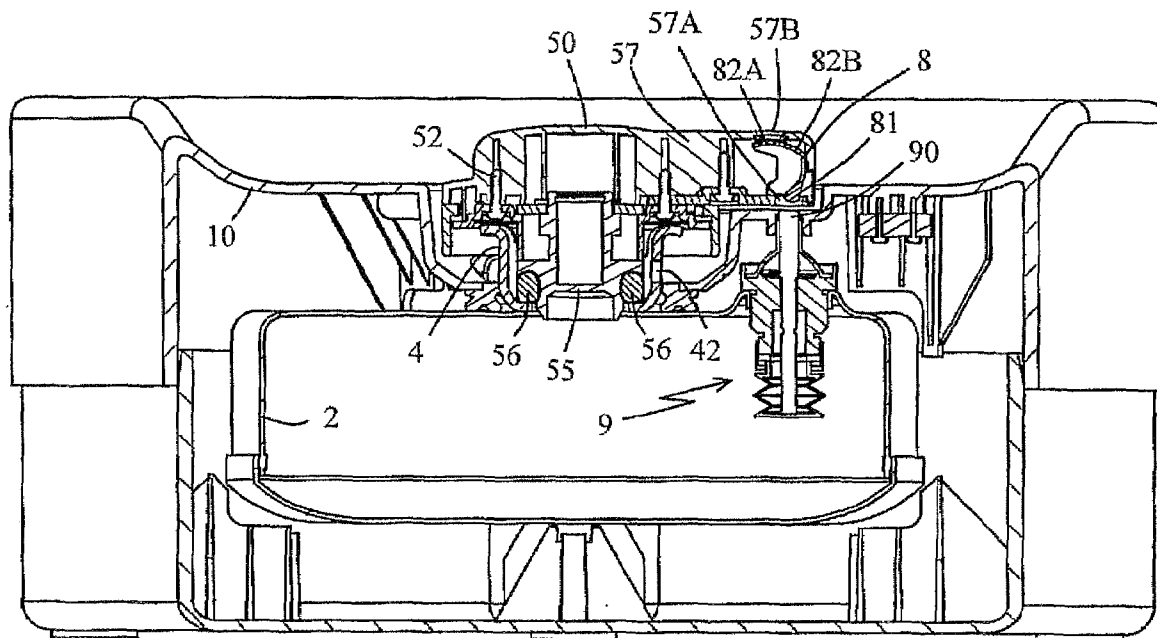
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(19) **United States**(12) **Patent Application Publication**
Gelus(10) **Pub. No.: US 2009/0064545 A1**(43) **Pub. Date: Mar. 12, 2009**(54) **IRONING APPLIANCE WITH A BASE
HAVING A TANK FOR THE PRODUCTION OF
STEAM UNDER PRESSURE**(30) **Foreign Application Priority Data**

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D06F 75/04 (2006.01)(52) **U.S. Cl.** **38/77.8**(73) Assignee: **SEB S.A., ECULLY (FR)**(21) Appl. No.: **12/282,857**(22) PCT Filed: **Mar. 6, 2007**(86) PCT No.: **PCT/FR2007/000393**§ 371 (c)(1),
(2), (4) Date: **Sep. 12, 2008**(57) **ABSTRACT**

The invention concerns an ironing appliance comprising a base (1) including a vessel (2) for producing steam under pressure provided with a filling orifice (3) closed with a removable plug (5), characterized in that the apparatus comprises linking means (6) connecting the removable plug (5) and the base (1) when the plug is in an open position providing access to the filling orifice (3).



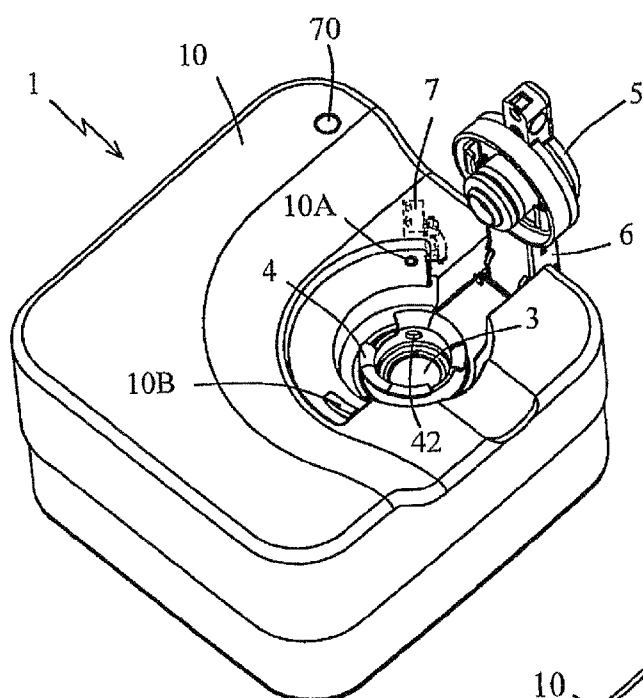


Fig 1A

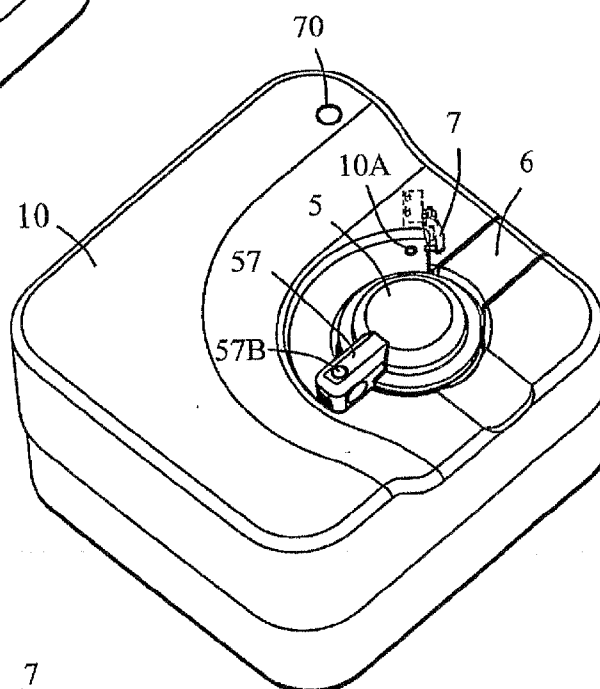


Fig 1B

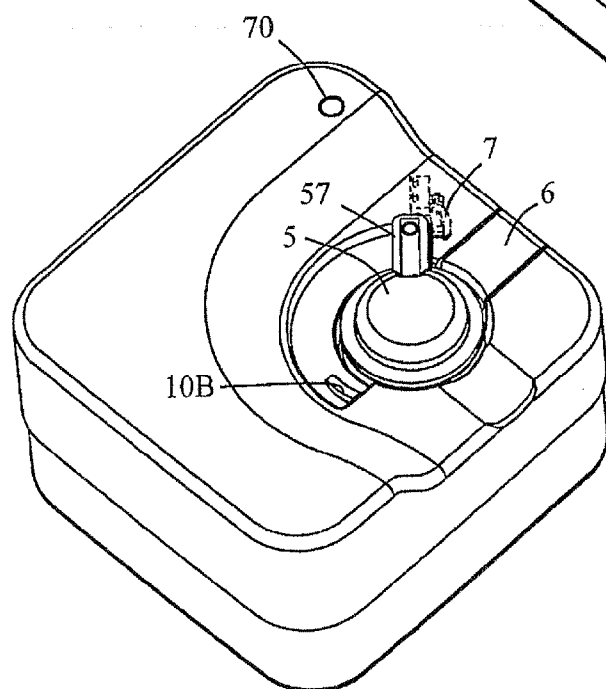


Fig 1C

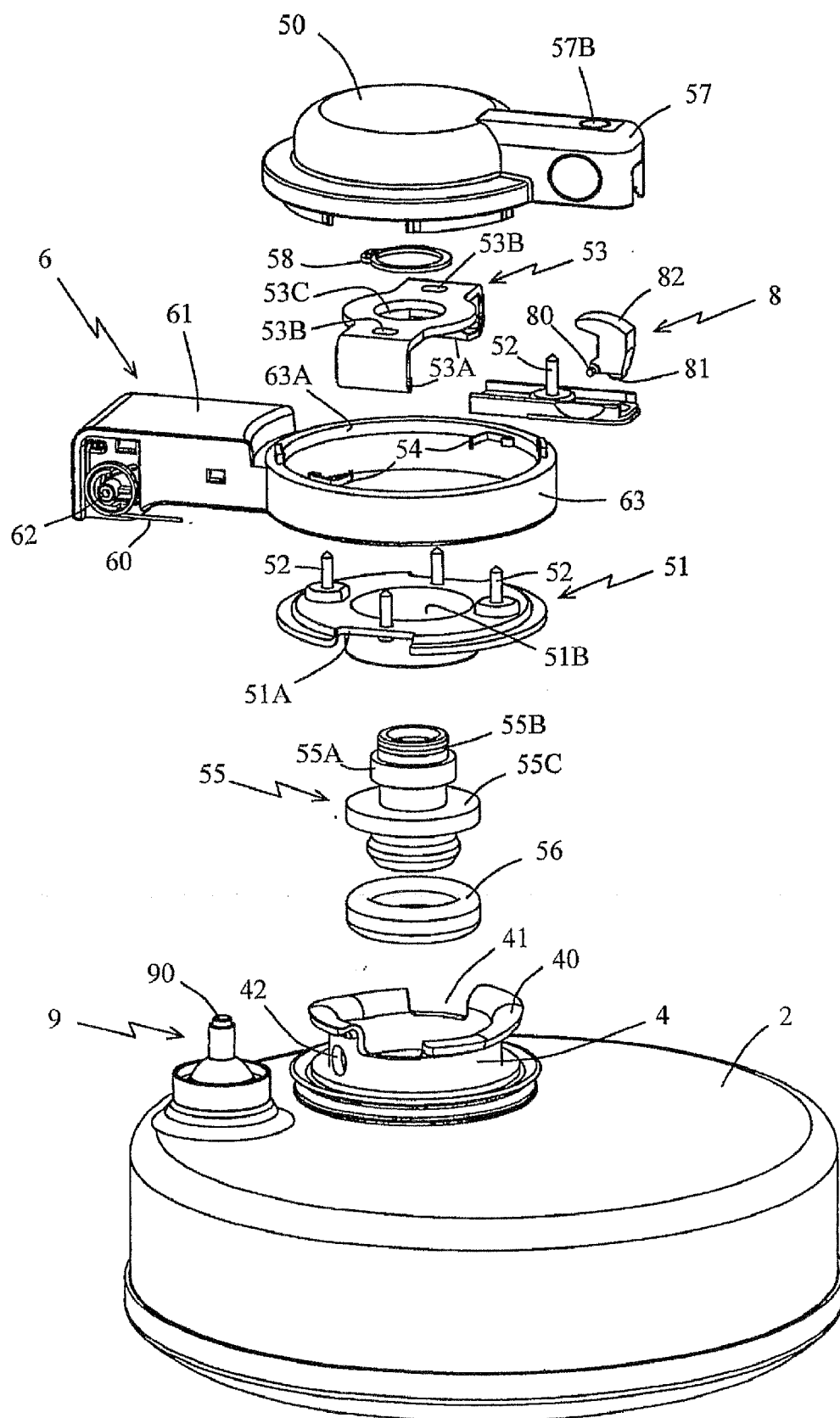
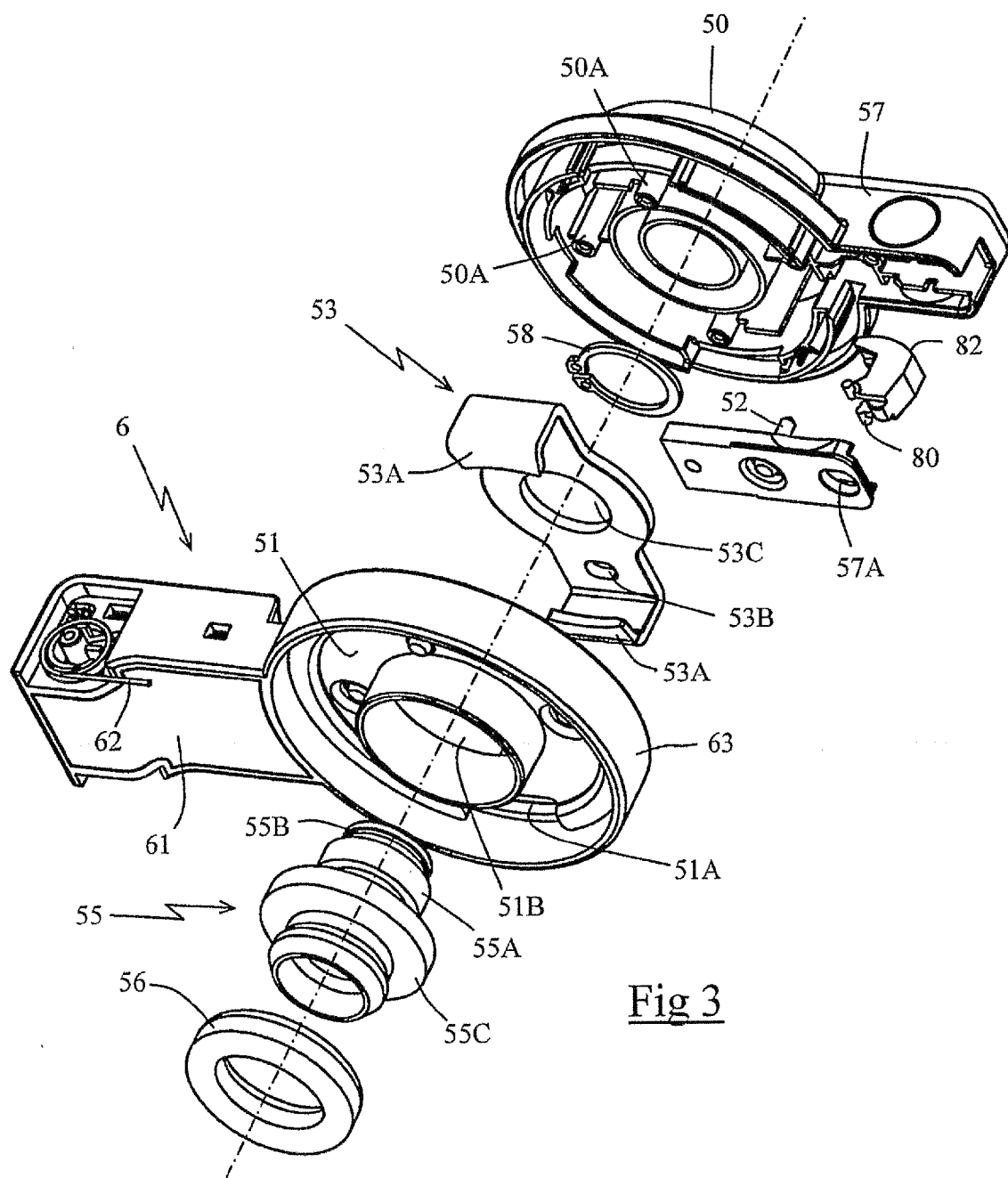


Fig 2



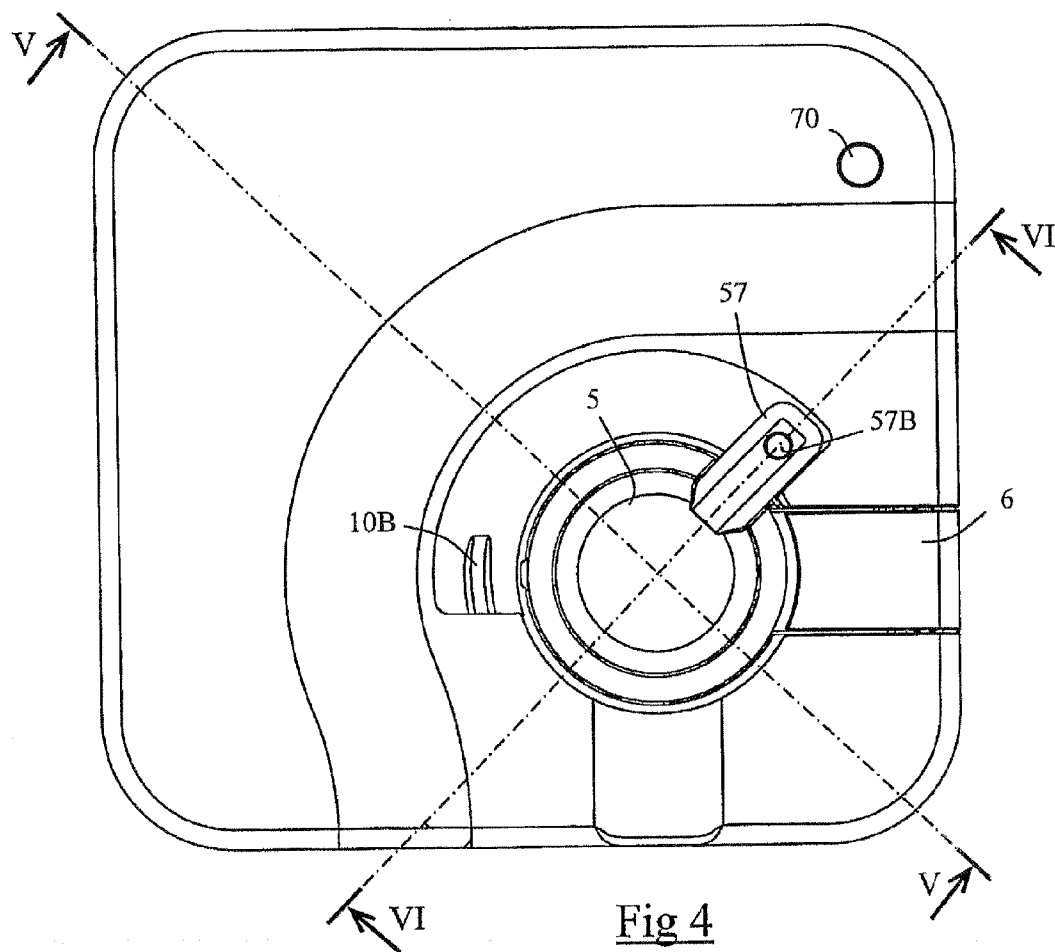


Fig 4

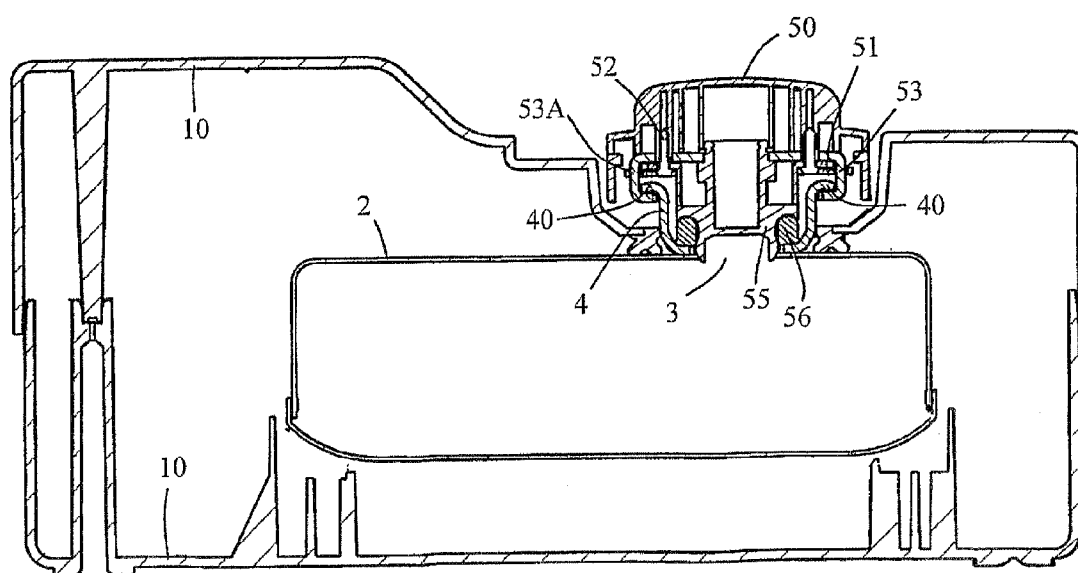


Fig 5

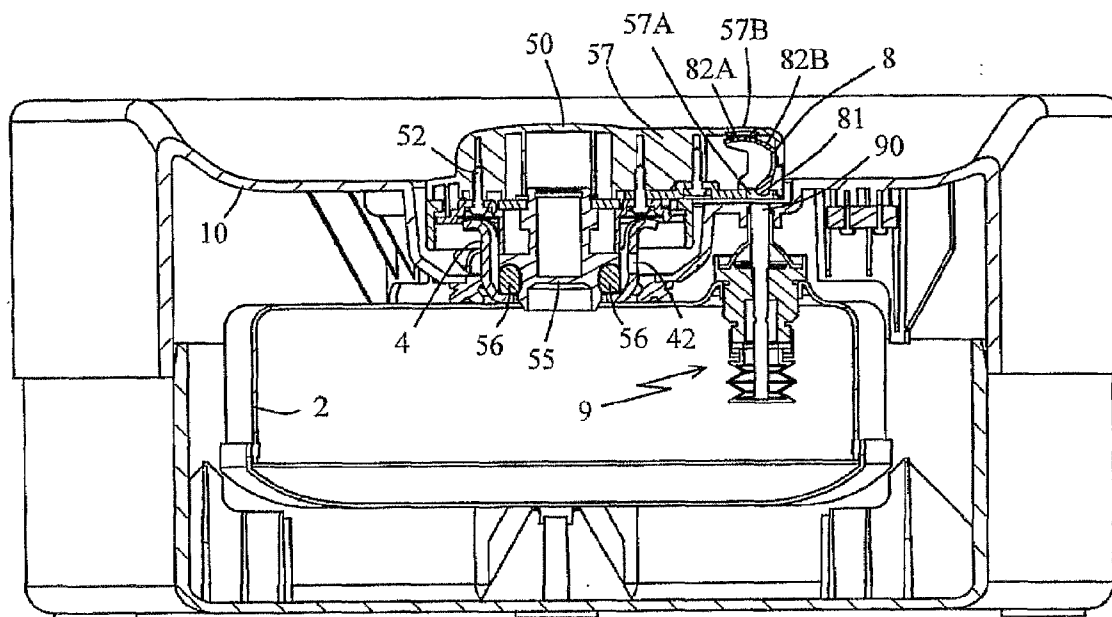


Fig 6

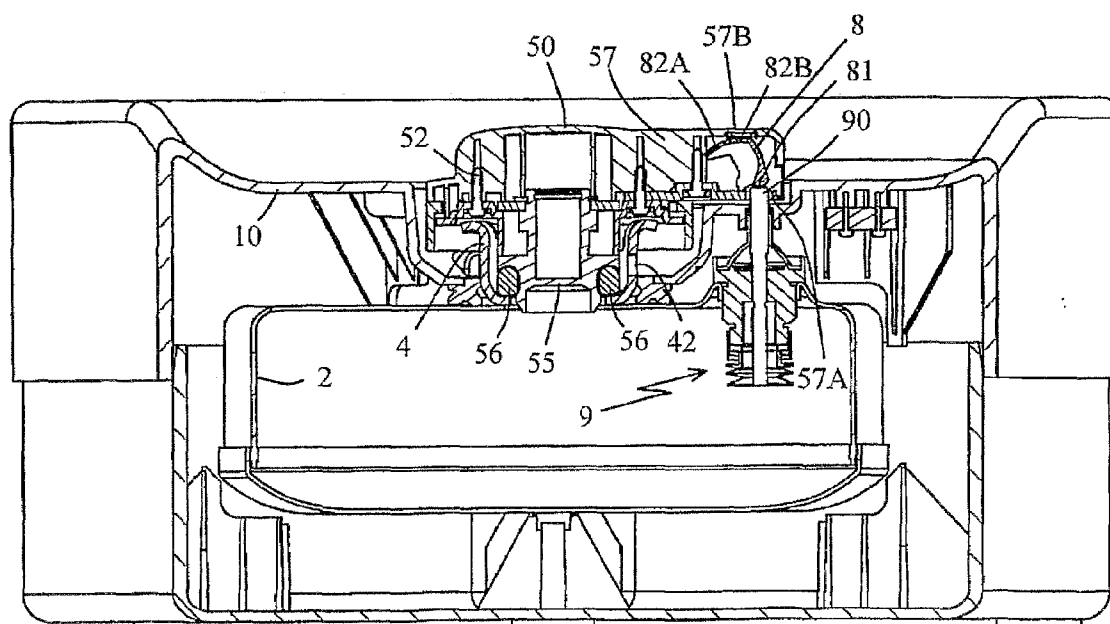


Fig 7

**IRONING APPLIANCE WITH A BASE
HAVING A TANK FOR THE PRODUCTION OF
STEAM UNDER PRESSURE**

[0001] The present invention relates to an ironing appliance having a base provided with a tank for the production of steam under pressure and relates more particularly to an ironing appliance in which the vessel is fitted with a filler hole closed by a removable cap, or plug.

[0002] Known ironing appliances include a tank for the production of steam under pressure with a filler hole closed by a removable cap that can be screwed into the filler hole. Such an appliance is, for example, described in the document FR 2 706 587.

[0003] However, with such appliances, the user does not know where to place the cap when it has been removed from the hole to fill the tank. The cap is thus most frequently placed on the base, with a significant risk of falling, exacerbated by the cylindrical shape of the cap, which tends to cause it to roll. Now, the cap may be damaged during the fall, with possible consequences on the safe use of the appliance.

[0004] Therefore, a goal of this invention is to remedy these problems by offering an ironing appliance in which the risks of falling of the cap for closing the filler hole are eliminated.

[0005] To this end, the invention has for its object an ironing appliance including a base with a tank for the production of steam under pressure with a filler hole closed by a removable cap, wherein the appliance has connection means connecting the removable cap to the base when the cap is in an open position permitting access to the filler hole.

[0006] Such a characteristic allows the cap to be prevented from falling when it is removed from the filler hole.

[0007] According to another characteristic of the invention, the connection means are constituted by an articulated arm connecting the cap to the base.

[0008] Such an arm has the advantage of ensuring proper and rapid placement of the cap against the filler hole during closing of the cap.

[0009] According to another characteristic of the invention, the cap is rotatably mounted on the articulated arm.

[0010] According to another characteristic of the invention, the base has a housing enclosing the tank for production of steam under pressure, the articulated arm being carried by the housing.

[0011] According to yet another characteristic of the invention, the removable cap is immobilized facing the filler hole by fastening means allowing the rapid opening and/or closing of the cap by rotating it through less than one turn.

[0012] Such a characteristic allows a great ergonomics of use of the appliance, particularly during periodic tank filling operations.

[0013] According to another characteristic of the invention, the cap is connected to the end of a pipe surrounding the filler hole by means of a bayonet type connection.

[0014] According to another characteristic of the invention, the cap includes a handle projecting radially from the cap.

[0015] According to yet another characteristic of the invention, the handle comes to operate a safety switch when the cap is properly closed.

[0016] Such a safety switch will enhance the safe use of the appliance by preventing operation of the appliance and more particularly heating of the tank when the cap is not properly closed.

[0017] According to another characteristic of the invention, the appliance includes guiding means raising the cap at the end of its opening travel, when the cap is not retained on the filler hole by the fastening means.

[0018] According to another characteristic of the invention, the appliance includes a safety body preventing the opening of the cap when the pressure in the tank exceeds a predetermined threshold.

[0019] The goals, aspects and benefits of this invention will be better understood from the description given below of a particular embodiment of the invention presented as a non-limiting example, referring to the attached drawings in which:

[0020] FIGS. 1A to 1C are perspective views of a base of an ironing appliance according to a particular embodiment of the invention, the closure cap being shown in different positions in these figures;

[0021] FIG. 2 is an exploded perspective view of the closure cap coming to face the filler hole of the tank of the appliance of FIGS. 1A to 1C, the housing of the appliance not being shown in this figure;

[0022] FIG. 3 is another perspective view, partly exploded, of the closure cap of FIG. 2;

[0023] FIG. 4 is a top view of the appliance of FIG. 1C;

[0024] FIG. 5 is a cross-sectional view along the line V-V of FIG. 4;

[0025] FIGS. 6 and 7 are cross-sectional views of the base of the appliance along line VI-VI of FIG. 4, when the tank is respectively at atmospheric pressure and under pressure.

[0026] Only those elements necessary for understanding the invention have been shown. To facilitate the reading of the drawings the same elements have the same references from one figure to another.

[0027] FIGS. 1A to 1C show an ironing appliance having a base 1 comprising a housing 10 containing a steam generating tank 2, visible in FIG. 2.

[0028] Tank 2 comprises conventionally heating means for the production of steam under a maximum pressure of about 4.5 bars and a solenoid valve designed to be connected to an iron by a cord, not shown in the figures.

[0029] Tank 2 is advantageously made of stainless steel material with a thickness of 1.2 mm and presents a filler hole 3 around which is welded or soldered a filler pipe 4 closed by a removable cap, or plug, 5.

[0030] More specifically according to the invention, the appliance includes connection means 6 connecting cap 5 to base 1 when cap 5 is open to allow access to the filler hole 3. In an advantageous manner, these types of connection means are formed by an articulated arm 6 connecting cap 5 to housing 10.

[0031] When cap 5 is open, articulated arm 6 is returned by a return spring 60, visible in FIG. 2, into a substantially vertical position illustrated in FIG. 1A, in which arm 6 is immobilized by an end of travel abutment.

[0032] According to FIGS. 2 and 3, articulated arm 6 has an elongated body 61, of substantially rectangular cross section, which is furnished at one end with an articulation axis 62 mounted to pivot at the edge of housing 10, the other end supporting a circular ring 63 receiving cap 5.

[0033] Cap 5 advantageously opens rapidly and is rotatably mounted on arm 6 in a manner to pivot by one-third of a turn between an unlocked position shown in FIG. 1B and a locked position shown in FIG. 1C.

[0034] Cap 5 has a cover 50 presenting a substantially circular body with a diameter of about 6 cm coming to cover

ring 63, the upper edge of the latter comprising a small diameter forming a shoulder 63A under which a disc 51 comes to be engaged. Disk 51 pivots inside circular ring 63 and presents a peripheral edge whose upper surface comes close to shoulder 63A of the circular ring.

[0035] Disc 63 and cover 50 are made of a polyamide material and are fixed to one another by assembly pieces 52, carried by disc 51, which are fitted in tubes 50A carried by lid 50.

[0036] The coupling of cap 5 on filler pipe 4 is provided by a jaw 53 of hardened stainless steel material having a thickness of 2.6 mm, which is disposed between cover 50 and disc 51. Jaw 53 has two symmetrical claws 53A traversing two lateral notches 51A of the disc and coming to engage under ramps 40 formed by a folded edge at the end of filler pipe 4 to form a bayonet type connection, the folded edge having locally two cutouts 41 for the passage of claws 53A.

[0037] In a preferred manner, claws 53A of the jaw and ramps 40 of the stainless steel tubing material are covered with Teflon or processed by immersion in a bath of tin, then possibly covered with a varnish to promote sliding during opening or closing of cap 5.

[0038] Jaw 53 has two oblong holes 53B in which are inserted two assembly pieces 52 so that the rotation of cover 50 entrains rotation of jaw 53, oblong holes 53B allowing a slight rotational deflection of jaw 53 with respect to lid 50, return springs 54 being provided to bring jaw 53 in abutment against one end of oblong holes 53B.

[0039] As shown in FIG. 3, disc 51 has a central opening 51B surrounded by a peripheral sleeve into which comes to be inserted central brass core 55, the upper end of central core 55 being inserted into a central opening 53C of jaw 53. Core 55 has a first shoulder 55A coming to be supported against the edge of central opening 53C of the jaw and presents a groove 55B receiving an elastic ring 58 axially blocking jaw 53 on core 55, core 55 however being able to turn freely relative to jaw 53.

[0040] The lower part of core 55 receives an annular joint 56, which is engaged elastically in a groove defined in its upper part by a second shoulder 55C, the latter having an external diameter corresponding substantially to the outer diameter of joint 56.

[0041] Such a shoulder 55C allows pressing sealing joint 56 against the edge of filler hole 3 when jaw 53 of the cap is screwed on filler pipe 4, as is illustrated in FIG. 5, ramp 40 of the pipe extending helicoidally so that the rotation of jaw 53 is accompanied by an axial translation of core 55 toward filler hole 3. During closure of cap 5, the free rotation of core 55 relative to jaw 53 has the advantage of applying the joint 56 axially on the edge of hole 3 without entraining the latter in rotation, which permits limiting considerably the wear of joint 56 due to friction.

[0042] Joint 56 is advantageously made of EPDM (ethylene propylene diene monomer) or silicone and has a minimum height of 4 mm and preferably of the order of 10 mm, so that it can be compressed, when the cap 5 is screwed on 4 filler pipe, to a minimum of 10% of its height and a maximum of 30%, depending on manufacturing tolerances. Such a characteristic allows to ensure both a good watertightness and a significant lifetime of joint 56 by allowing it to maintain a good elasticity over time.

[0043] In an advantageous manner, filler pipe 4 is equipped with an opening 42, or a lateral notch, permitting evacuation of excess water possibly present in the filler pipe.

[0044] Filler opening 3 advantageously has a diameter of between 20 mm and 40 mm, and preferably of the order of 30 mm, so as to allow a rapid filling or emptying of tank 2 without however excessive force on ramps 40 of the filler pipe as a result of pressure exerted on cap 5. For example, a diameter of 30 mm for the hole provides for a filling or emptying of 1 liter of water in 6 seconds.

[0045] To facilitate the handling of cap 5, cover 50 includes a radially extending handle 57, the side face of handle 57 coming to operate a safety switch 7 preventing activation of the heating means of tank 2 when cap 5 is not completely closed. This safety switch 7, shown in dotted lines in FIGS. 1A to 1C, is carried by housing 10 and is disposed at the end of travel of the trajectory swept by handle 57 during closing of cap 5. A signal light 70 is associated with this safety switch 7 so as to alert the user on the state of safety switch 7 and therefore on the correct closure of cap 5.

[0046] In an advantageous manner, handle 57 incorporates a pressure indicator formed by a lever 8 pivoting inside the body of the handle 57 about an axis 80, this lever 8 having a rounded tip 81 coming opposite an opening 57A formed in the lower wall of handle 57 and an indicator surface 82 moving next to a window 57B provided in the upper surface of the handle.

[0047] This lever 8 is intended to cooperate with a safety body 9, carried by tank 2, having a finger 90 able to be moved vertically as a function of the pressure in the tank, finger 90 passing through housing 10 at the level of a hole 10A facing opening 57A of the handle when the latter is in the closed position illustrated in FIG. 1C.

[0048] The operation of safety body 9 and its interaction with pressure indicator lever 8 will now be described with reference to FIGS. 6 and 7.

[0049] FIG. 6 illustrates the position of safety body 9 when the pressure difference between tank 2 and atmospheric pressure does not exceed 0.02 bar.

[0050] According to this figure, safety body 9 is then in lowered position in which the end of finger 90 of the safety body is flush with the top surface of housing 10. Lever 8 in the handle then occupies a first position into which it is moved by gravity. In this position, lever 8 is in abutment against the underside of handle 57, the rounded end 81 of the lever then being located inside hole 57A so that a first zone 82A of indicator surface 82 lies next to window 57B. In an advantageous manner, this first part 82A of indicator surface 82 is green in color to indicate that the user can open cap 5. In effect, when safety body 9 is in this position, handle 57 is not blocked against rotation by finger 90 and can be easily turned by the user.

[0051] When the pressure difference between tank 2 and atmospheric pressure is greater than 0.02 bar, for example following activation of the heating means, finger 90 of the safety body is moved upwardly as illustrated in FIG. 7. In this position, finger 90 of the safety body is engaged in hole 57A of handle 57, preventing any rotational movement of cap 5. The insertion of finger 90 through hole 57A is accompanied by pivoting of lever 8 into a position in which a second part 82B of indicator surface 82 is next to window 57B, this second part 82B advantageously being red in color in order to alert the user of the impossibility of opening cap 5 because of excessive steam pressure prevailing in tank 2.

[0052] The user is then obliged to wait until the pressure in tank 2 falls below the threshold of 0.02 bar to open the cap. This drop in pressure occurs naturally when the temperature

of the tank 2 drops and can be accelerated by the user by actuating, for example, the steam delivery trigger with which the steam iron is equipped.

[0053] In the case of a tentative opening of cap 5 while the finger 90 is engaged in the handle 57, the slight rotary deflection existing in the connection between handle 57 and jaw 53, because of the presence of oblong holes 53B, allows to not leave the safety finger 90 under a lateral constraint, the return springs 54 tending to return handle 57 into a correct position with respect to safety finger 90. The risk that the safety finger 90 is stuck in the upper position by lateral forces generated by handle 57 is thus eliminated.

[0054] In order to facilitate the opening of cap 5 and to counter a possible pressure drop being able to occur in tank 2 during cooling of the latter, there is provided, on the surface of the housing 10 swept by handle 57, a ramp 10B disposed at the end of the rotational opening travel of cap 5. This ramp 10B, shown in FIG. 4, presents a height of about 3 mm, which assures the lifting and pivoting of handle 57 and thus of joint 56 during the rotation of cap 5 for its opening, creating exposure of tank 2 to the air.

[0055] Such an appliance has the advantage of providing a great ergonomics in use in holding the cap when the latter is removed from the filler hole, thus avoiding any dropping of the cap. Moreover, the articulated arm has the advantage of ensuring proper placement of the cap against the filler pipe during closing of the cap so that the risks of improper engagement of the cap are eliminated. This last characteristic is particularly important in the case of a mating of the cap on the pipe by a screw turn, because it eliminates the risk of deterioration of the threads and blocking of the cap, which could happen if the cap is not properly engaged.

[0056] Of course, the invention is not limited to the embodiment described and illustrated that have been given only as an example. Changes are possible, especially from the viewpoint of the constitution of various elements or by substituting equivalents, for all without leaving the field of protection of the invention.

[0057] Thus, in the example shown, the core is hollow and has a central cavity closed by a wall ensuring the watertightness of the cap. However, in a variant of construction, not illustrated, the central cavity may receive, in a manner known per se, a safety valve subjected to the pressure in the tank through a hole formed in the wall. The safety valve could for example be arranged to open beyond a pressure of 6 bars so as to prevent any defect in regulation of the heating means of the tank.

[0058] Thus, in a variant of construction, not illustrated, the coupling of the cap on the filler pipe may be effected conventionally by screwing the cap in several turns instead of a bayonet connection.

1. Ironing appliance comprising a base (1) having a tank (2) comprising heating means for the production of steam under pressure, the tank (2) being furnished with a filler hole (3) closed with a removable cap (5), wherein the appliance includes connection means (6) connecting the removable cap (5) to the base (1) when the cap is in an open position permitting access to the filler hole (3).

2. Ironing appliance according to claim 1, wherein said connection means are formed by an articulated arm (6) connecting the cap (5) to the base (1).

3. Ironing appliance according to claim 2, wherein the cap (5) is rotatably mounted on the arm (6).

4. Ironing appliance according to claim 2, wherein the base (1) includes a housing (10) containing the tank (2) to produce steam under pressure and that the articulated arm (6) is carried by the housing (10).

5. Ironing appliance according to claim 1, wherein the removable cap (5) is immobilized opposite the filler hole (3) by fastening means allowing rapid opening and/or the closing of the cap (5) by rotating it through less than one turn.

6. Ironing appliance according to claim 5, wherein said cap (5) is connected to the end of a pipe (4) surrounding the filler hole (3) through a bayonet type connection.

7. Ironing appliance according to claim 4, wherein the cap (5) includes a handle (57) projecting radially from the cap (5).

8. Ironing appliance according to claim 7, wherein said handle (57) comes to activate a safety switch (7) when the cap (5) is properly closed.

9. Ironing appliance according to claim 5, wherein said appliance further comprises a guiding means raising the cap (5) at the end of the opening movement of the latter, when the cap (5) is not retained on the filler hole (3) by the fastening means.

10. Ironing appliance according to claim 9, wherein said appliance further comprises a safety body (9) preventing the opening of the cap (5) when the pressure in the tank (2) exceeds a predetermined threshold.

11. Ironing appliance according to claim 1, wherein said appliance further comprises a safety body (9) preventing the opening of the cap (5) when the pressure in the tank (2) exceeds a predetermined threshold.

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