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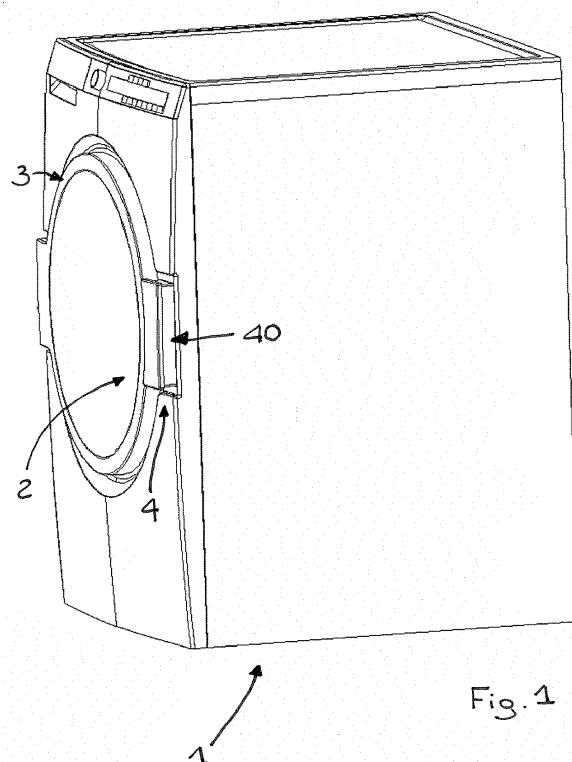
HOUSEHOLD APPLIANCE FOR WASHING AND/OR DRYING ITEMS

(57)

A household appliance for washing and/or drying fabric items, comprising:

- a washing and/or drying compartment (2);
- a hatch door (3) for access to the washing and/or drying compartment (2);
- an opening command (4) of the hatch door (3), said opening command (4) comprising a pusher (40) accessible by a user and located on a front of the household appliance (1);

 The pusher (40) extends in height for more than 8 centimetres in order to be easily compressible by an adult person using a knee.



Description

[0001] The present invention relates to a household appliance for washing and/or drying items of clothing, typically washing machines, dryers, washers-dryers, etc.

[0002] Front-loading household appliances for washing and/or drying are known, and comprise an access hatch door and a washing/drying compartment. In the known solution the access hatch door can be opened by means of a lever placed on the hatch door; in a further known solution the hatch door can be opened by means of a small button integrated in the front panel of the household appliance or on the hatch door. This button typically sends an electric signal which determines the opening of the hatch door.

[0003] This solution is not free of drawbacks. A first drawback is linked to the fact that a user, in order to be able to access to the washing/drying compartment, must bend over in order to open the hatch door with his/her hands. A further drawback is linked to the fact that a user nearing the household appliance with a basket full of clothes to be washed/dried usually has both hands busy. Consequently in order to open the hatch door he or she must first put the basket down.

[0004] An aim of the present invention is to provide a household appliance which is able to facilitate access to a washing and/or drying compartment for an operator.

[0005] The technical task set and the specified aims are substantially achieved by a household appliance comprising the technical characteristics set out in one or more of the appended claims.

[0006] Further characteristics and advantages of the present invention will become more apparent from the following indicative, and hence non-limiting, description of a preferred, but not exclusive, embodiment of a household appliance as illustrated in the appended drawings, in which:

- figures 1 and 2 illustrate a household appliance according to the present invention in two different configurations;
- figures 3 and 4 show two sections of the household appliance in the configuration of figure 1;
- figures 5 and 6 show two sections of the household appliance in the configuration of figure 2;

[0007] In the accompanying drawings, reference numeral 1 indicates a household appliance for washing and drying laundry items. For example, the household appliance 1 is a washing machine, a dryer or a washer-dryer machine.

[0008] The household appliance 1 comprises a washing and/or drying compartment 2. The washing compartment 2 usually houses a rotary basket for the laundry.

[0009] The washing compartment comprises a hatch door 3 for access to the washing and/or drying compartment 2. The hatch door 3 is typically shaped as a porthole.

[0010] The household appliance 1 comprises an open-

ing command 4 of the hatch door 3. The opening command 4 comprises a pusher 40 accessible by a user. The pusher 40 is located on a front of the household appliance 1.

[0011] The pusher 40, if pressed, enables opening of the hatch door 3; the pusher 40 in a "pressed" configuration is shown in figures 2, 5, 6. Figures 1, 3, 4 show the hatch door 3 closed and the pusher not pressed, in a rest configuration.

[0012] The household appliance 1 has an external casing (or cabinet) comprising, apart from the front, also a top (facing upwards) and lateral flanks.

[0013] The household appliance is front-loading. The hatch door 3 is on the front of the household appliance 1. The pusher 40 lies by a side of the hatch door 3 (but still on the front).

[0014] The pusher 40 is advantageously located in proximity of a first flank 34 of the hatch door 3. The first flank 34 of the hatch door 3 is the flank opposite the one in which the hatch door 3 is hinged to remaining parts of the household appliance 1.

[0015] The pusher 40 extends in height for more than 8 centimetres in order to be easily compressible by an adult person (hypothesizing a height typically comprised between 150 and 200 mm), using a knee. The pusher 40 preferably extends in height for more than 12 centimetres. An extension in height is intended to mean a vertical extension.

[0016] The height extension is important. In fact, it must be adapted to the fact that the activation of the pusher 40 must be easy for people of different height.

[0017] The pusher 40 conveniently extends in height for more than 3 centimetres. The maximum width of the pusher 40 is greater than 5 centimetres. The pusher 40 advantageously has a frontal surface that is greater than 50 cm².

[0018] The pusher 40 must in fact be easily activatable since it must be remembered that the activation thereof by a knee requires a larger surface with respect to a case in which the activation is done with the fingers of a hand (both for reasons of coordination and because the knee is larger than the fingers of a hand).

[0019] The pusher 40, when not pressed, projects with respect to an immediately adjacent zone. The fact that the pusher 40 projects makes it easily reachable by a user's knee. The pusher 40 is retro-activated elastically in order to be repositioned at rest position in a non-compressed configuration. At least a spring advantageously performs this elastic retro-action.

[0020] In order to facilitate the ergonomics of the household appliance, the pusher 40 has a minimum distance from a lower rest plane 5 of the household appliance 1 which is less than 35 centimetres. For the purposes of evaluation of the minimum distance the point closest to the rest plane 5 must be chosen.

[0021] Additionally or alternatively the pusher 40 has a maximum distance from a rest plane 5 of the household appliance 1 which is greater than 45 centimetres. For the

purposes of evaluation of the maximum distance the point closest to the rest plane 5 must be chosen.

[0022] The rest plane 5 of the household appliance 1 is a fictional plane which coincides with the floor plane or the surface on which the household appliance 1 is rested.

[0023] It is advantageously an imaginary horizontal plane 6 equidistant from an upper end 31 and from a lower end 32 of the hatch door 3 crosses the pusher 40. In the hypothesised case, in which the hatch door 3 comprises a porthole with a circular external perimeter, a horizontal plane passing through the centre of the perimeter of the porthole intersects the pusher 40.

[0024] The household appliance 1 comprises an opening command 8 of the hatch door 3. The mechanism 8 is activated by the pusher 40. The mechanism 8 is advantageously hidden from a user's sight, in particular it is in the casing (of the household appliance 1). The mechanism 8 is advantageously purely mechanical (and does not require electrically-commanded unblocking elements).

[0025] The opening mechanism 8 transforms a push on the pusher 40, orientated in a front-to-back direction of the household appliance 1, into a translation of a retaining cursor 70 of a hook 33 of the hatch door 3. This translation frees the hook 33 from the cursor 70. In a blocking configuration of the hatch door 3 the hook 33 comprises a catch 330 abutted by the cursor 70. With the activation of the pusher 40, the catch 330 frees from the abutment defined by the edge of a loop 36 afforded in the cursor 70. The catch 330 can therefore enter the loop 36.

[0026] The opening mechanism 8 comprises an L-shaped lever 81. The lever 81 comprises a first and a second arm 811, 812. The first and the second arm 811, 812 are reciprocally transversal, preferably orthogonal (and define the two sides of the L). The lever 81 can rotate about a pin 814 located along the first arm 811. The first arm 811 of said L-shaped lever is in contact with the pusher 40. The pin 814 is interposed between a contact zone of the first arm 811 with the pusher 40 and a connecting zone between the first arm 811 and the second arm 812.

[0027] The opening mechanism 8 advantageously comprises an intermediate element 813 hinged both to the second arm 812 and to the cursor 70. The cursor 70 comprises a shaping 71 which enables the pusher 40 to enter (see figure 6).

[0028] The present invention provides important advantages.

[0029] Primarily it enables easy opening of the hatch door 3 by a user without any need to bend over. Further it enables opening of the hatch door 3 even by a user having both hands busy, by using his or her knee on an opening command. For this purpose the position and shaping of the pusher 40 have been widely researched in order to optimise the ergonomics and facilitate the opening.

[0030] The invention as it is conceived is susceptible to numerous modifications and variants, all falling within the scope of the inventive concept characterized thereby. The materials used, as well as the dimensions, may in practice be of any type, according to needs. In practice, all the materials used, as well as the dimensions, can be any according to requirements.

10 Claims

1. A household appliance for washing and/or drying fabric items, comprising:

- a washing and/or drying compartment (2);
- a door (3) for access to the washing and/or drying compartment (2);
- an opening command (4) of the door (3), said opening command (4) comprising a pusher (40) accessible by a user and located on a front of the household appliance (1);

characterised in that said pusher (40) extends in height for more than 8 centimetres in order to be easily compressible by an adult person using a knee.

2. The household appliance according to claim 1, **characterised in that** it is front-loading, the pusher (40) lying at a side of the door (3).

3. The household appliance according to claim 1 or 2, **characterised in that** said pusher (40), when it is not pressed, projects with respect to an immediately-adjacent zone.

4. The household appliance according to any one of the preceding claims, **characterised in that** said pusher (40) has a minimum distance from a lower rest plane (5) of the household appliance (1) which is less than 35 centimetres.

5. The household appliance according to claim 4, **characterised in that** said pusher (40) has a maximum distance from the lower rest plane (5) which is more than 45 centimetres.

6. The household appliance according to any one of the preceding claims, **characterised in that** said pusher (40) has a front surface which is greater than 50 cm².

7. The household appliance according to any one of the preceding claims, **characterised in that** an imaginary horizontal plane (6) equidistant from an upper end (31) and from a lower end (32) of the door (3) crosses the pusher (40).

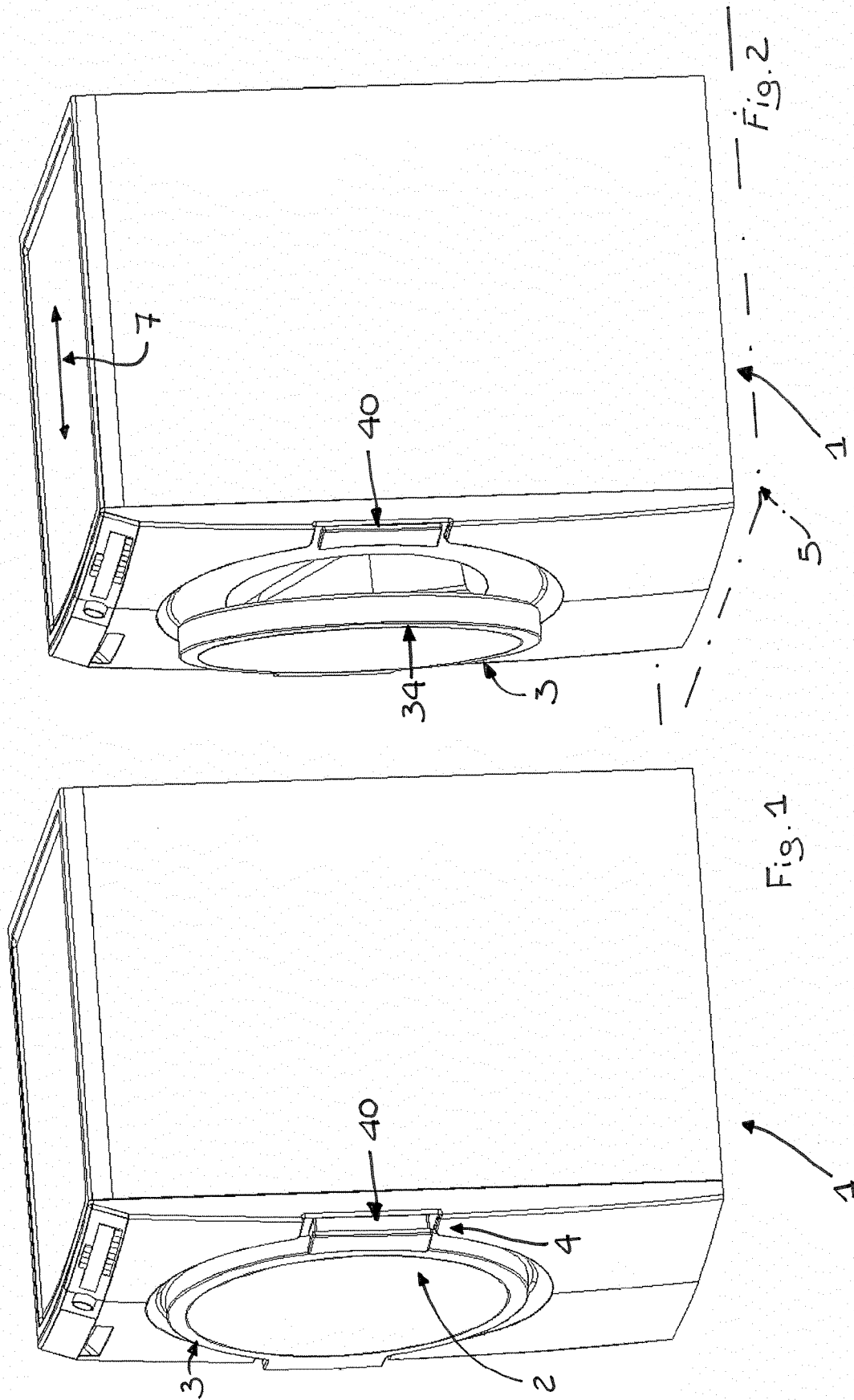
8. The household appliance according to any one of

the preceding claims, **characterised in that** it comprises an opening mechanism (8) of the door (3) activated by said pusher (40); said opening mechanism (8) transforming a push on the pusher (40), orientated in a front-to-back direction of the household appliance (1), into a translation of a retaining cursor (70) of a hook (33) of the door (3), said translation freeing the hook (33) from said cursor (70).

9. The household appliance according to claim 8, **characterised in that** the opening mechanism (8) comprises:

- a lever (81) having an L-shape: the lever (81) comprising a first and a second arm (811, 812) which are reciprocally transversal; the lever (81) being able to rotate about a pin (814) located along the first arm (811); the first arm (811) of said L-shaped lever being in contact with the pusher (40); the pin (814) being interposed between a contact zone of the first arm (811) with the pusher (40) and a connecting zone between the first arm (811) and the second arm (812);
- an element (813) hinged both to the second arm (812) and to the cursor (70).

10. The household appliance according to any one of the preceding claims, **characterised in that** said pusher (40) is a button.



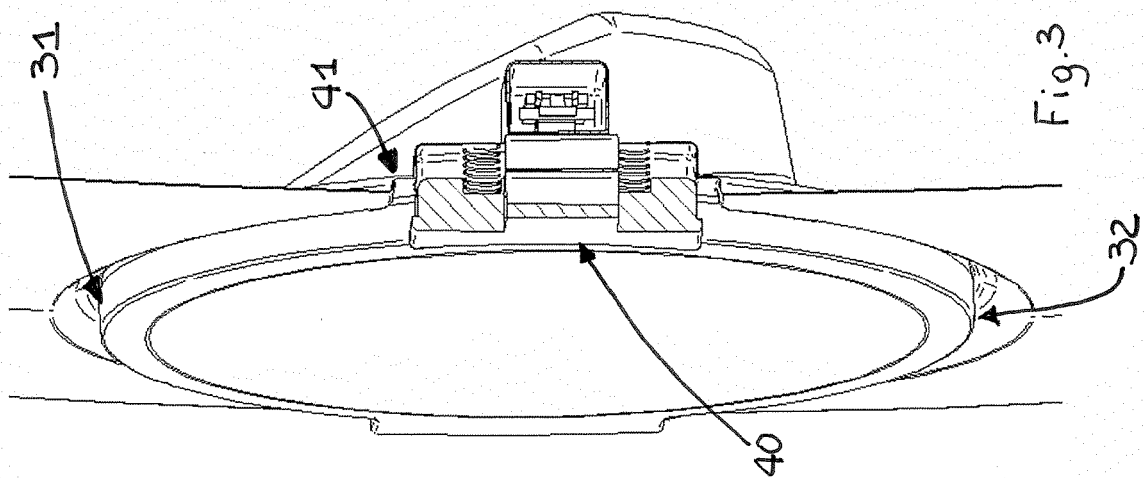


Fig. 3

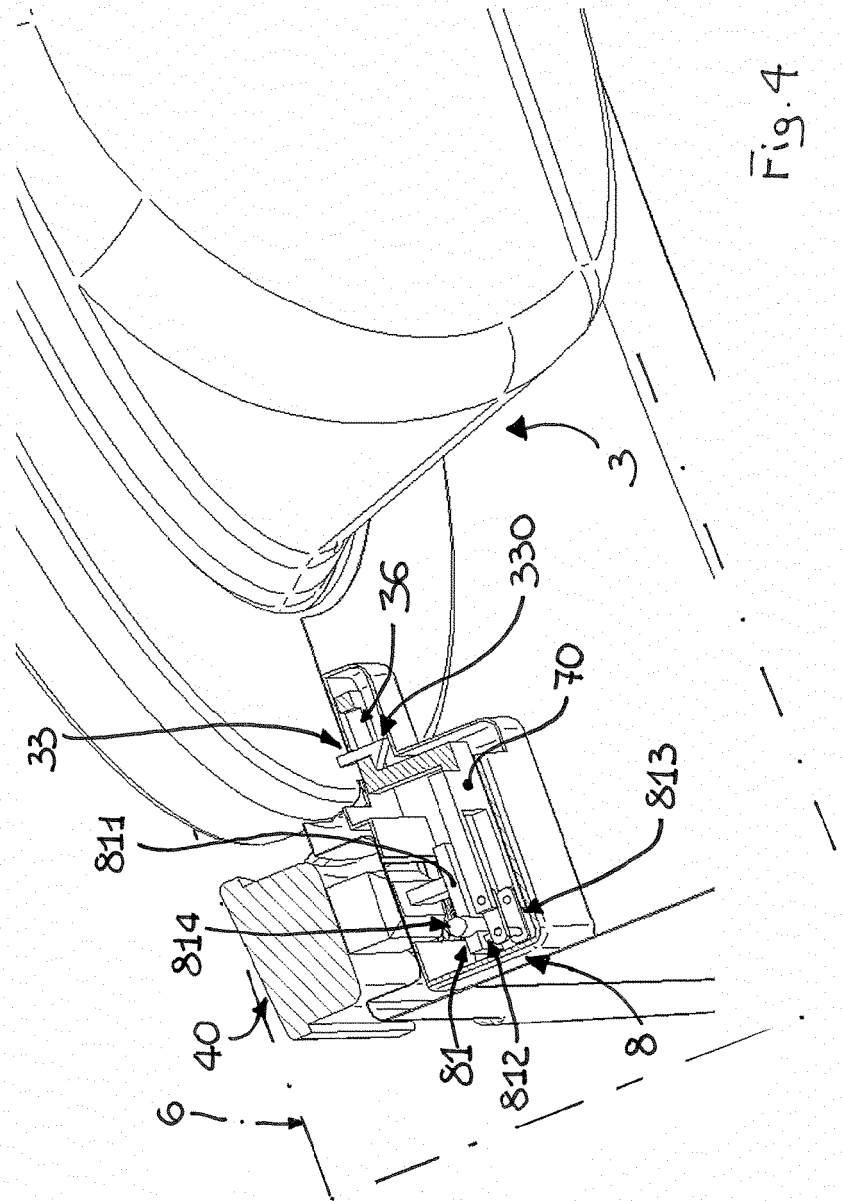


Fig. 4

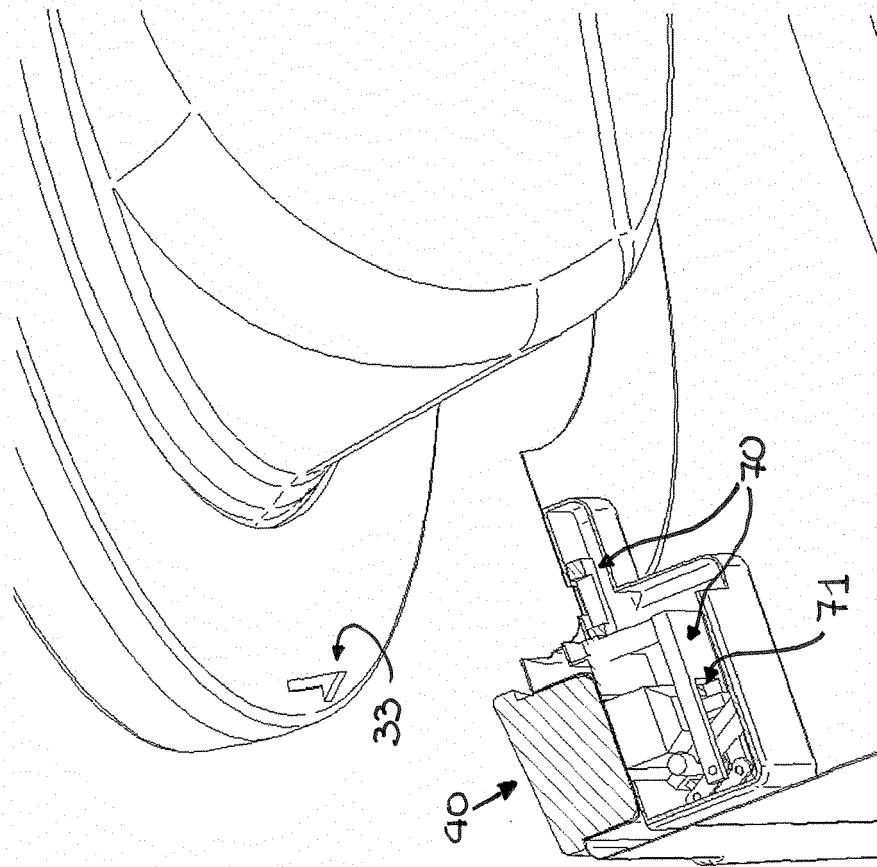


Fig. 6

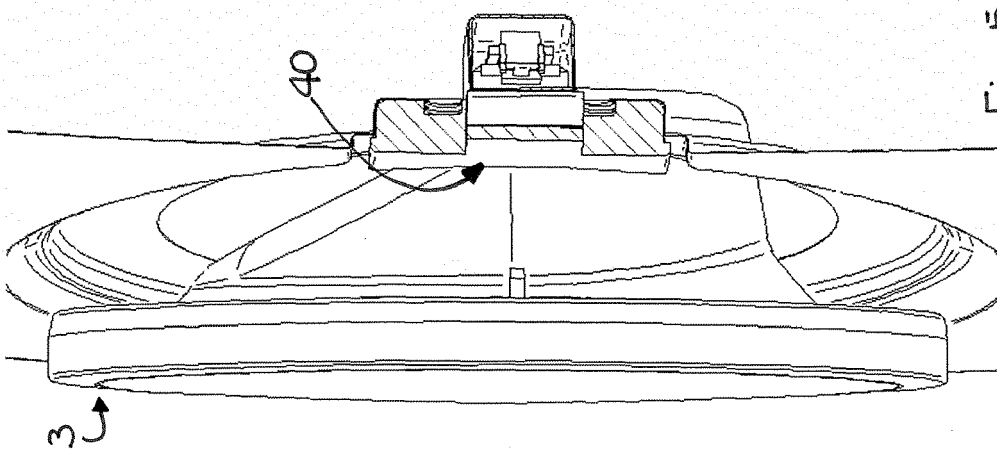


Fig. 5



EUROPEAN SEARCH REPORT

Application Number
EP 15 20 0373

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 2 053 156 A2 (PANASONIC CORP [JP]) 29 April 2009 (2009-04-29)	1,2,8-10	INV. D06F39/14
A	* paragraph [0016] * * paragraph [0025] - paragraph [0032]; figures 1, 2 * * paragraph [0040] - paragraph [0042] *	3-7	
X	EP 0 976 863 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 2 February 2000 (2000-02-02)	1,2,6,7, 10	
A	* paragraph [0001] * * paragraph [0014] - paragraph [0015] * * paragraph [0018] - paragraph [0025]; figure 1 *	3-5	TECHNICAL FIELDS SEARCHED (IPC) D06F
X	JP 2007 111108 A (TOSHIBA CORP; TOSHIBA CONSUMER MARKETING; TOSHIBA KADEN SEIZO KK) 10 May 2007 (2007-05-10)	1,2,8-10	
	* abstract; figures 1, 2, 5, 6 *		
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 1 March 2016	Examiner Fachin, Fabiano
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04/C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 20 0373

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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01-03-2016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2053156 A2	29-04-2009	CN 101413202 A	22-04-2009
		CN 201284426 Y	05-08-2009
		DE 202008013897 U1	24-12-2008
		EP 2053156 A2	29-04-2009
		JP 4715829 B2	06-07-2011
		JP 2009095529 A	07-05-2009
		TW 200920891 A	16-05-2009

EP 0976863 A1	02-02-2000	DE 19834642 A1	03-02-2000
		EP 0976863 A1	02-02-2000

JP 2007111108 A	10-05-2007	JP 4660347 B2	30-03-2011
		JP 2007111108 A	10-05-2007

ORM P0459