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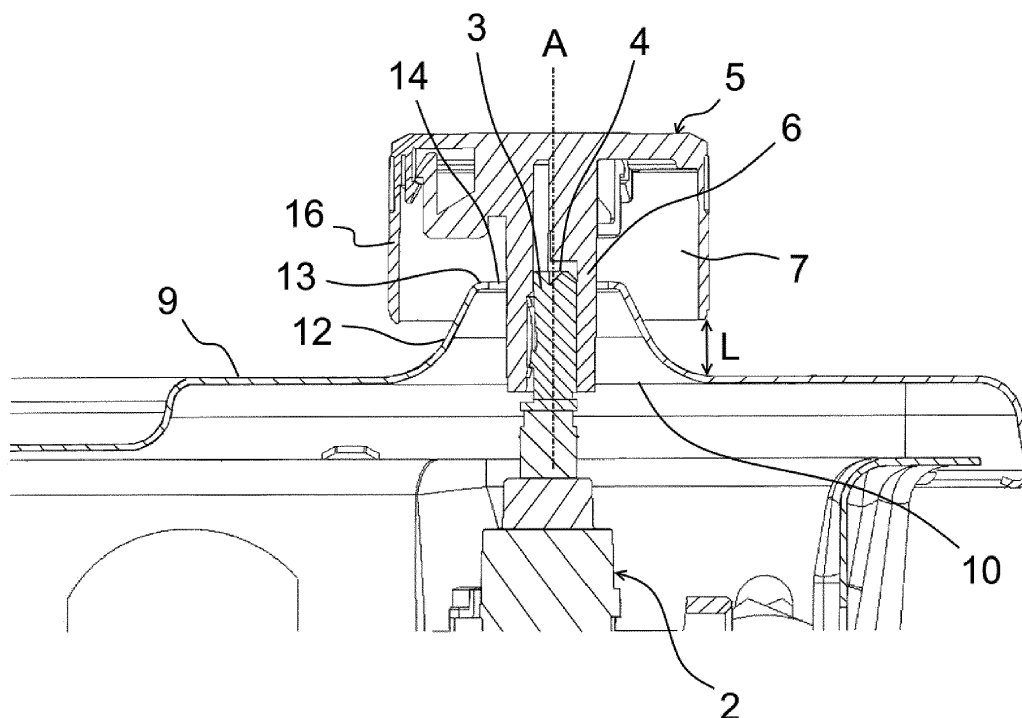
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(54) A GAS COOKING DEVICE COMPRISING A COOKTOP PLATE

(57) The present invention relates to a gas cooking device (1) comprising a cooktop plate (8), at least one opening (10) provided on the cooktop plate (8), a gas control member (2) positioned below the cooktop plate (8), having a rotatable shaft (3) which passes through

the opening (10). As an improvement, the cooktop plate (8) has an embossed form (11) defined along a periphery of the opening (10) in such a way that it is providing a barrier between the opening (10) and the cooktop plate (8).



Description

[0001] The present invention relates to a gas cooking device comprising a cooktop plate, at least one opening provided on the cooktop plate, a gas control member positioned below the cooktop plate, having a rotatable shaft which passes through the opening.

[0002] The patent application numbered WO2014016114 A2 discloses a sealing element suitable for using in cooking devices, especially counter-top cooktops, preventing the liquids spilled onto the panel from leaking through the aperture by providing leak-proofing of the apertures wherein the knobs placed onto the panel are mounted and comprising a gasket seated all around the edge of the aperture on the upper surface of the panel and produced from elastic material, and also relates to the cooking device wherein the sealing element is used.

[0003] The invention provides an additional improvement, an additional advantage or an alternative to the prior art.

[0004] The purpose of the present invention is to prevent liquid leakage from opening under the control knobs to inside the gas cooking device without using any kind of sealing member.

[0005] The invention, to achieve the abovementioned purpose, a gas cooking device comprising a cooktop plate, at least one opening provided on the cooktop plate, a gas control member positioned below the cooktop plate, having a rotatable shaft which passes through the opening. In the invention, the cooktop plate has an embossed form defined along a periphery of the opening in such a way that it is providing a barrier between the opening and the cooktop plate. Thus, penetrating of the liquid from the opening under the control knob to inside the gas cooking device, is prevented without using any kind of sealing member such as a gasket. Since, using of the sealing member under the control knob is eliminated and therefore, the possible undesirable dislocations of the sealing member is prevented, the sealing feature under the control knob is permanently provided. Moreover, the possible short circuits in the electric system inside the gas cooking device due to the liquid leakage from the opening under the control knob, is eliminated.

[0006] Here, the gas cooking device can be a gas cooktop or a gas oven comprising a cooktop plate. Here, the gas control member can be any kind of gas tap having a rotatable shaft.

[0007] In a possible embodiment of the invention, the cooktop plate has a base whereby the embossed form is in the form of an elevation with respect to said base. Thus, penetrating of the liquids from the opening under the control knob to inside the gas cooking device, is prevented.

[0008] In a possible embodiment of the invention, the embossed form is configured as a frusto-conical form. Thus, the sealing feature under the control knob is provided without using any kind of sealing member.

[0009] In a possible embodiment of the invention, the

embossed form has an aperture on a side away from the base, the rotatable shaft is provided in an accessible manner through the aperture and a flat surface is provided along a periphery of said aperture. Thus, the shaft connection housing can pass through the aperture in order to connect to the rotatable shaft. Moreover, sharp edges which can be unsafe for the users, is eliminated by forming the periphery of the aperture as the flat surface.

[0010] In a possible embodiment of the invention, a control knob has a shaft connection housing extending in the direction of a rotation axis of the rotatable shaft and the shaft connection housing connects to a free end of the rotatable shaft in such a way that it is rotating with the rotatable shaft jointly. Thus, the rotational movement and/or axial movement of the control knob can be transmitted to the rotatable shaft.

[0011] In a possible embodiment of the invention, the control knob has a shell surrounding the rotation axis whereby a knob housing is provided on a side facing the embossed form. Thus, the movement of the control knob in the direction of the rotation axis is not restricted.

[0012] In a possible embodiment of the invention, an axial movement distance is provided between the control knob and the base for an axial movement of the control knob in a direction towards the base, when the control knob is at a position away from the base. Thus, the distance for the axial movement of the control knob, is provided.

[0013] Further advantages may become apparent from the following description of the figure(s). In the figure, an exemplary embodiment of the invention is shown. The figure, the description and the claims contain a plurality of features in combination. The person having ordinary skill in the art will purposefully also consider the features separately and will find further expedient combinations.

[0014] If there is more than one specimen of a certain object, only one of these is given a reference numeral in the figures and in the description. The description of this specimen maybe correspondingly transferred to the other specimens of the object.

[0015] The figures, whose brief explanations are herewith provided, are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is to be interpreted in the absence of the description.

Fig. 1 represents an isometric view of the exemplary gas cooktop.

Fig. 2 represents an isometric view of the cooktop plate of the gas cooktop.

Fig. 3 represents an isometric view of a section of the gas cooktop where a plurality of control knob and embossed form is provided.

Fig. 4 represents a section view of the gas cooktop where the cooktop plate, the gas control member and the control knob is provided.

Fig. 5 represents a side view of the cooktop plate where the embossed form is provided.

[0016] As can be seen in Fig. 1, the subject matter gas cooking device (1), i.e. a gas cooktop, comprising a cooktop plate (8) having a width and depth. Said gas cooking device (1) further comprises a plurality of gas burners (15) and control knobs (5) for controlling a burning operation of the gas burners (15). In the present invention, as can be seen in Fig. 2, the cooktop plate (8) has an embossed form (11) configured under the control knob (5).

[0017] In Fig. 3, an isometric view of a section of the gas cooktop where a plurality of control knob (5) and embossed form (11) is provided, is given. There is a gas control member (2) positioned below the cooktop plate (8) (see in Fig. 4). Said gas control member (2) has a rotatable shaft (3) which passes through an opening (10) of the cooktop plate (8). The rotatable shaft (3) connects to the control knob (5). In Fig. 3, one of the control knob (5) is separated from the rotatable shaft (3) in order to be shown a section of the cooktop plate (8) where the embossed form (11) is provided. In a possible embodiment of the invention, the cooktop plate (8) has an embossed form (11) defined along a periphery of the opening (10) in such a way that it is providing a barrier between the opening (10) and a base (9) of the cooktop plate (8). The embossed form (11) has an aperture (14) on a side away from the base (9). As can be seen in Fig. 3, the rotatable shaft (3) is provided in an accessible manner through the aperture (14). Said rotatable shaft (3) which is rotatable around a rotation axis (A), extends in a direction of said rotation axis (A). Furthermore, the control knob (5) has a shaft connection housing (6) extending in the direction of the rotation axis (A).

[0018] In Fig. 4, a section view of the gas cooktop where the cooktop plate (8), the gas control member (2) and the control knob (5) are provided, is given. The gas control member (2) having the rotatable shaft (3) is positioned below the cooktop plate (8). Said rotatable shaft (3) of the gas control member (2) extends in the direction of said rotation axis (A) in a manner passing through the opening (10). In a possible embodiment, the embossed form (11) is configured along the periphery of the opening (10). In more details, the embossed form (11) is in the form of an elevation with respect to the base (9) of the cooktop plate (8). Preferably, said embossed form (11) is configured as a frusto-conical form. As can be seen in Fig. 5, the embossed form (11) has a barrier section (12) providing a barrier between the opening (10) and the base (9) of the cooktop plate (8). Said embossed form (11) has an aperture (14) on a side away from the base (9). The rotatable shaft (3) is provided in an accessible manner through the aperture (14). There is a flat surface

(13) provided along a periphery of said aperture (14) in order to eliminate the sharp edges of the embossed form (11) which can be unsafe for the users. The shaft connection housing (6) passes through the aperture (14) and connects to a free end (4) of the rotatable shaft (3) in such a way that it is rotating with the rotatable shaft (3) jointly. The control knob (5) has a shell (16) surrounding the rotation axis (A) whereby a knob housing (7) is provided on a side facing the embossed form (11). In a possible embodiment, an axial movement distance (L) is provided between the control knob (5) and the base (9) for an axial movement of the control knob (5) in a direction towards the base (9), when the control knob (5) is at a position away from the base (9).

[0019] In a possible embodiment of the invention, the cooktop plate (8) is made of a metal material. Said metal material can be any kind of metal which can be shaped by a deep drawing process. In a possible embodiment, the embossed form (11) is formed in a one piece manner with the cooktop plate (8).

[0020] In the light of the structural details and figures of the possible embodiment given above, the usage and functionalizing of the invention is as follows; there is not any burning operation at the related gas burner (15), when the related control knob (5) is at a first position where the control knob (5) has not rotated around the rotation axis (A). The control knob (5) transitions from the first position to a second position, when the control knob (5) is moved axially towards the cooktop plate (8) ve rotated around the rotation axis (A). The control knob (5) covers the embossed form (11) by means of the shell (16) and the knob housing (7), when the control knob (5) is axially moved towards the cooktop plate (8). The axial and rotational movements of the control knob (5) is directly transmitted to the rotatable shaft (3). The gas control member (2) directs an amount of gas according to the rotation level of the control knob (5) and the rotatable shaft (3), to the related gas burner (15) for feeding the burning of the cooking operation. In case of an overflow onto the cooktop plate (8) during the cooking operation, the barrier section (12) prevents penetrating of the liquids from the opening (10) under the control knob (5) to inside the gas cooking device (1).

REFERENCE LIST

[0021]

1. Gas cooking device
2. Gas control member
3. Rotatable shaft
4. Free end
5. Control knob
6. Shaft connection housing
7. Knob housing
8. Cooktop plate
9. Base
10. Opening

- | | | | |
|-----|-------------------------|---|-------------------------------------------------------|
| 11. | Embossed form | | towards the base (9), when the control knob (5) is at |
| 12. | Barrier section | | a position away from the base (9). |
| 13. | Flat surface | | |
| 14. | Aperture | | |
| 15. | Gas burner | 5 | |
| 16. | Shell | | |
| L. | Axial movement distance | | |
| A. | Rotation axis | | |

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Claims

1. A gas cooking device (1) comprising a cooktop plate (8), at least one opening (10) provided on the cooktop plate (8), a gas control member (2) positioned below the cooktop plate (8), having a rotatable shaft (3) which passes through the opening (10), **characterized in that** the cooktop plate (8) has an embossed form (11) defined along a periphery of the opening (10) in such a way that it is providing a barrier between the opening (10) and the cooktop plate (8). 15 20
2. A gas cooking device (1) according to Claim 1, wherein the cooktop plate (8) has a base (9) whereby the embossed form (11) is in the form of an elevation with respect to said base (9). 25
3. A gas cooking device (1) according to Claim 1 or 2, wherein the embossed form (11) is configured as a frusto-conical form. 30
4. A gas cooking device (1) according to Claim 2 or 3, wherein the embossed form (11) has an aperture (14) on a side away from the base (9), wherein the rotatable shaft (3) is provided in an accessible manner through the aperture (14) and wherein a flat surface (13) is provided along a periphery of said aperture (14). 35
5. A gas cooking device (1) according to any one of the preceding claims, wherein a control knob (5) has a shaft connection housing (6) extending in the direction of a rotation axis (A) of the rotatable shaft (3) and wherein the shaft connection housing (6) connects to a free end (4) of the rotatable shaft (3) in such a way that it is rotating with the rotatable shaft (3) jointly. 40 45
6. A gas cooking device (1) according to Claim 5, wherein the control knob (5) has a shell (16) surrounding the rotation axis (A) whereby a knob housing (7) is provided on a side facing the embossed form (11). 50
7. A gas cooking device (1) according to Claim 5 or 6, wherein an axial movement distance (L) is provided between the control knob (5) and the base (9) for an axial movement of the control knob (5) in a direction 55

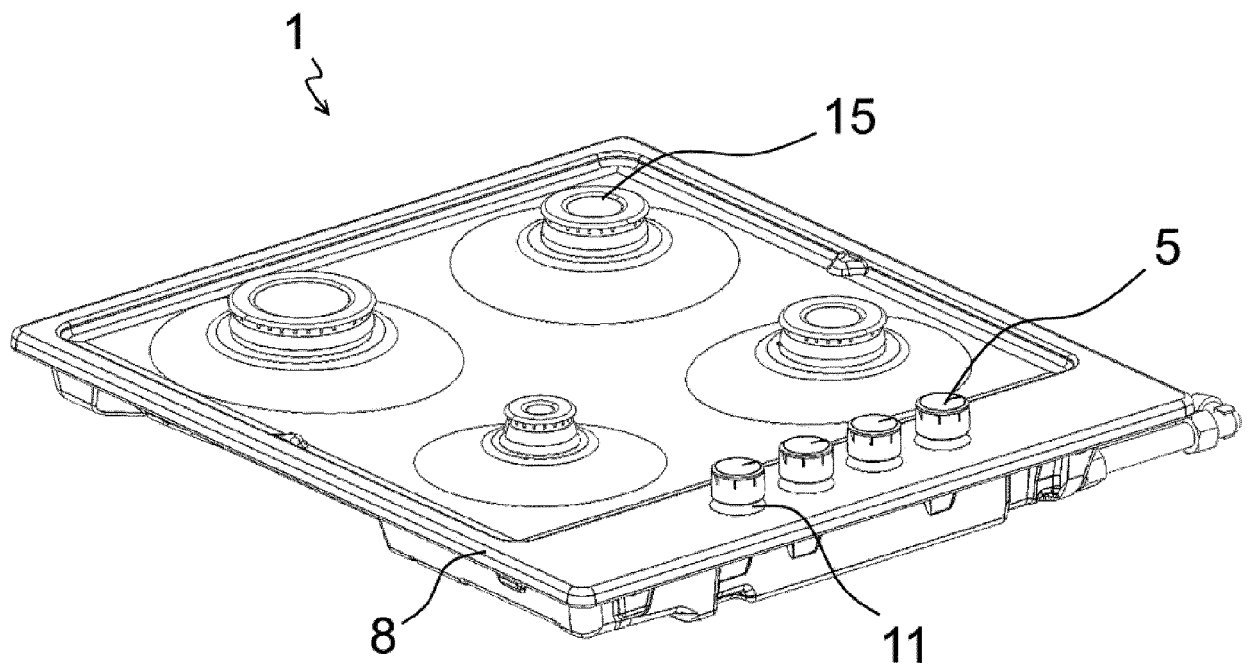


FIG. 1

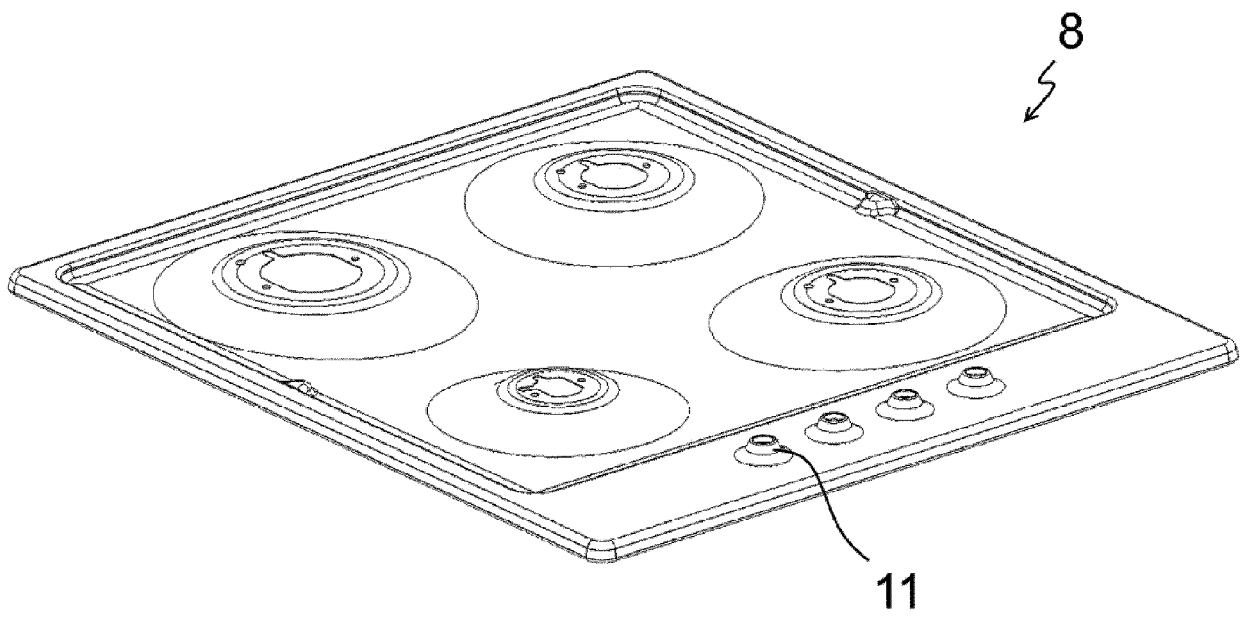


FIG. 2

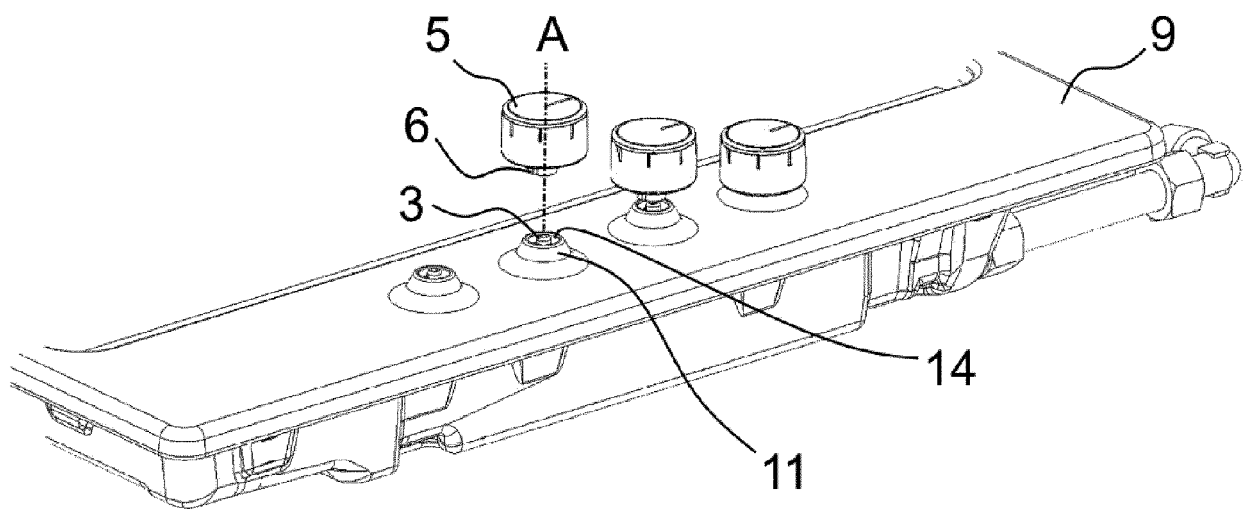


FIG. 3

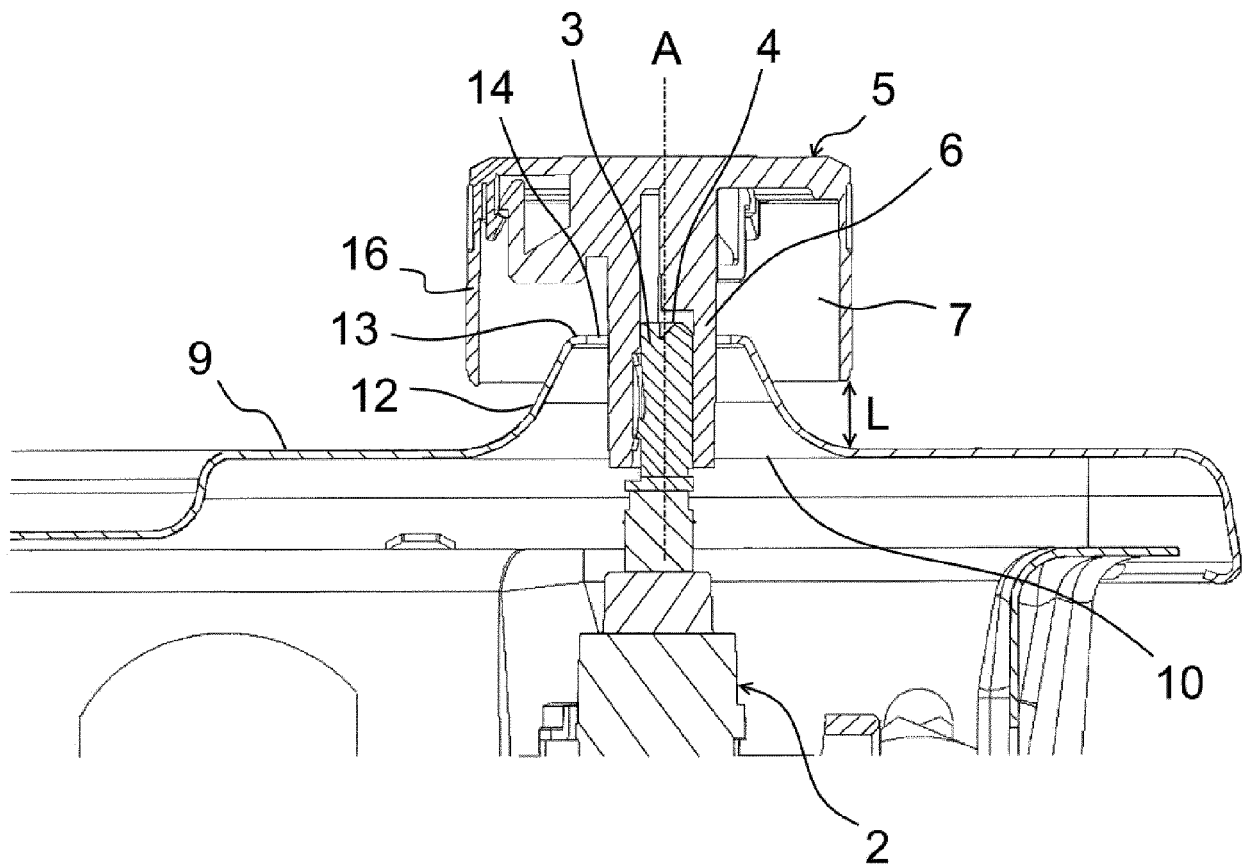


FIG. 4

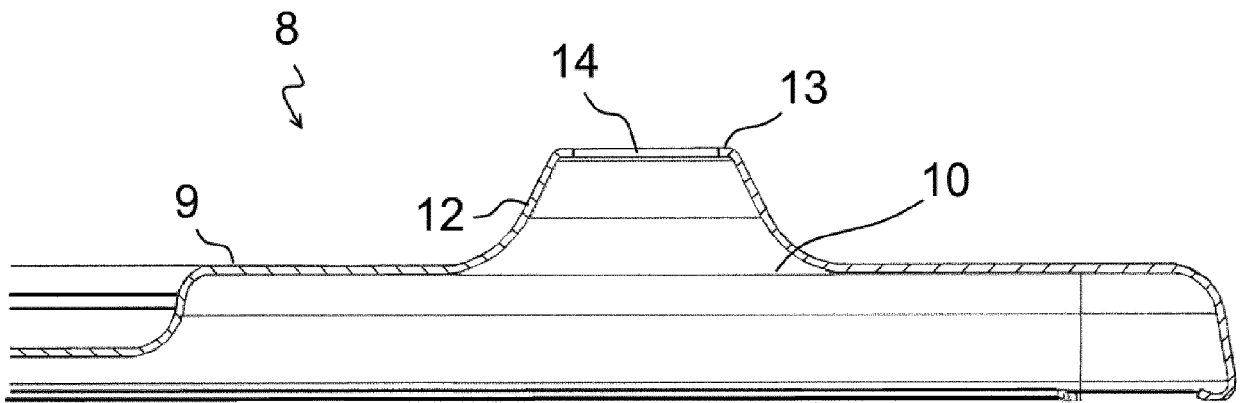


FIG. 5



EUROPEAN SEARCH REPORT

 Application Number
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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 1 046 865 A2 (CURVET SPA [IT]) 25 October 2000 (2000-10-25)	1,2,5	INV. F24C3/12 F24C15/10
Y	* paragraphs [0001], [0014], [0015]; claim 1; figures *	3	
X	----- CN 203 375 488 U (CHINABEST HOME APPLIANCES CO LTD) 1 January 2014 (2014-01-01) * figures 10-12 *	1,2,5-7	
X	----- JP 2001 182941 A (MATSUSHITA ELECTRIC IND CO LTD) 6 July 2001 (2001-07-06) * figures 1,2 *	1,2,5-7	
X	----- JP 2016 211815 A (RINNAI KK) 15 December 2016 (2016-12-15) * figure 4 *	1,2,4	
Y	----- EP 0 963 957 A1 (CORNING INC [US]) 15 December 1999 (1999-12-15) * paragraph [0050]; figure 1 *	3	
A	----- JP 2012 078072 A (RINNAI KK) 19 April 2012 (2012-04-19) * figures *	1-7	TECHNICAL FIELDS SEARCHED (IPC)
A	----- EP 1 541 928 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 15 June 2005 (2005-06-15) * paragraph [0020]; figure 1 *	1-7	F24C
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 3 March 2020	Examiner Verdoodt, Luk
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 (P04C01)

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

EP 19 20 2537

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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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45

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55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1046865 A2	25-10-2000	EP 1046865 A2	25-10-2000
		US 6257228 B1	10-07-2001

CN 203375488 U	01-01-2014	NONE	

JP 2001182941 A	06-07-2001	NONE	

JP 2016211815 A	15-12-2016	JP 6422393 B2	14-11-2018
		JP 2016211815 A	15-12-2016

EP 0963957 A1	15-12-1999	CA 2268677 A1	16-10-1999
		DE 69915542 T2	24-03-2005
		EP 0963957 A1	15-12-1999
		ES 2217640 T3	01-11-2004
		FR 2777559 A1	22-10-1999
		US 6182472 B1	06-02-2001

JP 2012078072 A	19-04-2012	CN 102563719 A	11-07-2012
		JP 5271988 B2	21-08-2013
		JP 2012078072 A	19-04-2012

EP 1541928 A1	15-06-2005	AT 376652 T	15-11-2007
		EP 1541928 A1	15-06-2005
		ES 2204349 A1	16-04-2004
		ES 2295774 T3	16-04-2008

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

- WO 2014016114 A2 [0002]