

(19)



(11)

EP 3 040 624 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
06.07.2016 Bulletin 2016/27

(51) Int Cl.:
F24C 15/00 (2006.01) **F21V 33/00** (2006.01)
F21V 7/00 (2006.01) **F24C 7/08** (2006.01)

(21) Application number: **15200178.0**

(22) Date of filing: **15.12.2015**

(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**
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(71) Applicant: **BSH Hausgeräte GmbH**
81739 München (DE)

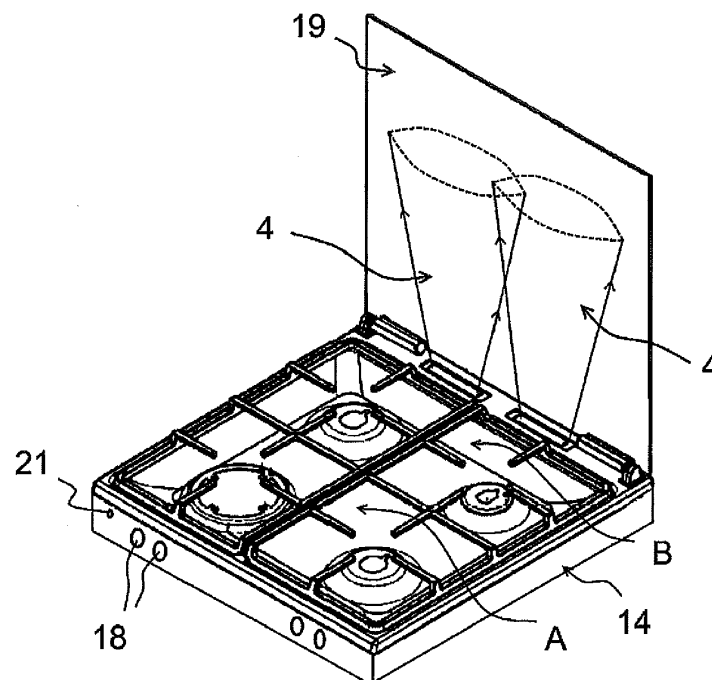
(72) Inventors:
• **Atalay, Engin**
59500 TEKIRDAG (TR)
• **Cetin, Tezcan**
59850 TEKIRDAG (TR)
• **Cosar, Sevgi**
34520 ISTANBUL (TR)

(30) Priority: **30.12.2014 TR 201416191**

(54) A COOKING DEVICE HAVING AN ILLUMINATION ELEMENT

(57) The present invention is a cooking device (1) comprising a cooktop (13) having a plate (14) with a front section (A) where a control element is placed and a rear section (B) where an illumination element (5) having a light source (51) is positioned. As an improvement, the

present invention is characterized in that the illumination element (5) comprises a light shield (53) positioned in the vicinity of the light source (51) and adjusted so as to prevent direct receiving of the light, diffused from the light source (51), by the front section (A) of the plate (14).

**Fig. 1****EP 3 040 624 A1**

Description

[0001] The present invention relates to cooking devices comprising a cooktop with illumination element and with or without cover where the cover provides covering of an upper plate of a cooktop in a closed position and the cover stands in an upright position on the upper plate in an open position.

[0002] Cooking devices can be in the form of a standalone cooktop or an oven with cooktop where there is a cooktop integrated to an oven. Cooktops have a cover which provides covering while the cooktop is not in use or which is kept open while the cooktop is in use. The cover is in general made of ceramic materials and particularly made of glass materials. In the same manner, the oven section of the cooking device has a door. The door is in general made of a glass material, and heat insulation is provided on the door.

[0003] In the present art, an upper plate of the cooking device is illuminated, thus, cooking pots are illuminated by means of an illumination element positioned on the cover.

[0004] One of these embodiments is disclosed in the patent document with publication number GB2143029. In said embodiment, a cooking hob includes a cover pivotable between a horizontal position, covering a top surface of the hob and an upright position in which the top surface is exposed. A fluorescent light is mounted on the cover adjacent a front edge thereof and can illuminate the top surface whenever the cover is in the upright position.

[0005] Another of these embodiments is disclosed in the patent document with publication number FR2598204. The invention relates to a domestic appliance comprising at least one cooking surface and a cover for protecting this cooking surface. It is characterized in that it comprises, associated with the cover, means for illuminating the surface of the hot plate of the cooking surface, so as to illuminate the top of the dishes placed on the hot plate.

[0006] The object of the present invention is to provide illumination of the cover of the cooking device and illumination of a wall to which the cooking device is rested and particularly the desired regions on the upper plate and on the cover.

[0007] In order to reach said object, the present invention is a cooking device comprising a cooktop having a plate with a front section where a control element is placed and a rear section where an illumination element having a light source is positioned. The illumination element comprises a light shield positioned in the vicinity of the light source and adjusted so as to prevent direct receiving of the light, diffused from the light source, by the front section of the plate. Thus, the rear side of the plate of the cooking device is illuminated. In probable embodiments of the present invention, the illumination element can be a LED, a halogen or a fluorescent lamp. In a probable embodiment of the present invention, the control element is a button; the light shield may be a lightproof surface coating or a paint or an element, integrated onto the illumination element.

[0008] In a probable embodiment of the present invention, the illumination element comprises at least one semi-transparent diffuser positioned on the light source and which diffuses the light beams. Thus, the light beams radiated from the light source are diffused in the region where they are reflected. The diffuser can be completely transparent or semi-transparent so as to transmit light. The diffuser provides the light to be diffused in a homogeneous manner.

[0009] In a probable embodiment of the present invention, the light shield is a lightproof section formed on the diffuser of the illumination element. Thus, the light shield prevents the light beams radiated from the light source from directly diffusing towards the front section of the plate.

[0010] In a probable embodiment of the present invention, the light shield is fixed on the illumination element. Thus, the light shield is kept fixed on a predetermined position on the illumination element.

[0011] In a probable embodiment of the present invention, the light shield is provided in a removable manner on the illumination element. Thus, the light shield can be easily removed from and re-fixed to the illumination element in cases like cleaning and maintenance.

[0012] In a probable embodiment of the present invention, the illumination element comprises an angled reflector positioned on the light source and adjusted so as to face the rear section of the plate. Thus, the light beams, resulting from the illumination element, reflect in the direction of the angle of the angled reflector.

[0013] In a probable embodiment of the present invention, the cooking device comprises a cover hinged to the plate in a rotatable manner between a horizontal position covering an upper side of the plate and an upright position where the plate is exposed. Thus, when the cooktop is not in use, the cover provides protection by covering the upper side of the cooktop plate. In an open position of the cover, the cover can be used for different purposes.

[0014] In a probable embodiment of the present invention, the illumination element comprises an angled reflector positioned on the light source and adjusted so as to face a front face of the cover in an upright position of the cover. Thus, the light beams, resulting from the illumination element, reflect in the direction of the angle of the angled reflector.

[0015] In a probable embodiment of the present invention, the cooking device comprises at least one visual area formed on the cover. Thus, the visual area or areas on the cover can be illuminated in a remarkable manner. In probable embodiments of the present invention, the visual area can be a logo, a hologram or a pattern. The visual area can be formed by means of serigraphy printing.

[0016] In a probable embodiment of the present invention, the illumination element is adjusted such that the visual area stays inside a light cone diffused from the illumination element. Thus, the illumination element is positioned so as

to face the visual area, and the visual area is illuminated in the most efficient manner.

[0017] In a probable embodiment of the present invention, the illumination element comprises a reflector which delimits and reflects the light beams, diffused by the diffuser of the illumination element, such that the light beams face the rear section of the plate. Thus, the light beams arriving on the reflector are refracted, and the area to which the reflector is guided is illuminated.

[0018] In a probable embodiment of the present invention, the plate comprises a cutout formed on the plate and where the illumination element is placed. Thus, the illumination element can be placed on the plate in at least partially embedded manner.

[0019] In a probable embodiment of the present invention, the cooking device comprises a sealing element which provides sealing between a periphery of the illumination element, placed to the cutout, and a periphery of the cutout. Thus, sealing is provided in the sections where the illumination element is positioned on the plate. Liquid leakage to the lower side of the plate and damaging of the illumination element are prevented.

[0020] In a probable embodiment of the present invention, the cooking device comprises a covering element assembled to a lower side of the plate and enclosing the illumination element from a lower section. Thus, the electric shock risk, which occurs since the lower side of the upper plate is accessible, is prevented. At the same time, the illumination element is protected.

[0021] In a probable embodiment of the present invention, the cooking device comprises a cooling element providing cooling of the illumination element and hidden at least partially at the lower side of the plate. Thus, the cooling of the illumination element is provided. In a probable embodiment of the present invention, the cooling element can be aluminum block plate, flaps, mini fan/propeller. The cooling element can provide cooling to the related section by means of placement under the illumination element.

Figure 1 is a frontal perspective schematic view of the light cone of a cooking device comprising a representative embodiment of the subject matter illumination element.

Figure 2 is the view of the embodiment illustrated in Figure 1 where the light cone is focused on the visual area.

Figure 3 is top view of a cooktop where a representative application of the subject matter illumination element is used at the rear section thereof.

Figure 4 is the perspective view of the upper plate from the bottom section thereof.

Figure 5 is the top view of an application of the rear section of the upper plate where two separate illumination elements are used.

Figure 6 is the top view of an application of the rear section of the upper plate where single illumination element is used.

Figure 7 is the frontal perspective view of an application of the subject matter illumination element in LED structure.

Figure 8 is the rear perspective view of an illumination element in LED structure given in Figure 7.

Figure 9 is the frontal view of an alternative illumination element having light shield.

Figure 10 is the rear view of the application given in Figure 9.

Figure 11 is the frontal view of a freestanding oven where a representative application of the subject matter illumination element is used.

[0022] In Figure 1, a cooktop using a representative embodiment of the subject matter illumination element (5) is illustrated in a perspective manner. In a closed position of a plate (14) of the cooking device (1) where the plate (14) is covered, the illumination element (5) is taken to the closed position, and in an open position where the plate (14) is upright, the illumination element (5) is taken to the open position.

[0023] The cooking device (1) can be an oven having at least one cooking chamber (12) or a cooktop (13) as illustrated in Figure 1, or it can be in the form of freestanding oven where both are provided on the same body (11) as illustrated in Figure 11. A cooktop (13) of the cooking device (1) is installed on a plate (14). The plate (14) is integrated onto the body (11). On the plate (14), there are burners (15), and there is a support grid (16) whereon the cooking pot is placed. There is a control panel (17) on a front section of the body (11) which is easily accessible. On the control panel (17), buttons (18) are positioned providing adjustment of the gas flow for burners (15), the heat of the cooking chamber (12), and the cooking functions in a compliant manner.

[0024] A hinge (3) provides the cover (19) of the home appliance (1) to be supported to the body (11) of the home appliance (1). The cover (19) has a form which completely covers the upper side of the upper plate (14) of the cooktop (13). Preferably two hinges (3) are used for supporting a cover (19). The cover (19) is hinged in a removable manner to the cooking device body (11) from the lower ends thereof.

[0025] In the open position of the cover (19) on the upper plate (14), the angle between the cover (19) and the upper plate (14) is 90° or approximately 100°. The cooking device (1) comprises at least one electronic card (22) having functional parameters like turning on/off the illumination element (5), the turning on duration, the colors, the illumination times of each color. On the control panel (17) of the cooking device,

[0026] In an alternative embodiment, a system is installed based on turning on the illumination element (5) in an open

position of the cover (19) and turning off the illumination element (5) in a closed position of the cover (19). Therefore, a switch (not illustrated in the figures) is formed which controls the illumination element (5) depending on the movement of the cover (19). The switch is activated by means of the movement of the cover (19). The switch is positioned on the body (11) or on the upper plate (14) at a position where the cover (19) can contact. In another alternative embodiment,

a switch can be used such that open or closed switching can be realized for the illumination element (5) respectively in the open or closed positions of the cover (19) on the cooking chamber (12).

[0027] The cover (19) is in open position in the cooking device (1) which is in cooktop form illustrated in Figure 1. The switch is activated by means of a triggering element (21) placed to the control panel, and light transfer is realized from the illumination elements (5) placed to the rear section (B) to the cover (19) by means of projection. As illustrated in Figure 2, in order for a visual area (8), which is differentiated from the adjacent area in terms of color and structure and which is for instance, a logo, a special print, to be illuminated more than the other peripheral areas; the light cone (4), formed with the help of a focused illuminated element (5), is used. In order to form the light cone (4) of the illumination element (5), there is a reflector (55). The reflector (55) is positioned so as to face the inner face (56). Each illumination element (5) has a reflector (55). Thus, each illumination element (5) is arranged so as to form the visual area (8) in a manner completing a part of the visual area (8). The visual area (8) can be formed on the cover (19), in an inner section of the handle; in an inner section of the upper profile (23). Moreover, it can be in the form of print, pattern, serigraphy, hologram, product logo, etc.

[0028] In Figure 3, the top view of a cooking device (1) is given. The illumination elements (5), positioned in the same alignment so as to be abutted to each other, are placed into one each cutout (141) formed so as to be close to the rear edge of the plate (14) at the rear section (B) as can be seen in the same embodiment illustrated in Figure 4. The illumination elements (5), viewed in Figure 5 from the bottom and placed into the cutout (141) structure extended transversely on an imaginary line at the rear section of the plate (14), are covered by means of a covering element (7) as illustrated in Figure 6. The covering element (7) forms a bearing for the illumination elements (5) from the bottom, and at the same time, it protects them from the heat of the cooking device (1). In a similar manner, the covering element (7) prevents intrusion of foreign substances like oil, dirt to the cutouts (141) from the outer environment.

[0029] In Figure 7, the frontal perspective view of a LED unit used as the illumination element (5) is given. An extended flange (54) surrounds the outside facing section of a light source (51). A diffuser (52) is placed on the light source (51) on the surrounded opening. There is a light shield (53) which is in curtain form extending on a peripheral edge of the light source (51). Since the outer periphery (57) of the illumination element (5) is wider than the cutout (141), it is configured so as to seat onto the plate (14) from above. In Figure 8, the rear view of the illumination element (5) is given. Behind the diffuser (52), there is an extension structure wherein the light source (51) is placed.

[0030] In Figure 9, the frontal view of the illumination element (5) is given. The light shield (53), provided on the upper section on the extended flange (54) structure, reduces the reflection of the light scattered from the light source (51) from the light shield (53) section, and it provides more intense light to be obtained in the section where the light is guided by means of an angled reflector (58). In Figure 10, the rear view of the same illumination element (5) is given. In alternative embodiments, halogen, fluorescent or other similar illumination types can be used instead of LED illumination element (5).

[0031] In Figure 11, a freestanding oven using the subject matter illumination element (5) is illustrated. Here, a cooking chamber (12) is provided inside the body (11). At the upper section of the body (11), a plate (14) of the cooktop (13) is provided. Burners (15) are distributed on the plate (14). At the rear section (B) of the plate (14), the cover (19) is hinged to the plate (14) from one each ends thereof. A visual area (8) is placed on the cover (8). An upper profile (23) extends along the upper edge of the cover (8). Again visual area (8) is provided on the front face (231) of the upper profile (23) facing the plate (14). Buttons (18) are provided on the control panel (17). A triggering element (21) is provided together with the buttons (18). The triggering element (21) is connected to an electronic card (22). When the triggering element (21) is pressed, the light source (5), provided at the rear section (B), is activated through the electronic card (22), and the light cone (4) is focused on the visual area (8) with the help of the reflector (55).

REFERENCE NUMBERS

1.	Cooking device	3.	Hinge
11.	Body	4.	Light cone
12.	Cooking chamber	5.	Illumination element
13.	Cooktop	51.	Light source
14.	Plate	52.	Diffuser
141.	Cutout	53.	Light shield
142.	Lower side	54.	Flange
15.	Burner	55.	Reflector
16.	Support grid	56.	Inner face

(continued)

17.	Control panel	57.	Periphery
18.	Button	58.	Angled reflector
19.	Cover	7.	Covering element
191.	Front face	8.	Visual area
21.	Triggering element	A:	Front section
22.	Electronic card	B:	Rear section
23.	Upper profile		
231.	Frontface		
24.	Door		

Claims

1. A cooking device (1) comprising a cooktop (13) having a plate (14) with a front section (A) where a control element is placed and a rear section (B) where an illumination element (5) having a light source (51) is positioned, **characterized in that** the illumination element (5) comprises a light shield (53) positioned in the vicinity of the light source (51) and adjusted so as to prevent direct receiving of the light, diffused from the light source (51), by the front section (A) of the plate (14).
2. A cooking device (1) according to Claim 1, wherein the illumination element (5) comprises at least one semi-transparent diffuser (52) positioned on the light source (51) and which diffuses the light beams.
3. A cooking device (1) according to Claim 2, wherein the light shield (53) is a lightproof section formed on the diffuser (52) of the illumination element (5).
4. A cooking device (1) according to any one of the preceding claims, wherein the light shield (53) is fixed on the illumination element (5).
5. A cooking device (1) according to any one of the claims between Claim 1 and 3, wherein the light shield (53) is provided in a removable manner on the illumination element (5).
6. A cooking device (1) according to any one of the preceding claims, wherein the illumination element (5) comprises an angled reflector (58) positioned on the light source (51) and adjusted so as to face the rear section (B) of the plate (14).
7. A cooking device (1) according to any one of the preceding claims, wherein the cooking device (1) comprises a cover (19) hinged to the plate (14) in a rotatable manner between a horizontal position covering an upper side of the plate (14) and an upright position where the plate (14) is exposed.
8. A cooking device (1) according to Claim 7, wherein the illumination element (5) comprises an angled reflector (58) positioned on the light source (51) and adjusted so as to face a front face (191) of the cover (19) in an upright position of the cover (19).
9. A cooking device (1) according to Claim 7 or 8, wherein the cooking device (1) comprises at least one visual area (8) formed on the cover (19).
10. A cooking device (1) according to Claim 9, wherein the illumination element (5) is adjusted such that the visual area (8) stays inside a light cone (4) diffused from the illumination element (5).
11. A cooking device (1) according to any one of the preceding claims, wherein the illumination element (5) comprises a reflector (55) which delimits and reflects the light beams, diffused by the diffuser (52) of the illumination element (5), such that the light beams face the rear section of the plate (14).
12. A cooking device (1) according to any one of the preceding claims, wherein the plate (14) comprises a cutout (141) formed on the plate (14) and where the illumination element (5) is placed.

EP 3 040 624 A1

13. A cooking device (1) according to any one of the preceding claims, wherein the cooking device (1) comprises a sealing element which provides sealing between a periphery (57) of the illumination element (5), placed to the cutout (141), and a periphery of the cutout (141).

5 14. A cooking device (1) according to any one of the preceding claims, wherein the cooking device (1) comprises a covering element (7) assembled to a lower side (142) of the plate (14) and enclosing the illumination element (5) from a lower section.

10 15. A cooking device (1) according to any one of the preceding claims, wherein the cooking device (1) comprises a cooling element providing cooling of the illumination element (5) and hidden at least partially at the lower side (142) of the plate (14).

15

20

25

30

35

40

45

50

55

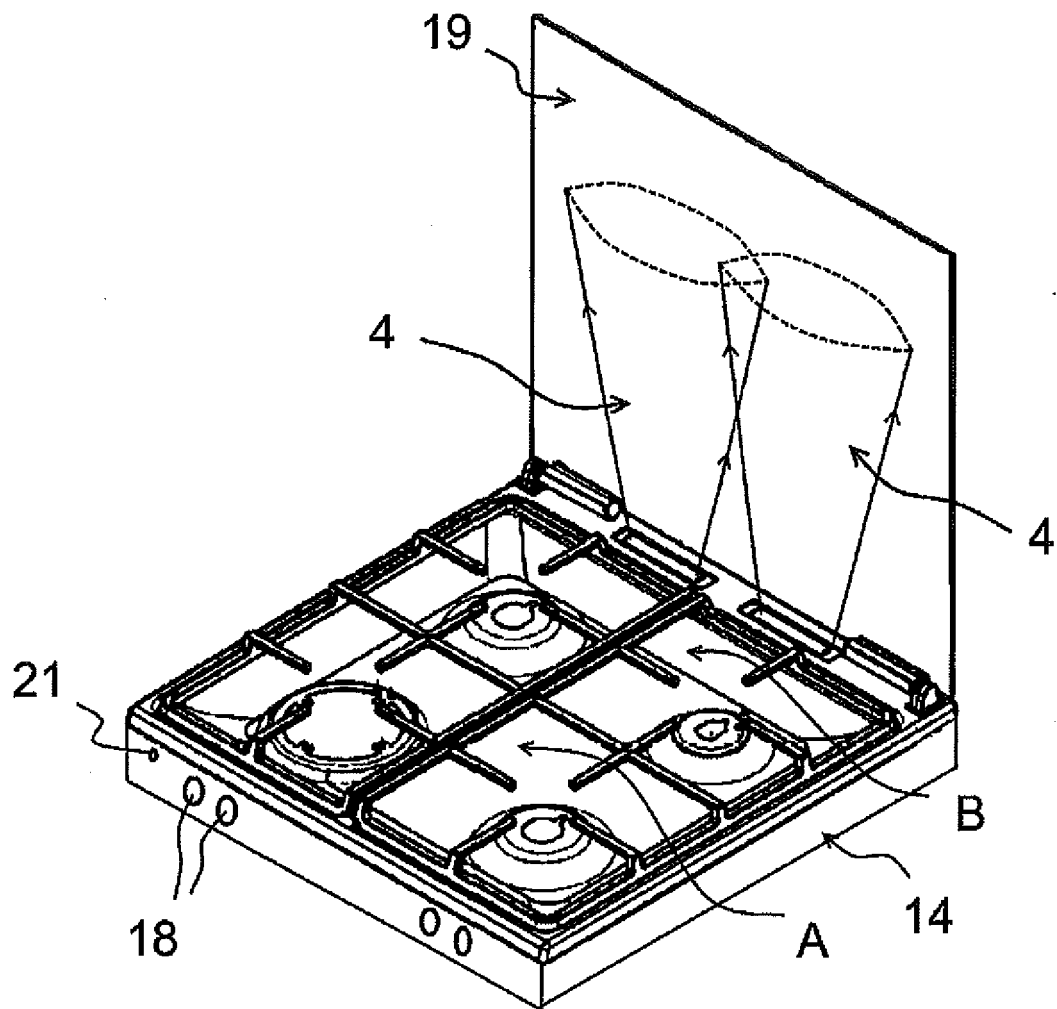


Fig. 1

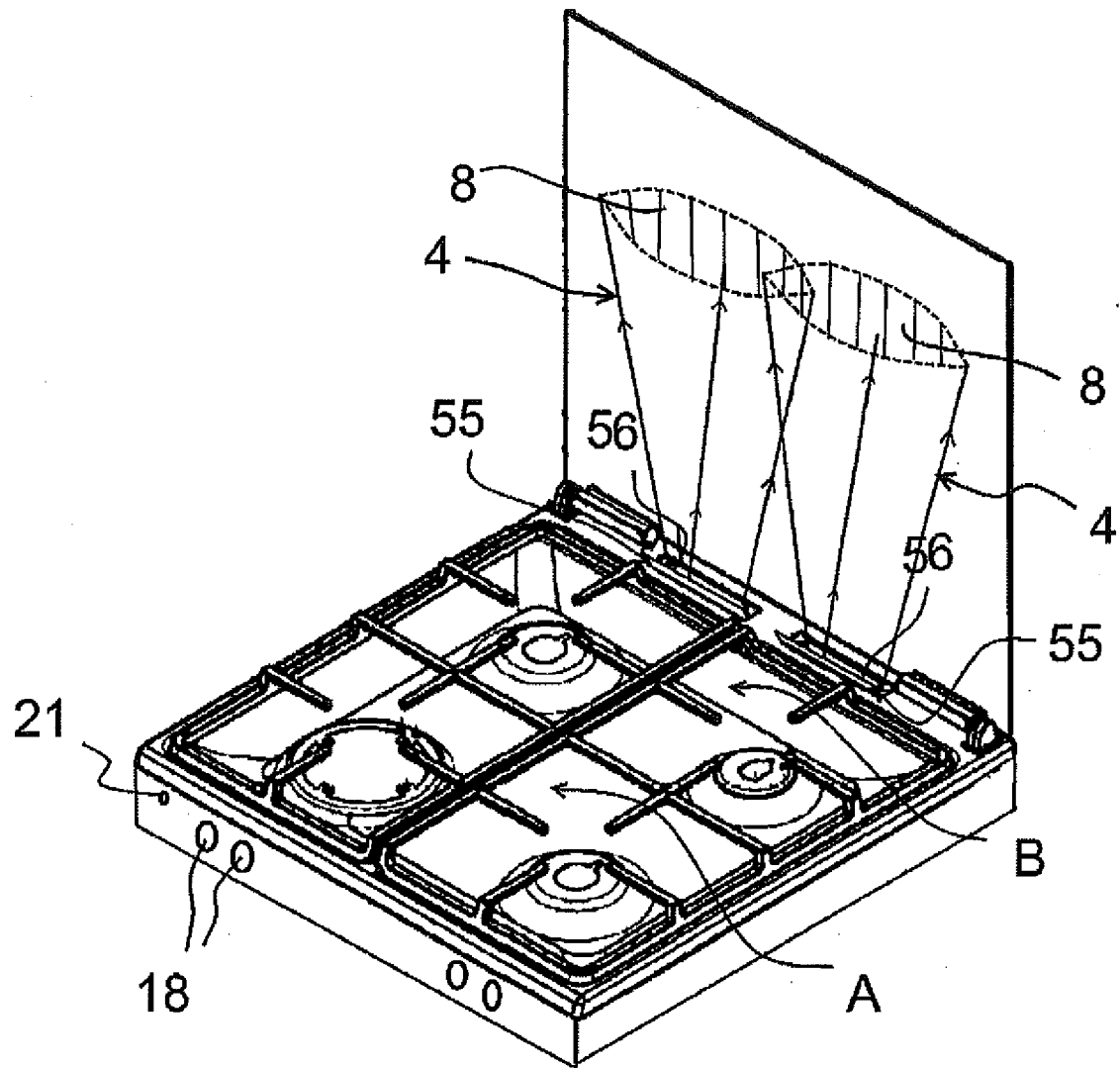


Fig. 2

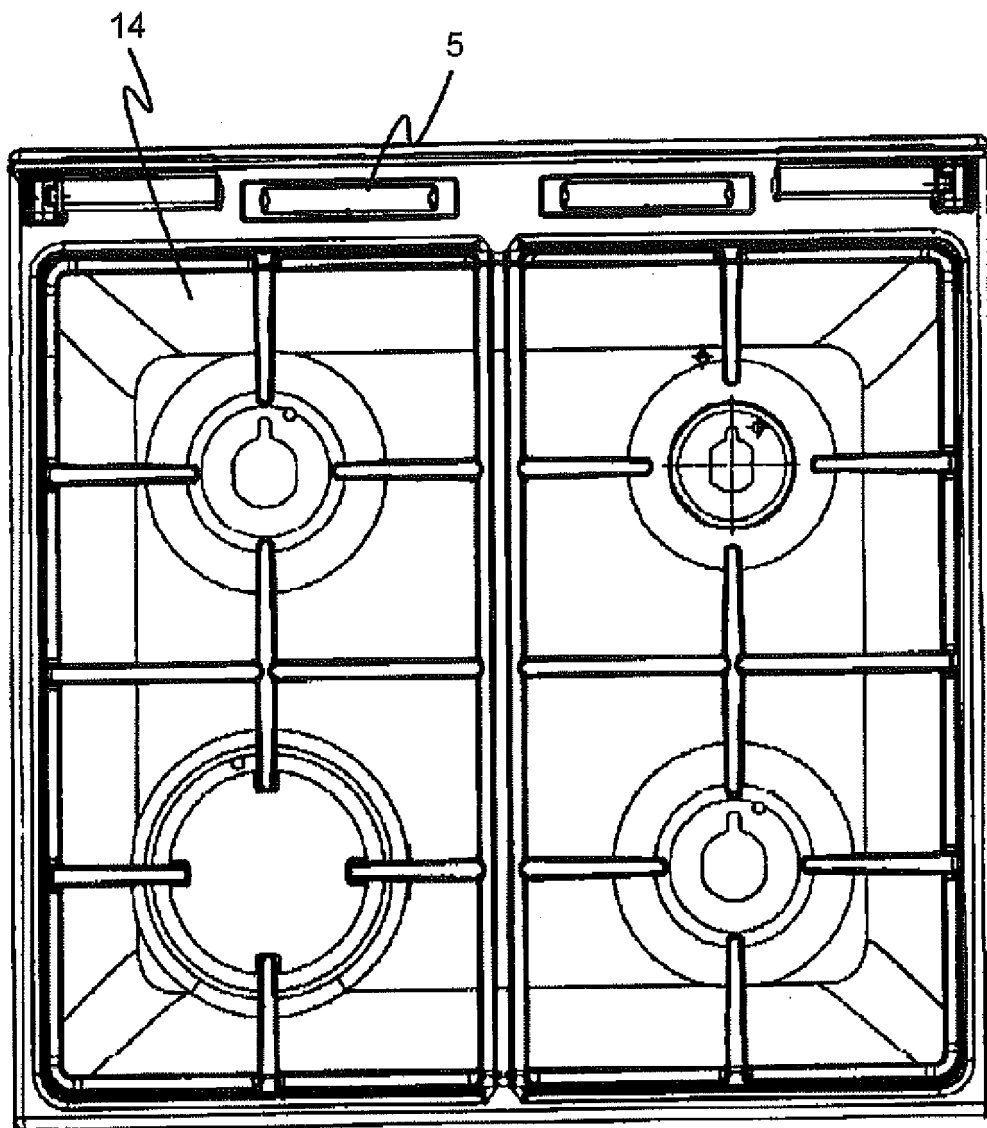


Fig. 3

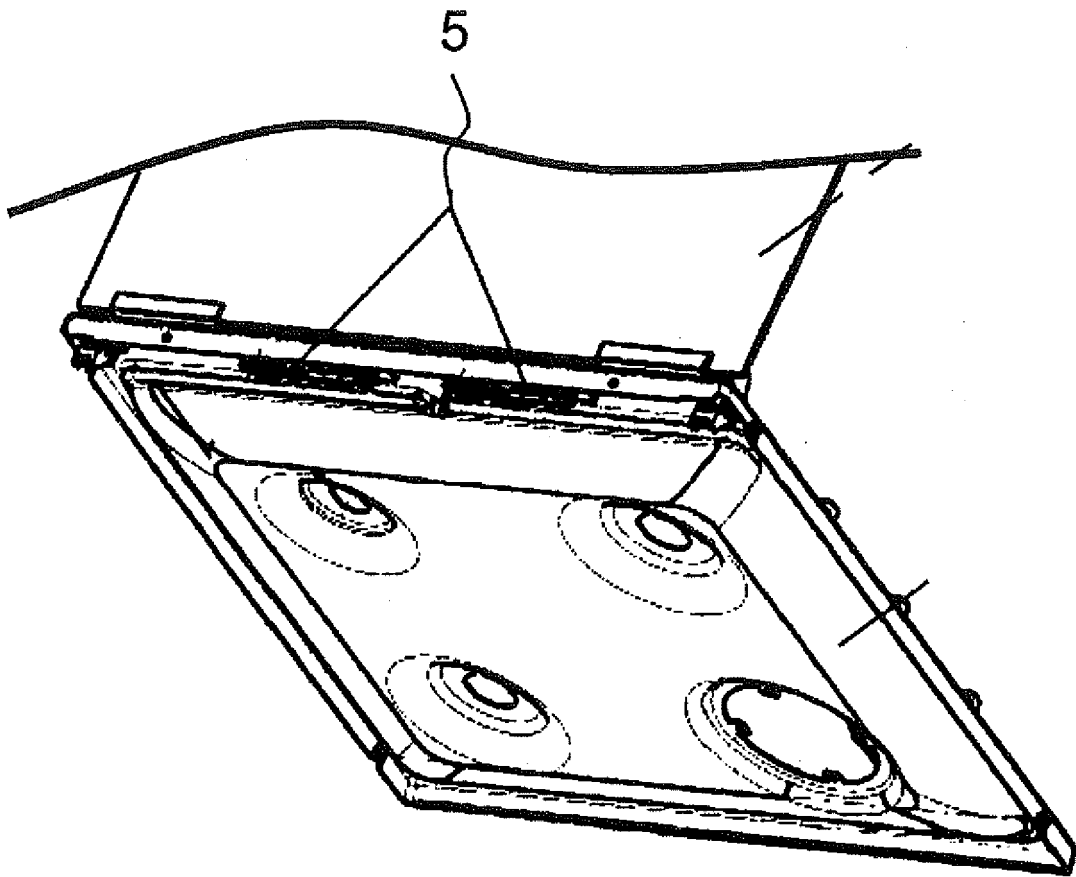


Fig. 4

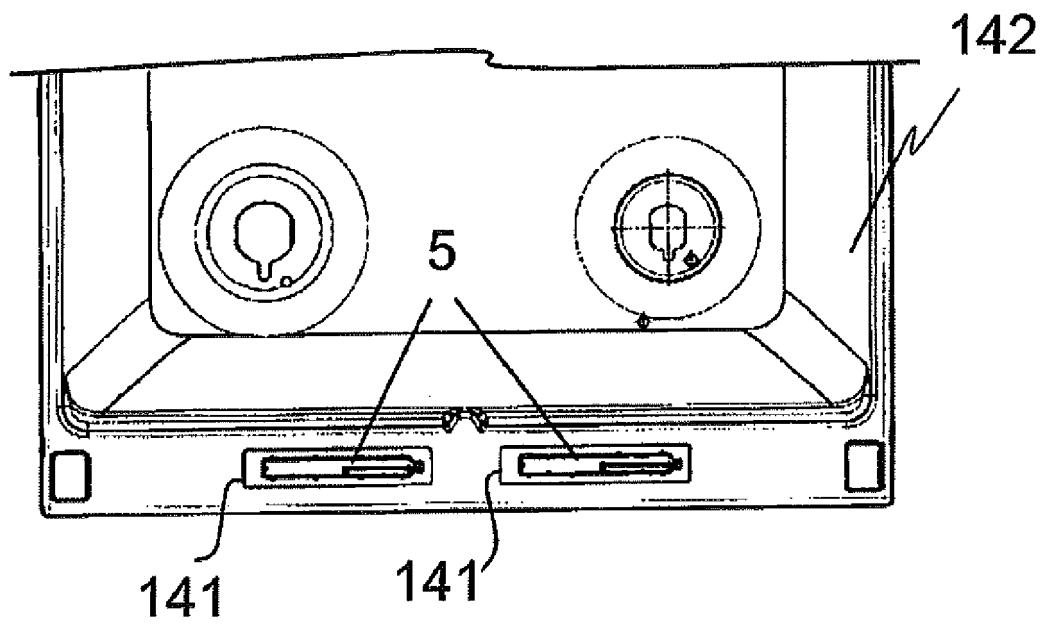


Fig. 5

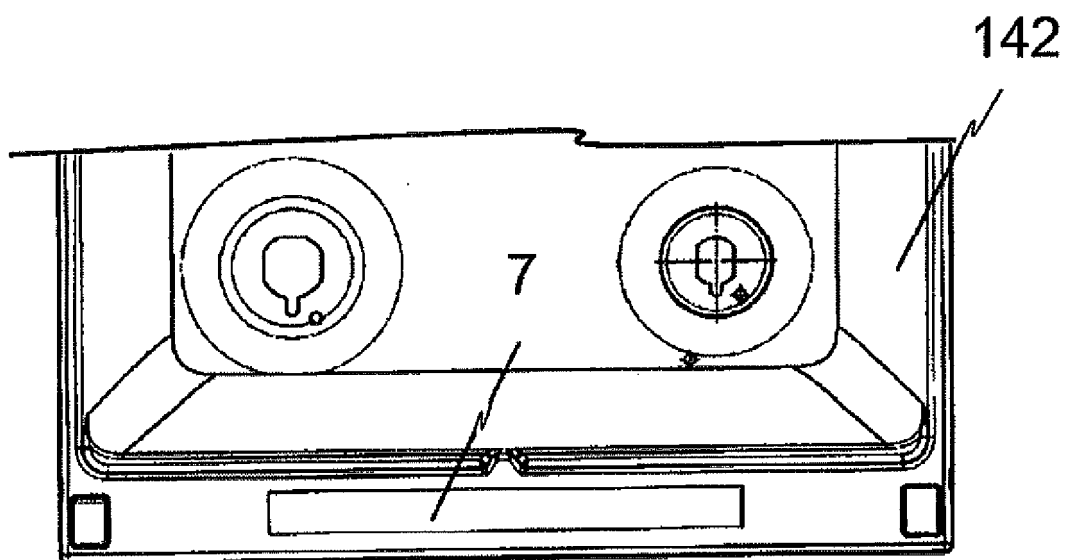


Fig. 6

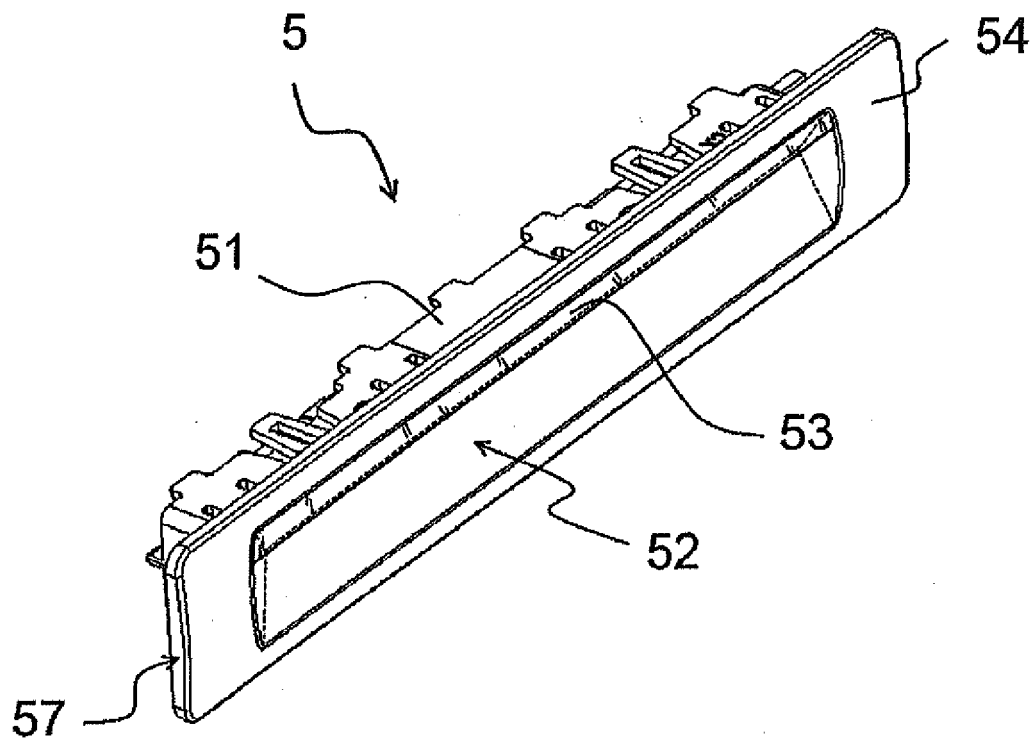


Fig. 7

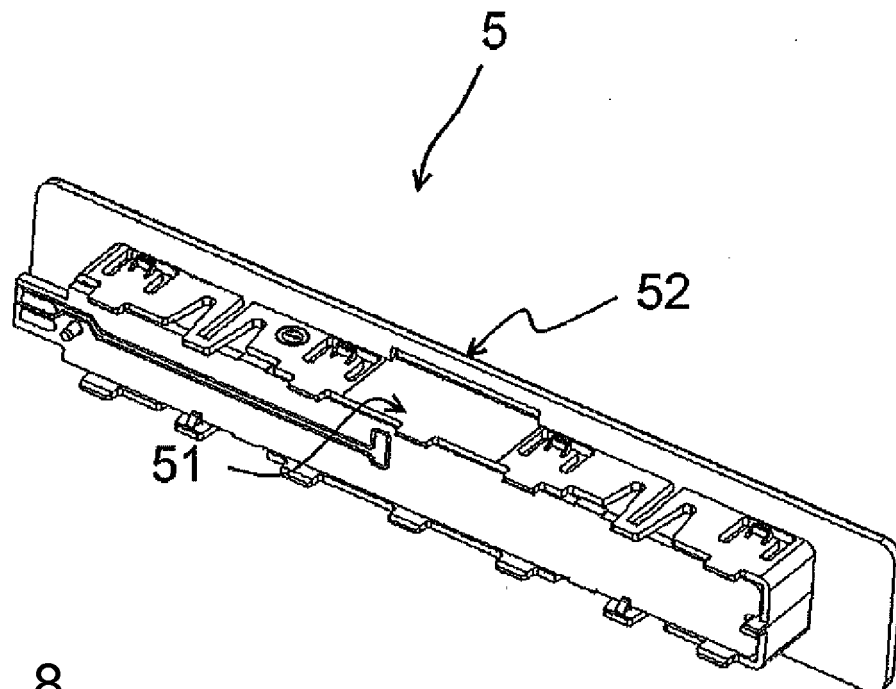


Fig. 8

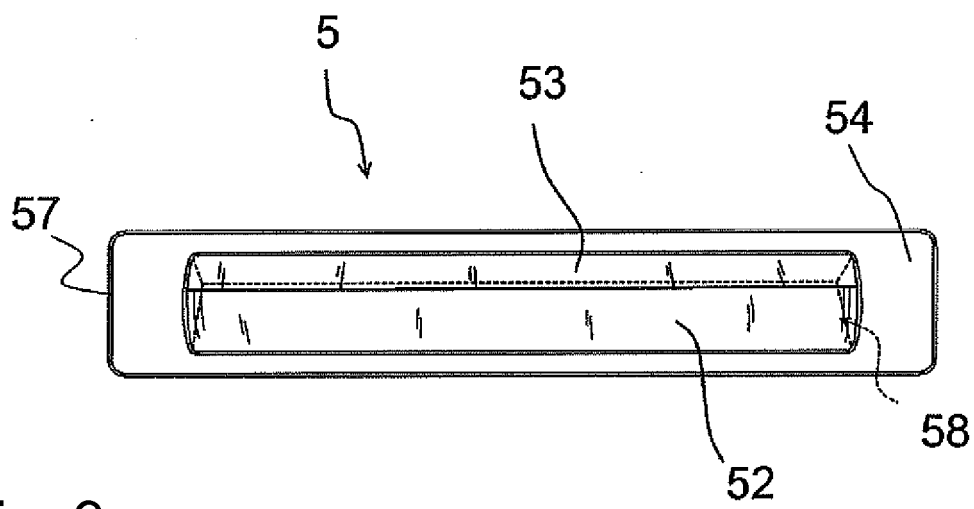


Fig. 9

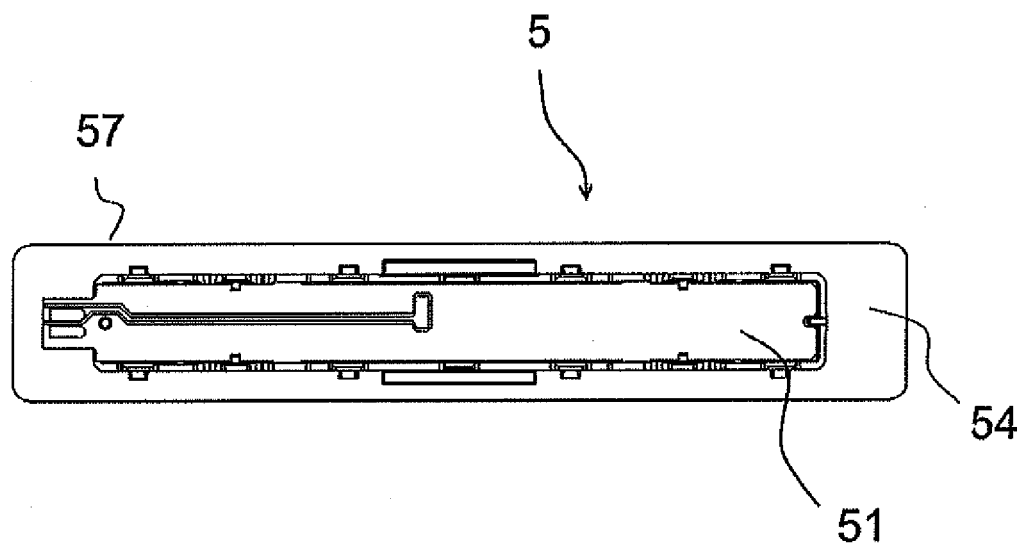


Fig. 10

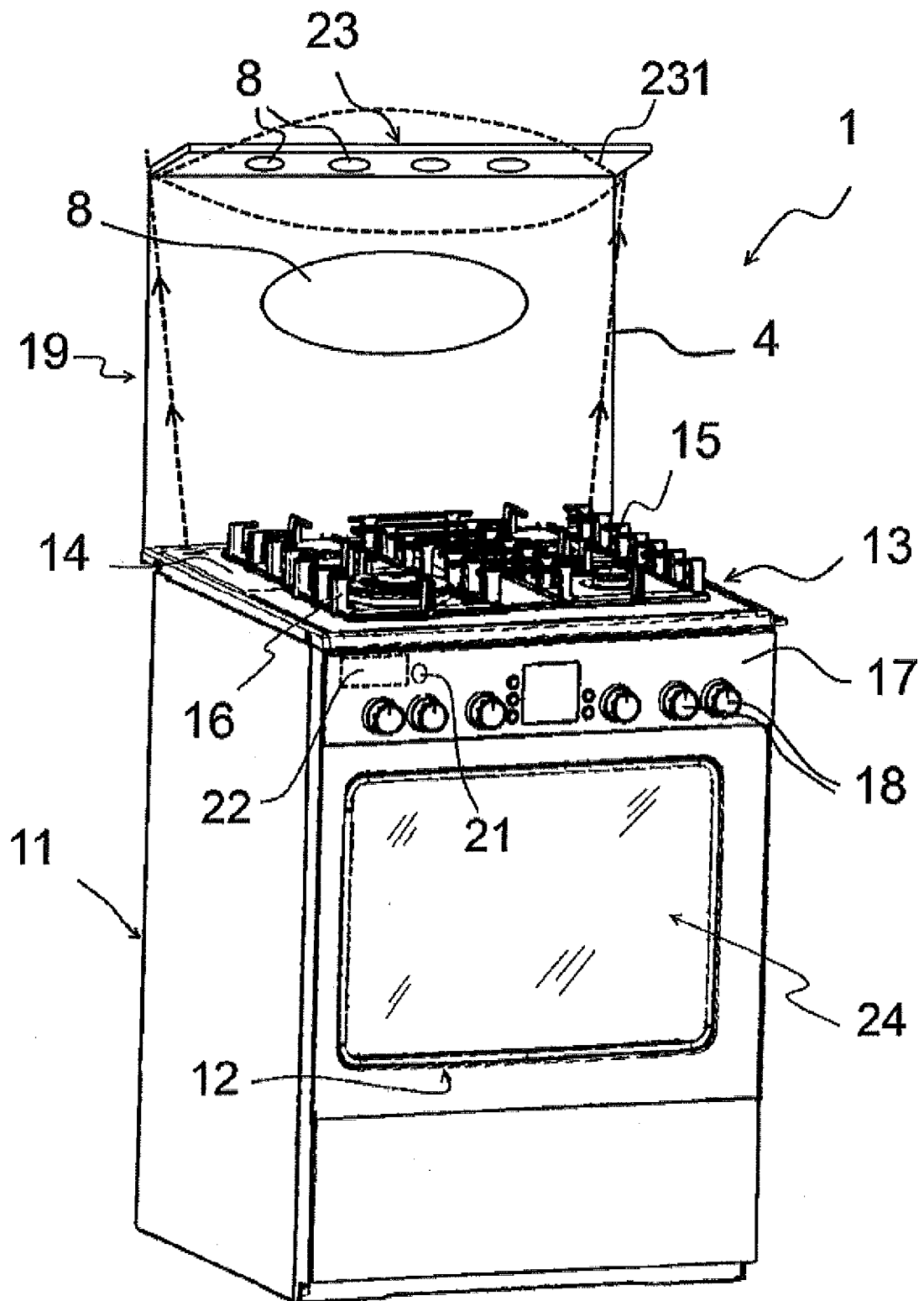


Fig. 11



EUROPEAN SEARCH REPORT

Application Number
EP 15 20 0178

5

10

15

20

25

30

35

40

45

50

55

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	GB 1 568 705 A (BELLING & CO LTD) 4 June 1980 (1980-06-04)	1-3,7,9	INV. F24C15/00 F21V33/00 F21V7/00 F24C7/08
Y	* the whole document *	10	
X	US 3 260 830 A (ALBRIGHT EDWARD E) 12 July 1966 (1966-07-12)	1-6,11,12	
X	EP 1 489 364 A1 (ELECTROLUX HOME PRODUCTS N V [BE]) 22 December 2004 (2004-12-22)	1	
Y	* the whole document *	10	
A,D	FR 2 598 204 A1 (EUROP EQUIP MENAGER [FR]) 6 November 1987 (1987-11-06)	1-15	
A	JP 2008 064364 A (OSAKA GAS CO LTD) 21 March 2008 (2008-03-21)	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24C F21V
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		19 February 2016	Makúch, Milan
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 15 20 0178

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-02-2016

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 1568705 A	04-06-1980	NONE	
US 3260830 A	12-07-1966	NONE	
EP 1489364 A1	22-12-2004	AT 479872 T DE 10327844 A1 DK 1489364 T3 EP 1489364 A1 ES 2350724 T3	15-09-2010 27-01-2005 29-11-2010 22-12-2004 26-01-2011
FR 2598204 A1	06-11-1987	NONE	
JP 2008064364 A	21-03-2008	JP 4896638 B2 JP 2008064364 A	14-03-2012 21-03-2008

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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

- GB 2143029 A [0004]
- FR 2598204 [0005]