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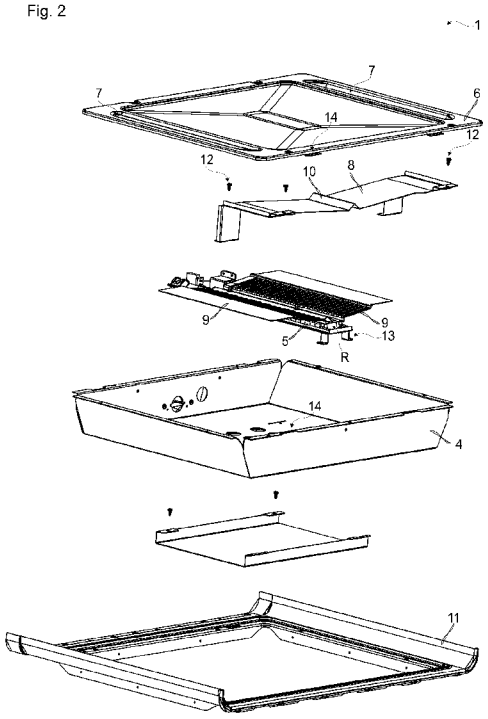
(54) Title: GAS OVEN WITH IMPROVED HEAT PROTECTION

Fig. 2



(57) Abstract: The present invention relates to a gas oven (1) comprising a cooking chamber (2), an opening (3) for accessing the cooking chamber (2), a combustion chamber (4) and a gas burner (5) which is disposed into the combustion chamber (4). The gas oven (1) of the present invention further comprises an enamelled cover (6) which defines the floor of the cooking chamber (2) and the ceiling of the combustion chamber (4), wherein the enamelled cover (6) has one or more apertures (7) for allowing the passage of the hot air from the combustion chamber (4) into the cooking chamber (2).

Description

GAS OVEN WITH IMPROVED HEAT PROTECTION

[0001] The present invention relates to a cooking appliance, in particular to a gas oven.

[0002] Gas ovens are commonly known in the art. A gas oven generally comprises a cooking chamber for cooking the food; an opening for allowing access to the cooking chamber; a combustion chamber for combusting the gas; and a gas burner which is disposed into the combustion chamber.

[0003] A problem with the prior art gas oven is that during the cooking/baking process the inner surface of the cooking chamber is generally spoiled with food residues. The cleaning of the hardened food residues is usually very laborious. In order to facilitate the cleaning of the hardened food residues, the inner surface of the cooking chamber is commonly enamelled. But the excessive heat of the combusted gas can deform the inner surface and develop hairline fractures in the enamel and even cause the enamel to flake off.

[0004] WO2008/077967A1 discloses a gas oven.

[0005] An objective of the present invention is to provide a gas oven which solves the aforementioned problems of the prior art in a cost-effective way and which enables a safe operation of the gas burner even at the maximum power.

[0006] This objective has been achieved by the gas oven as defined in claim 1. Further achievements have been attained by the subject-matters respectively defined in the dependent claims.

[0007] The gas oven of the present invention comprises: an enamelled cover which defines the floor of the cooking chamber and the ceiling of the combustion chamber, wherein the enamelled cover has one or more apertures for allowing the passage of the hot air from the combustion chamber into the cooking chamber; and a heat protective shield which is located immediately below the enamelled cover and immediately above the region which is exposed to the ascending flames that are emitted from the gas burner in operation so as to prevent the ascending flames from

hitting the enamelled cover.

[0008] A major advantageous effect of the present invention is that the enamelled cover is protected against deformations, hairline fractures and flaking off by virtue of the heat protective shield which prevent the ascending flames from hitting the enamelled cover. Thereby, the gas oven can be safely operated at the maximum power. With the present invention, the life of the gas oven can be prolonged, and the quality of the gas oven can be improved.

[0009] In an embodiment, wing-like radiators are spanned above the gas burner so as to uniformly radiate the heat towards the enamelled cover and the apertures. The wing-like radiators also have a function similar to the heat protective shield as they prevent the ascending flames from hitting the enamelled cover. In this embodiment, the heat protective shield is disposed immediately above the front end of the gas burner and above the front end of the wing-like radiators so to prevent the ascending flames from hitting the enamelled cover. This embodiment is particularly advantageous as the flames which migrate sideways and upwards around the fringes of the gas burner and the wing-like radiators can be effectively blocked by the heat protective shield, and thus the enamelled cover can be further protected against deformations, hairline fractures and flaking off.

[0010] In another embodiment, the heat protective shield has a reflector section that reflects the heat towards the apertures and away from the said region. This embodiment is particularly advantageous as the cooking chamber can be more uniformly heated, and thus the enamelled cover can be more effectively protected.

[0011] In this embodiment, the heat protective shield extends between the two apertures of the enamelled cover which are are respectively located on the left side and the right side. This embodiment is particularly advantageous as the enameled cover can be effectively protected without obstructing the flow passage of the hot air into the cooking chamber.

[0012] In another embodiment, the combustion chamber, the enamelled cover and the heat protective shield are removably held by the bottom frame of the gas oven. In this embodiment, the gas burner can be serviced through

the bottom frame and the opening of the cooking chamber when the door is opened and the enamelled cover and the heat protective shield have been removed. This embodiment is particularly advantageous as the maintenance of the gas burner can be easily performed.

[0013] In another embodiment, the heat protective shield is removably fixed to the combustion chamber and the bottom frame through a fixing means. In another embodiment, the fixing means comprises a screw connection. These embodiments are particularly advantageous as the heat protective shield can be securely held in place relative to the gas burner, and thus the integrity of the gas oven can be improved.

[0014] In another embodiment, the gas oven has a pyrolytic function which can be selected by the user for initiating the self-cleaning of the cooking chamber. This embodiment is particularly advantageous as the cooking chamber can be easily cleaned through the pyrolysis process.

[0015] Additional features and additional advantageous effects of the gas oven according to the present invention will become more apparent with the detailed description of the embodiments with reference to the accompanying drawings in which:

[0016] Figure 1 - is a schematic partial perspective view of a gas oven according to an embodiment of the present invention, wherein the upper parts of the cooking chamber and the door of the cooking chamber have been omitted for ease of illustration;

[0017] Figure 2 - is a schematic exploded view of the gas oven of Fig. 1;

[0018] Figure 3 - is a schematic top view of the gas oven of Fig. 1;

[0019] Figure 4 - is a schematic sectional view of the gas oven of Fig. 1, taken along the line A-A of Fig. 3;

[0020] Figure 5 - is a schematic sectional view of the gas oven of Fig. 1, taken along the line B-B of Fig. 3.

[0021] The reference signs appearing on the drawings relate to the following technical features.

1. Gas oven
2. Cooking chamber
3. Opening

4. Combustion chamber
5. Gas burner
6. Enamelled cover
7. Aperture
8. Heat protective shield
9. Wing-like radiator
10. Reflector section
11. Bottom frame
12. Fixing means
13. Fastening means
14. Attachment means

[0022] R: The region which is exposed to the ascending flames that are emitted from the gas burner (5).

[0023] The gas oven (1) comprises a cooking chamber (2) for cooking food; an opening (3) for allowing access to the cooking chamber (2), a pivotable door (not shown), a combustion chamber (4) for combusting the gas and a gas burner (5) which is disposed into the combustion chamber (4) (Fig. 1 and Fig. 2).

[0024] The gas oven (1) of the present invention further comprises an enamelled cover (6) which defines the floor of the cooking chamber (2) and the ceiling of the combustion chamber (4), wherein the enamelled cover (6) has one or more apertures (7) for allowing the passage of the hot air from the combustion chamber (4) into the cooking chamber (2) and a heat protective shield (8) which is located immediately below the enamelled cover (6) and immediately above the region (R) which is exposed to the ascending flames that are emitted from the gas burner (5) in operation so as to prevent the ascending flames from hitting the enamelled cover (6) (Fig. 2).

[0025] In an embodiment, the gas oven (1) further comprises wing-like radiators (9) which are symmetrically spanned above the entire length of the gas burner (5) and adapted to shield the ascending flames and to radiate the heat of the combusted gas towards the enamelled cover (6) (Fig. 2). In this embodiment, the gas burner (5) extends from the rear side to the front side

(Fig. 4). In this embodiment, the heat protective shield (8) is disposed immediately above the front end of the gas burner (5) and above the front end of the wing-like radiators (9) which together corresponds to the fringes of the said region (R) (Fig. 4).

[0026] In another embodiment, the heat protective shield (8) has a reflector section (10) which is centered and adapted to reflect the heat of the combusted gas towards the apertures (7) of the enamelled cover (6) and away from the said region (R) (Fig. 5).

[0027] In another embodiment, the enamelled cover (6) has at least two apertures (7) which are located respectively on the left side and the right side and which extend inwardly (Fig. 3). In this embodiment, the heat protective shield (8) extends between the said two apertures (7) across the width of the enamelled cover (6) (Fig. 5).

[0028] In another embodiment, the gas oven (1) further comprises a bottom frame (11) which surrounds the floor of the cooking chamber (2) (Fig. 1 and Fig. 2). In this embodiment, the combustion chamber (4), the enamelled cover (6) and the heat protective shield (8) are removably held by the bottom frame (11) (Fig. 2). In this embodiment, the enamelled cover (6) has a size and shape which allows the servicing of the gas burner (5) through the bottom frame (11) and the opening (3) of the cooking chamber (2) when the enamelled cover (6) and the heat protective shield (8) have been removed (Fig.2 and Fig. 4).

[0029] In another embodiment, the gas oven (1) further comprises a fixing means (12) for removably fixing the heat protective shield (8) to the combustion chamber (4) and the bottom frame (11) (Fig. 2 and Fig. 4).

[0030] In another embodiment, the gas oven (1) further comprises a fastening means (13) for removably fastening the gas burner (5) to the combustion chamber (4) (Fig. 2 and Fig. 4).

[0031] In another embodiment, the gas oven (1) further comprises an attachment means (14) for detachably attaching the enamelled cover (6) to the combustion chamber (4) and the bottom frame (11) (Fig. 2 and Fig. 4).

[0032] In another embodiment, the gas oven (1) further comprises a pyrolytic function for the self-cleaning of the cooking chamber.

[0033] A major advantageous effect of the present invention is that the enamelled cover (6) is protected against deformations, hairline fractures and flaking off by virtue of the heat protective shield (8) which prevents the ascending flames from hitting the enamelled cover (6) (Fig. 4). Thereby, the gas oven (1) can be safely operated at the maximum power. With the present invention, the life of the gas oven (1) can be prolonged, and the quality of the gas oven (1) can be improved. Other advantageous effects of the present invention can be taken from the above-described embodiments.

Claims

1. A gas oven (1) comprising a cooking chamber (2) for cooking food, an opening (3) for allowing access to the cooking chamber (2), a combustion chamber (4) for combusting the gas and a gas burner (5) which is disposed into the combustion chamber (4), **characterized in that** an enamelled cover (6) which defines the floor of the cooking chamber (2) and the ceiling of the combustion chamber (4), wherein the enamelled cover (6) has one or more apertures (7) for allowing the passage of the hot air from the combustion chamber (4) into the cooking chamber (2) and a heat protective shield (8) which is located immediately below the enamelled cover (6) and immediately above the region (R) which is exposed to the ascending flames that are emitted from the gas burner (5) in operation so as to prevent the ascending flames from hitting the enamelled cover (6).
2. The gas oven (1) according to claim 1, **characterized in that** wing-like radiators (9) which are symmetrically spanned above the entire length of the gas burner (5) and adapted to shield the ascending flames and to radiate the heat of the combusted gas towards the enamelled cover (6), wherein the gas burner (5) extends from the rear side to the front side, and wherein the heat protective shield (8) is disposed immediately above the front end of the gas burner (5) and above the front end of the wing-like radiators (9) which together correspond to the fringes of the said region (R).
3. The gas oven (1) according to claim 2, **characterized in that** the heat protective shield (8) has a reflector section (10) which is centered and adapted to reflect the heat of the combusted gas towards the apertures (7) of the enamelled cover (6) and away from the said region (R).
4. The gas oven (1) according to claim 1, **characterized in that** the enamelled cover (6) has at least two apertures (7) which are located respectively on the left side and the right side and which extend inwardly, and the heat protective shield (8) extends between the said two apertures (7) across the width of the enamelled cover (6).
5. The gas oven (1) according to any one of claims 1 to 4, **characterized in that** a bottom frame (11) which surrounds the floor of the cooking chamber (2), wherein the combustion chamber (4), the enamelled cover (6) and the heat

protective shield (8) are removably held by the bottom frame (11), and wherein the enamelled cover (6) has a size and shape which allows servicing of the gas burner (5) through the bottom frame (11) and the opening (3) of the cooking chamber (2) when the enamelled cover (6) and the heat protective shield (8) have been removed.

6. The gas oven (1) according to claim 5, **characterized in that** a fixing means (12) for removably fixing the heat protective shield (8) to the combustion chamber (4) and the bottom frame (11).
7. The gas oven (1) according to claim 1, **characterized in that** a pyrolytic function for the self-cleaning of the cooking chamber.

Fig. 1

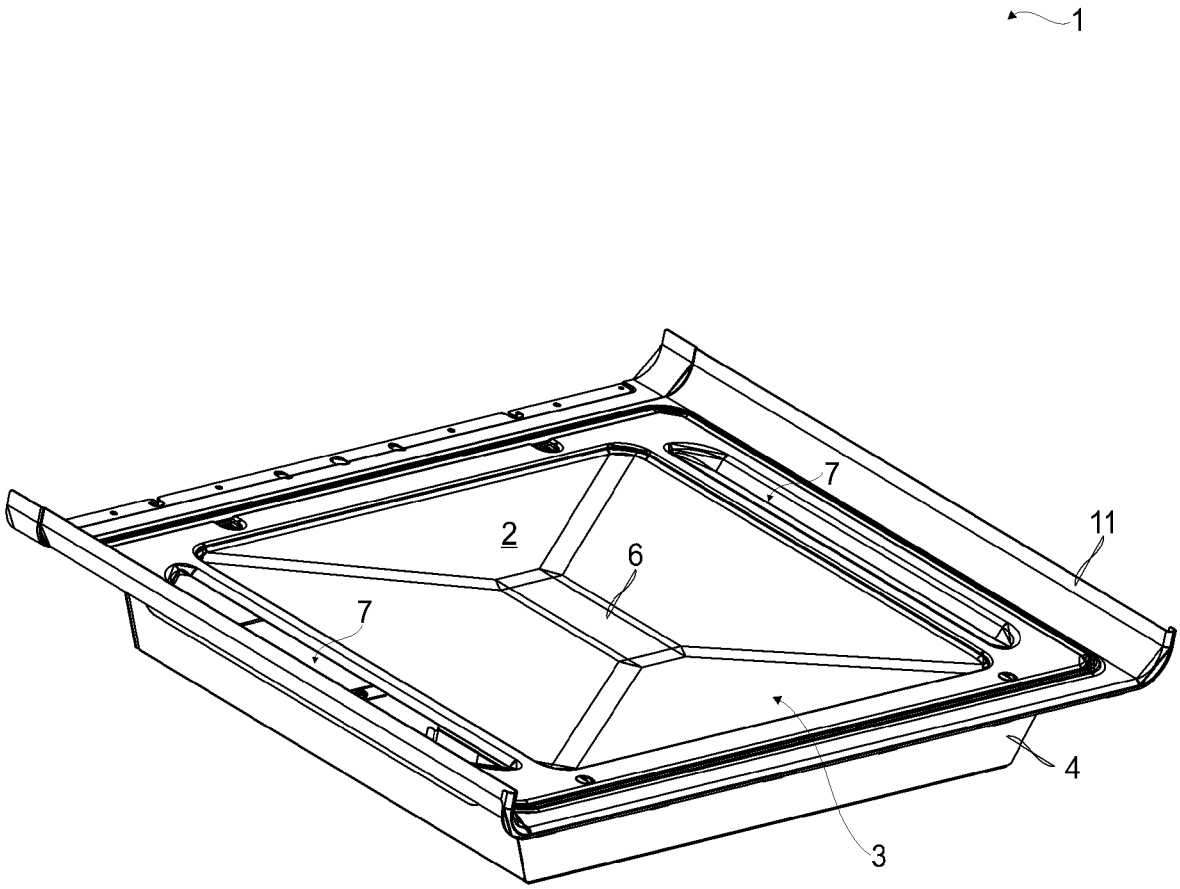


Fig. 2

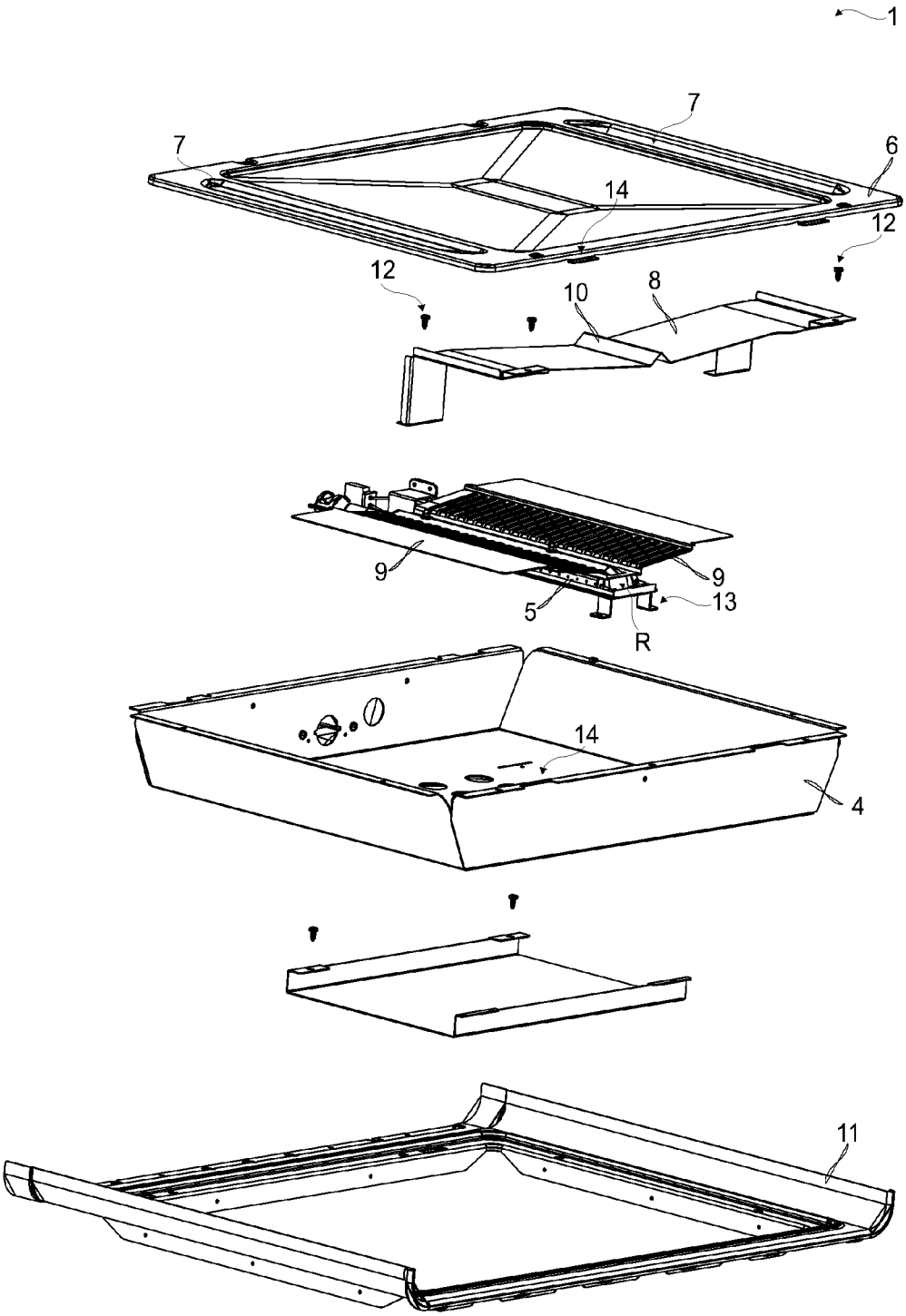


Fig. 3

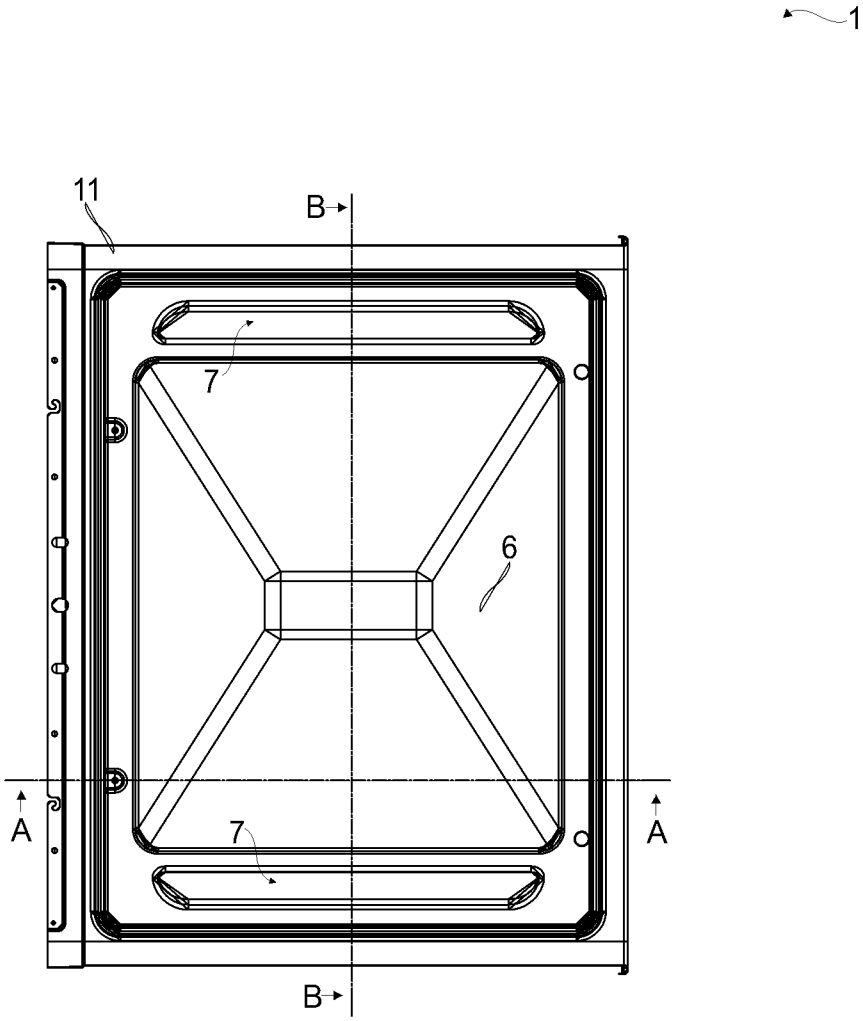


Fig. 4

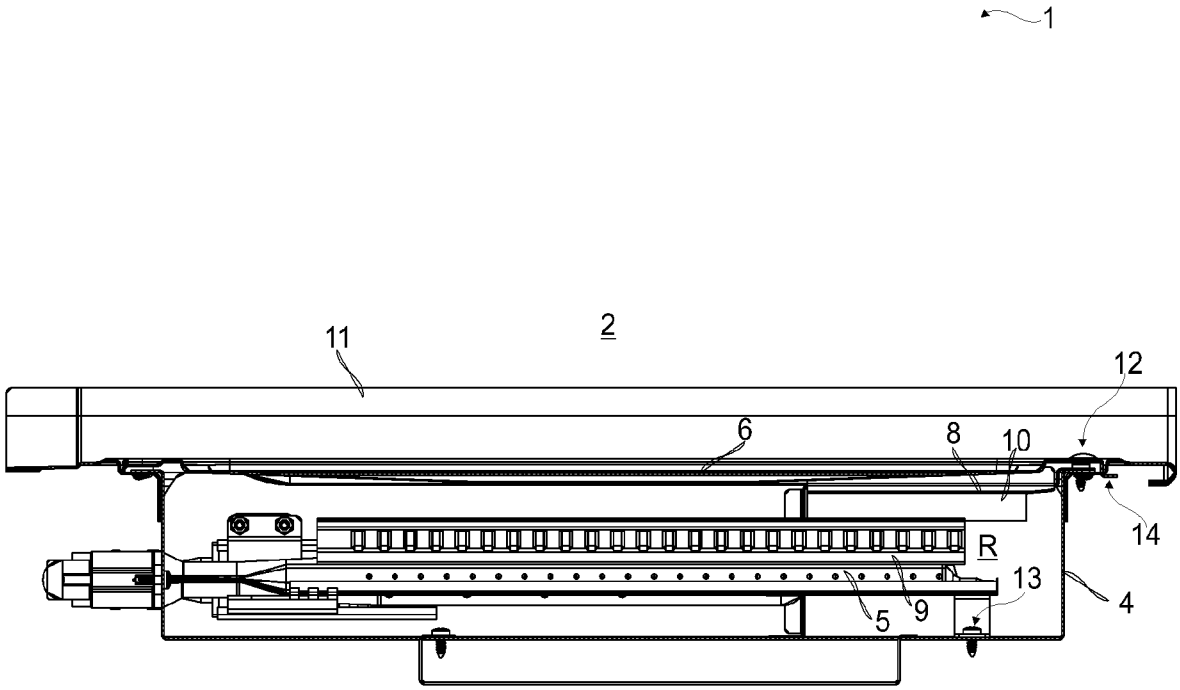
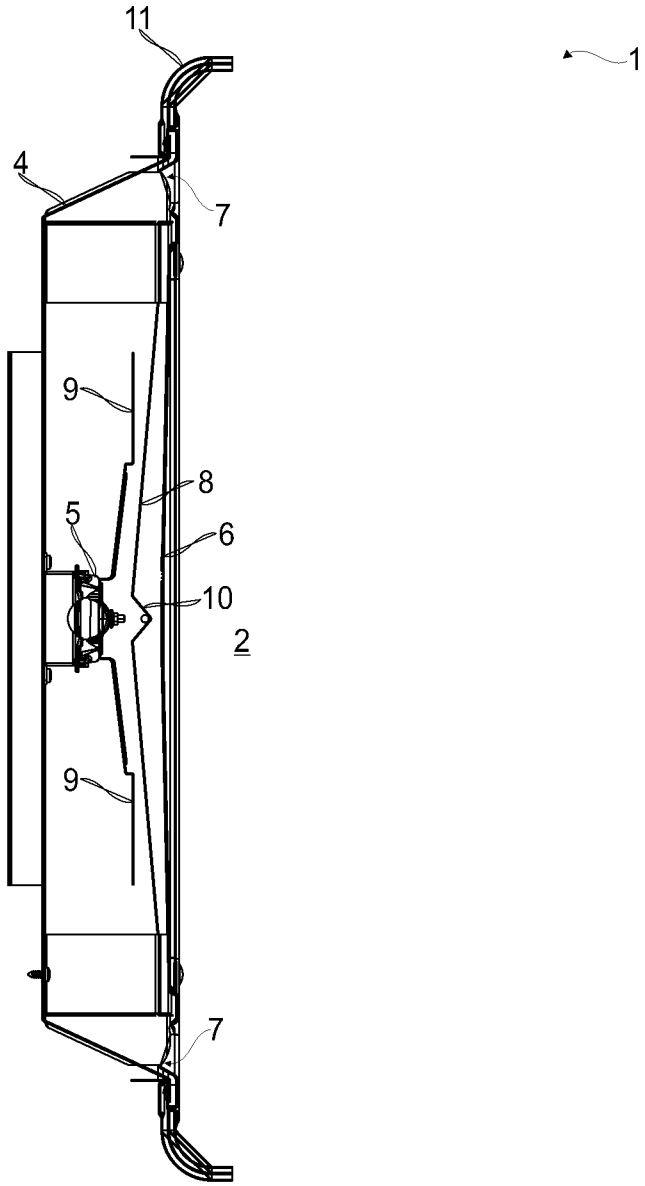


Fig. 5



INTERNATIONAL SEARCH REPORT

WO 2017/097327

International application No
PCT/EPCT/EP2015/078835

A. CLASSIFICATION OF SUBJECT MATTER
INV. F24C3/08 F24C14/02 F24C15/22 F24C15/24
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 039 029 A (EUROP EQUIP MENAGER) 30 July 1980 (1980-07-30) the whole document	1-6
A	EP 1 111 309 A1 (BRANDT COOKING [FR]) 27 June 2001 (2001-06-27) the whole document	5,6
A	US 3 624 743 A (DILLS RAYMOND L) 30 November 1971 (1971-11-30) the whole document	1-6
A	US 3 530 847 A (MYLER GEORGE W ET AL) 29 September 1970 (1970-09-29) the whole document	1-6
A	EP 2 184 545 A1 (INDESIT CO SPA [IT]) 12 May 2010 (2010-05-12) the whole document	1-6

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
9 August 2016	04/11/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Makúch, Milan

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2015/078835

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-6

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-6

   Gas oven comprising wing-like radiators

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2. claim: 7

   gas oven with a pyrolytic function

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2015/078835

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