(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 531 028 A1**

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
28.08.2019 Bulletin 2019/35

(51) Int Cl.:
F24C 15/32 *(2006.01)* ***F24C 15/00*** *(2006.01)*
H05B 6/64 *(2006.01)*

(21) Application number: **19159781.4**

(22) Date of filing: **27.02.2019**

(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:
KH MA MD TN

(30) Priority: **27.02.2018 IT 201800003098**

(71) Applicant: **SMEG S.p.A.**
42016 Guastalla, RE (IT)

(72) Inventors:
- **DALL'OGLIO, Alberto**
  46029 SUZZARA (MN) (IT)
- **MASTILOVIC, Nebojsa**
  42023 CADELBOSCO SOPRA (RE) (IT)

(74) Representative: **Eccetto, Mauro et al**
Studio Torta S.p.A.
Via Viotti, 9
10121 Torino (IT)

(54) OVEN FOR COOKING FOOD

(57) An oven (1) for cooking food comprising a supporting structure (2); a muffle (4), which is housed inside the supporting structure (2), delimits a cooking chamber (5) and comprises a wall (9B), which has an opening (16); a receptacle (15), which is configured to contain water and to be removably arranged in the muffle (4) through the opening (16) in the wall (9B); a first resistor (11), which is configured to heat the cooking chamber (5) and is housed below said wall (9B); and a second resistor (12), which is housed below the wall (9B) at the opening (16) to support and directly heat the receptacle (15) and vaporize the water contained in the receptacle (15).

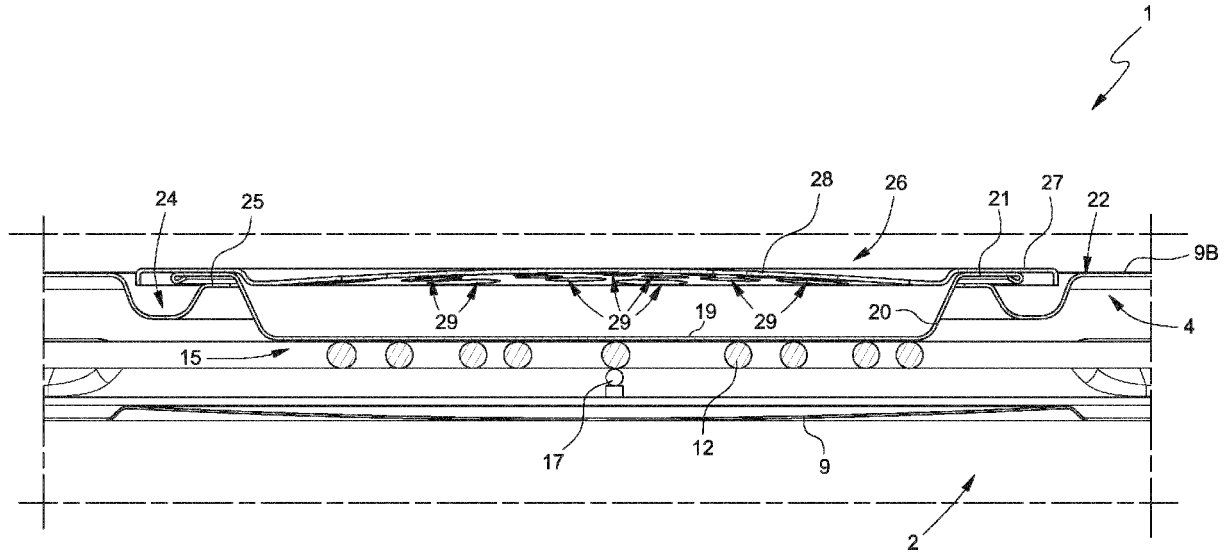

FIG. 3

EP 3 531 028 A1

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This patent application claims priority from Italian patent application no. 102018000003098 filed on 27/02/2018.

TECHNICAL FIELD

[0002] This invention refers to an oven for cooking food.

BACKGROUND ART

[0003] The baking process of certain foods comprises humidification of the cooking chamber by producing water vapour. To this end, various technical solutions have been developed both to feed water into the cooking chamber and to control the vapour production in the cooking chamber itself.

[0004] However, the technical solutions available are sometimes too complicated or not entirely satisfactory as regards the efficiency of water vapour production or because they can damage the muffle of the oven.

DISCLOSURE OF INVENTION

[0005] It is a purpose of the present invention to provide a humidified oven for cooking food that is simple, practical and functional and mitigates the drawbacks of the known art.

[0006] In accordance with the present invention an oven for cooking food is provided, the oven comprising a supporting structure; a muffle, which is housed inside the supporting structure, delimits a cooking chamber and comprises a wall, which has an opening; a receptacle, which is configured to contain water and to be removably arranged in the muffle and through the opening in the wall; a first resistor, which is configured to heat the cooking chamber and is housed below said wall; and a second resistor, which is housed below the wall at the opening to support and directly heat the receptacle and to vaporize the water contained in the receptacle.

[0007] Thus, the oven structure is particularly simple and the direct contact between the second resistor and the receptacle allows the water to be heated and vaporized quickly. Furthermore, the fact that the receptacle is not integral with the resistor allows the easy removal of the receptacle for its cleaning.

[0008] In particular, the second resistor is supported by a supporting member at the opening.

[0009] This prevents the water and receptacle load from deforming or shifting the second resistor.

[0010] In particular, the receptacle has a bottom wall configured to be arranged in contact with said second resistor.

[0011] In this way, the second resistor advantageously extends in a plane.

[0012] Advantageously, the receptacle comprises a flared lateral wall for centring the receptacle with respect to the opening and the second resistor.

[0013] In particular, the receptacle comprises an upper annular wall that covers, at least partially, the portion of the wall adjacent to the opening.

[0014] This prevents unwanted material from entering below the wall.

[0015] In particular, said wall has a main plane and a shaped rim around said opening, the shaped rim being arranged at a lower level with respect to the main plane.

[0016] This configuration allows the receptacle to be placed completely under the main plane of the lower wall. As a result, the receptacle does not limit the space inside the muffle.

[0017] In particular, the shaped rim comprises an annular groove to allow the receptacle to be gripped.

[0018] In particular, the distance of the second resistor from the wall is such that the receptacle is spaced from the wall.

[0019] In practice, this configuration allows to prevent direct contact between the receptacle and the muffle wall in order to avoid any damage to the muffle.

[0020] In particular, the oven comprises a lid to close the receptacle. The lid is provided with holes and is substantially at the same level as the main plane of the muffle.

[0021] The holes are designed to allow the vapour generated in the receptacle to flow and the fingers to be inserted for an easy grip of the lid.

[0022] In particular, the first and second resistors are independently controlled from each other to independently regulate the temperature in the muffle and the production of water vapour.

[0023] In particular, the wall is selectively removable from the oven so as to allow the underlying part of the muffle to be cleaned.

[0024] In addition, the first and second resistors are connected to the back wall of the muffle in a tilting manner and rest on the lower wall of the muffle in order to define a stable position for the first and second electrical resistors and, at the same time, allow the muffle to be cleaned.

[0025] In particular, the muffle is made of enamelled steel. This technical solution is particularly cost-effective and can be implemented since the heating or hot bodies are not arranged in direct contact with the muffle.

[0026] On the contrary, the receptacle is made of unenamelled metal material that withstands high temperatures when contacting the resistor.

BRIEF DESCRIPTION OF THE DRAWINGS

[0027] Further features and advantages of the present invention will be apparent from the following description of a non-limiting embodiment thereof, with reference to the figures of the accompanying drawings, wherein:

- Figure 1 is a sectional view, with parts removed for

clarity, of a humidified oven made in accordance with the present invention;

- Figure 2 is a sectional view of a detail of Figure 1, with parts removed for the sake of clarity and on an enlarged scale; and
- Figure 3 is a sectional view, with parts removed for clarity, of a detail of Figure 1 on a horizontal section plane.

BEST MODE FOR CARRYING OUT THE INVENTION

[0028] In Figure 1 reference numeral 1 indicates an oven for cooking food. The oven 1 comprises a supporting structure 2; a door 3 hinged to the supporting structure 2; and a muffle 4, which is housed in the supporting structure 2 and defines a cooking chamber 5, together with the door 3.

[0029] The oven 1 is substantially shaped like a solid body, the outer surface of which is defined by the supporting structure 2 and the door 3. The supporting structure 2 substantially comprises five walls defining five faces that are substantially orthogonal to each other. The muffle 4 has five walls and is spaced with respect to the supporting structure 2 in order to define a gap between the supporting structure 2 and the muffle 4.

[0030] In more detail, the muffle 4 comprises a back wall 6, two lateral walls 7, an upper wall 8, and a lower wall 9. The gap discontinuously extends along all the walls 6, 7, 8 and 9 of the muffle 4 and is designed to thermally insulate the muffle 4 from the supporting structure 2. The oven 1 comprises heating resistors 10, 11, 12, which are designed to heat the cooking chamber 5 and are variously located inside the muffle 4; a fan 13 arranged at the back wall 6; and a suction system 14 arranged at the upper wall 8 to evacuate excess vapour or fumes from the cooking chamber 5.

[0031] The oven 1 also comprises a receptacle 15 configured to contain water to be vaporized in the cooking chamber 5.

[0032] According to what is better illustrated in Figure 3, the muffle 4 comprises an additional wall 9B, which is substantially parallel to the lower wall 9, is arranged above the wall 9 so as to form a space between the walls 9 and 9B and has a circular opening 16 connecting the cooking chamber 5 with the underlying space. The receptacle 15 is configured to be arranged in a removable way in the muffle 4 and, partially, in said space through the opening 16 in the wall 9B.

[0033] The resistor 12 is designed to heat the receptacle 15 and to vaporize the water contained in the receptacle 15 and extends in the space between the lower wall 9 and the wall 9B and from the back wall 6 to the space below the opening 16. The receptacle 15 is arranged resting on the resistor 12 in order to achieve a fast heating and a rapid vaporization of the water.

[0034] With reference to Figure 2, the resistor 12 is mounted on the back wall 6 forming a set of coils, and is supported by a supporting member 17 at the opening 16. In particular, the supporting member 17 is anchored to the resistor 11, which extends around the resistor 12, is also mounted on the back wall 6, and is supported at the band opposite the back wall 6 by a supporting member 18 arranged resting on the lower wall 9 of the muffle 4. In practice, the supporting members 17 and 18 are bars provided with feet resting on the lower wall 9 of the muffle 4. The resistors 11 and 12 are independently controlled from each other to regulate in an independent manner the temperature in the cooking chamber 5 and the amount of vapour respectively.

[0035] In particular, the wall 9B is selectively removable so as to allow access to the underlying resistors 11 and 12, which are articulated to the back wall 6. The articulation of the resistors 11 and 12 can be made through a screw connection with the interposition of springs or other elastic elements which are not shown in the accompanying Figures.

[0036] With reference to Figure 3, the receptacle 15 has a flat bottom wall 19 configured to be arranged in direct contact with the resistor 12; a flared lateral wall 20 connected to the bottom wall 19; and an annular wall 21, which is connected to the lateral wall 20 and extends outwards. In practice, the receptacle 15 is shaped like a plate, the capacity of which depends on the height measured between the bottom wall 17 and the annular wall 19.

[0037] The wall 9B of the muffle 4 defines a main plane 22 and has a shaped rim 23, which delimits the opening 16 and is lowered compared to the main plane 22. The shaped rim 23 comprises an annular groove 24 to allow the receptacle 15 to be gripped. For this purpose, the annular wall 21 is partially extended above the groove 24 so that the fingers can be inserted into the groove 24 and below the annular wall 21 so as to easily remove the receptacle 15.

[0038] The rim 23 also comprises a flat annular portion 25. In practice, the lower wall 9 has, around the opening 16 and in sequence towards the opening 16, the groove 24 and the portion 25.

[0039] The distance in a vertical direction of the resistor 12 to the wall 9 is such that the receptacle 15 is spaced from the shaped rim 23 and there is no contact between the receptacle and the wall 9. In practice, the portion 25 and the annular wall 21 are not in mutual contact and the lateral wall 20 is spaced from the same portion 25.

[0040] The oven 1 comprises a lid 26 to partially close the receptacle 15 and, at least partially, the groove 24. The lid 26 has the shape of a disc, is shaped to be centred on the receptacle 15, and has an annular rim 27 configured to be arranged on the annular wall 21; and a central body 28 provided with holes 29 that allow the fingers to pass for removing or positioning the lid 26, and the vapour to flow during the vapour generation.

[0041] The muffle 4 is preferably made of enamelled steel, while the receptacle 15 and the lid are made of unenamelled metal material, preferably steel.

[0042] It is evident that modifications and variations can be made to the oven described herein while remain-

ing within the scope of protection of the appended claims.

Claims

1. An oven for cooking food, the oven (1) comprising a supporting structure (2); a muffle (4), which is housed inside the supporting structure (2), delimits a cooking chamber (5) and comprises a wall (9B), which has an opening (16); a receptacle (15), which is configured to contain water and to be removably arranged in the muffle (4) and through the opening (16) in the wall (9B); a first resistor (11), which is configured to heat the cooking chamber (5) and is housed below said wall (9B); and a second resistor (12), which is housed below the wall (9B) at the opening (16) to support and directly heat the receptacle (15) and vaporize the water contained in the receptacle (15).

2. The oven as claimed in Claim 1, wherein the second resistor (12) is supported by a supporting member (17) at the opening (16).

3. The oven as claimed in any one of the foregoing Claims, wherein the receptacle (15) has a bottom wall (19) configured to be arranged in contact with said second resistor (12).

4. The oven as claimed in any one of the foregoing Claims, wherein the receptacle (15) comprises a flared lateral wall (20) for centring the receptacle (15) with respect to the opening (16) and the second resistor (12).

5. The oven as claimed in any one of the foregoing Claims, wherein the receptacle (15) comprises an upper annular wall (21) that covers, at least partially, a portion of the wall (9B) adjacent to the opening (16).

6. The oven as claimed in any one of the foregoing Claims, wherein the wall (9B) of the muffle (4) has a main plane (22) and a shaped rim (23), which extends around said opening (16) and is arranged at a lower level with respect to the main plane (22).

7. The oven as claimed in Claim 6, wherein the shaped rim (23) comprises an annular groove (24) to allow the receptacle (15) to be gripped.

8. The oven as claimed in any one of the foregoing Claims, wherein the distance of the second resistor (12) from said wall (9B) is so selected to keep the receptacle (15) spaced from the wall (9B).

9. The oven as claimed in any one of the foregoing Claims, and comprising a lid (26) for closing the receptacle (15), the lid (26) being provided with holes (29) to allow the lid (26) to be gripped and the vapour to flow.

10. The oven as claimed in any one of the foregoing Claims, wherein the first and second resistors (11, 12) are independently controlled from each other.

11. The oven as claimed in any one of the foregoing Claims, wherein the wall (9B) is selectively removable from the oven (1).

12. The oven as claimed in any one of the foregoing Claims, wherein the first and the second resistors are connected to the back wall (6) of the muffle (4) in a tilting manner and rest on the lower wall (9) of the muffle (4).

13. The oven as claimed in any one of the foregoing Claims, wherein the muffle (4) is made of enamelled steel.

14. The oven as claimed in any one of the foregoing Claims, wherein the receptacle (15) and the lid (26) are made of unenamelled metal.

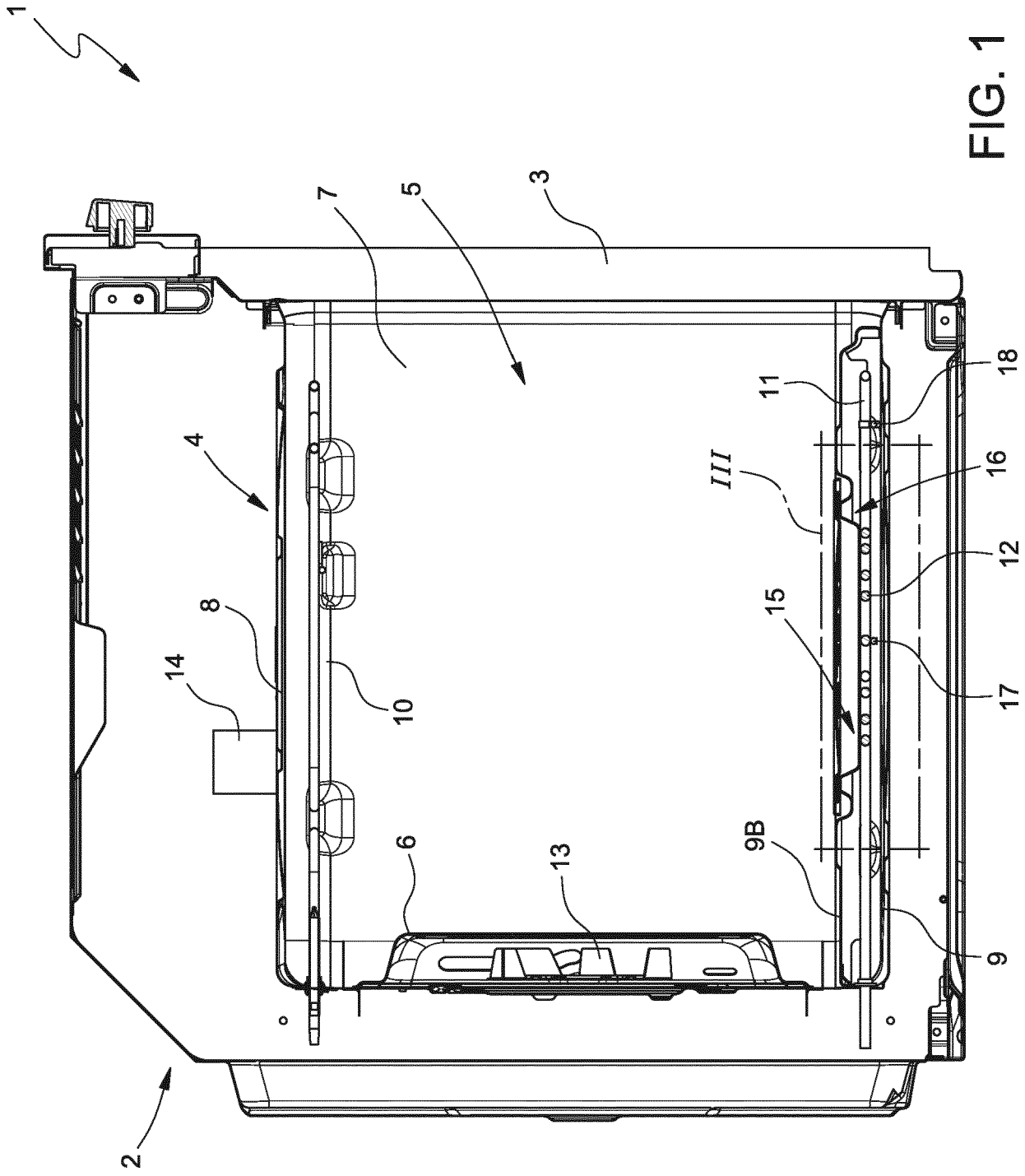

FIG. 1

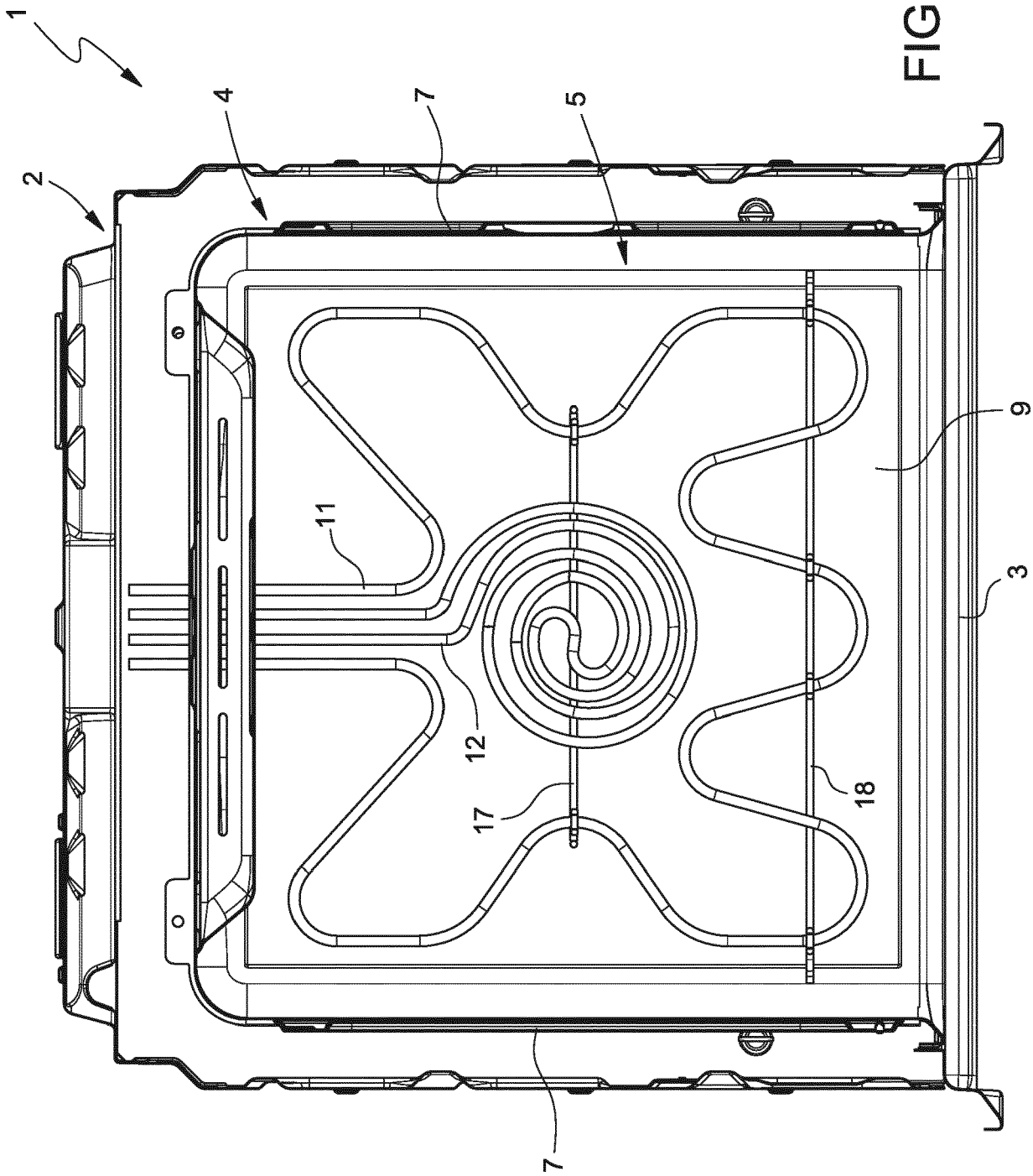

FIG. 2

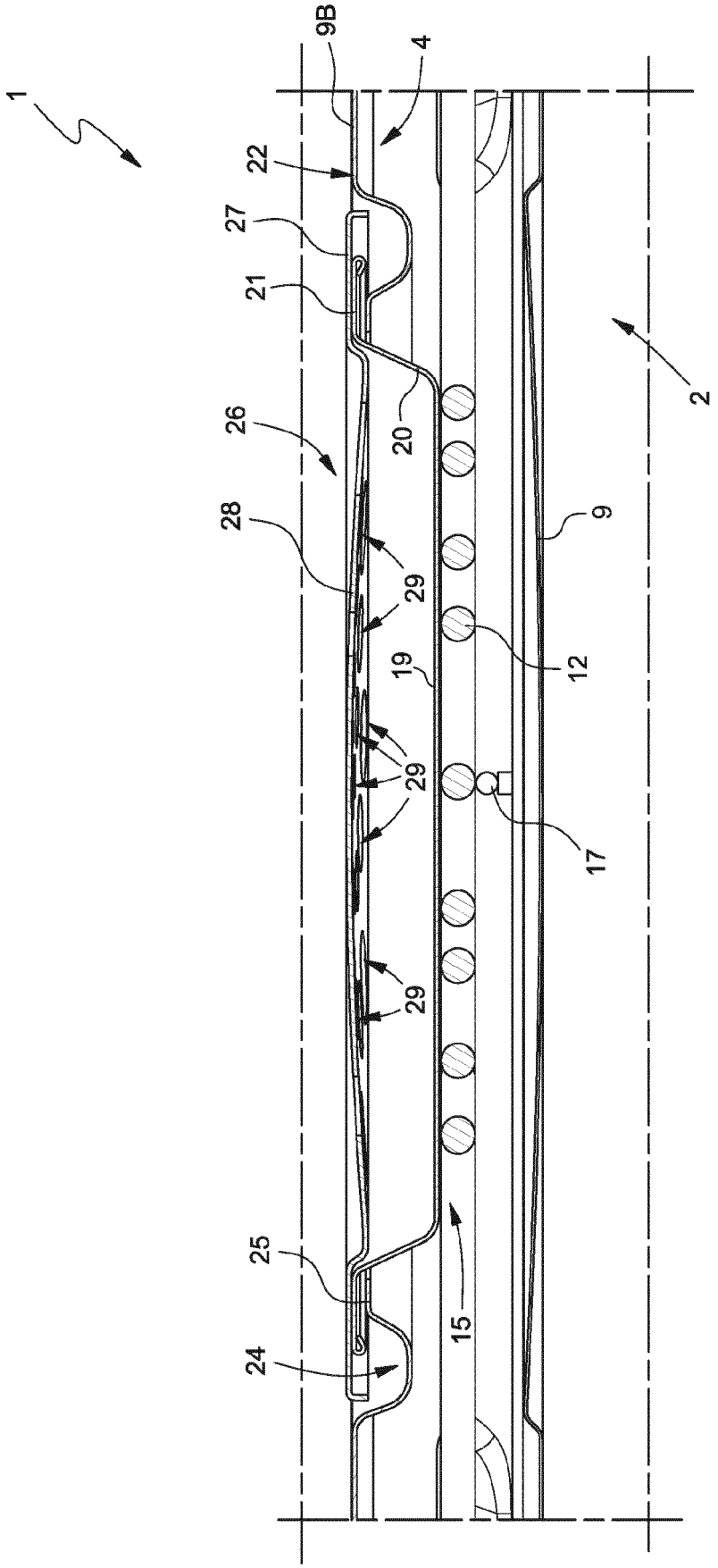

FIG. 3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 19 15 9781

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 0 517 681 A2 (SMEG SPA [IT]) 9 December 1992 (1992-12-09)	1-7, 9-11,13, 14	INV. F24C15/32 F24C15/00
A	* column 2, line 54 - column 3, line 9; figures 1,3,4 *	8,12	H05B6/64

A	EP 1 995 525 A1 (INDESIT CO SPA [IT]) 26 November 2008 (2008-11-26) * the whole document *	1-14	

A	DE 10 2010 029326 A1 (BSH BOSCH SIEMENS HAUSGERAETE [DE]) 1 December 2011 (2011-12-01) * the whole document *	1-14	

A	WO 2009/065197 A1 (WHIRLPOOL SA [BR]; WESTPHAL HARTKE CRISTINA [BR]) 28 May 2009 (2009-05-28) * the whole document *	12	

TECHNICAL FIELDS SEARCHED (IPC)

F24C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	27 June 2019	Rodriguez, Alexander

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 15 9781

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.

27-06-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0517681 A2	09-12-1992	NONE	
EP 1995525 A1	26-11-2008	NONE	
DE 102010029326 A1	01-12-2011	DE 102010029326 A1	01-12-2011
		WO 2011147678 A1	01-12-2011
WO 2009065197 A1	28-05-2009	BR PI0705924 A2	21-07-2009
		WO 2009065197 A1	28-05-2009

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

- IT 102018000003098 **[0001]**