(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
5 October 2017 (05.10.2017)

WIPO | PCT

(10) International Publication Number
WO 2017/168376 A1

(51) International Patent Classification:
F24C 7/06 (2006.01) *H05B 3/06* (2006.01)
A47J 37/07 (2006.01) *H05B 1/00* (2006.01)

(21) International Application Number:
PCT/IB2017/051842

(22) International Filing Date:
31 March 2017 (31.03.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
AU2016901199 31 March 2016 (31.03.2016) AU

(71) Applicant: **UNISITE PTY LTD** [AU/AU]; 10 Maddison Court, Bundaberg, Queensland 4670 (AU).

(72) Inventors: **ROWLAND, Anthony**; 10 Maddison Court, Bundaberg, Queensland 4670 (AU). **ROWLAND, Harvey**; 10 Maddison Court, Bundaberg, Queensland 4670 (AU).

(74) Agent: **ASHBY, Kevin**; 6 Nullamanna Rd, Camp Mountain, Queensland 4520 (AU).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: COOKING APPARATUS AND METHOD OF ASSEMBLY

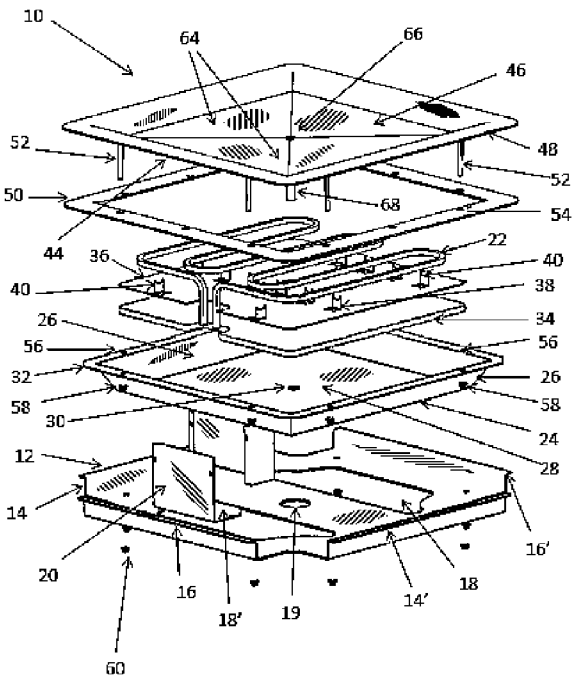

FIGURE 1

(57) Abstract: The invention relates to electrical cooking apparatus and a method of increasing heat utilisation at the cooking surface of such apparatus, by improving heat spread, wherein a compressible layer is placed against an electrical heating element to urge it against the underside of a cooking plate to be heated. The apparatus is adapted for outdoor use and in particular at public areas such as community picnic facilities and camping grounds.

WO 2017/168376 A1

Declarations under Rule 4.17:

— *as to the identity of the inventor (Rule 4.17(i))*

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

DESCRIPTION

TITLE: COOKING APPARATUS AND METHOD OF ASSEMBLY

Field of invention

[01] This invention relates to electrical cooking apparatus and a method of increasing heat utilisation at the cooking surface of such apparatus.

Background to the invention

[02] Electrically powered barbecue (BBQ) installations that are provided in public areas, such as parks, picnic sites and camping grounds, typically comprise a housing into which is installed a heating apparatus, which presents a cooktop of stainless steel, defining a heatable cooking surface. Such installations generally have an on/off switch and/or control dial connected to operate a thyristor or similar, to switch on a heating element, which is housed securely in a tamper-resistant heating enclosure. The enclosure comprises an assembly of components and is mounted in a cavity below the cook top. Such installations, unfortunately, are notorious for uneven heat distribution within the cooking surface, symptomized by clearly noticeable relatively hot and cold areas. This can lead to meat placed on the surface being stewed instead of seared. This tends to lengthen the overall cooking process, leading to unnecessary energy consumption.

[03] Part of this problem is caused by poor thermal contact between the heating element and the lower surface of the cooking plate, with consequent warping of the usually stainless steel cooking plate and irregular expansion, creating air gaps for heat to escape. Another factor is that the stainless steel plate is a relatively poor conductor of heat compared with metals such as copper, for example. This property militates against achievement of even heat distribution throughout the cooking plate area. Stainless steel, however, is a preferred material of construction because of its ruggedness, which makes it suitable for application in public areas where is runs high risk of misuse and even of vandalism.

[04] Energy efficiency impacts on operating expenses, with indirect effects on the social fabric when jobs are lost due to the scaling back of operations, the complete removal of cooking amenities of the present kind or, at worst, park closures.

Objects of the invention

[05] It is an object of this invention to address the shortcomings of the prior art and, in doing so, to provide a cooking apparatus with improved heat spread characteristics.

[06] A further object of the invention is to provide a method of increasing energy efficiency in cooking apparatus.

[07] The preceding discussion of the background to the invention is intended to facilitate an understanding of the present invention. However, it should be appreciated that the discussion is not an acknowledgement or admission that any of the material referred to was part of the common general knowledge in Australia or elsewhere as at the priority date of the present application.

[08] Further, and unless the context clearly requires otherwise, throughout the description and the claims, the words 'comprise', 'comprising', and the like are to be construed in an inclusive sense - that is to say, in the sense of "including, but not being limited to" - as opposed to an exclusive or exhaustive sense - that is to say meaning "including this and nothing else".

Summary of invention

[09] According to a first aspect of the invention, there is provided a cooking apparatus comprising an electrical heating element and an abutting cooking plate and biasing means located to bias the element against the plate.

[010] In a preferred form of the invention, the biasing means comprises a compressible layer and a surface supporting the layer, the layer being located between said supporting surface and the heating element.

[011] In a further preferred form of the invention, the compressible layer comprises frangible fibres.

[012] In an embodiment, the frangible fibres comprise silica. Preferably, the frangible fibres comprise at least 72% by mass silica as SiO_2. Further preferably, the frangible fibres comprise silica in the range from 90% to 98% by mass.

[013] Still further, the cooking apparatus preferably comprises an enclosure having a floor defined by said supporting surface and by a wall peripherally disposed about the floor, the heating element being mounted within the enclosure.

[014] In a yet further preferred form of the invention, the assembly comprises spacing means establishing a space between said compressible layer and the heating element.

[015] In a preferred embodiment, the spacing means comprises a rigid plate. Preferably, the rigid plate comprises polished stainless steel providing a thermally reflective surface.

[016] In a further preferred embodiment, the plate has projections spacing the plate from the heating element. The projections are on a side of the plate opposite to a side against which the compressible layer is disposed.

[017] In a preferred form of the invention, the projections have a cradling formation at their distal ends and are thus adapted for supporting the element at various points along the length of the element. The element is thus spaced from the rigid plate while being urged against the cooking plate underside surface. The projections may be integrally formed with the plate or may be fastened thereto, for example by rivets, or screw-threaded means, or by welding or suitable heat-resistant adhesive.

[018] According to a second aspect of the invention, there is provided a method of increasing efficiency of heat transfer in a cooking assembly having a cooking plate heated by an electrical heating element located below it, the method comprising the step of biasing the element into abutting relationship with the plate.

[019] In a preferred form of the invention, the biasing step comprises providing a compressible layer and a surface for supporting the layer, disposing the layer between said supporting surface and the heating element and urging said supporting surface

toward the cooking plate thereby to exert biasing pressure on the element to press it against the plate.

[020] In an embodiment of the method, the compressible layer comprises frangible fibres.

[021] In a further preferred form of the invention, the method includes the step of allowing at least some of the frangible fibres to break when pressing the element against the plate.

[022] In a yet further preferred form of the invention, the method includes the step of providing a space between said compressible layer and the heating element.

[023] The method preferably further includes interposing spacing means between said element and the compressible layer.

[024] In a preferred form of the invention, the spacing means comprises a rigid plate.

[025] In an embodiment, the spacing means further comprises projections from the rigid plate for spacing the element from the rigid plate. Preferably, the projections are adapted to support the element. The method extends to forming cradle formations at the distal ends of the projections.

[026] Further, according to the invention, the method includes providing an enclosure having a floor defined by said supporting surface and by a wall peripherally disposed about the floor, and mounting the heating element within the enclosure.

[027] The method further includes fastening the enclosure, with the element mounted within, to the cooking plate.

[028] In a further preferred form of the invention, the method includes providing fastening means for use in fastening the enclosure and cooking plate together in thermally sealing relationship.

Brief description of drawings

[029] In order that the invention may be readily understood, and put into practical effect, reference will now be made to the accompanying illustrations:

[030] Figure 1 is a perspective view of a preferred embodiment of the cooking apparatus of this invention in exploded form.

[031] Figure 2 is a cross-sectional view of the apparatus enclosure when operatively mounted.

Detailed description of an embodiment of the invention

[032] Referring to Figure 1, in a preferred embodiment of this invention, an example of electrical cooking apparatus, according to the invention, is generally denoted by the number 10 and shown in sideways exploded perspective view.

[033] The heating apparatus is configured for mounting as an assembly into a secure housing, the relevant benchtop portion of which is shown in Figure 2. Access to the housing is via a lockable door, not shown. A rectangular aperture 74 is cut into the benchtop 72. The aperture is sized for receiving the assembly into a cavity in the housing, as will be described in more detail below.

[034] The apparatus has an assembly clamp 12, which is shaped to have lipped formations 14, 14', 16, 16' to be brought into abutment with the underside 76 of benchtop 72 peripheral to aperture 74.

[035] An element enclosure tray 24 is adapted to rest on the assembly clamp. It has sides 26 and a floor 28 with a centrally located aperture 30 and a protruding lip 32. The lip has apertures through which it is fastened to the underside of a cooking plate 46.

[036] Assembly clamp 12 further has twin apertures 18, 18' and a central aperture 19 to allow for ventilation and avoid excessive heat build-up in the electrical components (not shown) located in the zone below enclosure tray 24. A thermostat housing is spot welded to the element enclosure tray 24 and provides protection and mounting support for a thermostat (not shown). The thermostat housing cover plate 20 is bolted on to the

thermostat housing, to cover the wiring that is connected to the electrical heating element 22.

[037] A textile glass insulating barrier sheet 34 is placed in enclosure tray 24, to cover its floor 28. A preferred example of a textile glass product is a silica glass needle mat having silica of about 95% as SiO_2. A supplier of this product is the Australian corporation, Aleteck Pty Ltd, of 73-75 Thabeban Street, Bundaberg, QLD.

[038] Upon insulating barrier sheet 34, is placed an element keeper plate 36, having a plurality of upwardly projecting spacer tabs 38. Each of the tabs has a cradle formation 40 at its summit edge, shaped for cradling the heating element 22 substantially equidistantly from keeper plate layer 36, defining an intervening space, so that an air-filled barrier layer exists between them. The tabs are cut and folded up out of the keeper plate, although other suitable fastening means may be employed.

[039] The keeper plate is made from stainless steel, polished to enhance its reflectivity. It assists in directing dissipated heat from the element back toward the underside of the cooking plate.

[040] Because the insulating barrier sheet 34 is of a compressible nature compared with the sheets above and below it, its compressibility provides biasing forces that act upwardly through the support sheet and its cradle formations to urge the element against the underside 44 of the cooking plate 46. This biasing effect is established when cooking plate 44 is urged towards tray 24 in the process of being secured thereto. This is described further below.

[041] The cooking plate is of rectangular shape and made of stainless steel. It is of conventional design, having a peripheral raised lip 48 that seats on a bench gasket 50. The gasket is made of thermally resistant vulcanized textile fibre of known composition.

[042] The cooking plate has locator pins 52 that locate into and through correspondingly located apertures 54 on the bench gasket and aligned apertures 56 in the element enclosure tray lip 32. The bench gasket rests on lip 32. The locating pins are threaded to enable them to be engaged by correspondingly threaded nuts 58 for

positioning below the enclosure tray. When the nuts are engaged with the locating pins and screwed upwardly, this causes the assembly components described above to come into abutment with each other. When the lower tray approaches the element and urges it via the cradles against the underside of the cooking plate, this places the insulating layer 34 under compression. As a result of the compression, some of the frangible fibres in the insulating layer break. Further fibres will (and are allowed and expected to) break until lip 32 of the support tray 24, gasket 50 and lip 48 of the cooking plate are firmly clamped together, being held by the nuts on the locating pins. Unless further fibres break, the degree of compression achieved is evenly maintained. Breakage is unlikely without further relative movement of the clamped elements. The stable condition achieved by this laminar structure is reproduced with each heating cycle.

[043] Cooking plate 46 has four facets 64 sloping to a central drain aperture 66 leading into a drain pipe 68. The drain pipe is fitted to pass through correspondingly located apertures in support layer 36, insulating layer 34, enclosure tray 24 and assembly clamp 12. It drains liquid from the cooking surface to a receptacle in the housing, or to a drainage installation leading to a grease trap or other waste disposal apparatus (not shown).

[044] Additional nuts 60 enable fastening of the element enclosure sub-assembly described above to the assembly clamp, so as to grip the housing bench-top 72, as illustrated in the cross sectional diagram of Figure 2. The nuts hold assembly clamp 12 up against the underside 76 of the bench, pulling cooking plate 46 down firmly on to the upper surface of the bench top.

[045] Optionally, to improve conductive heat transfer from the heating element to the cooking plate and distribution of the heat throughout, a copper or other suitable coating may be applied to the underside of the plate. This result may be obtained by known techniques, such as fusing or electroplating.

[046] It will be appreciated that instead of having a barrier layer of silica textile as contemplated in this invention, alternative thermal barrier materials may be used where they possess comparable compressibility, whether resilient or not. Where silica textile is

used, it preferably has a SiO_2 content of at least 70% by mass, further preferably 95% or more by mass. Preferably, the frangible fibres comprise at least 72% by mass silica as SiO_2. Further preferably, the frangible fibres comprise silica in the range from 90% to 98% by mass.

[047] The compression effect the barrier layer 34, and the reflective polished stainless steel element-keeper plate above it, ensure a constant even pressure being exerted on the element, pressing it against the cooking plate. Avoidable air gaps are eliminated and thermally effective contact between the element and the underside of the plate is ensured, over the entire operating temperature range of the apparatus, including fluctuations in temperature during use.

[048] The entire inside, including floor and internal side surfaces of the element enclosure are preferably well insulated with a high performance insulation sheet of the kind described above. This is to ensure that as much as possible of the heat emitted from the element is trapped in the enclosure zone below it, which is bounded by the keeper plate and the sides of the enclosure tray, and is allowed to escape upward through the cooking plate only, achieving maximum efficiency in the use of the supplied energy.

[049] The barrier sheet in other embodiments is therefore cut appropriately, preferably to fit not only over the floor of the enclosure or containment tray, but also up the adjacent sloping side walls until meeting the underside of the cooking plate periphery.

[050] The element keeper ensures maximum surface contact of the element against the under-surface being retained, despite possible relative displacement between plate and element caused by expansion or contraction from change of temperature.

[051] In alternative embodiments, the cooking plate may have different shapes and food-containment formations, wall inclines lip profiles and the like.

[052] These embodiments merely illustrate particular examples of the assembly kit and apparatus of the invention providing for improved heat utilisation in an electrically powered cooktop apparatus. With the insight gained from this disclosure, the person

skilled in the art is well placed to discern further embodiments by means of which to put the claimed invention into practice.

end

CLAIMS

The claims defining the invention are:

1. A cooking apparatus comprising an electrical heating element and an abutting cooking plate and biasing means located to bias the element against the plate.

2. The cooking apparatus of claim 1 wherein the biasing means comprises a compressible layer and a surface supporting the layer, the layer being located between said supporting surface and the heating element.

3. The cooking apparatus of claim 2 wherein the compressible layer comprises frangible fibres.

4. The cooking apparatus of claim 3 wherein the frangible fibres comprise silica.

5. The cooking apparatus of claim 4 wherein the frangible fibres comprise at least 72% by mass silica as SiO_2.

6. The cooking apparatus of claim 5 comprising silica in the range from 90% to 98% by mass.

7. The cooking apparatus of any one of claims 2 to 4 further comprising an enclosure having a floor defined by said supporting surface and by a wall peripherally disposed about the floor, the heating element being mounted within the enclosure.

8. The cooking apparatus of any one of claims 2 to 5 further comprising spacing means establishing a space between said compressible layer and the heating element.

9. The cooking apparatus of claim 8 wherein the spacing means comprises a rigid plate.

10. The cooking apparatus of claim 9 wherein the rigid plate comprises polished stainless steel providing a thermally reflective surface.

11. The cooking apparatus of any one of claims 8 to 10 wherein the rigid plate has projections for spacing the plate from the heating element.

12. A method of increasing efficiency of heat transfer in a cooking assembly having a cooking plate heated by an electrical heating element located below it, comprising the step of biasing the element into abutting relationship with the plate.

13. The method of claim 12 wherein the biasing step comprises providing a compressible layer and a surface for supporting the layer, disposing the layer between said supporting surface and the heating element and urging said supporting surface toward the cooking plate thereby to exert biasing pressure on the element to press it against the plate.

14. The method of claim 13 wherein the compressible layer comprises frangible fibres.

15. The method of claim 14 including allowing at least some of the frangible fibres to break when pressing the element against the plate.

16. The method of claim 15 wherein the frangible fibres comprise silica.

17. The method of any one of claims 13 to 16 including providing a space between said compressible layer and the heating element.

18. The method of claim 17 including interposing spacing means between said element and the compressible layer.

19. The method of claim 18 wherein the spacing means comprises a rigid plate.

20. The method of claim 19 wherein the spacing means further comprises projections from the rigid plate for spacing the element from the rigid plate.

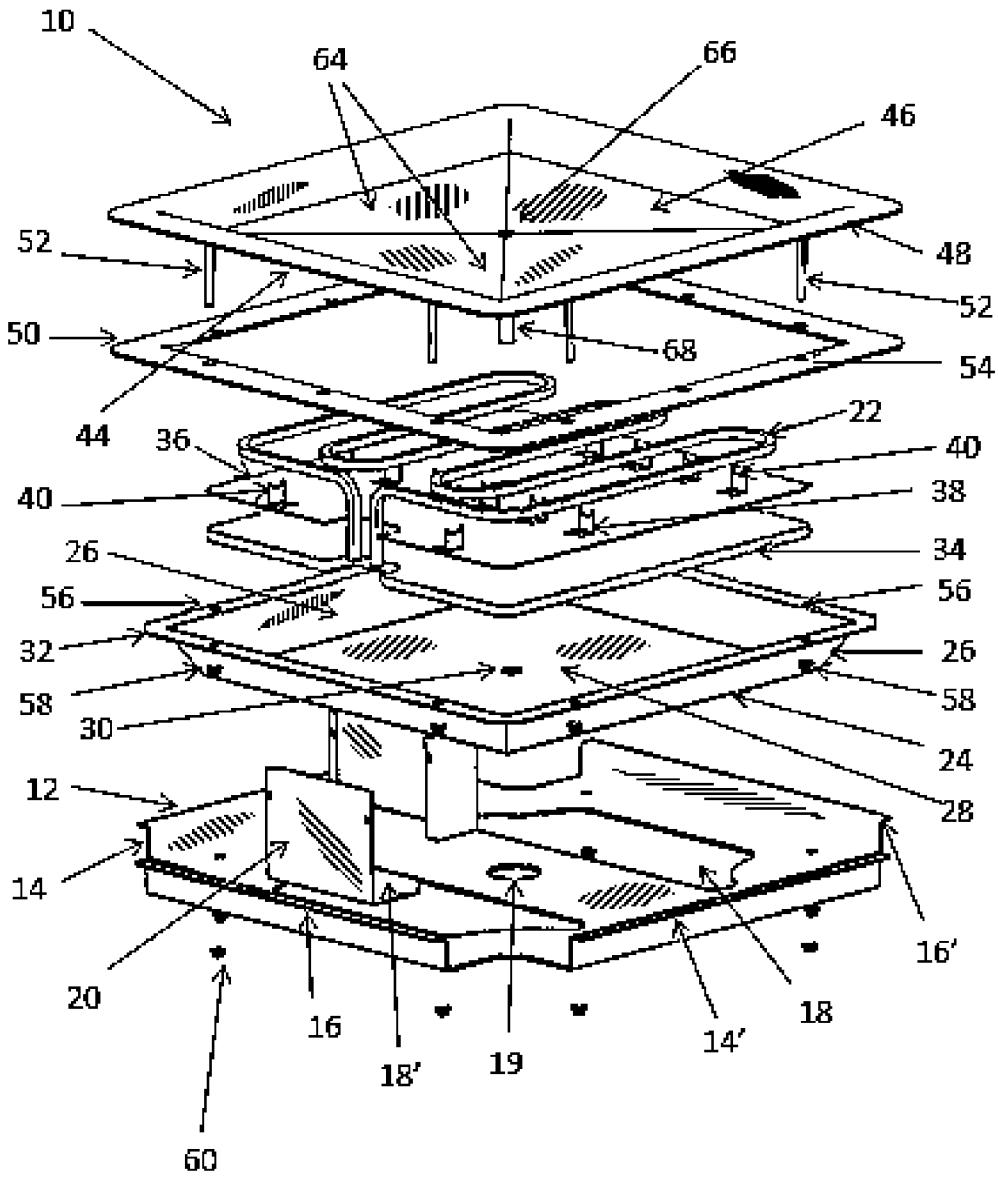
10
64
66
46
52
48
52
50
68
54
44
36
22
40
40
38
26
34
56
56
32
26
58
58
30
24
28
12
14
16'
20
16
18'
19
14'
18
60

FIGURE 1

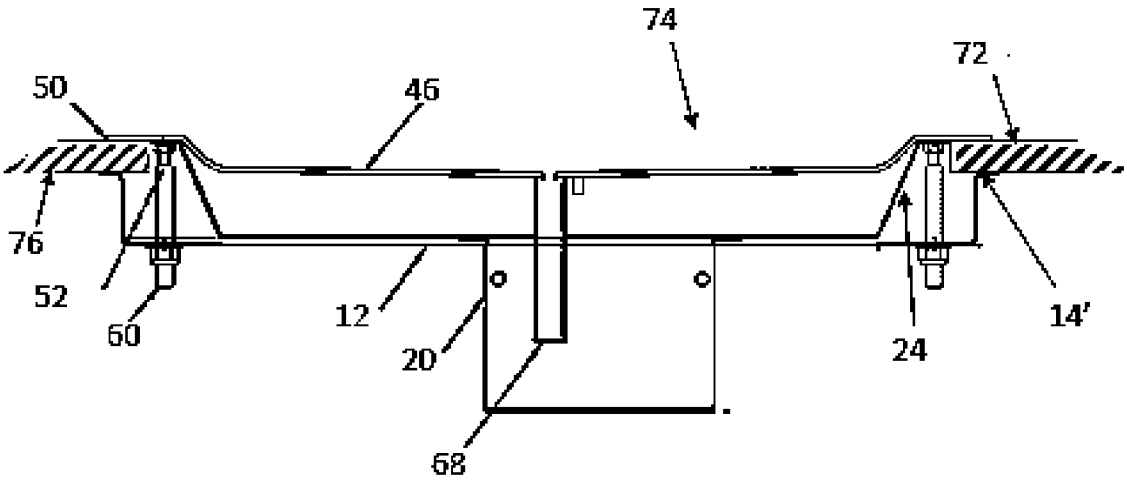

FIGURE 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/051842

A. CLASSIFICATION OF SUBJECT MATTER

F24C 7/06 (2006.01) A47J 37/07 (2006.01) H05B 3/06 (2006.01) H05B 1/00 (2006.01)

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)

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)

Databases: Espacenet, AUSPAT, PATENW, Google Patents. IPCs/CPCs: F24C7/06, F24C15/105, A47J37/07, A47J37/0709, A47J37/0722, A47J37/0736, A47J37/0629, A47J37/0676, A47J37/015, A47J37/105, F24C7/00, F24C15/00, H05B3/06, H05B3/00, H05B1/00. Keywords: ELEMENT, COIL, BIAS, PRESS, URGE, FORCE, PLATE, TRAY, COMPRESS, ELASTIC, FLEXIBLE, MATERIAL, LAYER, SHEET, MEMBRANE, SPACING, MEANS, MEMBER, TAB, PROJECTION, SPACER, FRANGIBLE, FIBRE, FIBER, BREAK, BRITTLE, GLASS, NEEDLE, MAT and similar terms. Applicant/Inventor name search carried out in ESPACENET, AUSPAT and internal databases provided by IP Australia.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	

[X] Further documents are listed in the continuation of Box C [X] 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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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 June 2017	09 June 2017
Name and mailing address of the ISA/AU	**Authorised officer**
AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Tom Banks AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0262832742

INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. **PCT/IB2017/051842**
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4410793 A (FISCHER et al.) 18 October 1983 Abstract, Fig 1, Col 3, lines 53-63, Col 3, line 67 to Col 4, line 8, col 5, line 60 to col 6, line 5	1-20
X	US 3632983 A (GENERAL ELECTRIC CO) 04 January 1972 Abstract, Fig 2, Col 3, lines 23-32,	1-20
X	US 2007/0257021 A1 (LOCKWOOD et al.) 08 November 2007 Figs 2-3, para 0022-0023, 0025	1-2, 8-9, 11-13 and 17-20
A	US 3356561 A (SQUIRE et al.) 05 December 1967 Col 1, lines 10-29	3-6 and 14-16
A	US 6855298 B2 (TENEYCK) 15 February 2005 Col 1, lines 30-35	3-6 and 14-16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2017/051842

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:
the subject matter listed in Rule 39 on which, under Article 17(2)(a)(i), an international search is not required to be carried out, including

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 Supplemental Box for Details

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 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.:

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.

Supplemental Box

Continuation of: **Box III**
This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This Authority has found that there are different inventions based on the following features that separate the claims into distinct groups:

Claims 1-2 and 12-13 are directed to a cooking apparatus. The features of an electrical heating element, an abutting cooking plate and a biasing means located to bias the element against the plate are present in these claims and are generic features. Furthermore, claims 2 and 13 (dependent on claims 1 and 12 respectively) introduce the features of a compressible layer and a supporting surface, which are also generic features.

Dependent claims 3-6 and 14-16 are directed to a cooking apparatus. The feature of the compressible layer comprising frangible fibres is specific to this group of claims.

Dependent claim 7 is directed to a cooking apparatus. The feature of an enclosure having a floor defined by said supporting surface and by a wall peripherally disposed about the floor, the heating element being mounted within the enclosure, is specific to this group of claims.

Dependent claims 8-11 and 17-20 are directed to a cooking apparatus. The feature of spacing the compressible layer and the heating element is specific to this group of claims.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

When there is no special technical feature common to all the claimed inventions there is no unity of invention.

In the above groups of claims, the identified features may have the potential to make a contribution over the prior art but are not common to all the claimed inventions and therefore cannot provide the required technical relationship. The only features common to all of the claimed inventions and which provides a technical relationship among them are:

- an electrical heating element, an abutting cooking plate and a biasing means located to bias the element against the plate, as defined in claims 1 and 12.

- a compressible layer and a supporting surface, as defined in claims 2 and 13.

However these features do not make a contribution over the prior art because they are disclosed in:

US 4410793 A (FISCHER et al.) 18 Oct 1983, and

US 3632983 A (GENERAL ELECTRIC CO) 4 Jan 1972

Therefore in the light of these documents these common features cannot be special technical features. Therefore there is no special technical feature common to all the claimed inventions and the requirements for unity of invention are consequently not satisfied *a posteriori*.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/IB2017/051842**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		**Patent Family Member/s**	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
US 4410793 A	18 October 1983	US 4410793 A	18 Oct 1983
		AU 7489681 A	18 Mar 1982
		AU 548139 B2	28 Nov 1985
		CA 1172678 A	14 Aug 1984
		DE 3033828 A1	29 Apr 1982
		DK 388481 A	10 Mar 1982
		EP 0047490 A2	17 Mar 1982
		EP 0047490 B1	04 Oct 1989
		FI 69230 B	30 Aug 1985
		GR 75315 B	13 Jul 1984
		JP S5777831 A	15 May 1982
		JP H0229940 B2	03 Jul 1990
		NO 813053 A	10 Mar 1982
		NO 154250 B	05 May 1986
		TR 22350 A	23 Feb 1987
		YU 216981 A	30 Sep 1983
		YU 42699 B	31 Oct 1988
		ZA 8106143 B	29 Sep 1982
US 3632983 A	04 January 1972	US 3632983 A	04 Jan 1972
US 2007/0257021 A1	08 November 2007	US 2007257021 A1	08 Nov 2007
		US 7326885 B2	05 Feb 2008
		EP 2014133 A2	14 Jan 2009
		WO 2007131030 A2	15 Nov 2007
US 3356561 A	05 December 1967	US 3356561 A	05 Dec 1967
US 6855298 B2	15 February 2005	US 2001024626 A1	27 Sep 2001
		US 6855298 B2	15 Feb 2005
		BR 9915039 A	17 Jul 2001
		BR 9915039 B1	05 Oct 2010
		CA 2353566 A1	15 Jun 2000
		CN 1329517 A	02 Jan 2002
		EP 1165209 A1	02 Jan 2002
		EP 1165209 B1	02 Mar 2005
		HU 0104490 A2	28 Mar 2002

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

INTERNATIONAL SEARCH REPORT Information on patent family members	International application No. **PCT/IB2017/051842**

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		**Patent Family Member/s**	
Publication Number	**Publication Date**	**Publication Number**	**Publication Date**
		JP 2002531720 A	24 Sep 2002
		JP 4526187 B2	18 Aug 2010
		MX PA01005803 A	21 Jul 2003
		US 6231818 B1	15 May 2001
		WO 0033946 A1	15 Jun 2000
		ZA 200003280 B	29 Jun 2001

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.