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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US	3603
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Mintz Levin/SharkNinja One Financial Center Boston, MA 02111			EXAMINER SHIRSAT, VIVEK K	
			ART UNIT	PAPER NUMBER
			3762	
			NOTIFICATION DATE	DELIVERY MODE
			07/28/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Arguments

1. Applicant's arguments, see pp. 6-8, filed 04/24/2025, with respect to the rejection(s) of claim(s) 71 and 82 under 35 U.S.C 102(a)(1) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. **Claim(s) 71-79 and 81** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2).

With respect to claim 71 Conrad discloses a cooking system comprising: a housing [reference character 108] having a first internal compartment and a second internal compartment [reference character 180₁ and 180₂]; a first cooking container [reference character 160] receivable within the first internal compartment [see Fig. 2] within an interior of said the first cooking container defining a first cooking volume; a second cooking container [also reference character 160, see Fig. 2] receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other: a first heater [reference character 120₁] thermally connected with the first internal compartment and a second heater [reference character 120₂] thermally connected to the second internal compartment; and a first fan [reference characters 120 and 124] and a second fan [reference characters 120 and 124] disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume.

Conrad does not disclose a user interface including a first input and a second input, the first input being operably coupled to the first heater and the first fan and configured to set a first time associated with operation of the first heater and the first fan, and the second input being operably coupled to the second heater and the second fan and configured to set a second time associated with operation of the second heater and the second fan. Note that Conrad does disclose a controller [paragraph 0163] having a user interface [see “switches” in paragraph 0163] which control both the first and second heaters and first and second fans and configured to set first and second times associated with the first heater and first fan and the second heater and the second fan [see paragraph 0166].

Veltrop discloses a cooking device that includes multiple zones [reference characters 24, 26, 28, and 30] each controlled by its own user interface/controller [reference characters 56, 58, 60, and 62].

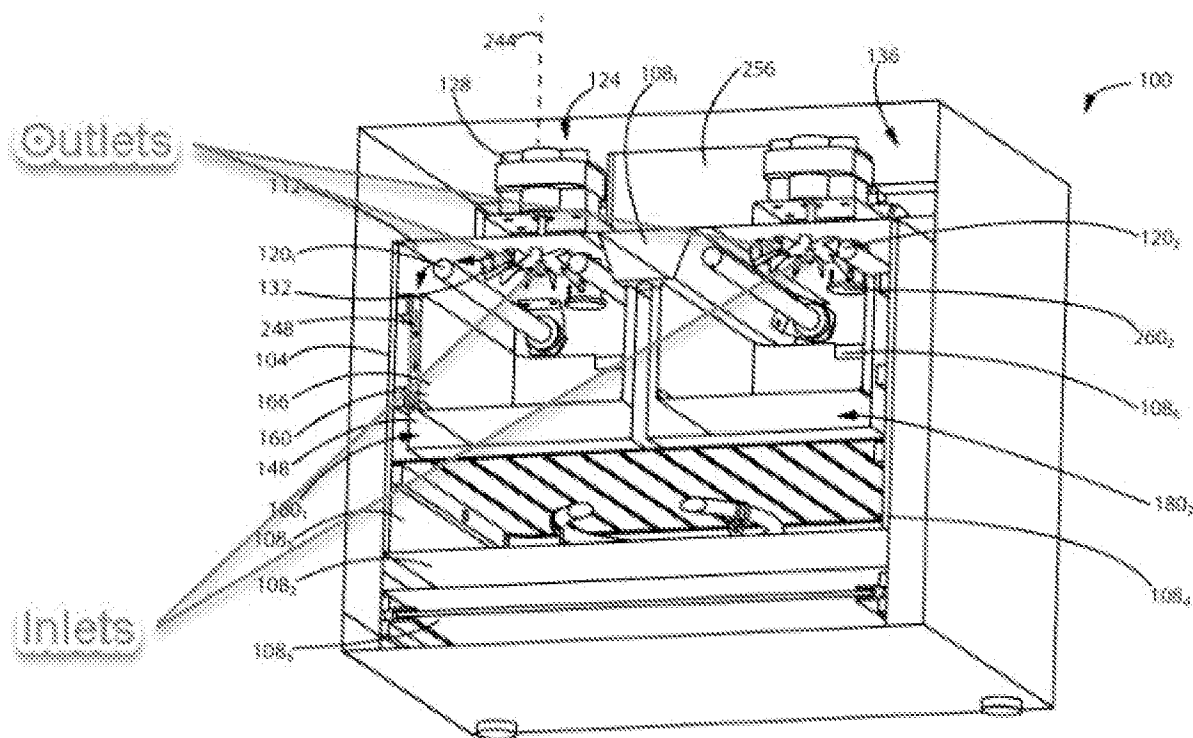
It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the system taught by Conrad by providing an independent user interface/control system for each zone, as taught by Veltrop in order to provide redundancy in the event of a controller malfunction for a particular zone.

With respect to claim 72 Conrad discloses that the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments [see Fig. 1].

With respect to claim 73 Conrad discloses that the first internal compartment and the second internal compartment are similarly sized [see Fig. 4].

With respect to claim 74 Conrad discloses that the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing [see Fig. 4].

With respect to claim 75 Conrad discloses that the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet [see annotated Fig. below, Conrad discloses impellers, see paragraph 0179, where a person having ordinary skill in the art would understand that the flow enters the center of the impeller and exits at the periphery].



With respect to claim 76 Conrad discloses that the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet [see annotated Fig. above].

With respect to claim 77 Conrad discloses that the first cooking container includes a first handle [reference character 176] and the second cooking container includes a second handle [reference character 176, see Fig. 2].

With respect to claim 78 Conrad discloses a motor operably coupled to each of the first fan and the second fan [reference character 128 for both, see Fig. 4].

With respect to claim 79 Conrad discloses that the motor is located external to the first internal compartment and the second internal compartment [see Fig. 4].

With respect to claim 81 Conrad discloses a control system configured to independently operate the first and second heaters and the first and second fans [see paragraph 0004]¹.

2. **Claim(s) 82-86, and 89** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2).

With respect to claim 82 Conrad discloses a housing having a first internal cooking compartment and a second internal compartment [reference character 180₁ and 180₂], the first internal compartment including a first heating assembly comprising a first fan [reference character 120 and 124] and a first heater [reference character 120₁], and the second internal cooking compartment including a second heating assembly comprising a second fan [reference character 120 and 124] and a second heater [reference character 120₂], the first and second internal cooking compartments being thermally and fluidly separated; a first cooking container [reference character 160] removably disposed within the first internal cooking compartment and a second cooking container [also reference character 160, see Fig. 2] removably disposed within the second internal cooking compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers [see paragraph 0004].

Conrad does not disclose a user interface including a first input and a second input, the first input being operably coupled to the first heating assembly and configured to set a first time associated with operation of the first heating assembly, and the second input being operably coupled to the second heating assembly and configured to set a second time associated with operation of the second heating assembly. Note that Conrad does disclose a controller [paragraph 0163] having a user interface [see “switches” in paragraph 0163] which control both the first and second

¹ “...cooking conditions in each cooking volume are individually controllable. For example, each cooking volume may have its own heating (IR) heating element or elements, one or more air moving members (e.g., a fan) to provide a directed airflow in the cooking volume and/or one or more steamers” [paragraph 0004]. Individual control over the cooking conditions in each cooking volume implies a control system that can perform the required function.

heaters and first and second fans and configured to set first and second times associated with the first heater and first fan and the second heater and the second fan [see paragraph 0166].

Veltrop discloses a cooking device that includes multiple zones [reference characters 24, 26, 28, and 30] each controlled by its own user interface/controller [reference characters 56, 58, 60, and 62].

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the system taught by Conrad by providing an independent user interface/control system for each zone, as taught by Veltrop in order to provide redundancy in the event of a controller malfunction for a particular zone.

With respect to claim 83 Conrad discloses that the first cooking container includes a first external handle [reference character 176] attached thereto and the second cooking container includes a second external handle [reference character 176, see Fig. 2] attached thereto.

With respect to claim 84 Conrad discloses that the first internal compartment and the second internal compartment are similarly sized [see Fig. 4].

With respect to claim 85 Conrad discloses that the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction [see paragraph 0004, the food is cooked by a convection].

With respect to claim 86 Conrad discloses a control system configured to independently operate the first and second heating assemblies [see paragraph 0004]².

With respect to claims 87-88 Conrad does not disclose that the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type (claim 87); or the control system is configured to adjust a cooking parameter based on sensed data without user input (claim 88).

Veltrop discloses a multi tray cooking system that includes a control panel [reference character 54] that allows “...the operator to select setpoint temperatures for the compartments... [a] control system in food warming apparatus 10 may control the heating systems for the compartments (e.g., thermostatically) so as to achieve and maintain the setpoint temperatures...the control system may measure the temperature at the heating system (e.g., at heater plate 50 or 52), so that the setpoint temperature corresponds to the temperature at the heating system” [column 4 lines 56-64].

² See footnote 1.

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the oven taught by Conrad by including a control panel and the control system taught by Veltrop in order to allow for automatic maintenance of a desired set point temperature.

With respect to claim 89 Conrad discloses a motor [reference character 128 for both, see Fig. 4] operably coupled to each of the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds [see paragraph 0004].

3. **Claim(s) 80 and 90** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2) and further in view of Caselani et. al (US 3,973,551).

With respect to claims 80 and 90 Conrad does not disclose that the motor is positioned between the first internal compartment and the second internal compartment.

Caselani discloses an oven with two fans [reference character 31 in Fig. 3] and a motor [reference character 30] between the fans.

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the oven taught by Conrad by driving the two fans with a single motor placed between the fans, as taught by Caselani in order to reduce the number of motors and the overall cost. Placing the motor between the fans would place the motor between the first and second internal compartments.

4. **Claim(s) 91-95** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2).

With respect to claim 91 Conrad discloses a housing having a first internal compartment and a second internal compartment [reference character 180₁ and 180₂], the first internal compartment including a first heating assembly comprising a first fan [reference characters 120 and 124] and a first heater [reference character 120₁], and the second internal compartment including a second heating assembly comprising a second fan [reference characters 120 and 124] and a second heater [reference character 120₂].

Conrad does not disclose a user interface including a first input and a second input, the first input being operably coupled to the first heating assembly and configured to set a first time associated with operation of the first heating assembly, and the second input being operably coupled to the second heating assembly and configured to set

a second time associated with operation of the second heating assembly. Note that Conrad does disclose a controller [paragraph 0163] having a user interface [see “switches” in paragraph 0163] which control both the first and second heaters and first and second fans and configured to set first and second times associated with the first heater and first fan and the second heater and the second fan [see paragraph 0166].

Veltrop discloses a cooking device that includes multiple zones [reference characters 24, 26, 28, and 30] each controlled by its own user interface/controller [reference characters 56, 58, 60, and 62].

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the system taught by Conrad by providing an independent user interface/control system for each zone, as taught by Veltrop in order to provide redundancy in the event of a controller malfunction for a particular zone.

With respect to claim 92 the combination of Conrad and Veltrop disclose that the first and second heating assemblies are independently operable [see paragraph 0004]³.

With respect to claim 93 the combination of Conrad and Veltrop disclose that the first input corresponds to a selection of a mode of operation of the first heating assembly, and wherein the second input corresponds to a selection of a mode of operation of the second heating assembly [see the rejection for claim 91].

With respect to claim 94 the combination of Conrad and Veltrop disclose that the first input corresponds to a cook time of the first heating assembly and the second input corresponds to a cook time of the second heating assembly, and wherein the first heating assembly and the second heating assembly are respectively operable in a manual mode of operation upon actuation of the first and second inputs [paragraph 0166 of Conrad].

With respect to claim 95 Conrad discloses a first cooking container [reference character 160] removably disposed within the first internal compartment and a second cooking container [reference character 160] removably disposed within the second internal compartment.

³ “...cooking conditions in each cooking volume are individually controllable. For example, each cooking volume may have its own heating (IR) heating element or elements, one or more air moving members (e.g., a fan) to provide a directed airflow in the cooking volume and/or one or more steamers” [paragraph 0004]. Individual control over the cooking conditions in each cooking volume implies a control system that can perform the required function.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any nonprovisional extension fee (37 CFR 1.17(a)) pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIVEK K SHIRSAT whose telephone number is (571)272-3722. The examiner can normally be reached M-F 9:00AM-5:20AM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B McAllister can be reached at 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/VIVEK K SHIRSAT/
Primary Examiner, Art Unit 3762

<i>Notice of References Cited</i>	Application/Control No. 17/159,414		Applicant(s)/Patent Under Reexamination Martin et al.	
	Examiner VIVEK K SHIRSAT		Art Unit 3762	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-8096231-B2	2012-01-17	Veltrop; Loren J.	A47J39/006	219/385
	B					
	C					
	D					
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

CPC - Searched*		
Symbol	Date	Examiner
A47J37/0641, 0664	03/08/2024	vks
A47/J27/12, 004	03/08/2024	vks

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
126	21A	03/08/2024	vks

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see search history	03/08/2024	vks
inventor search	03/08/2024	vks
class/subclass search	03/08/2024	vks
forward/backward search	03/08/2024	vks
text search	03/08/2024	vks
updated search	10/03/2024	vks
updated search	01/11/2025	vks
updated search	01/22/2025	vks
updated search	07/24/2025	vks

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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Bibliographic Data

Application No: 17/159,414

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /VIVEK K SHIRSAT/

Examiner's Signature

Initials

Title:

COOKING DEVICE AND COMPONENTS THEREOF

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/27/2021	126	3762	057664-348N01US
RULE			

APPLICANTS

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CONTINUING DATA

This application is a 371 of PCT/US2020/042120 07/15/2020

PCT/US2020/042120 has PRO of 62874193 07/15/2019

FOREIGN APPLICATIONS

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07/29/2022

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	225	("20170071408" OR "11297977" OR "20090126580" OR "20120272832" OR "20170231430" OR "10045651" OR "10051997" OR "10088173" OR "10094576" OR "10099839" OR "10101038" OR "10113749" OR "10143324" OR "10174953" OR "10190783" OR "10203117" OR "10234144" OR "10247424" OR "10271686" OR "10271690" OR "10285531" OR "10309659" OR "10337745" OR "10364990" OR "10364991" OR "10383477" OR "10390656" OR "10405696" OR "10405697" OR "10405698" OR "10405699" OR "10413121" OR "10413122" OR "10426176" OR "10448785" OR "10448786" OR "10451285" OR "10492641" OR "10495319" OR "10495320" OR "10502433" OR "10512363" OR "10524615" OR "10598391" OR "10619862" OR "10627116" OR "10638882" OR "10660471" OR "10674853" OR "10674854" OR "10684022" OR "10694753" OR	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:21 PM

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L4	1717	A47J27/004.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L5	168	A47J27/12.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L6	472	A47J37/0664.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
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L12	696	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/07 11:27 AM
L13	6698	A47J37/0641.cpc.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:27 AM
L14	14410	(air ADJ fryer) OR air\$1fryer	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L15	7100	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L16	360	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 11:41 AM

L17	13	("20020189463" "20050051034" "20080237212" "20130052310" "20160192808" "20170135523" "20180303285").pn. OR ("10575679").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 11:43 AM
L18	3556	L13 AND @py<="2019"	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L19	1866	L18 AND (blower OR fan)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L20	45	("2524272" "3384068" "3587557" "3590803").pn. OR ("3973551").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 12:41 PM
L21	189	("2563253" "2704802" "3210511" "3548152" "3581038" "3783832" "3813216" "3828760" "3973551" "4154861" "4160144" "4160145" "4283614" "4316069" "4327279" "4337384" "4338911" "4350504" "4354083" "4403128" "4409453" "4431889" "4437396" "4464554" "4480164" "4494525" "4737373" "4752268" "4786774" "4849597" "4924763" "4949629" "4958412" "4965435" "5025775" "5161889" "5166487" "5204503" "5205274" "5277105" "5369250" "5401940" "5555795" "5676870" "5717192" "5818014" "5825000" "5826496" "5927265" "5934178" "5994672" "6012442" "6058924" "6060701" "6114664" "6250296" "6369360" "6376817" "6399930" "6403937"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 12:46 PM

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L22	1	"10575679".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 05:28 PM
L23	2936	(((("MARTIN") near3 ("Christopher")) OR ((("GUERIN") near3 ("Thomas")) OR ((("JACKSON") near3 ("Roger")) OR ((("ANTHONY") near3 ("Joshua")) OR ((("SCHWARZ") near3 ("Kerry")) OR ((("DUBEAU") near3 ("Michaela")))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:27 PM
L24	172	L23 AND cooking	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:28 PM
L25	158	L23 AND cooking	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 06:28 PM
L26	1	"4034663".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/08 11:40 AM
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L28	1	"4034663".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/06/21 06:13 PM
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L30	40	9635979 "9661952 "9 668615 "9671114 "96 77774 "9681773 "969 3655 "9702564 "9723 954 "9746189 "97594 30 "9759432 "978868 7 "9795250 "9803873" "9863645 "9874354 "9 9879865 "9900936 "9 903598 "9974312 "99 76750 "9980322 "998 0606 "9993111 "D688 513 "D695058 "D7248 90 "20180303285").PN . ((US-20200352385-A1 OR US-20190298106- A1 OR US- 20190298105-A1 OR US-20230355032-A1 OR US-20230031394- A1 OR US- 20230015314-A1 OR US-20220395137-A1 OR US-20220313017- A1 OR US- 20220202239-A1 OR US-20160081509-A1 OR US-20180303285- A1 OR US- 20180317715-A1 OR US-20210212506-A1 OR US-20220125241- A1 OR US- 20200214500-A1 OR US-20200329909- A1).did. AND PGPB.dbnm.) OR ((US- 10448786-B2 OR US- 11739947-B2 OR US- 3973551-A OR US- 4034663-A OR US- 4506598-A OR US- 4585661-A OR US- 4728762-A OR US- 4962694-A OR US- 5398666-A OR US- 5771789-A OR US- 5996572-A OR US- 6049066-A OR US- 6131559-A OR US- 6225604-B1 OR US- 11297977-B1 OR US- 8011293-B2 OR US- 10638882-B1 OR US- 10881246-B2).did. AND USPT.dbnm.) OR ((US-	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:45 PM
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		10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.)					
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L35	41	<p>6131559-A OR US-6225604-B1 OR US-11297977-B1 OR US-8011293-B2 OR US-10638882-B1 OR US-10881246-B2 OR US-8096231-B2).did. AND USPT.dbnm.) OR ((US-10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.)</p> <p>((US-20200352385-A1 OR US-20190298106-A1 OR US-20190298105-A1 OR US-20230355032-A1 OR US-20230031394-A1 OR US-20230015314-A1 OR US-20220395137-A1 OR US-20220313017-A1 OR US-20220202239-A1 OR US-20160081509-A1 OR US-20180303285-A1 OR US-20180317715-A1 OR US-20210212506-A1 OR US-20220125241-A1 OR US-20200214500-A1 OR US-20200329909-A1).did. AND PGPB.dbnm.) OR ((US-10448786-B2 OR US-11739947-B2 OR US-3973551-A OR US-4034663-A OR US-4506598-A OR US-4585661-A OR US-4728762-A OR US-4962694-A OR US-5398666-A OR US-5771789-A OR US-5996572-A OR US-6049066-A OR US-6131559-A OR US-6225604-B1 OR US-11297977-B1 OR US-8011293-B2 OR US-10638882-B1 OR US-</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/01/13 04:23 PM
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L36	1	10881246-B2 OR US-8096231-B2).did. AND USPT.dbnm.) OR ((US-10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.) ("20220408966").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/13 04:26 PM
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L38	41	<p>10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.)</p> <p>((US-20200352385-A1 OR US-20190298106-A1 OR US-20190298105-A1 OR US-20230355032-A1 OR US-20230031394-A1 OR US-20230015314-A1 OR US-20220395137-A1 OR US-20220313017-A1 OR US-20220202239-A1 OR US-20160081509-A1 OR US-20180303285-A1 OR US-20180317715-A1 OR US-20210212506-A1 OR US-20220125241-A1 OR US-20200214500-A1 OR US-20200329909-A1).did. AND PGPB.dbnm.) OR ((US-10448786-B2 OR US-11739947-B2 OR US-3973551-A OR US-4034663-A OR US-4506598-A OR US-4585661-A OR US-4728762-A OR US-4962694-A OR US-5398666-A OR US-5771789-A OR US-5996572-A OR US-6049066-A OR US-6131559-A OR US-6225604-B1 OR US-11297977-B1 OR US-8011293-B2 OR US-10638882-B1 OR US-10881246-B2 OR US-8096231-B2).did. AND USPT.dbnm.) OR ((US-10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/07/23 10:52 AM
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L39	1	((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.) "8096231".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2025/07/23 11:22 AM
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		AND FTDB.dbnm.)					
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PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	1350	126/21A.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N2	784	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N3	1789	A47J27/004.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N4	172	A47J27/12.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N6	526	A47J37/0664.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:04 PM
N7	4179	N1 OR N2 OR N3 OR N4 OR N6	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:05 PM
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N9	1295	N8 AND (cook\$3)	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:07 PM
N10	531	N9 AND (heater OR heating\$1element)	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:07 PM



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
04/24/2025 03:47:28 PM Z ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Rachel Riley
PATENT CENTER #	70148781	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Grace Gong

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US Response to NFOA.pdf	8	Amendment/Request for Reconsideration-After Non- Final Rejection	53 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
057664-348N01US Response to NFOA.pdf	76AECA5D66392D367D0496C477A0944F2C450D656B7F41633 0A21E56069A307F2C9C8885F1C57DABCF76BDCEF71F269AD C0DC9367E37E167491E270EF82098CE

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Utility Application of:
Christopher T. Martin

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: Vivek K. Shirsat

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

Via Patent Center
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This paper is submitted in response to the Office Action dated January 28, 2025.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 6 of this paper.

AMENDMENTS TO THE CLAIMS

1-70. (Canceled)

71. (Currently Amended) A cooking system comprising:

a housing having a first internal compartment and a second internal compartment;

a first cooking container receivable within the first internal compartment, an interior of the first cooking container defining a first cooking volume;

a second cooking container receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other;

a first heater thermally connected to the first internal compartment and a second heater thermally connected to the second internal compartment; [[and]]

a first fan and a second fan disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume; and

a user interface including a first input and a second input, the first input being operably coupled to the first heater and the first fan and configured to set a first time associated with operation of the first heater and the first fan, and the second input being operably coupled to the second heater and the second fan and configured to set a second time associated with operation of the second heater and the second fan.

72. (Original) The cooking system of claim 71, wherein the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments.

73. (Original) The cooking system of claim 71, wherein the first internal compartment and the second internal compartment are similarly sized.

74. (Original) The cooking system of claim 71, wherein the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing.

75. (Original) The cooking system of claim 71, wherein the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet.
76. (Original) The cooking system of claim 71, wherein the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet.
77. (Original) The cooking system of claim 71, wherein the first cooking container includes a first handle and the second cooking container includes a second handle.
78. (Previously Presented) The cooking system of claim 71, further comprising a motor operably coupled to the first fan and the second fan.
79. (Original) The cooking system of claim 78, wherein the motor is located external to the first internal compartment and the second internal compartment.
80. (Original) The cooking system of claim 78, wherein the motor is positioned between the first internal compartment and the second internal compartment.
81. (Original) The cooking system of claim 71, further comprising a control system configured to independently operate the first and second heaters and the first and second fans.
82. (Currently Amended) A cooking system, comprising:
a housing having a first internal cooking compartment and a second internal cooking compartment, the first internal cooking compartment including a first heating assembly comprising a first fan and a first heater, and the second internal cooking compartment including a second heating assembly comprising a second fan and a second heater, the first and second internal cooking compartments being thermally and fluidly separated;
a first cooking container removably disposed within the first internal cooking compartment and a second cooking container removably disposed within the second internal cooking

compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers; and a user interface including a first input and a second input, the first input being operably coupled to the first heating assembly and configured to set a first time associated with operation of the first heating assembly, and the second input being operably coupled to the second heating assembly and configured to set a second time associated with operation of the second heating assembly.

83. (Original) The cooking system of claim 82, wherein the first cooking container includes a first external handle attached thereto and the second cooking container includes a second external handle attached thereto.

84. (Original) The cooking system of claim 82, wherein the first internal compartment and the second internal compartment are similarly sized.

85. (Original) The cooking system of claim 82, wherein the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction.

86. (Original) The cooking system of claim 82, further comprising a control system configured to independently operate the first and second heating assemblies.

87. (Currently Amended) The cooking system of claim [[82]] 86, wherein the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type.

88. (Currently Amended) The cooking system of claim [[82]] 86, wherein the control system is configured to adjust a cooking parameter based on sensed data without user input.

89. (Previously Presented) The cooking system of claim 82, further comprising a motor operably coupled to the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds.

90. (Original) The cooking system of claim 89, wherein the motor is positioned between the first internal compartment and the second internal compartment.

91. (New) A cooking system comprising:

a housing having a first internal compartment and a second internal compartment, the first internal compartment including a first heating assembly comprising a first fan and a first heater, and the second internal compartment including a second heating assembly comprising a second fan and a second heater; and

a user interface including a first input and a second input, the first input being operably coupled to the first heating assembly and configured to set a first time associated with operation of the first heating assembly, and the second input being operably coupled to the second heating assembly and configured to set a second time associated with operation of the second heating assembly.

92. (New) The cooking system of claim 91, wherein the first and second heating assemblies are independently operable.

93. (New) The cooking system of claim 91, wherein the first input corresponds to a selection of a mode of operation of the first heating assembly, and wherein the second input corresponds to a selection of a mode of operation of the second heating assembly.

94. (New) The cooking system of claim 91, wherein the first input corresponds to a cook time of the first heating assembly and the second input corresponds to a cook time of the second heating assembly, and wherein the first heating assembly and the second heating assembly are respectively operable in a manual mode of operation upon actuation of the first and second inputs.

95. (New) The cooking system of claim 91, further comprising a first cooking container removably disposed within the first internal compartment and a second cooking container removably disposed within the second internal compartment.

REMARKS

Status of the Claims

The Office Action addresses and maintains rejection of claims 71-90. Reconsideration and allowance of the current application are respectfully requested in light of the amendments and remarks herein.

Amendments to the Claims

Claims 71, 82, and 87-88 are amended. Claims 91-95 are added. Support for the amendments and new claims can be found throughout the specification and figures. No new matter is added.

With respect to any claim cancellations or amendments, Applicant has not dedicated to the public nor abandoned any unclaimed subject matter and moreover has not acquiesced to any rejections and/or objections. Applicant expressly reserves the right to pursue protection of any of the presently excluded subject matter or claim embodiments in one or more future continuation and/or divisional application(s).

Rejections Pursuant to 35 U.S.C. § 102 and 103

Claims 71-79, 81-86, and 89 are rejected pursuant to 35 U.S.C. § 102 as being anticipated by U.S. Patent Application No. 2020/0329909 of Conrad et al. (hereinafter “Conrad”). Claims 80 and 90 are rejected pursuant to 35 U.S.C. § 103 as being unpatentable over Conrad in view of U.S. Patent No. 3,973,551 of Caselani et al. (hereinafter “Caselani”). Claims 87-88 are rejected pursuant to 35 U.S.C. § 103 as being unpatentable over Conrad in view of U.S. Patent No. 8,096,231 of Veltrop et al. (hereinafter “Veltrop”).

Independent Claim 71

Claim 71 is rejected pursuant to 35 U.S.C. § 102 as being anticipated by Conrad. While Applicant respectfully disagrees, claim 71 is amended to recite, in relevant part, “a user interface

including a first input and a second input, the first input being operably coupled to the first heater and the first fan and configured to set a first time associated with operation of the first heater and the first fan, and the second input being operably coupled to the second heater and the second fan and configured to set a second time associated with operation of the second heater and the second fan.” Conrad fails to teach each and every limitation of claim 71 as amended herein.

Conrad is directed to a cooking apparatus with multiple cooking zones, each zone having a heater/fan. (*Conrad* at Abstract.) At most, Conrad describes that a user can select between cooking programs that set the temperature, humidity, and convection speed within a cooking zone. (*Id.* at ¶ [0150]). However, Conrad fails to teach a user input that directly sets a *time* associated with operation of a heater/fan. Moreover, Conrad fails to teach that different user inputs are associated with different heater/fans. Thus, Conrad does not teach or suggest “the first input being... configured to set a first time associated with operation of the first heater and the first fan” and “the second input being... configured to set a second time associated with operation of the second heater and the second fan,” as recited by claim 71 as amended herein.

For at least these reasons, Conrad fails to teach each and every limitation of claim 71 as amended herein. Accordingly, withdrawal of the rejection of claim 71 pursuant to 35 U.S.C. § 102 is respectfully requested.

Independent Claim 82

Claim 82 is rejected pursuant to 35 U.S.C. § 102 as being anticipated by Conrad. While Applicant respectfully disagrees, claim 82 is amended to incorporate similar limitations as amended claim 71. Accordingly, claim 82 is allowable for at least the reasons discussed herein. Furthermore, claims 83-90 depend from claim 82 and are allowable for their dependence upon an allowable base claim. Accordingly, allowance of claims 82-90 is respectfully requested.

New Independent Claim 91

New claim 91 incorporates similar limitations as amended claims 71 and 82. Accordingly, new claim 91 is allowable for at least the reasons discussed herein. Furthermore, new claims 92-95

depend from claim 91 and are allowable for their dependence upon an allowable base claim. Accordingly, allowance of new claims 91-95 is respectfully requested.

Conclusion

In conclusion, Applicant submits that all pending claims are now in condition for allowance, and allowance thereof is respectfully requested. Applicant's amendment of the claims does not constitute a concession that the claims are not allowable in their unamended form. The Examiner is encouraged to telephone the undersigned attorney for Applicant if such communication is deemed to expedite prosecution of this application.

No extension of time is believed to be due. In the event that a petition for an additional extension of time is required to be submitted at this time, Applicant hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to ensure that the above-identified application does not become abandoned.

Applicant believes no fee is due with this paper. However, if a fee is due, please charge our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: April 24, 2025

Respectfully submitted,

Electronic Signature: /Grace Gong/

Grace Gong

Registration No.: 81,627

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Agent for Applicant

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/159,414	Filing Date 01/27/2021	☐ To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x \$100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x \$480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	04/24/2025	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		
	Total (37 CFR 1.16(i))	* 25	Minus	** 28	= 0	x \$200 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 5	= 0	x \$600 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						PROGRAM SUPPORT SPECIALIST.	
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/ZURIASHWORK ZENEBE/	
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".							
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This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US	3603
177399	7590	01/28/2025	EXAMINER	
Mintz Levin/SharkNinja			SHIRSAT, VIVEK K	
One Financial Center			ART UNIT	PAPER NUMBER
Boston, MA 02111			3762	
			NOTIFICATION DATE	DELIVERY MODE
			01/28/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Response to Arguments

1. Applicant's arguments filed 12/06/2024 and 01/17/2025 have been fully considered but they are not persuasive. The applicant argues on pp. 5-6 of the remarks that Conrad does not disclose "the first and second cooking volumes being thermally and fluidly separate from each other" as required by independent claims 71 and 82 because Conrad discloses the possibility of heat and mass transfer between the two cooking zones due to "imperfect thermal isolation" [paragraph 0151] and because of gaps between the sidewalls and the top of the cooking volume [paragraph 0151]. The examiner respectfully disagrees. As best understood the applicant's argument is that because Conrad provides imperfect isolation of the cooking zones it cannot meet the limitations of the claims. However, isolation is different from separation, and the "imperfect thermal isolation" taught by Conrad in combination with a control system that can compensate for incidental heat transfer between the zones via independently controlled heating elements [see paragraph 0151] is sufficient to teach that the zones are in effect "thermally separate". With respect to "fluidly separate" since each zone is provided with an independent air supply via an independent fan and motor incidental air leakage between the two zones is not sufficient to say that the zones are not in effect "fluidly separate". For these reasons the rejections are maintained.

2. The applicant's amendments to claims 78 and 89 overcome the 112(b) rejections of claims 79-80 and 90 presented in the Final Rejection dated 10/09/2024, therefore those rejections are withdrawn.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

2. **Claim(s) 71-79 and 81** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Conrad et. al (US 2020/0329909 A1).

With respect to claim 71 Conrad discloses a cooking system comprising: a housing [reference character 108] having a first internal compartment and a second internal compartment [reference character 180₁ and 180₂]; a first cooking container [reference character 160] receivable within the first internal compartment [see Fig. 2] within an interior of said the first cooking container defining a first cooking volume; a second cooking container [also reference character 160, see Fig. 2] receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other: a first heater [reference character 120₁] thermally connected with the first internal compartment and a second heater [reference character 120₂] thermally connected to the second internal compartment; and a first fan [reference characters 120 and 124] and a second fan [reference characters 120 and 124] disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume.

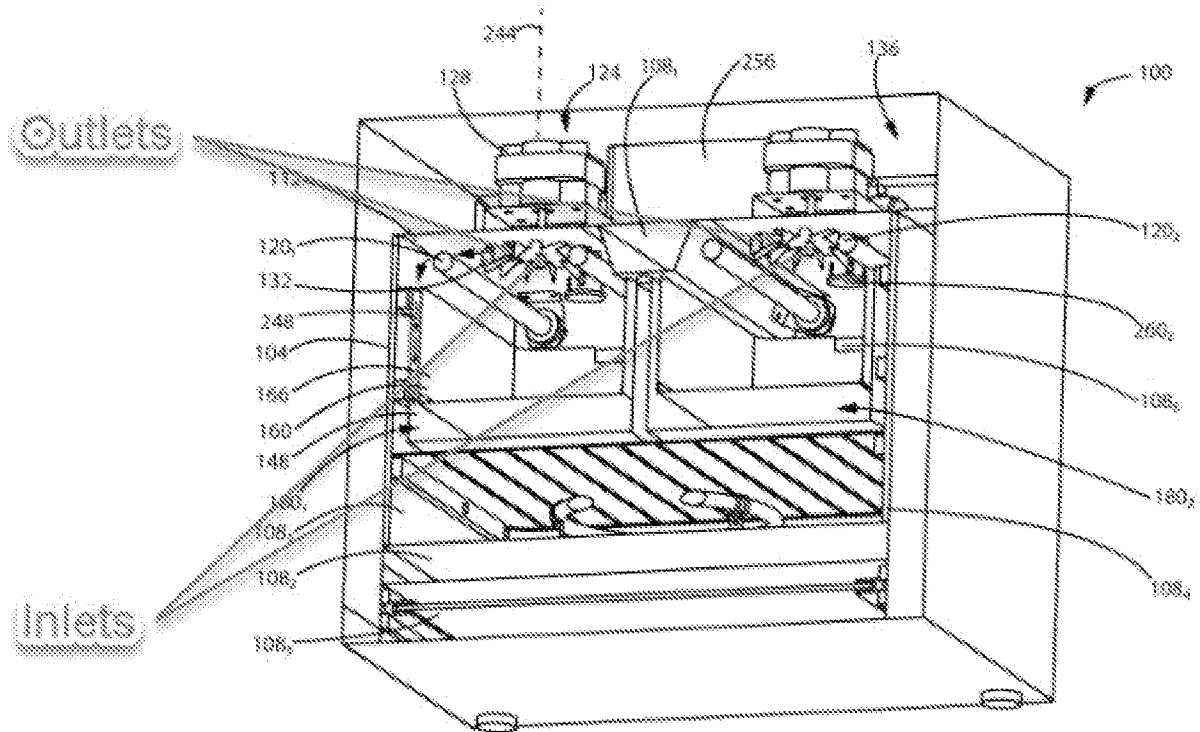
With respect to claim 72 Conrad discloses that the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments [see Fig. 1].

With respect to claim 73 Conrad discloses that the first internal compartment and the second internal compartment are similarly sized [see Fig. 4].

With respect to claim 74 Conrad discloses that the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing [see Fig. 4].

With respect to claim 75 Conrad discloses that the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet [see annotated Fig. below,

Conrad discloses impellers, see paragraph 0179, where a person having ordinary skill in the art would understand that the flow enters the center of the impeller and exits at the periphery].



With respect to claim 76 Conrad discloses that the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet [see annotated Fig. above].

With respect to claim 77 Conrad discloses that the first cooking container includes a first handle [reference character 176] and the second cooking container includes a second handle [reference character 176, see Fig. 2].

With respect to claim 78 Conrad discloses a motor operably coupled to each of the first fan and the second fan [reference character 128 for both, see Fig. 4].

With respect to claim 79 Conrad discloses that the motor is located external to the first internal compartment and the second internal compartment [see Fig. 4].

With respect to claim 81 Conrad discloses a control system configured to independently operate the first and second heaters and the first and second fans [see paragraph 0004]¹.

3. **Claim(s) 82-86, and 89** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Conrad et. al (US 2020/0329909 A1).

With respect to claim 82 Conrad discloses a housing having a first internal cooking compartment and a second internal compartment [reference character 180₁ and 180₂], the first internal compartment including a first heating assembly comprising a first fan [reference character 120 and 124] and a first heater [reference character 120₁], and the second internal cooking compartment including a second heating assembly comprising a second fan [reference character 120 and 124] and a second heater [reference character 120₂], the first and second internal cooking compartments being thermally and fluidly separated; a first cooking container [reference character 160] removably disposed within the first internal cooking compartment and a second cooking container [also reference character 160, see Fig. 2] removably disposed within the second internal cooking compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers [see paragraph 0004].

With respect to claim 83 Conrad discloses that the first cooking container includes a first external handle [reference character 176] attached thereto and the second cooking container includes a second external handle [reference character 176, see Fig. 2] attached thereto.

With respect to claim 84 Conrad discloses that the first internal compartment and the second internal compartment are similarly sized [see Fig. 4].

With respect to claim 85 Conrad discloses that the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction [see paragraph 0004, the food is cooked by a convection].

With respect to claim 86 Conrad discloses a control system configured to independently operate the first and second heating assemblies [see paragraph 0004]².

¹ "... cooking conditions in each cooking volume are individually controllable. For example, each cooking volume may have its own heating (IR) heating element or elements, one or more air moving members (e.g., a fan) to provide a directed airflow in the cooking volume and/or one or more steamers" [paragraph 0004]. Individual control over the cooking conditions in each cooking volume implies a control system that can perform the required function.

² See footnote 1.

With respect to claim 89 Conrad discloses a motor [reference character 128 for both, see Fig. 4] operably coupled to each of the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds [see paragraph 0004].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
3. **Claim(s) 80 and 90** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Caselani et. al (US 3,973,551).

With respect to claims 80 and 90 Conrad does not disclose that the motor is positioned between the first internal compartment and the second internal compartment.

Caselani discloses an oven with two fans [reference character 31 in Fig. 3] and a motor [reference character 30] between the fans.

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the oven taught by Conrad by driving the two fans with a single motor placed between the fans, as taught

by Caselani in order to reduce the number of motors and the overall cost. Placing the motor between the fans would place the motor between the first and second internal compartments.

4. **Claim(s) 87-88** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2).

With respect to claims 87-88 Conrad does not disclose that the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type (claim 87); or the control system is configured to adjust a cooking parameter based on sensed data without user input (claim 88).

Veltrop discloses a multi tray cooking system that includes a control panel [reference character 54] that allows "...the operator to select setpoint temperatures for the compartments... [a] control system in food warming apparatus 10 may control the heating systems for the compartments (e.g., thermostatically) so as to achieve and maintain the setpoint temperatures...the control system may measure the temperature at the heating system (e.g., at heater plate 50 or 52), so that the setpoint temperature corresponds to the temperature at the heating system" [column 4 lines 56-64].

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the oven taught by Conrad by including a control panel and the control system taught by Veltrop in order to allow for automatic maintenance of a desired set point temperature.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIVEK K SHIRSAT whose telephone number is (571)272-3722. The examiner can normally be reached M-F 9:00AM-5:20AM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VIVEK K SHIRSAT/
Primary Examiner, Art Unit 3762

<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

CPC - Searched*		
Symbol	Date	Examiner
A47J37/0641, 0664	03/08/2024	vks
A47/J27/12, 004	03/08/2024	vks

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
126	21A	03/08/2024	vks

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see search history	03/08/2024	vks
inventor search	03/08/2024	vks
class/subclass search	03/08/2024	vks
forward/backward search	03/08/2024	vks
text search	03/08/2024	vks
updated search	10/03/2024	vks
updated search	01/11/2025	vks
updated search	01/22/2025	vks

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	225	("20170071408" OR "11297977" OR "20090126580" OR "20120272832" OR "20170231430" OR "10045651" OR "10051997" OR "10088173" OR "10094576" OR "10099839" OR "10101038" OR "10113749" OR "10143324" OR "10174953" OR "10190783" OR "10203117" OR "10234144" OR "10247424" OR "10271686" OR "10271690" OR "10285531" OR "10309659" OR "10337745" OR "10364990" OR "10364991" OR "10383477" OR "10390656" OR "10405696" OR "10405697" OR "10405698" OR "10405699" OR "10413121" OR "10413122" OR "10426176" OR "10448785" OR "10448786" OR "10451285" OR "10492641" OR "10495319" OR "10495320" OR "10502433" OR "10512363" OR "10524615" OR "10598391" OR "10619862" OR "10627116" OR "10638882" OR "10660471" OR "10674853" OR "10674854" OR "10684022" OR "10694753" OR	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:21 PM

		"10694882" OR "10712018" OR "10729144" OR "10731865" OR "10743709" OR "10743710" OR "10794599" OR "10835077" OR "10841981" OR "10849457" OR "10852002" OR "10865994" OR "10881246" OR "10883721" OR "10887952" OR "10890336" OR "10890372" OR "10914473" OR "10918112" OR "10920992" OR "20120321770" OR "20160029829" OR "20160209028" OR "20160220057" OR "20170079473" OR "20170245683" OR "20170251859" OR "20180073746" OR "20180220500" OR "20180220842" OR "20180255971" OR "20180259194" OR "20180352612" OR "20190045590" OR "20190063123" OR "20190137111" OR "20190170368" OR "20190208956" OR "20190239517" OR "20190242590" OR "20190246835" OR "20190246836" OR "20190246841" OR "20190254473" OR "20190254474" OR "20190254476" OR "20190254479" OR "20190269276" OR "20190282029" OR "20190290062" OR "20190290072" OR "20190298104" OR "20190298105" OR "20190298106" OR "20190307291" OR "20190309955" OR "20190313846" OR "20190313847" OR					
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		"20190328175" OR "20190380533" OR "20200033009" OR "20200033010" OR "20200072475" OR "20200132309" OR "20200138238" OR "20200138239" OR "20200149746" OR "20200182484" OR "20200187708" OR "20200187710" OR "20200200393" OR "20200200394" OR "20200200395" OR "20200208844" OR "20200229276" OR "20200268200" OR "20200288725" OR "20200309379" OR "20200323222" OR "20200329908" OR "20200329909" OR "20200345173" OR "20200352385" OR "20200378609" OR "20200383512" OR "6545251" OR "6593552" OR "6653602" OR "6758206" OR "6761159" OR "6878904" OR "6917017" OR "7064297" OR "7105778" OR "7105779" OR "7117866" OR "7227102" OR "7238921" OR "7250587" OR "7250588" OR "7297905" OR "7328654" OR "7339140" OR "7442901" OR "7703389" OR "8006685" OR "8035062" OR "8096231" OR "8212188" OR "8217314" OR "8274020" OR "8378265" OR "8389907" OR "8404292" OR "8517006" OR "8640608" OR					
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		"8669500" OR "8720323" OR "8735778" OR "8748783" OR "8883234" OR "8895902" OR "8993026" OR "9021942" OR "9072403" OR "9074776" OR "9080774" OR "9115904" OR "9192262" OR "9314134" OR "9326639" OR "9351495" OR "9370275" OR "9404661" OR "9433321" OR "9462912" OR "9480364" OR "9482437" OR "9504351" OR "9534791" OR "9534794" OR "9541295" OR "9568200" OR "9618212" OR "9635979" OR "9661952" OR "9668615" OR "9671114" OR "9677774" OR "9681773" OR "9693655" OR "9702564" OR "9723954" OR "9746189" OR "9759430" OR "9759432" OR "9788687" OR "9795250" OR "9803873" OR "9863645" OR "9874354" OR "9879865" OR "9900936" OR "9903598" OR "9974312" OR "9976750" OR "9980322" OR "9980606" OR "9993111" OR "D688513" OR "D695058" OR "D724890" OR "20180303285").pn.					
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L2	1349	126/21A.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:43 PM
L3	696	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L4	1717	A47J27/004.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L5	168	A47J27/12.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L6	472	A47J37/0664.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L7	3998	L2 OR L3 OR L4 OR L5 OR L6	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:45 PM
L8	1955	L7 AND ((heating WITH element) OR heating\$1element)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
L9	1113	L8 AND (fan OR blower)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
L10	26	("10383477" "10390656 "10405696" "1040569 7" "10405698" "104131 21" "10413122" "10448 785" "10448786" "2019 0242590" "2019024683 5" "20190246836" "201 90254473" "201902544 74" "20190254476" "20 190254479" "20190269 276" "20190290062" "2 0190290072" "2019029 8105" "20190298106" " 20190307291" "201903 28175" "20200329909" " 20080052952" "20220 163212").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/07 11:26 AM
L12	696	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/07 11:27 AM
L13	6698	A47J37/0641.cpc.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:27 AM
L14	14410	(air ADJ fryer) OR air\$1fryer	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L15	7100	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L16	360	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 11:41 AM

L17	13	("20020189463" "20050051034" "20080237212" "20130052310" "20160192808" "20170135523" "20180303285").pn. OR ("10575679").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 11:43 AM
L18	3556	L13 AND @py<="2019"	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L19	1866	L18 AND (blower OR fan)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L20	45	("2524272" "3384068" "3587557" "3590803").pn. OR ("3973551").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 12:41 PM
L21	189	("2563253" "2704802" "3210511" "3548152" "3581038" "3783832" "3813216" "3828760" "3973551" "4154861" "4160144" "4160145" "4283614" "4316069" "4327279" "4337384" "4338911" "4350504" "4354083" "4403128" "4409453" "4431889" "4437396" "4464554" "4480164" "4494525" "4737373" "4752268" "4786774" "4849597" "4924763" "4949629" "4958412" "4965435" "5025775" "5161889" "5166487" "5204503" "5205274" "5277105" "5369250" "5401940" "5555795" "5676870" "5717192" "5818014" "5825000" "5826496" "5927265" "5934178" "5994672" "6012442" "6058924" "6060701" "6114664" "6250296" "6369360" "6376817" "6399930" "6403937"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 12:46 PM

		"6437303" "6472640" "6472647" "6481999" "6655373" "6712063" "6713741" "6874495" "6909078" "7055518" "7087872" "7360533" "7507938" "20010054605" "20020162833" "20020179588" "20030226452" "20040118392" "20040123858" "20040200828" "20040211765" "20040216732" "20050217503" "20060169272" "20070137633" "20070194011" "20080099008" "20080105133" "20080105135" "20080105136" "20080105249" "20080106483" "20080206420" "20080216812" "20080296284").pn. OR ("8011293").urpn. AND (PGPB USPT USOC).dbnm.					
L22	1	"10575679".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 05:28 PM
L23	2936	(((("MARTIN") near3 ("Christopher")) OR ((("GUERIN") near3 ("Thomas")) OR ((("JACKSON") near3 ("Roger")) OR ((("ANTHONY") near3 ("Joshua")) OR ((("SCHWARZ") near3 ("Kerry")) OR ((("DUBEAU") near3 ("Michaela")))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:27 PM
L24	172	L23 AND cooking	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:28 PM
L25	158	L23 AND cooking	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 06:28 PM
L26	1	"4034663".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/08 11:40 AM
L27	1	"8001293".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/08 11:41 AM

L28	1	"4034663".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/06/21 06:13 PM
L29	229	("11672377" "20210272 832" "20220408966" "6 450085" "20170071408 "11297977" "2009012 6580" "20120272832" " 20170231430" "100456 51" "10051997" "10088 173" "10094576" "1009 9839" "10101038" "101 13749" "10143324" "10 174953" "10190783" "1 0203117" "10234144" " 10247424" "10271686" " "10271690" "10285531" "10309659" "10337745 "10364990" "1036499 1" "10383477" "103906 56" "10405696" "10405 697" "10405698" "1040 5699" "10413121" "104 13122" "10426176" "10 448785" "10448786" "1 0451285" "10492641" " 10495319" "10495320" " "10502433" "10512363" "10524615" "10598391 "10619862" "1062711 6" "10638882" "106604 71" "10674853" "10674 854" "10684022" "1069 4753" "10694882" "107 12018" "10729144" "10 731865" "10743709" "1 0743710" "10794599" " 10835077" "10841981" " "10849457" "10852002" "10865994" "10881246 "10883721" "1088795 2" "10890336" "108903 72" "10914473" "10918 112" "10920992" "2012 0321770" "2016002982 9" "20160209028" "201 60220057" "201700794 73" "20170245683" "20 170251859" "20180073 746" "20180220500" "2 0180220842" "2018025 5971" "20180259194" " 20180352612" "201900 45590" "20190063123" " "20190137111" "20190 170368" "20190208956 "20190239517" "2019 0242590" "2019024683	(US-PGPUB; USPAT)	OR	ON	ON	2024/10/02 07:39 PM

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L30	40	9635979 "9661952 "9 668615 "9671114 "96 77774 "9681773 "969 3655 "9702564 "9723 954 "9746189 "97594 30 "9759432 "978868 7 "9795250 "9803873" "9863645 "9874354 "9 9879865 "9900936 "9 903598 "9974312 "99 76750 "9980322 "998 0606 "9993111 "D688 513 "D695058 "D7248 90 "20180303285").PN . ((US-20200352385-A1 OR US-20190298106- A1 OR US- 20190298105-A1 OR US-20230355032-A1 OR US-20230031394- A1 OR US- 20230015314-A1 OR US-20220395137-A1 OR US-20220313017- A1 OR US- 20220202239-A1 OR US-20160081509-A1 OR US-20180303285- A1 OR US- 20180317715-A1 OR US-20210212506-A1 OR US-20220125241- A1 OR US- 20200214500-A1 OR US-20200329909- A1).did. AND PGPB.dbnm.) OR ((US- 10448786-B2 OR US- 11739947-B2 OR US- 3973551-A OR US- 4034663-A OR US- 4506598-A OR US- 4585661-A OR US- 4728762-A OR US- 4962694-A OR US- 5398666-A OR US- 5771789-A OR US- 5996572-A OR US- 6049066-A OR US- 6131559-A OR US- 6225604-B1 OR US- 11297977-B1 OR US- 8011293-B2 OR US- 10638882-B1 OR US- 10881246-B2).did. AND USPT.dbnm.) OR ((US-	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:45 PM
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		10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.)					
L31	1	L30 AND setpoint	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:46 PM
L32	10	L29 AND setpoint	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:46 PM
L33	1	"20200329909".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 05:37 PM
L34	41	((US-20200352385-A1 OR US-20190298106-A1 OR US-20190298105-A1 OR US-20230355032-A1 OR US-20230031394-A1 OR US-20230015314-A1 OR US-20220395137-A1 OR US-20220313017-A1 OR US-20220202239-A1 OR US-20160081509-A1 OR US-20180303285-A1 OR US-20180317715-A1 OR US-20210212506-A1 OR US-20220125241-A1 OR US-20200214500-A1 OR US-20200329909-A1).did. AND PGPB.dbnm.) OR ((US-10448786-B2 OR US-11739947-B2 OR US-3973551-A OR US-4034663-A OR US-4506598-A OR US-4585661-A OR US-4728762-A OR US-4962694-A OR US-5398666-A OR US-5771789-A OR US-5996572-A OR US-6049066-A OR US-	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/01/11 06:01 PM

L35	41	<p>6131559-A OR US-6225604-B1 OR US-11297977-B1 OR US-8011293-B2 OR US-10638882-B1 OR US-10881246-B2 OR US-8096231-B2).did. AND USPT.dbnm.) OR ((US-10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.)</p> <p>((US-20200352385-A1 OR US-20190298106-A1 OR US-20190298105-A1 OR US-20230355032-A1 OR US-20230031394-A1 OR US-20230015314-A1 OR US-20220395137-A1 OR US-20220313017-A1 OR US-20220202239-A1 OR US-20160081509-A1 OR US-20180303285-A1 OR US-20180317715-A1 OR US-20210212506-A1 OR US-20220125241-A1 OR US-20200214500-A1 OR US-20200329909-A1).did. AND PGPB.dbnm.) OR ((US-10448786-B2 OR US-11739947-B2 OR US-3973551-A OR US-4034663-A OR US-4506598-A OR US-4585661-A OR US-4728762-A OR US-4962694-A OR US-5398666-A OR US-5771789-A OR US-5996572-A OR US-6049066-A OR US-6131559-A OR US-6225604-B1 OR US-11297977-B1 OR US-8011293-B2 OR US-10638882-B1 OR US-</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/01/13 04:23 PM
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L36	1	10881246-B2 OR US-8096231-B2).did. AND USPT.dbnm.) OR ((US-10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.) ("20220408966").pn.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/13 04:26 PM
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PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N1	1350	126/21A.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N2	784	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N3	1789	A47J27/004.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N4	172	A47J27/12.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:03 PM
N6	526	A47J37/0664.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:04 PM
N7	4179	N1 OR N2 OR N3 OR N4 OR N6	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:05 PM
N8	1363	N7 AND @py>="2019"	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:06 PM
N9	1295	N8 AND (cook\$3)	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:07 PM
N10	531	N9 AND (heater OR heating\$1element)	(US-PGPUB; USPAT)	OR	ON	ON	2025/01/11 06:07 PM

Bibliographic Data

Application No: 17/159,414

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /VIVEK K SHIRSAT/

Examiner's Signature

Initials

Title: COOKING DEVICE AND COMPONENTS THEREOF

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/27/2021	126	3762	057664-348N01US
RULE			

APPLICANTS

SHARKNINJA OPERATING LLC, Needham, MA, UNITED STATES

INVENTORS

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Kerry Schwarz, Needham, MA, UNITED STATES

Michaela Dubeau, Uxbridge, MA, UNITED STATES

CONTINUING DATA

This application is a 371 of PCT/US2020/042120 07/15/2020

PCT/US2020/042120 has PRO of 62874193 07/15/2019

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/29/2022

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Boston, MA 02111

UNITED STATES

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Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION # 17/159,414	RECEIPT DATE / TIME 01/17/2025 05:01:27 PM Z ET	ATTORNEY DOCKET # 057664-348N01US
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Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	June Watson
PATENT CENTER #	68809116	AUTHORIZED BY	Ryan Rieker
CUSTOMER #	177399	FILING DATE	01/27/2021
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Christopher T. Martin

Payment Information

PAYMENT METHOD DA / 500311	PAYMENT TRANSACTION ID E20251GH02237006	PAYMENT AUTHORIZED BY Ryan Rieker
PRE-AUTHORIZED ACCOUNT 500311	PRE-AUTHORIZED CATEGORY 37 CFR 1.492 (National application filing, search, and examination fees); 37 CFR 1.492(a) (Basic national fee only); 37 CFR 1.20 (Post Issuance fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.21 (Miscellaneous fees and charges); 37 CFR 1.17 (Patent application and reexamination processing fees)	

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
1251	EXTENSION FOR RESPONSE WITHIN FIRST MONTH	220.00	1	220.00
1801	REQUEST FOR CONTINUED EXAMINATION (RCE) - 1ST REQUEST (SEE 37 CFR 1.114)	1360.00	1	1360.00
TOTAL AMOUNT:				\$1,580.00

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
01/17/2025 05:01:27 PM Z ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	June Watson
PATENT CENTER #	68809116	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Ryan Rieker

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US Request for Continued Examination.pdf	1	Request for Continued Examination (RCE)	129 KB
Warning: This is not a USPTO supplied RCE fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
057664-348N01US Response to Advisory Action.pdf	6	-	149 KB
057664-348N01US Response to Advisory Action-AMSB.pdf	(1-1) 1	Amendment Submitted/Entered with Filing of Continued Prosecution Application (CPA)/Request for	104 KB

Continued Examination(RCE)

057664-348N01US Response to Advisory Action-CLM.pdf	(2-4)	3	Claims	110 KB
057664-348N01US Response to Advisory Action-REM.pdf	(5-6)	2	Applicant Arguments/Remarks Made in an Amendment	138 KB

Digest**DOCUMENT****MESSAGE DIGEST(SHA-512)**

057664-348N01US Request for Continued Examination.pdf	70F123C356E6039C8467E922F7995CB2C13D099EEDBACFC1 E4E2EE1C1659D8706F1D218636E9B19EF42E3CC56D3131D1 DEB7ED04C38C508BD3ED6B49C47CD404
057664-348N01US Response to Advisory Action.pdf	A15AA0DF57FB68973DB76BDF4160F997F503BA6217FBAEF45 119BAA4DE6118EC3FC9047858C987FE332AA1A49B3ED1D8F 11BC2E500C3AD844ECB71E3E1011902
057664-348N01US Response to Advisory Action-AMSB.pdf	0FA1A33CF45FFAE47DB75FBF1C810001071FEF3D880CD13C E744C1FBC572663C5381FFA755FCC396658178EB6907134377 7CDC80F05B3A1D49B08128973AAA5B
057664-348N01US Response to Advisory Action-CLM.pdf	E530C5F8FAD98F545E8913420C4C63F63294E01D22EF45A63 7F3F6F315F2F616D89524065779B964F447824E9007DBE6A63 5C9FC6E6620B57A6DB0ECCBF18481
057664-348N01US Response to Advisory Action-REM.pdf	AB27B1F9C4165D99D8D02549A31AB977ADF904D77CD69DAC 653374BED09C530F5FC78C2DDA6CF17FF6C4374BE47247B1 5C145A8975DEB79AB8E08E5CF190EE4F

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Utility Application of:
Christopher T. Martin

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: V. K. Shirsat

**AMENDMENT IN RESPONSE TO ADVISORY ACTION AND REQUEST FOR
CONTINUED EXAMINATION**

Via Patent Center
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This paper is submitted in response to the Advisory Action dated February 15, 2024.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

A **Request for Continued Examination** is submitted herewith.

AMENDMENTS TO THE CLAIMS

1-70. (Canceled)

71. (Previously Presented) A cooking system comprising:

a housing having a first internal compartment and a second internal compartment;
a first cooking container receivable within the first internal compartment, an interior of the first cooking container defining a first cooking volume;
a second cooking container receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other;
a first heater thermally connected to the first internal compartment and a second heater thermally connected to the second internal compartment; and
a first fan and a second fan disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume.

72. (Original) The cooking system of claim 71, wherein the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments.

73. (Original) The cooking system of claim 71, wherein the first internal compartment and the second internal compartment are similarly sized.

74. (Original) The cooking system of claim 71, wherein the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing.

75. (Original) The cooking system of claim 71, wherein the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet.

76. (Original) The cooking system of claim 71, wherein the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet.

77. (Original) The cooking system of claim 71, wherein the first cooking container includes a first handle and the second cooking container includes a second handle.

78. (Currently Amended) The cooking system of claim 71, further comprising a motor operably coupled to ~~each of~~ the first fan and the second fan.

79. (Original) The cooking system of claim 78, wherein the motor is located external to the first internal compartment and the second internal compartment.

80. (Original) The cooking system of claim 78, wherein the motor is positioned between the first internal compartment and the second internal compartment.

81. (Original) The cooking system of claim 71, further comprising a control system configured to independently operate the first and second heaters and the first and second fans.

82. (Original) A cooking system, comprising:

a housing having a first internal cooking compartment and a second internal compartment, the first internal compartment including a first heating assembly comprising a first fan and a first heater, and the second internal cooking compartment including a second heating assembly comprising a second fan and a second heater, the first and second internal cooking compartments being thermally and fluidly separated;

a first cooking container removably disposed within the first internal cooking compartment and a second cooking container removably disposed within the second internal cooking compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers.

83. (Original) The cooking system of claim 82, wherein the first cooking container includes a first external handle attached thereto and the second cooking container includes a second external handle attached thereto.

84. (Original) The cooking system of claim 82, wherein the first internal compartment and the second internal compartment are similarly sized.

85. (Original) The cooking system of claim 82, wherein the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction.

86. (Original) The cooking system of claim 82, further comprising a control system configured to independently operate the first and second heating assemblies.

87. (Original) The cooking system of claim 82, wherein the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type.

88. (Original) The cooking system of claim 82, wherein the control system is configured to adjust a cooking parameter based on sensed data without user input.

89. (Currently Amended) The cooking system of claim 82, further comprising a motor operably coupled to ~~each of~~ the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds.

90. (Original) The cooking system of claim 89, wherein the motor is positioned between the first internal compartment and the second internal compartment.

REMARKS

Status of the Claims

The Advisory Action addresses and maintains rejection of claims 71-90. Reconsideration and allowance of the current application are respectfully requested in light of the amendments and remarks herein.

In the Advisory Action, the Examiner maintains the rejection pursuant to 35 U.S.C. § 102 of: claims 71-79, 81-86 and 89 as being anticipated by U.S. Pub. No. 2020/0329909 of Conrad et al. (hereinafter “Conrad”); and claims 80 and 90 maintain rejected pursuant to 35 U.S.C. § 103 as being obvious over Conrad in view of U.S. Patent No. 3,973,551 to Caselani et al. (“Caselani”). Claims 87-88 are rejected pursuant to 35 U.S.C. § 103 as being obvious over Conrad in view of U.S. Patent No. 8,096,231 to Veltrop et al. (“Veltrop”).

Conclusion

In conclusion, Applicant submits that all pending claims are now in condition for allowance, and allowance thereof is respectfully requested. Applicant's amendment of the claims does not constitute a concession that the claims are not allowable in their unamended form. The Examiner is encouraged to telephone the undersigned attorney for Applicant if such communication is deemed to expedite prosecution of this application.

A request for a one-month extension of time is submitted herewith. In the event that a petition for an additional extension of time is required to be submitted at this time, Applicant hereby petitions under 37 C.F.R. 1.136(a) for an extension of time for as many months as are required to ensure that the above-identified application does not become abandoned.

Applicant believes no fee is due with this paper. However, if a fee is due, please charge our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: January 17, 2025

Respectfully submitted,

Electronic Signature: /Ryan Rieker/
Ryan Rieker

Registration No.: 80,734
MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.
One Financial Center
Boston, Massachusetts 02111
(617) 542-6000
Attorney for Applicant

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Request for Continued Examination (RCE) Transmittal Address to: Mail Stop RCE Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450	Application Number	17/159,414
	Filing Date	January 27, 2021
	First Named Inventor	Christopher T. Martin
	Art Unit	3762
	Examiner Name	V. K. Shirsat
	Attorney Docket Number	057664-348N01US

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
 Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. ☐ **Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).
- a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.
- i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ii. ☐ Other _____
- b. ☒ **Enclosed**
- i. ☒ Amendment/Reply
- ii. ☐ Affidavit(s)/ Declaration(s)
- iii. ☐ Information Disclosure Statement (IDS)
- iv. ☐ Other _____
2. ☐ **Miscellaneous**
- a. ☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)
- b. ☐ Other _____
3. ☐ **Fees** The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.
- a. ☒ The Director is hereby authorized to charge the following fees, any underpayment of fees, or credit any overpayments, to Deposit Account No. 50-0311.
- i. ☒ RCE fee required under 37 CFR 1.17(e)
- ii. ☒ Extension of time fee (37 CFR 1.136 and 1.17)
- iii. ☐ Other _____
- b. ☐ Check in the amount of \$ _____ enclosed
- c. ☐ Payment by credit card (Form PTO-2038 enclosed)
- d. ☒ Payment by USPTO patent electronic filing system.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED			
Signature	/Ryan Rieker/	Date	January 17, 2025
Name (Print/Type)	Ryan T. Rieker	Registration No.	80,734

CERTIFICATE OF MAILING OR TRANSMISSION	
I hereby certify that this correspondence is transmitted by the USPTO patent electronic filing system, or by facsimile to (571) 273-8300, to the USPTO, or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450, on the date shown below.	
Signature	
Name (Print/Type)	Date



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US	3603
177399	7590	01/17/2025	EXAMINER	
Mintz Levin/SharkNinja			SHIRSAT, VIVEK K	
One Financial Center			ART UNIT	PAPER NUMBER
Boston, MA 02111			3762	
			NOTIFICATION DATE	DELIVERY MODE
			01/17/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketingBOS@mintz.com
IPFileroombos@mintz.com
mintzdocketing@cpaglobal.com

Advisory Action Before the Filing of an Appeal Brief	Application No. 17/159,414	Applicant(s) Martin et al.	
	Examiner VIVEK K SHIRSAT	Art Unit 3762	AIA (FITF) Status Yes

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 06 December 2024 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☐ The period for reply expires ____ months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires ____ months from the mailing date of the prior Advisory Action or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANTS FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____ (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☐ For purposes of appeal, the proposed amendment(s): (a) ☐ will not be entered; or (b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____

9. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

10. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

11. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

12. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
See Continuation Sheet.

13. ☐ Note the attached Information *Disclosure Statement(s)*. (PTO/SB/08) Paper No(s). _____

14. ☐ Other: _____

STATUS OF CLAIMS

15. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: _____

Claim(s) objected to: _____

Claim(s) rejected: 71-90.

Claim(s) withdrawn from consideration: _____

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
--	--

Continuation of REQUEST FOR RECONSIDERATION/OTHER 12. The request for reconsideration has been considered but does NOT place the application in condition for allowance because: The applicant argues that Conrad does not disclose "the first and second cooking volumes being thermally and fluidly separate from each other" as required by independent claims 71 and 82 because Conrad discloses the possibility of heat and mass transfer between the two cooking zones due to "imperfect thermal isolation" [paragraph 0151] and because of gaps between the sidewalls and the top of the cooking volume [paragraph 0151]. The examiner respectfully disagrees. As best understood the applicant's argument is that because Conrad provides imperfect isolation of the cooking zones it cannot meet the limitations of the claims. However, isolation is different from separation, and the "imperfect thermal isolation" taught by Conrad in combination with a control system that can compensate for incidental heat transfer between the zones via independently controlled heating elements [see paragraph 0151] is sufficient to teach that the zones are "thermally separate". With respect to "fluidly separate" since each zone is provided with an independent air supply via an independent fan and motor incidental air leakage between the two zones is not sufficient to say that the zones are not "fluidly separate". For these reasons the rejections are maintained.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Utility Application of:
Christopher T. Martin

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: V. K. Shirsat

AMENDMENT IN RESPONSE TO FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.116

Via Patent Center
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This paper is filed in response to the Office Action dated October 9, 2024.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Utility Application of:
Christopher T. Martin

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: V. K. Shirsat

AMENDMENT IN RESPONSE TO FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.116

Via Patent Center
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This paper is filed in response to the Office Action dated October 9, 2024.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

1-70. (Canceled)

71. (Previously Presented) A cooking system comprising:

a housing having a first internal compartment and a second internal compartment;
a first cooking container receivable within the first internal compartment, an interior of the first cooking container defining a first cooking volume;
a second cooking container receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other;
a first heater thermally connected to the first internal compartment and a second heater thermally connected to the second internal compartment; and
a first fan and a second fan disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume.

72. (Original) The cooking system of claim 71, wherein the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments.

73. (Original) The cooking system of claim 71, wherein the first internal compartment and the second internal compartment are similarly sized.

74. (Original) The cooking system of claim 71, wherein the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing.

75. (Original) The cooking system of claim 71, wherein the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet.

76. (Original) The cooking system of claim 71, wherein the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet.

77. (Original) The cooking system of claim 71, wherein the first cooking container includes a first handle and the second cooking container includes a second handle.

78. (Currently Amended) The cooking system of claim 71, further comprising a motor operably coupled to ~~each of~~ the first fan and the second fan.

79. (Original) The cooking system of claim 78, wherein the motor is located external to the first internal compartment and the second internal compartment.

80. (Original) The cooking system of claim 78, wherein the motor is positioned between the first internal compartment and the second internal compartment.

81. (Original) The cooking system of claim 71, further comprising a control system configured to independently operate the first and second heaters and the first and second fans.

82. (Original) A cooking system, comprising:

a housing having a first internal cooking compartment and a second internal compartment, the first internal compartment including a first heating assembly comprising a first fan and a first heater, and the second internal cooking compartment including a second heating assembly comprising a second fan and a second heater, the first and second internal cooking compartments being thermally and fluidly separated;

a first cooking container removably disposed within the first internal cooking compartment and a second cooking container removably disposed within the second internal cooking compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers.

83. (Original) The cooking system of claim 82, wherein the first cooking container includes a first external handle attached thereto and the second cooking container includes a second external handle attached thereto.

84. (Original) The cooking system of claim 82, wherein the first internal compartment and the second internal compartment are similarly sized.

85. (Original) The cooking system of claim 82, wherein the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction.

86. (Original) The cooking system of claim 82, further comprising a control system configured to independently operate the first and second heating assemblies.

87. (Original) The cooking system of claim 82, wherein the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type.

88. (Original) The cooking system of claim 82, wherein the control system is configured to adjust a cooking parameter based on sensed data without user input.

89. (Currently Amended) The cooking system of claim 82, further comprising a motor operably coupled to ~~each of~~ the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds.

90. (Original) The cooking system of claim 89, wherein the motor is positioned between the first internal compartment and the second internal compartment.

REMARKS

Status of the Claims

The Office Action addresses and rejects claims 71-90. Reconsideration and allowance of the current application are respectfully requested in light of the amendments and remarks herein.

Amendments to the Claims

Claims 78 and 89 are amended. Support for the amendments can be found throughout the specification and figures. No new matter is added.

With respect to any claim cancellations or amendments, Applicant has not dedicated to the public nor abandoned any unclaimed subject matter and moreover has not acquiesced to any rejections and/or objections. Applicant expressly reserves the right to pursue protection of any of the presently excluded subject matter or claim embodiments in one or more future continuation and/or divisional application(s).

Rejection Pursuant to 35 U.S.C. § 112(b)

Claims 79-80 and 90 are rejected pursuant to 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor regards as the invention. Without conceding to the rejection, to expedite prosecution, claims 78 and 89 are amended as indicated herein, thereby obviating the basis for the rejection. Withdrawal of the rejection is respectfully requested.

Rejection Pursuant to 35 U.S.C. § 102

Claims 71-79, 81-86 and 89 are rejected pursuant to 35 U.S.C. § 102 as being anticipated by U.S. Pub. No. 2020/0329909 of Conrad et al. (hereinafter “Conrad”). Applicant respectfully disagrees.

Claim 71 recites, in relevant part, “the first and second cooking volumes being thermally and fluidly separate from each other.” Conrad fails to teach this limitation and, as a result, cannot anticipate claim 71.

In fact, Conrad plainly teaches the opposite: heat and/or moving air from one cooking zone can impact another cooking zone. Specifically, Conrad explains that “activating a cooking device (e.g. heating element 120) associated with one cooking zone 180 may impact cooking conditions (e.g. temperature) in another cooking zone 180.” *Conrad*, para. [0151]. Conrad adds that “first cooking zone 180₁ may be in fluid communication with second cooking zone 180₂ (e.g., the sidewalls of the cooking receptacles 140 may terminate before the top wall of the cooking volume 104) such that there is some gas (e.g. air) exchange between the cooking zones 180₁, 180₂.” *Id.* Therefore, Conrad fails to teach at least the above limitation of claim 71.

Claim 82 recites, in relevant part, “the first and second internal cooking compartments being thermally and fluidly separated.” For reasons similar to those described with respect to claim 71, Conrad fails to teach at least this limitation of claim 82.

Accordingly, because Conrad fails to teach or suggest each and every limitation of claim 71 or claim 82, claims 71 and 82 are allowable over Conrad for at least this reason. Claims 72-79, 81, 83-86, and 89 depend upon claim 71 or 82 and are allowable over Conrad at least for their dependence upon an allowable base claim. Withdrawal of the rejection is respectfully requested.

Rejection Pursuant to 35 U.S.C. § 103

Claims 80 and 90 are rejected pursuant to 35 U.S.C. § 103 as being obvious over Conrad in view of U.S. Patent No. 3,973,551 to Caselani et al. (“Caselani”). Claims 87-88 are rejected pursuant to 35 U.S.C. § 103 as being obvious over Conrad in view of U.S. Patent No. 8,096,231 to Veltrop et al. (“Veltrop”).

Claims 80, 87-88, and 90 variously depend upon claims 71 and 82, which are allowable over Conrad at least for the reasons provided above. Caselani and Veltrop are cited for dependent claim features and fail to remedy the deficiencies, alone or in combination, of Conrad as applied to claims

71 and 82. Accordingly, claims 80 and 90 are allowable over Conrad and Caselani, alone or in combination, and claims 87-88 are allowable over Conrad and Veltrop, alone or in combination, at least for their dependence upon claims 71 and/or 82. Withdrawal of the rejections is respectfully requested.

Conclusion

In conclusion, Applicant submits that all pending claims are now in condition for allowance, and allowance thereof is respectfully requested. Applicant's amendment of the claims does not constitute a concession that the claims are not allowable in their unamended form. The Examiner is encouraged to telephone the undersigned attorney for Applicant if such communication is deemed to expedite prosecution of this application.

No extension of time is believed to be due. In the event that a petition for an extension of time is required to be submitted at this time, Applicant hereby petitions under 37 C.F.R. 1.136(a) for an extension of time for as many months as are required to ensure that the above-identified application does not become abandoned.

Applicant believes no fee is due with this paper. However, if a fee is due, please charge our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: December 6, 2024

Respectfully submitted,

Electronic Signature: /Ryan Rieker/
Ryan Rieker

Registration No.: 80,734
MINTZ LEVIN COHN FERRIS GLOVSKY
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PATENT AND TRADEMARK OFFICE

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
12/06/2024 03:01:24 PM Z ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	June Watson
PATENT CENTER #	68261923	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Ryan Rieker

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US_Response_FOA.pdf	7	-	187 KB
057664-348N01US_Response_FOA-A.NE.pdf (1-1)	1	Response After Final Action	104 KB
057664-348N01US_Response_FOA-CLM.pdf (2-4)	3	Claims	109 KB
057664-348N01US_Response_FOA-REM.pdf (5-7)	3	Applicant Arguments/Remarks Made in an Amendment	175 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
057664- 348N01US_Response_FOA.pdf	445BC42810F3B3E3A462D8F18CA73E504CA4E31A58E4F1FFB A818B538CA398C243F34A49F567D882430CF2557828D4783CF 17839F0CD5F1FF2102F004291B3F3
057664- 348N01US_Response_FOA- A.NE.pdf	9010E43DE258BF16DE8614E007CB4124086CA3E4FBA34DA89 6B4A18D6E276E9CADADB676971EAC9640FF88F7F5FA0C71C 169A66A5F2DDE4C9058F0EDF94A9B6E
057664- 348N01US_Response_FOA- CLM.pdf	13EFE4406F8D341875E11BE88EB57542331878A304B87282AC B78A33C122443517F4FA7E7D8BCCDB3493AFA532F906A2B24 7C31ACA7DAF1284275E93D6504673
057664- 348N01US_Response_FOA- REM.pdf	0298ADED7F86F71A06D282A121349BED29EB99B4CC5F81564 E7D773089B95104CFD918E56AD5D822D7858E1F1E6DA5B8B BBCC2D6537C0B4A76FE477CFC166F56

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875				Application or Docket Number 17/159,414		Filing Date 01/27/2021		☐ To be Mailed			
ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO											
APPLICATION AS FILED - PART I											
		(Column 1)		(Column 2)							
FOR		NUMBER FILED		NUMBER EXTRA		RATE (\$)		FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))		N/A		N/A		N/A					
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))		N/A		N/A		N/A					
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))		N/A		N/A		N/A					
TOTAL CLAIMS (37 CFR 1.16(i))		minus 20 =		*		x \$100 =					
INDEPENDENT CLAIMS (37 CFR 1.16(h))		minus 3 =		*		x \$480 =					
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))		If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))											
* If the difference in column 1 is less than zero, enter "0" in column 2.						TOTAL					
APPLICATION AS AMENDED - PART II											
		(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	01/27/2021	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 28	Minus	** 28	= 0		x \$100 =		0		
	Independent (37 CFR 1.16(h))	* 5	Minus	*** 5	= 0		x \$480 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
								TOTAL ADD'L FEE		0	
		(Column 1)		(Column 2)		(Column 3)					
AMENDMENT	12/06/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR		PRESENT EXTRA		RATE (\$)		ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	* 20	Minus	** 28	= 0		x \$100 =		0		
	Independent (37 CFR 1.16(h))	* 1	Minus	*** 5	= 0		x \$480 =		0		
	☐ Application Size Fee (37 CFR 1.16(s))										
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
								TOTAL ADD'L FEE		0	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.								LIE			
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".								/ANITA JOHNSON/			
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".											
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.											

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US	3603
177399	7590	10/09/2024	EXAMINER	
Mintz Levin/SharkNinja			SHIRSAT, VIVEK K	
One Financial Center			ART UNIT	PAPER NUMBER
Boston, MA 02111			3762	
			NOTIFICATION DATE	DELIVERY MODE
			10/09/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IPDocketingBOS@mintz.com
IPFilerombos@mintz.com
mintzdocketing@cpaglobal.com

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 79-80 and 90** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

Claims 79-80 and 90 require “the motor”, however, claims 78 and 89 requires “...a motor coupled to *each* of the first fan and the second fan” [claim 78, equivalent in claim 89] which claims that each fan includes its own individual motor. Therefore, it is unclear if “the motor” is referring to the motor attached to the first fan or the second fan.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(2) the claimed invention was described in a patent issued under section 151, or in an application for patent published or deemed published under section 122(b), in which the patent or application, as the case may be, names another inventor and was effectively filed before the effective filing date of the claimed invention.

2. **Claim(s) 71-79 and 81** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Conrad et. al (US 2020/0329909 A1).

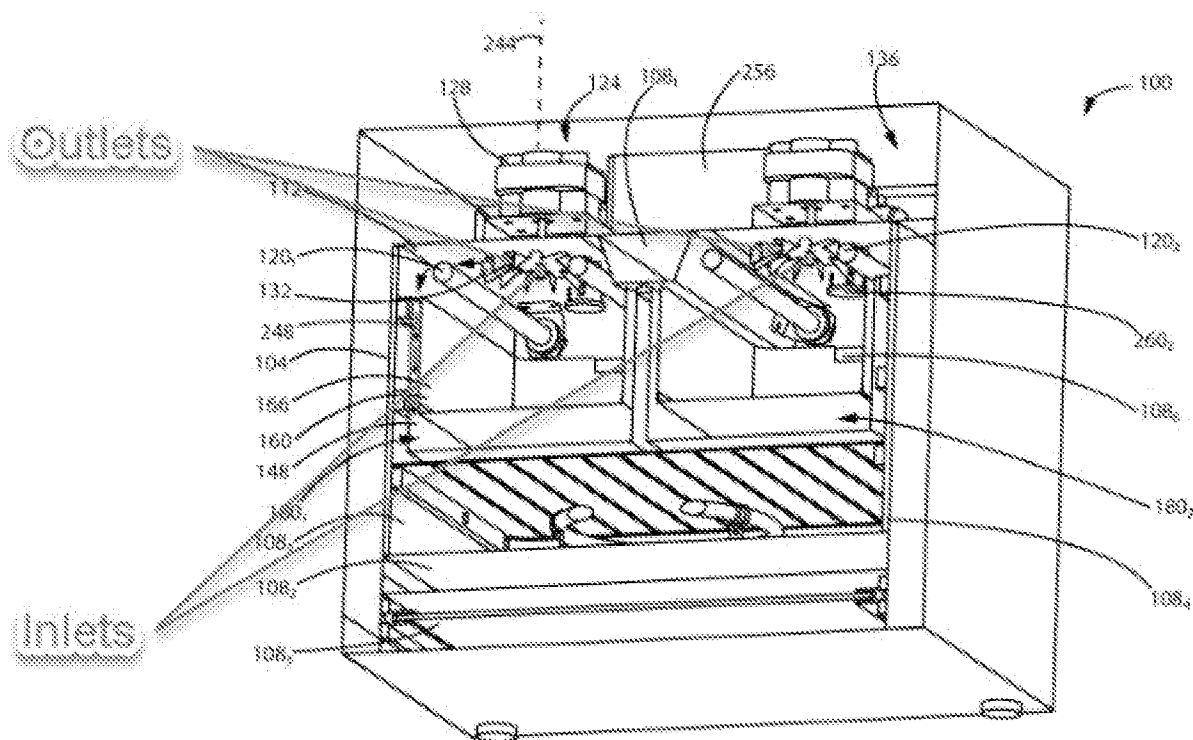
With respect to claim 71 Conrad discloses a cooking system comprising: a housing [reference character 108] having a first internal compartment and a second internal compartment [reference character 180₁ and 180₂]; a first cooking container [reference character 160] receivable within the first internal compartment [see Fig. 2] within an interior of said the first cooking container defining a first cooking volume; a second cooking container [also reference character 160, see Fig. 2] receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other: a first heater [reference character 120₁] thermally connected with the first internal compartment and a second heater [reference character 120₂] thermally connected to the second internal compartment; and a first fan [reference characters 120 and 124] and a second fan [reference characters 120 and 124] disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume.

With respect to claim 72 Conrad discloses that the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments [see Fig. 1].

With respect to claim 73 Conrad discloses that the first internal compartment and the second internal compartment are similarly sized [see Fig. 4].

With respect to claim 74 Conrad discloses that the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing [see Fig. 4].

With respect to claim 75 Conrad discloses that the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet [see annotated Fig. below, Conrad discloses impellers, see paragraph 0179, where a person having ordinary skill in the art would understand that the flow enters the center of the impeller and exits at the periphery].



With respect to claim 76 Conrad discloses that the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet [see annotated Fig. above].

With respect to claim 77 Conrad discloses that the first cooking container includes a first handle [reference character 176] and the second cooking container includes a second handle [reference character 176, see Fig. 2].

With respect to claim 78 Conrad discloses a motor operably coupled to each of the first fan and the second fan [reference character 128 for both, see Fig. 4].

With respect to claim 79 Conrad discloses that the motor is located external to the first internal compartment and the second internal compartment [see Fig. 4].

With respect to claim 81 Conrad discloses a control system configured to independently operate the first and second heaters and the first and second fans [see paragraph 0004]¹.

¹ “...cooking conditions in each cooking volume are individually controllable. For example, each cooking volume may have its own heating (IR) heating element or elements, one or more air moving members (e.g., a fan) to provide a directed airflow in the cooking volume and/or one or more steamers” [paragraph 0004]. Individual control over the cooking conditions in each cooking volume implies a control system that can perform the required function.

3. **Claim(s) 82-86, and 89** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Conrad et. al (US 2020/0329909 A1).

With respect to claim 82 Conrad discloses a housing having a first internal cooking compartment and a second internal compartment [reference character 180₁ and 180₂], the first internal compartment including a first heating assembly comprising a first fan [reference character 120 and 124] and a first heater [reference character 120₁], and the second internal cooking compartment including a second heating assembly comprising a second fan [reference character 120 and 124] and a second heater [reference character 120₂], the first and second internal cooking compartments being thermally and fluidly separated; a first cooking container [reference character 160] removably disposed within the first internal cooking compartment and a second cooking container [also reference character 160, see Fig. 2] removably disposed within the second internal cooking compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers [see paragraph 0004].

With respect to claim 83 Conrad discloses that the first cooking container includes a first external handle [reference character 176] attached thereto and the second cooking container includes a second external handle [reference character 176, see Fig. 2] attached thereto.

With respect to claim 84 Conrad discloses that the first internal compartment and the second internal compartment are similarly sized [see Fig. 4].

With respect to claim 85 Conrad discloses that the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction [see paragraph 0004, the food is cooked by a convection].

With respect to claim 86 Conrad discloses a control system configured to independently operate the first and second heating assemblies [see paragraph 0004]².

With respect to claim 89 Conrad discloses a motor [reference character 128 for both, see Fig. 4] operably coupled to each of the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds [see paragraph 0004].

² See footnote 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. **Claim(s) 80 and 90** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Caselani et. al (US 3,973,551).

With respect to claims 80 and 90 Conrad does not disclose that the motor is positioned between the first internal compartment and the second internal compartment.

Caselani discloses an oven with two fans [reference character 31 in Fig. 3] and a motor [reference character 30] between the fans.

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the oven taught by Conrad by driving the two fans with a single motor placed between the fans, as taught by Caselani in order to reduce the number of motors and the overall cost. Placing the motor between the fans would place the motor between the first and second internal compartments.

4. **Claim(s) 87-88** is/are rejected under 35 U.S.C. 103 as being unpatentable over Conrad et. al (US 2020/0329909 A1) in view of Veltrop et. al (US 8,096,231 B2).

With respect to claims 87-88 Conrad does not disclose that the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type (claim 87); or the control system is configured to adjust a cooking parameter based on sensed data without user input (claim 88).

Veltrop discloses a multi tray cooking system that includes a control panel [reference character 54] that allows “...the operator to select setpoint temperatures for the compartments... [a] control system in food warming apparatus 10 may control the heating systems for the compartments (e.g., thermostatically) so as to achieve and maintain the setpoint temperatures... the control system may measure the temperature at the heating system (e.g., at heater plate 50 or 52), so that the setpoint temperature corresponds to the temperature at the heating system” [column 4 lines 56-64].

It would have been obvious to one of ordinary skill in the art at the time of the filing date of the invention to modify the oven taught by Conrad by including a control panel and the control system taught by Veltrop in order to allow for automatic maintenance of a desired set point temperature.

Response to Arguments

5. Applicant's arguments with respect to claim(s) 71 have been considered but are moot because the new ground of rejection does not rely on any reference applied in the prior rejection of record for any teaching or matter specifically challenged in the argument.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIVEK K SHIRSAT whose telephone number is (571)272-3722. The examiner can normally be reached M-F 9:00AM-5:20AM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VIVEK K SHIRSAT/
Primary Examiner, Art Unit 3762

Notice of References Cited	Application/Control No. 17/159,414		Applicant(s)/Patent Under Reexamination Martin et al.	
	Examiner VIVEK K SHIRSAT		Art Unit 3762	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-20200329909-A1	2020-10-22	Conrad; Wayne Ernest	F24C15/327	1/1
*	B	US-3973551-A	1976-08-10	Caselani; Richard E.	A21B1/28	126/21A
*	C	US-8096231-B2	2012-01-17	Veltrop; Loren J.	A47J39/006	219/385
	D					
	E					
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FOREIGN PATENT DOCUMENTS

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	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

CPC - Searched*		
Symbol	Date	Examiner
A47J37/0641, 0664	03/08/2024	vks
A47/J27/12, 004	03/08/2024	vks

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
126	21A	03/08/2024	vks

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Search Notes		
Search Notes	Date	Examiner
see search history	03/08/2024	vks
inventor search	03/08/2024	vks
class/subclass search	03/08/2024	vks
forward/backward search	03/08/2024	vks
text search	03/08/2024	vks
updated search	10/03/2024	vks

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414	
	Filing Date		2021-01-27	
	First Named Inventor	Christopher T. Martin		
	Art Unit	3762		
	Examiner Name	Vivek K. Shirsat		
	Attorney Docket Number	057664-348N01US		

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	1	201847449	CN	U	2011-06-01	Yao Ling		☐
	2	110664270	CN	A	2020-01-10	Guo Xin		☐
	3	202019101468	DE	U1	2019-03-29	Reamotion Gmbh		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3762	
	Examiner Name	Vivek K. Shirsat	
	Attorney Docket Number	057664-348N01US	

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Examiner Signature	/VIVEK K SHIRSAT/		Date Considered	10/03/2024
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3762
Examiner Name	Vivek K. Shirsat
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Ryan T. Rieker/	Date (YYYY-MM-DD)	2024-07-09
Name/Print	Ryan T. Rieker	Registration Number	80,734

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	225	("20170071408" OR "11297977" OR "20090126580" OR "20120272832" OR "20170231430" OR "10045651" OR "10051997" OR "10088173" OR "10094576" OR "10099839" OR "10101038" OR "10113749" OR "10143324" OR "10174953" OR "10190783" OR "10203117" OR "10234144" OR "10247424" OR "10271686" OR "10271690" OR "10285531" OR "10309659" OR "10337745" OR "10364990" OR "10364991" OR "10383477" OR "10390656" OR "10405696" OR "10405697" OR "10405698" OR "10405699" OR "10413121" OR "10413122" OR "10426176" OR "10448785" OR "10448786" OR "10451285" OR "10492641" OR "10495319" OR "10495320" OR "10502433" OR "10512363" OR "10524615" OR "10598391" OR "10619862" OR "10627116" OR "10638882" OR "10660471" OR "10674853" OR "10674854" OR "10684022" OR "10694753" OR	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:21 PM

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L4	1717	A47J27/004.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
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L8	1955	L7 AND ((heating WITH element) OR heating\$1element)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
L9	1113	L8 AND (fan OR blower)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
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L12	696	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/07 11:27 AM
L13	6698	A47J37/0641.cpc.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:27 AM
L14	14410	(air ADJ fryer) OR air\$1fryer	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L15	7100	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
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L19	1866	L18 AND (blower OR fan)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
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L23	2936	(((("MARTIN") near3 ("Christopher")) OR ((("GUERIN") near3 ("Thomas")) OR ((("JACKSON") near3 ("Roger")) OR ((("ANTHONY") near3 ("Joshua")) OR ((("SCHWARZ") near3 ("Kerry")) OR ((("DUBEAU") near3 ("Michaela")))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:27 PM
L24	172	L23 AND cooking	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:28 PM
L25	158	L23 AND cooking	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 06:28 PM
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L28	1	"4034663".pn.	(US-PGPUB; USPAT)	OR	ON	ON	2024/06/21 06:13 PM
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L30	40	<p>9635979" "9661952" "9668615" "9671114" "9677774" "9681773" "9693655" "9702564" "9723954" "9746189" "9759430" "9759432" "9788687" "9795250" "9803873" "9863645" "9874354" "9879865" "9900936" "9903598" "9974312" "9976750" "9980322" "9980606" "9993111" "D688513" "D695058" "D724890" "20180303285").PN</p> <p>((US-20200352385-A1 OR US-20190298106-A1 OR US-20190298105-A1 OR US-20230355032-A1 OR US-20230031394-A1 OR US-20230015314-A1 OR US-20220395137-A1 OR US-20220313017-A1 OR US-20220202239-A1 OR US-20160081509-A1 OR US-20180303285-A1 OR US-20180317715-A1 OR US-20210212506-A1 OR US-20220125241-A1 OR US-20200214500-A1 OR US-20200329909-A1).did. AND PGPB.dbnm.) OR ((US-10448786-B2 OR US-11739947-B2 OR US-3973551-A OR US-4034663-A OR US-4506598-A OR US-4585661-A OR US-4728762-A OR US-4962694-A OR US-5398666-A OR US-5771789-A OR US-5996572-A OR US-6049066-A OR US-6131559-A OR US-6225604-B1 OR US-11297977-B1 OR US-8011293-B2 OR US-10638882-B1 OR US-10881246-B2).did. AND USPT.dbnm.) OR ((US-</p>	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:45 PM
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		10575679-B1 OR US-11304558-B1).did. AND DWPI.dbnm.) OR ((US-2245220-A).did. AND USOC.dbnm.) OR ((CN-102342761-A OR CN-103767562-A OR CN-105231802-A).did. AND FTDB.dbnm.)					
L31	1	L30 AND setpoint	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:46 PM
L32	10	L29 AND setpoint	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/03 04:46 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: Vivek K Shirsat

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed more than three months after the filing date of this application, OR more than three months after the date of entry of the national stage in the international application, AND after the mailing date of a first Office Action on the merits, but before the mailing date of any of a Final Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311 or an action that otherwise closes prosecution in this application (37 C.F.R. § 1.97(c)).

Application No.: 17/159,414

Docket No.: 057664-348N01US

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copies of U.S. patents and U.S. patent application publications are not submitted.

Applicant brings to the Examiner's attention the following U.S. Patent Applications, the prosecution of which may be relevant to the current application:

App. No.	Filing Date	Title
17/219,238	March 31, 2021	Cooking Device And Components Thereof
17/837,768	June 10, 2022	Cooking Device And Components Thereof
18/186,671	March 20, 2023	Cooking Device And Components Thereof

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

Please charge our Deposit Account No. 50-0311 in the amount of \$260.00 covering the fee set forth in 37 C.F.R. § 1.17(p). The Director is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 50-0311, under Order No. 057664-348N01US.

Dated: May 24, 2024

Respectfully submitted,

By: /Ryan T. Rieker/

Ryan T. Rieker

Registration No.: 80,734

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 239-8425

Application No.: 17/159,414

Docket No.: 057664-348N01US

Agent for Applicant

/VIVEK K SHIRSAT/

10/03/2024

Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 11/30/2020. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414	
	Filing Date		2021-01-27	
	First Named Inventor	Christopher T. Martin		
	Art Unit	3762		
	Examiner Name	Vivek K Shirsat		
	Attorney Docket Number	057664-348N01US		

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6450085	B1	2002-09-17	Riesselmann, Gottfried	
	2	11672377	B2	2023-06-13	Martin et al.	

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	1	20210272832	A1	2021-09-02	Burkhart et al.	
	2	20220408966	A1	2022-12-29	Martin et al.	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3762	
	Examiner Name	Vivek K Shirsat	
	Attorney Docket Number	057664-348N01US	

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EXAMINER SIGNATURE				
Examiner Signature	/VIVEK K SHIRSAT/		Date Considered	10/03/2024
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.				
<small> ¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached. </small>				

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3762
Examiner Name	Vivek K Shirsat
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Ryan T. Rieker/	Date (YYYY-MM-DD)	2024-05-24
Name/Print	Ryan T. Rieker	Registration Number	80,734

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Bibliographic Data

Application No: 17/159,414

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /VIVEK K SHIRSAT/

Examiner's Signature

Initials

Title: COOKING DEVICE AND COMPONENTS THEREOF

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/27/2021	126	3762	057664-348N01US
RULE			

APPLICANTS

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Kerry Schwarz, Needham, MA, UNITED STATES

Michaela Dubeau, Uxbridge, MA, UNITED STATES

CONTINUING DATA

This application is a 371 of PCT/US2020/042120 07/15/2020

PCT/US2020/042120 has PRO of 62874193 07/15/2019

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

07/29/2022

STATE OR COUNTRY

UNITED STATES

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One Financial Center

Boston, MA 02111

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APPLICATION #
17/159,414

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07/10/2024 09:48:47 AM Z ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Raghav Kapoor
PATENT CENTER #	66279979	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Ryan Rieker

Documents

TOTAL DOCUMENTS: 5

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US__17159414_NFOA__SIDS__Transmittal.pdf	2	Transmittal Letter	81 KB
057664-348N01US__17159414_NFOA__SB08_Jul_09_2024.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1234 KB
FOR_CN110664270A.pdf	18	Foreign Reference	1273 KB
FOR_CN201847449U.pdf	22	Foreign Reference	1442 KB
FOR_DE202019101468U1.p	17	Foreign Reference	1594 KB

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057664-348N01US_17159414_NFOA_SIDS_Transmittal.pdf	9D51D7A353B22F40E13FC27310FE59FE2C39CE8AA0901D664757303DAB32FDF86AA42CE225771C793FF9C374C5BB88246D03DE0168A6EC2EA58DC54373458058
057664-348N01US_17159414_NFOA_SB08_Jul_09_2024.pdf	840CE128763407CD82252024F5EE159C9E6B6C497D4CD5149D125D71FB3C1219A246A34A8103F8DF82F20210EF7E7C6B2B54891FF862996BCA7B51E548B904C2
FOR_CN110664270A.pdf	95C16295846EA0A96D851279E715FF26EB7120D4DF9ADA72E47E7129721A061267A5EDCEFE30F06491F9EFA97F86BBB7A61F246B3348B7302A0AFC61C7BD3723
FOR_CN201847449U.pdf	14FCA78A46502DFD16396F58E592CF453A27B6F8554F929C7E65EDBFB281FA5C7205CD72C8F3F9A50815778D169924B364C51BA3F103F9573E7FF0278A99A826
FOR_DE202019101468U1.pdf	C587D2B9C5C6BF8A3DE7C2DBE50E2B30CADC1F22927DE0E44FC8F803DD74BB02683D7370975C3954ABBB1D4E79DF239FE2E1747AFA3CDF9D8ACE96F96E1A055D

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an

international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3762	
	Examiner Name	Vivek K. Shirsat	
	Attorney Docket Number	057664-348N01US	

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Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	201847449	CN	U	2011-06-01	Yao Ling		☐
	2	110664270	CN	A	2020-01-10	Guo Xin		☐
	3	202019101468	DE	U1	2019-03-29	Reamotion Gmbh		☐

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3762
Examiner Name	Vivek K. Shirsat
Attorney Docket Number	057664-348N01US

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3762	
	Examiner Name	Vivek K. Shirsat	
	Attorney Docket Number	057664-348N01US	

CERTIFICATION STATEMENT

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OR

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Ryan T. Rieker/	Date (YYYY-MM-DD)	2024-07-09
Name/Print	Ryan T. Rieker	Registration Number	80,734

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Espacenet

Bibliographic data: DE202019101468 (U1) — 2019-03-29

Device for heating and/or cooking food

Inventor(s):

Applicant(s): REAMOTION GMBH [DE] ± (reamotion GmbH)

Classification: - **international:** A47J37/06
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Abstract of DE202019101468 (U1)

Device (1) for heating and/or cooking foodstuffs, in particular meat products and/or frozen products, with a device housing (2), wherein the device housing (2) has at least one cooking chamber (4) for the foodstuff, which is accessible via at least one opening (6, 6') in the device housing (2), and has a receiving container (8) for the foodstuff that corresponds to the respective cooking chamber (4) and can be inserted into or removed from the cooking chamber, and a heating device (10) assigned to the cooking chamber (4) with one or more heating elements (12, 14, 16), characterized in that the heating device (10) has at least two heating elements (12, 14, 16), wherein a first heating element (12, 16) has at least one radiant heater and the second heating element (14) comprises at least one convection heater.

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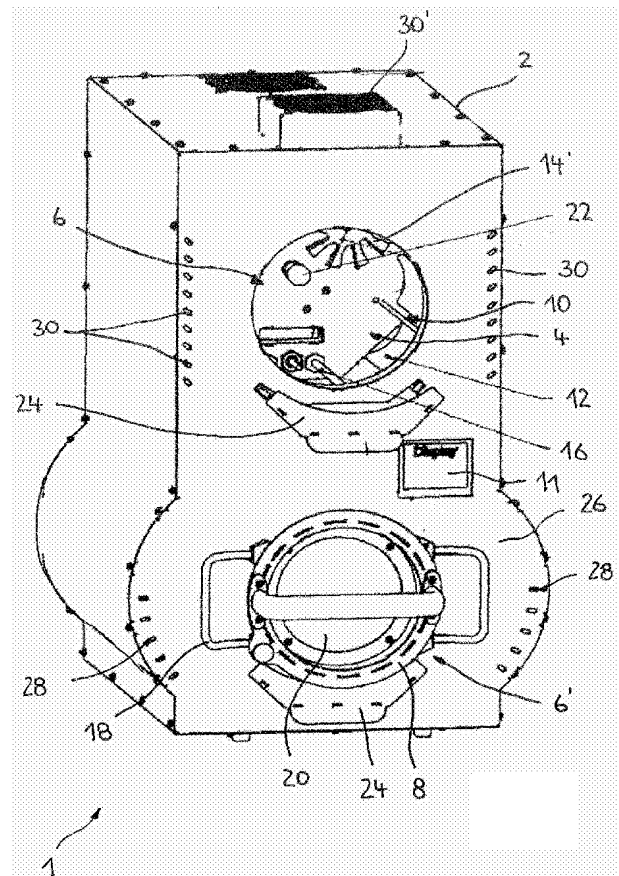
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Rechercheantrag gemäß § 7 GbmG ist gestellt.

Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen.

(54) Bezeichnung: **Vorrichtung zum Erhitzen und/oder Garen von Lebensmitteln**

(57) **Hauptanspruch:** Vorrichtung (1) zum Erhitzen und/oder Garen von Lebensmitteln, insbesondere von Fleischerzeugnissen und/oder Tiefkühlprodukten, mit einem Gerätegehäuse (2), wobei das Gerätegehäuse (2) wenigstens einen Garraum (4) für das Lebensmittel aufweist, welche über wenigstens eine Öffnung (6, 6') im Gerätegehäuse (2) zugänglich sind, und einen mit dem jeweiligen Garraum (4) korrespondierenden in den oder aus dem Garraum einsetz- und entnehmbaren Aufnahmebehälter (8) für das Lebensmittel aufweist, und einer dem Garraum (4) zugeordneten Heizeinrichtung (10) mit einem oder mehreren Heizelementen (12, 14, 16), dadurch gekennzeichnet, dass die Heizeinrichtung (10) mindestens zwei Heizelemente (12, 14, 16) aufweist, wobei ein erstes Heizelement (12, 16) wenigstens einen Strahlungsheizkörper aufweist und das zweite Heizelement (14) wenigstens einen Konvektionsheizkörper umfasst.



Beschreibung

[0001] Die Erfindung bezieht sich auf eine Vorrichtung zum Erhitzen und/oder Garen von Lebensmitteln, insbesondere von Fleischerzeugnissen und/oder Tiefkühlprodukten mit einem Gerätegehäuse mit mindestens einer Aufnahmeeinrichtung, wobei die Aufnahmeeinrichtung ein oder mehrere Aufnahme-fächer aufweist, welche über wenigstens eine Öffnung im Gerätegehäuse zugänglich sind, und einen mit dem jeweiligen Aufnahmefach korrespondierenden in das oder aus dem Aufnahmefach einsetz- und entnehmbare Aufnahmebehälter für das Lebensmittel aufweist, und einer der Aufnahmeeinrichtung zugeordneten Heizeinrichtung mit einem oder mehreren Heizelementen.

[0002] Bei der Zubereitung von Lebensmitteln in der Schnellgastronomie werden unter anderem Fleischerzeugnisse, wie Bratwürste oder Burger-Scheiben, mithilfe von Grill- oder Brateinheiten und Tiefkühlprodukte, wie beispielsweise Pommes oder Kroketten, unter Verwendung einer offenen Fritteuse für den Verzehr zubereitet. Bei der üblichen Zubereitung entstehen aufgrund der Art der Zubereitung typischerweise fetthaltige und geruchsintensive Dämpfe. Im Bereich der Schnellrestaurants und Imbissbetriebe wird versucht mithilfe aufwendiger Absaug- und Filteranlagen die fetthaltigen Dämpfe und Gerüche abzuleiten beziehungsweise zu binden, um die Belastung durch die beim Zubereiten der Lebensmittel entstehenden Dämpfe und Gerüche zu minimieren.

[0003] Darüber hinaus sind die in den Schnellrestaurants und Imbissbetrieben zum Einsatz kommenden Grill- und Brateinrichtungen sowie die Fritteusen dauerhaft auf einem bestimmten, gleichbleibenden Temperaturniveau zu halten, um eine entsprechende schnelle Zubereitung gewährleisten zu können. Zum Halten der Zubereitungseinrichtungen auf der nötigen Temperatur bedarf es jedoch einem hohen Energieaufwand. Ferner ist die Zubereitung von Lebensmitteln mit den üblichen bekannten Vorrichtungen zum Erhitzen und/oder Garen von Lebensmitteln durch das Servicepersonal zu überwachen bzw. zu kontrollieren. Dies ist notwendig, um die optimale Qualität bei der Zubereitung der Lebensmittel zu gewährleisten.

[0004] Aus DE 20 2014 005 299 U1 ist zum Beispiel eine Vorrichtung zum Garen der vorbezeichneten Gattung bekannt. Die Vorrichtung zum Erhitzen und/oder Garen von Lebensmitteln weist eine Aufnahmeeinrichtung zum Zubereiten von Fleischerzeugnissen und eine Aufnahmeeinrichtung zum Zubereiten von Tiefkühlprodukten auf. Die Aufnahmeeinrichtungen sind innerhalb des Gerätegehäuses übereinander angeordnet, wobei durch die Vorrichtung ein Heißluftstrom zum gleichmäßigen Garen der Lebensmittel geführt wird, um ein gleichmäßiges Er-

hitzen und/oder Garen der in den Aufnahmeeinrichtungen zuzubereitenden Lebensmittel umsetzen zu können. Der Energieaufwand bei dieser Art der Zubereitung ist zwar reduziert, jedoch noch vergleichsweise hoch, da der durch die Vorrichtung geleitete Luftstrom fortwährend auf einem vorbestimmten Temperaturniveau zu halten ist. Zudem lässt sich an der bekannten Vorrichtung nicht gänzlich vermeiden, dass fetthaltige und geruchsintensive Dämpfe doch beim Entnehmen der zubereiteten Produkte aus der bekannten Vorrichtung nach außen austreten.

[0005] Der Erfindung lag die Aufgabe zugrunde, eine Vorrichtung zum Erhitzen und/oder Garen von Lebensmitteln anzugeben, mithilfe der eine vereinfachte und schonende Zubereitung von Lebensmitteln bei einem verringerten Energieaufwand und unter weitgehender Vermeidung einer Geruchsbelastung möglich ist.

[0006] Die Erfindung löst die ihr zugrundeliegende Aufgabe bei einer Vorrichtung zum Erhitzen und/oder Garen von Lebensmitteln der vorbezeichneten Gattung mit den Merkmalen von Anspruch 1. Insbesondere weist die Heizeinrichtung mindestens zwei Heizelemente auf, wobei ein erstes Heizelement wenigstens einen Strahlungsheizkörper aufweist und das zweite Heizelement wenigstens einen Konvektionsheizkörper umfasst.

[0007] Erfindungsgemäß wird hier der Ansatz verfolgt, dass mit Hilfe der verschiedenen Heizelemente, von denen eines als Strahlungsheizkörper und das andere als Konvektionsheizkörper ausgebildet ist, eine effiziente Erwärmung bzw. Zubereitung der Lebensmittel möglich ist. Bevorzugt tiefgekühlte Lebensmittel, wie beispielsweise Pommes Frites, können dadurch in verkürzter Zeit zubereitet werden. Bevorzugt ist der Garraum im Wesentlichen nach außen abgeschlossen, sodass die mittels der Heizelemente erzeugte Wärme nicht aus dem Garraum austritt, sondern effektiv für das Erwärmen des Lebensmittels genutzt werden kann. Zudem wird bevorzugt durch die Kombination der verschiedenen Heizelemente sichergestellt, dass die zuzubereitenden Lebensmittel zum einen gleichmäßig auf eine gewünschte Temperatur erhitzt werden und zum anderen, vorzugsweise mittels des Strahlungsheizkörpers, auf der Oberfläche ein ansprechendes Äußeres in Form einer typischen Braufärbung erhalten.

[0008] Eine Weiterbildung der erfindungsgemäßen Vorrichtung sieht vor, dass das erste Heizelement als Rohrheizkörper oder Infrarot-Strahler ausgebildet ist, wobei das Heizelement bevorzugt dazu eingerichtet ist, gezielt Strahlung in eine Richtung abzugeben. Der Infrarot-Strahler weist bevorzugt eine Plattenform auf. Damit ist eine großflächige Abstrahlung von Wärmeenergie in den Garraum bewirkt. Vorzugsweise ist das als Infrarot-Strahler ausgebildete Heizele-

ment dazu eingerichtet, vornehmlich Wärme-Strahlung auf nur einem seiner Flächenbereiche abzugeben, nämlich der dem Garraum zugewandten Fläche des Infrarot-Strahlers. Dadurch wird eine effiziente Erwärmung des Lebensmittels im Garraum erzielt und eine direkte unerwünschte Erwärmung der den Garraum begrenzenden Wandung vermieden. Vorzugsweise weisen die plattenförmigen Heizelemente eine an die bevorzugt zylindrische Form des Garraumes angepasste, gekrümmte Form auf. Der Garraum und die plattenförmigen Heizelemente weisen ähnliche Krümmungsradien auf.

[0009] Vorzugsweise ist das zweite Heizelement als Heißluftgebläse ausgebildet, das innerhalb des Garraumes einen Umluftstrom erzeugt. Das Heißluftgebläse bewirkt somit eine gleichmäßige Verteilung der erzeugten Wärme innerhalb des Garraumes. Ein im Garraum befindliches Lebensmittel wird durch den Umluftstrom schneller und gleichmäßiger erwärmt. Durch die bevorzugt geschlossene Ausbildung des Garraumes ist trotz der im Garraum strömenden Umluft der Austritt der erzeugten Wärme aus dem Geräteinneeren minimiert.

[0010] Eine Weiterbildung der erfindungsgemäßen Vorrichtung sieht zwei Garräume für zuzubereitende Lebensmittel vor, wobei jeder Garraum einen in den Garraum einsetz- und entnehmbaren Aufnahmebehälter für das Lebensmittel aufweist, wobei der Aufnahmebehälter vorzugsweise drehbar aufgenommen ist. Je nach Art des zu erhitzenden Lebensmittels weisen die Aufnahmebehälter unterschiedliche Formen auf, wobei in einer Ausführungsform der Erfindung ein Garraum mit dem darin aufzunehmenden Aufnahmebehälter zum Zubereiten von Fleischerzeugnissen, wie beispielsweise Bratwürsten oder Fleischpaties eingerichtet ist. Ein weiterer Garraum kann in dieser Ausführungsform zum Zubereiten von Tiefkühlprodukten wie beispielsweise Pommes Frites, vorgesehen sein. Bevorzugt weist ein solcher Garraum einen als Trommel ausgebildeten Aufnahmebehälter für das Lebensmittel auf, der in einen bevorzugt zylindrisch ausgebildeten Garraum eingesetzt wird. In einer weiteren Ausführungsform weist die erfindungsgemäße Vorrichtung zwei Garräume auf, welche jeweils zum Aufnehmen eines trommelförmigen Aufnahmebehälters eingerichtet sind. Bevorzugt weist die Vorrichtung zwei übereinander im Gerätegehäuse angeordnete zylindrische Garräume auf, welche in Abhängigkeit von den in den Garräumen zuzubereitenden Lebensmitteln individuell angesteuert und bedarfsgerecht geregelt werden können. Insbesondere sind die Aufnahmebehälter jeweils um ihre Längsachse drehbar in den Garräumen aufgenommen, wodurch das zuzubereitende Lebensmittel während des Erhitzens/Garens mittels des Aufnahmebehälters im Garraum bewegt wird.

[0011] Vorzugsweise ist im Bodenbereich des Garraumes oder unterhalb des Garraumes eine aus dem Gerätegehäuse zumindest teilweise entnehmbare Auffangwanne angeordnet. Insbesondere bei der Zubereitung der Lebensmittel entstehende oder aus dem Aufnahmebehälter herausfallende Rückstände sammeln sich auf der Auffangwanne im Bodenbereich des Garraumes. Diese Rückstände können über die aus dem Gerätegehäuse entnehmbare Auffangwanne einfach entfernt werden, wodurch das Reinigen der erfindungsgemäßen Vorrichtung vereinfacht ist. Die Auffangwanne kann beispielsweise über eine Öffnung an der Front oder einem Seitenbereich des Gerätegehäuses herausgenommen werden. Die Auffangwanne wird bevorzugt in Richtung einer horizontal verlaufenden Ebene aus dem Gerätegehäuse entnommen bzw. in das Gerätegehäuse eingesetzt.

[0012] Bevorzugt ist ein den jeweiligen Garraum abdichtend verschließendes Verschlussstück vorgesehen, welches bevorzugt an dem Aufnahmebehälter für die Lebensmittel angeordnet ist. Jeder Garraum der erfindungsgemäßen Vorrichtung weist ein separates Verschlussstück zum Verschließen der zum Einsetzen und/oder Entnehmen des Aufnahmebehälters in den Garraum dienenden Öffnung auf. Insbesondere ist das Verschlussstück an dem Aufnahmebehälter für die Lebensmittel angeordnet und bildet bevorzugt einen Wandbereich des Aufnahmebehälters und des Gerätegehäuses aus. Das Verschlussstück hat somit eine Doppelfunktion, nämlich Verschließen des Aufnahmebehälters und Verschließen des Garraumes am Gerätegehäuse. Für eine bevorzugt hermetische Abriegelung des Garraumes ist es bevorzugt, an dem Verschlussstück wenigstens ein Dichtelement mit elastischen Eigenschaften, wie beispielsweise eine Dichtlippe anzuordnen. Mit dem Dichtelement am Verschlussstück ist der Energieverlust während des Garprozesses oder ein unerwünschtes Austreten von während des Garprozesses entstehenden Dämpfen aus dem Garraum zusätzlich behindert.

[0013] Gemäß einer weiteren bevorzugten Ausführungsform der erfindungsgemäßen Vorrichtung, die zugleich auch einen separaten Aspekt der Erfindung betrifft, weist das Gerätegehäuse ein oder mehrere Luftein- und/oder -auslässe auf und es sind ein oder mehrere mit den Luftein- und/oder -auslässen zusammenwirkende Lüfter zum Erzeugen eines Kühl-Luftstromes zwischen der Außenhaut des Gerätegehäuses und der oder den im Gerätegehäuse angeordneten Garräumen vorgesehen. Mit Hilfe des Kühl-Luftstroms im Inneren des Gerätegehäuses wird ein Wärmestau im Inneren der Vorrichtung vermieden, sodass die Außenseite des Gerätegehäuses trotz der hohen Temperatur innerhalb der Garräume das zulässige Temperaturniveau nicht überschreitet. Mögliche Verletzungen in Form von Verbrennungen durch eine die erfindungsgemäße Vorrichtung betätigende Person werden vermieden. Ferner ist auch ein

Schutz der innerhalb des Gerätegehäuses angeordneten, bevorzugt elektrischen Komponenten gegen Überhitzung erreicht.

[0014] Vorzugsweise sind mehrere Luftein- und/oder -auslässe in einem front- und rückseitigen Bereich und/oder einem Deckenbereich des Gerätegehäuses ausgebildet. Mit Hilfe der Luftein- und/oder -auslässe in der Front und der Rückseite der Vorrichtung ist eine Kühlluftströmung zwischen einander gegenüberliegenden Seiten des Gerätegehäuses bewirkt. Damit ist eine effektive Kühlung des Gehäuses bewirkt. Mit dem Vorsehen von einer oder mehreren Öffnungen im Deckenbereich und gegebenenfalls im Boden des Gerätegehäuses können mehrere im Gerätegehäuse vorzugsweise quer zueinander verlaufende Luftströmungen für eine weiter verbesserte Kühlfunktion erzeugt werden. Vorzugsweise ist jedem der Luftein- und/oder -auslässe aufweisenden Bereiche im Gerätegehäuse ein Lüfter zugeordnet. Gemäß einer bevorzugten Weiterbildung der erfindungsgemäßen Vorrichtung ist vorgesehen, dass der oder die Lüfter an einer Innenseite der Gehäusewand des Gerätegehäuses angeordnet ist/sind, welche vorzugsweise mindestens einen Luftein- und/oder -auslass für den durch das Innere des Gehäuses insbesondere gesaugten Luftstrom aufweist. Mittels der auf der Innenseite des Gerätegehäuses angeordneten Lüfters wird beispielsweise Luft aus dem Inneren herausgesaugt bzw. Luft in das Innere des Gerätegehäuses eingeleitet. Vorzugsweise wird mittels des Lüfters im Deckenbereich des Gerätegehäuses, die natürliche Konvektion unterstützend, sich unterhalb des Deckenbereiches ansammelnde Wärme aus dem Gerätegehäuse in die Umgebung herausgesaugt.

[0015] Gemäß einer weiteren bevorzugten Ausführungsform der Erfindung sind innerhalb des Gerätegehäuses ein oder mehrere Leiteinrichtungen zum gezielten Führen des durch das Gerätegehäuse geleiteten Luftstromes und/oder eine Trennwand innerhalb des Gerätegehäuses angeordnet. Damit können sich kritisch auf eine erhöhende Temperatur reagierende Bereiche im Inneren des Gerätegehäuses gezielt mit einer kühlen Luftströmung versorgt werden. Das Überschreiten der kritischen Temperatur innerhalb der Vorrichtung und damit verbundene Ausfälle werden dadurch vermieden. Zudem sind die Garräume jeweils von einem Isolierwerkstoff eighaust.

[0016] Ein weiterer Aspekt der Erfindung, für den separat und in Kombination mit dem voran genannten Erfindungsgegenstand in Form einer vorteilhaften Weiterbildung des Erfindungsgegenstandes nach Anspruch 1 Schutz beansprucht wird, betrifft eine Vorrichtung, deren Garraum mit mindestens einer Abluftreinigungseinrichtung fluidleitend koppelbar ist, welche einen elektrostatischen Filter und/oder einen Schwammfilter aufweist, die vorzugsweise inner-

halb eines Abluftkanals der Abluftreinigungseinrichtung angeordnet ist/sind. Der Erfindung liegt die Erkenntnis zugrunde, mit Hilfe einer Abluftreinigungseinrichtung die beim Zubereiten der Lebensmittel entstehenden fetthaltigen und geruchsintensiven Dämpfe oder auch Rauchgase oder Rußpartikel unmittelbar im Anschluss an die Zubereitung als Abluft aus dem Garraum abzuführen und die Abluft vor dem Abgeben in die Umgebung zu reinigen. Beim Öffnen der Garräume bzw. beim Entnehmen der Aufnahmebehälter aus dem Garraum gelangen somit nahezu keine Dämpfe oder Partikel über die Einsetzöffnungen mehr in die Umgebung. Vorzugsweise wird das Abführen der Abluft aus den Garräumen mittels der Abluftreinigungseinrichtung bedarfsgerecht gesteuert. Dazu wird während des Zubereitens der Lebensmittel der Abluftstrom aus den Garräumen unterbrochen. Erst mit Beendigen des Zubereitungs- bzw. Garvorganges wird die Abluft bevorzugt abgesaugt. Das Steuern des Abluftstromes erfolgt zum Beispiel über einen Ventilator der Abluftreinigungseinrichtung der während der Lebensmittel-Zubereitung ausgeschaltet wird.

[0017] Gemäß einer bevorzugten Ausführungsform der Erfindung können der elektrische Filter und/oder der Schwammfilter aus dem Abluftkanal der Abluftreinigungseinrichtung entnommen werden. Der elektrostatische Filter und der Schwammfilter können einfach aus dem Abluftkanal entnommen und entweder, sofern deren Betriebsstunden erreicht sind, ausgetauscht oder, wenn möglich, gereinigt werden. Damit kann die Effektivität der Abluftreinigungseinrichtung wieder auf einfache Weise hergestellt werden, sodass bei der erneuten Zubereitung der Lebensmittel entstehende Dämpfe beim Abführen des Abluftstroms sicher herausgefiltert werden können. Vorzugsweise weist der elektrostatische Filter Plattenelemente aus einem Metall mit nichtkorrodierenden Eigenschaften, wie beispielsweise Edelstahl, auf. Die Plattenelemente lassen sich mittels Plasma bevorzugt elektrisch aufladen, insbesondere elektrisch negativ aufladen. Gas- und Rußpartikel, die mit dem Abluftstrom durch den elektrostatischen Filter geleitet werden, haften an den negativ aufgeladenen Plattenelementen an. Das Reinigen des Edelstahl-Filters kann mit Hilfe eines Geschirrspülers erfolgen, mittels dem sich die Partikel wieder von den Plattenelementen lösen lassen.

[0018] Bevorzugt ist der Schwammfilter in Strömungsrichtung der Abluft dem elektrostatischen Filter vorgeschaltet, wodurch bereits ein Großteil der im Abluftstrom enthaltenen Partikel-Rückstände oder fetthaltigen Dämpfe vor Eintritt des Abluftstromes in den elektrostatischen Filter herausgefiltert werden. Dadurch wird die Effektivität des elektrostatischen Filters erhöht, was die Effizienz der Abluftreinigungseinrichtung insgesamt weiter verbessert.

[0019] Gemäß einer bevorzugten Ausgestaltung der Erfindung ist die Abluftreinigungseinrichtung in einem von dem mindestens einen Garraum abgetrennten Bereich des Gerätegehäuses oder in einem separat zum Gerätegehäuse ausgebildeten Gehäuse angeordnet, das mit dem Gerätegehäuse fluidleitend verbindbar ist. In einer Ausführungsform der erfindungsgemäßen Vorrichtung ist die Abluftreinigungseinrichtung fester Bestandteil der Vorrichtung und innerhalb des Gerätegehäuses angeordnet. Um die während des Zubereitens der Lebensmittel entstehende Wärme von der Ablufteinrichtung fernzuhalten, ist es vorgesehen, die Abluftreinigungseinrichtung im Gehäuse von den Garräumen zu separieren. Das kann beispielsweise über eine innerhalb des Gerätegehäuses vertikal angeordnete Trennwand erfolgen. Die Trennwand weist zumindest Öffnungen für den durch das Gerätegehäuse geleiteten Kühlluftstrom auf. In einer weiteren Ausführungsform der erfindungsgemäßen Vorrichtung ist die Abluftreinigungseinrichtung außerhalb des Gerätegehäuses angeordnet oder als separates Bauteil zur Vorrichtung ausgebildet. Die Abluftreinigungseinrichtung wird dazu mit den Garräumen im Gerätegehäuse über ein oder mehrere Abluft-Leitungen medienleitend verbunden. Die separate Ausgestaltung der Abluftreinigungseinrichtung als eine Art „Ablufttower“ ermöglicht bzw. erleichtert das Nachrüsten der erfindungsgemäßen Abluftreinigungseinrichtung an Zubereitungsanordnungen ohne eine solche Abluftreinigung. Um eine separat ausgebildete Abluftreinigungseinrichtung einfach mit einer Zubereitungs-Vorrichtung koppeln zu können, sind an den Leitungen der Abluftreinigungseinrichtung Koppelmittel zum reversiblen Koppeln und Entkoppeln mit korrespondierend ausgebildeten Koppelmitteln am Gerätegehäuse angeordnet.

[0020] In einer bevorzugten Ausgestaltung der Erfindung ist innerhalb des Abluftkanales eine Plasmakammer zum Reinigen der aus dem Aufnahmefach oder den Aufnahmeöffnungen abgeführten Abluft angeordnet. Innerhalb der Plasmakammer erfolgt bevorzugt eine Ionisation der durch die Plasmakammer geführten Abluft. Die Plasmakammer ist dem elektrostatischen Filter nachgeschaltet. In die Plasmakammer eingeleitete Abluft, insbesondere darin enthaltene Bestandteile, wie kleinste Fettpartikel, oder Öle werden so umgewandelt, dass im Abluftkanal nach der Plasmakammer vornehmlich Sauerstoff, Kohlendioxid und Wasserdampf Bestandteile der behandelten Abluft bilden. Mithilfe der im Abluftkanal zum Einsatz kommenden Plasmakammer wird die Abluft von bis zu 80% der darin enthaltenen nicht erwünschten Bestandteile gereinigt, vorzugsweise bis zu 98% der nicht erwünschten Bestandteile. Die das Gerätegehäuse verlassende Abluft ist damit nahezu vollständig gereinigt, wodurch die Belastung der Umgebungsluft auf ein Minimum reduziert ist.

[0021] Bevorzugt ist innerhalb des Abluftkanales ein der Plasmakammer vorgeschalteter Luftverwirbler zum Durchmischen der Abluft und vorzugsweise zum Beimischen von Umgebungsluft aus dem Gehäuseinneren angeordnet, wobei vorzugsweise in der Wandung des Gerätegehäuses wenigstens ein Ventilator zum Einleiten von Umgebungsluft in das Gerätegehäuse angeordnet ist. Mithilfe des innerhalb des Abluftkanales angeordneten Luftverwirblers wird in einer Ausführungsform die aus den Aufnahmeöffnungen der Vorrichtung abgeführte Abluft derart im Abluftkanal verwirbelt, dass über den Querschnitt des Abluftkanales ein gleichmäßiges Temperaturniveau herrscht. Darüber hinaus sollen Temperaturen von über 50°C, bevorzugt über 45°C innerhalb des Abluftkanales vermieden werden, bevor die Abluft in die Plasmakammer eintritt, womit der Wirkungsgrad der Plasmakammer verbessert ist. Vorzugsweise hat die Plasmakammer ihren höchsten Wirkungsgrad, wenn die in die Plasmakammer eingeleitete Abluft eine Temperatur von weniger 45°C aufweist.

[0022] Vorzugsweise ist dem Abluftkanal eine Einrichtung zum Steuern von zumindest der aus dem oder den Aufnahmeöffnungen abzuführenden Abluft zugeordnet. Mithilfe der Einrichtung zum Steuern der Abluft wird vorzugsweise in der einfachsten Ausgestaltung der Steuereinrichtung für die Abluft der durch den Abluftkanal strömende Massenstrom durch Verändern der Ventilatordrehzahl angepasst. In einer anderen Ausgestaltung der Erfindung ist vorgesehen, dass die Steuereinrichtung für die Abluft, nach erfolgter Zubereitung der Lebensmittel in dem jeweiligen Garraum, eine fluidleitende Verbindung zwischen dem Abluftkanal und dem oder den Garräumen herstellt. In einer weiteren Ausführungsform ist die Steuereinrichtung dazu eingerichtet, die verschiedenen Garräume für die Lebensmittel einzeln oder auch gemeinsam fluidleitend mit dem Abluftkanal zu verbinden beziehungsweise die fluidleitende Verbindung vor Beginn des nächsten Garvorganges wieder zu unterbrechen. Mittels der Einrichtung zum Steuern der Abluft ist in einer Ausführungsform gewährleistet, dass die Garräume für die darin einzusetzenden Aufnahmebehälter während des Zubereitungs Vorganges der Lebensmittel zur Ausbildung des nach außen hin geschlossenen Garraumes unter Verwendung geeigneter Abtrenn- oder Schließmittel im Verbindungsbereich zum Abluftkanal abdichten verschlossen sind.

[0023] Eine Weiterbildung der erfindungsgemäßen Vorrichtung sieht vor, dass die Einrichtung zum Steuern der Abluft wenigstens eine ansteuerbare Abluftklappe aufweist, mittels der wenigstens eine mit dem Abluftkanal verbundene Auslassöffnung am Garraum offenbar und verschließbar ist. Vorzugsweise ist ferner eine ansteuerbare Zuluftklappe vorgesehen, mittels der zumindest eine über einen Zuluftkanal mit der Umgebung verbundene Einlassöffnung am Garraum zum Einbringen von Frischluft in den Garraum

öffnen und verschließbar ist. Das Vorsehen einer Abluftklappe und einer Zuluftklappe an einem jeweiligen Garraum ermöglicht das einfache Steuern des Abführens der Abluft in die Abluftreinigungseinrichtung. Durch das Zuführen von Frischluft in den Garraum wird der Luftaustausch innerhalb des Garraumes begünstigt. Ein sich nachteilig auswirkender Unterdruck im Aufnahmefach ist zudem vermieden. Vorzugsweise weisen die Garräume für die zu erhitzenen beziehungsweise garenden Lebensmittel jeweils separat ansteuerbare Abluftklappen und/oder Zuluftklappen auf. Die Abluft- und Zuluftklappen sind vorzugsweise über entsprechende Antriebs- oder Stelleneinrichtungen ansteuer- bzw. betätigbar, mittels denen die Abluft- und/oder Zuluftklappen in ihre jeweilige Offenbeziehungsweise Geschlossenstellung gebracht werden.

[0024] In einer anderen Weiterbildung der erfindungsgemäßen Zubereitungsvorrichtung ist innerhalb des Abluftkanales in Strömungsrichtung hinter der Plasmakammer eine Filtereinrichtung, vorzugsweise ein Aktivkohlefilter angeordnet. Die Filtereinrichtung wird bevorzugt dazu verwendet, um mögliche verbliebene restliche Bestandteile, die innerhalb der Plasmakammer nicht umgewandelt werden konnten, aus der Abluft herauszufiltern. Vorzugsweise wird ein Aktivkohlefilter verwendet, der einen bevorzugt hohen Wirkungsgrad beim Filtern von molekularen Bestandteilen innerhalb eines Abluftstromes erzielt. Zudem ist über die Ausgestaltung der Filtereinrichtung als Aktivkohlefilter erreicht, dass möglicherweise innerhalb der Plasmakammer entstehendes Ozon, das mit dem gereinigten Abluftstrom die Plasmakammer verlässt, in den Aktivkohlefilter übergeleitet wird, dort gebunden und in nichtschädliche Bestandteile umgewandelt wird. Das Überleiten von Ozon in die Filtereinrichtung bewirkt ferner die Selbstreinigung des Aktivkohlefilters. Damit sind die Standzeiten der der Plasmakammer nachgeschalteten Filtereinrichtung im Vergleich zu herkömmlichen Filtereinrichtungen derart verbessert, dass das Mehrfache der üblichen Standzeiten an der erfindungsgemäßen Vorrichtung erreicht wird. In einer Ausführungsform der Erfindung können dem Aktivkohlefilter Duft pads zugeordnet sein, die bei Passieren durch die Abluft einen Duftstoff an die Abluft abgeben.

[0025] Gemäß einer besonders bevorzugten Ausführungsform der vorliegenden Erfindung, die zugleich auch einen weiteren separaten Aspekt der Erfindung betrifft, zeichnet sich diese durch zumindest eine der Öffnung im Gerätegehäuse zugeordnete Front-Absaugeinrichtung zum Absaugen von aus der Öffnung austretenden Dämpfen aus. Etwaige im Garraum verbliebene Zubereitungsdämpfe, die nicht durch die Abluftreinigungseinrichtung aus dem Garraum abgeführt werden konnten und somit beim Entnehmen des zubereiteten Lebensmittels aus der Entnahmeöffnung an der Front des Gerätegehäuses ent-

weichen, werden mit Hilfe der Front-Absaugeinrichtung aufgefangen. Die Zubereitung der Lebensmittel wird dadurch nahezu geruchsfrei, was den Einsatz der erfindungsgemäßen Zubereitungsvorrichtung an Orten ermöglicht, an denen eine Geruchsbelästigung durch Zubereitungsdämpfe unerwünscht ist.

[0026] Vorzugsweise ist die Front-Absaugeinrichtung fluidleitend mit der Abluftreinigungseinrichtung gekoppelt. Auch die an der Front des Gerätegehäuses austretenden Dämpfe werden als Abluft über die innerhalb des Gerätegehäuses oder separat zum Gerätegehäuse ausgebildet Abluftreinigungseinrichtung geleitet und entsprechend gereinigt. Damit wird eine nahezu geruchsfreie Zubereitung von Fleischerzeugnissen, wie beispielsweise Bratwürsten oder Fleischpatties, sowie Tiefkühlprodukten, wie Pommes Frites oder vorfrittiertem Gemüse, möglich. Die erfindungsgemäße Zubereitungseinrichtung kann somit auch beispielsweise in Aufenthaltsräumen eines Betriebes aufgestellt und für die Zubereitung von Lebensmitteln verwendet werden, ohne dass eine Geruchsbelästigung durch Zubereitungsdämpfe auftritt. Bevorzugt ist die Front-Absaugeinrichtung als eine an der Oberseite des Gerätegehäuses angeordnete Absaughaube ausgebildet. Bevorzugt weisen Bereiche des Gerätegehäuses, insbesondere zumindest die Front des Gerätegehäuses, eine vorzugsweise horizontal daran abstehende Abzugshaube auf, über die die aus der Öffnung am Gerätegehäuse austretenden und üblicherweise nach oben aufsteigenden Dämpfe aufgefangen werden.

[0027] Gemäß einer bevorzugten Weiterbildung weist die Front-Abzugseinrichtung ein Auffangteil auf, welches an der die Öffnungen zu den Garräumen aufweisenden Front und vorzugsweise an den Längsseiten des Gerätegehäuses absteht. Das Auffangteil der Abzugshaube erstreckt sich bevorzugt über die gesamte Front des Gerätegehäuses und zumindest abschnittsweise entlang der Längsseiten des Gerätegehäuses. Das Auffangteil ist ähnlich einer Auffangrinne ausgebildet, welche an der Oberseite des Gerätegehäuses mit ihrer Absaugöffnung nach unten in Richtung der darunterliegenden Öffnungen an der Front des Gerätegehäuses ausgerichtet ist. Das Auffangteil kann auch rohrartig mit mehreren im Abstand zueinander angeordnete Einlässe ausgebildet sein. Das Auffangteil ist vorzugsweise über eine Sammelleitung mit der Abluftreinigungseinrichtung verbunden.

[0028] Die Erfindung wird im Folgenden anhand eines bevorzugten Ausführungsbeispiels unter Bezugnahme auf die nachfolgenden Figuren näher beschrieben. Hierbei zeigen:

Fig. 1: eine perspektivische Ansicht einer ersten Ausführungsform einer erfindungsgemäßen Zubereitungsanordnung für Lebensmittel;

Fig. 2: eine Teilansicht in das Innere der erfindungsgemäßen Vorrichtung nach **Fig. 1** mit teilweise entfernter Seitenwand des Gerätegehäuses;

Fig. 3: eine perspektivische Ansicht einer weiteren Ausführungsform der erfindungsgemäßen Vorrichtung mit einer außerhalb des Gerätegehäuses angeordneten Abluftreinigungseinrichtung; und

Fig. 4: eine perspektivische Ansicht einer erfindungsgemäßen Vorrichtung nach **Fig. 1** mit einer an der Oberseite der Vorrichtung angeordneten erfindungsgemäßen Front-Absaugereinrichtung.

[0029] **Fig. 1** zeigt eine Vorrichtung **1** zum Erhitzen und/oder Garen von Lebensmitteln, insbesondere von Fleischerzeugnissen und/oder Tiefkühlprodukten. Die Vorrichtung **1** umfasst ein Gerätegehäuse **2**, in dem zwei Garräume **4** für die zuzubereitenden Lebensmittel vorgesehen sind. Das Gerätegehäuse **2** weist jeweils eine Öffnung **6**, **6'** als Zugang zu dem jeweiligen Garraum **4** auf. Über die Öffnung **6**, **6'** ist ein Aufnahmebehälter **8** in den oder aus dem Garraum **4** einsetz- und entnehmbar. Jeder der Garräume **4** weist eine Heizeinrichtung **10** auf, mittels der die benötigte Wärmeenergie innerhalb des Garraumes **4** für die Zubereitung der Lebensmittel erzeugt wird. An der Vorrichtung **1** ist ein Display **11** zum Steuern der mit der Vorrichtung umsetzbaren Garprozesse.

[0030] Die Heizeinrichtung **10** umfasst in der gezeigten Ausführungsform ein erstes Heizelement **12**, welches als Infrarot-Strahler ausgebildet ist und ein zweites Heizelement **14**, welches ein Heißluftgebläse mit mindestens einem Lüfterrad **14'** aufweist. Zudem ist ein Rohrheizkörper als weiteres Heizelement **16** im Garraum **4** angeordnet. Der in den Garraum **4** einsetzbare Aufnahmebehälter **8** ist als Trommel ausgebildet, der zwei Handgriffe **18** zum Einsetzen und Entnehmen aus dem Garraum **4** aufweist. Der Aufnahmebehälter **8** ist ferner über einen nicht näher gezeigten mit der Stirnseite der Trommel koppelbaren Verschluss **20** verschließbar. Das Verschluss **20** bildet zugleich einen Wandbereich des Aufnahmebehälters **8** wie auch einen Bereich des Gerätegehäuses **2** aus. Der Aufnahmebehälter **8** wird über den Drehantrieb **22** innerhalb des Garraumes **4** in eine Drehbewegung versetzt. Sämtliche Funktionen der erfindungsgemäßen Vorrichtung **1** werden mittels einer nicht näher beschriebenen elektronischen Steuerung verwirklicht, die mit sämtlichen Bauteilen der Vorrichtung **1** signalleitend verbunden ist.

[0031] In der in **Fig. 1** gezeigten Ausführung ist unterhalb jedes Garraumes **4** eine aus dem Gerätege-

häuse **2** zumindest teilweise entnehmbare Auffangwanne **24** für Lebensmittlrückstände bzw. Flüssigkeiten angeordnet, die bei der Zubereitung der Lebensmittel entstehen. Die Auffangwannen **24** sind in dieser gezeigten Ausführung von der Front **26** des Gerätegehäuses aus zugänglich. Das Verschluss **20** wie auch die Auffangwanne **24** sind bevorzugt abdichtend zum Gerätegehäuse ausgebildet, wobei das Verschluss **20** wie auch die Auffangwanne **24** wenigstens ein Dichtelement aufweisen, das im Bereich der Öffnung **6** für den Aufnahmebehälter **8** oder der Auffangwanne **24** gegenüber dem Gerätegehäuse **2** abdichtet.

[0032] Wie ferner aus den **Fig. 1** und **Fig. 2** ersichtlich, weist die erfindungsgemäße Vorrichtung **1** am Gerätegehäuse **2** ein oder mehrere Luftein- und/oder -auslässe **28**, **30** auf, die mit einem oder mehreren Lüftern **32**, **34** zum Erzeugen eines Kühlluftstromes zwischen der Innenseite des Gerätegehäuses und der oder den im Gerätegehäuse angeordneten Garräumen **4** zusammenwirken. Mehrere Luftein- und/oder -auslässe sind an der Front **26** und der Rückwand **36** des Gerätegehäuses **2** ausgebildet. In der gezeigten Ausführung, siehe **Fig. 1** und **Fig. 2**, ist ein weiterer Luftein- oder -auslass **30'** im Deckenbereich des Gerätegehäuses **2** ausgebildet, dem ein weiterer Lüfter zugeordnet ist. Mittels des Lüfters wird eine Luftströmung in vertikaler Richtung zwischen der Innenseite des Gehäuses und den Garräumen **4** erzeugt wird.

[0033] **Fig. 2** zeigt eine weitere Ausführungsform einer erfindungsgemäßen Vorrichtung **1** zum Zubereiten von Lebensmitteln, die entgegen der in **Fig. 1** abgebildeten Ausführung anstelle von zwei vertikal übereinander angeordneten Aufnahmebehältern **8** mehrere Garräume **4** aufweist, in die als Einsetzkassetten ausgebildete Aufnahmebehälter **8'** eingesetzt werden. Mit solchen Einsetzkassetten werden vorzugsweise Bratwürste oder Fleischpatties gegart. In einer nicht näher gezeigten Ausführungsform weist eine solche Einsetzkassette vier Aufnahmegefächer für je einen Fleischpatty auf. Die Aufnahmegefächer sind in einer Ebene verlaufend so nebeneinander ausgerichtet, dass in den Aufnahmebehältern **8'** eine 2 × 2-Anordnung ausgebildet wird.

[0034] Wie **Fig. 2** verdeutlicht, sind der oder die Lüfter **32**, **34** an einer Innen- oder Außenseite der Rückwand **36** des Gerätegehäuses **2** angeordnet. Über die Lüfter **32** an der Außenseite der Rückwand **36** im oberen Bereich des Gerätegehäuses wird Luft aus dem Inneren in die Umgebung abgeführt. Die Lüfter **34** im Bodenbereich des Gehäuses an der Innenseite der Rückwand **36** leiten Luft aus der Umgebung in das Innere des Gehäuses ein. Innerhalb des Gerätegehäuses **2** kann eine Leiteinrichtung zum Führen des Kühlluftstromes durch das Gerätege-

se bzw. mindestens eine etwa vertikal verlaufende Trennwand angeordnet sein.

[0035] Fig. 2 zeigt weiter eine Abluftreinigungseinrichtung 42 mit einem Abluftkanal 44 zum Abführen von Abluft aus den Garräumen, der mit den Garräumen 4 fluidleitend koppelbar ist. Zum Herausführen der Abluft aus den Garräumen 4 ist am oberen Ende des Abluftkanals 44 ein Ventilator 46 angeordnet. Der Ventilator 46 ist dazu eingerichtet, die Abluft aus den Garräumen abzusaugen. Dem Abluftkanal 44 ist eine Einrichtung 48 zum Steuern der aus den Garräumen 4 abzuführenden Abluft zugeordnet, mittels der während des Betriebs der Vorrichtung 1 die fluidleitende Verbindung zwischen dem Abluftkanal 44 und den Garräumen 4 unterbrochen wird. Beim Erhitzen bzw. Garen der Lebensmittel kann die benötigte Wärmeenergie nicht unbeabsichtigt aus den Garräumen 4 in den Abluftkanal entweichen.

[0036] Gemäß einer bevorzugten Ausführungsform weist die Steuerung 48 für die Abluft eine nicht näher gezeigte ansteuerbare Abluftklappe auf, mittels der ein mit dem Abluftkanal 44 verbundener Auslass an dem Garraum 4 geöffnet oder verschlossen werden kann. In einer nicht näher gezeigten Ausführung der vorliegenden Erfindung umfasst die Steuerung 48 ansteuerbare Zuluftklappen, welche Einlässen an den Garräumen 4 zugeordnet sind. Bei geöffneten Zuluftklappen kann Frischluft über die Einlässe in den Garraum einströmen.

[0037] Ferner ist aus Fig. 2 der Aufbau des Abluftkanals 44 mit seinen darin angeordneten Bauteilen verdeutlicht. Im Abluftkanal 34 ist in Strömungsrichtung der Abluft zuerst ein Fettfilter 50 zur Vorfilterung der aus den Garräumen 4 abgesaugten Abluft angeordnet. In Strömungsrichtung hinter dem Fettfilter 50 ist ein Luftverwirbler 52 angeordnet, der die Abluft mit Frischluft aus dem Gerätegehäuse vermischt. Über den Querschnitt des Abluftkanals wird damit ein verringertes und gleichmäßiges Temperaturniveau erzeugt. Dem Luftverwirbler 52 ist ein Schwammfilter 54 nachgeordnet, der einen Großteil der in der Abluft befindlichen fettthaltigen Rückstände herausfiltert. In Strömungsrichtung hinter dem Schwammfilter ist ein elektrostatischer Filter 56 angeordnet, der dazu eingerichtet ist, Rußpartikel sowie Rauchgase zu binden. In einer Ausführungsform weist der elektrostatische Filter 56 mehrere nicht näher gezeigte durch Plasma elektrisch negativ aufladbare Plattenelemente aus Edelstahl auf. Oberhalb des elektrostatischen Filters 56 ist eine Plasmakammer 58 zum Reinigen der Abluft angeordnet, innerhalb der eine Ionisation der hindurchgeführten Abluft erfolgt. In der Abluft mitgetragene Fett- und Geruchsmoleküle werden innerhalb der Plasmakammer 58 effektiv zersetzt. Der Plasmakammer 58 nachgeschaltet ist eine weitere Filtereinrichtung 60, insbesondere ein Aktivkohlefilter, mit der restliche in der Abluft verbliebene uner-

wünschte Bestandteile nahezu vollständig herausgefiltert werden.

[0038] Fig. 3 zeigt eine weitere Ausführungsform einer Vorrichtung 1 mit Garräumen, in die als Einsetzkassetten ausgebildete Aufnahmebehälter 8' eingesetzt werden. Im Gegensatz zu der in Fig. 2 gezeigten Ausführungsform weist die Vorrichtung in Fig. 3 eine Abluftreinigungseinrichtung 62 auf, welche außerhalb des Gerätegehäuses 2 angeordnet ist. Die Abluftreinigungseinrichtung 62 ist in mehreren verschiedenen Gehäusen 64, 64' untergebracht, wobei die Abluftreinigungseinrichtung 62 dieselben Bauteile umfasst wie die Abluftreinigungseinrichtung 42 in Fig. 2 innerhalb des Gerätegehäuses. Die verschiedenen Gehäuse 64, 64' der Abluftreinigungseinrichtung 62 sind über mehrere nicht näher gezeigte, die Abluft führende Abluft-Leitungen miteinander verbunden. Ferner weist die in Fig. 3 gezeigte Ausführung eine Auffangwanne 66 für entstehende Lebensmittelmückstände auf, welche über eine Öffnung an der Längsseite 27 des Gerätegehäuses 2 entnehmbar ist.

[0039] Fig. 4 zeigt eine weitere mögliche Ausführungsform auf Basis der in Fig. 1 gezeigten Vorrichtung 1 zum Erhitzen und/oder Garen von Lebensmitteln. Die in Fig. 4 gezeigte Ausführungsform umfasst eine Front-Absaugeinrichtung 68, welche an der Oberseite des Gerätegehäuses 2 angeordnet ist. Die Absaugeinrichtung 68 ist zum Absaugen von aus der oder den Öffnungen 6, 6' an der Front 26 des Gerätegehäuses austretenden Dämpfen eingerichtet. Die Front-Absaugeinrichtung 68 steht an der Front 26 und entlang der Längsseiten 27 des Gerätegehäuses im Wesentlichen in horizontaler Richtung vor. Die Absaugeinrichtung 68 bildet an der Oberseite des Gerätegehäuses eine Abzugshaube aus. In der vorliegenden Ausführung ist die Front-Absaugeinrichtung 68 fluidleitend mit der Abluftreinigungseinrichtung 42 (Fig. 2) gekoppelt. Durch eine geringfügige Modifikation der in Fig. 3 gezeigten Abluftreinigungseinrichtung 62 ist die Absaugeinrichtung 68 auch an der in Fig. 3 gezeigten Ausführungsform der erfindungsgemäßen Vorrichtung 1 einsetzbar.

[0040] Die Front-Absaugeinrichtung 68 weist mindestens ein als eine Art Auffangrinne ausgebildetes Auffangteil 70 auf, das eine oder mehrere in Richtung der Öffnungen 6, 6' weisende Einlässe zum Abführen von Dämpfen hat. In einer bevorzugten Ausführungsform weist die Front-Absaugeinrichtung 68 an den hinteren Enden der sich parallel zu den Längsseiten 27 des Gerätegehäuses 2 erstreckenden Schenkeln des Auffangteiles 70 in Richtung des Gerätegehäuses weisende, nicht näher abgebildete Auslässe für eine Verbindung in Richtung der Abluftreinigungseinrichtung im Inneren des Gerätegehäuses 2 auf.

Bezugszeichenliste

1	Vorrichtung
2	Gerätegehäuse
4	Garraum
6,6'	Öffnung
8, 8'	Aufnahmebehälter
10	Heizeinrichtung
11	Display
12	Heizelement
14	Heizelement
14'	Lüfterrad
16	Rohrheizkörper
18	Handgriff
20	Verschlussstück
22	Drehantrieb
24	Auffangwanne
26	Front
27	Längsseite
28,30	Luftin-/auslass
32, 34	Lüfter
36	Rückwand
38	Deckenbereich
40	Luftauslass
42	Abluftreinigungseinrichtung
44	Abluftkanal
46	Ventilator
48	Steuerung
50	Fettfilter
52	Luftverwirbler
54	Schwammfilter
56	elektrostatischer Filter
58	Plasmakammer
60	Filtereinrichtung
62	Abluftreinigungseinrichtung
64,64'	Gehäuse
66	Auffangwanne
68	Absaugereinrichtung
70	Auffangteil
72	Schenkel

ZITATE ENTHALTEN IN DER BESCHREIBUNG

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Zitierte Patentliteratur

- DE 202014005299 U1 [0004]

Schutzansprüche

1. Vorrichtung (1) zum Erhitzen und/oder Garen von Lebensmitteln, insbesondere von Fleischerzeugnissen und/oder Tiefkühlprodukten, mit einem Gerätegehäuse (2), wobei das Gerätegehäuse (2) wenigstens einen Garraum (4) für das Lebensmittel aufweist, welche über wenigstens eine Öffnung (6, 6') im Gerätegehäuse (2) zugänglich sind, und einen mit dem jeweiligen Garraum (4) korrespondierenden in den oder aus dem Garraum einsetz- und entnehmbaren Aufnahmebehälter (8) für das Lebensmittel aufweist, und einer dem Garraum (4) zugeordneten Heizeinrichtung (10) mit einem oder mehreren Heizelementen (12, 14, 16), **dadurch gekennzeichnet**, dass die Heizeinrichtung (10) mindestens zwei Heizelemente (12, 14, 16) aufweist, wobei ein erstes Heizelement (12, 16) wenigstens einen Strahlungsheizkörper aufweist und das zweite Heizelement (14) wenigstens einen Konvektionsheizkörper umfasst.
2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet**, dass das erste Heizelement (12, 16) als Rohrheizkörper oder Infrarot-Strahler ausgebildet ist, wobei der Infrarot-Strahler bevorzugt dazu eingerichtet ist, gezielt Strahlung in eine Richtung abzugeben.
3. Vorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet**, dass das zweite Heizelement (14) als Heißluftgebläse ausgebildet ist, das innerhalb des Garraumes (4) einen Umluftstrom erzeugt.
4. Vorrichtung nach einem der Ansprüche 1 bis 3, **gekennzeichnet durch** zwei Garräume (4) für zuzubereitende Lebensmittel, wobei jeder Garraum (4) einen in den Garraum einsetz- und entnehmbaren Aufnahmebehälter (8) für das Lebensmittel aufweist, wobei der Aufnahmebehälter (8) vorzugsweise drehbar aufgenommen ist.
5. Vorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass im Bodenbereich des Garraumes (4) oder unterhalb des Garraumes eine aus dem Gerätegehäuse (2) zumindest teilweise entnehmbare Auffangwanne (24) angeordnet ist.
6. Vorrichtung nach einem der vorstehenden Ansprüche, **gekennzeichnet durch** ein den jeweiligen Garraum (4) abdichtend verschließendes Verschlussstück (20), welches bevorzugt an dem Aufnahmebehälter (8) angeordnet ist.
7. Vorrichtung nach dem Oberbegriff von Anspruch 1 oder mindestens einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass das Gerätegehäuse ein oder mehrere Luftein- und/oder -auslässe (28, 30, 30') aufweist und ein oder mehrere mit den

Luftein- und/oder -auslässe (28, 30, 30') zusammenwirkende Lüfter (32, 34) zum Erzeugen eines Luftstromes zwischen der Innenseite des Gerätegehäuses (2) und der oder den im Gerätegehäuse angeordneten Garräumen (4) vorgesehen ist.

8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet**, dass mehrere Luftein- und/oder -auslässe (28, 30, 30') in einem front- und rückseitigen Bereich (26, 36) und/oder einem Deckenbereich des Gerätegehäuses (2) ausgebildet sind.

9. Vorrichtung nach Anspruch 7 oder 8, **dadurch gekennzeichnet**, dass der oder die Lüfter (32, 34) an einer Innenseite der Gehäusewand des Gerätegehäuses (2) angeordnet ist, welche vorzugsweise mindestens einen Luftein- und/oder -auslass (28, 30, 30') für den durch das Innere des Gehäuses (2) insbesondere gesaugten Luftstrom aufweist.

10. Vorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass innerhalb des Gerätegehäuses (2) ein oder mehrere Leiteinrichtungen zum gezielten Führen des durch das Gerätegehäuse geleiteten Luftstromes und/oder eine Trennwand innerhalb des Gerätegehäuses (2) angeordnet sind.

11. Vorrichtung nach dem Oberbegriff von Anspruch 1 oder mindestens einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass der Garraum (4) mit mindestens einer Abluftreinigungseinrichtung (42, 62) fluidleitend koppelbar ist, welche einen elektrostatischen Filter (56) und/oder einen Schwammfilter (54) aufweist, die vorzugsweise innerhalb eines Abluftkanals (44) der Abluftreinigungseinrichtung (42, 62) angeordnet ist/sind.

12. Vorrichtung nach Anspruch 11, **dadurch gekennzeichnet**, dass der elektrostatische Filter (56) und/oder der Schwammfilter (54) aus dem Abluftkanal (44) entnehmbar sind, wobei der elektrostatische Filter (56) bevorzugt mehrere durch Plasma elektrisch aufladbare Plattenelemente aus Metall mit nicht korrodierenden Eigenschaften aufweist.

13. Vorrichtung nach Anspruch 11 oder 12, **dadurch gekennzeichnet**, dass der Schwammfilter (54) in Strömungsrichtung der Abluft dem elektrostatischen Filter (56) vorgeschaltet ist.

14. Vorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass die Abluftreinigungseinrichtung (42, 62) in einem von dem mindestens einen Garraum (4) abgetrennten Bereich des Gerätegehäuses (2) oder in einem separat zum Gerätegehäuses (2) ausgebildeten Gehäuse (64, 64') angeordnet ist, das mit dem Gerätegehäuse fluidleitend verbindbar ist.

15. Vorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass die Abluftreinigungseinrichtung (42, 62) eine Einrichtung (48) zum Steuern von zumindest der aus dem oder den Garräumen (4) abzuführenden Abluft aufweist.

16. Vorrichtung nach Anspruch 15, **dadurch gekennzeichnet**, dass die Einrichtung (48) zum Steuern der Abluft wenigstens eine ansteuerbare Abluftklappe aufweist, welche dazu eingerichtet ist, wenigstens eine mit dem Abluftkanal (44) verbundene Auslassöffnung am Garraum (4) zu öffnen und zu schließen.

17. Vorrichtung nach dem Oberbegriff von Anspruch 1 oder mindestens einem der vorstehenden Ansprüche, **gekennzeichnet durch** zumindest eine den Öffnungen (6, 6') im Gerätegehäuse (2) zugeordneten Front-Absaugeinrichtung (68) zum Absaugen von aus der Öffnung (6, 6') austretenden Dämpfen.

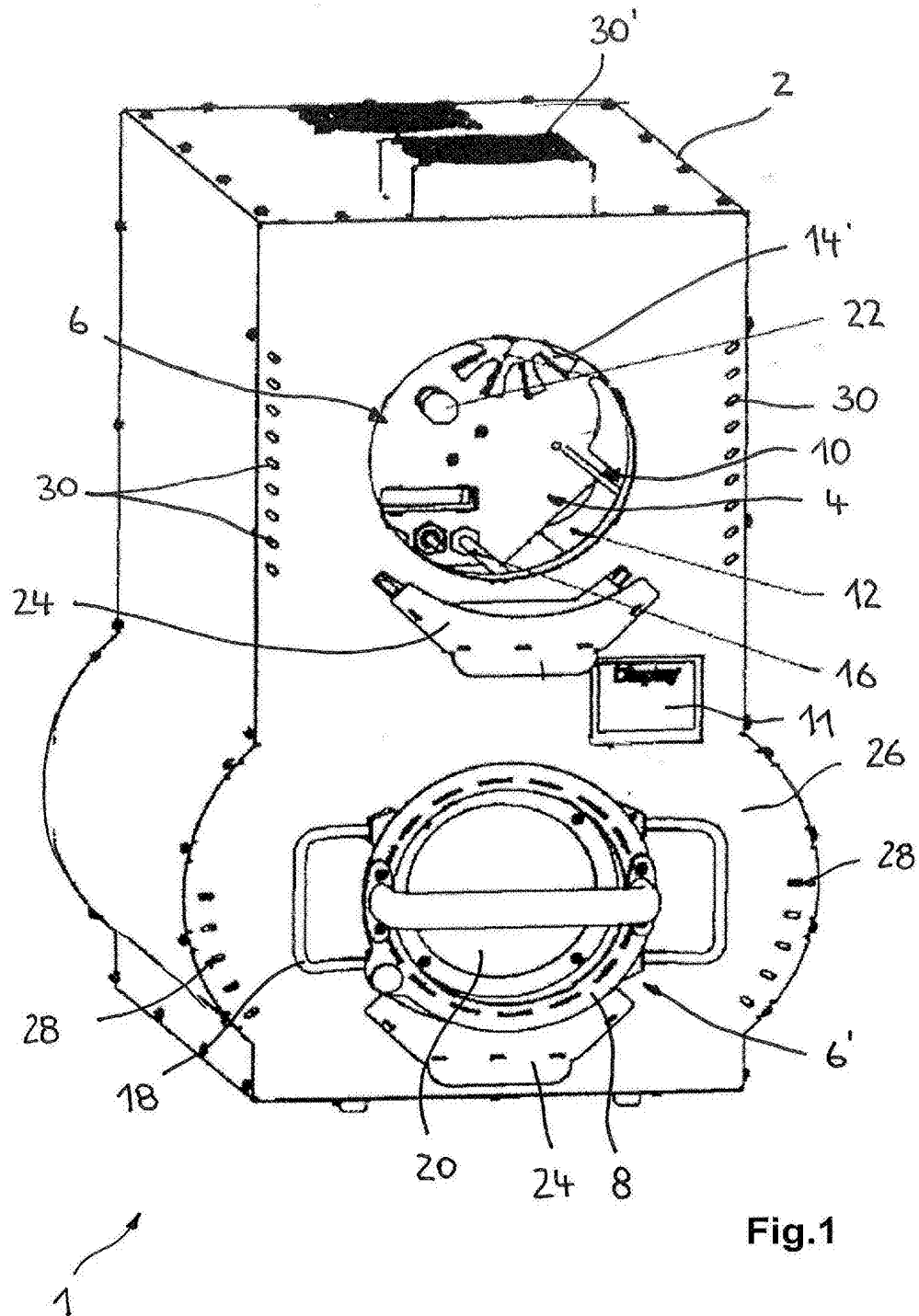
18. Vorrichtung nach Anspruch 17, **dadurch gekennzeichnet**, dass die Front-Absaugeinrichtung (68) fluidleitend mit der Abluftreinigungseinrichtung (62) gekoppelt ist.

19. Vorrichtung nach Anspruch 17 oder 18, **dadurch gekennzeichnet**, dass die Front-Absaugeinrichtung (68) als eine an der Oberseite des Gerätegehäuses (2) angeordnete Abzugshaube ausgebildet ist.

20. Vorrichtung nach einem der vorstehenden Ansprüche, **dadurch gekennzeichnet**, dass die Front-Absaugeinrichtung (68) ein Auffangteil (70) aufweist, welches an der die Öffnungen (6, 6') zu den Garräumen (4) aufweisenden Front (26) und vorzugsweise an den Längsseiten (27) des Gerätegehäuses (2) absteht.

Es folgen 4 Seiten Zeichnungen

Anhängende Zeichnungen



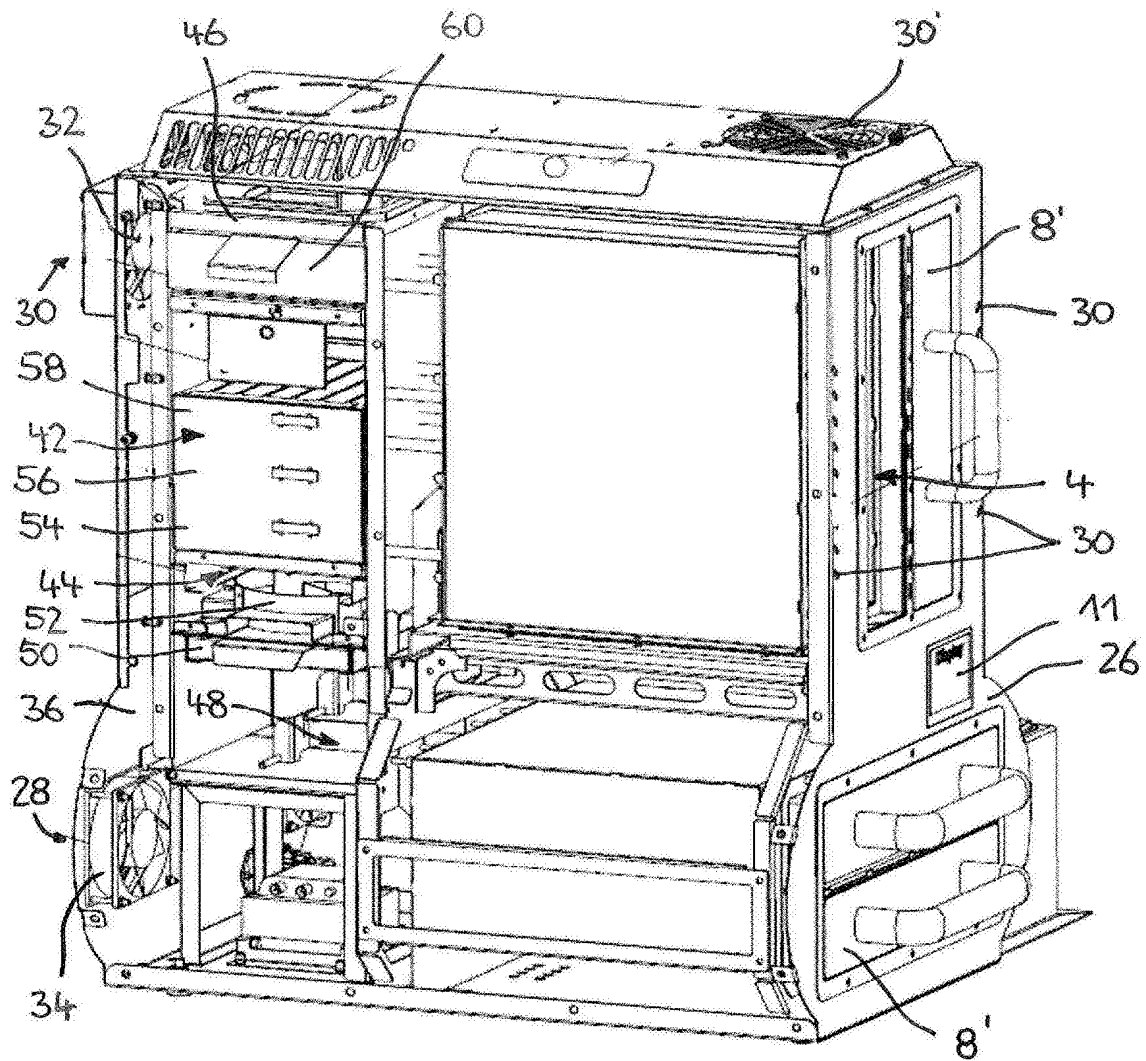


Fig.2

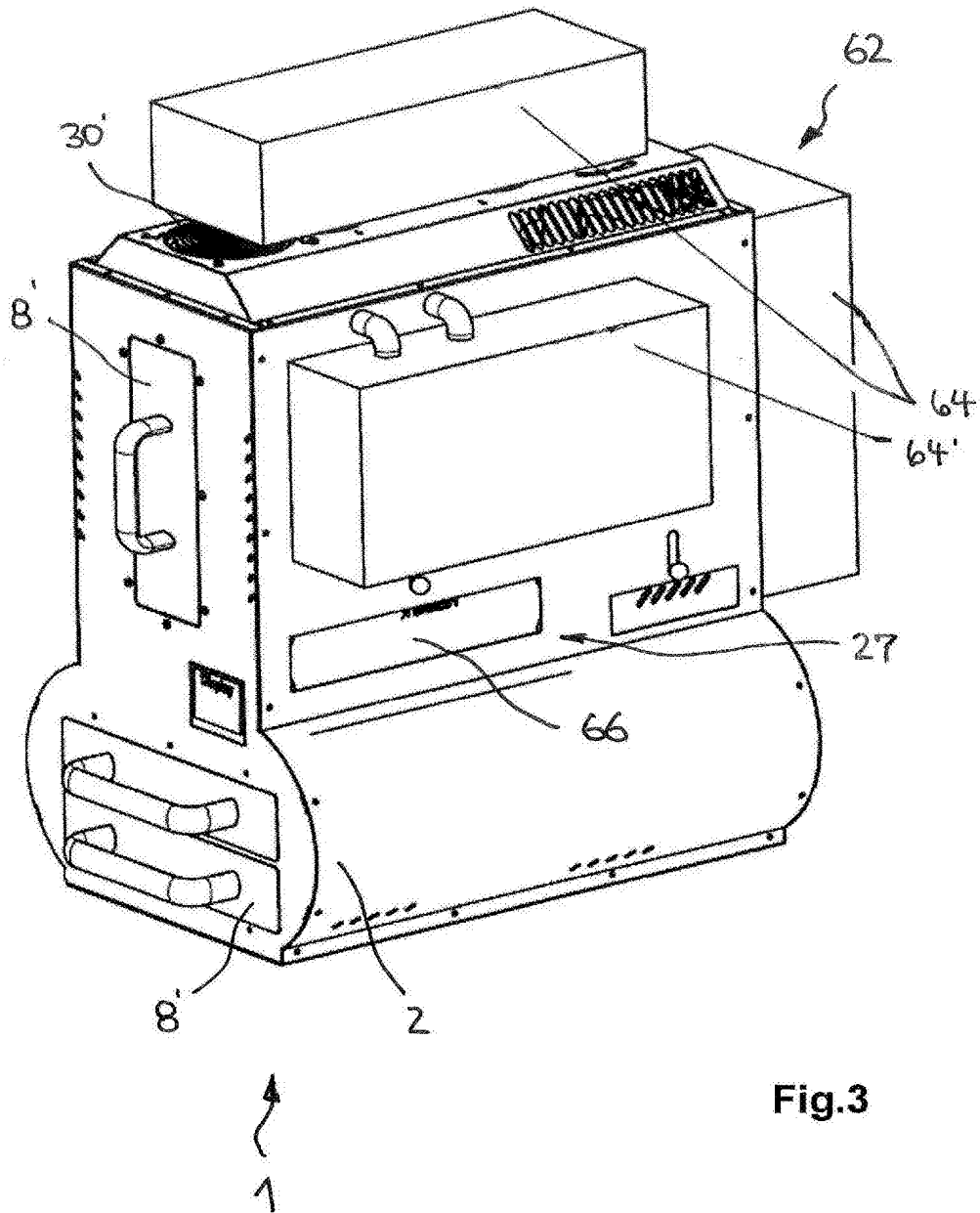


Fig.3

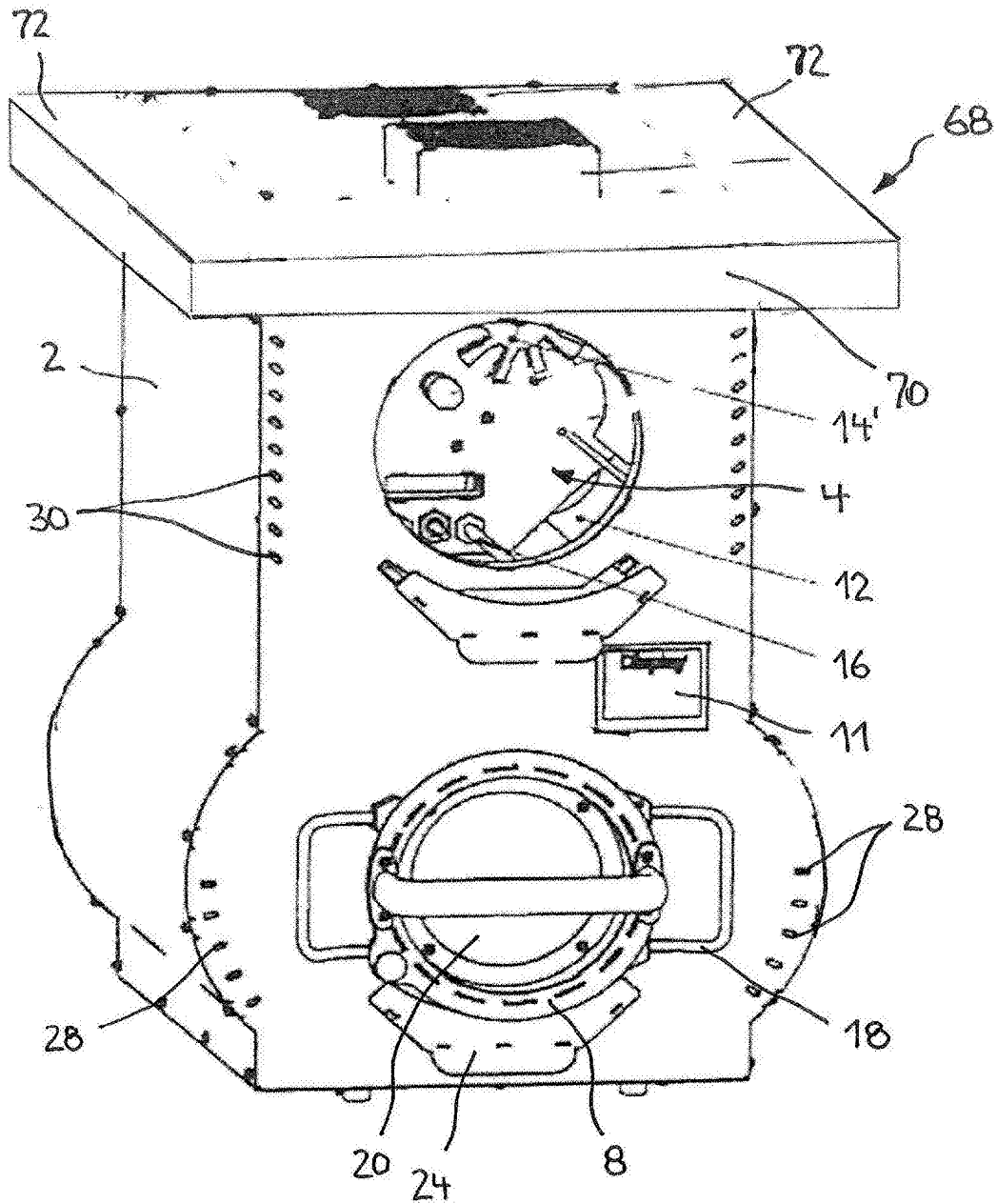


Fig.4

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

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Confirmation No.: 3603

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Art Unit: 3762

For: **COOKING DEVICE AND COMPONENTS
THEREOF**

Examiner: Vivek K. Shirsat

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed more than three months after the filing date of this application, OR more than three months after the date of entry of the national stage in the international application, AND after the mailing date of a first Office Action on the merits, but before the mailing date of any of a Final Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311 or an action that otherwise closes prosecution in this application (37 C.F.R. § 1.97(c)).

Submitted herewith are copies of Foreign Patents documents in accordance with 37 C.F.R. § 1.98(a)(2).

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

All fees due are believed to be paid. The Director is hereby authorized to charge any deficiency in the fees filed with this paper, asserted to be filed with this paper, or which should have been filed with this paper, to our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: July 9, 2024

Respectfully submitted,

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Air fryer

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Abstract of CN110664270 (A)

The invention relates to an air fryer. The air fryer comprises a machine body (1) internally provided with a cooking cavity, pot bodies which can enter and exit from the cooking cavity and an electric heating device which is arranged in the machine body (1) and located above the cooking cavity. The air fryer is characterized in that the pot bodies include a first pot body (21) and a second pot body (22); an integrated furnace chamber liner (13) is arranged in the cooking cavity of the machine body (1); a first accommodating cavity (13a) and a second accommodating cavity (13b) which can accommodate the first pot body (21) and the second pot body (22) respectively are formed in the integrated furnace chamber liner (13); the first pot body (21) is arranged in the first accommodating cavity (13a); and the second pot body (22) is arranged in the second accommodating cavity (13b). Compared with the prior art, the air fryer has the advantages that the first and second pot bodies which are independent are arranged, so that two cooking operations can be carried out simultaneously; and the integrated furnace chamber liner structure is adopted, so that the material cost is reduced and the assembly efficiency is improved.



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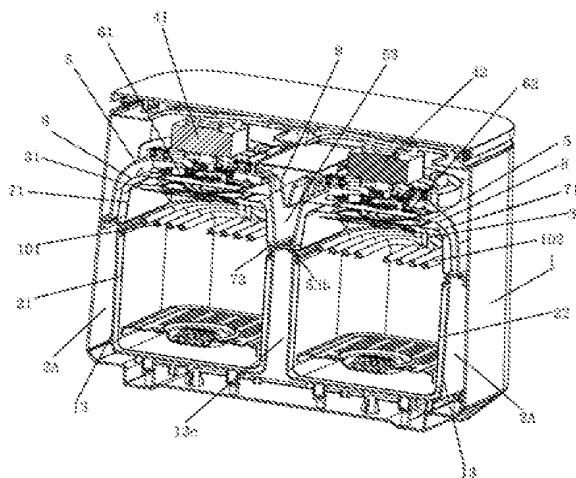
权利要求书2页 说明书4页 附图10页

(54)发明名称

空气炸锅

(57)摘要

本发明涉及一种空气炸锅,包括有内部形成有烹饪腔的机体(1),能进出烹饪腔的锅体,以及设于机体(1)内且位于烹饪腔上方的电热装置,其特征在于:所述锅体包括第一锅体(21)和第二锅体(22);所述机体(1)的烹饪腔内设有一体式炉腔内胆(13),该一体式炉腔内胆(13)上形成有能分别容置第一锅体(21)和第二锅体(22)的第一容腔(13a)和第二容腔(13b),所述第一锅体(21)设置在第一容腔(13a)内,所述第二锅体(22)设置在第二容腔(13b)内。与现有技术相比,本发明的优点在于:通过设置两个独立的第一锅体和第二锅体,可以同时进行两个烹饪操作,并且采用一体式炉腔内胆结构,节约了材料成本,提高了组装效率。



1. 一种空气炸锅, 包括有内部形成有烹饪腔的机体 (1), 能进出烹饪腔的锅体, 以及设于机体 (1) 内且位于烹饪腔上方的电热装置, 其特征在于: 所述锅体包括第一锅体 (21) 和第二锅体 (22); 所述机体 (1) 的烹饪腔内设有一体式炉腔内胆 (13), 该一体式炉腔内胆 (13) 上形成有能分别容置第一锅体 (21) 和第二锅体 (22) 的第一容腔 (13a) 和第二容腔 (13b), 所述第一锅体 (21) 设置在第一容腔 (13a) 内, 所述第二锅体 (22) 设置在第二容腔 (13b) 内。

2. 根据权利要求1所述的空气炸锅, 其特征在于: 所述一体式炉腔内胆 (13) 上形成有位于第一容腔 (13a) 和第二容腔 (13b) 之间的冷风风道 (13c), 一体式炉腔内胆 (13) 与机体内壁之间形成有冷风通道 (2A), 冷风风道 (13c) 与冷风通道 (2A) 连通。

3. 根据权利要求2所述的空气炸锅, 其特征在于: 第一容腔 (13a) 和第二容腔 (13b) 之间的一体式炉腔内胆 (13) 上开有与冷风风道 (13c) 连通的冷风流通孔 (13d)。

4. 根据权利要求2所述的空气炸锅, 其特征在于: 所述机体内还设有:

设置在电热装置上方、与第一锅体 (21) 位置相对的第一热风机 (31);

设置在电热装置上方、与第二锅体 (22) 位置相对的第二热风机 (32);

与第一热风机 (31) 连接并能驱动第一热风机转动的第一电机 (41);

与第二热风机 (32) 连接并能驱动第二热风机转动的第二电机 (42);

能同时安装第一电机 (41) 和第二电机 (42) 的电机架 (5), 电机架 (5) 上与第一热风机 (31) 位置对应的部位设有第一穿孔 (51), 电机架 (5) 上与第二热风机 (32) 位置对应的部位设有第二穿孔 (52), 第一电机 (41) 的输出轴穿过第一穿孔 (51) 后与第一热风机 (31) 连接, 第二电机 (41) 的输出轴穿过第二穿孔 (52) 后与第二热风机 (32) 连接; 所述电机架 (5) 中部形成有向下凹陷呈U型或V型的冷风风道槽 (53), 冷风风道槽 (53) 的侧壁开有冷风透穿孔 (53a), 冷风风道槽 (53) 的底部开有冷风出口 (53b), 冷风出口 (53b) 与一体式炉腔内胆 (13) 上的冷风风道 (13c) 连通。

5. 根据权利要求4所述的空气炸锅, 其特征在于: 所述电机架 (5) 的下部与第一穿孔对应的位置设有第一冷风机 (61), 第一冷风机 (61) 也与第一电机 (41) 的输出轴连接; 所述电机架 (5) 的下部与第二穿孔 (52) 对应的位置设有第二冷风机 (62), 第二冷风机 (62) 也与第二电机 (42) 的输出轴连接; 冷风风道槽 (53) 一侧的冷风透穿孔 (53a) 设置在与第一冷风机 (61) 相对的位置, 冷风风道槽另一侧的冷风透穿孔 (53a) 设置在与第二冷风机 (62) 相对的位置。

6. 根据权利要求5所述的空气炸锅, 其特征在于: 第一冷风机 (61) 位于第一热风机 (31) 上方, 且第一热风机 (31) 与第一冷风机 (61) 并联连接在第一电机 (41) 的输出轴上, 第一热风机 (31) 与第一冷风机 (61) 之间设有第一反射板 (71); 第二冷风机 (62) 位于第二热风机 (32) 上方, 第二热风机 (32) 与第二冷风机 (62) 并联连接在第二电机 (42) 的输出轴上, 第二热风机 (32) 与第二冷风机 (62) 之间设有第二反射板 (72); 第一反射盘 (71) 和第二反射盘 (72) 通过连接板 (73) 相互连接在一起, 且第一反射盘 (71)、第二反射盘 (72) 和连接板 (73) 呈一体件结构。

7. 根据权利要求6所述的空气炸锅, 其特征在于: 连接所述第一反射盘 (71) 与第二反射盘 (72) 的连接板 (73) 上开有通风口 (73a), 该通风口 (73a) 的位置与电机架上冷风风道槽底部的冷风出口 (53b) 相对应, 且该通风口 (73a) 与一体式炉腔内胆 (13) 上的冷风风道 (13c) 连通; 第一反射盘 (71)、第二反射盘 (72) 与第一冷风机 (61)、第二冷风机 (62) 之间设有一体

式隔热板(8),一体式隔热板(8)中部设有开口(81),电机架(5)上的冷风风道槽(53)穿过该开口(81)后与连接板(73)相对;所述电机架(5)的冷风风道槽(53)侧壁与一体式隔热板(8)中部的开口(81)边缘紧密贴合,并且所述电机架的冷风风道槽侧壁的冷风透穿孔(53a)位置高于一体式隔热板(8);电机架(5)上方与冷风风道槽对应的位置设有导风架(9),导风架(9)上具有能插入冷风风道槽内的U型或V型导风面(91)。

8.根据权利要求1~7中任意一项权利要求所述的空气炸锅,其特征在于:所述第一容腔(13a)在开口处设有倾斜设置的第一导向面(131),所述第一锅体(21)连接有第一锅体支架(211),第一锅体支架(211)上设有能与第一导向面(131)配合导向的第一斜面(211a);所述第二容腔(13b)在开口处设有倾斜设置的第二导向面(132),所述第二锅体(22)连接有第二锅体支架(221),第二锅体支架(221)上设有能与第二导向面(132)配合导向的第二斜面(221a)。

9.根据权利要求8所述的空气炸锅,其特征在于:所述第一导向面(131)和第二导向面(132)在一体式炉腔内胆(13)上形成V型结构。

10.根据权利要求8所述的空气炸锅,其特征在于:第一锅体支架(211)外侧面连接有第一手柄(212),第二锅体支架(221)外侧面连接有第二手柄(222);当第一锅体支架(211)带动第一锅体(21)进入第一容腔(13a)后,且第二锅体支架(221)带动第一锅体(22)进入第一容腔(13b)后,第一锅体支架(211)外侧面与第二锅体支架(221)外侧面保持齐平。

空气炸锅

技术领域

[0001] 本发明涉及厨房设备技术领域,具体指一种空气炸锅。

背景技术

[0002] 空气炸锅是一种利用高速、高温空气循环技术对食品进行炸制的新型家用电器,其做出的食品比传统电炸锅相比可降低80%油脂,在日常使用中易于清洁,既安全又经济,备受人们所青睐。

[0003] 现有的空气炸锅一般包括机体,机体内形成有烹饪腔体,机体内设有能向烹饪腔体内部送入高温空气的热风,烹饪腔体内设有用于盛放食物的锅体,利用热风工作时产生的高温热风,对锅体内的食材进行加热,热空气与食物充分接触,利用食物表面瞬间快速失去水分,或再加上食品自身产生的油脂,使食品表面形成酥脆口感,呈现被油炸的效果。具体结构可参见专利申请号为CN201710570933.8(公告号为CN107233007A)的发明专利《一种简易装配结构的空气炸锅》。

[0004] 但是上述空气炸锅中,烹饪腔内的锅体只有一个,不能同时烹饪两种不同食物或进行两种不同类型的烹饪程序。

发明内容

[0005] 本发明所要解决的技术问题是针对现有技术的现状,提供一种能同时进行两个烹饪操作、并且组装简便的空气炸锅。

[0006] 本发明解决上述技术问题所采用的技术方案为:一种空气炸锅,包括有内部形成有烹饪腔的机体,能进出烹饪腔的锅体,以及设于机体内且位于烹饪腔上方的电热装置,其特征在于:所述锅体包括第一锅体和第二锅体;所述机体的烹饪腔内设有一体式炉腔内胆,该一体式炉腔内胆上形成有能分别容置第一锅体和第二锅体的第一容腔和第二容腔,所述第一锅体设置在第一容腔内,所述第二锅体设置在第二容腔内。

[0007] 作为改进,所述一体式炉腔内胆上形成有位于第一容腔和第二容腔之间的冷风风道,一体式炉腔内胆与机体内壁之间形成有冷风通道,冷风风道与冷风通道连通。

[0008] 再改进,第一容腔和第二容腔之间的一体式炉腔内胆上开有与冷风风道连通的冷风流通孔。

[0009] 再改进,所述机体内还设有:

[0010] 设置在电热装置上方、与第一锅体位置相对的第一热风机;

[0011] 设置在电热装置上方、与第二锅体位置相对的第二热风机;

[0012] 与第一热风机连接并能驱动第一热风机转动的第一电机;

[0013] 与第二热风机连接并能驱动第二热风机转动的第二电机;

[0014] 能同时安装第一电机和第二电机的电机架,电机架上与第一热风机位置对应的部位设有第一穿孔,电机架上与第二热风机位置对应的部位设有第二穿孔,第一电机的输出轴穿过第一穿孔后与第一热风机连接,第二电机的输出轴穿过第二穿孔后与第二热风机连

接;所述电机架中部形成有向下凹陷呈U型或V型的冷风风道槽,冷风风道槽的侧壁开有冷风透穿孔,冷风风道槽的底部开有冷风出口,冷风出口与一体式炉腔内胆上的冷风风道连通。

[0015] 再改进,所述电机架的下部与第一穿孔对应的位置设有第一冷风机,第一冷风机也与第一电机的输出轴连接;所述电机架的下部与第二穿孔对应的位置设有第二冷风机,第二冷风机也与第二电机的输出轴连接;冷风风道槽一侧的冷风透穿孔设置在与第一冷风机相对的位置,冷风风道槽另一侧的冷风透穿孔设置在与第二冷风机相对的位置。

[0016] 再改进,第一冷风机位于第一热风机上方,且第一热风机与第一冷风机并联连接在第一电机的输出轴上,第一热风机与第一冷风机之间设有第一反射板;第二冷风机位于第二热风机上方,第二热风机与第二冷风机并联连接在第二电机的输出轴上,第二热风机与第二冷风机之间设有第二反射板;第一反射盘和第二反射盘通过连接板相互连接在一起,且第一反射盘、第二反射盘和连接板呈一体件结构。

[0017] 再改进,连接所述第一反射盘与第二反射盘的连接板上开有通风口,该通风口的位置与电机架上冷风风道槽底部的冷风出口相对应,且该通风口与一体式炉腔内胆上的冷风风道连通;第一反射盘、第二反射盘与第一冷风机、第二冷风机之间设有一体式隔热板,一体式隔热板中部设有开口,电机架上的冷风风道槽穿过该开口后与连接板相对;所述电机架的冷风风道槽侧壁与一体式隔热板中部的开口边缘紧密贴合,并且所述电机架的冷风风道槽侧壁的冷风透穿孔位置高于一体式隔热板;电机架上方与冷风风道槽对应的位置设有导风架,导风架上具有能插入冷风风道槽内的U型或V型导风面。

[0018] 再改进,所述第一容腔在开口处设有倾斜设置的第一导向面,所述第一锅体连接有第一锅体支架,第一锅体支架上设有能与第一导向面配合导向的第一斜面;所述第二容腔在开口处设有倾斜设置的第二导向面,所述第二锅体连接有第二锅体支架,第二锅体支架上设有能与第二导向面配合导向的第二斜面。

[0019] 再改进,所述第一导向面和第二导向面在一体式炉腔内胆上形成V型结构。

[0020] 再改进,第一锅体支架外侧面连接有第一手柄,第二锅体支架外侧面连接有第二手柄;当第一锅体支架带动第一锅体进入第一容腔后,且第二锅体支架带动第二锅体进入第一容腔后,第一锅体支架外侧面与第二锅体支架外侧面保持齐平。

[0021] 与现有技术相比,本发明的优点在于:通过设置两个独立的第一锅体和第二锅体,可以同时两个烹饪操作,并且采用一体式炉腔内胆结构,节约了材料成本,提高了组装效率。

附图说明

[0022] 图1为本发明实施例中空气炸锅的结构示意图。

[0023] 图2为本发明实施例中空气炸锅的立体剖视图。

[0024] 图3为本发明实施例中一体式炉腔内胆的结构示意图;

[0025] 图4为本发明实施例中一体式炉腔内胆另一视角的结构示意图;

[0026] 图5为本发明实施例中第一锅体和第二锅体的结构示意图;

[0027] 图6为本发明实施例中第一锅体和第二锅体与一体式炉腔内胆装配后的结构示意图。

- [0028] 图7为本发明实施例中电机架的立体结构示意图。
- [0029] 图8为本发明实施例中一体式隔热板的立体结构示意图；
- [0030] 图9为本发明实施例中一体式反射板的立体结构示意图；
- [0031] 图10为本发明实施例中导风架的立体结构示意图。

具体实施方式

[0032] 以下结合附图实施例对本发明作进一步详细描述。

[0033] 如图1和图2所示的空气炸锅,包括有内部形成有烹饪腔的机体1,能进出烹饪腔的锅体,以及设于机体1内且位于烹饪腔上方的电热装置,其中锅体包括第一锅体21和第二锅体22,第一锅体21和第二锅体22能同时进入并置于所述烹饪腔内;电热装置包括位于第一锅体21上方的第一电热管101,位于第二锅体22上方的第二电热管102。

[0034] 所述机体1的烹饪腔内设有一体式炉腔内胆13,该一体式炉腔内胆13上形成有能分别容置第一锅体21和第二锅体22的第一容腔13a和第二容腔13b,所述第一锅体21设置在第一容腔13a内,所述第二锅体22设置在所述第二容腔13b内。一体式炉腔内胆13可以同时容置两个锅体,节约了材料成本,提高了组装效率,参见图3所示。

[0035] 所述一体式炉腔内胆13上形成有位于第一容腔13a和第二容腔13b之间的冷风风道13c,第一容腔13a和第二容腔13b之间的一体式炉腔内胆13上开有与冷风风道13c连通的冷风流通孔13d,一体式炉腔内胆13与机体内壁之间形成有冷风通道2A,冷风风道13c与冷风通道2A连通,参见图2和图4所示。设置冷风风道13c和冷风通道2A,可以给机体内壁冷却降温,避免其温度过高变形。

[0036] 所述第一容腔13a在开口处设有倾斜设置的第一导向面131,所述第一锅体21连接有第一锅体支架211,第一锅体支架211上设有能与第一导向面131配合导向的第一斜面211a;所述第二容腔13b在开口处设有倾斜设置的第二导向面132,所述第二锅体22连接有第二锅体支架221,第二锅体支架221上设有能与第二导向面132配合导向的第二斜面221a;第一导向面131和第二导向面132在一体式炉腔内胆13上形成V型结构,参见图3、5、6所示。第一锅体支架211外侧面连接有第一手柄212,第二锅体支架221外侧面连接有第二手柄222;当第一锅体支架211带动第一锅体21进入第一容腔13a后,且第二锅体支架221带动第二锅体22进入第二容腔13b后,第一锅体支架211外侧面与第二锅体支架221外侧面保持齐平,参见图1、图5和图6。一体式炉腔内胆与两个锅体支架之间通过V形导向面配合,这样可以保证两个锅体在推入一体式炉腔内胆的容腔时,不会出现倾斜卡死现象,而且两个锅体再同时推入时因为V形导向结构的存在,既不会出现相互碰撞摩擦现象,还能保证第一锅体支架211外侧面与第二锅体支架221外侧面保持齐平,提升使用体验,提高外形美观。

[0037] 另外,所述机体1内还设有:

[0038] 设置在第一电热管101上方、与第一锅体21位置相对的第一热风机31;

[0039] 设置在第二电热管102上方、与第二锅体22位置相对的第二热风机32;

[0040] 设置在第一热风机31上方的第一反射板71;

[0041] 设置在第二热风机32上方的第二反射板72;

[0042] 设置在第一反射板71和第二反射板72上方的一体式隔热板8;

[0043] 设置在一体式隔热板8上方的第一冷风机61;

[0044] 设置在一体式隔热板8上方的第二冷风机62;

[0045] 设置在第一冷风机61和第二冷风机62上方的电机架5;

[0046] 安装在电机架5上的第一电机41和第二电机42。

[0047] 电机架5上设有第一穿孔51和第二穿孔52,第一电机41的输出轴穿过第一穿孔51后,第一热风机31与第一冷风机61并联连接在第一电机41的输出轴上;第二电机41的输出轴穿过第二穿孔52后,第二热风机32与第二冷风机62并联连接在第二电机42的输出轴上;当然,一体式隔热板8和第一反射板71上开有允许第一电机41的输出轴穿过的安装孔,一体式隔热板8和第二反射板72上开有允许第二电机42的输出轴穿过的安装孔。所述电机架5中部形成有向下凹陷呈U型或V型的冷风风道槽53,冷风风道槽53的侧壁开有冷风透穿孔53a,冷风风道槽53的底部开有冷风出口53b,参见图7所示;第一锅体21和第二锅体22与机体内壁之间设有冷风通道2A,冷风风道槽53底部的冷风出口53b与冷风通道2A连通。冷风风道槽53一侧的冷风透穿孔53a设置在与第一冷风机61相对的位置,冷风风道槽另一侧的冷风透穿孔53a设置在与第二冷风机62相对的位置。第一反射盘71和第二反射盘72通过连接板73相互连接在一起,且第一反射盘71、第二反射盘72和连接板73相互连接有呈一体件结构,形成一体式反射板7,参见图9所示。连接所述第一反射盘71与第二反射盘72的连接板73上开有通风口73a,该通风口73a的位置与电机架上冷风风道槽底部的冷风出口53b相对应,且该通风口73a与第一锅体和第二锅体之间的冷风通道2A连通。一体式隔热板8中部设有开口81,参见图8所示。电机架5上的冷风风道槽53穿过该开口81后与连接第一反射盘71与第二反射盘72的连接板73相对。所述电机架5的冷风风道槽53侧壁与一体式隔热板8中部的开口81边缘紧密贴合,并且所述电机架的冷风风道槽侧壁的冷风透穿孔53a位置高于一体式隔热板8。电机架5四周边缘与机体内壁固定连接,一体式反射板7的四周也与机体内壁固定连接,一体式隔热板8四周固定在一体式反射板7上。本实施例中,所述电机架5上方与冷风风道槽对应的位置设有导风架9,导风架9上具有能插入冷风风道槽内的U型或V型导风面91,参见图10所示。

[0048] 本实施例中的空气炸锅在工作时,在两个电机带动下,两个热风风机和两个冷风风机开始高速旋转;一方面,两个热风风机分别将两个电热管产生的热量分别吹向两个锅体内部,对两个锅体内部的食物进行加热;另一方面,外界冷空气通过机体上方的冷风入口进入机体与电机架之间,由于电机架上也开有冷风入口,冷风进一步通过电机架上的冷风入口进行电机架与一体隔热板之间的冷风腔内,在两个冷风风机高速旋转下,冷气通过电机架5上的冷风风道槽53的冷风透穿孔53a进入冷风风道槽53,进一步通过冷风风道槽53底部的冷风出口53b和连接板73上的通风口73a进入一体式炉腔内胆13的冷风风道13c,并进入一体式炉腔内胆13与机体内壁之间形成的冷风通道2A内,从而对机体内壁进行冷却散热降温,避免机体因温度过高变形。

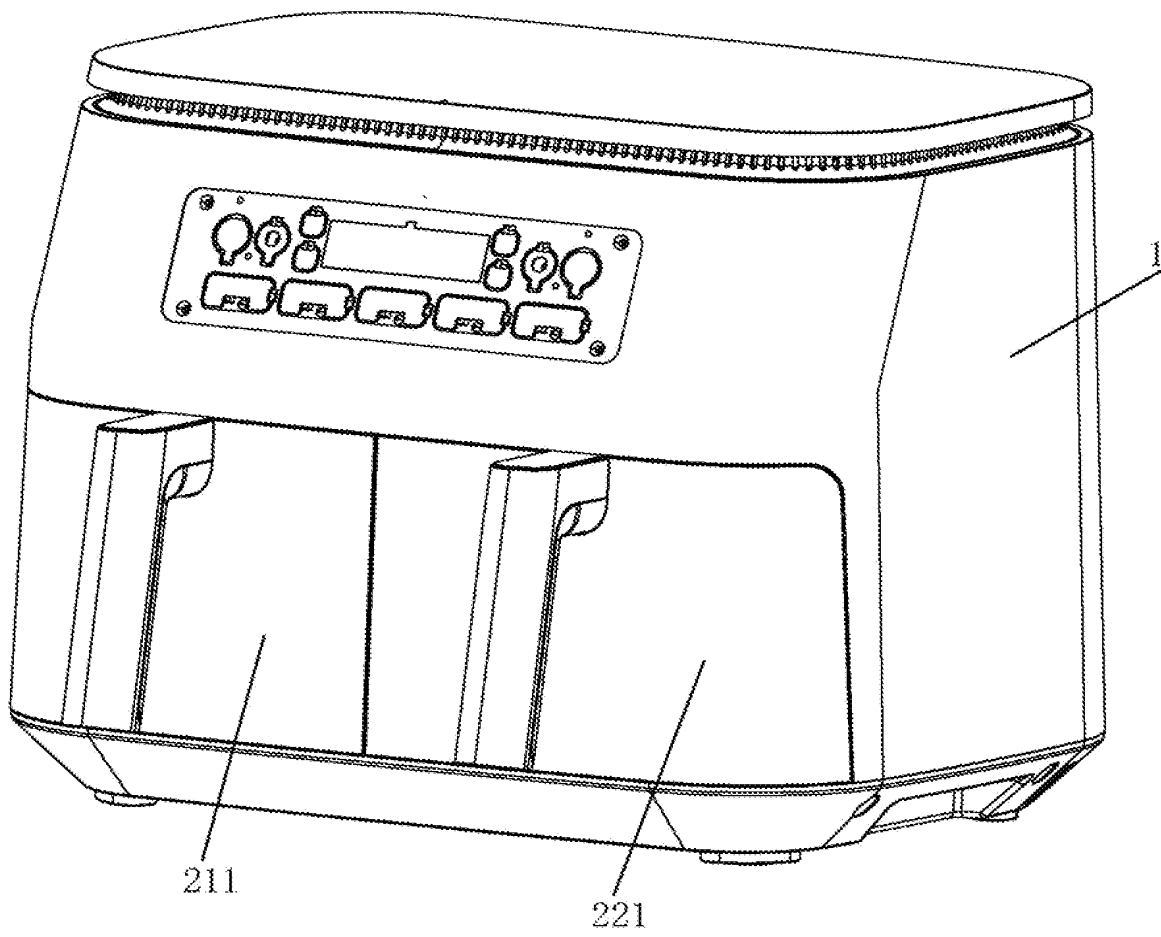


图1

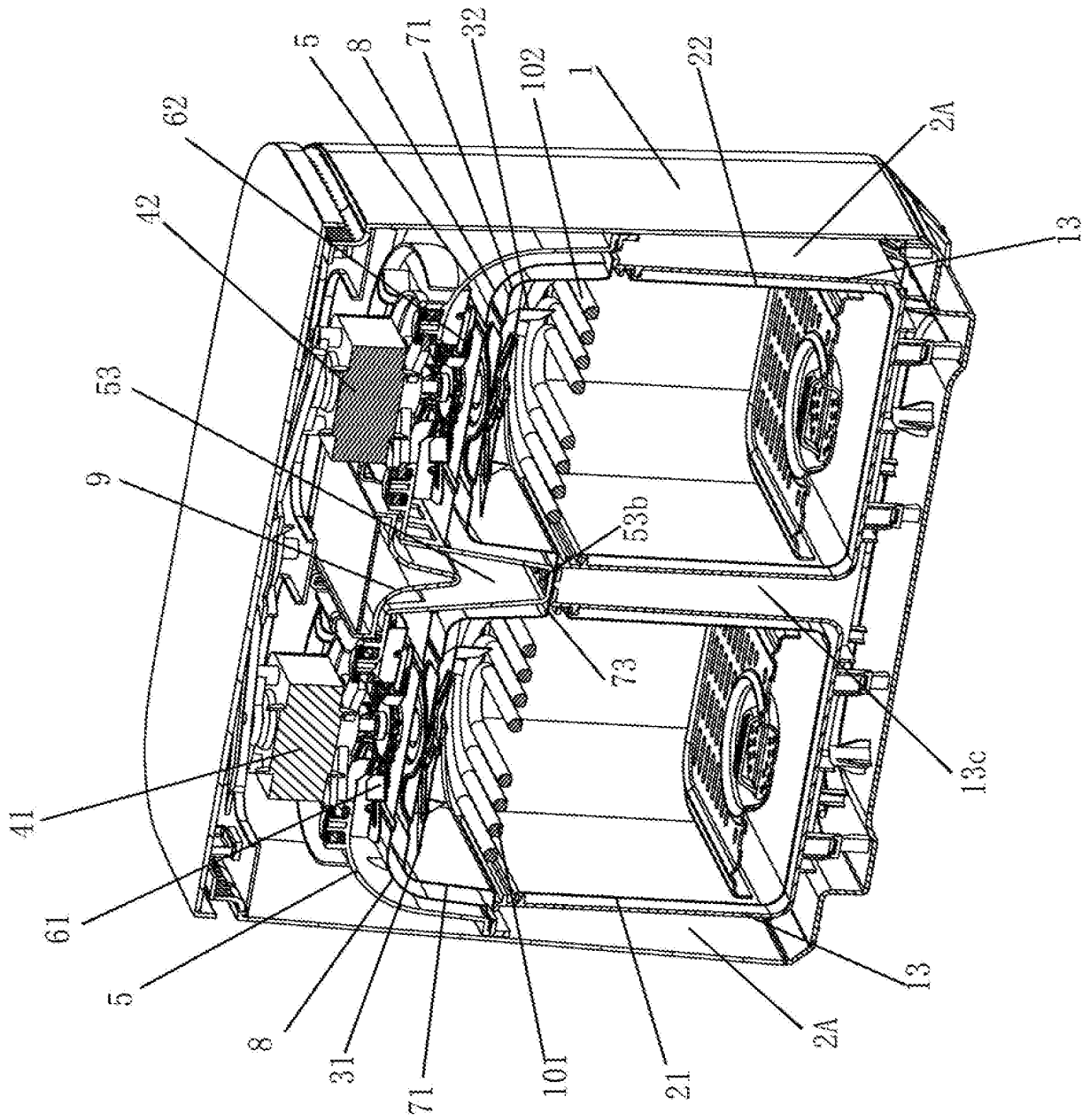


图2

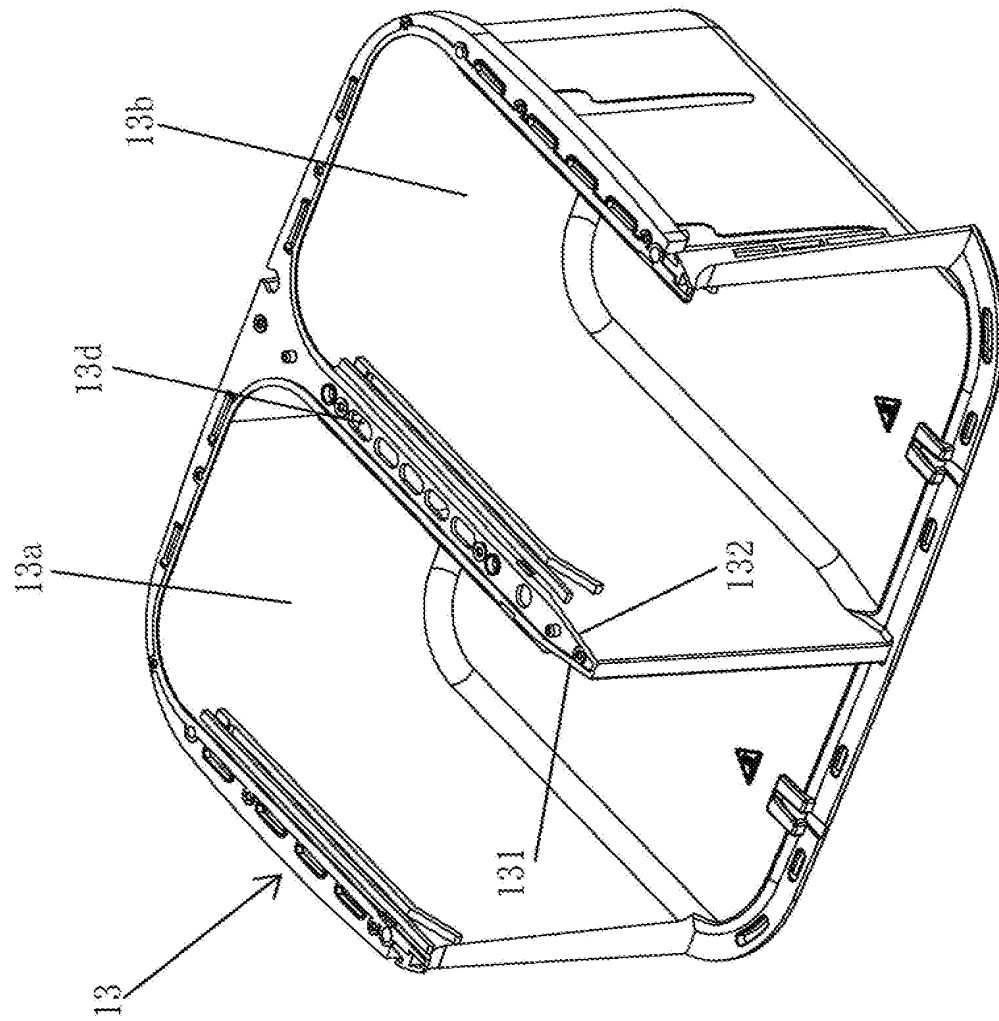


图3

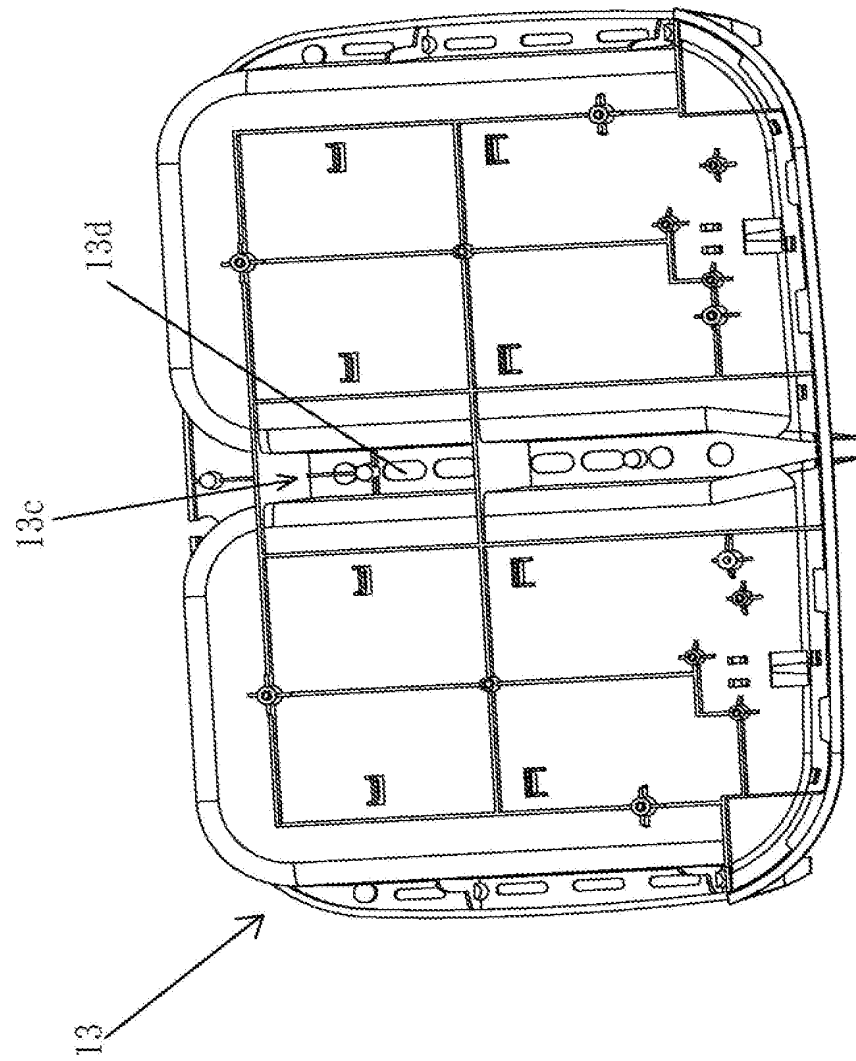


图4

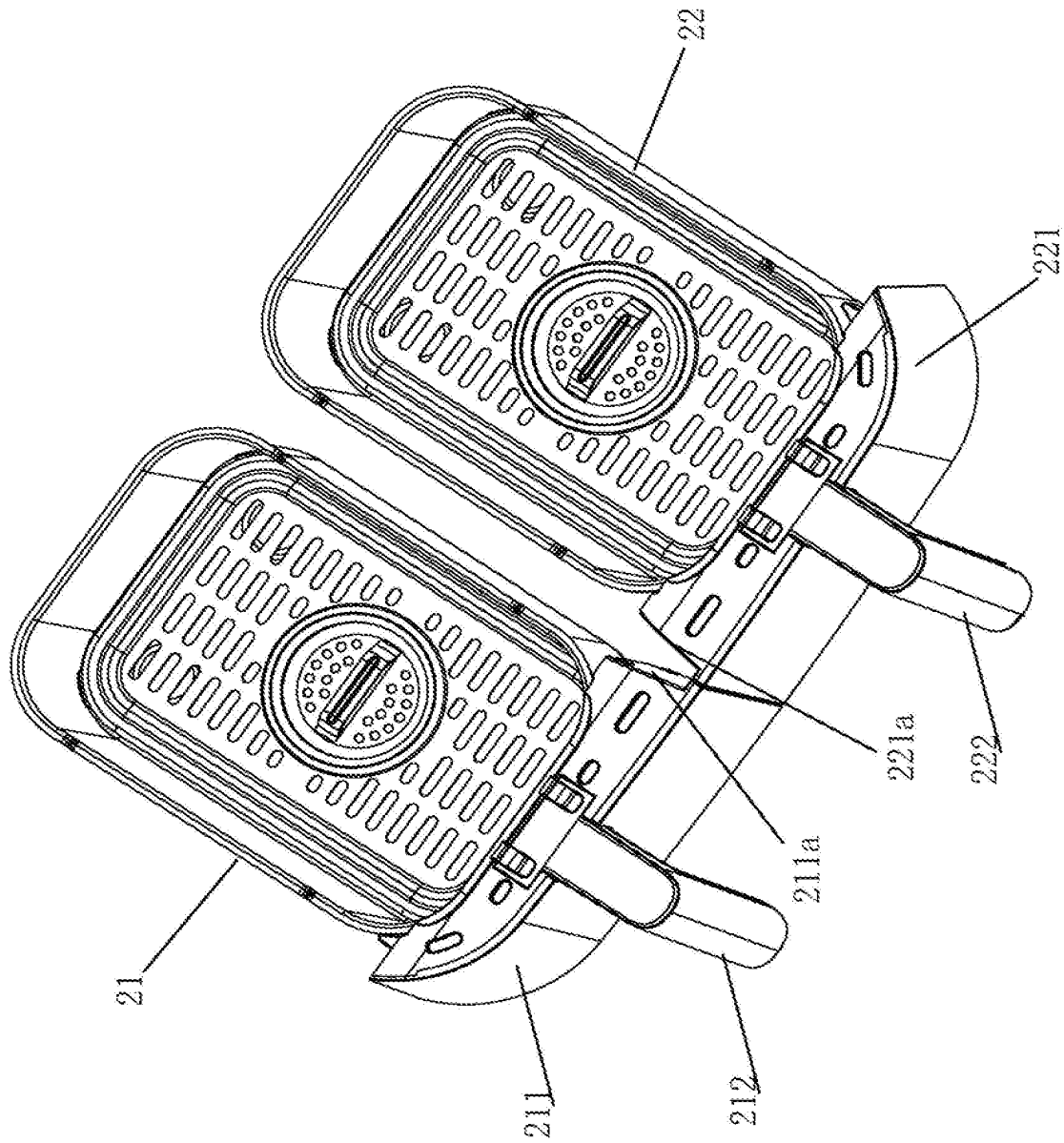


图5

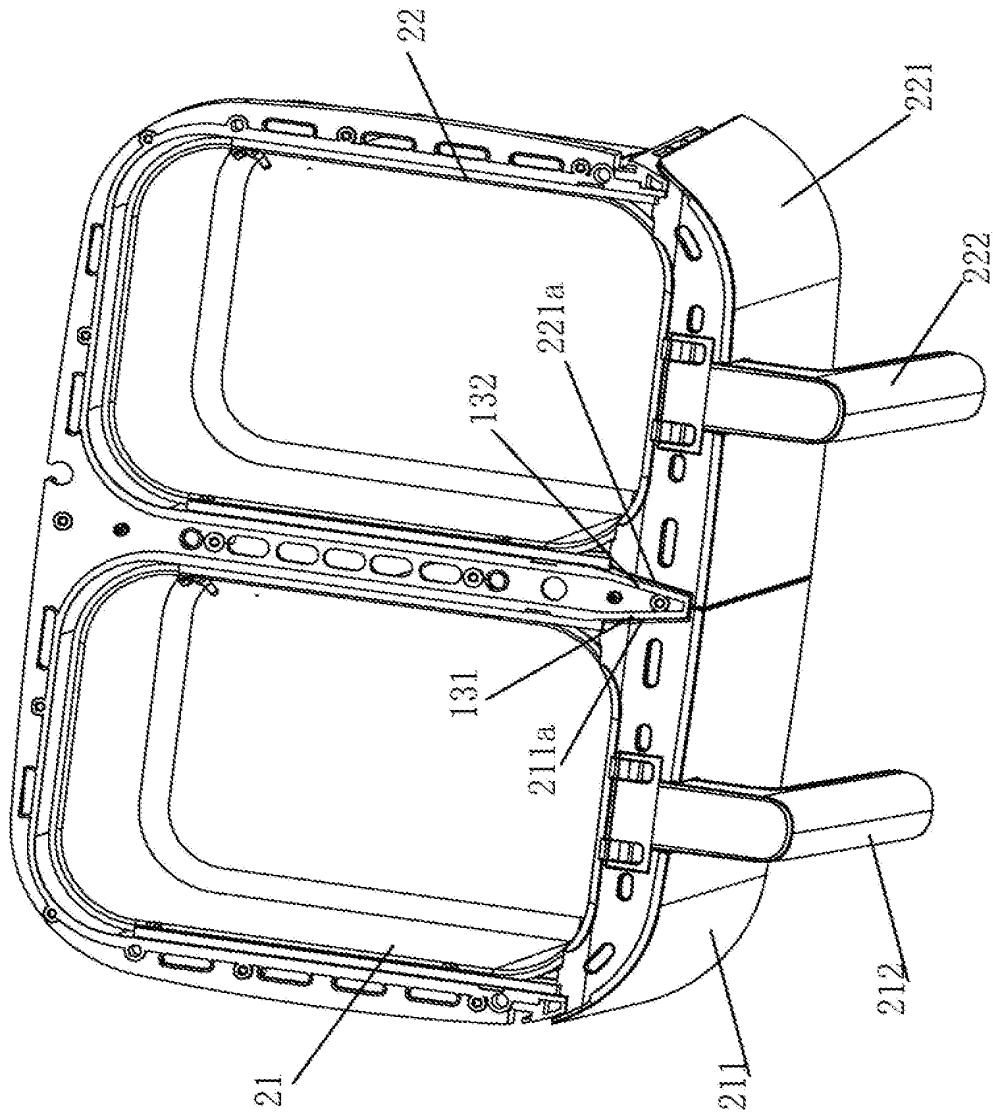


图6

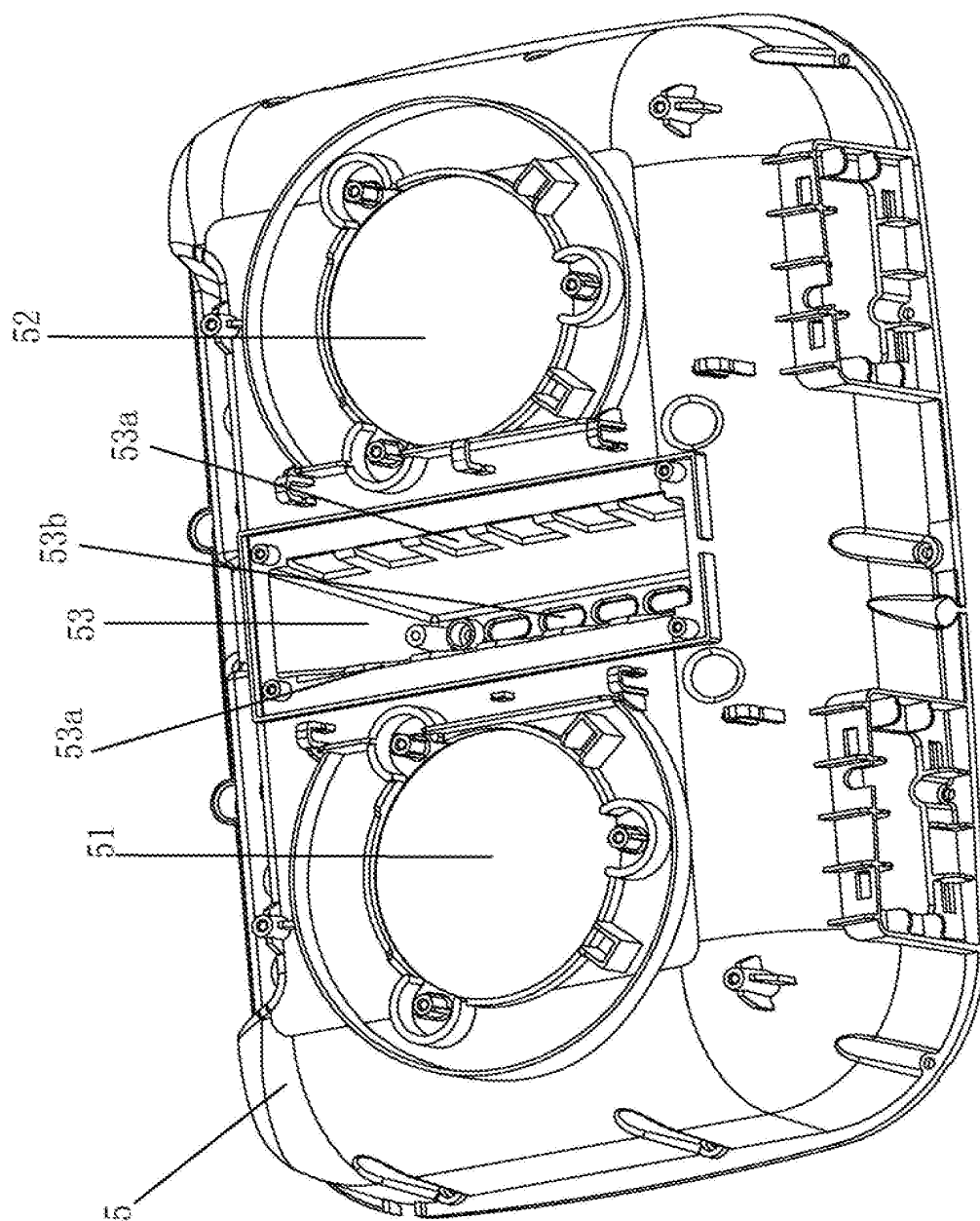


图7

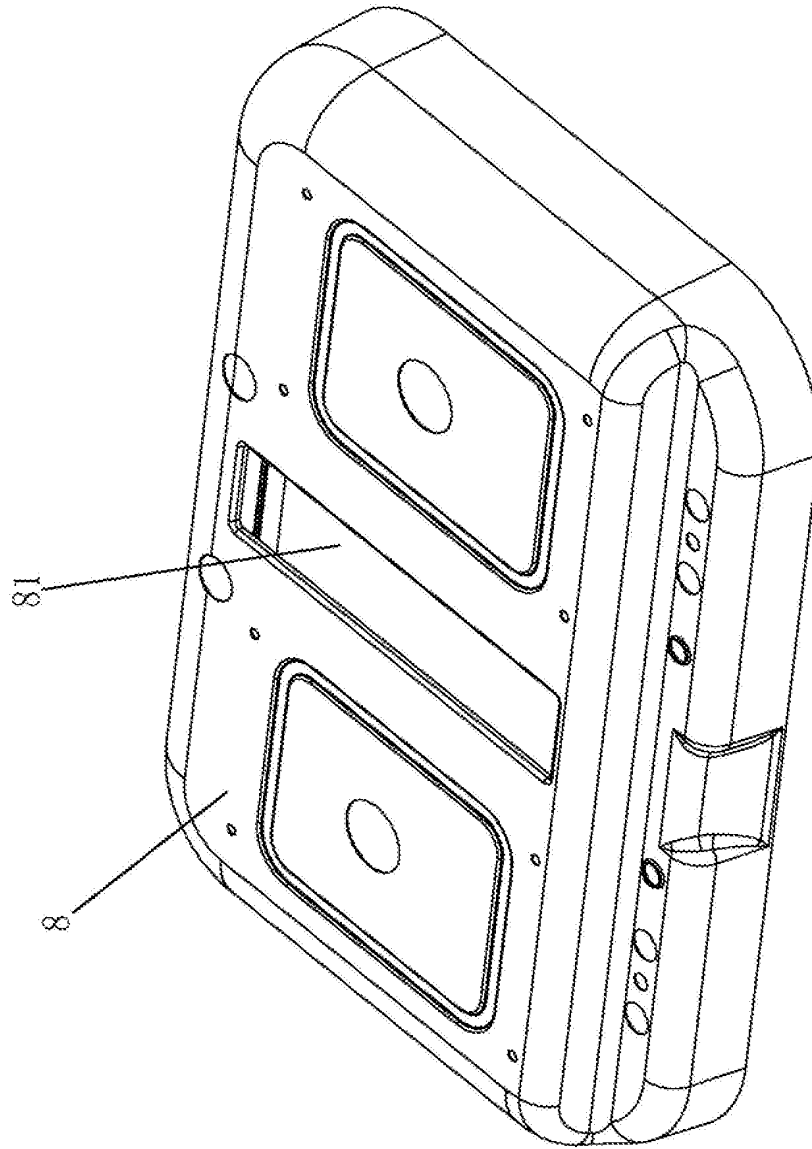


图8

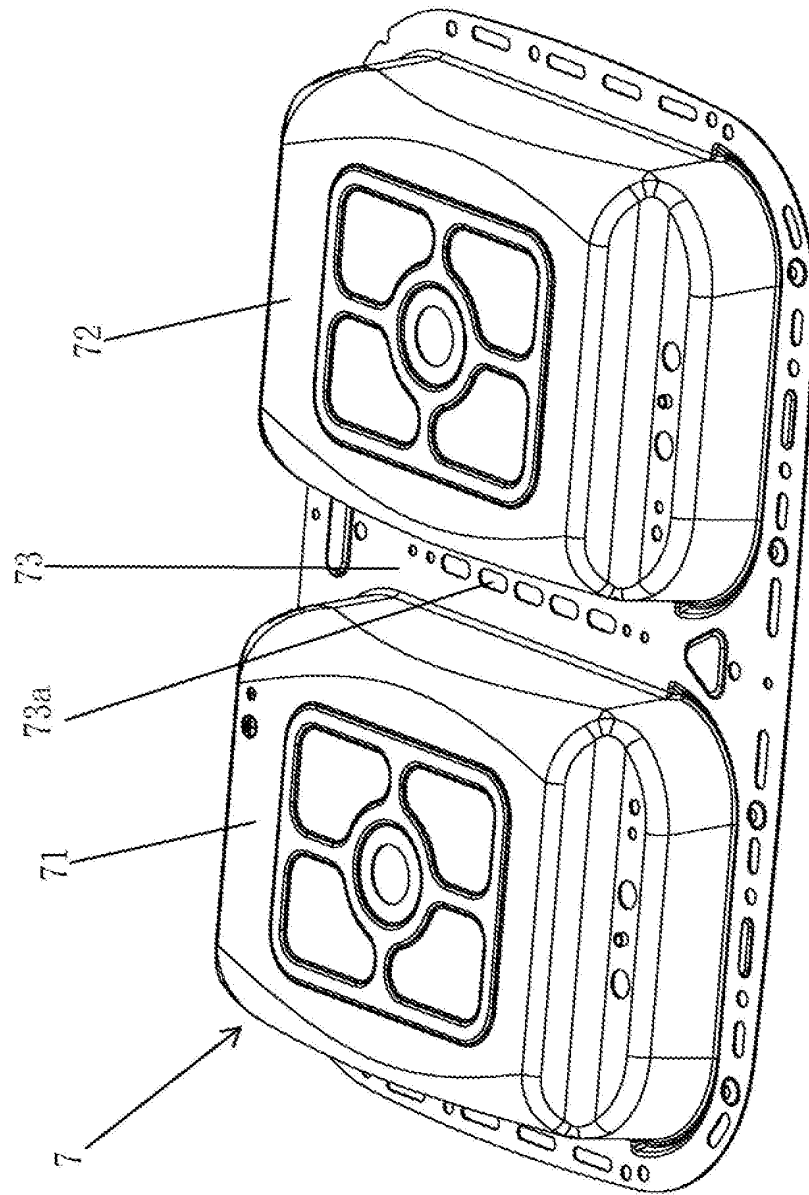


图9

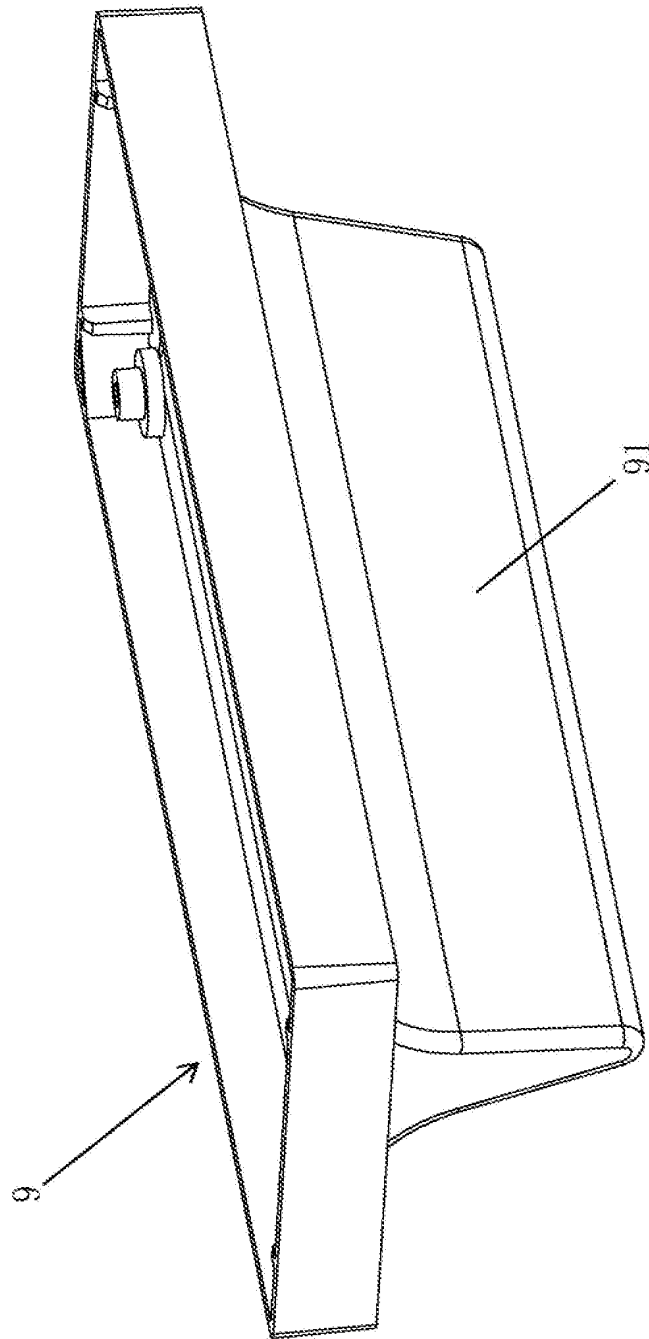


图10



Espacenet

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Reservation cooking machine

Inventor(s): LING YAO ± (YAO LING)

Applicant(s): LING YAO ± (YAO LING)

Classification: - **international:** A47J27/00; A47J27/04; A47J36/00; A47J37/06; F25D23/12
- **cooperative:**

Application number: CN201020547486U 20100928

Priority number(s): CN201020547486U 20100928

Abstract of CN201847449 (U)

The utility model provides a reservation cooking machine which is richer in function, more convenient to use and compact in structure and can take reservations for cooking food and dish at the same time. The reservation cooking machine comprises a shell, a set of electric heating rice cookers, one set or more sets of electric heating food cookers including an electric heater and a cooking vessel, a set of electrical coolers, thermal insulation layers and a control device; the electric heating rice cookers and the electric heating food cookers are arranged inside the shell, and the thermal insulation layers are arranged among the inner cavities of the electric heating food cookers, the inner cavities of the electric heating food cookers and the shell; the heat-absorbing ends of the electrical coolers are connected with the inner cavities of the electric heating rice cookers and the electric heating food cookers; and the output terminal of the control device is electrically connected with the electrical coolers, the electrical heaters for the electric heating rice cookers and the electrical heaters for the electric heating food cookers. The reservation cooking machine can be used for cooking not only rice but also more food and dish by reservation and is more convenient to use.



(12) 实用新型专利

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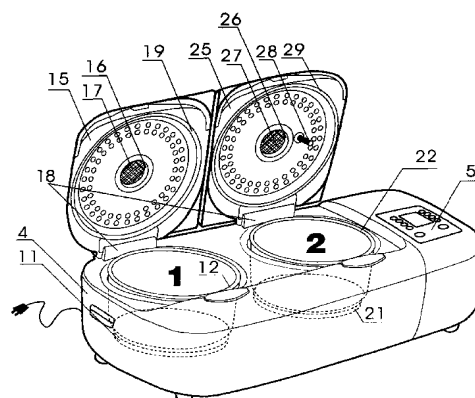
权利要求书 1 页 说明书 8 页 附图 11 页

(54) 实用新型名称

一种预约煮食机

(57) 摘要

本实用新型提供了一种功能更丰富、使用更方便、结构紧凑、可同时预约煮饭和煮菜肴的预约煮食机。本实用新型包括壳体、一套电热煮饭器、一套或一套以上包含电加热器及煮食容器组成的电热煮食器、一套电制冷器、隔热层、控制装置；电热煮饭器及电热煮食器设在壳体内部，电热煮饭器内腔及电热煮食器内腔与壳体之间设有隔热层；电制冷器的吸热端热连接电热煮饭器内腔和电热煮食器内腔；控制装置的输出端分别与电制冷器、电热煮饭器的电加热器、电热煮食器的电加热器电连接。本实用新型可同时预约煮更多的食物、菜肴，使预约煮食不只限于煮饭，使用更方便。



1. 一种预约煮食机,其特征是:包括壳体、一套电热煮饭器、一套或一套以上包含电加热器及煮食容器组成的电热煮食器、一套电制冷器、隔热层、控制装置;

电热煮饭器及电热煮食器设在壳体内部,电热煮饭器内腔及电热煮食器内腔与壳体之间设有隔热层;

电制冷器的吸热端热连接电热煮饭器内腔和电热煮食器内腔;

控制装置的输出端分别与电制冷器、电热煮饭器的电加热器、电热煮食器的电加热器电连接。

2. 根据权利要求1所述的预约煮食机,其特征是:所述的控制装置包含微电脑控制器和电信遥控器,电信遥控器的输出端与微电脑控制器的触发端电连接。

3. 根据权利要求1或2所述的预约煮食机,其特征是:所述的微电脑控制器可具备一套或一套以上的单片机电脑。

4. 根据权利要求1或2所述的预约煮食机,其特征是:所述的电热煮饭器和电热煮食器设有盖体,在盖体上可设有蒸汽口,在蒸汽口通道内设有低导热过滤网。

5. 根据权利要求1或2所述的预约煮食机,其特征是:作为控制装置的微电脑控制器既是电热煮饭器的控制装置同时也是电热煮食器的控制装置。

6. 根据权利要求1或2所述的预约煮食机,其特征是:所述的电热煮食器的盖体下方、蒸汽口周围0-15cm范围内还设有防溢电极,防溢电极与微电脑控制器的防溢检测端电连接。

7. 根据权利要求1或2所述的预约煮食机,其特征是:所述的电热煮食器的电加热器设为远红外线发热器。

8. 根据权利要求1或2所述的预约煮食机,其特征是:所述的电热煮饭器内腔和电热煮食器内腔是一个热连通的腔体。

9. 根据权利要求1或2所述的预约煮食机,其特征是:所述的预约煮食机还设有保温箱体,电制冷器的吸热端热连接保温箱体内腔。

10. 根据权利要求1或2所述的预约煮食机,其特征是:无线遥控器的接收部分的输出端与微电脑控制器的触发端电连接。

一种预约煮食机

技术领域

[0001] 本实用新型涉及一种煮食装置,尤其是一种具备两个以上煮食器的预约煮食机。

背景技术

[0002] 随着现代人生活节奏不断在加快,生活方式趋向于更方便快捷,使人们的时间精力更多地应用在工作及休闲上,并有计划地安排在繁琐家务上所付出的时间和精力,现代生活的发展对技术及产品提出了新的需求,预约煮食是一种在煮食装置预先放置食物,按人们意愿确定时间煮熟食物的煮食方式,可以使人们回家就有饭菜食用,让人们可以有计划地获得更多休闲、工作时间。

[0003] 中国专利号 200820189108 公开了“一种可预约煮食的电饭煲”,该专利在现有技术的机械式或微电脑式电饭煲的基础上增加了制冷部件及远程遥控开关,通过制冷部件对电饭煲内放置的食品进行降温保鲜,在一天至三天内,使用者可以通过远程遥控开关,启动电饭煲煮饭,顺便把预先放在电饭煲内的肉菜也蒸熟了,主人回到家就有饭菜吃,达到预约煮食的目的。中国专利号 200820189108 “一种可预约煮食的电饭煲”实质是对现有技术的电饭煲进行功能改进的方案,主要是用于做饭为主,该专利的功能显得比较单一;对于吃惯了多样化佐餐菜肴品种的人来说或预约吃饭的人数为多个人,希望回到家就能吃到够吃的刚煮好饭菜,该专利不能一次性地做好更多够吃的饭菜,使用者可能回到家还要动手用其它煮食炉具煮其它菜肴才够吃,该专利显得不够方便。

实用新型内容

[0004] 为了克服中国专利号 200820189108 “一种可预约煮食的电饭煲”其功能单一、不够方便的缺点,本实用新型提供了一种功能更丰富、使用更方便、结构紧凑、可同时预约煮饭和煮菜肴的预约煮食机。

[0005] 本实用新型一种预约煮食机的技术方案是:包括壳体、一套电热煮饭器、一套或一套以上包含电加热器及煮食容器组成的电热煮食器、一套电制冷器、隔热层、控制装置;

[0006] 电热煮饭器及电热煮食器设在壳体内部,电热煮饭器内腔及电热煮食器内腔与壳体之间设有隔热层;

[0007] 电制冷器的吸热端热连接电热煮饭器内腔和电热煮食器内腔;

[0008] 控制装置的输出端分别与电制冷器、电热煮饭器的电加热器、电热煮食器的电加热器电连接。

[0009] 所述的电热煮食器至少包含电加热器及煮食容器,电加热器设为可对煮食容器进行高效加热,能在控制装置的控制下实现基本的煮食功能,它是涵盖了众多现有技术常见煮食电器的共性结构。所述的电加热器为现有技术的用电转换为热量的装置或部件,它可以是电热盘、电热管、远红外线发热器、光波烘烤器、电磁炉所用的电磁感应发热装置、微波炉所用的微波发生器、电蒸汽发生器等结构形式的一种;所述的煮食容器可以是锅体、盘体、盅体、蒸汽室、微波室、烘烤室等部件的一种,电热煮食器因此可涵盖如下常见现有技术

的电器：电饭煲（电加热器为电热盘，煮食容器为饭锅）、电炖盅（电加热器为电热管，煮食容器为盅体或炖盅）、微波炉（电加热器为微波发生器，煮食容器为微波室）、电煎锅（电加热器为电热管，煮食容器为盘体）、电烤箱（电加热器为远红外线发热管，煮食容器为烘烤室）、电蒸笼（电加热器为电蒸汽发生器，煮食容器为蒸汽室）、自动烹饪锅（电加热器为电磁感应发热装置，煮食容器为不锈钢锅体），从以上举例可见，上述煮食电器是以电加热器及煮食容器为不可缺少的基本结构，增加相应的控制装置或辅助部件组成的，凡是包含电加热器及煮食容器的煮食电器被本实用新型归纳为电热煮食器，用于实现所需的煮食功能。

[0010] 本实用新型的结构限定了至少有一套煮食装置是可用于自动煮饭的电热煮饭器。所述的电热煮饭器是现有技术用于煮饭（即把米和水煮成熟饭）、其结构部件或所设的程序可以实现自动煮饭功能的电煮食装置，电热煮饭器可以是现有技术的机械式电饭煲或微电脑式电饭煲、电蒸笼等煮饭装置。机械式电饭煲的基本结构为电热盘、饭锅、磁钢限温器、杠杆开关等部件，按照常规机械式电饭煲的电连接方式，可基本实现自动煮饭的功能，机械式电饭煲通常还设有保温开关、限流电阻、指示灯、锅盖、外壳等辅助结构，可使机械式电饭煲结构更完整；微电脑式电饭煲的基本结构由电加热器、饭锅、温度传感器、微电脑控制器等结构组成，微电脑式电饭煲通常还设有盖体、锅盖加热器、锅盖温度传感器、盖体锁件、铰接装置、盖体密封圈、蒸汽口、外壳等辅助结构，可使微电脑式电饭煲结构更完整；电饭煲的电加热器可以是电热盘也可以是电磁炉所用的电磁感应发热装置。

[0011] 所述的电制冷器可以是现有技术的压缩式电冰箱所使用压缩机制冷系统、半导体制冷电冰箱所使用半导体制冷系统、吸收式制冷系统等制冷器的一种。常用的压缩机制冷系统包含压缩机、蒸发器、冷凝器、毛细管、干燥过滤器，是一个注入制冷剂的封闭循环系统，运转时制冷器的吸热端（即蒸发器）吸收隔热箱体内的热量，并将热量转移、传递到箱体外，以实现制冷；吸收式制冷系统是由一些钢管经弯曲成型、组合焊接而成的全封闭循环系统，包括贮液罐、发生器、冷凝器、蒸发器、吸收器、氨液管等结构部件，本实用新型所用的吸收式制冷系统机芯可采用电发热源推动制冷剂循环达到制冷目的；半导体制冷系统是以半导体致冷片为制冷核心部件，一般由半导体致冷片、散热器、风扇、直流变压器等组成，半导体致冷片的吸热端（即制冷的一面）紧贴固定在隔热箱体内壁，散热器在箱外紧贴固定在半导体致冷片的散热端（即发热的一面），风扇装在散热器上用于促进散热，其吸热端的热量可被转移到箱外的散热端，达到降温的目的。

[0012] 所述的制冷器的吸热端在压缩机制冷系统和吸收式制冷系统结构中是蒸发器，而在半导体制冷系统结构中是半导体致冷片制冷的一面。所述的半导体致冷片可以是一层或一层以上的半导体致冷片。

[0013] 所述的隔热层可以是现有技术的保温隔热材料，例如：聚氨脂泡沫、聚苯乙烯泡沫、玻璃棉、岩棉、海棉等。

[0014] 所述的控制装置可以是控制煮食过程的微电脑控制器或定时控制装置，也可包含采用电信途径进行遥控的电信遥控器以及无线遥控器；本实用新型可单独采用微电脑控制器作为控制装置，也可以采用微电脑控制器加电信遥控器或无线遥控器组合的控制装置，对负载电路进行控制，让本实用新型的使用更方便；控制装置输出端是控制装置的控制输出接口，所连接上输出端的负载电路的打开和关闭受控于控制装置。

[0015] 微电脑控制器是现有技术,可由专业技术人员按具体的应用而开发,市场上的微电脑电饭煲等家用电器的应用有着极丰富的案例,专业技术人员按照本实用新型说明书描述的应用要求将相应的程序设置在微电脑控制器即可合乎本实用新型的要求。本实用新型中的微电脑控制器可具备一套或一套以上的单片机电脑。

[0016] 所述的电信遥控器是现有技术通过电信方式作为远距离控制方式的控制装置,它可以是固定电话遥控器电路或手机遥控器电路或互联网遥控器电路其中的一种。固定电话遥控器电路是以固定电话网作远距离遥控途径,使用者在外通过固定电话或手机对被遥控设备的固定电话遥控器电路呼出电话,输入控制命令,可对被遥控设备进行远程遥控,现有技术的固定电话遥控器电路具有技术成熟、造价低的优点,符合普及化家用电器的低成本要求,现在市售的电话远程遥控插座类产品,例如辽宁省沈阳市金正系统集成有限公司生产销售的 HH-501 电话远程电源控制器,其电路就是一种固定电话遥控器电路,作为现有技术,本实用新型可选用这种电路作为电信遥控器,控制执行煮食的操作;手机遥控器电路是由无线接入移动电话网的手机终端设备为核心的控制执行装置,不需要布设控制电缆,使用的移动电话网可以是 gsm 移动电话网、cdma 移动电话网及正在发展的 3G 类移动电话网,控制方式有短信控制、键盘控制等,市场上较为多见的是由短信控制的手机遥控器电路,例如山东超微电子有限公司生产销售的 CWTY-101 型、CW1020 型 GSM 短信控制器,其电路就是一种手机遥控器电路,使用者使用手机发一个特定内容的短信给被遥控设备的手机遥控器电路即可控制被控设备启动和关闭;现有技术的互联网遥控器电路在使用时连接上互联网,使用者在异地用电脑可通过软件界面或网页界面访问互联网遥控器电路来控制受控电器的开关,同样适用于本实用新型对远距离遥控的要求。使用者通过电信遥控器可对本实用新型的煮食程序进行远距离控制,随时启动煮饭、煮菜肴过程。

[0017] 所述的电热煮饭器内腔及电热煮食器内腔至少包含煮食容器的内部腔体(例如:电蒸笼结构的蒸汽室)或用于容纳煮食容器的腔体(例如:电饭煲用于容纳饭锅的空腔),电热煮饭器内腔及电热煮食器内腔在隔热层围蔽下可形成保持低温的空间。

[0018] 本实用新型电制冷器的吸热端与电热煮饭器内腔及电热煮食器内腔热连接方式可以是以下几种:1、电制冷器的吸热端紧贴电热煮饭器内腔及电热煮食器内腔的内腔壁;2、电制冷器的吸热端通过金属传热至电热煮饭器内腔及电热煮食器内腔;3、电制冷器的吸热端经空气或导热剂传热至电热煮饭器内腔及电热煮食器内腔的内腔壁;4、电制冷器的吸热端直接设在电热煮饭器内腔及电热煮食器内腔里面。

[0019] 本实用新型可应用微电脑电饭煲的盖体、密封圈、温度传感器等各种现有技术的结构。所述的电热煮饭器和电热煮食器设有盖体,在盖体上可设有蒸汽口,在蒸汽口通道内设有低导热过滤网。所述的低导热过滤网可以是导热系数较低的塑料材料或植物纤维制成的过滤网,包括以下常见的滤网种类:泡沫过滤网、过滤用百洁布、用纺织方法制成的塑料滤网、过滤用无纺布等,其总厚度可设为 0.2-4 厘米,低导热过滤网作用在于既能通过蒸汽又能有保温效果。

[0020] 本实用新型的具体结构设计可通过上述的具体零部件根据实际情况进行按需组合,其组合方式很多,其组合方式皆可实现设计目的,在后面列举的部分具体实施例中,可反映出本实用新型的切实可行性。

[0021] 本实用新型不仅是煮饭器具,它还是具备两个以上煮食器组成的综合煮食装置。

本实用新型用一套电制冷器分别作用于一套电热煮饭器和另外的一套或一套以上电热煮食器,使被隔热层围蔽的电热煮饭器内腔及电热煮食器内腔降温,将预先放在煮食容器内的待煮食物保鲜,可按使用者计划的时间启动本实用新型煮熟食物。本实用新型限定了一套电热煮饭器作为基本煮食装置,是因为本实用新型主要设计给以米饭为主食的亚洲人使用的,然后灵活地搭配其它电热煮食器用于预约煮其它佐餐菜肴,使本实用新型功能更丰富;本实用新型可同时预约煮更多的食物、菜肴,使预约煮食不只限于煮饭,使用更方便;电热煮饭器和电热煮食器共同使用同一套制冷器提供制冷,有利于降低制造本实用新型的物料成本以及使本实用新型的结构可以设计得更紧凑。本实用新型采用以上的设计,达到了设计的目的。

附图说明

[0022] 下面结合附图和实施例对本实用新型进一步说明。

[0023] 图 1 是本实用新型实施例 1 的外观结构示意图。

[0024] 图 2 是本实用新型实施例 1 的电连接示意图。

[0025] 图 3 是本实用新型实施例 1 的剖面结构示意图。

[0026] 图 4 是本实用新型实施例 2 的外观结构示意图。

[0027] 图 5 是本实用新型实施例 2 的剖面结构示意图。

[0028] 图 6 是本实用新型实施例 3 的外观结构示意图。

[0029] 图 7 是本实用新型实施例 3 的剖面结构示意图。

[0030] 图 8 是本实用新型实施例 4 的外观结构示意图。

[0031] 图 9 是本实用新型实施例 4 的剖面结构示意图。

[0032] 图 10 是本实用新型实施例 5 的剖面结构示意图。

[0033] 图 11 是本实用新型实施例 6 的电连接示意图。

[0034] 图 12 是本实用新型实施例 7 的电连接示意图。

具体实施方式

[0035] 本实用新型实施例 1 的方案:

[0036] 如图 1、图 2、图 3 所示,本实用新型一种预约煮食机,包括壳体 4、一套电热煮饭器 1、一套包含电加热器 21 及煮食容器 22 组成的电热煮食器 2、一套电制冷器 8、隔热层 6、控制装置 5;电热煮饭器 1 及电热煮食器 2 设在壳体 4 内部,电热煮饭器内腔 14 及电热煮食器内腔 24 与壳体 4 之间设有隔热层 6;电制冷器 8 的吸热端 85 热连接电热煮饭器内腔 14 和电热煮食器内腔 24;控制装置 5 的输出端(53、56、57)分别与电制冷器 8、电热煮饭器的电加热器 11、电热煮食器的电加热器 21 电连接。本实施例 1 的控制装置 5 采用了微电脑控制器。

[0037] 本实施例 1 上述结构部件设在一个独立的壳体结构内。

[0038] 电热煮饭器 1 的基本结构由作为电加热器的电热盘 11、锅体 12、温度传感器 13、微电脑控制器 5 组成,其辅助结构还包含盖体 15、盖体温度传感器 133、蒸汽口 16、低导热过滤网 17、铰接装置 18、盖体密封圈 19、用于容纳锅体 12 的电热煮饭器内腔 14,这是一套现有技术的微电脑电饭煲内部结构。在本实施例 1 中,作为控制装置 5 的微电脑控制器 5 既是电

热煮饭器 1 的控制装置同时也是电热煮食器 2 的控制装置,使本实施例 1 内部结构更紧凑及节省制造的物料成本。

[0039] 电热煮食器 2 的基本结构由电加热器 21 及煮食容器 22 组成,在本实施例 1 的电加热器 21 是电热盘,煮食容器 22 是金属锅体,煮食容器 22 使用时放在电加热器 21 上面,两者紧密接触,电加热器 21 可对煮食容器 22 进行高效加热;在以上基础上电热煮食器 2 还设置了包含温度传感器 23、盖体 25、蒸汽口 26、低导热过滤网 27、防溢电极 28、盖体密封圈 29、用于容纳锅体 22 的电热煮食器内腔 24 等辅助结构。

[0040] 电制冷器 8 在本实施例 1 采用了由压缩机 81、蒸发器 85、冷凝器 82、毛细管 84、干燥过滤器 83 为主要部件组成的压缩机制冷系统。在本实施例 1 中电制冷器 8 的吸热端 85(蒸发器)与电热煮饭器内腔 14 及电热煮食器内腔 24 热连接方式为:电制冷器 8 的吸热端 85 紧贴电热煮饭器内腔 14 及电热煮食器内腔 24 的内腔壁,内腔壁是金属板材或 0.5cm 以下有利于导热的塑料板材。

[0041] 本实施例 1 在壳体 4 后上方设置了铰接装置 18 连接盖体 (15、25),盖体 (15、25) 能够以开闭自如的方式各自将电热煮饭器 1 和电热煮食器 2 的锅体 (12、22) 对应覆盖,在盖体 (15、25) 下面各自设有对应锅体 (12、22) 上部边沿的密封圈 (19、29),电热煮饭器 1 的温度传感器 13 设在锅体 12 下面,盖体温度传感器 133 设在盖体 15 上,电热煮食器 2 的温度传感器 23 设在锅体 22 下面;在盖体 (15、25) 内也可设有隔热层;在盖体 (15、25) 上还各自设有供煮食时排放蒸汽的蒸汽口 (16、26),在蒸汽口通道内设有能透过蒸汽且具有保温效果的低导热过滤网 (17、27);电热煮食器 2 的盖体 25 下方、蒸汽口 26 周围 0-15cm 范围内还设有防溢电极 28,防溢电极 28 与作为控制装置的微电脑控制器 5 的防溢检测端 55 电连接,该防溢电极 28 是一长条状导电条,制作材料可以是金属的,向锅体下方伸出,用于对在煮食时锅体 22 内汁水沸腾泛起泡沫造成的溢锅现象进行检测。

[0042] 如图 2 所示,微电脑控制器 5 的电源输入端 58 使用时连接公共电网 220 伏交流电源,它设有三路输出端 (53、56、57) 分别控制电热煮饭器 1 的电加热器 11、电热煮食器 2 的电加热器 21、电制冷器 8 的供电;微电脑控制器 5 还设有对应电热煮饭器的测温端 (51、52),对应电热煮食器的测温端 54、防溢检测单元及其防溢检测端 55;电热煮饭器测温端 (51、52) 分别电连接温度传感器 13 和盖体温度传感器 133,电热煮食器测温端 54 电连接温度传感器 23,防溢检测端 55 其中一个电极电连接锅体 22,另外一个电极电连接防溢电极 28,防溢电极 28 和锅体 22 静置时相互不作电连接,当本实施例 1 煮食时锅体 22 内汁水沸腾泛起泡沫接触防溢电极 28,防溢电极 28 与锅体 22 即导通电流,微电脑控制器 5 的防溢检测单元检测到防溢电极 28 与锅体 22 的导通可作出响应,控制电热加热器 21 停止加热,使汁水不向锅体 22 外面溢出;微电脑控制器 5 通过检测温度传感器及防溢电极的反馈,选择合适的煮饭或煮菜肴程序,控制电热煮饭器 1 和电热煮食器 2 的加热动作。

[0043] 通过以上的设置,本实施例 1 可实现同时预约煮饭和焖煮菜肴功能,以下举例对本实施例 1 的使用过程进行说明:使用者计划在中午预约晚上七时煮熟一锅饭、两个菜肴供一家三口人食用,使用者在中午空闲时,把洗好的米和适量的水放进电热煮饭器锅体 12 内,把一份腌好菜肴也放在锅体 12 中,准备放在饭上面的蒸架蒸熟;在电热煮食器锅体 22 内放入要焖煮的食材及配料、适量的水;将本实用新型实施例 1 接上电源并打开开关,把微电脑控制器 5 设定时间在晚上七时煮好饭菜,电制冷器通电后即启动制冷工作,使电热煮

饭器 1 和电热煮食器 2 内的食物材料降温并保持温度在 1-10 度进行保鲜 ; 在晚上七时前一小时, 微电脑控制器 5 自动关闭电制冷器 8 停止制冷, 分别启动对电热煮饭器 1 和电热煮食器 2 的煮食程序进行煮食, 微电脑控制器 5 按常用的微电脑电饭煲煮饭程序在晚上七时前把饭及饭上面的蒸制菜肴煮好 ; 同时微电脑控制器 5 控制对电热煮食器 2 的电加热器 21 供电加热进行焖煮, 在检测到锅体 22 底部的菜肴温度在 130 度即将糊锅时暂停加热, 隔 10 秒待温度降低后再加热, 上述程序重复直至煮食程序完成 ; 在煮食过程中, 锅体 22 内汁水沸腾泛起泡沫接触防溢电极 28, 作为防溢检测端另一电极的锅体 22 与防溢电极 28 导通, 微电脑控制器 5 因此检测到汁水即将溢锅, 立即停止对电热煮食器 2 的加热, 以防止溢锅。这样, 使用者一家三口人就可以在晚上七时吃到使用本实施例 1 预约煮好的一锅饭、一份在饭上蒸熟的菜肴、一份焖煮好的菜肴了。

[0044] 本实用新型实施例 2 的方案 :

[0045] 如图 4、图 5 所示, 本实施例 2 的电热煮饭器 1 的结构同样是一套微电脑电饭煲结构, 与实施例 1 不同的是电加热器 11 是电磁感应加热装置, 可使煮饭的效率更高 ; 本实施例 2 的电热煮食器 2 其基本结构由作为电加热器 21 的电热管及作为煮食容器 22 的炖盅组成, 电热煮食器内腔 24 是装水盅体, 在本实施例 2 中电热煮食器 2 可视为是一套电炖盅的结构 ; 电制冷器 8 使用包括贮液罐 811、发生器 822、冷凝器 833、蒸发器 85、吸收器 866、氨液管 844、电加热器 877 等基本结构的吸收式制冷系统, 电制冷器 8 的吸热端 (蒸发器) 85 经空气传热至电热煮饭器内腔 14 和电热煮食器内腔 24 的内腔壁, 进而使电热煮饭器内腔 14 及电热煮食器内腔 24 降温。实施例 2 的其它结构与实施例 1 相同, 不再详述。

[0046] 本实施例 2 实质上在一个机器主体上集合了微电脑电饭煲和电炖盅两种煮食装置用来预约煮食, 可使用电热煮饭器 1 煮饭、蒸菜肴, 使用电热煮食器 2 做炖汤。操作方法可参考实施例 1。

[0047] 本实用新型实施例 3 的方案 :

[0048] 如图 6、图 7 所示, 实施例 3 中的电热煮饭器 1 是由作为电加热器 11 的电热盘、饭锅 12、磁钢限温器 1333、杠杆开关 13333 等组成的一套机械式电饭煲结构, 在杠杆开关 13333 伸出壳体 4 外的开孔位置, 设有软性海绵 66 填充开孔位置, 达到隔热保温的效果又能让杠杆开关 13333 的按键在煮好饭后弹起 ; 电热煮食器 2 的电加热器 21 设为远红外线发热器, 煮食容器 22 设为锅体, 远红外线发热器装设在盖体 25 下面, 光照发热方向对应锅体 22 内底部, 远红外线发热器 (21) 和锅体 (22) 组成一个电烤箱结构, 在微电脑控制器 5 的控制下, 采用光照加热烤熟食物, 例如做烤鸡、烤面包等。

[0049] 实施例 3 的电制冷器 8 选用由半导体致冷片 8111、散热器 8222、风扇 8333、变压器等组成的半导体制冷系统, 半导体致冷片制冷的一面 (吸热端 85) 经铝块 8444 导热至电热煮食器内腔 24 的内腔壁, 电热煮饭器 1 和电热煮食器 2 之间的相连位置 144 设计为穿孔连通, 因此电热煮饭器内腔 14 和电热煮食器内腔 24 是一个热连通的腔体, 电制冷器 8 的制冷作用可以同时令电热煮饭器内腔 14 和电热煮食器内腔 24 降温。实施例 3 除上述结构外其它结构与实施例 1 基本相同, 这是一套制造成本相对较低的方案。

[0050] 通过以上的设置, 在预约煮食时, 使用者把米和适量的水放进作为电热煮饭器 1 的机械式电饭煲内, 然后需要先按下机械式电饭煲的杠杆开关 13333 按键, 使相连的磁钢限温器 1333 吸合, 电加热器 11 因此接通电源, 同时也在电热煮食器 2 的锅体 22 内放进要烤

制的食物（例如：烤鸡）；本实施例 3 接通电源后，电制冷器启动对电热煮饭器 1 和电热煮食器 2 进行制冷降温，保鲜其内部的食物；使用者如果希望在晚上 7 时煮好饭和菜肴，需设置微电脑控制器 5 在晚上六时启动电热煮饭器 1（机械式电饭煲）和电热煮食器 2（烤箱）进行煮食，同时断开电制冷器 8 的供电停止制冷；机械式电饭煲在饭熟后温度上升至 105 度可由杠杆开关 13333 和磁钢限温器 1333 控制自动断电，电热煮食器 2（烤箱）设置为按食物重量定时，将食物烤制至熟；这样，晚上 7 时使用者就可吃到本实施例 3 预约做好的饭和菜肴了。

[0051] 本实用新型实施例 4 的方案：

[0052] 如图 8、图 9 所示，本实用新型一种预约煮食机，包括壳体 4、一套电热煮饭器 1、一套包含电加热器 21 及煮食容器 22 组成的电热煮食器 2、一套电制冷器 8、隔热层 6、控制装置 5；电热煮饭器 1 及电热煮食器 2 设在壳体 4 内部，电热煮饭器内腔 14 及电热煮食器内腔 24 与壳体 4 之间设有隔热层 6；电制冷器 8 的吸热端 85 热连接电热煮饭器内腔 14 和电热煮食器内腔 24；控制装置 5 的输出端分别与电制冷器 8、电热煮饭器的电加热器 11、电热煮食器的电加热器 21 电连接。本实施例 4 上述的预约煮食机还设有保温箱体 9，电制冷器 8 的吸热端 855 热连接保温箱体 9 内腔。保温箱体 9 上还设有门体 91。

[0053] 本实施例 4 是在实施例 1 的结构上加了一个保温箱体 9 的设计，并把电制冷器 8 的另一个吸热端 855（蒸发器）设置在保温箱体 9 内，使电制冷器 8 也可以为保温箱体 9 提供制冷，保温箱体 9 因此成为冰箱；本实用新型除了可以煮饭、煮菜肴外，还增加了一项冰箱功能，充分利用了电制冷器 8 的制冷作用，在应用功能上更丰富实用。

[0054] 本实用新型实施例 5 的方案：

[0055] 如图 10 所示，本实用新型一种预约煮食机，包括壳体 4、一套电热煮饭器 1、两套包含电加热器（21、31）及煮食容器（22、32）组成的电热煮食器（2、3）、一套电制冷器 8、隔热层 6、控制装置 5；电热煮饭器 1 及电热煮食器（2、3）设在壳体 4 内部，电热煮饭器内腔 14 及电热煮食器内腔（24、34）与壳体 4 之间设有隔热层 6；电制冷器 8 的吸热端（85、8555，即蒸发器）热连接电热煮饭器内腔 14 和电热煮食器内腔（24、34）；控制装置 5 的输出端分别与电制冷器 8、电热煮饭器的电加热器 11、电热煮食器的电加热器（21、31）电连接。

[0056] 实施例 5 是在实施例 1 的结构上增加了一套包含电加热器 31 及煮食容器 32 组成的电热煮食器 3，电热煮食器 3 与电热煮食器 2 的结构相同，在此不再详述。当然，微电脑控制器 5 也要增加一组与电热煮食器 2 相同的程序、输出端、检测端用于控制电热煮食器 3。

[0057] 本实用新型实施例 6 的方案：

[0058] 本实施例 6 是在实施例 1 具体方案之上增加一套作为控制装置的电信遥控器 7，电信遥控器 7 可以是固定电话遥控器电路或手机遥控器电路或互联网遥控器电路其中的一种，本实施例 6 的其它结构与实施例 1 相同。

[0059] 如图 11 所示，所述的控制装置包含微电脑控制器 5 和电信遥控器 7，微电脑控制器 5 和电信遥控器 7 之间电连接，具体地说是电信遥控器 7 的输出端 71 与微电脑控制器 5 的触发端 59 电连接；所述的触发端 59 是微电脑控制器 5 用于启动煮饭、煮菜肴程序的激活端口；电信遥控器 7 的输出端 71 可对触发端 59 的两个电极进行接通和关闭的动作，触发端 59 所设的两个电极互相接触再断开可立即启动微电脑控制器 5 煮饭、煮菜肴的程序及关闭电制冷器 8，之后由微电脑控制器 5 自动控制完成煮饭、煮菜肴的全过程。

[0060] 本实施例6可使用和实施例1相同的使用方式,此外,使用者还可以在回到家前一个小时打电话或上网遥控电信遥控器7触发微电脑控制器5的触发端59,启动煮饭和煮菜肴程序及停止电制冷器的制冷;当电热煮饭器1和电热煮食器2加热把饭和菜肴煮熟,使用者回到家中就有刚煮好的饭和菜肴吃了。本实施例6比实施例1可以更自由地控制煮食的时间。

[0061] 本实用新型实施例7的方案:

[0062] 本实施例7是在实施例6具体方案之上增加一套作为控制装置的无线遥控器,本实施例7的其它结构与实施例6相同。

[0063] 如图12所示,所述的控制装置包含微电脑控制器5和电信遥控器7、无线遥控器(701、702),无线遥控器包含发射部分701和接收部分702;微电脑控制器5和无线遥控器的接收部分702之间电连接,具体地说是无线遥控器的接收部分702的输出端7022与微电脑控制器5的触发端59电连接。在本实施例7中,包含电热煮饭器1、电热煮食器2、电制冷器8、隔热层6、微电脑控制器5、无线遥控器的接收部分702等执行保鲜、煮食的结构部件设在一个独立的壳体结构内,组成煮食主体1B。

[0064] 电信遥控器7和无线遥控器的发射部分701组成一个遥控主体1A。电信遥控器7和无线遥控器的发射部分701之间电连接,具体地说是电信遥控器7的输出端71与无线遥控器发射部分701输入端7011电连接。

[0065] 这样,本实施例6被分成至少两个的分体结构,无线遥控器的发射部分701和接收部分702是一套可实现发射、接收控制功能的无线遥控器,在电信遥控器7和微电脑控制器5之间搭起了一道无线遥控的桥梁,可以使煮食主体1B可自由摆放在无线遥控器遥控范围内的任意位置,避免了煮食主体1B因摆放的位置而产生需要布设控制用电线的麻烦。

[0066] 上列的实施例只是部分切实可行的方案,并不因此而限制本实用新型的保护范围,本实用新型在形状、构造、及原理所作的等效变化,均属本实用新型的保护范围。

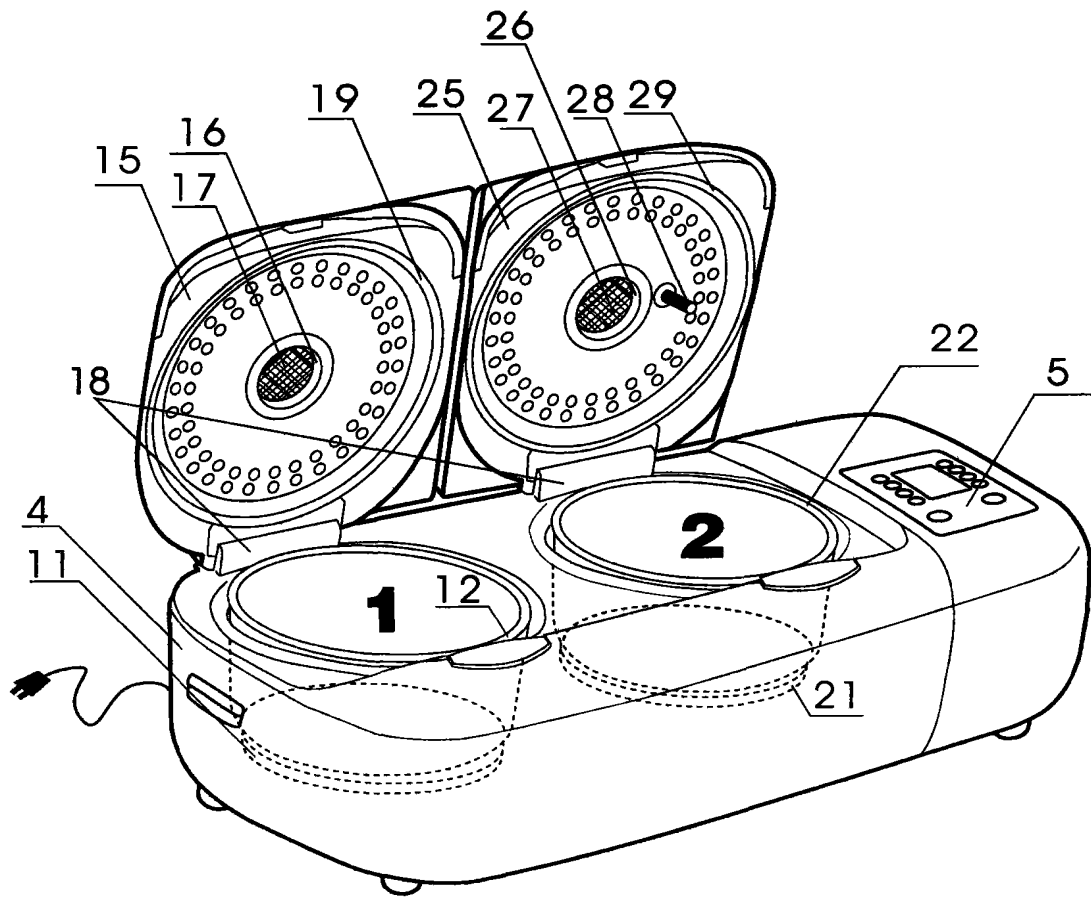


图 1

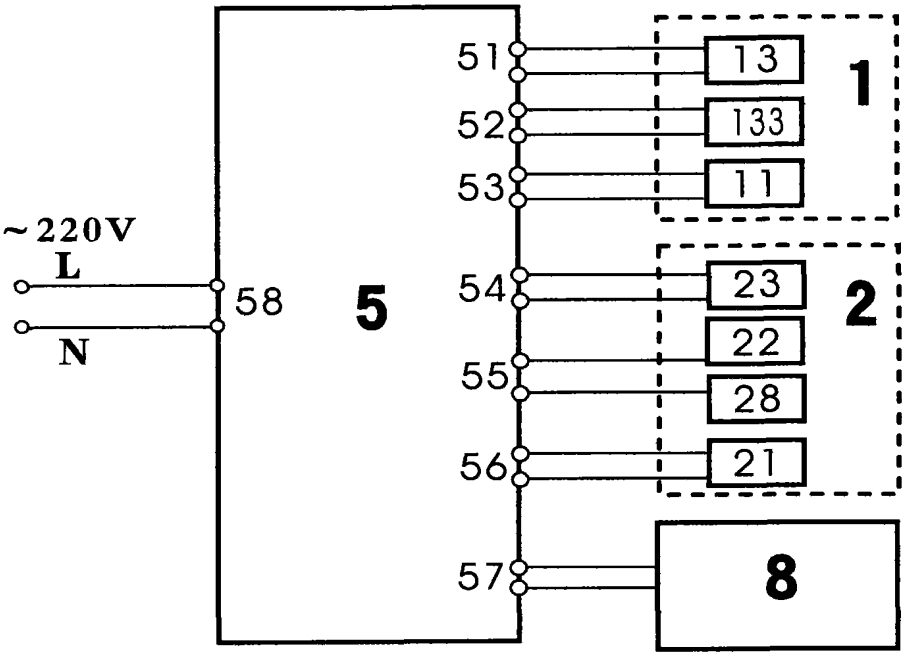


图 2

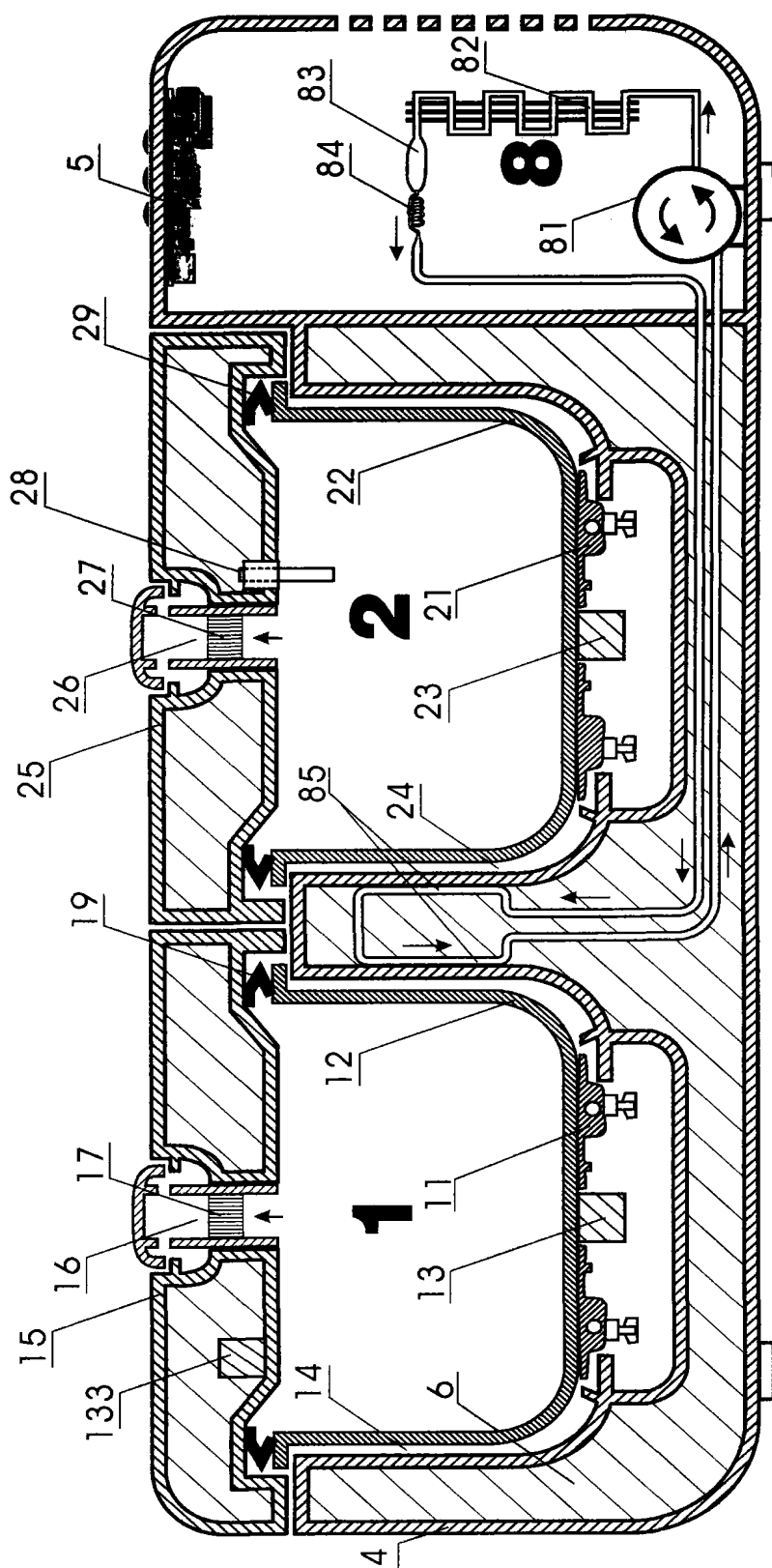


图 3

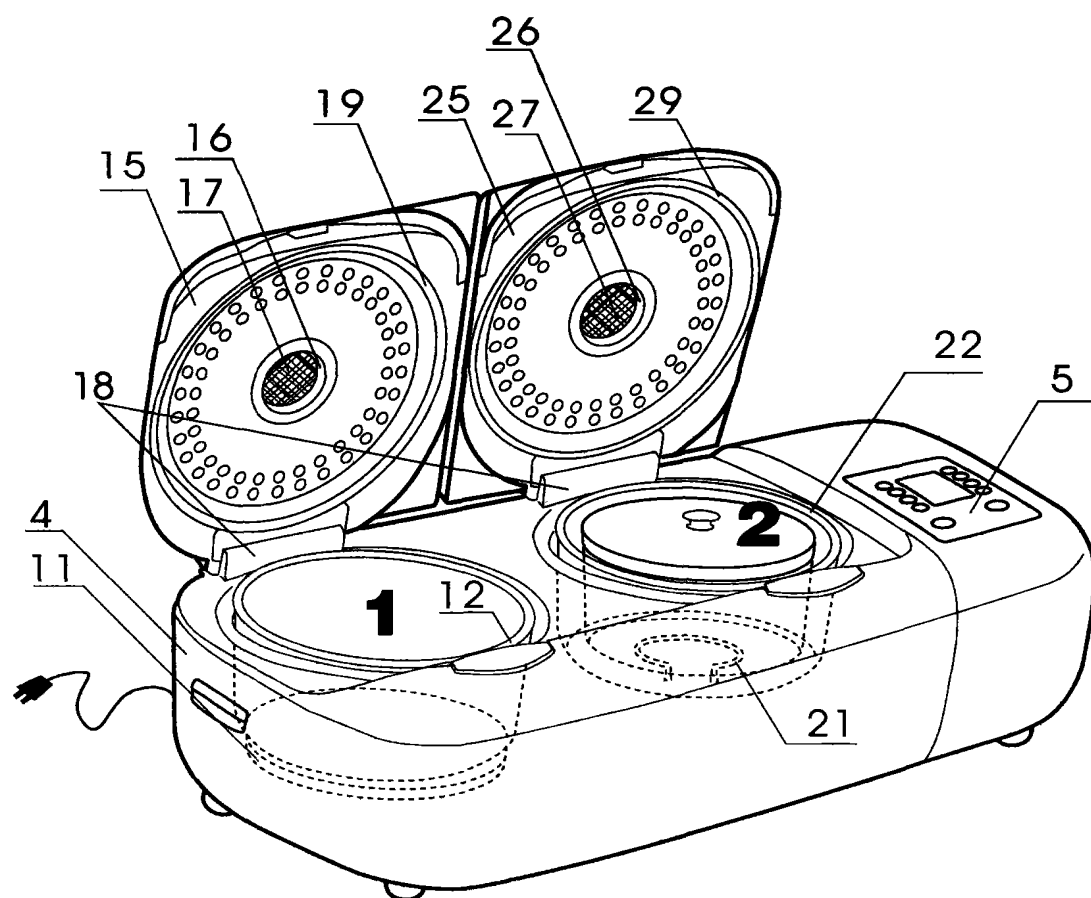


图 4

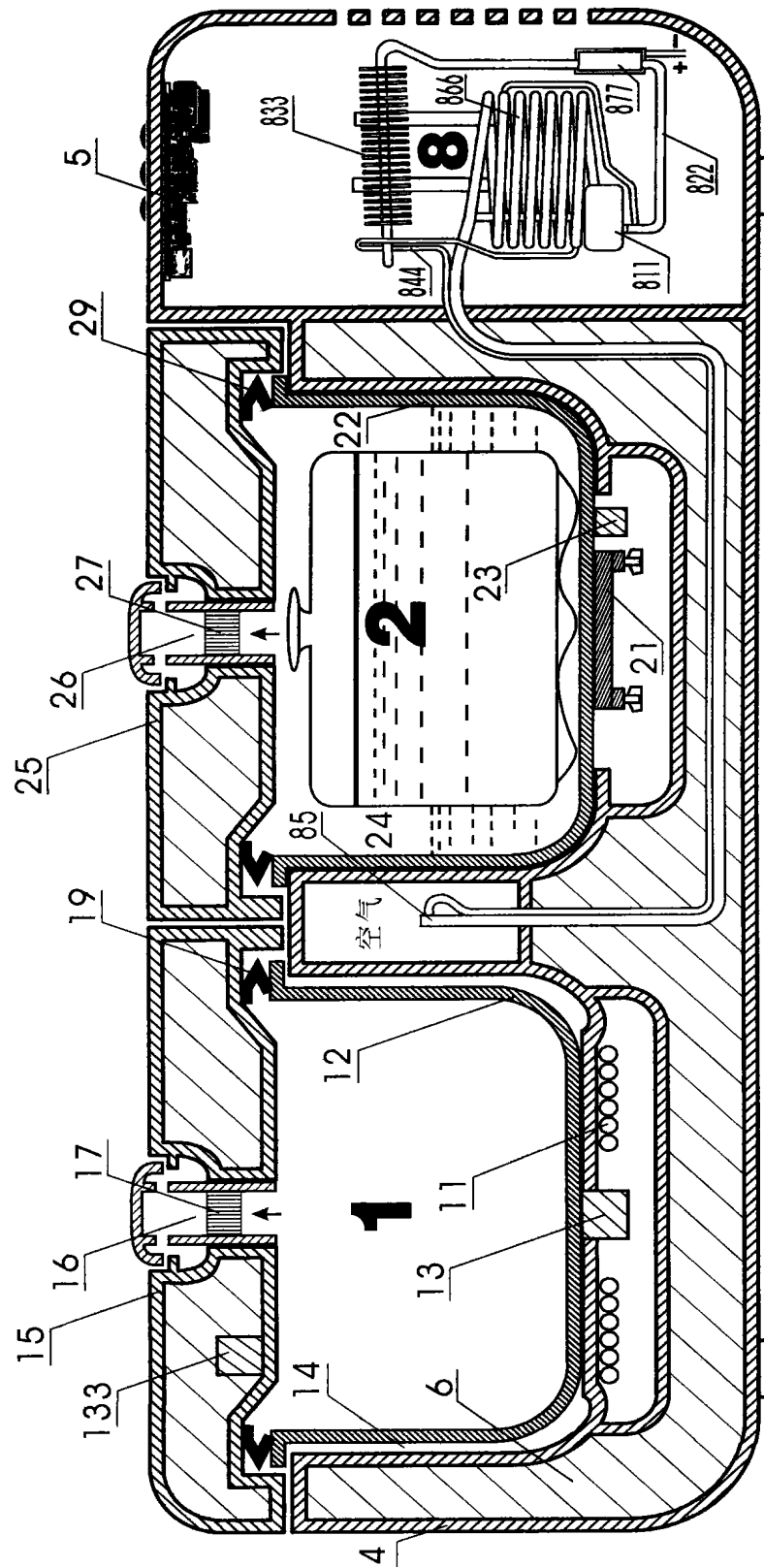


图 5

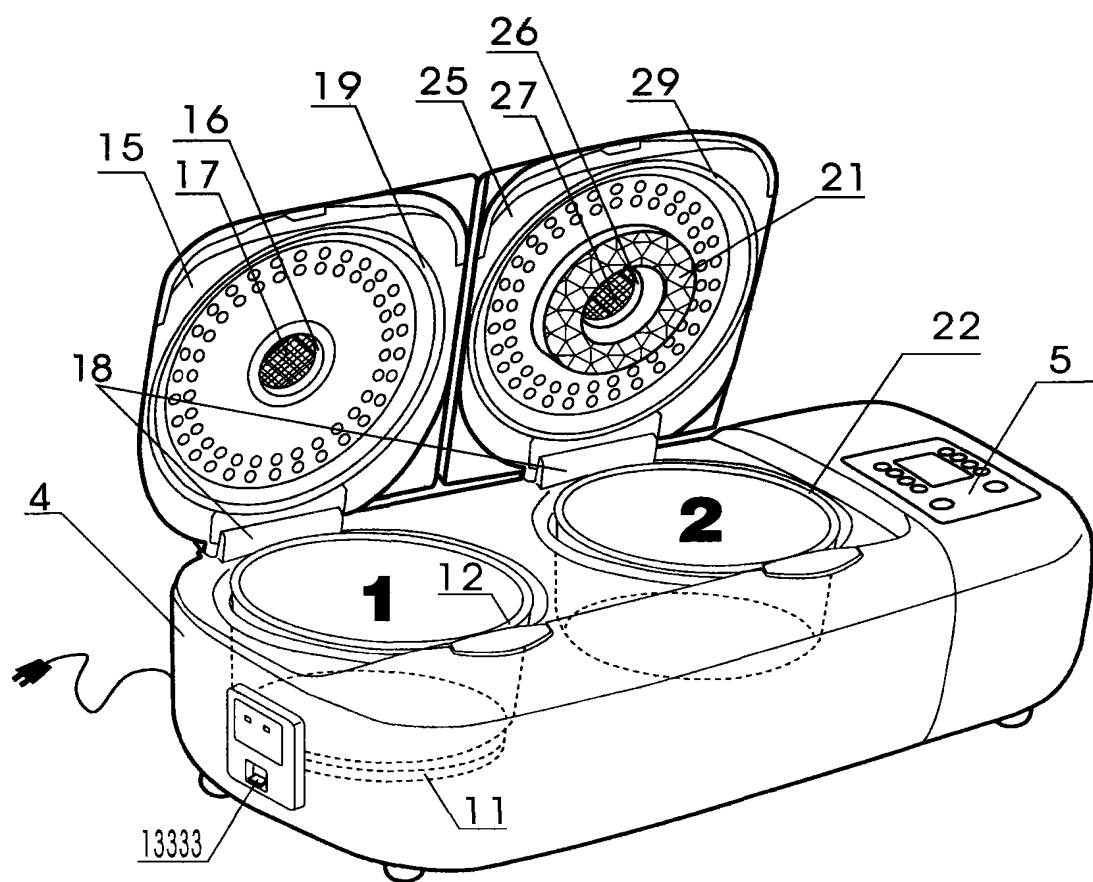


图 6

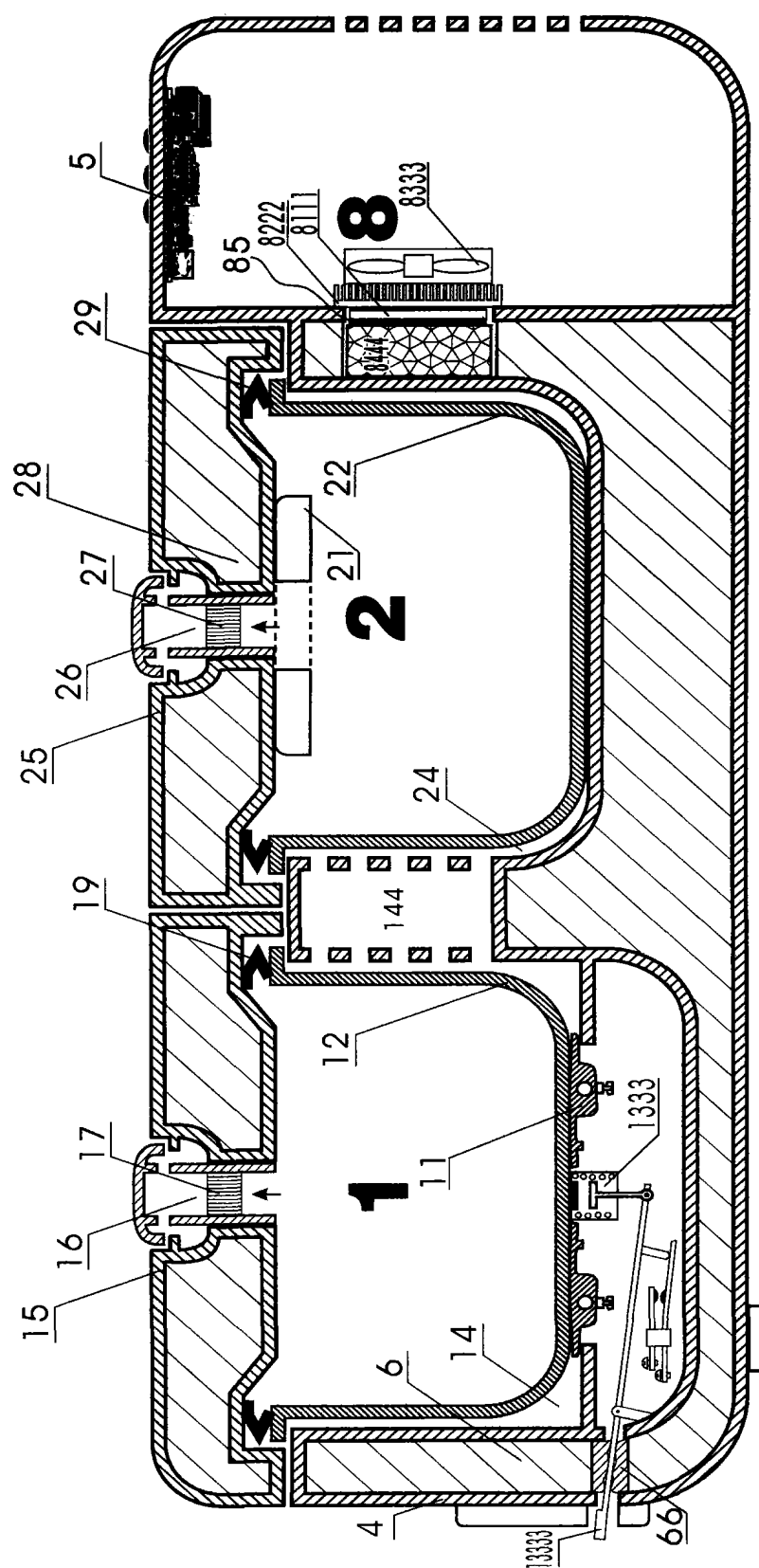


图 7

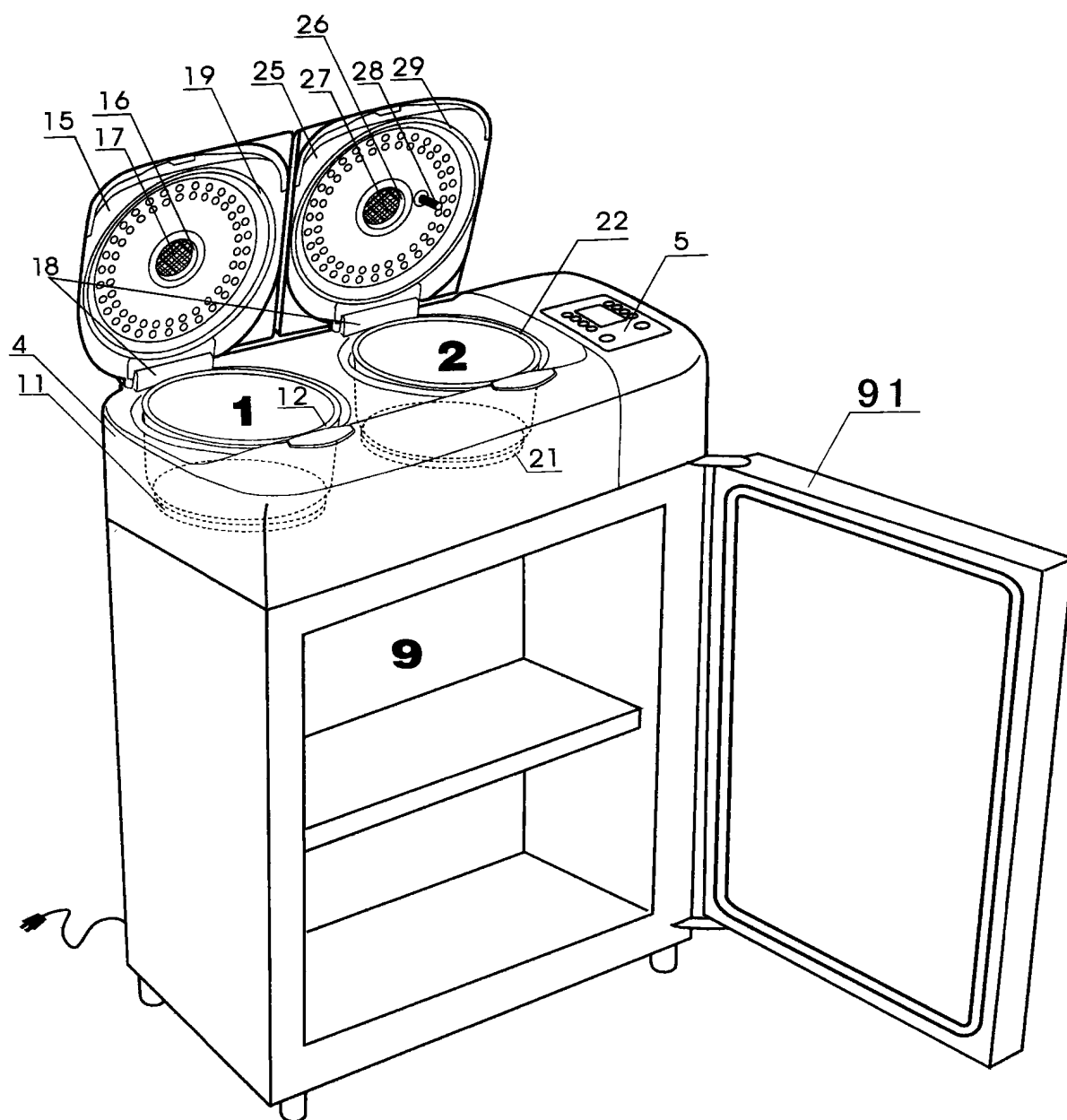


图 8

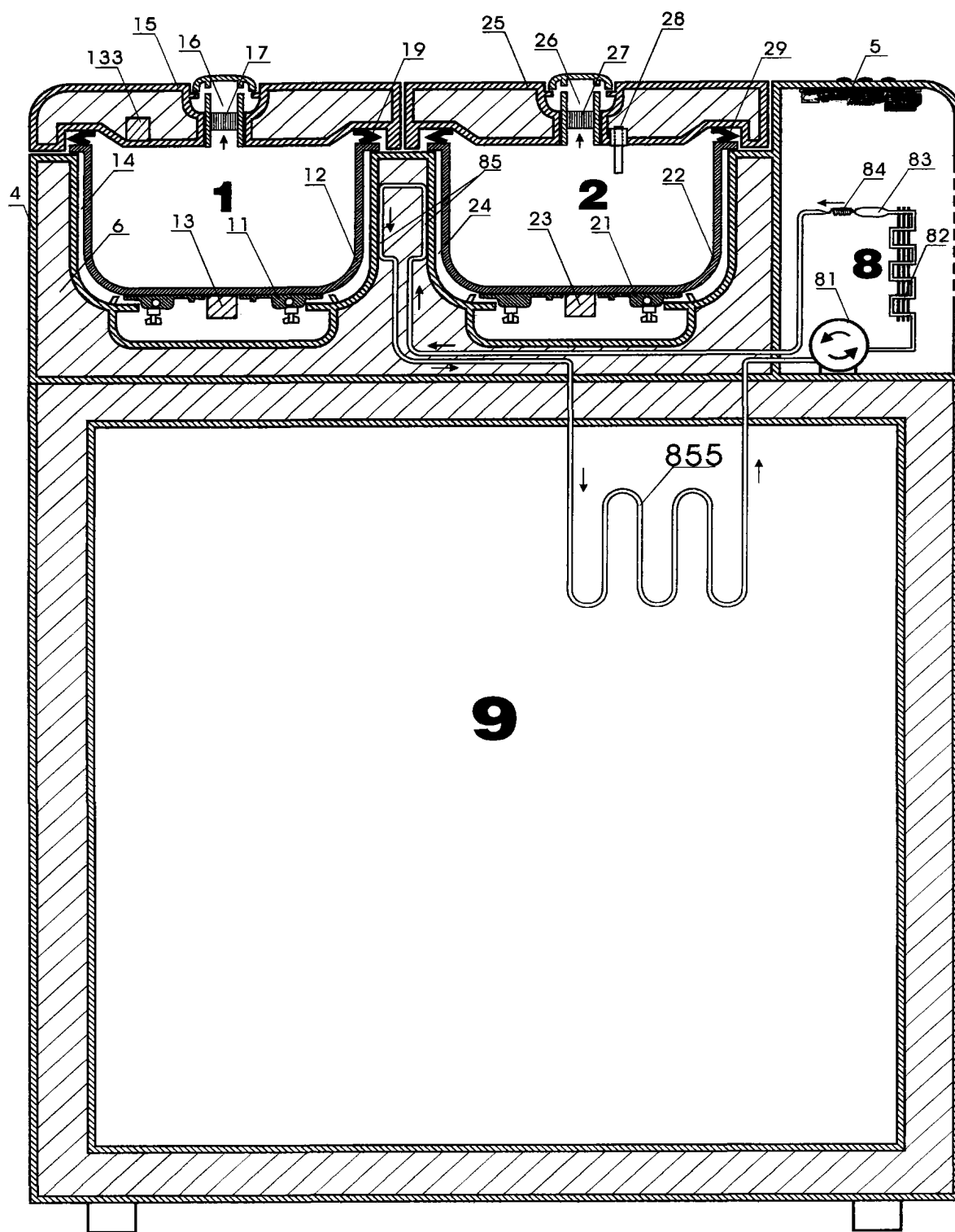


图 9

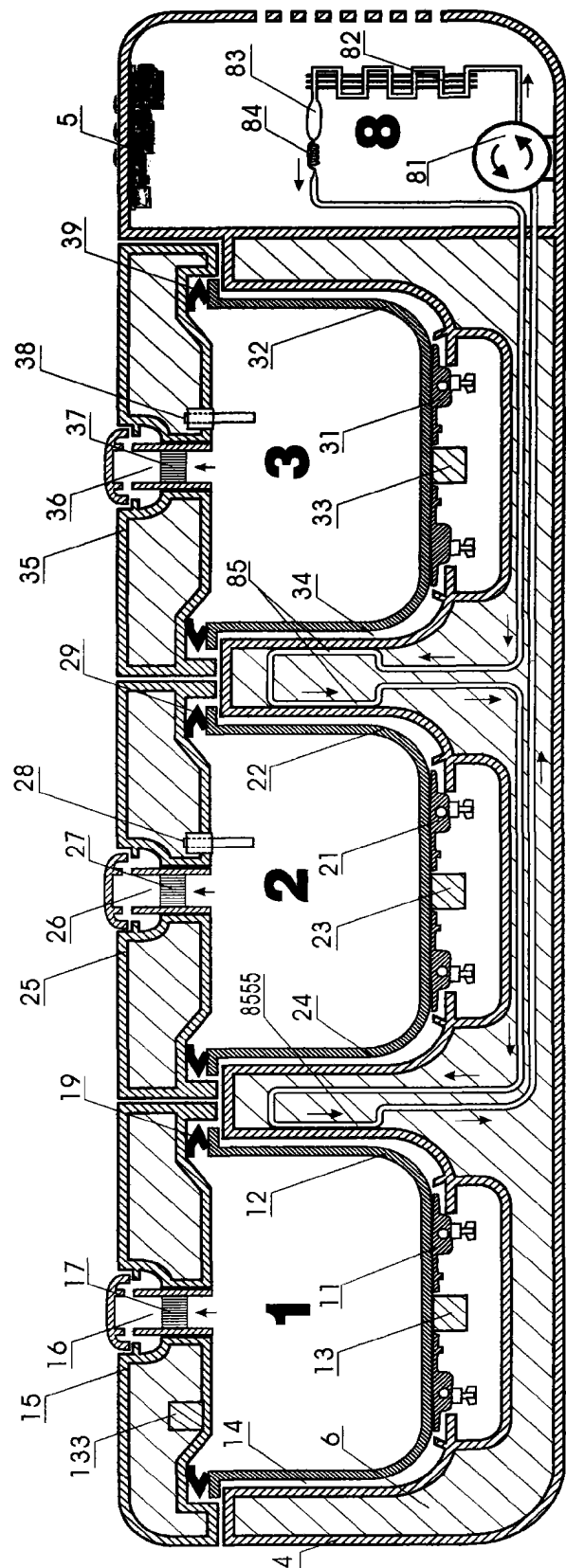


图 10

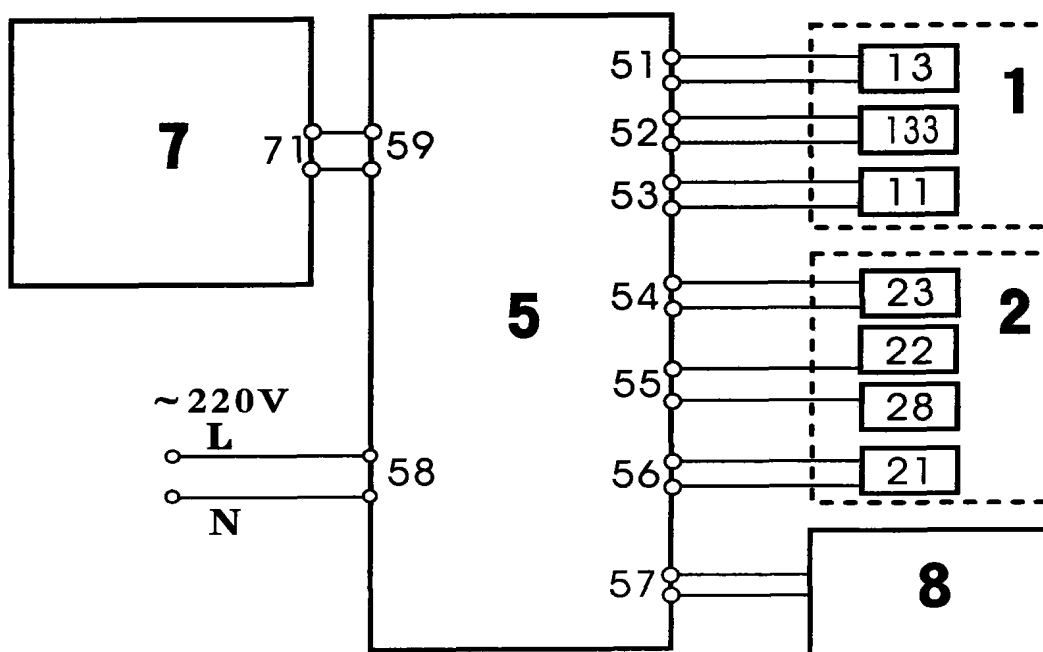


图 11

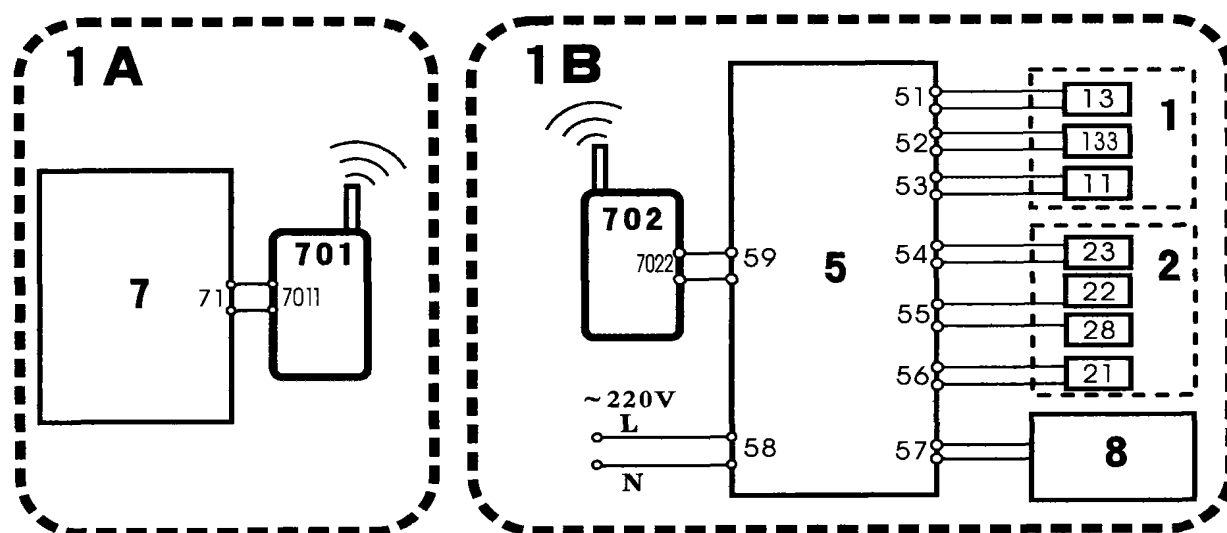


图 12



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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
06/11/2024 04:02:01 PM Z ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Whitney Thomson
PATENT CENTER #	65918711	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Nicholas Foster

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US - Response to NFOA.pdf	9	Amendment/Request for Reconsideration-After Non-Final Rejection	436 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
057664-348N01US - Response to NFOA.pdf	12A44743B9656752FB7D64DEB07FBA34EFB11FE70EE79A324 A641A94EC71CAD5BC70A15D48E64CE478BA58C8CF9E766A8 0CF1CC4E215E3CB52F352C1502FF983

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Utility Application of:
Christopher T. Martin

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: V. K. Shirsat

AMENDMENT IN RESPONSE TO NON-FINAL OFFICE ACTION UNDER 37 C.F.R. § 1.111

Via Patent Center
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This paper is filed in response to the Office Action dated March 13, 2024.

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

1-70. (Canceled)

71. (Currently Amended) A cooking system comprising:

a housing having ~~at least one~~ a first internal compartment and a second internal compartment;
a first cooking container receivable within ~~said at least one~~ the first internal compartment,
~~wherein a cooking volume is defined within an interior of said the first cooking container defining a~~
first cooking volume;

a second cooking container receivable within the second internal compartment, an interior of
the second cooking container defining a second cooking volume, the first and second cooking
volumes being thermally and fluidly separate from each other;

a ~~first heating element~~ associated thermally connected to ~~said at least one~~ the first
internal compartment and a second heater thermally connected to the second internal compartment;
and

~~an air movement mechanism~~ a first fan and a second fan disposed in ~~said the~~ the housing, the
first fan being in fluid communication with the first cooking volume and the second fan being in
fluid communication with the second cooking volume ~~said air movement mechanism being~~
~~positioned vertically above said cooking volume and horizontally offset from said heating element~~.

72. (New) The cooking system of claim 71, wherein the first cooking container and the second cooking container each form a continuous outer surface with the housing when the first and second cooking containers are inserted into the respective first and second internal compartments.

73. (New) The cooking system of claim 71, wherein the first internal compartment and the second internal compartment are similarly sized.

74. (New) The cooking system of claim 71, wherein the first fan is stacked vertically relative to the first heater within the housing and the second fan is stacked vertically relative to the second heater within the housing.

75. (New) The cooking system of claim 71, wherein the first fan includes a first inlet, a second inlet, and an outlet, the first inlet and the second inlet being arranged in fluid communication with the outlet.
76. (New) The cooking system of claim 71, wherein the first fan has a first axially oriented inlet and a first radially oriented outlet and the second fan has a second axially oriented inlet and a second radially oriented outlet.
77. (New) The cooking system of claim 71, wherein the first cooking container includes a first handle and the second cooking container includes a second handle.
78. (New) The cooking system of claim 71, further comprising a motor operably coupled to each of the first fan and the second fan.
79. (New) The cooking system of claim 78, wherein the motor is located external to the first internal compartment and the second internal compartment.
80. (New) The cooking system of claim 78, wherein the motor is positioned between the first internal compartment and the second internal compartment.
81. (New) The cooking system of claim 71, further comprising a control system configured to independently operate the first and second heaters and the first and second fans.
82. (New) A cooking system, comprising:
a housing having a first internal cooking compartment and a second internal compartment, the first internal compartment including a first heating assembly comprising a first fan and a first heater, and the second internal cooking compartment including a second heating assembly comprising a second fan and a second heater, the first and second internal cooking compartments being thermally and fluidly separated;
a first cooking container removably disposed within the first internal cooking compartment and a second cooking container removably disposed within the second internal cooking

compartment, the first and second heating assemblies being independently operable to independently cook food contained within the respective first and second cooking containers.

83. (New) The cooking system of claim 82, wherein the first cooking container includes a first external handle attached thereto and the second cooking container includes a second external handle attached thereto.

84. (New) The cooking system of claim 82, wherein the first internal compartment and the second internal compartment are similarly sized.

85. (New) The cooking system of claim 82, wherein the first internal cooking compartment and the second internal cooking compartment are independently operable to cook food using at least one of conduction, convection, radiation, and induction.

86. (New) The cooking system of claim 82, further comprising a control system configured to independently operate the first and second heating assemblies.

87. (New) The cooking system of claim 82, wherein the control system is configured to receive a user input corresponding to at least one of a temperature, a cook time, and a food type.

88. (New) The cooking system of claim 82, wherein the control system is configured to adjust a cooking parameter based on sensed data without user input.

89. (New) The cooking system of claim 82, further comprising a motor operably coupled to each of the first and second fans, the motor configured to operate the first and second fans at the same speed or at different speeds.

90. (New) The cooking system of claim 89, wherein the motor is positioned between the first internal compartment and the second internal compartment.

REMARKS

Status of the Claims

The Office Action addresses and rejects claims 1-5, 11, 13-14, 17, 20-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51 and 71. Reconsideration and allowance of the current application are respectfully requested in light of the amendments and remarks herein.

Amendments to the Claims

Claim 71 is amended, claims 1-5, 11, 13-14, 17, 20-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51 are canceled, and new claims 72-90 are added. Support for the amendments can be found throughout the specification and figures. No new matter is added.

With respect to any claim cancellations or amendments, Applicant has not dedicated to the public nor abandoned any unclaimed subject matter and moreover has not acquiesced to any rejections and/or objections. Applicant expressly reserves the right to pursue protection of any of the presently excluded subject matter or claim embodiments in one or more future continuation and/or divisional application(s).

Rejection Pursuant to 35 U.S.C. § 112(b)

Claims 17, 20, 22-24, 27 and 30 are rejected pursuant to 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor regards as the invention. While Applicant respectfully disagrees, claims 17, 20, 22-24, 27 and 30 are canceled, rendering the rejections thereof moot. Accordingly, withdrawal of this rejection is respectfully requested.

Rejection Pursuant to 35 U.S.C. § 102

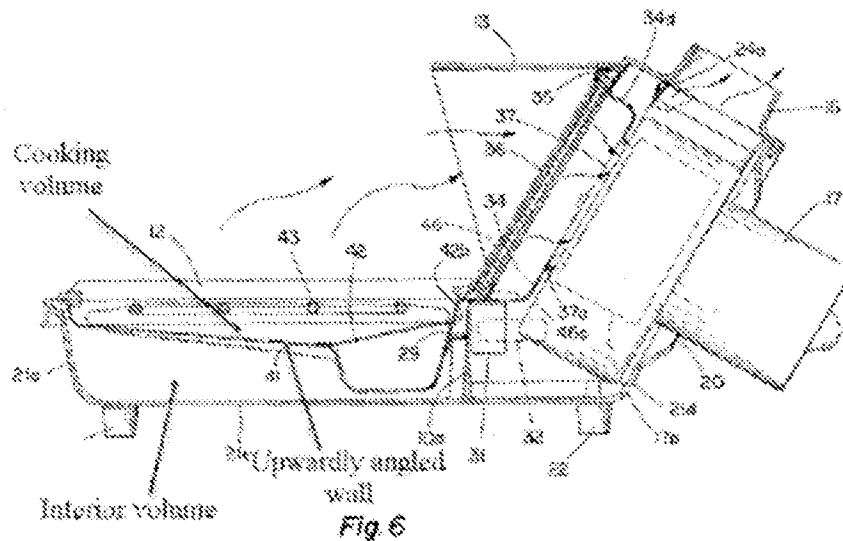
Claims 1-5, 13-14, 17, 27 and 71 are rejected pursuant to 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 4,034,663 of Jenn et al. (hereinafter “Jenn”). Claims 17, 20, 22-24, 30-32, 34, 37-38, 44-47 and 51 are rejected pursuant to 35 U.S.C. § 102 as being anticipated by U.S.

Patent No. 3,973,551 of Caselani et al. (hereinafter “Caselani”). Claims 1, 5, and 11 are rejected pursuant to 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 10,575,679 of Cheng et al. (hereinafter “Cheng”). Claims 31 and 41 are rejected pursuant to 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 8,011,293 of McFadden et al. (hereinafter “McFadden”).

Claim 71

Claim 71 is rejected pursuant to 35 U.S.C. § 102 as being anticipated by Jenn. While Applicant respectfully disagrees, claim 71 is amended to recite, in relevant part, “a housing having a first internal compartment and a second internal compartment,” “a first cooking container receivable within the first internal compartment, an interior of the first cooking container defining a first cooking volume,” “a second cooking container receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume, the first and second cooking volumes being thermally and fluidly separate from each other,” “a first heater thermally connected to the first internal compartment and a second heater thermally connected to the second internal compartment,” and “a first fan and a second fan disposed in the housing, the first fan being in fluid communication with the first cooking volume and the second fan being in fluid communication with the second cooking volume.” Jenn fails to teach each and every limitation of claim 71 as amended herein.

For example, Jenn fails to teach a housing having a first internal compartment and a second internal compartment. Jenn is generally directed to a portable grill assembly having a housing 10, 11 and a drain pan 41. *Jenn*, col. 1, lines 46-51, and col. 2, lines 57-60. The Examiner relies on the housing 10, 11 of Jenn for support for a housing having an internal compartment, as evidenced in FIG. 6 of Jenn as marked-up by the Examiner and reproduced below. However, inasmuch as the housing 10, 11 can be construed as a housing having an internal compartment, which Applicant does not concede, Jenn is silent as to a second internal compartment. Accordingly, Jenn fails to teach a housing having a first internal compartment and a second internal compartment.



As another example, Jenn fails to teach a second cooking container receivable within the second internal compartment, with an interior of the second cooking container defining a second cooking volume. The Examiner relies on the drain pan 41 for support for a cooking container with a cooking volume defined within an interior of the cooking container. However, inasmuch as the drain pan 41 can be construed as a cooking container with an interior that defines a cooking volume, which Applicant does not concede, Jenn is silent to a second cooking container with an interior that defines a second cooking volume, let alone a second cooking container that is receivable within a second internal compartment of the housing. Accordingly, Jenn fails to teach a second cooking container receivable within the second internal compartment, an interior of the second cooking container defining a second cooking volume.

For at least these reasons, Jenn fails to teach each and every limitation of claim 71 as amended herein. Accordingly, withdrawal of the rejection of claim 71 pursuant to 35 U.S.C. § 102 is respectfully respected.

New claims 72-81 depend on claim 71 and are allowable for their dependence upon an allowable base claim. Accordingly, allowance of new claims 72-81 is respectfully requested.

Claims 1-5, 11, 13-14, 17, 20, 22-24, 27, 30-32, 34, 37-38, 41, 44-47, and 51

While Applicant respectfully disagrees with the rejections, claims 1-5, 11, 13-14, 17, 20, 22-24, 27, 30-32, 34, 37-38, 41, 44-47, and 51 are canceled, thereby rendering the rejections thereof moot. Withdrawal of these rejections is respectfully requested.

New Claims 82-90

New independent claim 82 incorporates similar limitations as amended independent claim 71. Accordingly, claim 82 is allowable for at least the reasons discussed herein. Furthermore, claims 83-90 depend on claim 82 and are allowable for their dependence upon an allowable base claim. Accordingly, allowance of new claims 82-90 is respectfully requested.

Conclusion

In conclusion, Applicant submits that all pending claims are now in condition for allowance, and allowance thereof is respectfully requested. Applicant's amendment of the claims does not constitute a concession that the claims are not allowable in their unamended form. The Examiner is encouraged to telephone the undersigned attorney for Applicant if such communication is deemed to expedite prosecution of this application.

No extension of time is believed to be due. In the event that a petition for an extension of time is required to be submitted at this time, Applicant hereby petitions under 37 C.F.R. 1.136(a) for an extension of time for as many months as are required to ensure that the above-identified application does not become abandoned.

Applicant believes no fee is due with this paper. However, if a fee is due, please charge our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: June 11, 2024

Respectfully submitted,

Electronic Signature: /Nicholas Foster/
Nicholas Foster

Registration No.: 78,289
MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.
One Financial Center
Boston, Massachusetts 02111
(617) 542-6000
Attorney for Applicant

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 17/159,414	Filing Date 01/27/2021	☐ To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE (\$)	FEE (\$)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	x \$100 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	x \$480 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)	
AMENDMENT	06/11/2024	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA			
	Total (37 CFR 1.16(i))	* 20	Minus	** 28	= 0	x \$100 =	0	
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 5	= 0	x \$480 =	0	
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
						TOTAL ADD'L FEE	0	
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$0 =		
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$0 =		
	☐ Application Size Fee (37 CFR 1.16(s))							
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							
						TOTAL ADD'L FEE		
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE		
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/JAMES ELLIOTT/		
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The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.								

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3762

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: Vivek K Shirsat

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed more than three months after the filing date of this application, OR more than three months after the date of entry of the national stage in the international application, AND after the mailing date of a first Office Action on the merits, but before the mailing date of any of a Final Action under 37 C.F.R. § 1.113, a Notice of Allowance under 37 C.F.R. § 1.311 or an action that otherwise closes prosecution in this application (37 C.F.R. § 1.97(c)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copies of U.S. patents and U.S. patent application publications are not submitted.

Applicant brings to the Examiner's attention the following U.S. Patent Applications, the prosecution of which may be relevant to the current application:

App. No.	Filing Date	Title
17/219,238	March 31, 2021	Cooking Device And Components Thereof
17/837,768	June 10, 2022	Cooking Device And Components Thereof
18/186,671	March 20, 2023	Cooking Device And Components Thereof

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

Please charge our Deposit Account No. 50-0311 in the amount of \$260.00 covering the fee set forth in 37 C.F.R. § 1.17(p). The Director is hereby authorized to charge any additional fees which may be required with respect to this communication, or credit any overpayment, to Deposit Account No. 50-0311, under Order No. 057664-348N01US.

Dated: May 24, 2024

Respectfully submitted,

By: /Ryan T. Rieker/

Ryan T. Rieker

Registration No.: 80,734

MINTZ LEVIN COHN FERRIS GLOVSKY
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Application No.: 17/159,414

Docket No.: 057664-348N01US

Agent for Applicant



UNITED STATES
PATENT AND TRADEMARK OFFICE

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
05/26/2024 05:53:25 PM Z ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Deepti Rastogi
PATENT CENTER #	65656710	AUTHORIZED BY	Ryan Rieker
CUSTOMER #	177399	FILING DATE	01/27/2021
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	FIRST NAMED INVENTOR	Christopher T. Martin

Payment Information

PAYMENT METHOD DA / 500311	PAYMENT TRANSACTION ID E20245PH53505409	PAYMENT AUTHORIZED BY Ryan Rieker
PRE-AUTHORIZED ACCOUNT 500311	PRE-AUTHORIZED CATEGORY 37 CFR 1.17 (Patent application and reexamination processing fees); 37 CFR 1.19 (Document supply fees); 37 CFR 1.20 (Post issuance fees); 37 CFR 1.21 (Miscellaneous fees and charges); 37 CFR 1.492(a) (Basic national fee only)	

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
1806	SUBMISSION OF AN INFORMATION DISCLOSURE STATEMENT	260.00	1	260.00
TOTAL AMOUNT:				\$260.00

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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
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05/26/2024 05:53:25 PM Z ET

ATTORNEY DOCKET #
057664-348N01US

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APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Deepti Rastogi
PATENT CENTER #	65656710	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Ryan Rieker

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US_17159414_NFOA__SIDS__Transmittal.pdf	3	Transmittal Letter	138 KB
057664-348N01US_17159414_NFOA__SB08_May_24_2024.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1011 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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SIDS_Transmittal.pdf	FCB4A2E363621A7C53B7E79AF1260

057664-	2A69E2862B68487D5857E24732E12C821C6E53207DAC48B92F
348N01US_17159414_NFOA_	A3DA0CA459B7D8B7B6A577AD1114A7238C1716513976420CE
SB08_May_24_2024.pdf	38888FD02773FC0236FEB226AD0C0

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414	
	Filing Date		2021-01-27	
	First Named Inventor	Christopher T. Martin		
	Art Unit	3762		
	Examiner Name	Vivek K Shirsat		
	Attorney Docket Number	057664-348N01US		

U.S.PATENTS Remove						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6450085	B1	2002-09-17	Riesselmann, Gottfried	
	2	11672377	B2	2023-06-13	Martin et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20210272832	A1	2021-09-02	Burkhart et al.	
	2	20220408966	A1	2022-12-29	Martin et al.	

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	1							☐

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3762
Examiner Name	Vivek K Shirsat
Attorney Docket Number	057664-348N01US

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3762	
	Examiner Name	Vivek K Shirsat	
	Attorney Docket Number	057664-348N01US	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Ryan T. Rieker/	Date (YYYY-MM-DD)	2024-05-24
Name/Print	Ryan T. Rieker	Registration Number	80,734

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US	3603
177399	7590	03/13/2024	EXAMINER	
Mintz Levin/SharkNinja			SHIRSAT, VIVEK K	
One Financial Center			ART UNIT	PAPER NUMBER
Boston, MA 02111			3762	
			NOTIFICATION DATE	DELIVERY MODE
			03/13/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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IPFilerombos@mintz.com
mintzdocketing@cpaglobal.com

Office Action Summary

Application No.

17/159,414

Applicant(s)

Martin et al.

Examiner

VIVEK K SHIRSAT

Art Unit

3762

AIA (FITF) Status

Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 01/27/2021.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-5, 11, 13-14, 17, 20-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51 and 71 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-5, 11, 13-14, 17, 20-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51 and 71 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see

http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 01/27/2021 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some** c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)

4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 17, 20, 22-24, 27 and 30** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

The term “relatively horizontally” in claim 17 is a relative term which renders the claim indefinite. The term “relatively horizontally” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Additionally, the applicant does not specify against what reference plane “horizontally” is to be taken, for example the housing could always be tilted or positioned such that the axis is horizontal.

Claim Rejections - 35 USC § 102

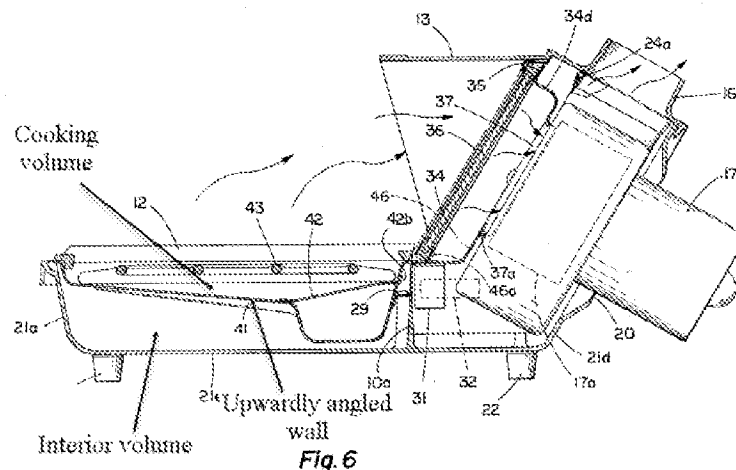
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.

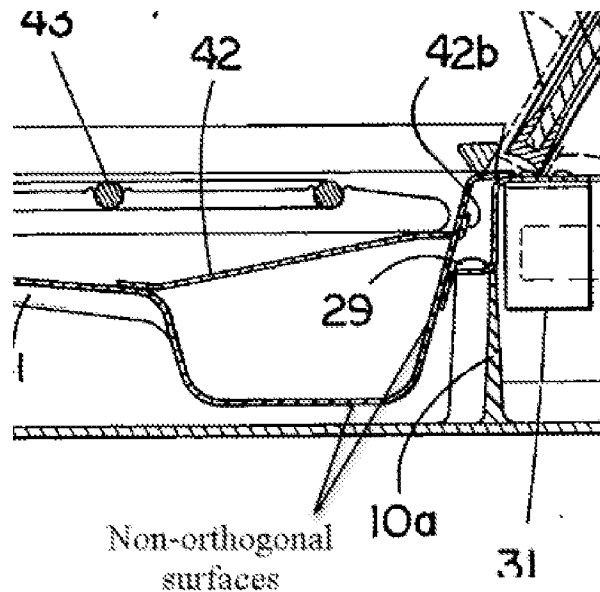
2. **Claim(s) 1-5 and 13-14** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Jenn et. al (US 4,034,663).

With respect to claim 1 Jenn discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. below]; a cooking container [reference character 41] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. below] is defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly [see annotated Fig. below]; and a heating element [reference character 43] associated with said at least one internal compartment.

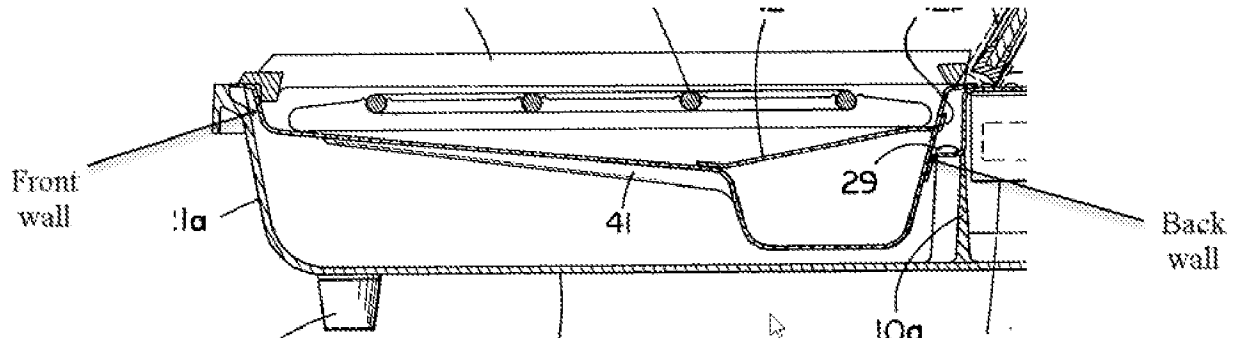


With respect to claim 2 Jenn discloses that said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system [see Figs. 1 and 6].

With respect to claim 3 Jenn discloses that said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container [see annotated Fig. below].



With respect to claim 4 Jenn discloses that said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container [see annotated Fig. below].



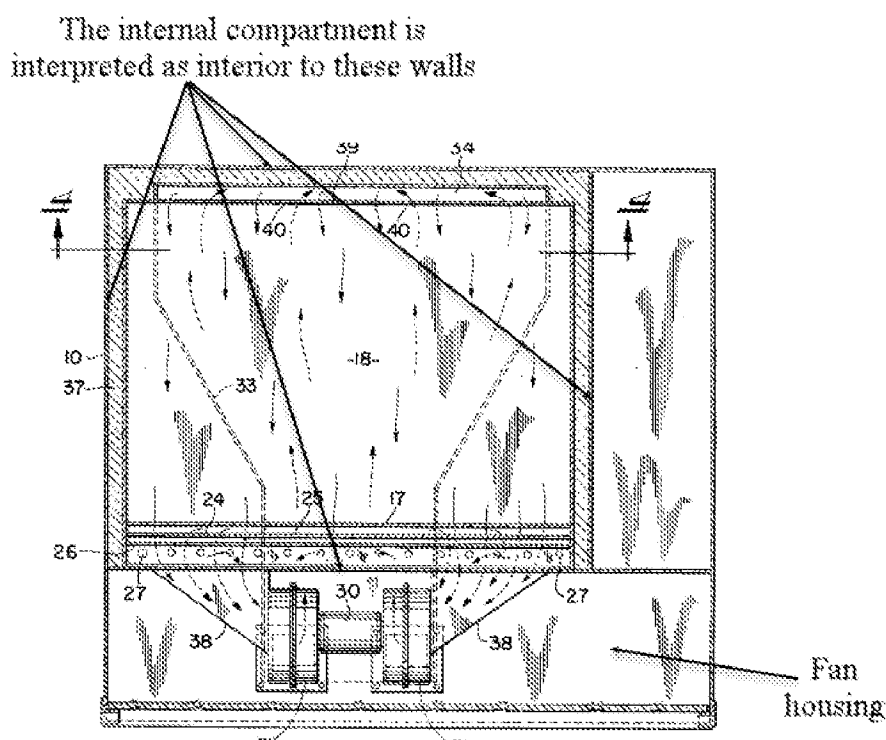
With respect to claim 5 Jenn discloses an insert [reference character 12] positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

With respect to claim 13 Jenn discloses an air movement mechanism [reference character 17a] disposed in said housing.

With respect to claim 14 Jenn discloses a motor [reference character 17] operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment [see Fig. 6].

3. **Claim(s) 17, 20, 22-24, and 30** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Caselani et. al (US 3,973,551).

With respect to claim 17 Caselani discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. below] ; a cooking container [formed by the walls of the oven cavity reference character 11] receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container; a heating element [column 5 lines 24-26] associated with said at least one internal compartment; and an air movement mechanism [reference character 31] disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally [see Fig. 3].



With respect to claim 20 Caselani discloses said air movement mechanism includes a first inlet [at the left side of blower 31 in Fig. 3], a second inlet [at the right side of blower 31 in Fig. 3], and an outlet [reference character 33], said first inlet and said second inlet being arranged in fluid communication with said outlet [column 3 lines 6-11].

With respect to claim 22 Caselani discloses a motor [reference character 30] operable to rotate said air movement mechanism about said axis or rotation, wherein said motor is located at least partially external to said at least one internal compartment [see annotated Fig. above].

With respect to claim 23 Caselani discloses said air movement mechanism further comprises: a fan housing [see annotated Fig. above]; and a fan wheel [reference character 31] rotatably mounted within said fan housing.

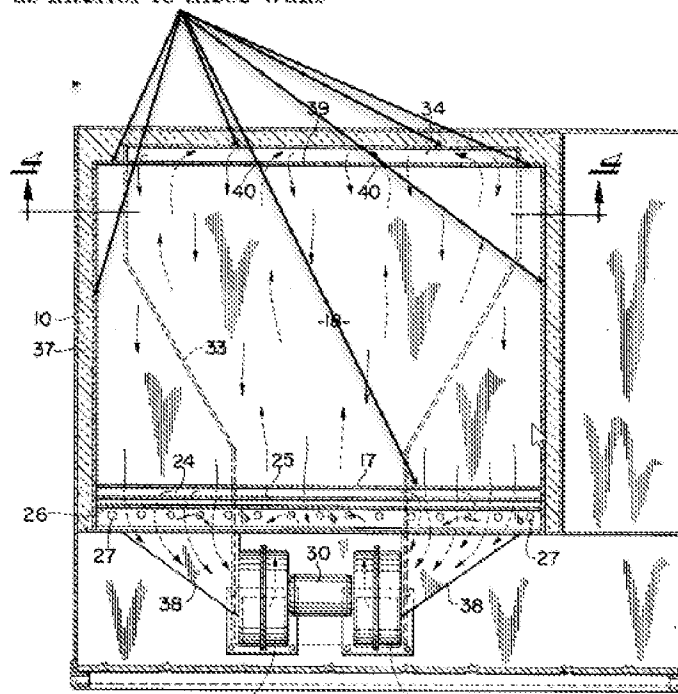
With respect to claim 24 Caselani discloses said fan wheel includes a first wheel [reference character 31] portion having a first plurality of impeller blades and a second wheel portion [also reference character 31] having a second plurality of impeller blades.

With respect to claim 30 Caselani discloses that said air movement mechanism is horizontally offset from said heating element [column 5 lines 24-26].

4. **Claim(s) 31-32, 34, 37-38** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Caselani et. al (US 3,973,551).

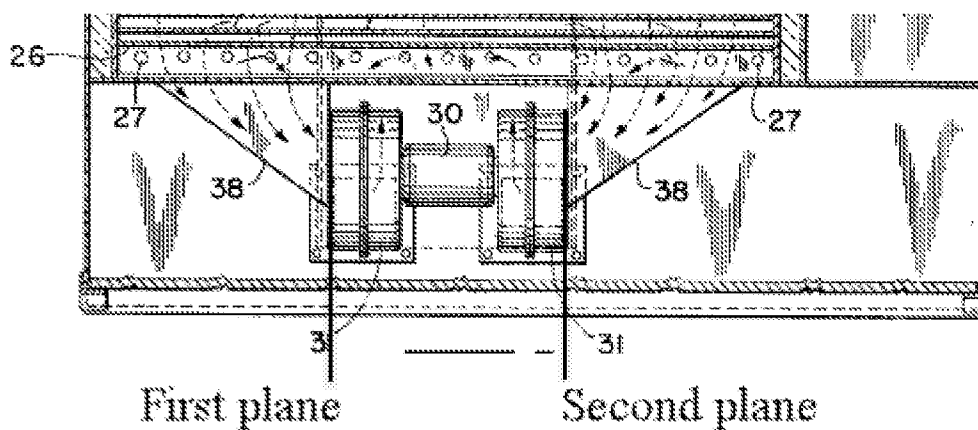
With respect to claim 31 Caselani discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. above]; a cooking container [see annotated Fig. below] receivable within said at least one internal compartment, wherein a cooking volume [reference character 11] is defined within an interior of said cooking container; a heating element [column 5 lines 24-26] associated with said cooking volume; a rotatable air movement mechanism [reference character 31] having: a first inlet [at the left side of blower 31 in Fig. 3] arranged in a first plane of said air movement mechanism; a second inlet [at the right side of blower 31 in Fig. 3] arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane; and an outlet [reference character 32] arranged in fluid communication with both said first inlet and said second inlet.

The cooking container is interpreted
 as interior to these walls



With respect to claim 32 Caselani discloses that said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation [see Fig. 3].

With respect to claim 34 Caselani discloses that said first plane and said second plane are substantially parallel [see annotated Fig. below].



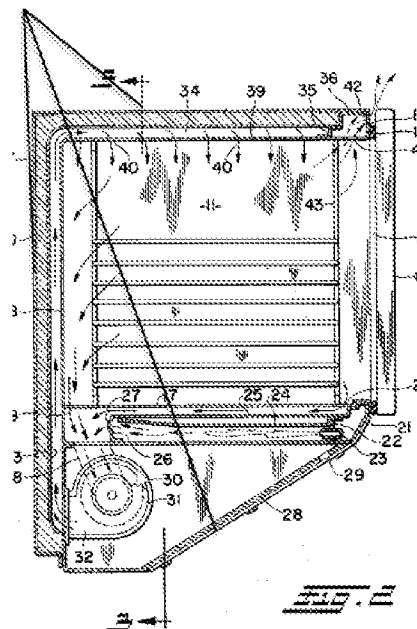
With respect to claim 37 Caselani discloses an air duct [reference character 33-34] separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct [at the inlet to 33].

With respect to claim 38 Caselani discloses a motor [reference character 30] operable to rotate said air movement mechanism about said axis or rotation, wherein said motor is located at least partially external to said at least one internal compartment [see annotated Fig. above].

5. **Claim(s) 44-47 and 51** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Caselani et. al (US 3,973,551).

With respect to claim 44 Caselani discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. below]; a cooking container [see annotated Fig. above] receivable within said at least one internal compartment, wherein a cooking volume [reference character 11] is defined within an interior of said cooking container; a heating element [column 5 lines 24-26] associated with said cooking volume; a plurality of air movement mechanisms [reference character 31] disposed within said housing; and a motor [reference character 30] operably coupled to said plurality of air movement mechanisms.

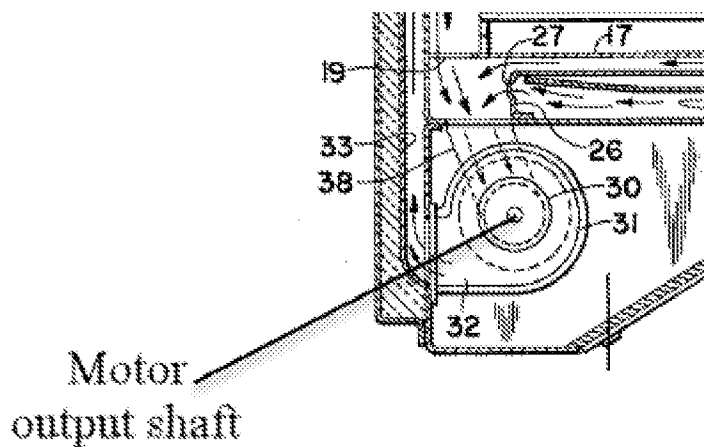
The internal compartment is interpreted
as being interior to these walls



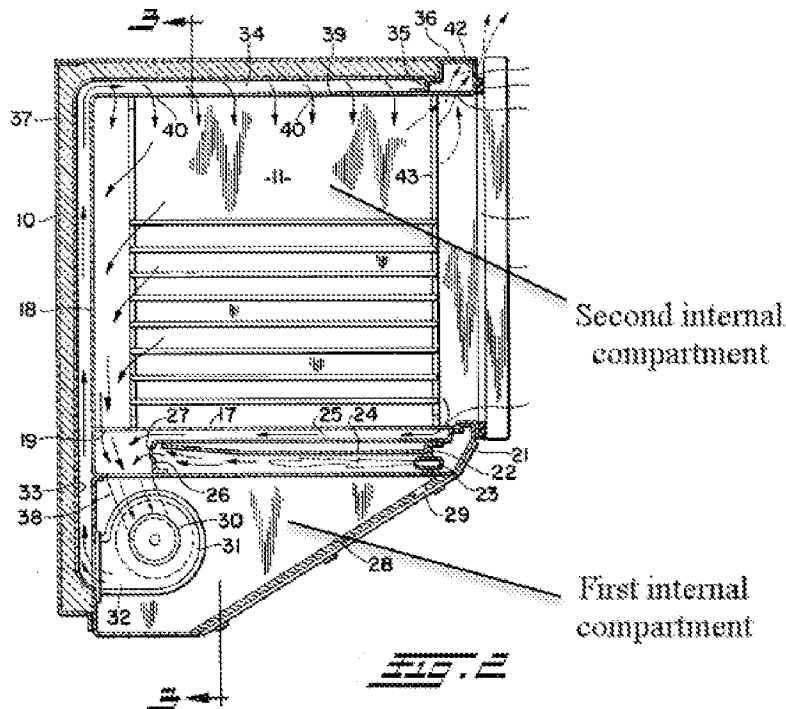
With respect to claim 45 Caselani discloses that said motor is located externally to said at least one internal compartment [see Fig. 2].

With respect to claim 46 Caselani discloses said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism [both reference character 31].

With respect to claim 47 Caselani discloses that said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft [see annotated Fig. below].



With respect to claim 51 Caselani discloses that internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment [see annotated Fig. below].



6. **Claim(s) 71** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Jenn et. al (US 4,034,663).

With respect to claim 71 Jenn discloses a cooking system comprising: a housing [reference character 10-11] having at least one internal compartment [see annotated Fig. above in connection with claim 1]; a cooking container [reference character 41] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. above in connection with claim 1] is defined within an interior of said cooking container, a heating element [reference character 43] associated with said at least one internal compartment and an air movement mechanism [reference character 17a] disposed in said housing, said air movement mechanism being positioned vertically above said cooking volume and horizontally offset from said heating element [see Fig. 3].

7. **Claim(s) 1, 5, and 11** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Cheng et. al (US 10,575,679).

With respect to claim 1 Cheng discloses a cooking system comprising: a housing [reference character 122] having at least one internal compartment [see annotated Fig. below]; a cooking container [reference character 108] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. below] is

defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly [see annotated Fig. below]; and a heating element [reference character 126] associated with said at least one internal compartment.

With respect to claim 5 Cheng discloses an insert [reference character 106] positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

With respect to claim 11 Cheng discloses an air duct [reference character 136] separate from said cooking volume is defined between said insert and a portion of said cooking container.

8. **Claim(s) 17 and 27** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Jenn et. al (US 4,034,663).

With respect to claim 17 Jenn discloses a cooking system comprising: a housing [reference character 10-11] having at least one internal compartment [see annotated Fig. above in connection with claim 1]; a cooking container [reference character 41] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. above in connection with claim 1] is defined within an interior of said cooking container; a heating element [reference character 43] associated with said at least one internal compartment; and an air movement mechanism [reference character 17a] disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally [see 112(b) rejection above].

With respect to claim 27 Jenn discloses that the air movement mechanism is disposed vertically above said cooking volume [see Fig. 3].

9. **Claim(s) 31 and 41** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by McFadden et. al (US 8,011,293).

With respect to claim 31 McFadden discloses a cooking system comprising: a housing [reference characters 105-106 and 194-195] having at least one internal compartment [the space internal to those walls]; a cooking container [the housing formed by 123a-123b] receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container; a heating element [reference character 114] associated with said cooking volume; a rotatable air movement mechanism [reference characters 191a-191b] having: a first inlet arranged in a first plane of said air movement mechanism; a second inlet arranged in a second plane of said air

movement mechanism, said second plane being distinct from said first plane [see annotated Fig. 1]; and an outlet [reference characters 115a-115b] arranged in fluid communication with both said first inlet and said second inlet.

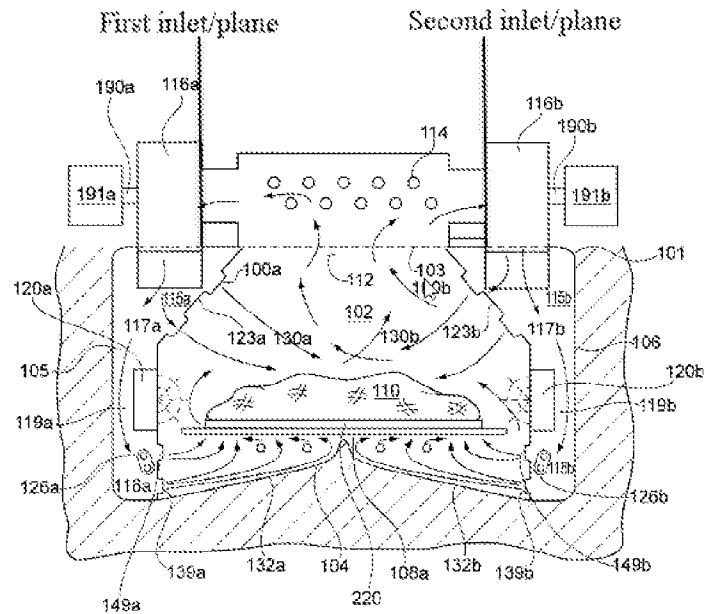


FIG. 1

With respect to claim 41 McFadden discloses that said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container [see Fig. 1].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIVEK K SHIRSAT whose telephone number is (571)272-3722. The examiner can normally be reached M-F 9:00AM-5:20AM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VIVEK K SHIRSAT/
Primary Examiner, Art Unit 3762

Notice of References Cited	Application/Control No. 17/159,414		Applicant(s)/Patent Under Reexamination Martin et al.	
	Examiner VIVEK K SHIRSAT		Art Unit 3762	Page 1 of 1

U.S. PATENT DOCUMENTS						
*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-4034663-A	1977-07-12	Jenn; Louis J.	A47J37/0623	126/300
*	B	US-3973551-A	1976-08-10	Caselani; Richard E.	A21B1/28	126/21A
*	C	US-10575679-B1	2020-03-03	Cheng; Xiao	A23L5/17	1/1
*	D	US-8011293-B2	2011-09-06	McFadden; David H.	A21B1/24	219/400
	E					
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

CPC - Searched*		
Symbol	Date	Examiner
A47J37/0641, 0664	03/08/2024	vks
A47/J27/12, 004	03/08/2024	vks

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
126	21A	03/08/2024	vks

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see search history	03/08/2024	vks
inventor search	03/08/2024	vks
class/subclass search	03/08/2024	vks
forward/backward search	03/08/2024	vks
text search	03/08/2024	vks

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 05/31/2024. OMB 0651-0031

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Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	11297977	B1	2022-04-12	Man, Kaimong	

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	1	105615640	CN	A	2016-06-01	Huichi Development Co., Limited		
	2	205849310	CN	U	2017-01-04	Liu Jianchang		
	3	206675433	CN	U	2017-11-28	Yunnan Lingyuexuan Food Co., Ltd.		

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Examiner Signature	/VIVEK K SHIRSAT/	Date Considered	03/06/2024
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Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2022-11-18
Name/Print	Lisa Adams	Registration Number	44,238

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Bibliographic Data

Application No: 17/159,414

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /VIVEK K SHIRSAT/

Examiner's Signature

Initials

Title: COOKING DEVICE AND COMPONENTS THEREOF

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/27/2021	126	3762	057664-348N01US
RULE			

APPLICANTS

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INVENTORS

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Kerry Schwarz, Needham, MA, UNITED STATES

Michaela Dubeau, Uxbridge, MA, UNITED STATES

CONTINUING DATA

This application is a 371 of PCT/US2020/042120 07/15/2020

PCT/US2020/042120 has PRO of 62874193 07/15/2019

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Boston, MA 02111

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Doc description: Information Disclosure Statement (IDS) Filed

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Art Unit	NA
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

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	1	20170071408	A1	2017-03-16	Veltrop et al.	

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Attorney Docket Number	057664-348N01US

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Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2023-04-13
Name/Print	Lisa Adams	Registration Number	44,238

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Examiner Name	Not Yet Assigned
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	1	20090126580	A1	2009-05-21	Hartfelder et al.	
	2	20120272832	A1	2012-11-01	Kwon et al.	
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Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2021-12-08
Name/Print	Lisa Adams	Registration Number	44,238

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4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	Christopher T. MARTIN		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	EUP1549US2		

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5832812	A	1998-11-10	WOLFE, RONALD DALE ET AL.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20180303285	A1	2018-10-25	CHENG	

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FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	202665302	CN	U	2013-01-16	HUANG ZHENXIONG		☐
	2	206080273	CN	U	2017-04-12	GUANGDONG RONGSHENG ELECTRIC HOLDING CO LTD		☐
	3	209032019	CN	U	2019-06-28	YUE MEIYI		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
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	Examiner Name		
	Attorney Docket Number	EUP1549US2	

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NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	International Search Report of the International Searching Authority; International Application No. PCT/US2020/042120; International Filing Date: July 15, 2020; Date of Mailing: October 30, 2020; 5 pages (EUP1549PCT)	☐
	2	Written Opinion of the International Searching Authority; International Application No. PCT/US2020/042120; International Filing Date: July 15, 2020; Date of Mailing: October 30, 2020; 11 pages (EUP1549PCT)	☐

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EXAMINER SIGNATURE			
Examiner Signature	/VIVEK K SHIRSAT/	Date Considered	03/06/2024

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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First Named Inventor	Christopher T. MARTIN	
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Attorney Docket Number	EUP1549US2	

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alicia Hayter, Reg. No. 67,093/	Date (YYYY-MM-DD)	2021-01-27
Name/Print	ALICIA HAYTER	Registration Number	67093

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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	Examiner Name		
	Attorney Docket Number		EUP1549US2

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10045651	B2	2018-08-14	HUANG	
	2	10051997	B2	2018-08-21	CONTARINO JR., ALFRED F.	
	3	10088173	B2	2018-10-02	MCKEE, PHILIP R. ET AL.	
	4	10094576	B2	2018-10-09	KIM ET AL.	
	5	10099839	B2	2018-10-16	SCHONING, HENNY	
	6	10101038	B2	2018-10-16	KIM, SHIN KYUM KIM ET AL.	
	7	10113749	B2	2018-10-30	YANCEY, MARTIN ALAN	
	8	10143324	B2	2018-12-04	KATAOKA ET AL.	

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

9	10174953	B2	2019-01-08	JADHAV, TUSHAR ET AL.	
10	10190783	B2	2019-01-29	ROGERS, PAUL ROSS ET AL.	
11	10203117	B2	2019-02-12	MOON, SEONG CHEOL ET AL.	
12	10234144	B2	2019-03-19	DESHPANDE, BIPIN PRABHAKAR	
13	10247424	B2	2019-04-02	ADELMANN, CHRISTOPHER JAMES ET AL.	
14	10271686	B2	2019-04-30	ROY	
15	10271690	B2	2019-04-30	VELTROP, LOREN ET AL.	
16	10285531	B2	2019-05-14	CHANOWITZ, BENSON	
17	10309659	B2	2019-06-04	MOON, SEONG CHEOL ET AL.	
18	10337745	B2	2019-07-02	MCKEE, PHILIP R. ET AL.	
19	10364990	B2	2019-07-30	LEE, SANGKYUN	

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

20	10364991	B2	2019-07-30	KANG, HAN SEONG ET AL.	
21	10383477	B2	2019-08-20	PAYEN, JEAN-MARC ET AL.	
22	10390656	B2	2019-08-27	GILL, ET AL.	
23	10405696	B2	2019-09-10	KIM, HAN JU	
24	10405697	B2	2019-09-10	GILL ET AL	
25	10405698	B2	2019-09-10	GILL ET AL	
26	10405699	B2	2019-09-10	CONTARINO JR., ALFRED F.	
27	10413121	B2	2019-09-17	GILL ET AL	
28	10413122	B2	2019-09-17	GILL ET AL.	
29	10426176	B2	2019-10-01	DIXON, WILLIAM A. ET AL.	
30	10448785	B2	2019-10-22	VAN DER WEIJ, FEDDE	

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Application Number	17159414
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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

31	10448786	B2	2019-10-22	VAN DER BURG, JOHAN MICHIEL ET AL.	
32	10451285	B2	2019-10-22	DUMENIL, SEAN	
33	10492641	B2	2019-12-03	KESTNER, KYLE THOMAS ET AL.	
34	10495319	B2	2019-12-03	LEE, DONG HO ET AL.	
35	10495320	B2	2019-12-03	TORRENTES, MARCELO ET AL.	
36	10502433	B2	2019-12-10	PARK, SANG JUN ET AL.	
37	10512363	B2	2019-12-24	KESTNER, KYLE THOMAS ET AL.	
38	10524615	B2	2020-01-07	REALES BERTOMEIO, EMILIO ET AL.	
39	10598391	B2	2020-03-24	PADULA, CORY F.	
40	10619862	B2	2020-04-14	BRUIN-SLOT, ZACHARY ET AL.	
41	10627116	B2	2020-04-21	BRUIN-SLOT, ZACHARY J. ET AL.	

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

42	10638882	B1	2020-05-05	HE ET AL.	
43	10660471	B2	2020-05-26	KIM, TAE-HUN ET AL.	
44	10674853	B2	2020-06-09	HUANG, ZHONGHUI	
45	10674854	B2	2020-06-09	HUANG, ZHONGHUI	
46	10684022	B2	2020-06-16	MCKEE, PHILIP R. ET AL.	
47	10694753	B2	2020-06-30	REESE ET AL .	
48	10694882		2020-06-30	HUANG	
49	10712018	B2	2020-07-14	ADELMANN, CHRISTOPHER JAMES ET AL.	
50	10729144	B2	2020-08-04	MCKEE, PHILIP R. ET AL.	
51	10731865	B2	2020-08-04	JADHAV, TUSHAR ET AL.	
52	10743709	B2	2020-08-18	NIE, HUAYAO	

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

53	10743710	B2	2020-08-18	FREHN, STEVEN ET AL.	
54	10794599	B2	2020-10-06	JANG, HYEONG JIN ET AL.	
55	10835077	B2	2020-11-17	NIE, HUAYAO	
56	10841981	B1	2020-11-17	KESTNER, KYLE THOMAS ET AL.	
57	10849457	B2	2020-12-01	BELL, PAUL DAVID	
58	10852002	B2	2020-12-01	KESTNER, KYLE THOMAS ET AL.	
59	10865994	B2	2020-12-15	LEE, DONGJAE ET AL.	
60	10881246	B2	2021-01-05	HE, ARNO ET AL.	
61	10883721	B2	2021-01-05	PALLER, HANS JUERGEN	
62	10887952	B2	2021-01-05	PETERSON, THERESA	
63	10890336	B2	2021-01-12	MCKEE, PHILIP R. ET AL.	

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Art Unit		
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Attorney Docket Number	EUP1549US2	

	64	10890372	B2	2021-01-12	HANNING, JEFFREY L.	
	65	10914473	B2	2021-02-09	KIM, KYOUNG MOK ET AL.	
	66	10918112	B2	2021-02-16	BIGOTT, JAMES W. ET AL.	
	67	10920992	B2	2021-02-16	KOBAYASHI, AHIHIKO ET AL.	
	68	6545251	B2	2003-04-08	ALLERA, RICCARDO ET AL.	
	69	6593552	B1	2003-07-15	LI, GEORGE T.C.	
	70	6653602	B2	2003-11-25	LI, GEORGE T. C.	
	71	6758206	B1	2004-07-06	BARNES, SHELTON T. ET AL.	
	72	6761159	B1	2004-07-13	BARNES, SHELTON T. ET AL.	
	73	6878904	B2	2005-04-12	VERVENIOTIS, NICHOLAS G.	
	74	6917017	B2	2005-07-12	MOON ET AL.	

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Attorney Docket Number	EUP1549US2

75	7064297	B2	2006-06-20	TIDEY, SCOTT	
76	7105778	B1	2006-09-12	DELONG ET AL.	
77	7105779	B2	2006-09-12	SHEI, STEVEN M.	
78	7117866	B2	2006-10-10	CANTAL, DANTE	
79	7227102	B2	2007-06-05	SHEI, STEVEN M.	
80	7238921	B2	2007-07-03	BEESLEY ET AL.	
81	7250587	B2	2007-07-31	ELY ET AL.	
82	7250588	B2	2007-07-31	ELY, DAVID ET AL.	
83	7297905	B2	2007-11-20	KIM, CHEOL JIN ET AL.	
84	7328654	B2	2008-02-12	SHEI, STEVEN M.	
85	7339140	B2	2008-03-04	TIDEY, SCOTT	

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86	7442901	B2	2008-10-28	KIM, YANG KYEONG ET AL.	
87	7703389	B2	2010-04-27	MCLEMORE, JOHN D. ET AL.	
88	8006685	B2	2001-08-30	BOLTON ET AL.	
89	8035062	B2	2011-10-11	MCFADDEN, DAVID H. ET AL.	
90	8096231	B2	2012-01-17	VELTROP, LOREN J. ET AL.	
91	8212188	B2	2012-07-03	KIM, TAE WOO ET AL.	
92	8217314	B2	2012-07-10	KIM, TAE WOO ET AL.	
93	8274020	B2	2012-09-25	DONARSKI, ROBERT S. ET AL.	
94	8378265	B2	2013-02-19	GREENWOOD ET AL.	
95	8389907	B2	2013-03-05	WILLETT, PAUL EATON	
96	8404292	B2	2013-03-26	VELTROP, LOREN J. ET AL.	

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Art Unit		
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Attorney Docket Number	EUP1549US2	

	97	8517006	B2	2013-08-27	FROCK ET AL.	
	98	8640608	B2	2014-02-04	VOLATIER, SEBASTIEN	
	99	8669500	B2	2014-03-11	HENSEL, KEITH JAMES ET AL.	
	100	8720323	B2	2014-05-13	DOUGLAS, PAUL GRAHAM ET AL.	
	101	8735778	B2	2014-05-27	GREENWOOD, JACK ET AL.	
	102	8748783	B2	2014-06-10	HENSEL, KEITH JAMES ET AL.	
	103	8883234	B2	2014-11-11	CHOI, SUNG-HO	
	104	8895902	B2	2014-11-25	SHEI, STEVEN M. ET AL.	
	105	8993026	B2	2015-03-31	MOLNAR, JON P. ET AL.	
	106	9021942	B2	2015-05-05	LEE, JONGHO ET AL.	
	107	9072403	B2	2015-06-07	BRADEN, BEN ET AL.	

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	108	9074776	B2	2015-06-07	GREENWOOD, JACK ET AL.	
	109	9080774	B2	2015-07-14	KIM, YANGHO ET AL.	
	110	9115904	B2	2015-08-25	BRINGE, WILLIAM ET AL.	
	111	9192262	B2	2015-11-24	KANBUR, ERDOGAN ET AL.	
	112	9314134	B2	2016-04-19	MOLNAR, JON P.	
	113	9326639	B2	2016-05-03	MCKEE, PHILIP R. ET AL.	
	114	9351495	B2	2016-05-31	MCFADDEN, DAVID H.	
	115	9370275	B2	2016-06-21	JACKSON, DAVID L. ET AL.	
	116	9404661	B2	2016-08-02	KIM, HAGSOO ET AL.	
	117	9433321	B2	2016-09-06	PIAZZI, ENRICO	
	118	9462912	B2	2016-10-11	JACKSON, DAVID L. ET AL.	

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	119	9480364	B2	2016-11-01	MCKEE ET AL.	
	120	9482437	B2	2016-11-01	KEMPER, LARS	
	121	9504351	B2	2016-11-29	CADIMA, PAUL BRYAN	
	122	9534791	B2	2017-01-03	WIE, JEAHYUK ET AL.	
	123	9534794	B2	2017-01-03	ROGERS, PAUL ROSS ET AL.	
	124	9541295	B2	2017-01-10	ADELMANN, CHRISTOPHER JAMES ET AL.	
	125	9568200	B2	2017-02-14	MOON, SEONG CHEOL ET AL.	
	126	9618212	B2	2017-04-11	SCHOOTSTRA, SIEBE ET AL.	
	127	9635979	B2	2017-05-02	ABRAMS, JOHN LUTHER ET AL.	
	128	9661952	B2	2017-05-30	JACKSON, DAVID L. ET AL.	
	129	9668615	B2	2017-06-06	CONTARINO JR, ALFRED F.	

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Examiner Name	
Attorney Docket Number	EUP1549US2

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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Art Unit	
Examiner Name	
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Art Unit	
Examiner Name	
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Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
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52	20200200394	A1	2020-06-25	BRUIN-SLOT, ZACHARY J. ET AL.	
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Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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	3	2019129598	WO	A1	2019-07-04	ARCELIK ANONIM SIRKETI		☐
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Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

5	2019157848	WO	A1	2019-08-22	KE M O HOUSE CO LTD		☐
6	2019207325	WO	A1	2019-10-31	LAMBRIANIDIS, PANAGIOTIS		☐
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14	2020118993	WO	A1	2020-06-18	GUANGDONG MEIKONG ELECTRONIC TECHNOLOGY CO LTD.		☐
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Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alicia Hayter, Reg. No. 67,093/	Date (YYYY-MM-DD)	2021-03-16
Name/Print	ALICIA HAYTER	Registration Number	67093

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L1	225	("20170071408" OR "11297977" OR "20090126580" OR "20120272832" OR "20170231430" OR "10045651" OR "10051997" OR "10088173" OR "10094576" OR "10099839" OR "10101038" OR "10113749" OR "10143324" OR "10174953" OR "10190783" OR "10203117" OR "10234144" OR "10247424" OR "10271686" OR "10271690" OR "10285531" OR "10309659" OR "10337745" OR "10364990" OR "10364991" OR "10383477" OR "10390656" OR "10405696" OR "10405697" OR "10405698" OR "10405699" OR "10413121" OR "10413122" OR "10426176" OR "10448785" OR "10448786" OR "10451285" OR "10492641" OR "10495319" OR "10495320" OR "10502433" OR "10512363" OR "10524615" OR "10598391" OR "10619862" OR "10627116" OR "10638882" OR "10660471" OR "10674853" OR "10674854" OR "10684022" OR "10694753" OR	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:21 PM

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		"20190328175" OR "20190380533" OR "20200033009" OR "20200033010" OR "20200072475" OR "20200132309" OR "20200138238" OR "20200138239" OR "20200149746" OR "20200182484" OR "20200187708" OR "20200187710" OR "20200200393" OR "20200200394" OR "20200200395" OR "20200208844" OR "20200229276" OR "20200268200" OR "20200288725" OR "20200309379" OR "20200323222" OR "20200329908" OR "20200329909" OR "20200345173" OR "20200352385" OR "20200378609" OR "20200383512" OR "6545251" OR "6593552" OR "6653602" OR "6758206" OR "6761159" OR "6878904" OR "6917017" OR "7064297" OR "7105778" OR "7105779" OR "7117866" OR "7227102" OR "7238921" OR "7250587" OR "7250588" OR "7297905" OR "7328654" OR "7339140" OR "7442901" OR "7703389" OR "8006685" OR "8035062" OR "8096231" OR "8212188" OR "8217314" OR "8274020" OR "8378265" OR "8389907" OR "8404292" OR "8517006" OR "8640608" OR					
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L2	1349	126/21A.ccls.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:43 PM
L3	696	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L4	1717	A47J27/004.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L5	168	A47J27/12.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L6	472	A47J37/0664.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:44 PM
L7	3998	L2 OR L3 OR L4 OR L5 OR L6	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:45 PM
L8	1955	L7 AND ((heating WITH element) OR heating\$1element)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
L9	1113	L8 AND (fan OR blower)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
L10	26	("10383477" "10390656 "10405696" "1040569 7" "10405698" "104131 21" "10413122" "10448 785" "10448786" "2019 0242590" "2019024683 5" "20190246836" "201 90254473" "201902544 74" "20190254476" "20 190254479" "20190269 276" "20190290062" "2 0190290072" "2019029 8105" "20190298106" " 20190307291" "201903 28175" "20200329909" " 20080052952" "20220 163212").PN.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/07 11:26 AM
L12	696	A47J37/0641.cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/07 11:27 AM
L13	6698	A47J37/0641.cpc.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:27 AM
L14	14410	(air ADJ fryer) OR air\$1fryer	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L15	7100	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:41 AM
L16	360	L14 AND (fan OR blower)	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 11:41 AM

L17	13	("20020189463" "20050051034" "20080237212" "20130052310" "20160192808" "20170135523" "20180303285").pn. OR ("10575679").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 11:43 AM
L18	3556	L13 AND @py<="2019"	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L19	1866	L18 AND (blower OR fan)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L20	45	("2524272" "3384068" "3587557" "3590803").pn. OR ("3973551").urpn. AND (PGPB USPT USOC).dbnm.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 12:41 PM
L21	189	("2563253" "2704802" "3210511" "3548152" "3581038" "3783832" "3813216" "3828760" "3973551" "4154861" "4160144" "4160145" "4283614" "4316069" "4327279" "4337384" "4338911" "4350504" "4354083" "4403128" "4409453" "4431889" "4437396" "4464554" "4480164" "4494525" "4737373" "4752268" "4786774" "4849597" "4924763" "4949629" "4958412" "4965435" "5025775" "5161889" "5166487" "5204503" "5205274" "5277105" "5369250" "5401940" "5555795" "5676870" "5717192" "5818014" "5825000" "5826496" "5927265" "5934178" "5994672" "6012442" "6058924" "6060701" "6114664" "6250296" "6369360" "6376817" "6399930" "6403937"	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 12:46 PM

		"6437303" "6472640" "6472647" "6481999" "6655373" "6712063" "6713741" "6874495" "6909078" "7055518" "7087872" "7360533" "7507938" "20010054605" "20020162833" "20020179588" "20030226452" "20040118392" "20040123858" "20040200828" "20040211765" "20040216732" "20050217503" "20060169272" "20070137633" "20070194011" "20080099008" "20080105133" "20080105135" "20080105136" "20080105249" "20080106483" "20080206420" "20080216812" "20080296284").pn. OR ("8011293").urpn. AND (PGPB USPT USOC).dbnm.					
L22	1	"10575679".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 05:28 PM
L23	2936	(((("MARTIN") near3 ("Christopher")) OR ((("GUERIN") near3 ("Thomas")) OR ((("JACKSON") near3 ("Roger")) OR ((("ANTHONY") near3 ("Joshua")) OR ((("SCHWARZ") near3 ("Kerry")) OR ((("DUBEAU") near3 ("Michaela")))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:27 PM
L24	172	L23 AND cooking	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:28 PM
L25	158	L23 AND cooking	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 06:28 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17159414
	Filing Date	2021-01-27
	First Named Inventor	Christopher Martin
	Art Unit	NA
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	057664-348N01US

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	1	20170071408	A1	2017-03-16	Veltrop et al.	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher Martin
Art Unit	NA
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

1	
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EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher Martin
Art Unit	NA
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2023-04-13
Name/Print	Lisa Adams	Registration Number	44,238

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: Not Yet Assigned

For: **COOKING DEVICE AND COMPONENTS
THEREOF**

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the “References Cited” on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copy of U.S. publication is not submitted.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be

an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

Please charge our Deposit Account No. 50-0311 in the amount of \$260.00 covering the fee set forth in 37 C.F.R. § 1.17(p). However, if a fee is due, please charge our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: April 13, 2023

Respectfully submitted,

By: /Lisa Adams/

Lisa Adams

Registration No.: 44,238

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 348-3054

Attorney for Applicant



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
04/13/2023 11:17:48 AM ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Deepti Rastogi
PATENT CENTER #	61913891	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Lisa Adams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US_17159414_IDS_Transmittal.pdf	2	Transmittal Letter	104 KB
17159414_SIDS_Apr_13_2023.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1234 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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17159414_SIDS_Apr_13_2023. pdf	DA0A09D62963F1BEEDFBBA506F0C5DE6F5A25D83C2DF4728 AE6A99B4BDF1F3315E7C51EBA65C366A05DCD59AAF8BB70C CD170DFE65A7633D8DF08202269ED2DA

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US

CONFIRMATION NO. 3603

PUBLICATION NOTICE



OC000000137108199

177399
Mintz Levin/SharkNinja
One Financial Center
Boston, MA 02111

Title:COOKING DEVICE AND COMPONENTS THEREOF

Publication No.US-2022-0408966-A1

Publication Date:12/29/2022

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Christopher T. Martin, et al.

FILING DATE January 27, 2021

EXAMINER: CENTRAL, DOCKET

SERIAL NUMBER 17/159,414

ART UNIT: OPAP

FOR: COOKING DEVICE AND COMPONENTS THEREOF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR STATUS OF FIRST ACTION

Applicant kindly request that the undersigned attorney be informed of the status of the above-referenced patent application filed on January 27, 2021. To date, the subject patent application has not been assigned an Examiner Name or Group Art Unit.

No fees are believed due in connection with this communication. However, the Commissioner is authorized to credit any overpayment or charge any deficiencies to Deposit Account No. 50-0311, Reference No. 057664-348N01US.

Respectfully Submitted,

Dated: November 30, 2022

/Lisa Adams /

Lisa Adams

Registration No.: 44,238

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 542-6000

Attorney for Applicant

Electronic Acknowledgement Receipt

EFS ID:	47116805
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	177399
Filer:	Lisa Adams/Valerie Borry
Filer Authorized By:	Lisa Adams
Attorney Docket Number:	057664-348N01US
Receipt Date:	30-NOV-2022
Filing Date:	27-JAN-2021
Time Stamp:	17:11:28
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for status of Application	057664348N01USRequestStatus.pdf	108073 cc0b2e1f2f5cea501458e1184f48f4ca1f0be01d	no	1

Warnings:

Information:	
Total Files Size (in bytes):	108073
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17159414
	Filing Date	2021-01-27
	First Named Inventor	Christopher T. Martin
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	057664-348N01US

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	1	105615640	CN	A	2016-06-01	Huichi Development Co., Limited		
	2	205849310	CN	U	2017-01-04	Liu Jianchang		
	3	206675433	CN	U	2017-11-28	Yunnan Lingyuexuan Food Co., Ltd.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	N/A	
	Examiner Name	Not Yet Assigned	
	Attorney Docket Number	057664-348N01US	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2022-11-18
Name/Print	Lisa Adams	Registration Number	44,238

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Espacenet

Bibliographic data: CN206675433 (U) — 2017-11-28

Even cake that is heated toasts equipment

Inventor(s): WANG GUIPING ± (王桂平)

Applicant(s): YUNNAN LINGYUEXUAN FOOD CO LTD ± (云南凌悦轩食品有限公司)

Classification: - **international:** **A47J37/06**
- **cooperative:**

Application number: CN20172005968U 20170104

Priority number(s): CN20172005968U 20170104

Abstract of CN206675433 (U)

The utility model discloses an even cake that is heated toasts equipment, including box, furnace gate, controlling means and universal wheel, box and furnace gate swing joint, the box surface is equipped with controlling means, the furnace gate surface is equipped with heat -resisting tempering glass window and handle, and the handle is located heat -resisting tempering glass window top, the controlling means surface is equipped with thermoregulator and timer, and the thermoregulator is located the timer top. The utility model discloses a two piece upper and lower heating pipes can make thermally equivalent about the material, when starting, upper and lower heating pipe concurrent heating, the fan starts simultaneously, the hot -air pass through the furnace gate about from top to bottom the inner wall rebound in proper order, intracavity circulation including all the time, the messenger is heated more evenly, has reduced thermal loss simultaneously, the side is equipped with nylon matter tool bag, and the instrument can convenient and fast when using takes out the use to categorised income that can be convenient, though the universal wheel equipment of bottom heavier also can make things convenient for laborsaving with its removal.



(12)实用新型专利

(10)授权公告号 CN 206675433 U

(45)授权公告日 2017. 11. 28

(21)申请号 201720005968.2

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(51)Int.Cl.

A47J 37/06(2006.01)

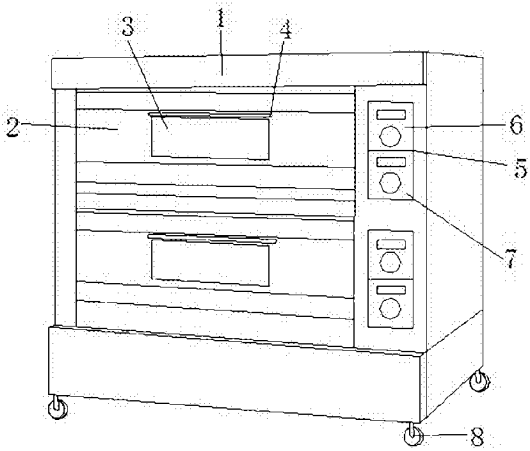
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(54)实用新型名称

一种受热均匀的糕点烘烤设备

(57)摘要

本实用新型公开了一种受热均匀的糕点烘烤设备,包括箱体、炉门、控制装置和万向轮,所述箱体和炉门活动连接,所述箱体表面设有控制装置,所述炉门表面设有耐热钢化玻璃窗和把手,且把手位于耐热钢化玻璃窗上方,所述控制装置表面设有调温器和定时器,且调温器位于定时器上方。本实用新型通过上下两根加热管,可以使材料上下均匀受热,当启动时,上下加热管同时加热,风机同时启动,热空气通过炉门上下左右内壁依次反弹,始终在内腔内循环,使受热更为均匀,同时减少了热量的损耗;侧面设有尼龙质工具袋,在使用时工具可以方便快捷的取出使用,并且可以方便的分类收入,底部的万向轮即使设备较重也可以方便省力将其移动。



CN 206675433 U

1. 一种受热均匀的糕点烘烤设备,包括箱体(1)、炉门(2)、控制装置(5)和万向轮(8),其特征在于:所述箱体(1)和炉门(2)活动连接,所述箱体(1)表面设有控制装置(5),所述炉门(2)表面设有耐热钢化玻璃窗(3)和把手(4),且把手(4)位于耐热钢化玻璃窗(3)上方,所述控制装置(5)表面设有调温器(6)和定时器(7),且调温器(6)位于定时器(7)上方,所述箱体(1)内部设有内腔(9),所述内腔(9)内部顶端设有耐高温照明灯(10),所述内腔(9)内部设有上加热管(11)和下加热管(14),且上加热管(11)位于下加热管(14)上方,所述内腔(9)内部设有烤架(13),且烤架(13)位于上加热管(11)与下加热管(14)之间,所述内腔(9)底端设有烤盘(15),所述内腔(9)内表面设有风机挡板(12),所述风机挡板(12)一侧设有风机(17),所述箱体(1)一侧设有工具袋(16),所述箱体(1)底端设有万向轮(8)。

2. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述上加热管(11)和下加热管(14)为石英加热管。

3. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述烤盘(15)为不锈钢金属烤盘。

4. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述工具袋(16)为尼龙材质。

5. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述工具袋(16)数量为若干个。

一种受热均匀的糕点烘烤设备

技术领域

[0001] 本实用新型涉及一种糕点加工技术领域,特别涉及一种受热均匀的糕点烘烤设备。

背景技术

[0002] 糕点制作离不开烘烤,随着社会的发展,在最开始的在外面购买糕点,到现在已经有很多人选择自己制作糕点,烤箱正逐渐走入我们的家庭之中;目前大多数烤箱内部加热管都是设有一个,即使设有两个加热管,在烤制时受热方面还是很不均匀,在烤制时需要经常对材料翻面,很多时候出现一面烤制都已经过火了,另外一面刚刚好,并且一些烤制工具,如模具,防烫手套,金属夹等等这些工具使用时非常凌乱让人手忙脚乱,并且箱体大多比较笨重,移动时非常的费力。为此,我们提出一种受热均匀的糕点烘烤设备。

[0003] 【实用新型内容】

[0004] 本实用新型的主要目的在于提供一种受热均匀的糕点烘烤设备,可以有效解决背景技术中的问题。

[0005] 为实现上述目的,本实用新型采取的技术方案为:

[0006] 一种受热均匀的糕点烘烤设备,包括箱体、炉门、控制装置和万向轮,所述箱体和炉门活动连接,所述箱体表面设有控制装置,所述炉门表面设有耐热钢化玻璃窗和把手,且把手位于耐热钢化玻璃窗上方,所述控制装置表面设有调温器和定时器,且调温器位于定时器上方,所述柜体内部设有内腔,所述内腔内部顶端设有耐高温照明灯,所述内腔内部设有上加热管和下加热管,且上加热管位于下加热管上方,所述内腔内部设有烤架,且烤架位于上加热管与下加热管之间,所述内腔底端设有烤盘,所述内腔内表面设有风机挡板,所述风机挡板一侧设有风机,所述箱体一侧设有工具袋,所述箱体底端设有万向轮。

[0007] 进一步地,所述上加热管和下加热管为石英加热管。

[0008] 进一步地,所述烤盘为不锈钢金属烤盘。

[0009] 进一步地,所述工具袋为尼龙材质。

[0010] 进一步地,所述工具袋数量为若干个。

[0011] 与现有技术相比,本实用新型具有如下有益效果:本实用新型通过上下两根加热管,可以使材料上下均匀受热,当启动时,上下加热管同时加热,风机同时启动,热空气通过炉门上下左右内壁依次反弹,始终在内腔内循环,使受热更为均匀,同时减少了热量的损耗;侧面设有尼龙质工具袋,在使用时工具可以方便快捷的取出使用,并且可以方便的分类收入,底部的万向轮即使设备较重也可以方便省力将其移动。

[0012] 【附图说明】

[0013] 图1为本实用新型一种受热均匀的糕点烘烤设备的整体结构示意图。

[0014] 图2为本实用新型一种受热均匀的糕点烘烤设备的内腔结构示意图。

[0015] 图3为本实用新型一种受热均匀的糕点烘烤设备的侧面结构示意图。

[0016] 图4为本实用新型一种受热均匀的糕点烘烤设备的挡板结构示意图。

[0017] 图中:1、箱体;2、炉门;3、耐热钢化玻璃窗;4、把手;5、控制装置;6、调温器;7、定时器;8、万向轮;9、内腔;10、耐高温照明灯;11、上加热管;12、风机挡板;13、烤架;14、下加热管;15、烤盘;16、工具袋;17、风机。

[0018] 【具体实施方式】

[0019] 为使本实用新型实现的技术手段、创作特征、达成目的与功效易于明白了解,下面结合具体实施方式,进一步阐述本实用新型。

[0020] 如图1-4所示,一种受热均匀的糕点烘烤设备,包括箱体1、炉门2、控制装置5和万向轮8,所述箱体1和炉门2活动连接,所述箱体1表面设有控制装置5,所述炉门2表面设有耐热钢化玻璃窗3和把手4,且把手4位于耐热钢化玻璃窗3上方,所述控制装置5表面设有调温器6和定时器7,且调温器6位于定时器7上方,所述箱体1内部设有内腔9,所述内腔9内部顶端设有耐高温照明灯10,所述内腔9内部设有上加热管11和下加热管14,且上加热管11位于下加热管14上方,所述内腔9内部设有烤架13,且烤架13位于上加热管11与下加热管14之间,所述内腔9底端设有烤盘15,所述内腔9内表面设有风机挡板12,所述风机挡板12一侧设有风机17,所述箱体1一侧设有工具袋16,所述箱体1底端设有万向轮8。

[0021] 本实用新型一种受热均匀的糕点烘烤设备,本实用新型通过上下两根加热管,可以使材料上下均匀受热,当启动时,上下加热管同时加热,风机同时启动,热空气通过炉门上下左右内壁依次反弹,始终在内腔内循环,使受热更为均匀,同时减少了热量的损耗;侧面设有尼龙质工具袋,在使用时工具可以方便快捷的取出使用,并且可以方便分类收入,底部的万向轮即使设备较重也可以方便省力将其移动。

[0022] 其中,所述上加热管11和下加热管14为石英加热管。

[0023] 其中,所述烤盘15为不锈钢金属烤盘。

[0024] 其中,所述工具袋16为尼龙材质。

[0025] 其中,所述工具袋16数量为若干个。

[0026] 需要说明的是,本实用新型为一种受热均匀的糕点烘烤设备,使用时将材料置于烤架13上,通过调温器6与定时器7调整所需要的烘烤温度与时间,当启动时,上加热管11与下加热管14同时加热,此时风机17同时启动,热空气通过炉门2上下左右内壁依次反弹,始终在内腔9内循环,使材料更为均匀受热并且减少了热能的多余损耗;内腔9底部的烤盘15不仅可以盛接烤制时材料掉落的油污,残渣等,亦可以在烤制当做托盘,其不锈钢金属材质也会使其受热更快更为均匀。

[0027] 以上显示和描述了本实用新型的基本原理和主要特征和本实用新型的优点。本行业的技术人员应该了解,本实用新型不受上述实施例的限制,上述实施例和说明书中描述的只是说明本实用新型的原理,在不脱离本实用新型精神和范围的前提下,本实用新型还会有各种变化和改进,这些变化和改进都落入要求保护的本实用新型范围内。本实用新型要求保护范围由所附的权利要求书及其等效物界定。

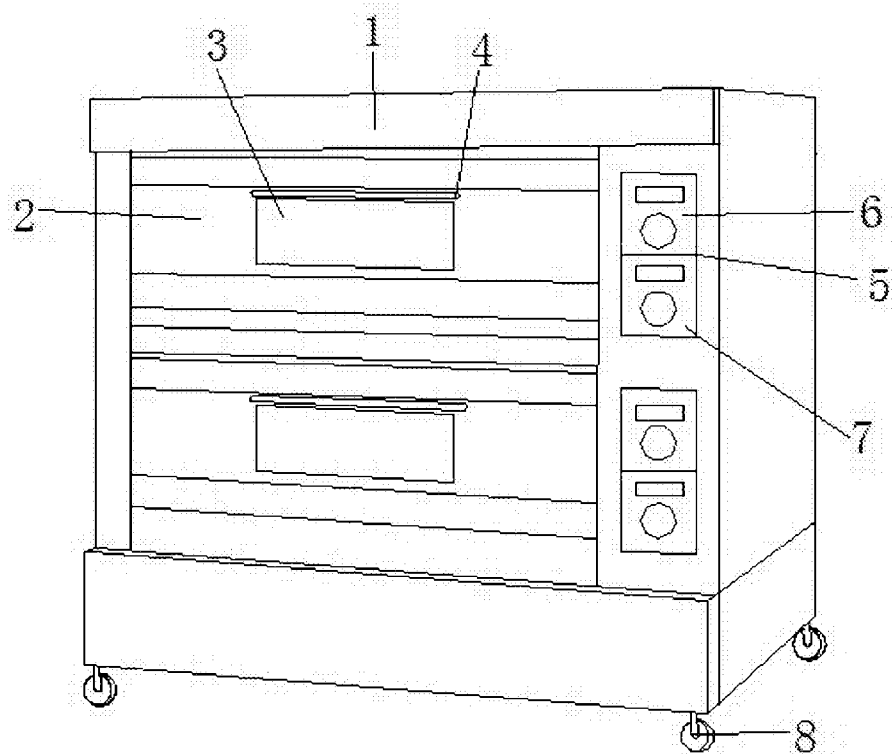


图1

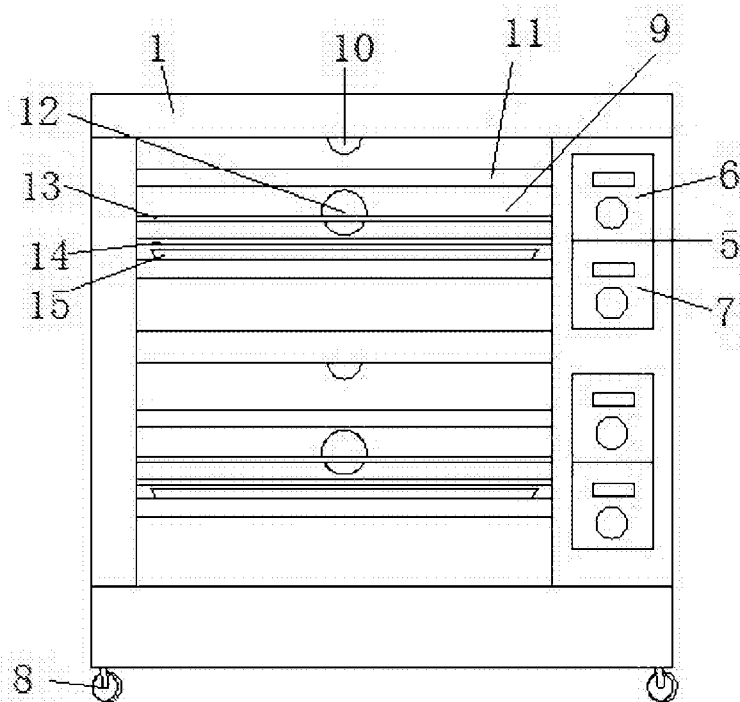


图2

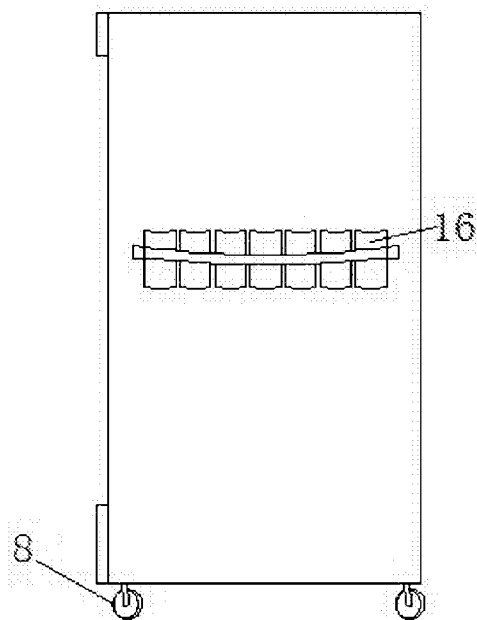


图3

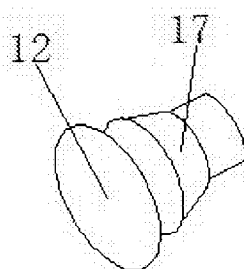


图4



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APPLICATION #
17/159,414

RECEIPT DATE / TIME
11/18/2022 11:32:47 AM ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Rajiv Kumar
PATENT CENTER #	61195888	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Lisa Adams

Documents

TOTAL DOCUMENTS: 5

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US_17159414_Docketed_New_Case_SIDS_Nov_18_2022.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1234 KB
057664-348N01US_17159414_Docketed_New_Case_Transmittal.pdf	2	Transmittal Letter	95 KB
CN_105615640_A.pdf	14	Foreign Reference	978 KB
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7

Foreign Reference

493 KB

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DOCUMENT	MESSAGE DIGEST(SHA-512)
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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: Not Yet Assigned

For: **COOKING DEVICE AND COMPONENTS
THEREOF**

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copy of a U.S. patent are not submitted. Submitted herewith are copies of foreign patents in accordance with 37 C.F.R. § 1.98(a)(2).

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with

37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

All fees due are believed to be paid. The Director is hereby authorized to charge any deficiency in the fees filed with this paper, asserted to be filed with this paper, or which should have been filed with this paper, to our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: November 18, 2022

Respectfully submitted,

Electronic signature: /Lisa Adams/

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**Espacenet****Bibliographic data: CN205849310 (U) — 2017-01-04**

Electric oven

Inventor(s): LIU JIANCHANG ± (刘建厂)
Applicant(s): LIU JIANCHANG ± (刘建厂)
Classification: - **international:** **A47J37/06**
- **cooperative:**
Application number: CN201620486435U 20160525
Priority number(s): CN201620486435U 20160525

Abstract of CN205849310 (U)

The utility model discloses an electric oven, including the furnace body, be equipped with two baking chamber in the furnace body at least, the furnace body front side corresponds every baking chamber and is equipped with the pull mouth, is equipped with the overware that can follow the pull mouth and take out in the baking chamber, and the inherent overware top of baking chamber is equipped with a heating device, is equipped with the 2nd heating device below the overware, and the heating device electricity in every baking chamber is connected with control switch, the furnace body top is equipped with roast board in advance, and the furnace body inherence is corresponding the 3rd heating device that is equipped with in roast board below in advance. The utility model discloses in every baking chamber all can carry out toasting of food alone, can choose for use the baking chamber of suitable quantity to toast according to passenger flow volume during the use to the adjustment baking guarantees that food both can satisfy the supply, prevents again that processing is excessive. The furnace body top is equipped with roast board in advance, and the furnace body inherence is corresponding the 3rd heating device that is equipped with in roast board below in advance, can carry out the preliminary drying to food and bake.



(12)实用新型专利

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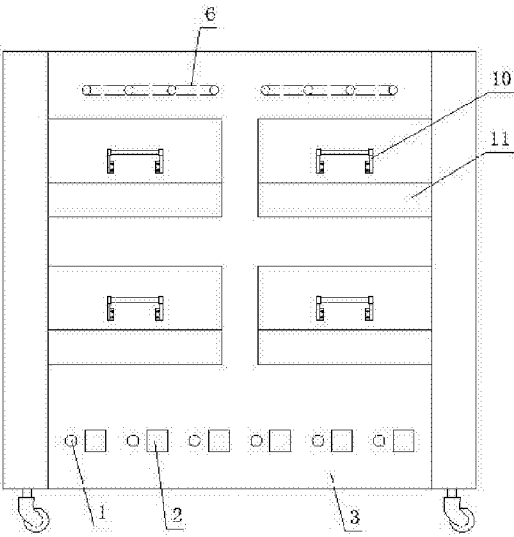
权利要求书1页 说明书3页 附图3页

(54)实用新型名称

电烤炉

(57)摘要

本实用新型公开了一种电烤炉,包括炉体,炉体内至少设有两个烘烤腔,炉体前侧对应每个烘烤腔设有抽拉口,烘烤腔内设有可从抽拉口抽出的烤盘,烘烤腔内在烤盘上方设有第一加热装置、在烤盘下方设有第二加热装置,每个烘烤腔内的加热装置电连接有控制开关;炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置。本实用新型中每个烘烤腔均可单独进行食品的烘烤,使用时可根据客流量选用合适数量的烘烤腔进行烘烤,从而调整烘烤量,保证食品既可满足供应,又防止加工过量。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置,可以对食品进行预烘烤。



CN 205849310 U

1.一种电烤炉,包括炉体(3),其特征是所述炉体内至少设有两个烘烤腔,所述炉体前侧对应每个烘烤腔设有抽拉口,所述烘烤腔内设有可从抽拉口抽出的烤盘(7),所述烘烤腔内在烤盘(7)上方设有第一加热装置(4)、在烤盘(7)下方设有第二加热装置(5),每个烘烤腔内的加热装置电连接有控制开关;所述炉体顶部设有预烤板,所述炉体内在预烤板下方对应设有第三加热装置(6)。

2.根据权利要求1所述的电烤炉,其特征是所述烘烤腔内的第一加热装置(4)和第二加热装置(5)串联设置,所述炉体前侧设有控制开关,所述控制开关电连接在第一加热装置(4)和第二加热装置(5)的供电回路上,所述烘烤腔内设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第一加热装置(4)和第二加热装置(5)的供电回路上。

3.根据权利要求1所述的电烤炉,其特征是所述炉体内在预烤板下方设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第三加热装置(6)的供电回路上。

4.根据权利要求1所述的电烤炉,其特征是所述第一加热装置(4)和第二加热装置(5)均为电热管。

5.根据权利要求1所述的电烤炉,其特征是所述第三加热装置(6)包括两根电热管,两根电热管分设在炉体的左右两侧并分别电连接有控制开关。

6.根据权利要求1所述的电烤炉,其特征是所述烤盘(7)包括多条沿左右方向间隔设置的支撑条,支撑条的前端固接在上封板上,支撑条的后端通过横向设置的连接杆连接,所述上封板的前侧设有把手,所述烘烤腔内在第二加热装置(5)下方设有接油盘(8),所述接油盘(8)的前端固接在下封板(11)上,所述下封板和上封板共同将抽拉口封闭。

7.根据权利要求1至6中任一项所述的电烤炉,其特征是所述炉体内设有四个烘烤腔,其中两个烘烤腔设置在炉体左侧并上下对应设置,另外两个烘烤腔设置在炉体右侧并上下对应设置。

8.根据权利要求7所述的电烤炉,其特征是位于同侧的两个烘烤腔沿前后方向的长度一致。

9.根据权利要求1至6中任一项所述的电烤炉,其特征是所述炉体内设有两个烘烤腔,两个烘烤腔左右对称设置。

10.根据权利要求9所述的电烤炉,其特征是所述炉体在烘烤腔下方设有存储腔,所述炉体前侧对应存储腔设有开口并对应开口设有可将开口封闭的箱门(9)。

电烤炉

技术领域

[0001] 本实用新型涉及一种电烤炉。

背景技术

[0002] 市面上的电烤炉一般只有一个烘烤腔,烘烤腔内放置多个烘烤盘,此种电烤炉可一次性制作较多食品,适应于客流量较大的食品店,但是部分食品店的客流量不稳定,客流量时大时小,若一次性烤制较多食品,未在较短时间内卖完,其口味会变差,口味变差后卖给食客,会影响食品店的回头率,若剩下的食品不卖,又会严重亏本,影响食品店的盈利。而用较小的电烤炉,一次性烤制量小,耗电低,可在较短时间内卖完,但是当客流量大时,其供不应求,顾客等待时间延长,顾客流失的可能性增大。

发明内容

[0003] 本实用新型要解决的技术问题是提供一种可调节烘烤量的电烤炉。

[0004] 为解决上述技术问题,本实用新型包括炉体,其结构特点是所述炉体内至少设有两个烘烤腔,所述炉体前侧对应每个烘烤腔设有抽拉口,所述烘烤腔内设有可从抽拉口抽出的烤盘,所述烘烤腔内在烤盘上方设有第一加热装置、在烤盘下方设有第二加热装置,每个烘烤腔内的加热装置电连接有控制开关;所述炉体顶部设有预烤板,所述炉体内在预烤板下方对应设有第三加热装置。

[0005] 所述烘烤腔内的第一加热装置和第二加热装置串联设置,所述炉体前侧设有控制开关,所述控制开关电连接在第一加热装置和第二加热装置的供电回路上,所述烘烤腔内设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第一加热装置和第二加热装置的供电回路上。

[0006] 所述炉体内在预烤板下方设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第三加热装置的供电回路上。

[0007] 所述第一加热装置和第二加热装置均为电热管。

[0008] 所述第三加热装置包括两根电热管,两根电热管分设在炉体的左右两侧并分别电连接有控制开关。

[0009] 所述烤盘包括多条沿左右方向间隔设置的支撑条,支撑条的前端固接在上封板上,支撑条的后端通过横向设置的连接杆连接,所述上封板的前侧设有把手,所述烘烤腔内在第二加热装置下方设有接油盘,所述接油盘的前端固接在下封板上,所述下封板和上封板共同将抽拉口封闭。

[0010] 所述炉体内设有四个烘烤腔,其中两个烘烤腔设置在炉体左侧并上下对应设置,另外两个烘烤腔设置在炉体右侧并上下对应设置。

[0011] 位于同侧的两个烘烤腔沿前后方向的长度一致。

[0012] 所述炉体内设有两个烘烤腔,两个烘烤腔左右对称设置。

[0013] 所述炉体在烘烤腔下方设有存储腔,所述炉体前侧对应存储腔设有开口并对应开口设有可将开口封闭的箱门。

[0014] 采用上述结构后,本实用新型中炉体内设有多个烘烤腔,烘烤腔内在烤盘上方设有第一加热装置、在烤盘下方设有第二加热装置,每个烘烤腔内的加热装置电连接有控制开关,此种结构的烤炉每个烘烤腔均可单独进行食品的烘烤,使用时可根据客流量选用合适数量的烘烤腔进行烘烤,从而调整烘烤量,保证食品既可满足供应,又防止加工过量。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置,可以对食品进行预烘烤。

附图说明

[0015] 下面结合附图及具体实施方式对本实用新型作进一步详细说明:

[0016] 图1为本实用新型第一种实施例的结构示意图;

[0017] 图2为本实用新型第二种实施例的结构示意图;

[0018] 图3为烘烤腔内部的结构示意图;

[0019] 图4为图3沿A-A线剖视的结构示意图。

具体实施方式

[0020] 如图1、图3和图4所示,电烤炉包括炉体3,炉体底面四角设有可锁止的行走轮。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置6,本实施例中第三加热装置6包括两根电热管,两根电热管分设在炉体的左右两侧,两根电热管分别电连接有控制开关1,控制开关1设置在炉体前侧下部,每根电热管弯折呈蛇形。炉体内至少设有两个烘烤腔,本实施例中炉体内设有四个烘烤腔,其中两个烘烤腔设置在炉体左侧并上下对应设置,另外两个烘烤腔设置在炉体右侧并上下对应设置,本实施例中位于同侧的两个烘烤腔沿前后方向的长度一致,位于不同侧的烘烤腔长度不一致,使用时可根据烧烤的量选用前后长度合适的烘烤腔加工食品,同时第三加热装置6也可只开启对应侧的电热管,可节约用电量。炉体前侧对应每个烘烤腔设有抽拉口,烘烤腔内设有可从抽拉口抽出的烤盘7,烘烤腔内设有用于对烤盘7支撑并供烤盘7滑动的支撑装置,支撑装置可选用角钢焊接在烘烤腔的腔壁上形成,烘烤腔内在烤盘7上方设有第一加热装置4、在烤盘7下方设有第二加热装置5,本实用新型中第一加热装置4和第二加热装置5均选用价格较低廉、使用效果好的电热管。本实施例中烤盘7包括多条沿左右方向间隔设置的支撑条,支撑条的前端固接在上封板上,支撑条的后端通过横向设置的连接杆连接,连接杆和支撑条可均选用钢条制成,上封板的前侧设有用于抽拉烤盘7的把手10。此种结构的烤盘7,需在其下部设置接油盘8,本实施例中接油盘8设置在第二加热装置5下方,其下表面直接与腔壁的下部接触实现支撑,接油盘8的大小与烤盘7的大小相适应,接油盘8的前端固接在下封板11上,下封板11和上封板共同将抽拉口封闭。前述结构的烤盘7,其上下贯通,烘烤腔内第一加热装置4和第二加热装置5加热后,热量扩散均匀,烘烤出的食品味道更好。本实用新型中烤盘也可直接选用底部由平板支撑的烤盘,选用此种烤盘的烤炉不需再设置接油盘8。

[0021] 本实用新型中为更好的固定电热管,在烘烤腔前侧固装有沿左右方向设置的支撑板12,支撑板12位于电热管的下方,支撑板12上固装有将电热管锁紧的锁紧片13,锁紧片13

的两个自由端分设在电热管两侧并固接在支撑板上,实现对电热管的支撑与固定。

[0022] 如图2所示,为本实用新型的第二种实施例,其与第一种实施例的不同之处在于:炉体内仅设有两个烘烤腔,两个烘烤腔左右对称设置。炉体在烘烤腔下方设有存储腔,炉体前侧对应存储腔设有开口并对应开口设有可将开口封闭的箱门9。此种结构的烤炉适宜客流量较小的食品店。

[0023] 本实用新型中同一个烘烤腔内的第一加热装置4和第二加热装置5串联设置,炉体前侧设有控制开关1,控制开关1电连接在第一加热装置4和第二加热装置5的供电回路上,烘烤腔内设有温度传感器,温度传感器电连接有温度显示装置2,温度显示装置2安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第一加热装置4和第二加热装置5的供电回路上。

[0024] 本实用新型中炉体内在预烤板下方左侧和右侧分别设有温度传感器,每个温度传感器电连接有温度显示装置2,温度显示装置2安装在炉体前侧,温度传感器还电连接有温控开关,温控开关电连接在电热管的供电回路上,从而实现两个电热管的单独控制。

[0025] 本实用新型在使用时,当烤制区内的温度达到设定温度后,温控开关切断加热装置的供电回路,加热装置停止加热,当烤制区的温度低于设定值时,温控开关接通加热装置的供电回路,加热装置重新工作,以维持烤制区的温度,使食品在烤制过程中,受热均匀,保证食品风味。使用者可根据烤制的具体情况调整温控开关的设定温度,使火烧烤炉内的温度始终保持在适宜温度。

[0026] 本实用新型中炉体内设有多个烘烤腔,烘烤腔内在烤盘7上方设有第一加热装置4、在烤盘7下方设有第二加热装置5,每个烘烤腔内的加热装置电连接有控制开关1,此种结构的烤炉每个烘烤腔均可单独进行食品的烘烤,使用时可根据客流量选用合适数量的烘烤腔进行烘烤,从而调整烘烤量,保证食品既可满足供应,又防止加工过量。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置6,可以对食品进行预烘烤,且第三加热装置6左侧和右侧的电热管可根据下部烘烤腔的工作状态单独开启,更好利用下部烘烤腔辐射出的热量,降低能耗。

[0027] 以上所述仅为本实用新型的优选实施例,并不用于限制本实用新型。前述实施例对本实用新型进行了详细的说明,对于本领域的技术人员来说,其依然可以对前述各实施例所记载的技术方案进行修改,或者对其中部分技术特征进行等同替换。但凡在本实用新型的发明构思范围之内,所做的任何修改、等同替换、改进等,均包含在本实用新型的保护范围之内。

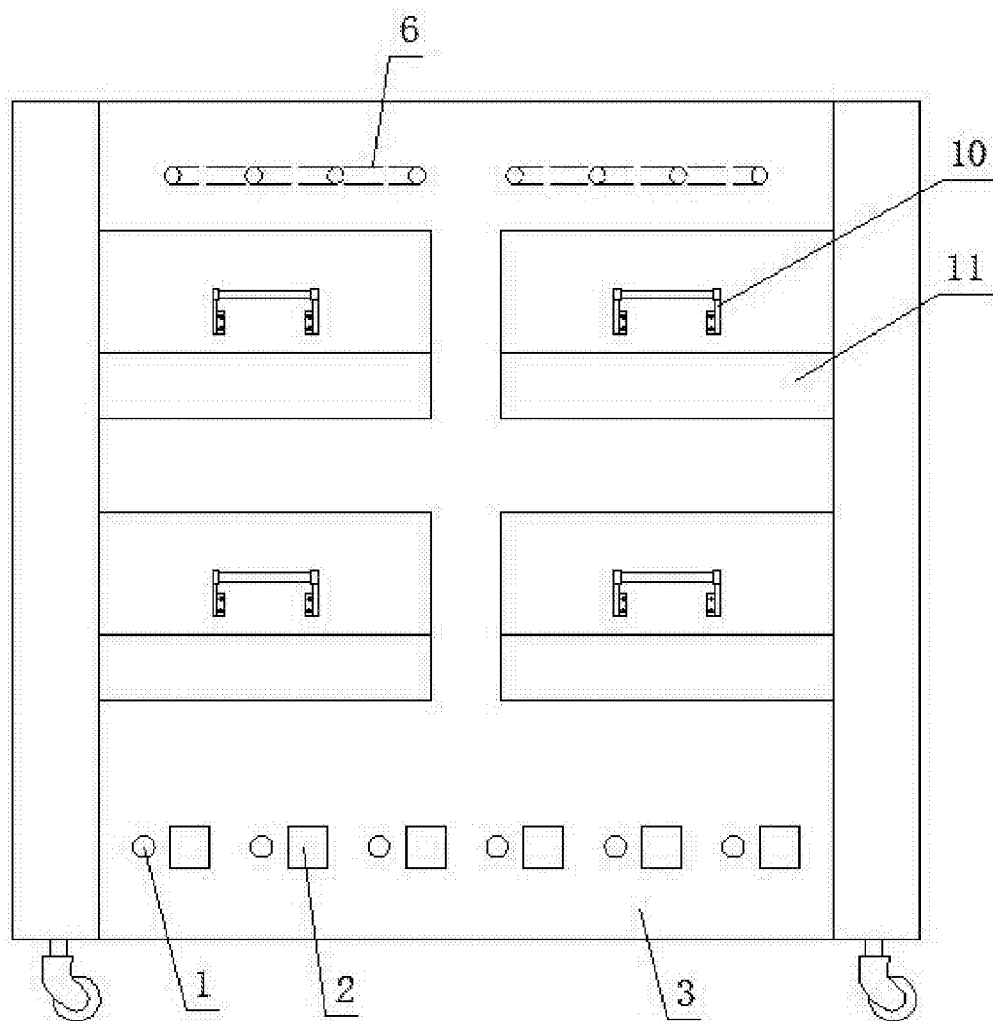


图1

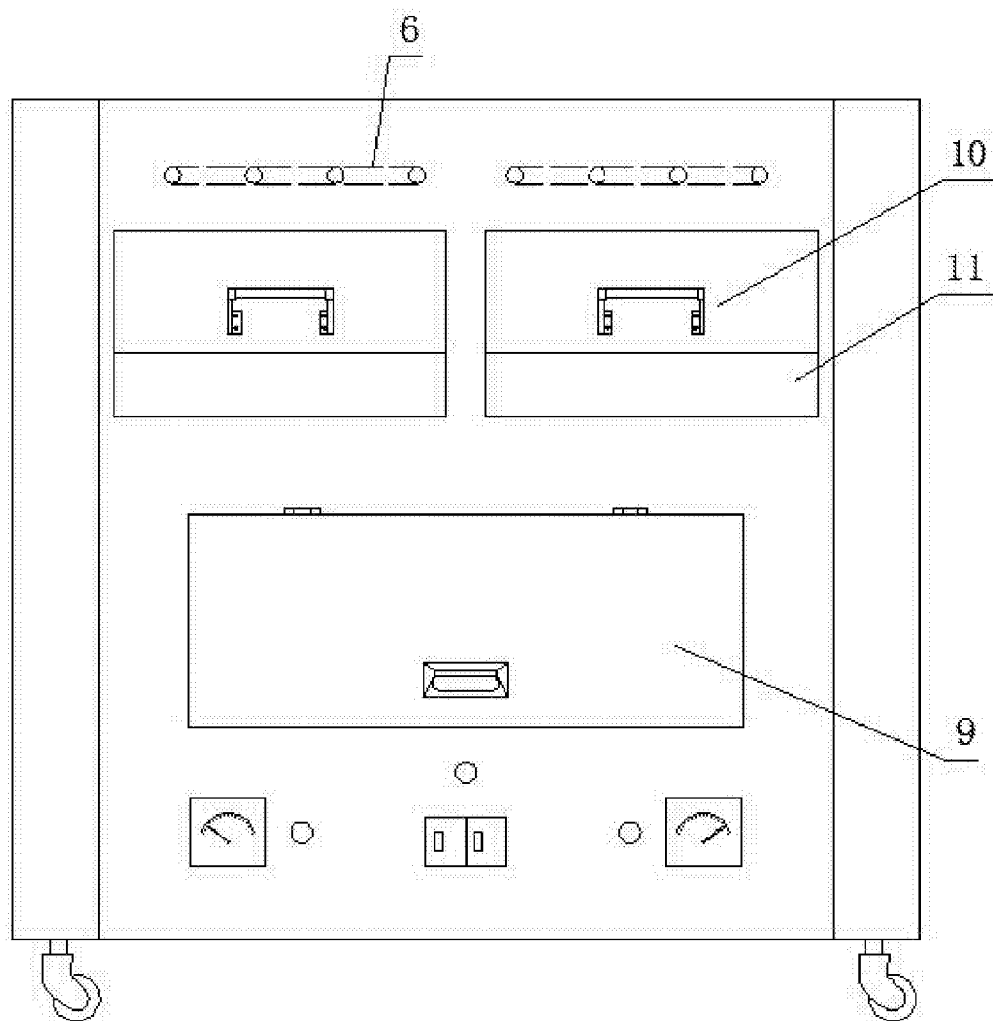


图2

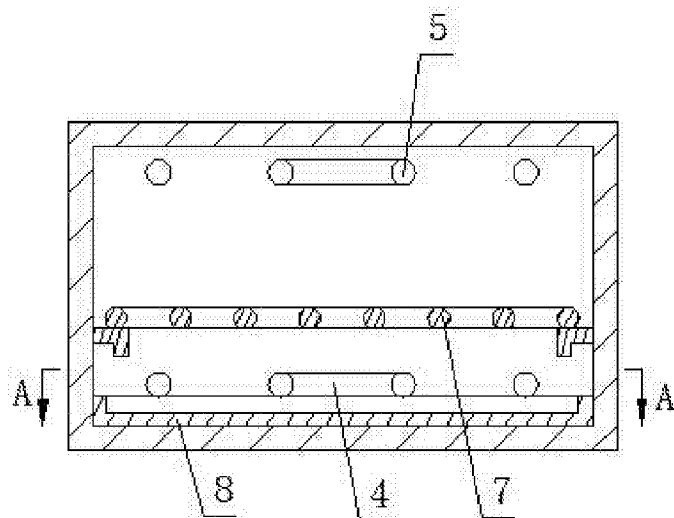


图3

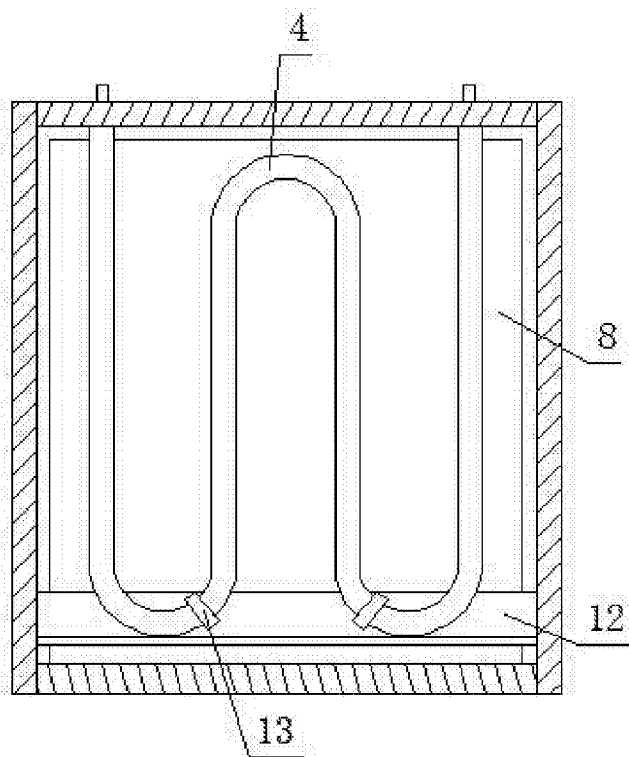


图4

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Cooking device and cooking method

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Abstract of CN105615640 (A)

The invention relates to a cooking device. The cooking device comprises a shell, a base, an inner container, a cover and a heating module, a transparent window is arranged on the cover, the cooking device further comprises a control module and an exhaust module, the control module comprises a processor and an input panel connected with the processor, the heating module comprises a bottom heating unit positioned in a containing cavity which is connected with the processor, the inner container is arranged in the containing cavity and positioned above the bottom heating unit, the exhaust module comprises an air inflation element, an air suction element, an air incoming passage and an air exhausting passage, and the air suction element is used for sucking out mist or lampblack positioned in the inner container before the cover is opened and continues running after the cover is opened. The invention further provides a cooking method. The cooking device has the advantages of compact structure and capability of avoiding lampblack pollution.



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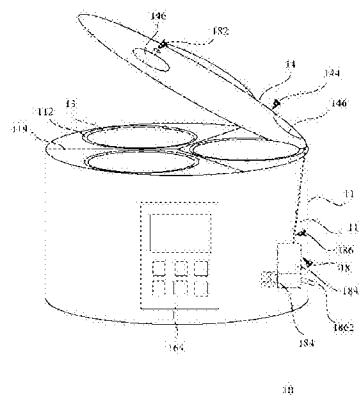
权利要求书1页 说明书6页 附图5页

(54) 发明名称

烹饪装置及烹饪方法

(57) 摘要

本发明涉及一种烹饪装置及烹饪方法。上述烹饪装置包括壳体、底座、内胆、盖体及加热模块，该盖体上设有透明视窗，该烹饪装置还包括控制模块与排气模块，该控制模块包括处理器及与该处理器相连的输入面板，该加热模块具有位于该容纳腔内的底部加热单元，该底部加热单元与该处理器连接，该内胆设于该容纳腔内且在该底部加热单元的上方，该排气模块包括充气元件、抽气元件、进气通道及排气通道，该抽气元件用于在打开该盖体前抽出位于该内胆内的雾气或油烟且在该盖体打开后继续运行。本发明还提供一种烹饪方法。上述烹饪装置具有结构较为紧凑且可以避免油烟污染的优点。



1. 一种烹饪装置,其包括壳体、底座、内胆、盖体及加热模块,该壳体设于该底座上,该壳体内具有容纳腔,该内胆位于该容纳腔内,该盖体设于该壳体上且与该容纳腔的开口相配合,其特征在于,该烹饪装置还包括控制模块与排气模块,该控制模块包括处理器及与该处理器相连的输入面板,该加热模块具有位于该容纳腔内的底部加热单元,该底部加热单元与该处理器连接,该内胆设于该容纳腔内且在该底部加热单元的上方,该排气模块包括充气元件、抽气元件、进气通道及排气通道,该抽气元件位于该排气通道上,该抽气元件用于在打开该盖体前抽出位于该内胆内的雾气或油烟且在该盖体打开后继续运行。

2. 如权利要求1所述的烹饪装置,其特征在于:该盖体上设有透明视窗,该烹饪装置还包括压力感测器,该压力感测器设置在该盖体上。

3. 如权利要求1所述的烹饪装置,其特征在于:该烹饪装置还包括与该处理器相连的影像采集单元,该影像采集单元的采集头设置在该盖体上,该影像采集单元在该抽气元件抽气后开启拍摄功能。

4. 如权利要求1所述的烹饪装置,其特征在于:该加热模块包括多个位于该容纳腔内且相互独立的底部加热单元,每个加热单元分别与该处理器连接,所述内胆也具有多个而与预定的底部加热单元相对应。

5. 如权利要求4所述的烹饪装置,其特征在于:该容纳腔内根据该底部加热单元的设置,由多个间隔壁分隔成多个子容纳腔,每个子容纳腔内至少含有一个底部加热单元。

6. 如权利要求1所述的烹饪装置,其特征在于:该进气通道位于该盖体上且该进气通道具有突出于该盖体的喷嘴。

7. 如权利要求1所述的烹饪装置,其特征在于:该充气元件具有用于向内胆中快速喷气的高压气体储藏腔。

8. 如权利要求1所述的烹饪装置,其特征在于:该抽气元件具有用于快速抽气的真空腔。

9. 一种烹饪方法,其包括以下步骤:

将待烹饪的食物放入如权利要求1所述的烹饪装置的内胆中;

盖上盖体,开启该烹饪装置;

在烹饪时,通过该控制模块设定将外部空气输入到内胆与正在烹饪的食物接触;

在打开盖体前,通过该控制模块控制,由该排气模块将该内胆中的雾气或油烟排出,并在替换为外部空气;

在打开盖体后,设定该排气模块的抽气元件继续保持继续运行,以抽出从食物中继续蒸发出的雾气或油烟。

10. 如权利要求9所述的烹饪方法,其特征在于:在打开该盖体前,通过该控制模块控制该充气元件与该抽气元件在,将该内胆内的雾气或油烟后由外部空气替换后,还继续让该充气元件运行使该内胆内的气压大于外部环境的气压。

烹饪装置及烹饪方法

技术领域

[0001] 本发明涉及一种家用电器,尤其是一种家用烹饪装置及烹饪方法。

背景技术

[0002] 食物的烹饪是人们生活中必不可少的一项活动。随着技术的发展,烹饪方法和烹饪装置的种类和样式越来越丰富。然而市场上推出的烹饪装置普遍为一个单锅,该单锅集炒锅、蒸锅、烧烤等功能于一体,由于一锅集多种功能导致每一功能的实用质量不高,多而不精。

[0003] 因此现有技术中也逐渐出现一些多用锅,其可以同时多种食物进行烹饪。例如何廷华等发明的一些烹饪装置,如CN99240621.8揭示一种双体智能电饭煲。施军达等发明的一些烹饪装置,如CN201010564027.5揭示一种三位慢炖锅,CN201010223628.X揭示一种组合式三位慢炖锅,CN201310313040.7揭示一种带电脑控制板的慢炖锅,CN200810061573.X揭示一种组合式慢炖锅,CN201110087910.4揭示一种具有嵌装加热结构的慢炖锅,CN201110066811.8揭示一种套装组合式多位保温锅,CN200910153461.1揭示一种多锅位慢炖锅,CN201310168675.2揭示一种可拆卸慢炖锅,CN201110030368.9揭示一种三锅体结构的保温锅,CN201310168728.0揭示一种三合一多用锅;这些烹饪装置能一次炖制三种不同的食物。再例如湛平涛、吴金水及杨国清等发明的一些烹饪装置,如CN201320276658.6揭示一种电炖锅,CN201320179101.0揭示一种电炖锅,CN201220553296.6揭示一种电炖锅;这些烹饪装置能一次炖制两种或以上不同的食物。

[0004] 然而,上述现有技术中的多用锅,其结构类似于现有的灶台,仍较为复杂,不够紧凑。

[0005] 此外,针对电饭锅内的雾气,在CN200510037553.5中,李文庆揭示了一种真空保温装置,其通过对内锅抽真空,可以延迟保温中的米饭变黄、变酸。然而,这样的设计对于烹饪过程产生的油烟污染却无帮助。在CN200910204171.5中,钱海鹏等揭示了一种烹饪装置,包括外壳、与外壳上端部铰接的上盖、固设在外壳内的保温内筒、设置在保温内筒中的烹饪锅以及用于控制烹饪装置运行的控制装置,还包括:下加热装置,位于烹饪锅的下部,并固设在保温内筒的内底面上;排气装置的进气喷嘴与外壳和上盖形成的腔体连通,排气装置的出气口与大气连通,用于排出腔体中的废气;温控装置设置在保温内筒的底面,用于检测烹饪锅的温度并将温度信息传给控制装置以控制下加热装置的开关;下加热装置、排气装置和温控装置分别与控制装置电连接。通过下加热装置对放入烹饪锅中的食物进行加热,并通过排气装置将烹饪装置腔体中的油烟和水蒸气排出,提高制作食物的质量。进一步,在CN200910204171.5中,烹饪装置还包括有鼓气装置,鼓气装置的排气口与所述外壳和所述上盖形成的腔体连通,所述鼓气装置的入气口与大气连通,用于向所述腔体中的注入空气。然而,在CN200910204171.5中,与外界相通的进气喷嘴都是设置在烹饪装置的底部位置,在外界空气进入烹饪装置后会被加热才会到内胆,如此外界空气不易于替换内胆中的水蒸气或油烟,在开盖的时候仍容易有较多水蒸气或油烟外溢,造成空气污染。

发明内容

[0006] 鉴于上述状况,有必要提供一种结构较为紧凑、可以改善油烟污染的烹饪装置及烹饪方法。

[0007] 一种烹饪装置,其包括壳体、底座、内胆、盖体及加热模块,该壳体设于该底座上,该壳体内具有容纳腔,该内胆位于该容纳腔内,该盖体设于该壳体上且与该容纳腔的开口相配合,该烹饪装置还包括控制模块与排气模块,该控制模块包括处理器及与该处理器相连的输入面板,该加热模块具有位于该容纳腔内的底部加热单元,该底部加热单元与该处理器连接,该内胆设于该容纳腔内且在该底部加热单元的上方,该排气模块包括充气元件、抽气元件、进气通道及排气通道,该抽气元件位于该排气通道上,该抽气元件用于在打开该盖体前抽出位于该内胆内的雾气或油烟且在该盖体打开后继续运行。

[0008] 该盖体上设有透明视窗,该烹饪装置还包括压力感测器,该压力感测器设置在该盖体上。

[0009] 该烹饪装置还包括与该处理器相连的影像采集单元,该影像采集单元的采集头设置在该盖体上,该影像采集单元在该抽气元件抽气后开启拍摄功能。

[0010] 该加热模块包括多个位于该容纳腔内且相互独立的底部加热单元,每个加热单元分别与该处理器连接,所述内胆也具有多个而与预定的底部加热单元相对应。

[0011] 该容纳腔内根据该底部加热单元的设置,由多个间隔壁分隔成多个子容纳腔,每个子容纳腔内至少含有一个底部加热单元。

[0012] 该进气通道位于该盖体上且该进气通道具有突出于该盖体的喷嘴。

[0013] 该充气元件具有用于向内胆中快速喷气的高压气体储藏腔。

[0014] 该抽气元件具有用于快速抽气的真空腔。

[0015] 一种烹饪方法,其包括以下步骤:将待烹饪的食物放入如上述的烹饪装置的内胆中;盖上盖体,开启该烹饪装置;在烹饪时,通过该控制模块设定将外部空气输入到内胆与正在烹饪的食物接触;在打开盖体前,通过该控制模块控制,由该排气模块将该内胆中的雾气或油烟排出,并在替换为外部空气;在打开盖体后,设定该排气模块的抽气元件继续保持继续运行,以抽出从食物中继续蒸发出的雾气或油烟。

[0016] 在打开该盖体前,通过该控制模块控制该充气元件与该抽气元件在,将该内胆内的雾气或油烟后由外部空气替换后,还继续让该充气元件运行使该内胆内的气压大于外部环境的气压。

[0017] 上述烹饪装置包括排气模块,排气模块可以排出烹饪时产生的雾气或其他油烟排出,可防止油烟对人体健康的影响及对厨房的污染。

附图说明

[0018] 图1是本发明第一实施例的烹饪装置的立体示意图。

[0019] 图2是图1所示的烹饪装置在移除盖体及内胆后的俯视图。

[0020] 图3是图1所示的烹饪装置的盖体的仰视图。

[0021] 图4是图1所示的烹饪装置的控制模块的连接框图。

[0022] 图5是图1所示的烹饪装置的一种使用状态示意图。

- [0023] 图6是图1所示的烹饪装置的另一种使用状态示意图。
- [0024] 图7是本发明第二实施例的烹饪装置的在移除盖体及内胆后的示意图。
- [0025] 图8是图7所示的烹饪装置沿VIII-VIII'线剖开的示意图。
- [0026] 图9是本发明第三实施例的烹饪装置的控制模块的连接框图。

具体实施方式

[0027] 下面将结合附图及实施例对本发明的烹饪装置及烹饪方法作进一步的详细说明。

[0028] 请参见图1-图4,本发明实施例的烹饪装置10包括壳体11、底座12、内胆13、盖体14、加热模块15、控制模块16及排气模块18。壳体11设于底座12上。壳体11内具有容纳腔112。内胆13位于容纳腔112内。控制模块16包括处理器162及与处理器162相连的输入面板164。加热模块15位于容纳腔112内且包括多个相互独立的底部加热单元152、154及156。底部加热单元152、154及156分别与处理器162连接。内胆13有多个,其设于容纳腔112内且与预定的底部加热单元152、154及156相对应。盖体14设于壳体11上且与容纳腔112的开口相配合。盖体14具有内表面142、与内表面142相对的外表面144及透明视窗146。排气模块18可与处理器162相连。排气模块18包括充气元件181、进气通道182、抽气元件184及排气通道186。进气通道182位于盖体14上。充气元件181位于进气通道182上,且充气元件181具有用于向内胆13中快速喷气的高压气体储藏腔1812。抽气元件184与处理器162相连。抽气元件184位于排气通道186上,且抽气元件184具有用于快速抽气的真空腔1842。透明视窗146可用于观看内胆13内的雾气或油烟情况。抽气元件184用于在打开盖体14前抽出位于内胆13内的雾气或油烟且可在盖体14打开后继续运行。

[0029] 具体在本实施例中,壳体11的容纳腔112的被分隔成数量与底部加热单元152、154及156的数量想对应的子容纳腔,即在壳体11中有三个子容纳腔,每个子容纳腔内都包含有一个底部加热单元。子容纳腔的数量是可以根据实际设计时的需求来设定的,其可对应不同规格的内胆13,从而满足更多的需求。可以理解,每个子容纳腔内也可以对应多个底部加热单元,以使得对应于内胆13的加热可以设计更多的加热控制方案。

[0030] 容纳腔112可以通过可拆卸的间隔壁114来分隔形成子容纳腔。间隔壁114可以通过壳体11的内壁及底座12来固定;详细来说,可以在壳体11的内壁设置相应的侧边固定槽(图未示),在底座12的上表面设置底边固定槽(图未示),来共同固定间隔壁114。请参见图5与图6,在使用的过程中,通过间隔壁114的安装或移除可以放入不同规格的内胆,从而满足更多的使用需求。例如在图5中,通过移除一个间隔壁114,使得子容纳腔扩大一倍,这时可放入内胆132,以便于烹饪更大量的食物;在图6中,通过移除所有的间隔壁114,使得子容纳腔变为最大的容纳腔112,这时可放入内胆134。从图1、图5与图6中可以看出,烹饪装置10通过安装可拆卸的间隔壁114,可便于让烹饪装置10实现不同的烹饪功能,例如在图1中,在具有三个子容纳腔时,烹饪装置10可以同时烹饪三种食物,烹饪菜式最多样,满足使用者不同的营养和口味需求;在图5中,具有一大一小两个子容纳腔,烹饪装置10可以同时烹饪两种食物,例如较大的子容纳腔用于炖汤而较小的子容纳腔用于煮菜;在图6中,烹饪装置10可放入最大的内胆134,其例如用于炖汤或煮粥等。

[0031] 请参见图1与图3,盖体14具有内表面142及与内表面142相对的外表面144。在本实施例中,与子容纳腔的开口相对应地,在盖体14的内表面142上设有与密封单元148。密封单

元有三组,第一组密封单元1482用于与最小的内胆13或子容纳腔开口相对应,第二组密封单元1484用于与中号的内胆132或子容纳腔开口相对应,第三组密封单元1486用于与最大的内胆134或容纳腔开口相对应。密封单元148可用于密封放入对应的容纳腔或子容纳腔中的内胆。每个密封单元148与对应子容纳腔之间最好设置定位结构,以使得密封单元148在密封对应内胆13时可以具有较好的密封效果。若根据烹饪要求来设计密封单元148,当烹饪装置10仅设计为常压烹饪功能时,密封单元148主要用于阻止烹饪时的部分散热问题及防止内胆13之间烹饪的菜式相互影响,这时对密封单元148的结构要求可以是密封单元148外周尺寸大于内胆13开口尺寸,即密封单元148可以覆盖内胆13开口,从而在不增加结构复杂程度的前提下,尽量减少散热及降低各个内胆13之间的在烹饪过程的互相影响。

[0032] 请参加图1与图4,控制模块16的处理器162可以设置在壳体11或底座12内,而输入面板164可以设置在壳体11的表面116上。其中,输入面板164可包括触控面板或声控单元,其上还可以设有显示屏,其作用主要是作为人工输入命令的界面。使用时,使用者可以通过输入面板164输入所需控制命令,处理器162则根据控制命令分别控制底部加热单元152、154及156,从而使相应放在底部加热单元152、154及156上的内胆13可以进行相同的或不同的加热过程,进而让使用者可以在一个烹饪装置10中同时烹饪多种菜式,提升烹饪的速度及使用的方便性。

[0033] 在本实施例中,与子容纳腔的开口相对应地,在盖体14上设有透明视窗146,即使得容纳腔112中放入不同的内胆13时,每个内胆13都可以对应至少一个透明视窗146,从而让使用者可以看到内胆13中的烹饪的一些情况。进气通道182具有进气喷嘴1822,进气喷嘴1822设于内表面142上,且进气喷嘴1822的数量与底部加热单元底部加热单元的数量相对应,即内胆13上方都对应配合有至少一个进气喷嘴1822。进气喷嘴1822可为可转动的喷嘴,即其可以利用充气元件中气流的冲击力,让进气喷嘴1822自动改变方向,从而让气体可以喷到内胆中不同的位置。充气元件181位于进气通道182上,具有用于向内胆13中快速喷气的高压气体储藏腔1812。高压气体储藏腔1812可用于在内胆13中的菜式需要急冷或爆炒时,可以快速释放高压气体储藏腔1812气体,从而让外部空气更快的与内胆13中的菜式接触。抽气元件184可以设置在壳体11或盖体14内,本实施例中是在壳体11内。排气通道186可以设置在壳体11或盖体14内,本实施例中是在壳体11内。本实施例中排气通道186具有排气口1862,排气口1862位于盖体14侧壁上。抽气元件184的真空腔1842,可以在需要时较快的排出蒸汽或其他油烟,由于真空腔1842的存在,抽气元件184不需要等风扇的运转就可以因为压差的存在,先让内胆13中的蒸汽或其他油烟部分快速排出,此时启动的风扇也可以开始起到作用排气的作用,因此可以减少使用者开盖过程等待的时间,提升使用的便利性。总的来说,烹饪时,通过抽气元件184的运转,外部的空气进入内胆13,内胆13中的雾气、蒸汽或其他油烟则进入排气通道186,并从排气口1862排出。由于烹饪装置10加入了排气模块18,使得烹饪装置10在烹饪食物时候,可根据烹饪食物的需要,将食物加热所产生的蒸汽实时排出,防止食物过熟或腐烂;并且在内部的蒸汽排出时,还引入了外部空气,在一些需要氧化或新鲜空气的菜式烹饪上,这些外部空气还可让烹饪的菜肴更具营养、更健康或更美观;更特别的是,在需要打开盖体14时,可通过透明视窗146事先观察,然后判断是否需要先将食物加热所产生的雾气或其他油烟排出,这样打开盖体14的时候就不会有朝使用者“扑面而来”的蒸汽/气体,因此可以方便使用者对烹饪装置10的使用,并保护使用者的健康。进

一步,排气模块18可以将烹饪时产生的蒸汽直接排出到下水道或者户外,这样可以减少厨房中的油烟,从而有利于改善烹饪环境,防止油烟对人体健康的影响及对厨房的污染。此外,可通过设置抽气元件184的开启设计,使得打开盖体14前,抽气元件184在抽完该内胆内的雾气或油烟后,还继续运行使内胆13内的气压大于或等于外部环境的气压。内胆13内的气压大于或等于外部环境的气压可以便于盖体14的开启。

[0034] 上述烹饪装置10包括可以独立控制的多个底部加热单元152、154及156,底部加热单元152、154及156对应的子容纳腔内可放置不同的内胆,且在盖体14上对应于每个子容纳腔可设计有预定的密封结构,使得烹饪装置10可以同时烹饪多种食物或菜式,且相互之间不会影响(例如不同的菜式之间发生串味)。特别的是,烹饪装置10采用一体设计,有别于现有技术中采用多个独立烹饪设置之间的串联或单个加热器同时加热不同的内胆,烹饪装置10即可以实现底部加热单元152、154及156之间分别加热,还可使结构上更加的紧凑,从而更便于满足人们生活中不同的烹饪需求以及降低能耗。进一步,排气模块18可以排出烹饪时产生的雾气或其他油烟排出,可防止油烟对人体健康的影响及对厨房的污染。

[0035] 请参见图7与图8,所示为本发明第二实施例的烹饪装置。第二实施例的烹饪装置与烹饪装置10相似,包括加热模块25,加热模块25位于容纳腔内且包括多个相互独立的底部加热单元252、254及256;特别地,在本实施例中,加热模块25还包括第二加热单元257与第三加热单元258,底座22的中部设有连接电极222,并且在间隔壁214上还设有温度感测器27。第二加热单元257与第三加热单元258分别与控制模块的处理器相连。第二加热单元257设置在间隔壁214上,且位于间隔壁214中部靠下的位置上。连接电极222与第二加热单元257电连接,其可通过在间隔壁214内部设置导线且在间隔壁214固定时与连接电极222建立连通。第三加热单元258设置在壳体21的内壁上,且与子容纳腔相对应,本实施例中至少有三个第三加热单元258。温度感测器27设置在间隔壁214上以及壳体21的内壁上,且温度感测器27与控制模块的处理器相连,其用于感测烹饪过程中内胆的温度信息,并将温度信息传送给处理器。在本实施例中,在间隔壁214上以及壳体21的内壁上设置有第二加热单元257与第三加热单元258,因此在烹饪时可以从内胆的侧面对内胆进行加热,从而有利于提升加热的均匀性;特别的是,各个间隔壁214上均设置有第二加热单元257,使得各个子容纳腔之间的温度控制变得更加准确。温度感测器27设置在底部加热单元与第二加热单元257中间的位置,以及设置在底部加热单元与第三加热单元258中间的位置;通过在间隔壁214上以及壳体21的内壁上设置温度感测器27,使得烹饪时,温度感测器27还可以感测内胆侧壁的温度,从而可更加全面的监测到烹饪时内胆各处的温度,让烹饪时的温度控制变得更加准确,进而可以防止烹饪时食物不熟或过热的情况发生。

[0036] 请参见图9,所示为本发明第三实施例的烹饪装置。第三实施例的烹饪装置与烹饪装置10相似,第三实施例的烹饪装置包括加热模块35、控制模块36、感测模块370、排气模块38及冷却模块39。其中,加热模块35具有多个独立的底部加热单元。控制模块36包括处理器362、输入面板364及无线单元366,处理器362分别与输入面板364及无线单元366相连。输入面板364及无线单元366可用作信息输入设备,为烹饪装置输入控制命令。例如,输入面板364上可设置触控或声控单元,从而通过触控或声控的方式输入烹饪命令;无线单元366可与便携式电子装置(例如手机、笔记本或平板电脑等)之间进行信息交互,从而可将外部的控制命令通过便携式电子装置输入烹饪装置,或者将烹饪装置中的所形成的烹饪参数传输

给便携式电子装置。感测模块370与控制模块36的控制器362相连。感测模块370可包括温度感测器37、图像感测器372及压力感测器374。温度感测器37可设置在烹饪装置的底座、壳体内壁或间隔壁上,图像感测器372与压力感测器可设置在烹饪装置的盖体上。排气模块38与冷却模块39也分别与控制模块36的控制器362。排气模块38的进气喷嘴可设置在盖体上。冷却模块39可以设置在烹饪装置的底座、壳体内壁、间隔壁或盖体上,较佳的是设置在盖体上。由于设置有图像感测器372与排气模块38,在烹饪时就可以记录烹饪过程的图像或影像,从而让烹饪过程的记录更加直观,并且因为排气模块38可以将烹饪时食物所产生的气体排出,从而可以让图像感测器372更加清晰的拍摄到图片或影像,举例来说,在开启图像感测器372之前,可以先通过排气模块38先将内胆中的蒸汽排出,甚至通过抽气元件还可将内胆中的气体压力排到略低于大气压,从而确保图像感测器372拍摄到清晰的图片或影像且还可以尽量避免图像感测器372被食物所产生的蒸汽污染。通过设置无线单元366来做为输入及输出设备,还可以设计使烹饪装置通过感测模块370记录烹饪过程的烹饪参数,并通过处理器362及无线单元366传送出去;也可以通过无线单元366接收来至便携式电子装置的控制命令,让烹饪装置实现更加智能的自动烹饪的功能。通过设置冷却模块39,可以使得烹饪装置烹饪出更多口味的食物,例如在有些需要骤冷的菜式中,可以通过冷却模块来实现内胆的骤冷,从而烹饪出更加美味的食物来。

[0037] 以上所述,仅是本发明的较佳实施例而已,并非对本发明作任何形式上的限制,虽然本发明已以较佳实施例揭露如上,然而并非用以限定本发明,任何熟悉本专业的技术人员,在不脱离本发明技术方案范围内,当可利用上述揭示的技术内容做出些许更动或修饰为等同变化的等效实施例,但凡是未脱离本发明技术方案内容,依据本发明的技术实质对以上实施例所作的任何简单修改、等同变化与修饰,均仍属于本发明技术方案的范围。

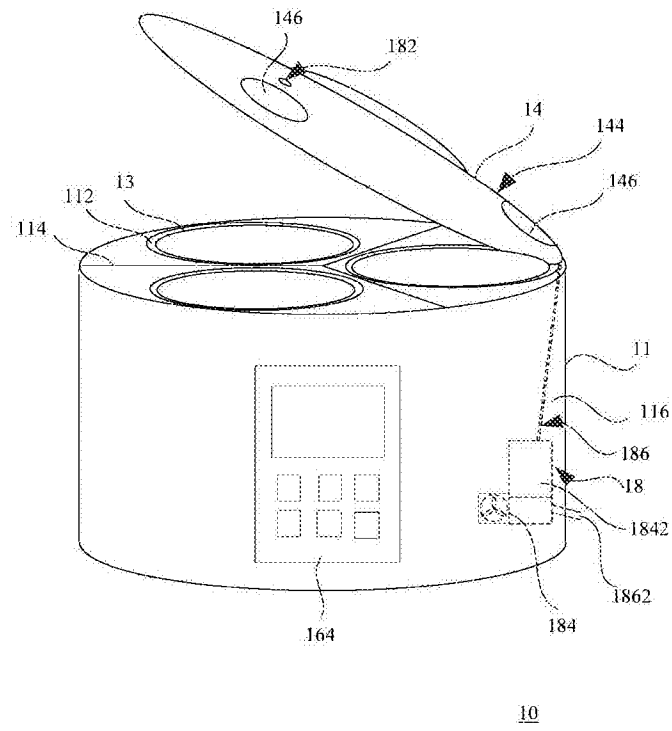


图1

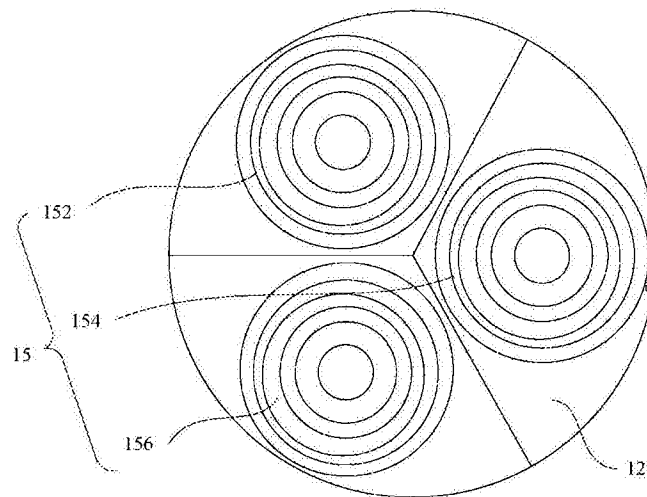


图2

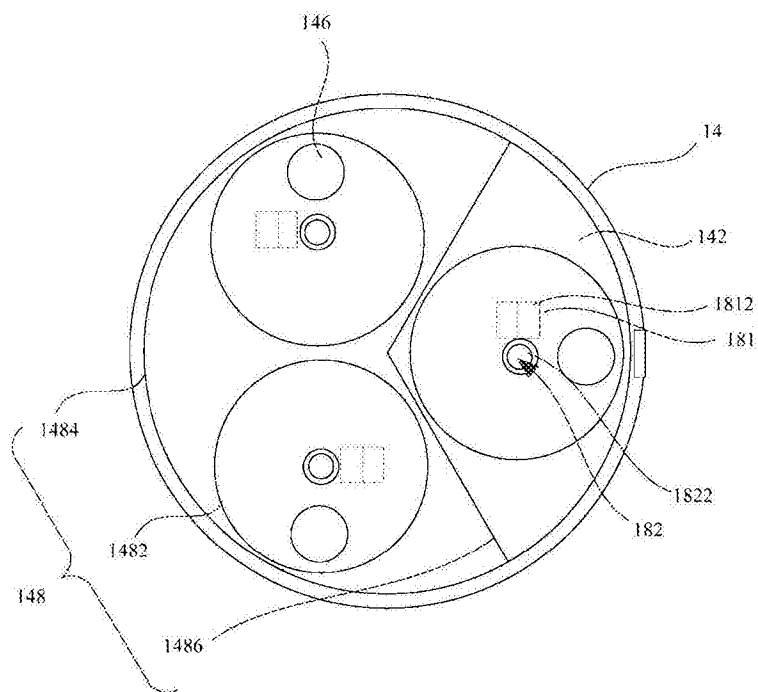


图3

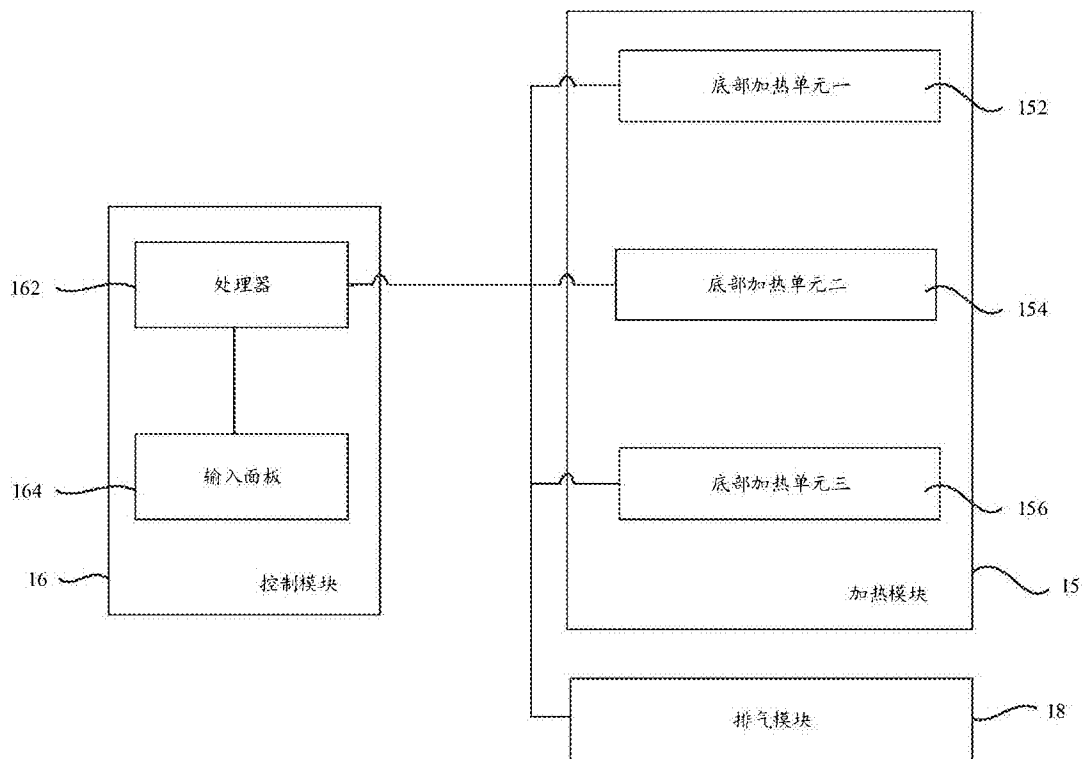


图4

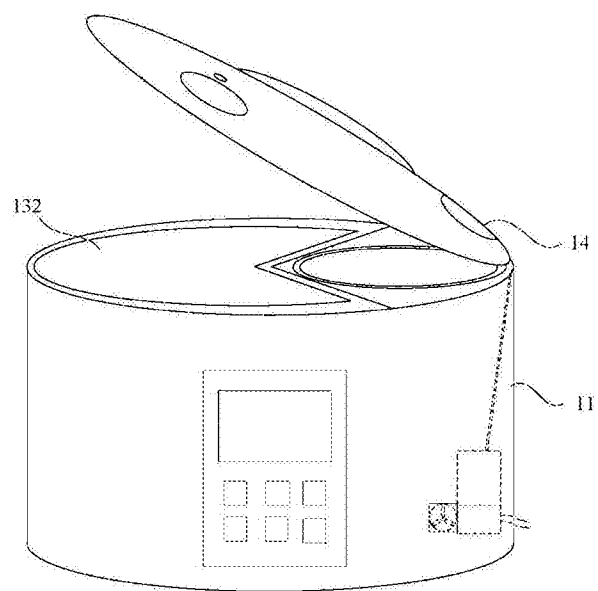


图5

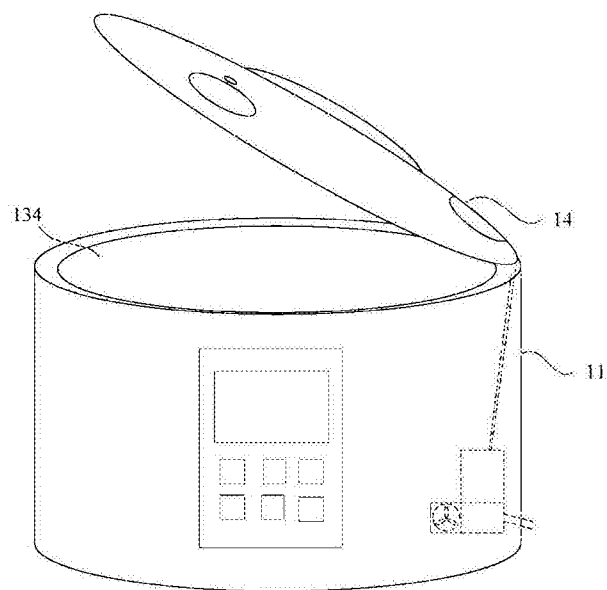


图6

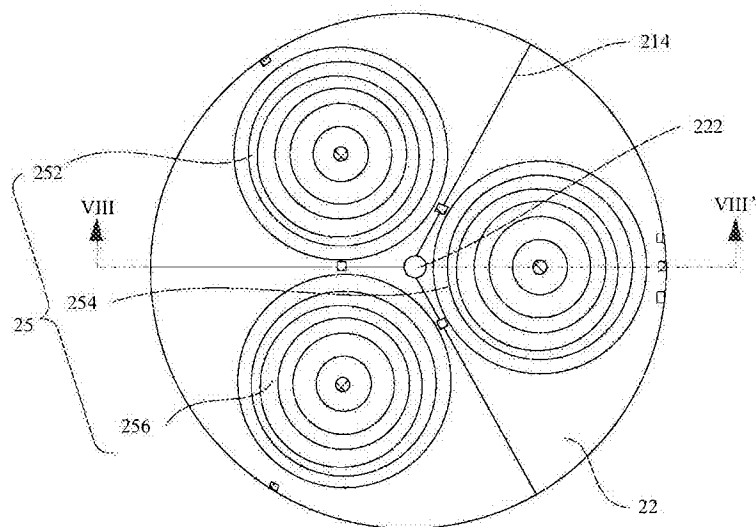


图7

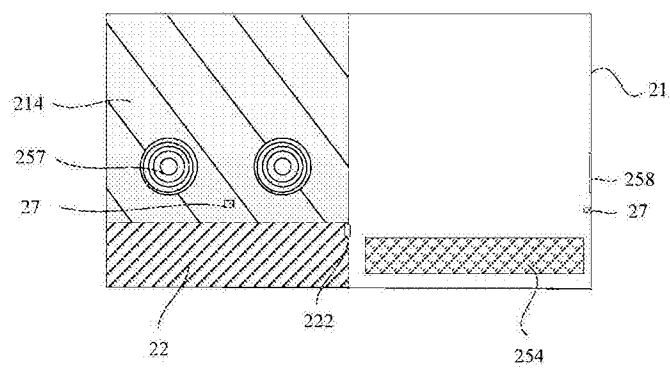


图8

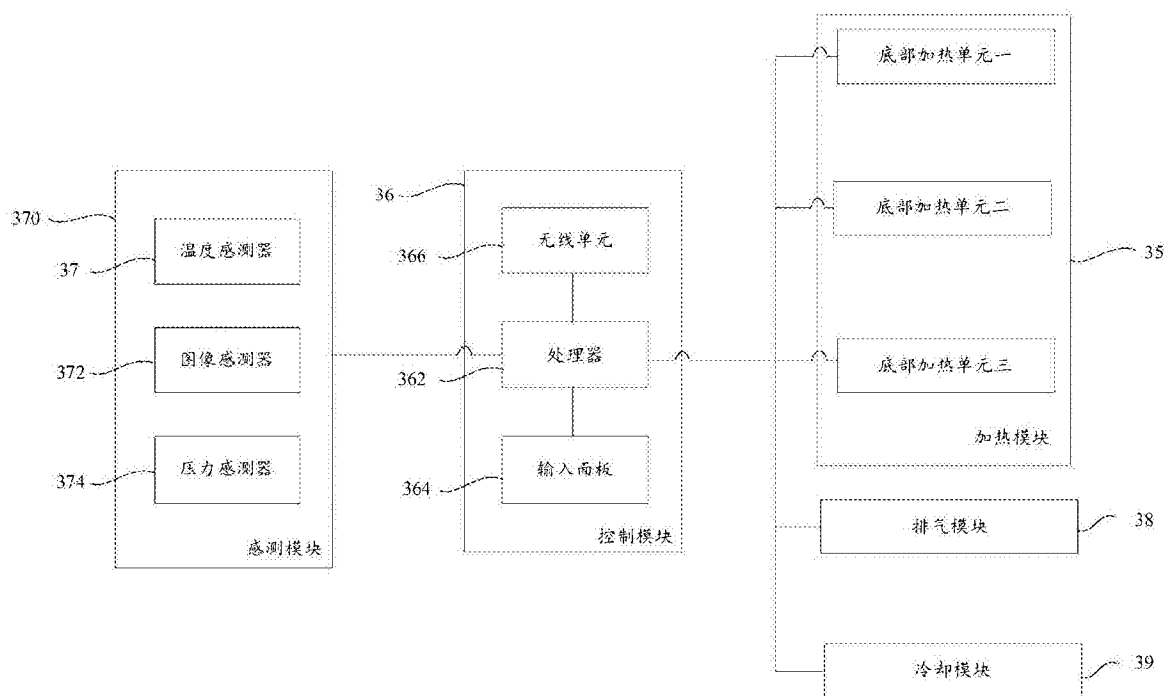


图9

<div>MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET</div> <div>Substitute for Form PTO-1360 (For use with Form PTO/SB/06)</div>							<div>Application Number</div> <div>17159414</div>		<div>Filing Date</div>					
							<div>Applicant(s) Christopher Martin</div>							
							<div>* May be used for additional claims or amendments</div>							
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT				*		*		*	
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1	1		1							1		1		
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38		1		1										
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Total Indep	6		5		0									
Total Depend	65		23		0									
Total Claims	71		28		0									

51		1		1		
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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
17/159,414	01/27/2021	3761	3580	057664-348N01US	28	5

CONFIRMATION NO. 3603

177399
Mintz Levin/SharkNinja
One Financial Center
Boston, MA 02111

FILING RECEIPT



0000000136315842

Date Mailed: 09/20/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please submit a written request for a corrected Filing Receipt, including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections provided that the request is grantable.

Inventor(s)

Christopher T. Martin, North Attleboro, MA;
Thomas Guerin, Boston, MA;
Roger Neil Jackson, Cornwall, UNITED KINGDOM;
Joshua D. Anthony, North Billerica, MA;
Kerry Schwarz, Needham, MA;
Michaela Dubeau, Uxbridge, MA;

Applicant(s)

SHARKNINJA OPERATING LLC, Needham, MA

Power of Attorney: The patent practitioners associated with Customer Number 177399

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US2020/042120 07/15/2020
which claims benefit of 62/874,193 07/15/2019

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/29/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/159,414**

Projected Publication Date: 12/29/2022

Non-Publication Request: No

Early Publication Request: No

Title

COOKING DEVICE AND COMPONENTS THEREOF

Preliminary Class

219

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop

technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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www.uspto.gov

U.S. APPLICATION NO. 17/159,414	FIRST NAMED INVENTOR Christopher T. Martin	ATTY. DOCKET NO. 057664-348N01US		
177399 Mintz Levin/SharkNinja One Financial Center Boston, MA 02111		INTERNATIONAL APPLICATION NO. PCT/US2020/042120		
		<table border="1"><tr><td>I.A. FILING DATE 07/15/2020</td><td>PRIORITY DATE 07/15/2019</td></tr></table>	I.A. FILING DATE 07/15/2020	PRIORITY DATE 07/15/2019
I.A. FILING DATE 07/15/2020	PRIORITY DATE 07/15/2019			

CONFIRMATION NO. 3603
371 ACCEPTANCE LETTER



Date Mailed: 09/20/2022

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

01/27/2021
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Copy of the International Application filed on 01/27/2021
- Copy of the International Search Report filed on 01/27/2021
- Preliminary Amendments filed on 01/27/2021
- Information Disclosure Statements filed on 01/27/2021
- Inventor's Oath or Declaration filed on 01/18/2022
- U.S. Basic National Fees filed on 01/27/2021
- Authorize Access to Search Results filed on 01/27/2021
- Priority Documents filed on 01/27/2021
- Power of Attorney filed on 04/23/2021
- Authorization to Permit Access filed on 01/27/2021
- Application Data Sheet (37 CFR 1.76) filed on 01/27/2021

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

JOHN L ANDERSON

Telephone: (571) 272-0385

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 17/159,414	
APPLICATION AS FILED - PART I							
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800
TOTAL CLAIMS (37 CFR 1.16(j))	28 minus 20 =	*	8			x 100 =	800
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5 minus 3 =	*	2			x 480 =	960
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
				TOTAL		TOTAL	3420
* If the difference in column 1 is less than zero, enter "0" in column 2.							
APPLICATION AS AMENDED - PART II							
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		TOTAL ADD'L FEE	
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)
	Total (37 CFR 1.16(i))	*	Minus **	=	x =		x =
	Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		x =
	Application Size Fee (37 CFR 1.16(s))						
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
				TOTAL ADD'L FEE		TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.							



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US

177399
Mintz Levin/SharkNinja
One Financial Center
Boston, MA 02111

CONFIRMATION NO. 3603
POA ACCEPTANCE LETTER



Date Mailed: 09/06/2022

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/23/2021.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/jlanderson/



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Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US

CONFIRMATION NO. 3603

POWER OF ATTORNEY NOTICE



130401
Cantor Colburn - Euro-Pro
20 Church Street
22nd. Floor
Hartford, CT 06103-3207

Date Mailed: 09/06/2022

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/23/2021.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/jlanderson/



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :John Anderson

Refund Accounting Date:09/01/2022

Effective Date	Sale Item Reference Number	Refund Total
01/27/2021	17159414	\$160.00

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method	Account Number
I202291748243419	1206	UNDETERMINED CLAIMS NATL STAGE APPLIC	\$160.00		*****4889



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Office of the Chief Financial Officer

Document Code:WFEE

User :John Anderson

Sale Adjustment Accounting Date:09/01/2022

Effective Date	Sale Accounting Date	Sale Item Reference Number
01/27/2021	09/01/2022	17159414

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I202291748243419	1206	UNDETERMINED CLAIMS NATL STAGE APPLIC	\$160.00	



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :Karen McLean

Sale Accounting Date:07/28/2022

Sale Item Reference Number

17159414

Effective Date

01/27/2021

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20227RJ55032716	1633	NATIONAL STAGE EXAM - ALL OTHER CASES	\$800.00	Salea
I20227RJ55032716	1617	OATH/DECL > 30 MOS FROM 371 COMMENCEMENT	\$160.00	Salea
I20227RJ55032716	1615	CLAIMS IN EXCESS OF 20	\$800.00	Salea
I20227RJ55032716	1642	NATL STAGE SEARCH FEE - REPORT PROVIDED	\$540.00	Salea
I20227RJ55032716	1631	NATIONAL STAGE FEE	\$320.00	Salea
I20227RJ55032716	1614	INDEPENDENT CLAIMS IN EXCESS OF 3	\$960.00	Salea
I20227RJ55032716	1206	UNDETERMINED CLAIMS NATL STAGE APPLIC	\$160.00	Salea

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)****Title of
Invention**

COOKING DEVICE AND COMPONENTS THEREOF

As the below named inventor, I hereby declare that:

This declaration ☐ The attached application, or
is directed to:☒ United States application or PCT international application number 17/159,414
filed on 01-27-2021.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001
by fine or imprisonment of not more than five (5) years, or both.**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTORInventor: Christopher T. Martin Date (Optional) : _____Signature: / Christopher T. Martin

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Thomas Guerin Date (Optional) : _____Signature: / Thomas Guerin /

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Roger Neil Jackson Date (Optional) : _____Signature: / Roger Neil Jackson /

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Joshua D. Anthony Date (Optional) : _____Signature: / Joshua D. Anthony /
OCF4A03FB77A442

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
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Invention**

COOKING DEVICE AND COMPONENTS THEREOF

As the below named inventor, I hereby declare that:

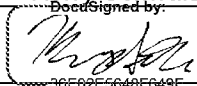
This declaration ☐ The attached application, or
is directed to:☒ United States application or PCT international application number 17/159,414
filed on 01-27-2021.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001
by fine or imprisonment of not more than five (5) years, or both.**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTORInventor: Kerry SchwarzDate (Optional) : 1/14/2022 | 2:55:31 PM PSTSignature: /  /

36E02EC648F649F...

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF
-------------------------------	---------------------------------------

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or

☒ United States application or PCT international application number 17/159,414

filed on Jul 15, 2020

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

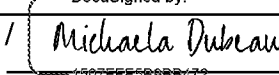
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Michaela DUBEAU Date (Optional): 5/6/2021 | 2:31:52 PM EDT

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	44770569
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Lisa Adams/Cynthia Tsang
Filer Authorized By:	Lisa Adams
Attorney Docket Number:	057664-348N01US
Receipt Date:	18-JAN-2022
Filing Date:	
Time Stamp:	16:50:21
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	057664-348N01US- Declarations_executed_COMPL ETE.pdf	893303 e9bcaa1d38530dffaab3fc5451a5b18ba6c85861	no	6

Warnings:

Information:	
Total Files Size (in bytes):	893303
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17159414
	Filing Date	2021-01-27
	First Named Inventor	Christopher T. Martin
	Art Unit	3761
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	057664-348N01US

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090126580	A1	2009-05-21	Hartfelder et al.	
	2	20120272832	A1	2012-11-01	Kwon et al.	
	3	20170231430	A1	2017-08-17	Moon et al.	

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	1							

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3761	
	Examiner Name	Not Yet Assigned	
	Attorney Docket Number	057664-348N01US	

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3761
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2021-12-08
Name/Print	Lisa Adams	Registration Number	44,238

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	44462516
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Lisa Adams
Filer Authorized By:	
Attorney Docket Number:	EUP1549US2
Receipt Date:	08-DEC-2021
Filing Date:	
Time Stamp:	12:48:45
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	057664-348N01US_IDS_Trans mittal.pdf	101639 5f4b625deaf55b0c3ffc5aeab20e5bfc6b41b 9a4	no	2

Warnings:

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	057664-348N01US_SB08.pdf	1035003	no	4
			8f5a31f07c7c26b85f8c50fb33a3488863ee28f7		
Warnings:					
Information:					
Total Files Size (in bytes):			1136642		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3761

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copies of U.S. patent application publications are not submitted.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance

with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

Applicant believes no fee is due with this response.

Dated: December 8, 2021

Respectfully submitted,

Electronic signature: /Lisa Adams/

Lisa Adams

Registration No.: 44,238

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 348-3054

Attorney for Applicant

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	17/159,414
Filing Date	
First Named Inventor	Christopher T. Martin
Title	COOKING DEVICE AND COMPONENTS THEREOF
Art Unit	3761
Examiner Name	
Attorney Docket Number	057664-348N01US

SIGNATURE of Applicant or Patent Practitioner

Signature	/Lisa Adams/	Date (Optional)	
Name	Lisa Adams	Registration Number	44238
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

177399

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

SharkNinja Operating LLC

☐ Inventor or Joint Inventor (title not required below)

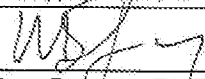
☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	1-28-2021
Name	William B. Lacy, Ph.D.		
Title	VP / Senior Associate GC		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of 1 forms are submitted.

Electronic Acknowledgement Receipt

EFS ID:	42535311
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Lisa Adams/Jennifer McIntosh
Filer Authorized By:	Lisa Adams
Attorney Docket Number:	EUP1549US2
Receipt Date:	23-APR-2021
Filing Date:	
Time Stamp:	12:25:19
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	057664-348N01US_POA.pdf	642845	no	2
			89f8debb02ede3d06c38add662cf73da49c b2214		

Warnings:

Information:	
Total Files Size (in bytes):	642845
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US	3603
177399	7590	03/13/2024	EXAMINER	
Mintz Levin/SharkNinja			SHIRSAT, VIVEK K	
One Financial Center			ART UNIT	PAPER NUMBER
Boston, MA 02111			3762	
			NOTIFICATION DATE	DELIVERY MODE
			03/13/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary**Application No.**

17/159,414

Applicant(s)

Martin et al.

Examiner

VIVEK K SHIRSAT

Art Unit

3762

AIA (FITF) Status

Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 01/27/2021.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-5, 11, 13-14, 17, 20-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51 and 71 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-5, 11, 13-14, 17, 20-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51 and 71 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see

http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☐ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 01/27/2021 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some** c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)

4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 112

The following is a quotation of 35 U.S.C. 112(b):

(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. **Claims 17, 20, 22-24, 27 and 30** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

The term “relatively horizontally” in claim 17 is a relative term which renders the claim indefinite. The term “relatively horizontally” is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Additionally, the applicant does not specify against what reference plane “horizontally” is to be taken, for example the housing could always be tilted or positioned such that the axis is horizontal.

Claim Rejections - 35 USC § 102

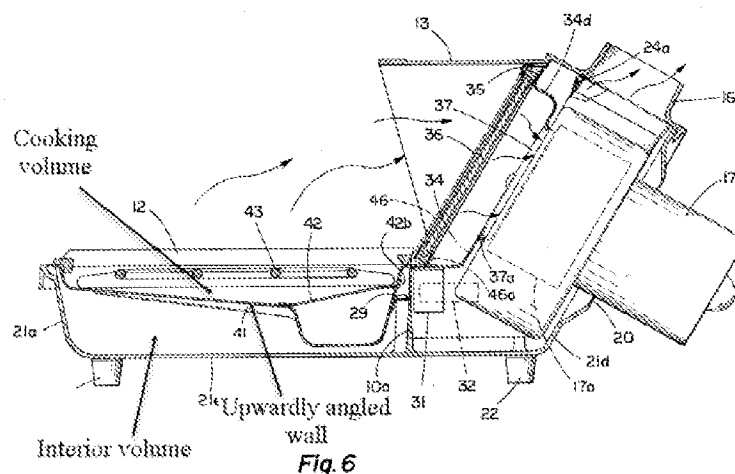
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.

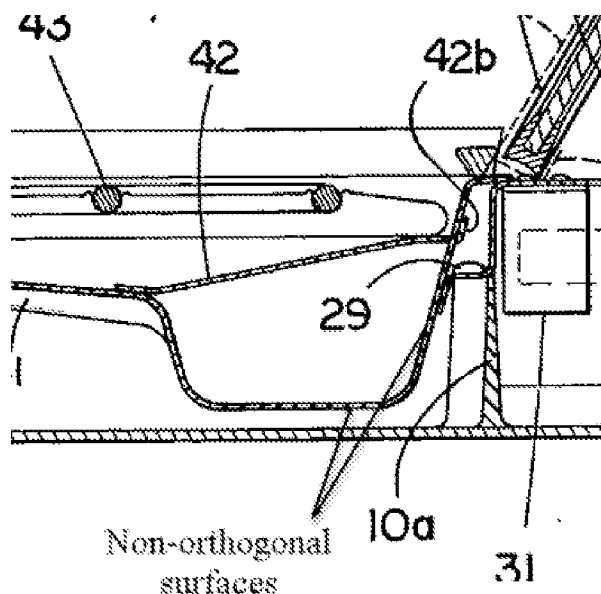
2. **Claim(s) 1-5 and 13-14** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Jenn et. al (US 4,034,663).

With respect to claim 1 Jenn discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. below]; a cooking container [reference character 41] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. below] is defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly [see annotated Fig. below]; and a heating element [reference character 43] associated with said at least one internal compartment.

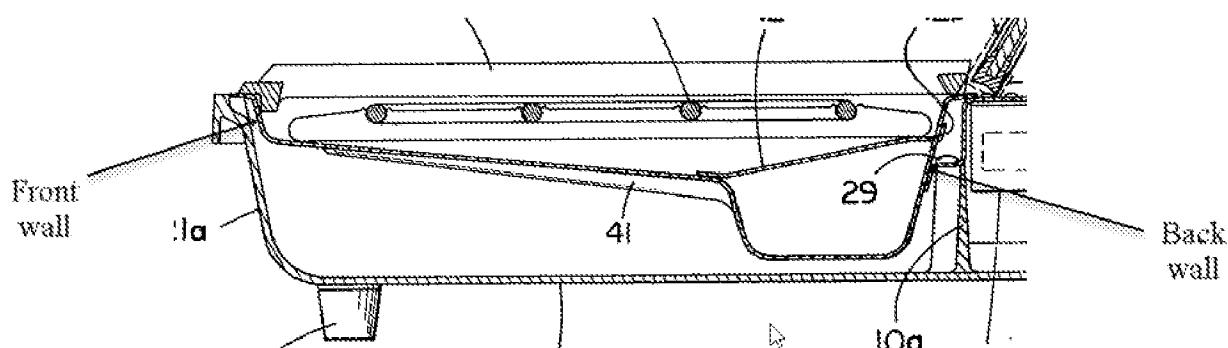


With respect to claim 2 Jenn discloses that said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system [see Figs. 1 and 6].

With respect to claim 3 Jenn discloses that said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container [see annotated Fig. below].



With respect to claim 4 Jenn discloses that said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container [see annotated Fig. below].



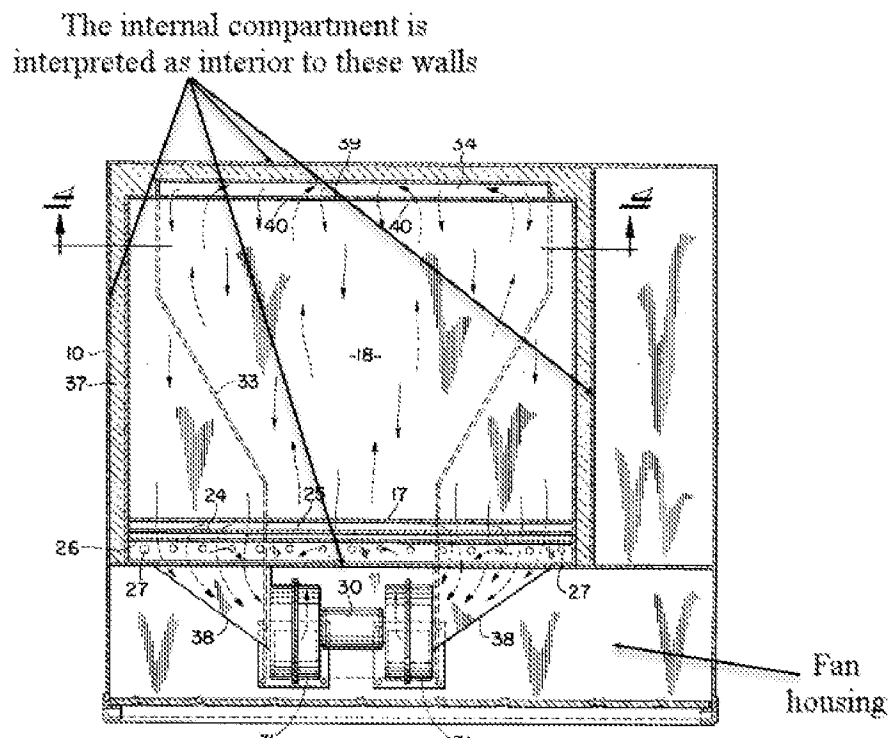
With respect to claim 5 Jenn discloses an insert [reference character 12] positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

With respect to claim 13 Jenn discloses an air movement mechanism [reference character 17a] disposed in said housing.

With respect to claim 14 Jenn discloses a motor [reference character 17] operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment [see Fig. 6].

3. **Claim(s) 17, 20, 22-24, and 30** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Caselani et. al (US 3,973,551).

With respect to claim 17 Caselani discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. below] ; a cooking container [formed by the walls of the oven cavity reference character 11] receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container; a heating element [column 5 lines 24-26] associated with said at least one internal compartment; and an air movement mechanism [reference character 31] disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally [see Fig. 3].



With respect to claim 20 Caselani discloses said air movement mechanism includes a first inlet [at the left side of blower 31 in Fig. 3], a second inlet [at the right side of blower 31 in Fig. 3], and an outlet [reference character 33], said first inlet and said second inlet being arranged in fluid communication with said outlet [column 3 lines 6-11].

With respect to claim 22 Caselani discloses a motor [reference character 30] operable to rotate said air movement mechanism about said axis or rotation, wherein said motor is located at least partially external to said at least one internal compartment [see annotated Fig. above].

With respect to claim 23 Caselani discloses said air movement mechanism further comprises: a fan housing [see annotated Fig. above]; and a fan wheel [reference character 31] rotatably mounted within said fan housing.

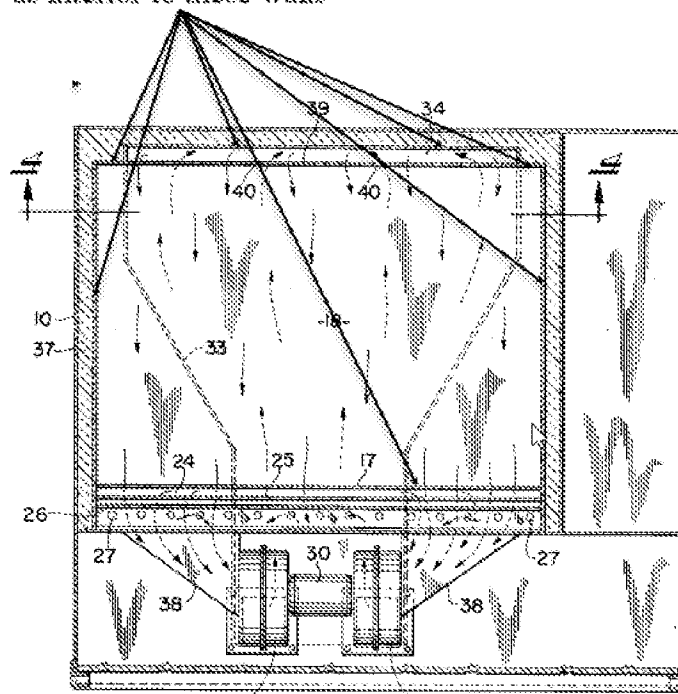
With respect to claim 24 Caselani discloses said fan wheel includes a first wheel [reference character 31] portion having a first plurality of impeller blades and a second wheel portion [also reference character 31] having a second plurality of impeller blades.

With respect to claim 30 Caselani discloses that said air movement mechanism is horizontally offset from said heating element [column 5 lines 24-26].

4. **Claim(s) 31-32, 34, 37-38** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Caselani et. al (US 3,973,551).

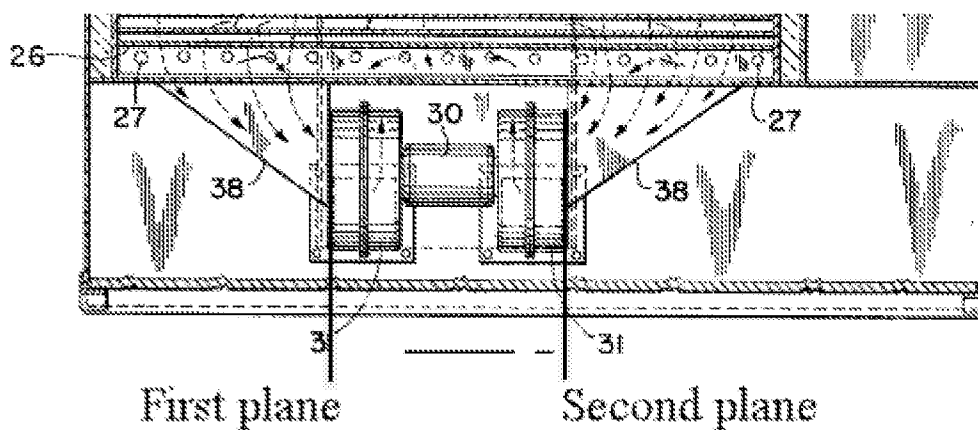
With respect to claim 31 Caselani discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. above]; a cooking container [see annotated Fig. below] receivable within said at least one internal compartment, wherein a cooking volume [reference character 11] is defined within an interior of said cooking container; a heating element [column 5 lines 24-26] associated with said cooking volume; a rotatable air movement mechanism [reference character 31] having: a first inlet [at the left side of blower 31 in Fig. 3] arranged in a first plane of said air movement mechanism; a second inlet [at the right side of blower 31 in Fig. 3] arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane; and an outlet [reference character 32] arranged in fluid communication with both said first inlet and said second inlet.

The cooking container is interpreted
 as interior to these walls



With respect to claim 32 Caselani discloses that said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation [see Fig. 3].

With respect to claim 34 Caselani discloses that said first plane and said second plane are substantially parallel [see annotated Fig. below].



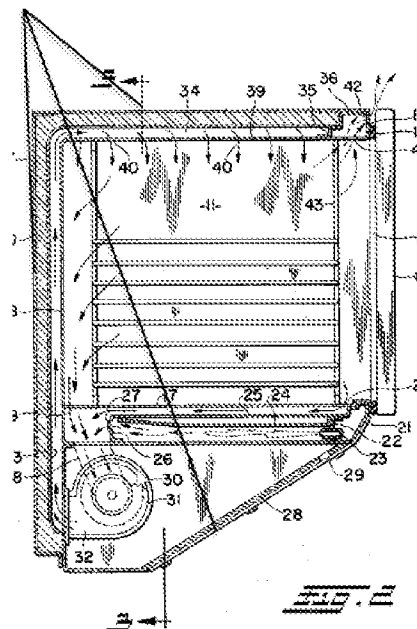
With respect to claim 37 Caselani discloses an air duct [reference character 33-34] separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct [at the inlet to 33].

With respect to claim 38 Caselani discloses a motor [reference character 30] operable to rotate said air movement mechanism about said axis or rotation, wherein said motor is located at least partially external to said at least one internal compartment [see annotated Fig. above].

5. **Claim(s) 44-47 and 51** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Caselani et. al (US 3,973,551).

With respect to claim 44 Caselani discloses a cooking system comprising: a housing [reference character 10] having at least one internal compartment [see annotated Fig. below]; a cooking container [see annotated Fig. above] receivable within said at least one internal compartment, wherein a cooking volume [reference character 11] is defined within an interior of said cooking container; a heating element [column 5 lines 24-26] associated with said cooking volume; a plurality of air movement mechanisms [reference character 31] disposed within said housing; and a motor [reference character 30] operably coupled to said plurality of air movement mechanisms.

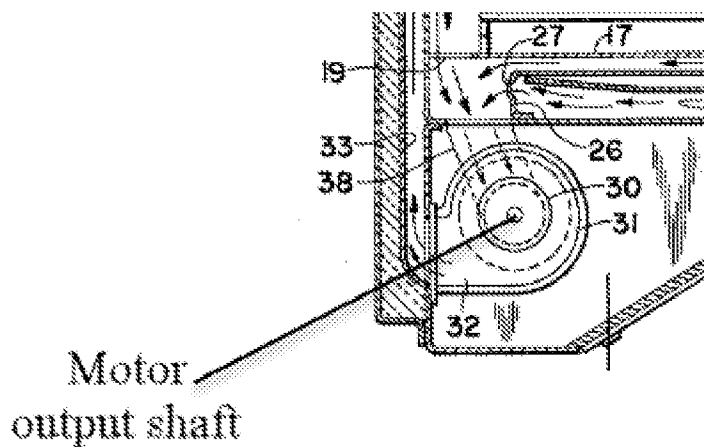
The internal compartment is interpreted
as being interior to these walls



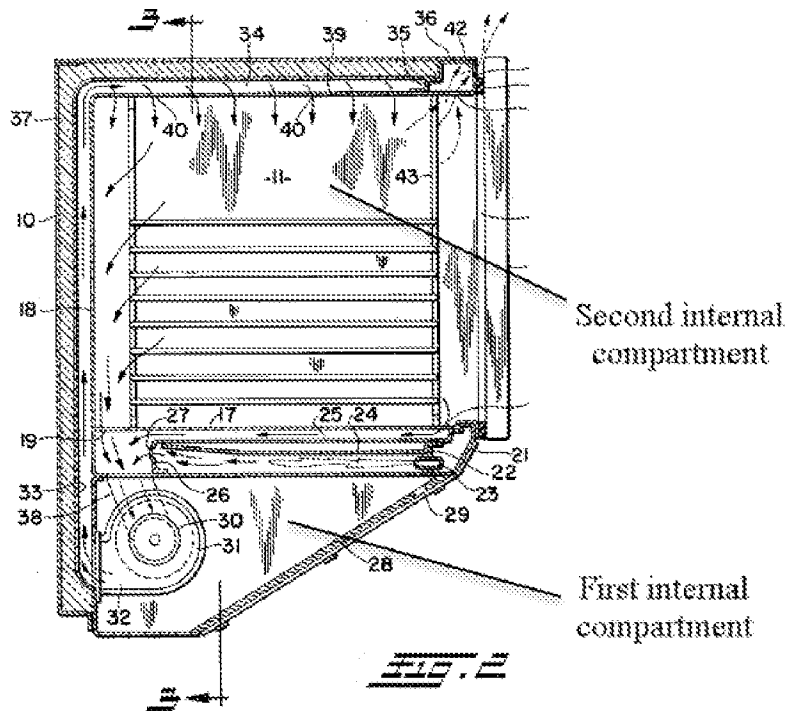
With respect to claim 45 Caselani discloses that said motor is located externally to said at least one internal compartment [see Fig. 2].

With respect to claim 46 Caselani discloses said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism [both reference character 31].

With respect to claim 47 Caselani discloses that said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft [see annotated Fig. below].



With respect to claim 51 Caselani discloses that internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment [see annotated Fig. below].



6. **Claim(s) 71** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Jenn et. al (US 4,034,663).

With respect to claim 71 Jenn discloses a cooking system comprising: a housing [reference character 10-11] having at least one internal compartment [see annotated Fig. above in connection with claim 1]; a cooking container [reference character 41] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. above in connection with claim 1] is defined within an interior of said cooking container, a heating element [reference character 43] associated with said at least one internal compartment and an air movement mechanism [reference character 17a] disposed in said housing, said air movement mechanism being positioned vertically above said cooking volume and horizontally offset from said heating element [see Fig. 3].

7. **Claim(s) 1, 5, and 11** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Cheng et. al (US 10,575,679).

With respect to claim 1 Cheng discloses a cooking system comprising: a housing [reference character 122] having at least one internal compartment [see annotated Fig. below]; a cooking container [reference character 108] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. below] is

defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly [see annotated Fig. below]; and a heating element [reference character 126] associated with said at least one internal compartment.

With respect to claim 5 Cheng discloses an insert [reference character 106] positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

With respect to claim 11 Cheng discloses an air duct [reference character 136] separate from said cooking volume is defined between said insert and a portion of said cooking container.

8. **Claim(s) 17 and 27** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by Jenn et. al (US 4,034,663).

With respect to claim 17 Jenn discloses a cooking system comprising: a housing [reference character 10-11] having at least one internal compartment [see annotated Fig. above in connection with claim 1]; a cooking container [reference character 41] receivable within said at least one internal compartment, wherein a cooking volume [see annotated Fig. above in connection with claim 1] is defined within an interior of said cooking container; a heating element [reference character 43] associated with said at least one internal compartment; and an air movement mechanism [reference character 17a] disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally [see 112(b) rejection above].

With respect to claim 27 Jenn discloses that the air movement mechanism is disposed vertically above said cooking volume [see Fig. 3].

9. **Claim(s) 31 and 41** is/are rejected under 35 U.S.C. 102(a)(1) as being anticipated by McFadden et. al (US 8,011,293).

With respect to claim 31 McFadden discloses a cooking system comprising: a housing [reference characters 105-106 and 194-195] having at least one internal compartment [the space internal to those walls]; a cooking container [the housing formed by 123a-123b] receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container; a heating element [reference character 114] associated with said cooking volume; a rotatable air movement mechanism [reference characters 191a-191b] having: a first inlet arranged in a first plane of said air movement mechanism; a second inlet arranged in a second plane of said air

FIG. 1

With respect to claim 41 McFadden discloses that said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container [see Fig. 1].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VIVEK K SHIRSAT whose telephone number is (571)272-3722. The examiner can normally be reached M-F 9:00AM-5:20AM.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B McAllister can be reached on 571-272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/VIVEK K SHIRSAT/
Primary Examiner, Art Unit 3762

<i>Notice of References Cited</i>	Application/Control No. 17/159,414		Applicant(s)/Patent Under Reexamination Martin et al.	
	Examiner VIVEK K SHIRSAT		Art Unit 3762	Page 1 of 1

U.S. PATENT DOCUMENTS						
*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
*	A	US-4034663-A	1977-07-12	Jenn; Louis J.	A47J37/0623	126/300
*	B	US-3973551-A	1976-08-10	Caselani; Richard E.	A21B1/28	126/21A
*	C	US-10575679-B1	2020-03-03	Cheng; Xiao	A23L5/17	1/1
*	D	US-8011293-B2	2011-09-06	McFadden; David H.	A21B1/24	219/400
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FOREIGN PATENT DOCUMENTS						
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
 Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

<i>Search Notes</i> 	Application/Control No. 17/159,414	Applicant(s)/Patent Under Reexamination Martin et al.
	Examiner VIVEK K SHIRSAT	Art Unit 3762

CPC - Searched*		
Symbol	Date	Examiner
A47J37/0641, 0664	03/08/2024	vks
A47/J27/12, 004	03/08/2024	vks

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
126	21A	03/08/2024	vks

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
see search history	03/08/2024	vks
inventor search	03/08/2024	vks
class/subclass search	03/08/2024	vks
forward/backward search	03/08/2024	vks
text search	03/08/2024	vks

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/VIVEK K SHIRSAT/ Primary Examiner, Art Unit 3762	
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Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 05/31/2024. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

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	1	105615640	CN	A	2016-06-01	Huichi Development Co., Limited		
	2	205849310	CN	U	2017-01-04	Liu Jianchang		
	3	206675433	CN	U	2017-11-28	Yunnan Lingyuexuan Food Co., Ltd.		

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	N/A	
	Examiner Name	Not Yet Assigned	
	Attorney Docket Number	057664-348N01US	

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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EXAMINER SIGNATURE

Examiner Signature	/VIVEK K SHIRSAT/	Date Considered	03/06/2024
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2022-11-18
Name/Print	Lisa Adams	Registration Number	44,238

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Bibliographic Data

Application No: 17/159,414

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged: /VIVEK K SHIRSAT/

Examiner's Signature

Initials

Title: COOKING DEVICE AND COMPONENTS THEREOF

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
01/27/2021	126	3762	057664-348N01US
RULE			

APPLICANTS

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Michaela Dubeau, Uxbridge, MA, UNITED STATES

CONTINUING DATA

This application is a 371 of PCT/US2020/042120 07/15/2020

PCT/US2020/042120 has PRO of 62874193 07/15/2019

FOREIGN APPLICATIONS

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07/29/2022

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Mintz Levin/SharkNinja

One Financial Center

Boston, MA 02111

UNITED STATES

FILING FEE RECEIVED

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Doc code: IDS

PTO/SB/08a (01-22)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 05/31/2024. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher Martin
Art Unit	NA
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

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	1	20170071408	A1	2017-03-16	Veltrop et al.	

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Attorney Docket Number	057664-348N01US

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OR

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See attached certification statement.

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☒ A certification statement is not submitted herewith.

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Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2023-04-13
Name/Print	Lisa Adams	Registration Number	44,238

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Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 11/30/2020. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3761
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

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	1	20090126580	A1	2009-05-21	Hartfelder et al.	
	2	20120272832	A1	2012-11-01	Kwon et al.	
	3	20170231430	A1	2017-08-17	Moon et al.	

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Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2021-12-08
Name/Print	Lisa Adams	Registration Number	44,238

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PTO/SB/08a (02-18)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number			
	Filing Date			
	First Named Inventor	Christopher T. MARTIN		
	Art Unit			
	Examiner Name			
	Attorney Docket Number	EUP1549US2		

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5832812	A	1998-11-10	WOLFE, RONALD DALE ET AL.	

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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20180303285	A1	2018-10-25	CHENG	

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	1	202665302	CN	U	2013-01-16	HUANG ZHENXIONG		☐
	2	206080273	CN	U	2017-04-12	GUANGDONG RONGSHENG ELECTRIC HOLDING CO LTD		☐
	3	209032019	CN	U	2019-06-28	YUE MEIYI		☐

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	First Named Inventor	Christopher T. MARTIN	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	EUP1549US2	

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	1	International Search Report of the International Searching Authority; International Application No. PCT/US2020/042120; International Filing Date: July 15, 2020; Date of Mailing: October 30, 2020; 5 pages (EUP1549PCT)	☐
	2	Written Opinion of the International Searching Authority; International Application No. PCT/US2020/042120; International Filing Date: July 15, 2020; Date of Mailing: October 30, 2020; 11 pages (EUP1549PCT)	☐

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Signature	/Alicia Hayter, Reg. No. 67,093/	Date (YYYY-MM-DD)	2021-01-27
Name/Print	ALICIA HAYTER	Registration Number	67093

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Doc code: IDS

PTO/SB/08a (02-18)

Doc description: Information Disclosure Statement (IDS) Filed

Approved for use through 11/30/2020. OMB 0651-0031

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher MARTIN	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	EUP1549US2	

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Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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10	10190783	B2	2019-01-29	ROGERS, PAUL ROSS ET AL.	
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12	10234144	B2	2019-03-19	DESHPANDE, BIPIN PRABHAKAR	
13	10247424	B2	2019-04-02	ADELMANN, CHRISTOPHER JAMES ET AL.	
14	10271686	B2	2019-04-30	ROY	
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16	10285531	B2	2019-05-14	CHANOWITZ, BENSON	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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21	10383477	B2	2019-08-20	PAYEN, JEAN-MARC ET AL.	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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	33	10492641	B2	2019-12-03	KESTNER, KYLE THOMAS ET AL.	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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65	10914473	B2	2021-02-09	KIM, KYOUNG MOK ET AL.	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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76	7105778	B1	2006-09-12	DELONG ET AL.	
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78	7117866	B2	2006-10-10	CANTAL, DANTE	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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98	8640608	B2	2014-02-04	VOLATIER, SEBASTIEN	
99	8669500	B2	2014-03-11	HENSEL, KEITH JAMES ET AL.	
100	8720323	B2	2014-05-13	DOUGLAS, PAUL GRAHAM ET AL.	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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	120	9482437	B2	2016-11-01	KEMPER, LARS	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
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First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

29	20190282029	A1	2019-09-19	GOLDBERG, STEPHEN J.	
30	20190290062	A1	2019-09-26	PRIETO ET AL.	
31	20190290072	A1	2019-09-26	PRIETO ET AL.	
32	20190298104	A1	2019-10-03	BALSAMO, MICHAEL ET AL.	
33	20190298105	A1	2019-10-03	FLOESSHOLZER, HANNES UWE	
34	20190298106	A1	2019-10-03	CICHOSZ, FILIP PAWEL	
35	20190307291	A1	2019-10-10	DE' LONGHI, GIUSEPPE ET AL.	
36	20190309955	A1	2019-10-10	CASTILLO ET AL.	
37	20190313846	A1	2019-10-17	ABUKASHEF, ABDALLA	
38	20190313847	A1	2019-10-17	CHUN, YOUNG ET AL.	
39	20190328175	A1	2019-10-31	BANCROFT	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

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First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

	40	20190380533	A1	2019-12-19	LIEN, HUNG MEI	
	41	20200033009	A1	2020-01-30	LEE ET AL.	
	42	20200033010	A1	2020-01-30	KANG, CHUNG ET AL.	
	43	20200072475	A1	2020-03-05	CROW, NICHOLAS E. ET AL.	
	44	20200132309	A1	2020-04-30	OH, SUNGMIN ET AL.	
	45	20200138238	A1	2020-05-07	GROMOWSKI, PAUL ET AL.	
	46	20200138239	A1	2020-05-07	GROMOWSKI ET AL.	
	47	20200149746	A1	2020-05-14	LEE, KYUNG HWAN ET AL.	
	48	20200182484	A1	2020-06-11	COWAN, RICHARD W. ET AL.	
	49	20200187708	A1	2020-06-18	SAMONIGG, GERT ET AL.	
	50	20200187710	A1	2020-06-18	GUO ET AL .	

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Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

51	20200200393	A1	2020-06-25	GOLDBERG, JOSHUA GOULED ET AL.	
52	20200200394	A1	2020-06-25	BRUIN-SLOT, ZACHARY J. ET AL.	
53	20200200395	A1	2020-06-25	KLOK, MARTIJN	
54	20200208844	A1	2020-07-02	BRUIN-SLOT, ZACHARY J. ET AL.	
55	20200229276	A1	2020-07-16	KIM, HAG SOO ET AL.	
56	20200268200	A1	2020-08-27	ANTHONY, JOSHUA D. ET AL.	
57	20200288725	A1	2020-09-17	TEN DAM, MARTIJN	
58	20200309379	A1	2020-10-01	PALLER, HANS JUERGEN	
59	20200323222	A1	2020-10-15	REESE, ROBERT J. ET AL.	
60	20200329908	A1	2020-10-22	CHEN	
61	20200329909	A1	2020-10-22	CONRAD ET AL.	

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First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

62	20200329909	A1	2020-10-22	CONRAD, ET AL.	
63	20200345173	A1	2020-11-05	REALES BERTOMEIO, EMILIO	
64	20200352385	A1	2020-11-12	HOME, WILLIAM	
65	20200378609	A1	2020-12-03	PALLER, HANS JUERGEN	
66	20200383512	A1	2020-12-10	ITO, YUICHIRO ET AL.	

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	2019092346	WO	A1	2019-05-16	SEB S.A.		☐
	2	2019092347	WO	A1	2019-05-16	SEB S.A.		☐
	3	2019129598	WO	A1	2019-07-04	ARCELIK ANONIM SIRKETI		☐
	4	2019153512	WO	A1	2019-08-15	GUANGDONG MIDEA KITCHEN APPLIANCES MFG CO LTD		☐

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Attorney Docket Number	EUP1549US2	

5	2019157848	WO	A1	2019-08-22	KE M O HOUSE CO LTD		☐
6	2019207325	WO	A1	2019-10-31	LAMBRIANIDIS, PANAGIOTIS		☐
7	2020016085	WO	A1	2020-01-23	SEB SA		☐
8	2020033980	WO	A1	2020-02-13	RAUBENHEIMER, PIETER JACOBUS ADRIAAN		☐
9	2020043427	WO	A1	2020-03-05	KAMMERER GMBH		☐
10	2020077606	WO	A1	2020-04-23	DONGGUAN CITY JINYI ELECTRONIC TECHNOLOGY CO. LTD.		☐
11	2020098748	WO	A1	2020-05-22	GUANGDONG MIDEA KITCHEN APPLIANCES MFG CO LTD		☐
12	2020108917	WO	A1	2020-06-04	ARCELIK ANONIM SIRKETI		☐
13	2020113990	WO	A1	2020-06-11	GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI		☐
14	2020118993	WO	A1	2020-06-18	GUANGDONG MEIKONG ELECTRONIC TECHNOLOGY CO LTD.		☐
15	2020125025	WO	A1	2020-06-25	GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414	
	Filing Date		2021-01-27	
	First Named Inventor	Christopher MARTIN		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		EUP1549US2	

	16	2020148164	WO	A1	2020-07-23	KONINKLIJKE PHILIPS N.V.		☐
	17	2020148187	WO	A1	2020-07-23	KONINKLIJKE PHILIPS N.V.		☐
	18	2020168202	WO	A1	2020-08-20	WIEDER, MAXWELL ET AL.		☐
	19	2020174329	WO	A1	2020-09-03	THETFORD BV		☐
	20	2020233111	WO	A1	2020-11-26	GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI		☐
	21	2021005543	WO	A1	2021-01-14	I.R.C.A. S.P.A. INDUSTRIA RESISTENZE CORAZZATE E A		☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1		☐

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Examiner Signature	/VIVEK K SHIRSAT/	Date Considered	03/06/2024
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	17159414		
Filing Date	2021-01-27		
First Named Inventor	Christopher MARTIN		
Art Unit			
Examiner Name			
Attorney Docket Number	EUP1549US2		

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alicia Hayter, Reg. No. 67,093/	Date (YYYY-MM-DD)	2021-03-16
Name/Print	ALICIA HAYTER	Registration Number	67093

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L1	225	("20170071408" OR "11297977" OR "20090126580" OR "20120272832" OR "20170231430" OR "10045651" OR "10051997" OR "10088173" OR "10094576" OR "10099839" OR "10101038" OR "10113749" OR "10143324" OR "10174953" OR "10190783" OR "10203117" OR "10234144" OR "10247424" OR "10271686" OR "10271690" OR "10285531" OR "10309659" OR "10337745" OR "10364990" OR "10364991" OR "10383477" OR "10390656" OR "10405696" OR "10405697" OR "10405698" OR "10405699" OR "10413121" OR "10413122" OR "10426176" OR "10448785" OR "10448786" OR "10451285" OR "10492641" OR "10495319" OR "10495320" OR "10502433" OR "10512363" OR "10524615" OR "10598391" OR "10619862" OR "10627116" OR "10638882" OR "10660471" OR "10674853" OR "10674854" OR "10684022" OR "10694753" OR	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:21 PM

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L8	1955	L7 AND ((heating WITH element) OR heating\$1element)	(US-PGPUB; USPAT)	OR	ON	ON	2024/03/06 04:46 PM
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L18	3556	L13 AND @py<="2019"	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
L19	1866	L18 AND (blower OR fan)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/03/07 11:49 AM
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L22	1	"10575679".pn.	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 05:28 PM
L23	2936	(((("MARTIN") near3 ("Christopher")) OR ((("GUERIN") near3 ("Thomas")) OR ((("JACKSON") near3 ("Roger")) OR ((("ANTHONY") near3 ("Joshua")) OR ((("SCHWARZ") near3 ("Kerry")) OR ((("DUBEAU") near3 ("Michaela")))).INV.	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:27 PM
L24	172	L23 AND cooking	(US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT)	OR	ON	ON	2024/03/07 06:28 PM
L25	158	L23 AND cooking	(US-PGPUB; USPAT; USOCR)	OR	ON	ON	2024/03/07 06:28 PM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17159414
	Filing Date	2021-01-27
	First Named Inventor	Christopher Martin
	Art Unit	NA
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	057664-348N01US

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
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Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20170071408	A1	2017-03-16	Veltrop et al.	

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**INFORMATION DISCLOSURE
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(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher Martin
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Attorney Docket Number	057664-348N01US

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EXAMINER SIGNATURE

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¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2023-04-13
Name/Print	Lisa Adams	Registration Number	44,238

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: Not Yet Assigned

For: **COOKING DEVICE AND COMPONENTS
THEREOF**

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the “References Cited” on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copy of U.S. publication is not submitted.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be

an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

Please charge our Deposit Account No. 50-0311 in the amount of \$260.00 covering the fee set forth in 37 C.F.R. § 1.17(p). However, if a fee is due, please charge our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: April 13, 2023

Respectfully submitted,

By: /Lisa Adams/

Lisa Adams

Registration No.: 44,238

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 348-3054

Attorney for Applicant



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
04/13/2023 11:17:48 AM ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Deepti Rastogi
PATENT CENTER #	61913891	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Lisa Adams

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US_17159414_IDS_Transmittal.pdf	2	Transmittal Letter	104 KB
17159414_SIDS_Apr_13_2023.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1234 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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057664-348N01US_17159414_IDS_Tra nsmittal.pdf	215324FB98A06EEF846F6B736290868599EDCB4F64DA5BB7C B630D471C2D2ECDF3BC9E68CE80C7E1D906343FB357B0FF3 6DC067DD99EF9FF741AD0DC5A1D7124
17159414_SIDS_Apr_13_2023. pdf	DA0A09D62963F1BEEDFBBA506F0C5DE6F5A25D83C2DF4728 AE6A99B4BDF1F3315E7C51EBA65C366A05DCD59AAF8BB70C CD170DFE65A7633D8DF08202269ED2DA

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US

CONFIRMATION NO. 3603

PUBLICATION NOTICE



OC000000137108199

177399
Mintz Levin/SharkNinja
One Financial Center
Boston, MA 02111

Title:COOKING DEVICE AND COMPONENTS THEREOF

Publication No.US-2022-0408966-A1

Publication Date:12/29/2022

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Public Records Division. The Public Records Division can be reached by telephone at (571) 272-3150 or (800) 972-6382, by facsimile at (571) 273-3250, by mail addressed to the United States Patent and Trademark Office, Public Records Division, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <https://portal.uspto.gov/pair/PublicPair>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Christopher T. Martin, et al.

FILING DATE January 27, 2021

EXAMINER: CENTRAL, DOCKET

SERIAL NUMBER 17/159,414

ART UNIT: OPAP

FOR: COOKING DEVICE AND COMPONENTS THEREOF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR STATUS OF FIRST ACTION

Applicant kindly request that the undersigned attorney be informed of the status of the above-referenced patent application filed on January 27, 2021. To date, the subject patent application has not been assigned an Examiner Name or Group Art Unit.

No fees are believed due in connection with this communication. However, the Commissioner is authorized to credit any overpayment or charge any deficiencies to Deposit Account No. 50-0311, Reference No. 057664-348N01US.

Respectfully Submitted,

Dated: November 30, 2022

/Lisa Adams /

Lisa Adams

Registration No.: 44,238

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 542-6000

Attorney for Applicant

Electronic Acknowledgement Receipt

EFS ID:	47116805
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	177399
Filer:	Lisa Adams/Valerie Borry
Filer Authorized By:	Lisa Adams
Attorney Docket Number:	057664-348N01US
Receipt Date:	30-NOV-2022
Filing Date:	27-JAN-2021
Time Stamp:	17:11:28
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Request for status of Application	057664348N01USRequestStatus.pdf	108073 cc0b2e1f2f5cea501458e1184f48f4ca1f0be01d	no	1

Warnings:

Information:	
Total Files Size (in bytes):	108073
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17159414
	Filing Date	2021-01-27
	First Named Inventor	Christopher T. Martin
	Art Unit	N/A
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	057664-348N01US

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	1	11297977	B1	2022-04-12	Man, Kaimong	

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	1	105615640	CN	A	2016-06-01	Huichi Development Co., Limited		
	2	205849310	CN	U	2017-01-04	Liu Jianchang		
	3	206675433	CN	U	2017-11-28	Yunnan Lingyuexuan Food Co., Ltd.		

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
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First Named Inventor	Christopher T. Martin
Art Unit	N/A
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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First Named Inventor	Christopher T. Martin
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SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2022-11-18
Name/Print	Lisa Adams	Registration Number	44,238

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



Espacenet

Bibliographic data: CN206675433 (U) — 2017-11-28

Even cake that is heated toasts equipment

Inventor(s): WANG GUIPING ± (王桂平)

Applicant(s): YUNNAN LINGYUEXUAN FOOD CO LTD ± (云南凌悦轩食品有限公司)

Classification: - **international:** **A47J37/06**
- **cooperative:**

Application number: CN20172005968U 20170104

Priority number(s): CN20172005968U 20170104

Abstract of CN206675433 (U)

The utility model discloses an even cake that is heated toasts equipment, including box, furnace gate, controlling means and universal wheel, box and furnace gate swing joint, the box surface is equipped with controlling means, the furnace gate surface is equipped with heat -resisting tempering glass window and handle, and the handle is located heat -resisting tempering glass window top, the controlling means surface is equipped with thermoregulator and timer, and the thermoregulator is located the timer top. The utility model discloses a two piece upper and lower heating pipes can make thermally equivalent about the material, when starting, upper and lower heating pipe concurrent heating, the fan starts simultaneously, the hot -air pass through the furnace gate about from top to bottom the inner wall rebound in proper order, intracavity circulation including all the time, the messenger is heated more evenly, has reduced thermal loss simultaneously, the side is equipped with nylon matter tool bag, and the instrument can convenient and fast when using takes out the use to categorised income that can be convenient, though the universal wheel equipment of bottom heavier also can make things convenient for laborsaving with its removal.



(12)实用新型专利

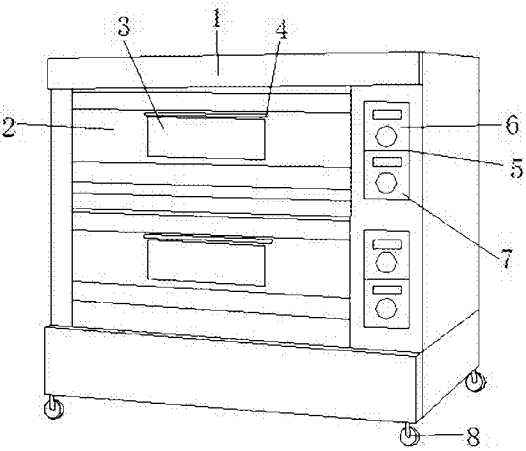
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权利要求书1页 说明书2页 附图2页

(54)实用新型名称
一种受热均匀的糕点烘烤设备

(57)摘要
本实用新型公开了一种受热均匀的糕点烘烤设备,包括箱体、炉门、控制装置和万向轮,所述箱体和炉门活动连接,所述箱体表面设有控制装置,所述炉门表面设有耐热钢化玻璃窗和把手,且把手位于耐热钢化玻璃窗上方,所述控制装置表面设有调温器和定时器,且调温器位于定时器上方。本实用新型通过上下两根加热管,可以使材料上下均匀受热,当启动时,上下加热管同时加热,风机同时启动,热空气通过炉门上下左右内壁依次反弹,始终在内腔内循环,使受热更为均匀,同时减少了热量的损耗;侧面设有尼龙质工具袋,在使用时工具可以方便快捷的取出使用,并且可以方便的分类收入,底部的万向轮即使设备较重也可以方便省力将其移动。



1. 一种受热均匀的糕点烘烤设备,包括箱体(1)、炉门(2)、控制装置(5)和万向轮(8),其特征在于:所述箱体(1)和炉门(2)活动连接,所述箱体(1)表面设有控制装置(5),所述炉门(2)表面设有耐热钢化玻璃窗(3)和把手(4),且把手(4)位于耐热钢化玻璃窗(3)上方,所述控制装置(5)表面设有调温器(6)和定时器(7),且调温器(6)位于定时器(7)上方,所述箱体(1)内部设有内腔(9),所述内腔(9)内部顶端设有耐高温照明灯(10),所述内腔(9)内部设有上加热管(11)和下加热管(14),且上加热管(11)位于下加热管(14)上方,所述内腔(9)内部设有烤架(13),且烤架(13)位于上加热管(11)与下加热管(14)之间,所述内腔(9)底端设有烤盘(15),所述内腔(9)内表面设有风机挡板(12),所述风机挡板(12)一侧设有风机(17),所述箱体(1)一侧设有工具袋(16),所述箱体(1)底端设有万向轮(8)。

2. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述上加热管(11)和下加热管(14)为石英加热管。

3. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述烤盘(15)为不锈钢金属烤盘。

4. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述工具袋(16)为尼龙材质。

5. 根据权利要求1所述的一种受热均匀的糕点烘烤设备,其特征在于:所述工具袋(16)数量为若干个。

一种受热均匀的糕点烘烤设备

技术领域

[0001] 本实用新型涉及一种糕点加工技术领域,特别涉及一种受热均匀的糕点烘烤设备。

背景技术

[0002] 糕点制作离不开烘烤,随着社会的发展,在最开始的在外面购买糕点,到现在已经有很多人选择自己制作糕点,烤箱正逐渐走入我们的家庭之中;目前大多数烤箱内部加热管都是设有一个,即使设有两个加热管,在烤制时受热方面还是很不均匀,在烤制时需要经常对材料翻面,很多时候出现一面烤制都已经过火了,另外一面刚刚好,并且一些烤制工具,如模具,防烫手套,金属夹等等这些工具使用时非常凌乱让人手忙脚乱,并且箱体大多比较笨重,移动时非常的费力。为此,我们提出一种受热均匀的糕点烘烤设备。

[0003] 【实用新型内容】

[0004] 本实用新型的主要目的在于提供一种受热均匀的糕点烘烤设备,可以有效解决背景技术中的问题。

[0005] 为实现上述目的,本实用新型采取的技术方案为:

[0006] 一种受热均匀的糕点烘烤设备,包括箱体、炉门、控制装置和万向轮,所述箱体和炉门活动连接,所述箱体表面设有控制装置,所述炉门表面设有耐热钢化玻璃窗和把手,且把手位于耐热钢化玻璃窗上方,所述控制装置表面设有调温器和定时器,且调温器位于定时器上方,所述柜体内部设有内腔,所述内腔内部顶端设有耐高温照明灯,所述内腔内部设有上加热管和下加热管,且上加热管位于下加热管上方,所述内腔内部设有烤架,且烤架位于上加热管与下加热管之间,所述内腔底端设有烤盘,所述内腔内表面设有风机挡板,所述风机挡板一侧设有风机,所述箱体一侧设有工具袋,所述箱体底端设有万向轮。

[0007] 进一步地,所述上加热管和下加热管为石英加热管。

[0008] 进一步地,所述烤盘为不锈钢金属烤盘。

[0009] 进一步地,所述工具袋为尼龙材质。

[0010] 进一步地,所述工具袋数量为若干个。

[0011] 与现有技术相比,本实用新型具有如下有益效果:本实用新型通过上下两根加热管,可以使材料上下均匀受热,当启动时,上下加热管同时加热,风机同时启动,热空气通过炉门上下左右内壁依次反弹,始终在内腔内循环,使受热更为均匀,同时减少了热量的损耗;侧面设有尼龙质工具袋,在使用时工具可以方便快捷的取出使用,并且可以方便的分类收入,底部的万向轮即使设备较重也可以方便省力将其移动。

[0012] 【附图说明】

[0013] 图1为本实用新型一种受热均匀的糕点烘烤设备的整体结构示意图。

[0014] 图2为本实用新型一种受热均匀的糕点烘烤设备的内腔结构示意图。

[0015] 图3为本实用新型一种受热均匀的糕点烘烤设备的侧面结构示意图。

[0016] 图4为本实用新型一种受热均匀的糕点烘烤设备的挡板结构示意图。

[0017] 图中:1、箱体;2、炉门;3、耐热钢化玻璃窗;4、把手;5、控制装置;6、调温器;7、定时器;8、万向轮;9、内腔;10、耐高温照明灯;11、上加热管;12、风机挡板;13、烤架;14、下加热管;15、烤盘;16、工具袋;17、风机。

[0018] 【具体实施方式】

[0019] 为使本实用新型实现的技术手段、创作特征、达成目的与功效易于明白了解,下面结合具体实施方式,进一步阐述本实用新型。

[0020] 如图1-4所示,一种受热均匀的糕点烘烤设备,包括箱体1、炉门2、控制装置5和万向轮8,所述箱体1和炉门2活动连接,所述箱体1表面设有控制装置5,所述炉门2表面设有耐热钢化玻璃窗3和把手4,且把手4位于耐热钢化玻璃窗3上方,所述控制装置5表面设有调温器6和定时器7,且调温器6位于定时器7上方,所述箱体1内部设有内腔9,所述内腔9内部顶端设有耐高温照明灯10,所述内腔9内部设有上加热管11和下加热管14,且上加热管11位于下加热管14上方,所述内腔9内部设有烤架13,且烤架13位于上加热管11与下加热管14之间,所述内腔9底端设有烤盘15,所述内腔9内表面设有风机挡板12,所述风机挡板12一侧设有风机17,所述箱体1一侧设有工具袋16,所述箱体1底端设有万向轮8。

[0021] 本实用新型一种受热均匀的糕点烘烤设备,本实用新型通过上下两根加热管,可以使材料上下均匀受热,当启动时,上下加热管同时加热,风机同时启动,热空气通过炉门上下左右内壁依次反弹,始终在内腔内循环,使受热更为均匀,同时减少了热量的损耗;侧面设有尼龙质工具袋,在使用时工具可以方便快捷的取出使用,并且可以方便的分收入,底部的万向轮即使设备较重也可以方便省力将其移动。

[0022] 其中,所述上加热管11和下加热管14为石英加热管。

[0023] 其中,所述烤盘15为不锈钢金属烤盘。

[0024] 其中,所述工具袋16为尼龙材质。

[0025] 其中,所述工具袋16数量为若干个。

[0026] 需要说明的是,本实用新型为一种受热均匀的糕点烘烤设备,使用时将材料置于烤架13上,通过调温器6与定时器7调整所需要的烘烤温度与时间,当启动时,上加热管11与下加热管14同时加热,此时风机17同时启动,热空气通过炉门2上下左右内壁依次反弹,始终在内腔9内循环,使材料更为均匀受热并且减少了热能的多余损耗;内腔9底部的烤盘15在不仅可以盛接烤制时材料掉落的油污,残渣等,亦可以在烤制当做托盘,其不锈钢金属材质也会使其受热更快更为均匀。

[0027] 以上显示和描述了本实用新型的基本原理和主要特征和本实用新型的优点。本行业的技术人员应该了解,本实用新型不受上述实施例的限制,上述实施例和说明书中描述的只是说明本实用新型的原理,在不脱离本实用新型精神和范围的前提下,本实用新型还会有各种变化和改进,这些变化和改进都落入要求保护的本实用新型范围内。本实用新型要求保护范围由所附的权利要求书及其等效物界定。

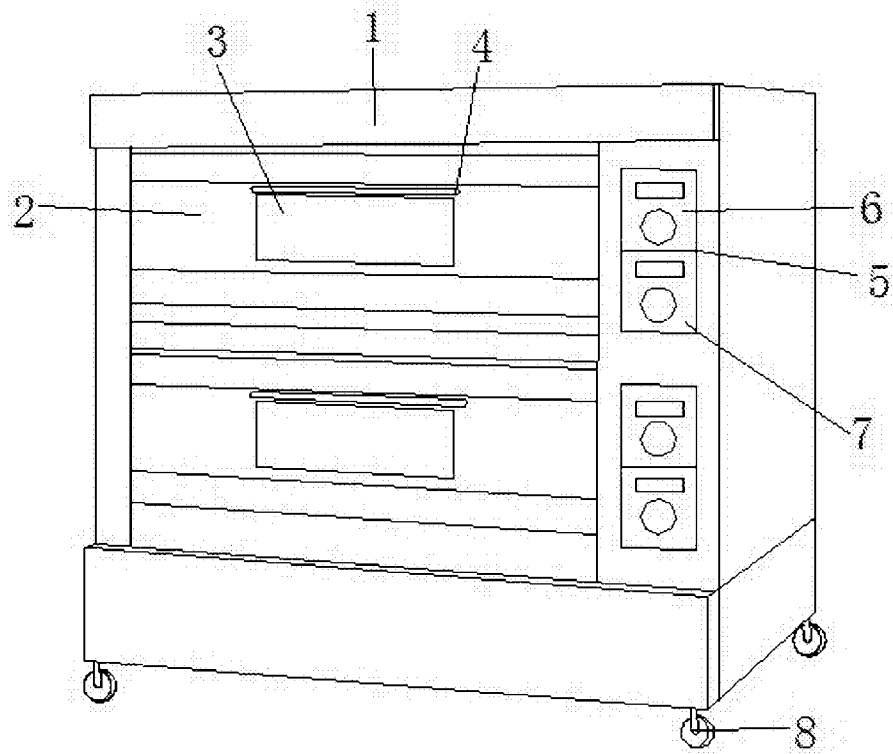


图1

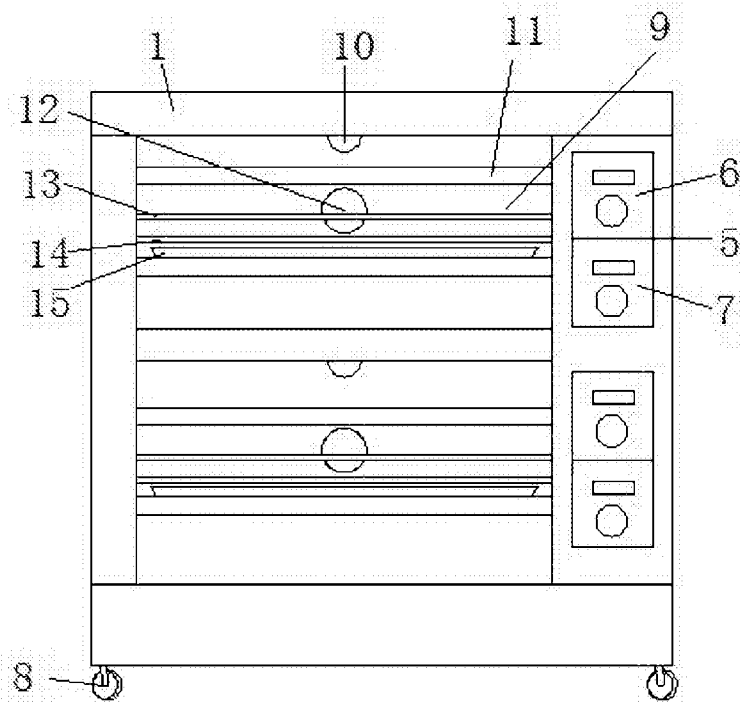


图2

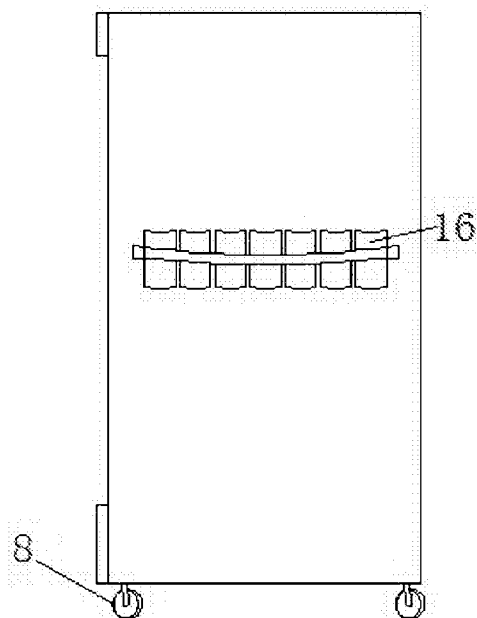


图3

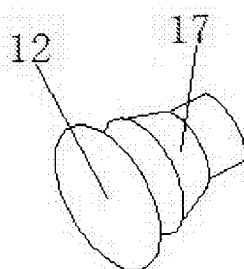


图4



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
17/159,414

RECEIPT DATE / TIME
11/18/2022 11:32:47 AM ET

ATTORNEY DOCKET #
057664-348N01US

Title of Invention

COOKING DEVICE AND COMPONENTS THEREOF

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3603	FILED BY	Rajiv Kumar
PATENT CENTER #	61195888	FILING DATE	01/27/2021
CUSTOMER #	177399	FIRST NAMED INVENTOR	Christopher T. Martin
INTL. APPLICATION #	-	INTL. FILING DATE	-
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Lisa Adams

Documents

TOTAL DOCUMENTS: 5

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
057664-348N01US_17159414_Docketed_New_Case_SIDS_Nov_18_2022.pdf	4	Information Disclosure Statement (IDS) Form (SB08)	1234 KB
057664-348N01US_17159414_Docketed_New_Case_Transmittal.pdf	2	Transmittal Letter	95 KB
CN_105615640_A.pdf	14	Foreign Reference	978 KB
CN_205849310_U.pdf	9	Foreign Reference	770 KB

CN_206675433_U.pdf

7

Foreign Reference

493 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: 057664-348N01US
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: Not Yet Assigned

For: **COOKING DEVICE AND COMPONENTS
THEREOF**

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copy of a U.S. patent are not submitted. Submitted herewith are copies of foreign patents in accordance with 37 C.F.R. § 1.98(a)(2).

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance with

37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

All fees due are believed to be paid. The Director is hereby authorized to charge any deficiency in the fees filed with this paper, asserted to be filed with this paper, or which should have been filed with this paper, to our Deposit Account No. 50-0311, under Order No. 057664-348N01US from which the undersigned is authorized to draw.

Dated: November 18, 2022

Respectfully submitted,

Electronic signature: /Lisa Adams/

Lisa Adams

Registration No.: 44,238

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**Espacenet****Bibliographic data: CN205849310 (U) — 2017-01-04**

Electric oven

Inventor(s): LIU JIANCHANG ± (刘建厂)
Applicant(s): LIU JIANCHANG ± (刘建厂)
Classification: - **international:** **A47J37/06**
- **cooperative:**
Application number: CN201620486435U 20160525
Priority number(s): CN201620486435U 20160525

Abstract of CN205849310 (U)

The utility model discloses an electric oven, including the furnace body, be equipped with two baking chamber in the furnace body at least, the furnace body front side corresponds every baking chamber and is equipped with the pull mouth, is equipped with the overware that can follow the pull mouth and take out in the baking chamber, and the inherent overware top of baking chamber is equipped with a heating device, is equipped with the 2nd heating device below the overware, and the heating device electricity in every baking chamber is connected with control switch, the furnace body top is equipped with roast board in advance, and the furnace body inherence is corresponding the 3rd heating device that is equipped with in roast board below in advance. The utility model discloses in every baking chamber all can carry out toasting of food alone, can choose for use the baking chamber of suitable quantity to toast according to passenger flow volume during the use to the adjustment baking guarantees that food both can satisfy the supply, prevents again that processing is excessive. The furnace body top is equipped with roast board in advance, and the furnace body inherence is corresponding the 3rd heating device that is equipped with in roast board below in advance, can carry out the preliminary drying to food and bake.



(12)实用新型专利

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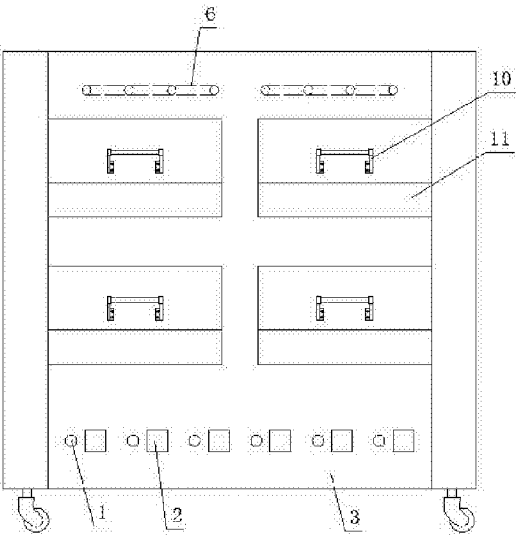
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权利要求书1页 说明书3页 附图3页

(54)实用新型名称
电烤炉

(57)摘要

本实用新型公开了一种电烤炉,包括炉体,炉体内至少设有两个烘烤腔,炉体前侧对应每个烘烤腔设有抽拉口,烘烤腔内设有可从抽拉口抽出的烤盘,烘烤腔内在烤盘上方设有第一加热装置、在烤盘下方设有第二加热装置,每个烘烤腔内的加热装置电连接有控制开关;炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置。本实用新型中每个烘烤腔均可单独进行食品的烘烤,使用时可根据客流量选用合适数量的烘烤腔进行烘烤,从而调整烘烤量,保证食品既可满足供应,又防止加工过量。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置,可以对食品进行预烘烤。



CN 205849310 U

1.一种电烤炉,包括炉体(3),其特征是所述炉体内至少设有两个烘烤腔,所述炉体前侧对应每个烘烤腔设有抽拉口,所述烘烤腔内设有可从抽拉口抽出的烤盘(7),所述烘烤腔内在烤盘(7)上方设有第一加热装置(4)、在烤盘(7)下方设有第二加热装置(5),每个烘烤腔内的加热装置电连接有控制开关;所述炉体顶部设有预烤板,所述炉体内在预烤板下方对应设有第三加热装置(6)。

2.根据权利要求1所述的电烤炉,其特征是所述烘烤腔内的第一加热装置(4)和第二加热装置(5)串联设置,所述炉体前侧设有控制开关,所述控制开关电连接在第一加热装置(4)和第二加热装置(5)的供电回路上,所述烘烤腔内设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第一加热装置(4)和第二加热装置(5)的供电回路上。

3.根据权利要求1所述的电烤炉,其特征是所述炉体内在预烤板下方设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第三加热装置(6)的供电回路上。

4.根据权利要求1所述的电烤炉,其特征是所述第一加热装置(4)和第二加热装置(5)均为电热管。

5.根据权利要求1所述的电烤炉,其特征是所述第三加热装置(6)包括两根电热管,两根电热管分设在炉体的左右两侧并分别电连接有控制开关。

6.根据权利要求1所述的电烤炉,其特征是所述烤盘(7)包括多条沿左右方向间隔设置的支撑条,支撑条的前端固接在上封板上,支撑条的后端通过横向设置的连接杆连接,所述上封板的前侧设有把手,所述烘烤腔内在第二加热装置(5)下方设有接油盘(8),所述接油盘(8)的前端固接在下封板(11)上,所述下封板和上封板共同将抽拉口封闭。

7.根据权利要求1至6中任一项所述的电烤炉,其特征是所述炉体内设有四个烘烤腔,其中两个烘烤腔设置在炉体左侧并上下对应设置,另外两个烘烤腔设置在炉体右侧并上下对应设置。

8.根据权利要求7所述的电烤炉,其特征是位于同侧的两个烘烤腔沿前后方向的长度一致。

9.根据权利要求1至6中任一项所述的电烤炉,其特征是所述炉体内设有两个烘烤腔,两个烘烤腔左右对称设置。

10.根据权利要求9所述的电烤炉,其特征是所述炉体在烘烤腔下方设有存储腔,所述炉体前侧对应存储腔设有开口并对应开口设有可将开口封闭的箱门(9)。

电烤炉

技术领域

[0001] 本实用新型涉及一种电烤炉。

背景技术

[0002] 市面上的电烤炉一般只有一个烘烤腔,烘烤腔内放置多个烘烤盘,此种电烤炉可一次性制作较多食品,适应于客流量较大的食品店,但是部分食品店的客流量不稳定,客流量时大时小,若一次性烤制较多食品,未在较短时间内卖完,其口味会变差,口味变差后卖给食客,会影响食品店的回头率,若剩下的食品不卖,又会严重亏本,影响食品店的盈利。而用较小的电烤炉,一次性烤制量小,耗电低,可在较短时间内卖完,但是当客流量大时,其供不应求,顾客等待时间延长,顾客流失的可能性增大。

发明内容

[0003] 本实用新型要解决的技术问题是提供一种可调节烘烤量的电烤炉。

[0004] 为解决上述技术问题,本实用新型包括炉体,其结构特点是所述炉体内至少设有两个烘烤腔,所述炉体前侧对应每个烘烤腔设有抽拉口,所述烘烤腔内设有可从抽拉口抽出的烤盘,所述烘烤腔内在烤盘上方设有第一加热装置、在烤盘下方设有第二加热装置,每个烘烤腔内的加热装置电连接有控制开关;所述炉体顶部设有预烤板,所述炉体内在预烤板下方对应设有第三加热装置。

[0005] 所述烘烤腔内的第一加热装置和第二加热装置串联设置,所述炉体前侧设有控制开关,所述控制开关电连接在第一加热装置和第二加热装置的供电回路上,所述烘烤腔内设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第一加热装置和第二加热装置的供电回路上。

[0006] 所述炉体内在预烤板下方设有温度传感器,温度传感器电连接有温度显示装置,所述温度显示装置安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第三加热装置的供电回路上。

[0007] 所述第一加热装置和第二加热装置均为电热管。

[0008] 所述第三加热装置包括两根电热管,两根电热管分设在炉体的左右两侧并分别电连接有控制开关。

[0009] 所述烤盘包括多条沿左右方向间隔设置的支撑条,支撑条的前端固接在上封板上,支撑条的后端通过横向设置的连接杆连接,所述上封板的前侧设有把手,所述烘烤腔内在第二加热装置下方设有接油盘,所述接油盘的前端固接在下封板上,所述下封板和上封板共同将抽拉口封闭。

[0010] 所述炉体内设有四个烘烤腔,其中两个烘烤腔设置在炉体左侧并上下对应设置,另外两个烘烤腔设置在炉体右侧并上下对应设置。

[0011] 位于同侧的两个烘烤腔沿前后方向的长度一致。

[0012] 所述炉体内设有两个烘烤腔,两个烘烤腔左右对称设置。

[0013] 所述炉体在烘烤腔下方设有存储腔,所述炉体前侧对应存储腔设有开口并对应开口设有可将开口封闭的箱门。

[0014] 采用上述结构后,本实用新型中炉体内设有多个烘烤腔,烘烤腔内在烤盘上方设有第一加热装置、在烤盘下方设有第二加热装置,每个烘烤腔内的加热装置电连接有控制开关,此种结构的烤炉每个烘烤腔均可单独进行食品的烘烤,使用时可根据客流量选用合适数量的烘烤腔进行烘烤,从而调整烘烤量,保证食品既可满足供应,又防止加工过量。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置,可以对食品进行预烘烤。

附图说明

[0015] 下面结合附图及具体实施方式对本实用新型作进一步详细说明:

[0016] 图1为本实用新型第一种实施例的结构示意图;

[0017] 图2为本实用新型第二种实施例的结构示意图;

[0018] 图3为烘烤腔内部的结构示意图;

[0019] 图4为图3沿A-A线剖视的结构示意图。

具体实施方式

[0020] 如图1、图3和图4所示,电烤炉包括炉体3,炉体底面四角设有可锁止的行走轮。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置6,本实施例中第三加热装置6包括两根电热管,两根电热管分设在炉体的左右两侧,两根电热管分别电连接有控制开关1,控制开关1设置在炉体前侧下部,每根电热管弯折呈蛇形。炉体内至少设有两个烘烤腔,本实施例中炉体内设有四个烘烤腔,其中两个烘烤腔设置在炉体左侧并上下对应设置,另外两个烘烤腔设置在炉体右侧并上下对应设置,本实施例中位于同侧的两个烘烤腔沿前后方向的长度一致,位于不同侧的烘烤腔长度不一致,使用时可根据烧烤的量选用前后长度合适的烘烤腔加工食品,同时第三加热装置6也可只开启对应侧的电热管,可节约用电量。炉体前侧对应每个烘烤腔设有抽拉口,烘烤腔内设有可从抽拉口抽出的烤盘7,烘烤腔内设有用于对烤盘7支撑并供烤盘7滑动的支撑装置,支撑装置可选用角钢焊接在烘烤腔的腔壁上形成,烘烤腔内在烤盘7上方设有第一加热装置4、在烤盘7下方设有第二加热装置5,本实用新型中第一加热装置4和第二加热装置5均选用价格较低廉、使用效果好的电热管。本实施例中烤盘7包括多条沿左右方向间隔设置的支撑条,支撑条的前端固接在上封板上,支撑条的后端通过横向设置的连接杆连接,连接杆和支撑条可均选用钢条制成,上封板的前侧设有用于抽拉烤盘7的把手10。此种结构的烤盘7,需在其下部设置接油盘8,本实施例中接油盘8设置在第二加热装置5下方,其下表面直接与腔壁的下部接触实现支撑,接油盘8的大小与烤盘7的大小相适应,接油盘8的前端固接在下封板11上,下封板11和上封板共同将抽拉口封闭。前述结构的烤盘7,其上下贯通,烘烤腔内第一加热装置4和第二加热装置5加热后,热量扩散均匀,烘烤出的食品味道更好。本实用新型中烤盘也可直接选用底部由平板支撑的烤盘,选用此种烤盘的烤炉不需再设置接油盘8。

[0021] 本实用新型中为更好的固定电热管,在烘烤腔前侧固装有沿左右方向设置的支撑板12,支撑板12位于电热管的下方,支撑板12上固装有将电热管锁紧的锁紧片13,锁紧片13

的两个自由端分设在电热管两侧并固接在支撑板上,实现对电热管的支撑与固定。

[0022] 如图2所示,为本实用新型的第二种实施例,其与第一种实施例的不同之处在于:炉体内仅设有两个烘烤腔,两个烘烤腔左右对称设置。炉体在烘烤腔下方设有存储腔,炉体前侧对应存储腔设有开口并对应开口设有可将开口封闭的箱门9。此种结构的烤炉适宜客流量较小的食品店。

[0023] 本实用新型中同一个烘烤腔内的第一加热装置4和第二加热装置5串联设置,炉体前侧设有控制开关1,控制开关1电连接在第一加热装置4和第二加热装置5的供电回路上,烘烤腔内设有温度传感器,温度传感器电连接有温度显示装置2,温度显示装置2安装在炉体前侧,所述温度传感器还电连接有温控开关,所述温控开关电连接在第一加热装置4和第二加热装置5的供电回路上。

[0024] 本实用新型中炉体内在预烤板下方左侧和右侧分别设有温度传感器,每个温度传感器电连接有温度显示装置2,温度显示装置2安装在炉体前侧,温度传感器还电连接有温控开关,温控开关电连接在电热管的供电回路上,从而实现两个电热管的单独控制。

[0025] 本实用新型在使用时,当烤制区内的温度达到设定温度后,温控开关切断加热装置的供电回路,加热装置停止加热,当烤制区的温度低于设定值时,温控开关接通加热装置的供电回路,加热装置重新工作,以维持烤制区的温度,使食品在烤制过程中,受热均匀,保证食品风味。使用者可根据烤制的具体情况调整温控开关的设定温度,使火烧烤炉内的温度始终保持在适宜温度。

[0026] 本实用新型中炉体内设有多个烘烤腔,烘烤腔内在烤盘7上方设有第一加热装置4、在烤盘7下方设有第二加热装置5,每个烘烤腔内的加热装置电连接有控制开关1,此种结构的烤炉每个烘烤腔均可单独进行食品的烘烤,使用时可根据客流量选用合适数量的烘烤腔进行烘烤,从而调整烘烤量,保证食品既可满足供应,又防止加工过量。炉体顶部设有预烤板,炉体内在预烤板下方对应设有第三加热装置6,可以对食品进行预烘烤,且第三加热装置6左侧和右侧的电热管可根据下部烘烤腔的工作状态单独开启,更好利用下部烘烤腔辐射出的热量,降低能耗。

[0027] 以上所述仅为本实用新型的优选实施例,并不用于限制本实用新型。前述实施例对本实用新型进行了详细的说明,对于本领域的技术人员来说,其依然可以对前述各实施例所记载的技术方案进行修改,或者对其中部分技术特征进行等同替换。但凡在本实用新型的发明构思范围之内,所做的任何修改、等同替换、改进等,均包含在本实用新型的保护范围之内。

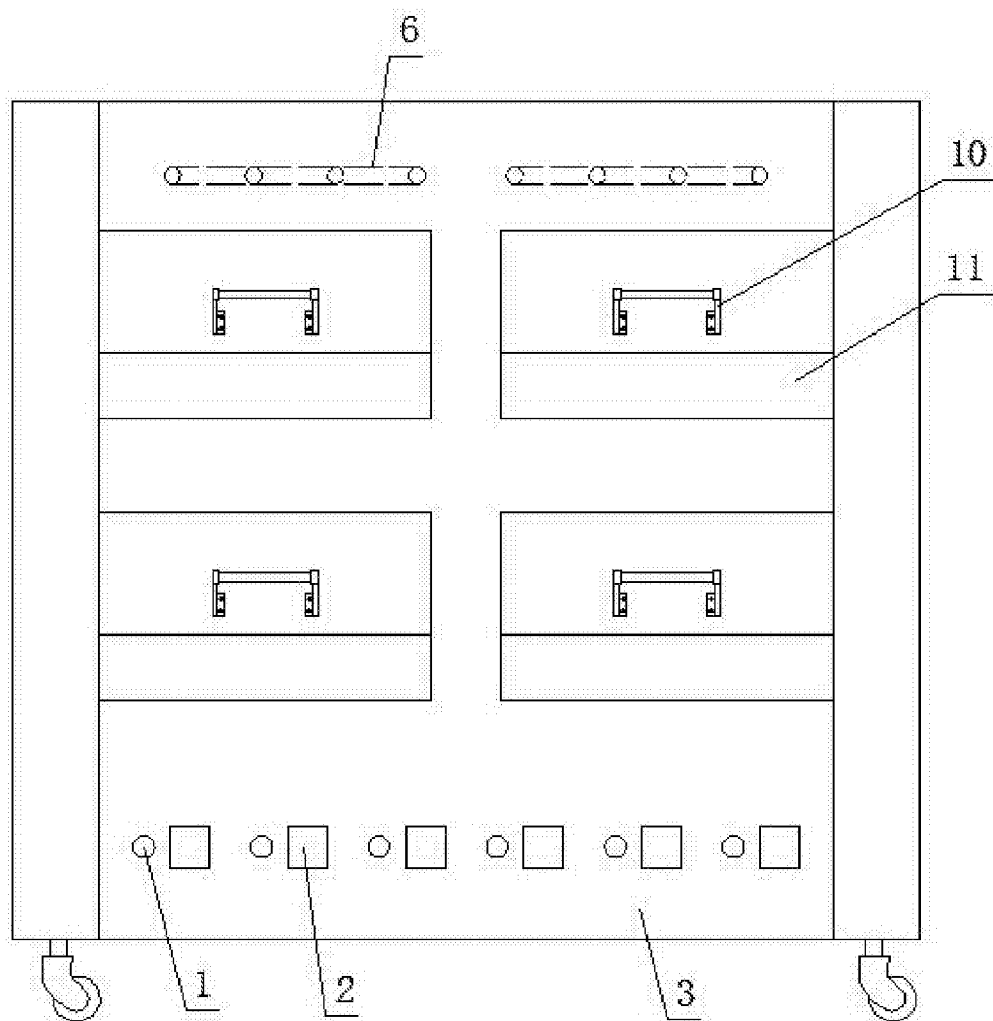


图1

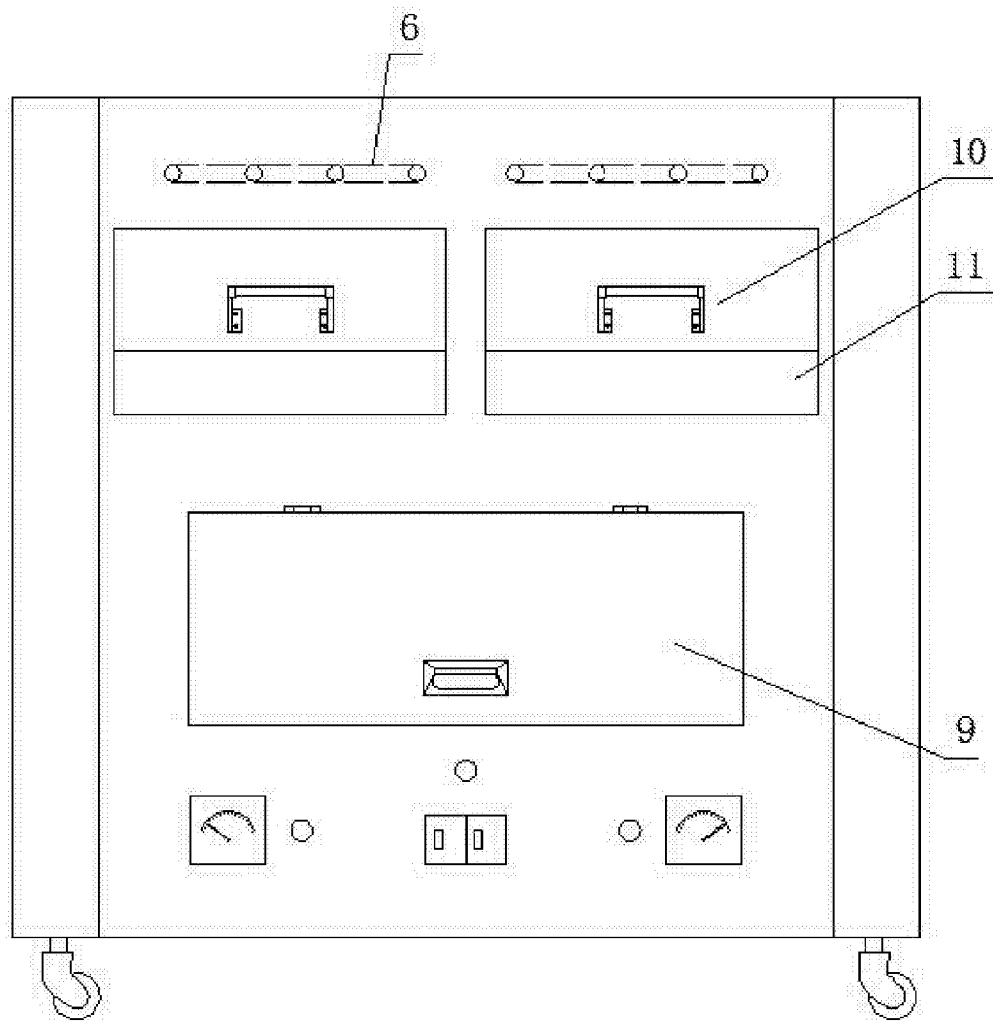


图2

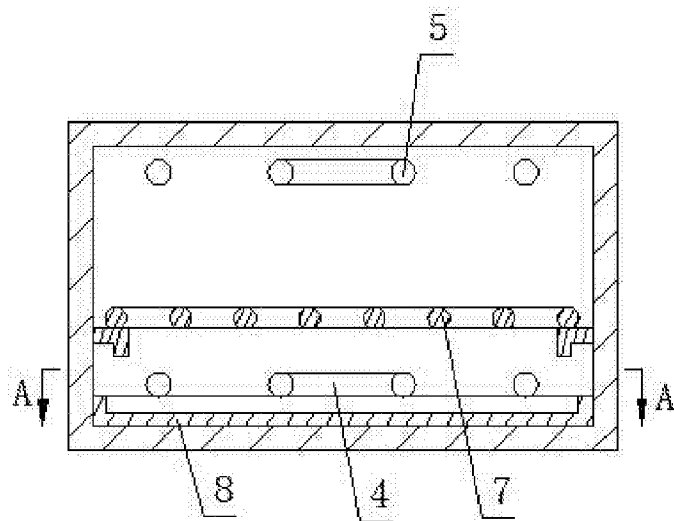


图3

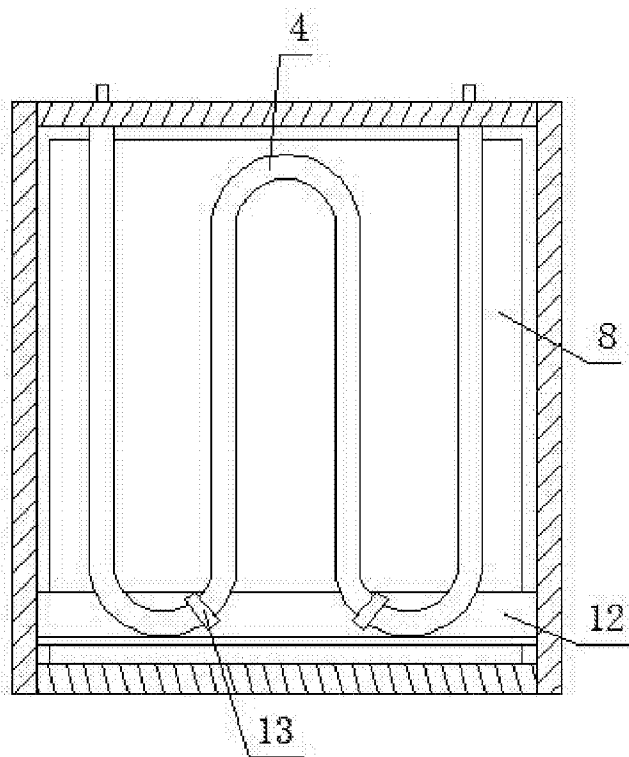


图4

**Espacenet****Bibliographic data: CN105615640 (A) — 2016-06-01**

Cooking device and cooking method

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Abstract of CN105615640 (A)

The invention relates to a cooking device. The cooking device comprises a shell, a base, an inner container, a cover and a heating module, a transparent window is arranged on the cover, the cooking device further comprises a control module and an exhaust module, the control module comprises a processor and an input panel connected with the processor, the heating module comprises a bottom heating unit positioned in a containing cavity which is connected with the processor, the inner container is arranged in the containing cavity and positioned above the bottom heating unit, the exhaust module comprises an air inflation element, an air suction element, an air incoming passage and an air exhausting passage, and the air suction element is used for sucking out mist or lampblack positioned in the inner container before the cover is opened and continues running after the cover is opened. The invention further provides a cooking method. The cooking device has the advantages of compact structure and capability of avoiding lampblack pollution.



(12) 发明专利申请

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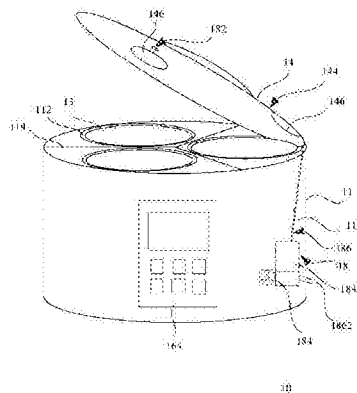
权利要求书1页 说明书6页 附图5页

(54) 发明名称

烹饪装置及烹饪方法

(57) 摘要

本发明涉及一种烹饪装置及烹饪方法。上述烹饪装置包括壳体、底座、内胆、盖体及加热模块，该盖体上设有透明视窗，该烹饪装置还包括控制模块与排气模块，该控制模块包括处理器及与该处理器相连的输入面板，该加热模块具有位于该容纳腔内的底部加热单元，该底部加热单元与该处理器连接，该内胆设于该容纳腔内且在该底部加热单元的上方，该排气模块包括充气元件、抽气元件、进气通道及排气通道，该抽气元件用于在打开该盖体前抽出位于该内胆内的雾气或油烟且在该盖体打开后继续运行。本发明还提供一种烹饪方法。上述烹饪装置具有结构较为紧凑且可以避免油烟污染的优点。



1. 一种烹饪装置,其包括壳体、底座、内胆、盖体及加热模块,该壳体设于该底座上,该壳体内具有容纳腔,该内胆位于该容纳腔内,该盖体设于该壳体上且与该容纳腔的开口相配合,其特征在于,该烹饪装置还包括控制模块与排气模块,该控制模块包括处理器及与该处理器相连的输入面板,该加热模块具有位于该容纳腔内的底部加热单元,该底部加热单元与该处理器连接,该内胆设于该容纳腔内且在该底部加热单元的上方,该排气模块包括充气元件、抽气元件、进气通道及排气通道,该抽气元件位于该排气通道上,该抽气元件用于在打开该盖体前抽出位于该内胆内的雾气或油烟且在该盖体打开后继续运行。

2. 如权利要求1所述的烹饪装置,其特征在于:该盖体上设有透明视窗,该烹饪装置还包括压力感测器,该压力感测器设置在该盖体上。

3. 如权利要求1所述的烹饪装置,其特征在于:该烹饪装置还包括与该处理器相连的影像采集单元,该影像采集单元的采集头设置在该盖体上,该影像采集单元在该抽气元件抽气后开启拍摄功能。

4. 如权利要求1所述的烹饪装置,其特征在于:该加热模块包括多个位于该容纳腔内且相互独立的底部加热单元,每个加热单元分别与该处理器连接,所述内胆也具有多个而与预定的底部加热单元相对应。

5. 如权利要求4所述的烹饪装置,其特征在于:该容纳腔内根据该底部加热单元的设置,由多个间隔壁分隔成多个子容纳腔,每个子容纳腔内至少含有一个底部加热单元。

6. 如权利要求1所述的烹饪装置,其特征在于:该进气通道位于该盖体上且该进气通道具有突出于该盖体的喷嘴。

7. 如权利要求1所述的烹饪装置,其特征在于:该充气元件具有用于向内胆中快速喷气的高压气体储藏腔。

8. 如权利要求1所述的烹饪装置,其特征在于:该抽气元件具有用于快速抽气的真空腔。

9. 一种烹饪方法,其包括以下步骤:

将待烹饪的食物放入如权利要求1所述的烹饪装置的内胆中;

盖上盖体,开启该烹饪装置;

在烹饪时,通过该控制模块设定将外部空气输入到内胆与正在烹饪的食物接触;

在打开盖体前,通过该控制模块控制,由该排气模块将该内胆中的雾气或油烟排出,并在替换为外部空气;

在打开盖体后,设定该排气模块的抽气元件继续保持继续运行,以抽出从食物中继续蒸发出的雾气或油烟。

10. 如权利要求9所述的烹饪方法,其特征在于:在打开该盖体前,通过该控制模块控制该充气元件与该抽气元件在,将该内胆内的雾气或油烟后由外部空气替换后,还继续让该充气元件运行使该内胆内的气压大于外部环境的气压。

烹饪装置及烹饪方法

技术领域

[0001] 本发明涉及一种家用电器,尤其是一种家用烹饪装置及烹饪方法。

背景技术

[0002] 食物的烹饪是人们生活中必不可少的一项活动。随着技术的发展,烹饪方法和烹饪装置的种类和样式越来越丰富。然而市场上推出的烹饪装置普遍为一个单锅,该单锅集炒锅、蒸锅、烧烤等功能于一体,由于一锅集多种功能导致每一功能的实用质量不高,多而不精。

[0003] 因此现有技术中也逐渐出现一些多用锅,其可以同时多种食物进行烹饪。例如何廷华等发明的一些烹饪装置,如CN99240621.8揭示一种双体智能电饭煲。施军达等发明的一些烹饪装置,如CN201010564027.5揭示一种三位慢炖锅,CN201010223628.X揭示一种组合式三位慢炖锅,CN201310313040.7揭示一种带电脑控制板的慢炖锅,CN200810061573.X揭示一种组合式慢炖锅,CN201110087910.4揭示一种具有嵌装加热结构的慢炖锅,CN201110066811.8揭示一种套装组合式多位保温锅,CN200910153461.1揭示一种多锅位慢炖锅,CN201310168675.2揭示一种可拆卸慢炖锅,CN201110030368.9揭示一种三锅体结构的保温锅,CN201310168728.0揭示一种三合一多用锅;这些烹饪装置能一次炖制三种不同的食物。再例如湛平涛、吴金水及杨国清等发明的一些烹饪装置,如CN201320276658.6揭示一种电炖锅,CN201320179101.0揭示一种电炖锅,CN201220553296.6揭示一种电炖锅;这些烹饪装置能一次炖制两种或以上不同的食物。

[0004] 然而,上述现有技术中的多用锅,其结构类似于现有的灶台,仍较为复杂,不够紧凑。

[0005] 此外,针对电饭锅内的雾气,在CN200510037553.5中,李文庆揭示了一种真空保温装置,其通过对内锅抽真空,可以延迟保温中的米饭变黄、变酸。然而,这样的设计对于烹饪过程产生的油烟污染却无帮助。在CN200910204171.5中,钱海鹏等揭示了一种烹饪装置,包括外壳、与外壳上端部铰接的上盖、固设在外壳内的保温内筒、设置在保温内筒中的烹饪锅以及用于控制烹饪装置运行的控制装置,还包括:下加热装置,位于烹饪锅的下部,并固设在保温内筒的内底面上;排气装置的进气喷嘴与外壳和上盖形成的腔体连通,排气装置的出气口与大气连通,用于排出腔体中的废气;温控装置设置在保温内筒的底面,用于检测烹饪锅的温度并将温度信息传给控制装置以控制下加热装置的开关;下加热装置、排气装置和温控装置分别与控制装置电连接。通过下加热装置对放入烹饪锅中的食物进行加热,并通过排气装置将烹饪装置腔体中的油烟和水蒸气排出,提高制作食物的质量。进一步,在CN200910204171.5中,烹饪装置还包括有鼓气装置,鼓气装置的排气口与所述外壳和所述上盖形成的腔体连通,所述鼓气装置的入气口与大气连通,用于向所述腔体中的注入空气。然而,在CN200910204171.5中,与外界相通的进气喷嘴都是设置在烹饪装置的底部位置,在外界空气进入烹饪装置后会被加热才会到内胆,如此外界空气不易于替换内胆中的水蒸气或油烟,在开盖的时候仍容易有较多水蒸气或油烟外溢,造成空气污染。

发明内容

[0006] 鉴于上述状况,有必要提供一种结构较为紧凑、可以改善油烟污染的烹饪装置及烹饪方法。

[0007] 一种烹饪装置,其包括壳体、底座、内胆、盖体及加热模块,该壳体设于该底座上,该壳体内具有容纳腔,该内胆位于该容纳腔内,该盖体设于该壳体上且与该容纳腔的开口相配合,该烹饪装置还包括控制模块与排气模块,该控制模块包括处理器及与该处理器相连的输入面板,该加热模块具有位于该容纳腔内的底部加热单元,该底部加热单元与该处理器连接,该内胆设于该容纳腔内且在该底部加热单元的上方,该排气模块包括充气元件、抽气元件、进气通道及排气通道,该抽气元件位于该排气通道上,该抽气元件用于在打开该盖体前抽出位于该内胆内的雾气或油烟且在该盖体打开后继续运行。

[0008] 该盖体上设有透明视窗,该烹饪装置还包括压力感测器,该压力感测器设置在该盖体上。

[0009] 该烹饪装置还包括与该处理器相连的影像采集单元,该影像采集单元的采集头设置在该盖体上,该影像采集单元在该抽气元件抽气后开启拍摄功能。

[0010] 该加热模块包括多个位于该容纳腔内且相互独立的底部加热单元,每个加热单元分别与该处理器连接,所述内胆也具有多个而与预定的底部加热单元相对应。

[0011] 该容纳腔内根据该底部加热单元的设置,由多个间隔壁分隔成多个子容纳腔,每个子容纳腔内至少含有一个底部加热单元。

[0012] 该进气通道位于该盖体上且该进气通道具有突出于该盖体的喷嘴。

[0013] 该充气元件具有用于向内胆中快速喷气的高压气体储藏腔。

[0014] 该抽气元件具有用于快速抽气的真空腔。

[0015] 一种烹饪方法,其包括以下步骤:将待烹饪的食物放入如上述的烹饪装置的内胆中;盖上盖体,开启该烹饪装置;在烹饪时,通过该控制模块设定将外部空气输入到内胆与正在烹饪的食物接触;在打开盖体前,通过该控制模块控制,由该排气模块将该内胆中的雾气或油烟排出,并在替换为外部空气;在打开盖体后,设定该排气模块的抽气元件继续保持继续运行,以抽出从食物中继续蒸发出的雾气或油烟。

[0016] 在打开该盖体前,通过该控制模块控制该充气元件与该抽气元件在,将该内胆内的雾气或油烟后由外部空气替换后,还继续让该充气元件运行使该内胆内的气压大于外部环境的气压。

[0017] 上述烹饪装置包括排气模块,排气模块可以排出烹饪时产生的雾气或其他油烟排出,可防止油烟对人体健康的影响及对厨房的污染。

附图说明

[0018] 图1是本发明第一实施例的烹饪装置的立体示意图。

[0019] 图2是图1所示的烹饪装置在移除盖体及内胆后的俯视图。

[0020] 图3是图1所示的烹饪装置的盖体的仰视图。

[0021] 图4是图1所示的烹饪装置的控制模块的连接框图。

[0022] 图5是图1所示的烹饪装置的一种使用状态示意图。

- [0023] 图6是图1所示的烹饪装置的另一种使用状态示意图。
- [0024] 图7是本发明第二实施例的烹饪装置的在移除盖体及内胆后的示意图。
- [0025] 图8是图7所示的烹饪装置沿VIII-VIII'线剖开的示意图。
- [0026] 图9是本发明第三实施例的烹饪装置的控制模块的连接框图。

具体实施方式

[0027] 下面将结合附图及实施例对本发明的烹饪装置及烹饪方法作进一步的详细说明。

[0028] 请参见图1-图4,本发明实施例的烹饪装置10包括壳体11、底座12、内胆13、盖体14、加热模块15、控制模块16及排气模块18。壳体11设于底座12上。壳体11内具有容纳腔112。内胆13位于容纳腔112内。控制模块16包括处理器162及与处理器162相连的输入面板164。加热模块15位于容纳腔112内且包括多个相互独立的底部加热单元152、154及156。底部加热单元152、154及156分别与处理器162连接。内胆13有多个,其设于容纳腔112内且与预定的底部加热单元152、154及156相对应。盖体14设于壳体11上且与容纳腔112的开口相配合。盖体14具有内表面142、与内表面142相对的外表面144及透明视窗146。排气模块18可与处理器162相连。排气模块18包括充气元件181、进气通道182、抽气元件184及排气通道186。进气通道182位于盖体14上。充气元件181位于进气通道182上,且充气元件181具有用于向内胆13中快速喷气的高压气体储藏腔1812。抽气元件184与处理器162相连。抽气元件184位于排气通道186上,且抽气元件184具有用于快速抽气的真空腔1842。透明视窗146可用于观看内胆13内的雾气或油烟情况。抽气元件184用于在打开盖体14前抽出位于内胆13内的雾气或油烟且可在盖体14打开后继续运行。

[0029] 具体在本实施例中,壳体11的容纳腔112的被分隔成数量与底部加热单元152、154及156的数量想对应的子容纳腔,即在壳体11中有三个子容纳腔,每个子容纳腔内都包含有一个底部加热单元。子容纳腔的数量是可以根据实际设计时的需求来设定的,其可对应不同规格的内胆13,从而满足更多的需求。可以理解,每个子容纳腔内也可以对应多个底部加热单元,以使得对应于内胆13的加热可以设计更多的加热控制方案。

[0030] 容纳腔112可以通过可拆卸的间隔壁114来分隔形成子容纳腔。间隔壁114可以通过壳体11的内壁及底座12来固定;详细来说,可以在壳体11的内壁设置相应的侧边固定槽(图未示),在底座12的上表面设置底边固定槽(图未示),来共同固定间隔壁114。请参见图5与图6,在使用的过程中,通过间隔壁114的安装或移除可以放入不同规格的内胆,从而满足更多的使用需求。例如在图5中,通过移除一个间隔壁114,使得子容纳腔扩大一倍,这时可放入内胆132,以便于烹饪更大量的食物;在图6中,通过移除所有的间隔壁114,使得子容纳腔变为最大的容纳腔112,这时可放入内胆134。从图1、图5与图6中可以看出,烹饪装置10通过安装可拆卸的间隔壁114,可便于让烹饪装置10实现不同的烹饪功能,例如在图1中,在具有三个子容纳腔时,烹饪装置10可以同时烹饪三种食物,烹饪菜式最多样,满足使用者不同的营养和口味需求;在图5中,具有一大一小两个子容纳腔,烹饪装置10可以同时烹饪两种食物,例如较大的子容纳腔用于炖汤而较小的子容纳腔用于煮菜;在图6中,烹饪装置10可放入最大的内胆134,其例如用于炖汤或煮粥等。

[0031] 请参见图1与图3,盖体14具有内表面142及与内表面142相对的外表面144。在本实施例中,与子容纳腔的开口相对应地,在盖体14的内表面142上设有与密封单元148。密封单

元有三组,第一组密封单元1482用于与最小的内胆13或子容纳腔开口相对应,第二组密封单元1484用于与中号的内胆132或子容纳腔开口相对应,第三组密封单元1486用于与最大的内胆134或容纳腔开口相对应。密封单元148可用于密封放入对应的容纳腔或子容纳腔中的内胆。每个密封单元148与对应子容纳腔之间最好设置定位结构,以使得密封单元148在密封对应内胆13时可以具有较好的密封效果。若根据烹饪要求来设计密封单元148,当烹饪装置10仅设计为常压烹饪功能时,密封单元148主要用于阻止烹饪时的部分散热问题及防止内胆13之间烹饪的菜式相互影响,这时对密封单元148的结构要求可以是密封单元148外周尺寸大于内胆13开口尺寸,即密封单元148可以覆盖内胆13开口,从而在不增加结构复杂程度的前提下,尽量减少散热及降低各个内胆13之间的在烹饪过程的互相影响。

[0032] 请参加图1与图4,控制模块16的处理器162可以设置在壳体11或底座12内,而输入面板164可以设置在壳体11的表面116上。其中,输入面板164可包括触控面板或声控单元,其上还可以设有显示屏,其作用主要是作为人工输入命令的界面。使用时,使用者可以通过输入面板164输入所需控制命令,处理器162则根据控制命令分别控制底部加热单元152、154及156,从而使相应放在底部加热单元152、154及156上的内胆13可以进行相同的或不同的加热过程,进而让使用者可以在一个烹饪装置10中同时烹饪多种菜式,提升烹饪的速度及使用的方便性。

[0033] 在本实施例中,与子容纳腔的开口相对应地,在盖体14上设有透明视窗146,即使得容纳腔112中放入不同的内胆13时,每个内胆13都可以对应至少一个透明视窗146,从而让使用者可以看到内胆13中的烹饪的一些情况。进气通道182具有进气喷嘴1822,进气喷嘴1822设于内表面142上,且进气喷嘴1822的数量与底部加热单元底部加热单元的数量相对应,即内胆13上方都对应配合有至少一个进气喷嘴1822。进气喷嘴1822可为可转动的喷嘴,即其可以利用充气元件中气流的冲击力,让进气喷嘴1822自动改变方向,从而让气体可以喷到内胆中不同的位置。充气元件181位于进气通道182上,具有用于向内胆13中快速喷气的高压气体储藏腔1812。高压气体储藏腔1812可用于在内胆13中的菜式需要急冷或爆炒时,可以快速释放高压气体储藏腔1812气体,从而让外部空气更快的与内胆13中的菜式接触。抽气元件184可以设置在壳体11或盖体14内,本实施例中是在壳体11内。排气通道186可以设置在壳体11或盖体14内,本实施例中是在壳体11内。本实施例中排气通道186具有排气口1862,排气口1862位于盖体14侧壁上。抽气元件184的真空腔1842,可以在需要时较快的排出蒸汽或其他油烟,由于真空腔1842的存在,抽气元件184不需要等风扇的运转就可以因为压差的存在,先让内胆13中的蒸汽或其他油烟部分快速排出,此时启动的风扇也可以开始起到作用排气的作用,因此可以减少使用者开盖过程等待的时间,提升使用的便利性。总的来说,烹饪时,通过抽气元件184的运转,外部的空气进入内胆13,内胆13中的雾气、蒸汽或其他油烟则进入排气通道186,并从排气口1862排出。由于烹饪装置10加入了排气模块18,使得烹饪装置10在烹饪食物时候,可根据烹饪食物的需要,将食物加热所产生的蒸汽实时排出,防止食物过熟或腐烂;并且在内部的蒸汽排出时,还引入了外部空气,在一些需要氧化或新鲜空气的菜式烹饪上,这些外部空气还可让烹饪的菜肴更具营养、更健康或更美观;更特别的是,在需要打开盖体14时,可通过透明视窗146事先观察,然后判断是否需要先将食物加热所产生的雾气或其他油烟排出,这样打开盖体14的时候就不会有朝使用者“扑面而来”的蒸汽/气体,因此可以方便使用者对烹饪装置10的使用,并保护使用者的健康。进

一步,排气模块18可以将烹饪时产生的蒸汽直接排出到下水道或者户外,这样可以减少厨房中的油烟,从而有利于改善烹饪环境,防止油烟对人体健康的影响及对厨房的污染。此外,可通过设置抽气元件184的开启设计,使得打开盖体14前,抽气元件184在抽完该内胆内的雾气或油烟后,还继续运行使内胆13内的气压大于或等于外部环境的气压。内胆13内的气压大于或等于外部环境的气压可以便于盖体14的开启。

[0034] 上述烹饪装置10包括可以独立控制的多个底部加热单元152、154及156,底部加热单元152、154及156对应的子容纳腔内可放置不同的内胆,且在盖体14上对应于每个子容纳腔可设计有预定的密封结构,使得烹饪装置10可以同时烹饪多种食物或菜式,且相互之间不会影响(例如不同的菜式之间发生串味)。特别的是,烹饪装置10采用一体设计,有别于现有技术中采用多个独立烹饪设置之间的串联或单个加热器同时加热不同的内胆,烹饪装置10即可以实现底部加热单元152、154及156之间分别加热,还可使结构上更加的紧凑,从而更便于满足人们生活中不同的烹饪需求以及降低能耗。进一步,排气模块18可以排出烹饪时产生的雾气或其他油烟排出,可防止油烟对人体健康的影响及对厨房的污染。

[0035] 请参见图7与图8,所示为本发明第二实施例的烹饪装置。第二实施例的烹饪装置与烹饪装置10相似,包括加热模块25,加热模块25位于容纳腔内且包括多个相互独立的底部加热单元252、254及256;特别地,在本实施例中,加热模块25还包括第二加热单元257与第三加热单元258,底座22的中部设有连接电极222,并且在间隔壁214上还设有温度感测器27。第二加热单元257与第三加热单元258分别与控制模块的处理器相连。第二加热单元257设置在间隔壁214上,且位于间隔壁214中部靠下的位置上。连接电极222与第二加热单元257电连接,其可通过在间隔壁214内部设置导线且在间隔壁214固定时与连接电极222建立连通。第三加热单元258设置在壳体21的内壁上,且与子容纳腔相对应,本实施例中至少有三个第三加热单元258。温度感测器27设置在间隔壁214上以及壳体21的内壁上,且温度感测器27与控制模块的处理器相连,其用于感测烹饪过程中内胆的温度信息,并将温度信息传送给处理器。在本实施例中,在间隔壁214上以及壳体21的内壁上设置有第二加热单元257与第三加热单元258,因此在烹饪时可以从内胆的侧面对内胆进行加热,从而有利于提升加热的均匀性;特别的是,各个间隔壁214上均设置有第二加热单元257,使得各个子容纳腔之间的温度控制变得更加准确。温度感测器27设置在底部加热单元与第二加热单元257中间的位置,以及设置在底部加热单元与第三加热单元258中间的位置;通过在间隔壁214上以及壳体21的内壁上设置温度感测器27,使得烹饪时,温度感测器27还可以感测内胆侧壁的温度,从而可更加全面的监测到烹饪时内胆各处的温度,让烹饪时的温度控制变得更加准确,进而可以防止烹饪时食物不熟或过热的情况发生。

[0036] 请参见图9,所示为本发明第三实施例的烹饪装置。第三实施例的烹饪装置与烹饪装置10相似,第三实施例的烹饪装置包括加热模块35、控制模块36、感测模块370、排气模块38及冷却模块39。其中,加热模块35具有多个独立的底部加热单元。控制模块36包括处理器362、输入面板364及无线单元366,处理器362分别与输入面板364及无线单元366相连。输入面板364及无线单元366可用作信息输入设备,为烹饪装置输入控制命令。例如,输入面板364上可设置触控或声控单元,从而通过触控或声控的方式输入烹饪命令;无线单元366可与便携式电子装置(例如手机、笔记本或平板电脑等)之间进行信息交互,从而可将外部的控制命令通过便携式电子装置输入烹饪装置,或者将烹饪装置中的所形成的烹饪参数传输

给便携式电子装置。感测模块370与控制模块36的控制器362相连。感测模块370可包括温度感测器37、图像感测器372及压力感测器374。温度感测器37可设置在烹饪装置的底座、壳体内壁或间隔壁上,图像感测器372与压力感测器可设置在烹饪装置的盖体上。排气模块38与冷却模块39也分别与控制模块36的控制器362。排气模块38的进气喷嘴可设置在盖体上。冷却模块39可以设置在烹饪装置的底座、壳体内壁、间隔壁或盖体上,较佳的是设置在盖体上。由于设置有图像感测器372与排气模块38,在烹饪时就可以记录烹饪过程的图像或影像,从而让烹饪过程的记录更加直观,并且因为排气模块38可以将烹饪时食物所产生的气体排出,从而可以让图像感测器372更加清晰的拍摄到图片或影像,举例来说,在开启图像感测器372之前,可以先通过排气模块38先将内胆中的蒸汽排出,甚至通过抽气元件还可将内胆中的气体压力排到略低于大气压,从而确保图像感测器372拍摄到清晰的图片或影像且还可以尽量避免图像感测器372被食物所产生的蒸汽污染。通过设置无线单元366来做为输入及输出设备,还可以设计使烹饪装置通过感测模块370记录烹饪过程的烹饪参数,并通过处理器362及无线单元366传送出去;也可以通过无线单元366接收来至便携式电子装置的控制命令,让烹饪装置实现更加智能的自动烹饪的功能。通过设置冷却模块39,可以使得烹饪装置烹饪出更多口味的食物,例如在有些需要骤冷的菜式中,可以通过冷却模块来实现内胆的骤冷,从而烹饪出更加美味的食物来。

[0037] 以上所述,仅是本发明的较佳实施例而已,并非对本发明作任何形式上的限制,虽然本发明已以较佳实施例揭露如上,然而并非用以限定本发明,任何熟悉本专业的技术人员,在不脱离本发明技术方案范围内,当可利用上述揭示的技术内容做出些许更动或修饰为等同变化的等效实施例,但凡是未脱离本发明技术方案内容,依据本发明的技术实质对以上实施例所作的任何简单修改、等同变化与修饰,均仍属于本发明技术方案的范围。

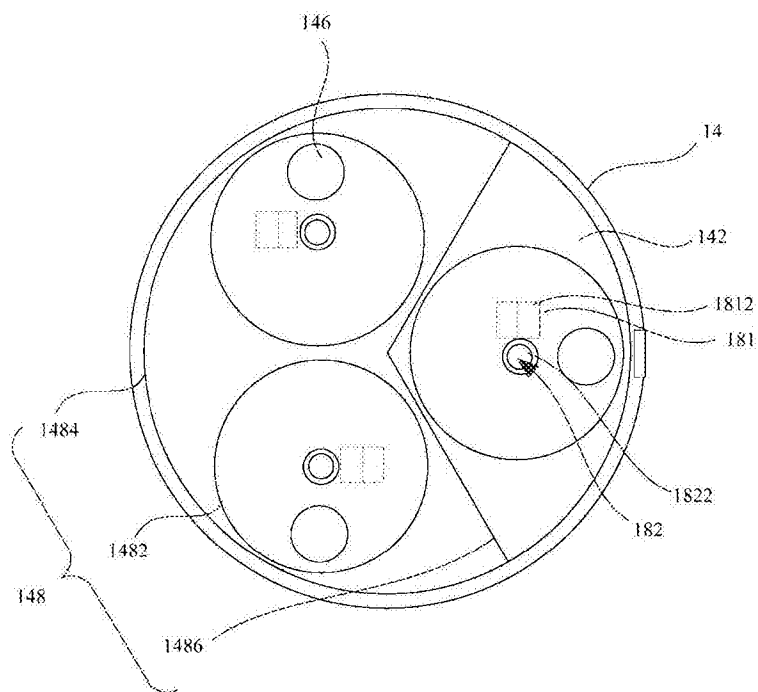


图3

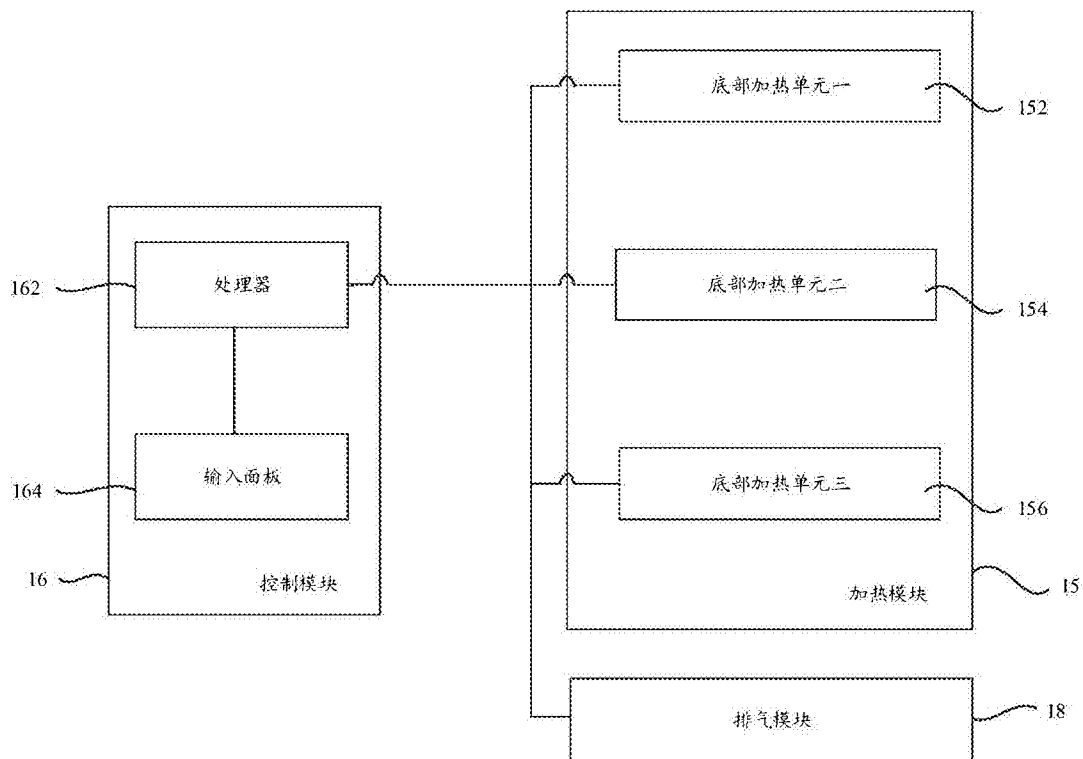


图4

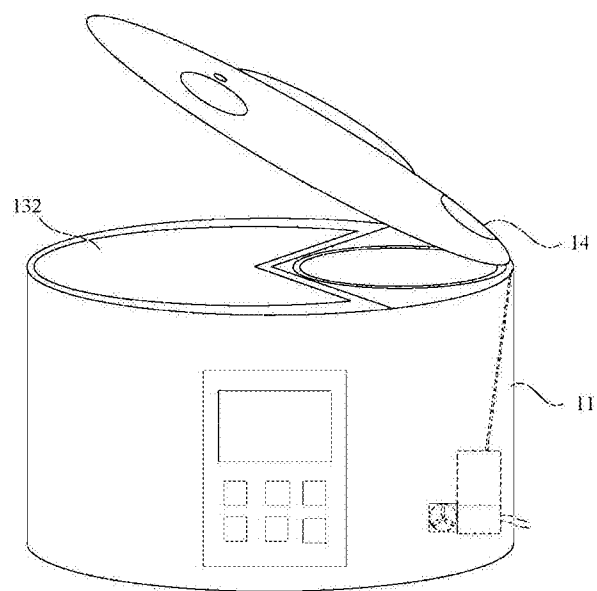


图5

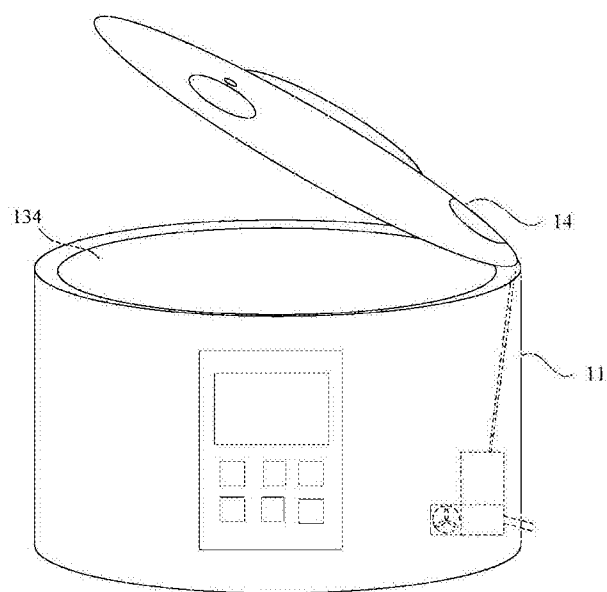


图6

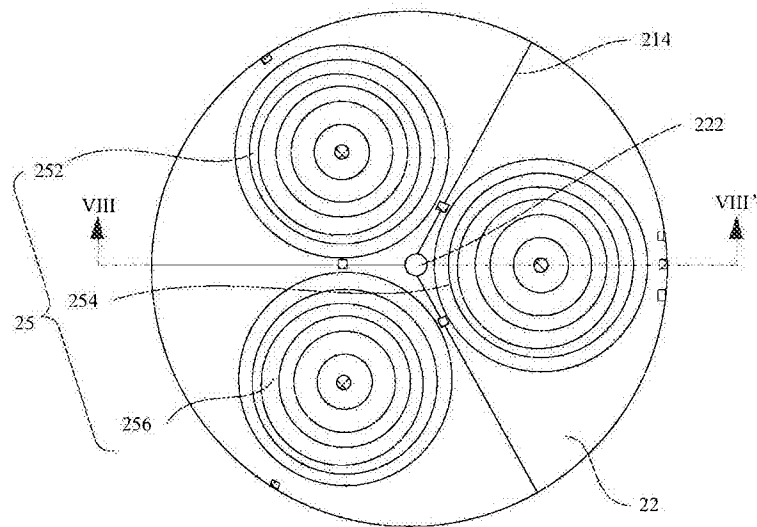


图7

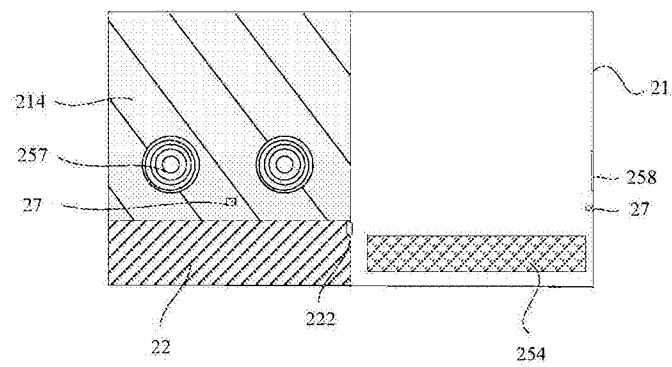


图8

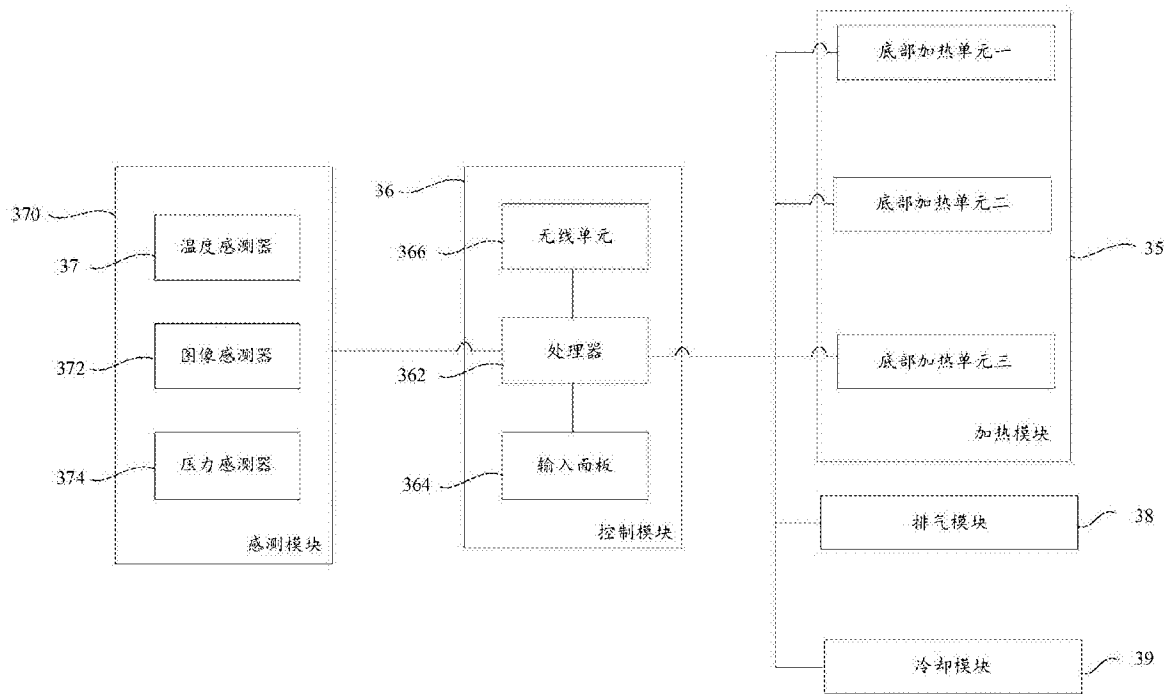


图9

<div>MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET</div> <div>Substitute for Form PTO-1360 (For use with Form PTO/SB/06)</div>							<div>Application Number</div> <div>17159414</div>		<div>Filing Date</div>					
							<div>Applicant(s) Christopher Martin</div>							
							<div>* May be used for additional claims or amendments</div>							
CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT				*		*		*	
	Indep	Depend	Indep	Depend	Indep	Depend			Indep	Depend	Indep	Depend	Indep	Depend
1	1		1							1		1		
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CONFIRMATION NO. 3603

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FILING RECEIPT



0000000136315842

Date Mailed: 09/20/2022

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US2020/042120 07/15/2020
which claims benefit of 62/874,193 07/15/2019

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 07/29/2022

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 17/159,414**

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Early Publication Request: No

Title

COOKING DEVICE AND COMPONENTS THEREOF

Preliminary Class

219

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific

page 2 of 4

countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER
Title 35, United States Code, Section 184
Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

U.S. APPLICATION NO. 17/159,414	FIRST NAMED INVENTOR Christopher T. Martin	ATTY. DOCKET NO. 057664-348N01US		
177399 Mintz Levin/SharkNinja One Financial Center Boston, MA 02111		INTERNATIONAL APPLICATION NO. PCT/US2020/042120		
		<table border="1"><tr><td>I.A. FILING DATE 07/15/2020</td><td>PRIORITY DATE 07/15/2019</td></tr></table>	I.A. FILING DATE 07/15/2020	PRIORITY DATE 07/15/2019
I.A. FILING DATE 07/15/2020	PRIORITY DATE 07/15/2019			

CONFIRMATION NO. 3603
371 ACCEPTANCE LETTER



Date Mailed: 09/20/2022

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

01/27/2021
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Copy of the International Application filed on 01/27/2021
- Copy of the International Search Report filed on 01/27/2021
- Preliminary Amendments filed on 01/27/2021
- Information Disclosure Statements filed on 01/27/2021
- Inventor's Oath or Declaration filed on 01/18/2022
- U.S. Basic National Fees filed on 01/27/2021
- Authorize Access to Search Results filed on 01/27/2021
- Priority Documents filed on 01/27/2021
- Power of Attorney filed on 04/23/2021
- Authorization to Permit Access filed on 01/27/2021
- Application Data Sheet (37 CFR 1.76) filed on 01/27/2021

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

JOHN L ANDERSON

Telephone: (571) 272-0385

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 17/159,414				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	320			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	540			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	800			
TOTAL CLAIMS (37 CFR 1.16(j))	28 minus 20 =	*	8			x 100 =	800			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5 minus 3 =	*	2			x 480 =	960			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.				TOTAL		TOTAL	3420			
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =			x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =			x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x =			x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =			x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))									
						TOTAL ADD'L FEE			TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US

177399
Mintz Levin/SharkNinja
One Financial Center
Boston, MA 02111

CONFIRMATION NO. 3603
POA ACCEPTANCE LETTER



Date Mailed: 09/06/2022

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/23/2021.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/jlanderson/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
17/159,414	01/27/2021	Christopher T. Martin	057664-348N01US

CONFIRMATION NO. 3603

POWER OF ATTORNEY NOTICE



130401
Cantor Colburn - Euro-Pro
20 Church Street
22nd. Floor
Hartford, CT 06103-3207

Date Mailed: 09/06/2022

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 04/23/2021.

- The Power of Attorney to you in this application has been revoked by the applicant. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/jlanderson/



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :John Anderson

Refund Accounting Date:09/01/2022

Effective Date	Sale Item Reference Number	Refund Total
01/27/2021	17159414	\$160.00

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method	Account Number
I202291748243419	1206	UNDETERMINED CLAIMS NATL STAGE APPLIC	\$160.00		*****4889



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :John Anderson

Sale Adjustment Accounting Date:09/01/2022

Effective Date	Sale Accounting Date	Sale Item Reference Number
01/27/2021	09/01/2022	17159414

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I202291748243419	1206	UNDETERMINED CLAIMS NATL STAGE APPLIC	\$160.00	



United States Patent and Trademark Office

Office of the Chief Financial Officer

Document Code:WFEE

User :Karen McLean

Sale Accounting Date:07/28/2022

Sale Item Reference Number

17159414

Effective Date

01/27/2021

Document Number	Fee Code	Fee Code Description	Amount Paid	Payment Method
I20227RJ55032716	1633	NATIONAL STAGE EXAM - ALL OTHER CASES	\$800.00	Salea
I20227RJ55032716	1617	OATH/DECL > 30 MOS FROM 371 COMMENCEMENT	\$160.00	Salea
I20227RJ55032716	1615	CLAIMS IN EXCESS OF 20	\$800.00	Salea
I20227RJ55032716	1642	NATL STAGE SEARCH FEE - REPORT PROVIDED	\$540.00	Salea
I20227RJ55032716	1631	NATIONAL STAGE FEE	\$320.00	Salea
I20227RJ55032716	1614	INDEPENDENT CLAIMS IN EXCESS OF 3	\$960.00	Salea
I20227RJ55032716	1206	UNDETERMINED CLAIMS NATL STAGE APPLIC	\$160.00	Salea

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)****Title of
Invention**

COOKING DEVICE AND COMPONENTS THEREOF

As the below named inventor, I hereby declare that:

This declaration ☐ The attached application, or
is directed to:☒ United States application or PCT international application number 17/159,414
filed on 01-27-2021.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001
by fine or imprisonment of not more than five (5) years, or both.**WARNING:**

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTORInventor: Christopher T. Martin Date (Optional) : _____Signature: / Christopher T. Martin

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Thomas Guerin Date (Optional) : _____Signature: / Thomas Guerin /

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Roger Neil Jackson Date (Optional) : _____Signature: / Roger Neil Jackson /

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Joshua D. Anthony Date (Optional) : _____Signature: / Joshua D. Anthony /
OCF4A03FB77A442

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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LEGAL NAME OF INVENTORInventor: Kerry SchwarzDate (Optional) : 1/14/2022 | 2:55:31 PM PSTSignature: /


36E02EC648F649F...

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

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**DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN
APPLICATION DATA SHEET (37 CFR 1.76)****Title of
Invention**

COOKING DEVICE AND COMPONENTS THEREOF

As the below named inventor, I hereby declare that:

This declaration is directed to: ☐ The attached application, or

☒ United States application or PCT international application number 17/159,414
 filed on Jul 15, 2020

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

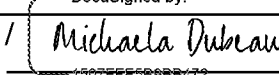
I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

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LEGAL NAME OF INVENTOR

Inventor: Michaela DUBEAU Date (Optional) : 5/6/2021 | 2:31:52 PM EDT

Signature: 

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form or must have been previously filed. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	44770569
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Lisa Adams/Cynthia Tsang
Filer Authorized By:	Lisa Adams
Attorney Docket Number:	057664-348N01US
Receipt Date:	18-JAN-2022
Filing Date:	
Time Stamp:	16:50:21
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	057664-348N01US- Declarations_executed_COMPL ETE.pdf	893303 e9bcaa1d38530dffaab3fc5451a5b18ba6c85861	no	6

Warnings:

Page503

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Information:	
Total Files Size (in bytes):	893303
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number	17159414
	Filing Date	2021-01-27
	First Named Inventor	Christopher T. Martin
	Art Unit	3761
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	057664-348N01US

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20090126580	A1	2009-05-21	Hartfelder et al.	
	2	20120272832	A1	2012-11-01	Kwon et al.	
	3	20170231430	A1	2017-08-17	Moon et al.	

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FOREIGN PATENT DOCUMENTS								Remove
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1							

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher T. Martin	
	Art Unit	3761	
	Examiner Name	Not Yet Assigned	
	Attorney Docket Number	057664-348N01US	

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
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If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher T. Martin
Art Unit	3761
Examiner Name	Not Yet Assigned
Attorney Docket Number	057664-348N01US

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Lisa Adams/	Date (YYYY-MM-DD)	2021-12-08
Name/Print	Lisa Adams	Registration Number	44,238

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	44462516
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Lisa Adams
Filer Authorized By:	
Attorney Docket Number:	EUP1549US2
Receipt Date:	08-DEC-2021
Filing Date:	
Time Stamp:	12:48:45
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	057664-348N01US_IDS_Trans mittal.pdf	101639 5f4b625deaf55b0c3ffc5aeb20e5bfc6b41b 9a4	no	2

Warnings:

Page509

EX1006

Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	057664-348N01US_SB08.pdf	1035003	no	4
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Warnings:					
Information:					
Total Files Size (in bytes):			1136642		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Christopher T. Martin et al.

Application No.: 17/159,414

Confirmation No.: 3603

Filed: January 27, 2021

Art Unit: 3761

For: COOKING DEVICE AND COMPONENTS
THEREOF

Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

VIA EFS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

Pursuant to 37 C.F.R. §§ 1.56, 1.97, and 1.98, the attention of the United States Patent and Trademark Office is hereby directed to the references listed on the attached PTO/SB/08. It is respectfully requested that the information be expressly considered during the prosecution of the above-identified application, and that the references be made of record therein and appear among the “References Cited” on any patent to issue therefrom.

This Information Disclosure Statement is filed before the mailing date of a first Office Action on the merits (37 C.F.R. § 1.97(b)(3)).

In accordance with 37 C.F.R. § 1.98(a)(2)(ii), copies of U.S. patent application publications are not submitted.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed as a representation that a search has been made. In accordance

with 37 C.F.R. § 1.97(h), the filing of this Information Disclosure Statement shall not be construed to be an admission that the information cited in this Information Disclosure Statement is, or is considered to be, material to the patentability as defined in 37 C.F.R. § 1.56(b).

It is submitted that the Information Disclosure Statement is in compliance with 37 C.F.R. § 1.98, and the Examiner is respectfully requested to consider the listed references.

Applicant believes no fee is due with this response.

Dated: December 8, 2021

Respectfully submitted,

Electronic signature: /Lisa Adams/

Lisa Adams

Registration No.: 44,238

MINTZ LEVIN COHN FERRIS GLOVSKY
AND POPEO, P.C.

One Financial Center

Boston, Massachusetts 02111

(617) 348-3054

Attorney for Applicant

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	17/159,414
Filing Date	
First Named Inventor	Christopher T. Martin
Title	COOKING DEVICE AND COMPONENTS THEREOF
Art Unit	3761
Examiner Name	
Attorney Docket Number	057664-348N01US

SIGNATURE of Applicant or Patent Practitioner

Signature	/Lisa Adams/	Date (Optional)	
Name	Lisa Adams	Registration Number	44238
Title (if Applicant is a juristic entity)			
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 1 forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)

☒ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

177399

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☒ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

☐ Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

SharkNinja Operating LLC

☐ Inventor or Joint Inventor (title not required below)

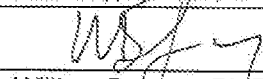
☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☒ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	1-28-2021
Name	William B. Lacy, Ph.D.		
Title	VP / Senior Associate GC		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of 1 forms are submitted.

Electronic Acknowledgement Receipt

EFS ID:	42535311
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Lisa Adams/Jennifer McIntosh
Filer Authorized By:	Lisa Adams
Attorney Docket Number:	EUP1549US2
Receipt Date:	23-APR-2021
Filing Date:	
Time Stamp:	12:25:19
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Power of Attorney	057664-348N01US_POA.pdf	642845	no	2
			89f8debb02ede3d06c38add662cf73da49c b2214		

Warnings:

Page515

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Information:	
Total Files Size (in bytes):	642845
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414
	Filing Date		2021-01-27
	First Named Inventor	Christopher MARTIN	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	EUP1549US2	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	10045651	B2	2018-08-14	HUANG	
	2	10051997	B2	2018-08-21	CONTARINO JR., ALFRED F.	
	3	10088173	B2	2018-10-02	MCKEE, PHILIP R. ET AL.	
	4	10094576	B2	2018-10-09	KIM ET AL.	
	5	10099839	B2	2018-10-16	SCHONING, HENNY	
	6	10101038	B2	2018-10-16	KIM, SHIN KYUM KIM ET AL.	
	7	10113749	B2	2018-10-30	YANCEY, MARTIN ALAN	
	8	10143324	B2	2018-12-04	KATAOKA ET AL.	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

9	10174953	B2	2019-01-08	JADHAV, TUSHAR ET AL.	
10	10190783	B2	2019-01-29	ROGERS, PAUL ROSS ET AL.	
11	10203117	B2	2019-02-12	MOON, SEONG CHEOL ET AL.	
12	10234144	B2	2019-03-19	DESHPANDE, BIPIN PRABHAKAR	
13	10247424	B2	2019-04-02	ADELMANN, CHRISTOPHER JAMES ET AL.	
14	10271686	B2	2019-04-30	ROY	
15	10271690	B2	2019-04-30	VELTROP, LOREN ET AL.	
16	10285531	B2	2019-05-14	CHANOWITZ, BENSON	
17	10309659	B2	2019-06-04	MOON, SEONG CHEOL ET AL.	
18	10337745	B2	2019-07-02	MCKEE, PHILIP R. ET AL.	
19	10364990	B2	2019-07-30	LEE, SANGKYUN	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

20	10364991	B2	2019-07-30	KANG, HAN SEONG ET AL.	
21	10383477	B2	2019-08-20	PAYEN, JEAN-MARC ET AL.	
22	10390656	B2	2019-08-27	GILL, ET AL.	
23	10405696	B2	2019-09-10	KIM, HAN JU	
24	10405697	B2	2019-09-10	GILL ET AL	
25	10405698	B2	2019-09-10	GILL ET AL	
26	10405699	B2	2019-09-10	CONTARINO JR., ALFRED F.	
27	10413121	B2	2019-09-17	GILL ET AL	
28	10413122	B2	2019-09-17	GILL ET AL.	
29	10426176	B2	2019-10-01	DIXON, WILLIAM A. ET AL.	
30	10448785	B2	2019-10-22	VAN DER WEIJ, FEDDE	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

31	10448786	B2	2019-10-22	VAN DER BURG, JOHAN MICHIEL ET AL.	
32	10451285	B2	2019-10-22	DUMENIL, SEAN	
33	10492641	B2	2019-12-03	KESTNER, KYLE THOMAS ET AL.	
34	10495319	B2	2019-12-03	LEE, DONG HO ET AL.	
35	10495320	B2	2019-12-03	TORRENTES, MARCELO ET AL.	
36	10502433	B2	2019-12-10	PARK, SANG JUN ET AL.	
37	10512363	B2	2019-12-24	KESTNER, KYLE THOMAS ET AL.	
38	10524615	B2	2020-01-07	REALES BERTOMEIO, EMILIO ET AL.	
39	10598391	B2	2020-03-24	PADULA, CORY F.	
40	10619862	B2	2020-04-14	BRUIN-SLOT, ZACHARY ET AL.	
41	10627116	B2	2020-04-21	BRUIN-SLOT, ZACHARY J. ET AL.	

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

	42	10638882	B1	2020-05-05	HE ET AL.	
	43	10660471	B2	2020-05-26	KIM, TAE-HUN ET AL.	
	44	10674853	B2	2020-06-09	HUANG, ZHONGHUI	
	45	10674854	B2	2020-06-09	HUANG, ZHONGHUI	
	46	10684022	B2	2020-06-16	MCKEE, PHILIP R. ET AL.	
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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414
Filing Date	2021-01-27
First Named Inventor	Christopher MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number		17159414
Filing Date		2021-01-27
First Named Inventor	Christopher MARTIN	
Art Unit		
Examiner Name		
Attorney Docket Number	EUP1549US2	

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		17159414	
	Filing Date		2021-01-27	
	First Named Inventor	Christopher MARTIN		
	Art Unit			
	Examiner Name			
	Attorney Docket Number		EUP1549US2	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	17159414	
Filing Date	2021-01-27	
First Named Inventor	Christopher MARTIN	
Art Unit		
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STATEMENT BY APPLICANT**
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HEATING COOKER

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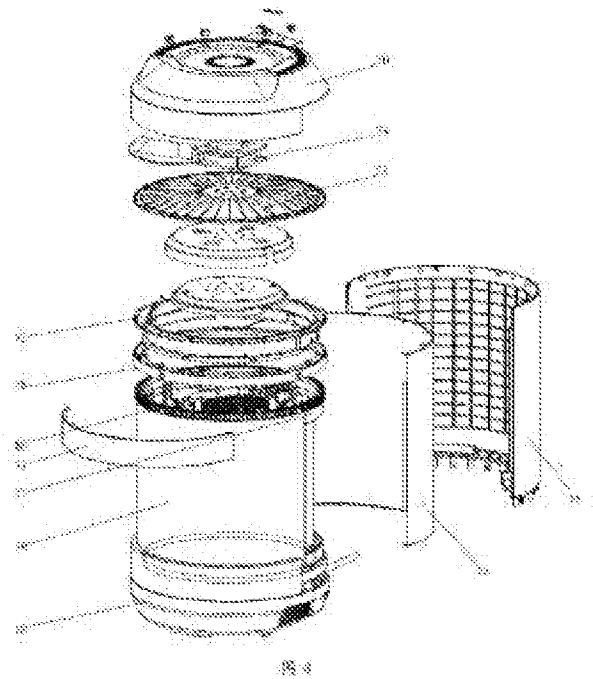
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Abstract of WO2019153512 (A1)

A heating cooker, comprising: a base (10), a lower electrical room being formed thereinside; a cavity (20) provided on the base (10), a heating cavity (34) for placing food being formed thereinside and one side of the heating cavity (34) being formed with an opening that allows entrance and exit of the food; a door (50) provided on the cavity (20); and an upper cover (70) for covering the cavity (20), an upper electrical room being enclosed between the upper cover (70) and the cavity (20). The lower electrical room and/or the upper electrical room is formed with an air guide channel with respect to the outer surface of the door (50); the lower electrical room or the upper electrical room is provided with a fan (74). Air blown from the fan (74) flows to the outer surface of the door (50) along the air guide channel, or a high-temperature airflow on the outer surface of the door (50) is guided out from the air guide channel so that the door (50)

can be quickly cooled, such that there is no need to set the thickness of the door (50) too great to prevent a user from being burnt when contacting the door (50), and the visibility of the door (50) of observing the inside of the cavity (20) will not be affected.



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DESCRIPTION WO2019153512A1

¹⁰Heating cooker

[0001]

¹⁴This application claims the priority of the Chinese patent application with the application number 201810130673.7 and the invention titled "Heating Cooker" filed at the State Intellectual Property Office of China on February 08, 2018, the entire content of which is incorporated by reference in this application.

¹⁷Technical field

[0002]

²¹The invention relates to the field of household appliances, in particular, to a heating cooker.

²²Background technique

[0003]

²⁵Generally, as shown in FIG. 1, a heating cooker such as a microwave oven has a rectangular parallelepiped shape, and has a heating cavity for placing the food to be heated and a door body that can close the cooking cavity from an opening in front of the heating cavity. This door body mainly includes three layers: Inner glass layer, metal mesh layer, outer glass layer.

³⁰The inner glass layer directly faces the inside of the cooking cavity; the metal mesh layer is placed close to the inner glass layer to prevent microwave radiation from the door body to the outside; the outer glass layer is isolated from the metal mesh layer and is provided to prevent users from contacting the outside. When the glass layer is scalded, it is generally necessary to set the distance between the outer glass layer and the metal mesh layer above 6mm, so that the heat from inside the cooking cavity cannot be directly transmitted to the outer glass layer.

[0004]

39 In addition to the conventional cuboid heating cooker, cylindrical heating cookers have also appeared in the prior art.

41 The cylindrical heating cooker is welcomed by users because of its unique appearance that can provide users with a new experience. In the process of realizing the cylindrical heating cooker, the inventor found that, on the one hand, in order to improve the visibility when looking inside the cooking cavity through the door body, it is required to set the door body thinner, that is, between the inner and outer glass The distance is as small as possible; on the other hand, in order to prevent the user from being scalded when touching the outer glass layer, the door body needs to be set thick enough, that is, the distance between the inner and outer glass is large enough. In order to prevent burns, the thickness of the door body has been difficult to set thinner, as in the conventional rectangular cooker-shaped heating cooker, and its visibility is difficult to further improve.

[0005]

52 Summary of the invention

[0006]

56 The invention aims to provide a heating cooker, which can further improve the visibility of the door body on the premise of ensuring that the user is not scalded when touching the door body.

[0007]

61 In order to achieve the above object, the technical solution of the present invention provides a heating cooker including: a base with a lower appliance chamber formed therein; a cavity provided with the base and a heating cavity for placing food in the interior One side of the door is formed as an opening for food to enter and exit; the door body is provided on the cavity for closing or opening the opening; the upper cover is provided on the cavity, and the upper cover and the cavity are enclosed Electrical appliance room; the lower appliance room and/or the upper appliance room form an air duct with respect to the outer surface of the door; the lower appliance room or the upper appliance room is provided with a fan, and the fan passes from the lower appliance room or the upper appliance room through the air duct The air is blown to the outer surface of the door body, or the fan draws air from the outer surface of the door body to the lower electrical appliance room or the upper electrical appliance room through the air duct.

[0008]

74 In this technical solution, the heat generated in the cooker will cause the door and other components to be in a high temperature state, so that the user may easily cause burns when touching the door or the main body of the cooker. To prevent this from happening and not affecting the door Depending on the visibility, it is necessary to design a cooling structure to quickly cool the high-temperature components. Therefore, a fan and an air guide duct matched with the fan are provided in the cooker to achieve rapid cooling of the door body, so that the thickness of the door body does not need to be set. Too thick can prevent the user from being scalded

when touching the door, and at the same time does not affect the visibility of the door when viewing the inside of the cavity.

[0009]

85In addition, the heating cooker in the above technical solution provided by the present invention may also have the following additional technical features:

[0010]

90In the above technical solution, preferably, the fan is provided in the upper appliance room; the upper appliance room is provided with a disc-shaped top air guide plate, the fan is provided on the top air guide plate, and the wind emitted by the fan is guided by the top air guide plate To the wind channel.

[0011]

96In the above technical solution, preferably, the fan is provided in the center of the top wind deflector, and the upper surface of the top wind deflector is provided with a wind deflector extending from the center to the circumferential direction.

[0012]

102In the above technical solution, preferably, the edge of the top wind deflector is provided with a first air duct; the first air duct constitutes at least a part of the air duct.

[0013]

107In the above technical solution, preferably, the heating cooker further includes a cylindrical top support plate provided with a flange, the top support plate is supported above the cavity, and the top air guide plate is supported above the top support plate, the top A second air duct is provided at the flange of the support plate corresponding to the first air duct of the top air guide plate; the first air duct and the second air duct constitute at least a part of the air duct.

[0014]

115In the above technical solution, preferably, the door body includes: an outer see-through layer formed into a semi-cylindrical shape; an inner see-through layer formed into a semi-cylindrical shape adapted to the outer see-through layer; and disposed on the outer see-through layer and the inner see-through layer The semi-cylindrical metal mesh layer in between is formed with a plurality of through holes on its surface; the outer see-through layer, the inner see-through layer and the metal mesh layer constitute the facade; the upper side formed as a ring is movable Rails, which are used to fix the facade from the upper side; upper fixed rails, which are formed in a ring shape adapted to the upper movable rails, are used to support the upper movable

rails from the upper and/or outer sides, and the upper side The movable rail can move relative to the upper fixed rail; the upper fixed rail is provided with a third air channel; the upper fixed rail is sleeved outside the top support plate, and the third air channel on the upper fixed rail and the top support plate The second air duct at the flange of at least partially faces; the first air duct, the second air duct and the third air duct constitute at least a part of the air guiding air duct.

[0015]

¹³⁰In the above technical solution, preferably, a fourth air duct is provided on the upper movable guide rail, and the first air duct, the second air duct, the third air duct, and the fourth air duct constitute at least a part of the air guiding air duct.

[0016]

¹³⁶In the above technical solution, preferably, a plurality of second protrusions are provided on the upper movable rail at intervals, and a gap between two adjacent second protrusions forms a fourth air passage.

[0017]

¹⁴¹In any of the above technical solutions, preferably, at least one set of positioning components is further included, and each set of positioning components includes mutually matching positioning posts and positioning holes, one of the positioning posts and the positioning holes being provided on the top support plate, and the other Set on the top wind deflector.

[0018]

¹⁴⁸In any of the above technical solutions, preferably, it further includes at least one set of connection components, and each set of connection components includes mutually matching guide holes and connection holes, one of the guide holes and the connection holes is provided on the top support plate, and the other Set on the top wind deflector.

[0019]

¹⁵⁵Additional aspects and advantages of the present invention will become apparent in the following description, or will be learned through the practice of the present invention.

¹⁵⁷BRIEF DESCRIPTION

[0020]

¹⁶¹Figure 1 shows a structural diagram of a conventional heating cooker;

[0021]

165 FIG. 2 shows a closed state diagram of the heating cooker according to the embodiment of the present invention;

[0022]

170 FIG. 3 shows an open state diagram of the heating cooker according to the embodiment of the present invention;

[0023]

175 4 shows an exploded structural view of a heating cooker according to an embodiment of the present invention;

[0024]

180 5 shows a structural diagram of a cavity according to an embodiment of the present invention;

[0025]

184 6 shows an exploded structural view of a cavity according to an embodiment of the present invention;

[0026]

188 7 shows a structural diagram of a door body and a rail structure according to an embodiment of the present invention;

[0027]

193 FIG. 8 shows an exploded structural view of a door body and a guide rail structure according to an embodiment of the present invention;

[0028]

198 9 shows a structural view of an upper movable rail and an upper fixed rail according to an embodiment of the present invention;

[0029]

203 10 shows an exploded structural view of the upper appliance room according to an embodiment of the present invention;

[0030]

208 11 shows a structural diagram of a top wind deflector according to an embodiment of the present invention;

[0031]

212 12 shows a partial structural view of a top support plate according to an embodiment of the present invention;

[0032]

216 The correspondence between the reference signs and component names in Figures 2 to 12 is:

[0033]

220 10 Base, 20 cavity, 21 bottom wall, 22 top wall, 23 rear wall, 24 stirring chamber, 25 stirring chamber cover, 26 left choke teeth, 27 right choke teeth, 28 upper choke teeth, 29 Lower choke teeth, 30 reinforcements, 32 rear support plates, 33 rear outer cover, 34 heating chamber, 50 door body, 50a facade, 51 outer see-through layer, 52 inner see-through layer, 54 lower movable rail, 57 upper Side movable guide rail, 57a fourth air duct, 572 second protrusion, 58 upper fixed rail, 58a third air duct, 59 door drive motor, 60 door drive gear, 70 upper cover, 71 top trim, 72 top support plate, 72a second air duct, 722 positioning column, 724 guide hole, 73 top air guide plate, 73a first air duct, 73b air guide, 732 positioning hole, 734 connection hole, 74 fan, 75 speaker, 76 voice function module, 77 projector, 78 projection power circuit, 80 heating tube.

228 detailed description

[0034]

232 In order to be able to understand the above objects, features and advantages of the present invention more clearly, the present invention will be described in further detail below with reference to the accompanying drawings and specific embodiments.

235 It should be noted that the embodiments of the present application and the features in the embodiments can be combined with each other without conflict.

[0035]

240 In the following description, many specific details are set forth in order to fully understand the present invention. However, the present invention can also be implemented in other ways than those described here. Therefore, the protection scope of the present invention is not limited to the specific Limitations of the embodiment.

[0036]

247 As shown in FIGS. 2-12, FIG. 2 is a schematic diagram of a heating cooker according to an embodiment of the

present invention.

249 FIG. 3 is a perspective view of the door 50 in an open state.

250 As shown in FIGS. 2 and 3, the heating cooker mainly includes a base 10, and a lower electrical appliance room (not shown) for installing electrical components such as a power board, a magnetron, and an inverter can be formed in the interior; a cavity 20 which is set on the base 10, a heating cavity 34 for placing food is formed inside, and one side of the heating cavity 34 is formed as an opening for food to enter and exit; a door 50, which is provided on the cavity 20, is used to close or open the heating cavity 34. The opening of the upper cover 70, which is provided on the cavity 20, and an upper electrical appliance room (not shown) for installing electrical devices such as a fan and a voice control module can be formed inside.

[0037]

260 Specifically, as shown in FIGS. 4 and 7 to 12, the lower appliance room and/or the upper appliance room form an air duct with respect to the outer surface of the door 50; the lower appliance room or the upper appliance room is provided with a fan 74. The fan 74 blows air from the lower appliance room or the upper appliance room to the outer surface of the door body 50 through the air guide air passage, or the fan 74 draws air from the outer surface of the door body 50 to the lower appliance room or the upper appliance room through the air guide air passage.

[0038]

269 In this embodiment, the wind blown by the fan 74 flows to the outer surface of the door body 50 along the air guide air channel; or the high-temperature airflow from the outer surface of the door body 50 is drawn out from the air guide air channel, so that the door body 50 can be quickly cooled. It is not necessary to set the thickness of the door body too thick to prevent the user from being scalded when touching the door body 50, and at the same time, the visibility of the door body 50 when observing the interior of the cavity 20 is not affected.

[0039]

278 In the above embodiment, preferably, as shown in FIGS. 4 and 10, the fan 74 is provided in the upper appliance room; the upper appliance room is provided with a disc-shaped top air guide plate 73, and the fan 74 is provided on the top air guide plate 73. The wind emitted by the fan 74 is guided by the top wind guide plate 73 to the wind guide air duct.

[0040]

285 In this embodiment, the wind blown by the fan 74 flows from the center of the top air guide plate 73 to the edge or from the edge of the top air guide plate 73 to the center through the guiding effect of the top air guide plate 73. Under the driving effect of 74, the air flow speed is increased, so that the electric device and the door body 50 can be quickly cooled, and the cooling efficiency is improved.

[0041]

222 Further, as shown in FIGS. 4, 10 and 11, the fan 74 is provided in the center of the top air guide plate 73, and the upper surface of the top air guide plate 73 is provided with an air guide piece 73b extending from the center to the circumferential direction.

[0042]

228 In this embodiment, the air flow path between the center and the edge of the top air guide plate 73 is formed by the air guide piece 73b, and the guiding effect of the top air guide plate 73 is achieved.

[0043]

303 In some embodiments of the present invention, as shown in FIG. 11, the edge of the top air guide plate 73 is provided with a first air duct 73a; the first air duct 73a constitutes at least a part of the air duct.

[0044]

308 In this embodiment, under the driving action of the fan 74, the high-temperature airflow on the surface of the door body 50 is discharged through the first air passage 73a located at the edge of the top air guide plate 73, or the wind blown by the fan 74 is discharged from the top air guide plate 73. The first air duct 73a at the edge blows toward the door body 50, so that the door body can be quickly cooled, and the heat dissipation efficiency of the heating cooker is improved.

[0045]

316 In other embodiments of the present invention, as shown in FIGS. 4, 10 and 12, the heating cooker further includes a cylindrical top support plate 72 provided with a flange, and the top support plate 72 is supported by the cavity 20. Above, the top air guide plate 73 is supported on the top support plate 72, and the second air channel 72a is provided at the position of the flange of the top support plate 72 corresponding to the first air channel 73a of the top air guide plate 73. The air duct 73a and the second air duct 72a constitute at least a part of the air guide air duct.

[0046]

325 In this embodiment, by matching the first air passage 73a and the second air passage 72a, an air guide air passage for air flow is formed, and the wind blown by the fan 74 is along the first air passage 73a and the second air passage 72a is blown toward the furnace door, so that the door body 50 can be cooled quickly, and the thickness of the door body does not need to be set too thick to prevent the user from being scalded when touching the door body 50 and does not affect the door body 50 when observing the interior of the cavity 20. Visibility.

[0047]

334 FIG. 7 is an assembly diagram of the door 50 and its related structure according to an embodiment of the present invention.

336 FIG. 8 is an exploded schematic diagram of the door 50 and its related structure according to an embodiment of the present invention.

338 As shown in FIGS. 7 and 8, the door body 50 mainly includes: an outer see-through layer 51 formed into a substantially semi-cylindrical shape; an inner see-through layer 52 adapted to the outer see-through layer 51 and also formed into a substantially semi-cylindrical shape; A metal mesh layer formed between the outer see-through layer 51 and the inner see-through layer 52, which is also formed into a substantially semi-cylindrical shape, has many through holes formed on its surface to prevent microwaves from passing through the outer see-through layer from the heating cavity 34 under the microwave heating function 51 and the inner see-through layer 52 are transmitted, and both the outer see-through layer 51 and the inner see-through layer 52 form a door surface 50a; a substantially circular upper movable rail 57 is formed to fix the door surface from above 50a; the upper fixed rail 58 is formed into a ring shape adapted to the upper movable rail 57 for supporting the upper movable rail 57 from the upper side and/or the outer side, and the upper movable rail 57 can be opposed The upper fixed rail 58 slides or rolls through a plurality of rollers (not shown) provided therebetween.

[0048]

339 It should be noted that, in the figure, since the metal mesh layer closely adheres to the outer see-through layer 51 and the inner see-through layer 52, the structure is not specifically shown in the figure.

[0049]

338 Specifically, as shown in FIG. 9, the upper fixed rail 58 is provided with a third air channel 58a; the upper fixed rail 58 is sleeved outside the top support plate 72, and the third air channel 58a on the upper fixed rail 58 The second air duct 72a at the flange of the top support plate 72 is at least partially opposite; the first air duct 73a, the second air duct 72a, and the third air duct 58a constitute at least a part of the air guide air duct.

[0050]

335 In this embodiment, the wind blown by the fan 74 is sequentially blown toward the door 50 along the first air passage 73a, the second air passage 72a, and the third air passage 58a, to achieve rapid cooling of the door 50 The channel 58a is provided on the upper fixed guide rail 58 and can also realize the relative rotation of the upper fixed guide rail 58 and the upper movable guide rail 57 to generate heat while discharging or cooling air to cool the guide rail, which solves the heat dissipation problem of the guide rail structure.

[0051]

373 Further, a fourth air duct 57a is provided on the upper movable guide 57, and the first air duct 73a, the second

air duct 72a, the third air duct 58a, and the fourth air duct 57a constitute at least a part of the air guide air duct.

[0052]

379 In this embodiment, a part of the wind blown by the fan 74 is directed to the door body 50 and the other part to the cavity through the fourth air duct 57a, which not only realizes the rapid cooling of the door body 50, but also realizes the rapidity of the cavity body 20 cool down.

[0053]

385 In any of the above embodiments, preferably, as shown in FIG. 9, a plurality of second protrusions 572 are provided at intervals on the upper movable rail 57, and a gap between two adjacent second protrusions 572 is formed. The fourth air duct 57a.

[0054]

391 In the embodiment, by providing a plurality of second protrusions 572 at intervals on the upper movable rail 57, on the one hand, the contact area between the two rails is reduced, that is, the sliding friction resistance of the contact surface is reduced, so that the two The relative rotation of the guide rail is smoother, and at the same time, the wear caused by the direct contact between the two guide rails is reduced; on the other hand, the gap between the two adjacent second protrusions 572 is used to form a fourth air passage 57a for air circulation, the structure is more simple and reduce production costs.

[0055]

400 It should be noted that the second convex portion 572 may be a convex block or a convex strip provided on the surface of the upper movable rail 57 or any combination of the convex block and the convex strip.

[0056]

405 FIG. 5 is an assembly diagram of the cavity 20 and its related structure according to an embodiment of the present invention.

407 FIG. 6 is an exploded schematic view of the cavity 20 and its related structure according to an embodiment of the present invention.

409 As shown in FIGS. 5 and 6, the cavity 20 mainly includes: a bottom wall 21, a top wall 22, and a rear wall 23 surrounding the heating cavity 34; the top wall 22 is provided to overlap and separate from the rear wall 23, and is provided. The rear support plate 32 of such components and the rear cover 33 provided on the outside of the rear support plate 32 are covered.

413 Corresponding to the above-mentioned base 10 may be round, round or rectangular with rounded corners, the cavity 20 may be cylindrical, cylindrical or cylindrical with a rounded rectangular cross-section. In this embodiment, The cavity 20 is cylindrical as an example.

[0057]

⁴¹⁹In this embodiment, the bottom wall 21 has a circular plate shape, and the central portion thereof is recessed toward the base 10 to form a stirring chamber 24.

⁴²¹The stirring chamber 24 is separated from the heating chamber 34 by a stirring chamber cover 25.

⁴²²The stirring chamber cover 25 is formed of a microwave-transmissive material.

⁴²³The rear wall 23 has a substantially semi-circular arc shape and is provided along the outer periphery of the bottom wall 21, and the top wall 22 is also a circular plate shape, and its outer periphery is connected to the rear wall 23, whereby the bottom wall 21, the top wall 22, and the rear wall 23 is formed as a heating cavity 34 that is open on the front side (the side facing when the user operates the heating cooker) and closed on the rear side, and the opening can be closed or opened by the door body 50.

[0058]

⁴³¹For a heating cooker with a microwave heating function, even if the door 50 closes the opening of the heating cavity 34, microwaves may still leak out of the gap between the door 50 and the cavity 20. Therefore, in this embodiment, left and right choke teeth 26 and right choke teeth 27 are vertically arranged at the left and right edges of the rear wall 23, respectively, and a semi-annular upper choke tooth 28 is provided above the outer periphery of the opening side of the top wall 22, at the bottom. Below the outer periphery of the opening side of the wall 21, a substantially semi-circular lower choke tooth 29 is provided.

[0059]

⁴⁴⁰The rear support plate 32 has a substantially semicircular arc shape, and is provided on the rear side, that is, on the side opposite to the opening side.

⁴⁴²Relative to the rear side, because there is no support by the rear support plate 32 on the front side, the bottom wall 21 portion on the front side and the lower choke teeth 29 are easily deformed by being pressed by heavy objects (such as food to be heated, etc.). For this reason, in this embodiment, a reinforcement 30 is added below the portion of the bottom wall 21 on the front side and the lower choke teeth 29 to increase the strength of the portion.

[0060]

⁴⁵⁰In addition, optionally, as shown in FIG. 8, a door drive motor 59 may also be provided on the base 10, and a door drive gear 60 may be provided on the upper end of the door. The door drive gear 60 may be ring-shaped with the lower movable rail 54. The teeth formed on the inner surface are meshed so that the door body 50 can be automatically rotated by the door body drive motor 59.

[0061]

⁴⁵⁷4 is a schematic diagram of the positions of the upper cover 70 and the heating tube 80 relative to other

components.

459 FIG. 10 is an exploded schematic view of the upper cover 70 and some internal structures involved in the embodiment of the present invention.

461 As shown in FIGS. 4 and 10, the upper cover 70 has a substantially disc shape, and is formed to heat the top of the cooker.

463 The upper cover 70 can cooperate with the semi-ring-shaped top decorative sheet 71 and be buckled on the cavity 20.

465 Inside the upper electrical appliance chamber formed by the upper cover 70 and the cavity 20, a cylindrical top support plate 72 with a flange is provided, which is fixedly connected to the aforementioned upper fixed rail 58.

468 Above the flange surface of the top support plate 72, a disc-shaped top wind guide plate 73 may be provided.

469 The top wind deflector 73 is used to divide the upper electrical appliance room into a lower high temperature electrical appliance room and an upper lower temperature electrical appliance room.

471 The high-temperature electrical appliance room is used for installing the heating tube 80 and related components shown in FIG. 4 and is a high-temperature area.

473 The low-temperature electrical appliance room is used for the installation of the top fan 74, the speaker 75, the voice function module 76, the projector 77, the projection power supply circuit 78 and the like, and is a low-temperature area.

476 Among them, the top fan 74 is used to cool the low-temperature electrical appliance room and the like, and can also blow air to the heating tube 80 so that the heat generated by the heating tube 80 can enter the heating cavity 34 better.

[0062]

482 In any of the above embodiments, preferably, as shown in FIGS. 11 and 12, at least one group of positioning components is further included, and each group of positioning components includes a positioning post 722 and a positioning hole 732 that cooperate with each other, and the positioning post 722 and the positioning hole 732 are provided on the top support plate 72, and the other is provided on the top wind guide plate 73.

[0063]

490 In this embodiment, when connecting the top support plate 72 and the top air guide plate 73 of the cooker, the top air guide plate 73 is first mounted on the top support plate 72 through the positioning post 722 and the positioning hole 732 in the positioning assembly. The determination of the installation position is achieved through the setting of the positioning post 722 and the positioning hole 732 to achieve precise positioning of the installation position, which facilitates the quick installation of the top wind deflector 73.

[0064]

498 In any of the above embodiments, preferably, as shown in FIG. 11 and FIG. 12, it further includes at least one set of connection components, and each set of connection components includes a guide hole 724 and a

connection hole 734 that cooperate with each other, and the guide hole 724 and the connection hole One of the 734 is provided on the top support plate 72, and the other is provided on the top wind guide plate 73

[0065]

505 In this embodiment, the fastening connection for the top support plate 72 and the top wind deflector 73 is achieved through the guide hole 724 and the connection hole 734 in the connection assembly; when the positioning post 722 cooperates with the positioning hole 732 and the guide hole 724 is connected. When the holes 734 are connected, the top wind guide plate 73 is accurately installed on the top support plate 72, and the fixed connection between the top support plate 72 and the top wind guide plate 73 is achieved.

[0066]

513 In the present invention, the terms "first", "second", and "third" are used for descriptive purposes only, and cannot be understood as indicating or implying relative importance; the term "plurality" refers to two or two Above, unless otherwise specifically limited.

516 The terms "installation", "connection", "connection", "fixation" and other terms should be understood in a broad sense. For example, "connection" may be a fixed connection, a detachable connection, or an integral connection; "connection" may It is directly connected, or indirectly connected through an intermediary.

519 Those of ordinary skill in the art can understand the specific meanings of the above terms in the present invention according to specific situations.

[0067]

524 In the description of the present invention, it should be understood that the terms "upper", "lower", "left", "right", "front", "rear", etc. indicate the orientation or positional relationship based on the orientation shown in the drawings Or the positional relationship is only for the convenience of describing the present invention and simplifying the description, rather than indicating or implying that the device or unit referred to must have a specific direction and be constructed and operated in a specific orientation, and therefore cannot be construed as limiting the present invention.

[0068]

533 In the description of this specification, the description of the terms "one embodiment", "some embodiments", "specific embodiments", etc. means that the specific features, structures, materials or characteristics described in connection with the embodiments or examples are included in the present invention In at least one embodiment or example.

537 In this specification, the schematic representation of the above terms does not necessarily refer to the same implementation or example.

539 Moreover, the specific features, structures, materials, or characteristics described may be combined in any suitable manner in any one or more embodiments or examples.

[0069]

544 The above are only preferred embodiments of the present invention and are not intended to limit the present invention. For those skilled in the art, the present invention may have various modifications and changes.

546 Any modification, equivalent replacement, improvement, etc. made within the spirit and principle of the present invention shall be included in the protection scope of the present invention.

Notice

This translation is machine-generated. It cannot be guaranteed that it is intelligible, accurate, complete, reliable or fit for specific purposes. Critical decisions, such as commercially relevant or financial decisions, should not be based on machine-translation output.

CLAIMS WO2019153512A1

1

13 A heating cooker, characterized in that it includes: a base (10) with a lower appliance chamber formed therein; a cavity (20) provided on the base (10) and a heating cavity for placing food inside (34), one side of the heating cavity (34) is formed as an opening for food to enter and exit; a door body (50) is provided on the cavity (20) for closing or opening the opening; A cover (70), which is provided on the cavity (20), and an upper electrical appliance room is enclosed between the upper lid (70) and the cavity (20); the lower electrical appliance room and/or The upper electrical appliance room forms an air duct with respect to the outer surface of the door body (50); a fan (74) is provided in the lower electrical appliance room or the upper electrical appliance room, and the fan (74) passes through the The wind guide air duct blows air from the lower appliance room or the upper appliance room to the outer surface of the door body (50), or the fan (74) passes from the door body (50) through the wind guide air passage) Draughts the outer surface of the lower electrical appliance room or the upper electrical appliance room.

2

27 The heating cooker according to claim 1, characterized in that the fan (74) is provided in the upper appliance room; the upper appliance room is provided with a disc-shaped top wind deflector (73), so The fan (74) is disposed on the top wind guide plate (73), and the wind blown by the fan (74) is guided to the wind guide air passage by the top wind guide plate (73).

3

31 The heating cooker according to claim 2 characterized in that the fan (74) is provided at the center of the top air guide plate (73), and the upper surface of the top air guide plate (73) is arranged from the center to A wind deflector (73b) extending in the circumferential direction.

4

40 The heating cooker according to claim 2 characterized in that: a first air duct (73a) is provided on the edge of the top air guide plate (73); the first air duct (73a) constitutes the air guide At least part of the air duct.

5

45 The heating cooker according to claim 4 characterized in that the heating cooker further includes a cylindrical top support plate (72) provided with a flange, the top support plate (72) supporting the Above the cavity (20), the top wind deflector (73) is supported on the top support plate (72), the flange of the top support plate (72) is connected to the top wind deflector (72 73) A second air duct (72a) is provided at a position corresponding to the first air duct (73a); the first air duct (73a) and the second air duct (72a) constitute the wind-guiding wind At least part of the Tao.

6

54 The heating cooker according to claim 5 characterized in that the door body (30) includes: an outer see-through layer (51) formed in a semi-cylindrical shape; adapted to the outer see-through layer (51), A semi-cylindrical inner see-through layer (52); a semi-cylindrical metal mesh layer disposed between the outer see-through layer (51) and the inner see-through layer (52) on the surface A plurality of through holes are formed; the outer see-through layer (51), the inner see-through layer (52) and the metal mesh layer constitute a door surface (30a); an upper movable rail (57) formed as a ring, Which is used to fix the door surface (30a) from the upper side; an upper fixed rail (58), which is formed into a ring shape adapted to the upper movable rail (57), is used to Or the outer side supports the upper movable rail (57), and the upper movable rail (57) can move relative to the upper fixed rail (58); the upper fixed rail (58) is provided with A third air duct (58a); the upper fixed rail (58) is sleeved outside the top support plate (72), and the third air duct (58a) on the upper fixed rail (58)) At least partially opposed to the second air duct (72a) at the flange of the top support plate (72); the first air duct (73a), the second air duct (72a) and all The third air duct (58a) constitutes at least a part of the air duct.

7.

70 The heating cooker according to claim 6 characterized in that a fourth air duct (57a) is provided on the upper movable rail (57), the first air duct (73a), the second The air duct (72a), the third air duct (58a) and the fourth air duct (57a) constitute at least a part of the wind guide air duct.

8

75 The heating cooker according to claim 7, wherein a plurality of second protrusions (572) are arranged at intervals on the upper movable rail (57), and two adjacent second protrusions The gap between (572) forms the fourth air duct (57a).

9

8 The heating cooker according to any one of claims 5 to 8 further comprising at least one group of positioning components, each group of the positioning components includes a positioning column (72) and a positioning hole (73) that cooperate with each other One of the positioning post (72) and the positioning hole (73) is provided on the top support plate (72), and the other is provided on the top wind guide plate (73).

10

9 The heating cooker according to any one of claims 5 to 8 further comprising at least one set of connecting components, each set of the connecting components includes a guide hole (72) and a connecting hole (73) that cooperate with each other One of the guide hole (72) and the connecting hole (73) is provided on the top support plate (72), and the other is provided on the top wind guide plate (73).

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(54) Title: HEATING COOKER

(54) 发明名称: 加热烹调器

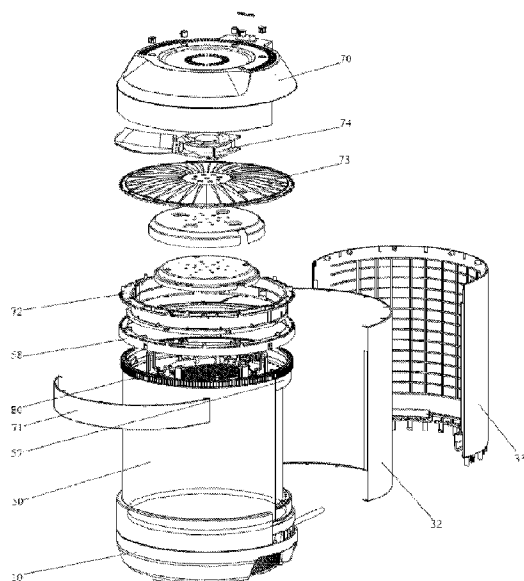


图 4

(57) Abstract: A heating cooker, comprising: a base (10), a lower electrical room being formed thereinside; a cavity (20) provided on the base (10), a heating cavity (34) for placing food being formed thereinside and one side of the heating cavity (34) being formed with an opening that allows entrance and exit of the food; a door (50) provided on the cavity (20); and an upper cover (70) for covering the cavity (20), an upper electrical room being enclosed between the upper cover (70) and the cavity (20). The lower electrical room and/or the upper electrical room is formed with an air guide channel with respect to the outer surface of the door (50); the lower electrical room or the upper electrical room is provided with a fan (74). Air blown from the fan (74) flows to the outer surface of the door (50) along the air guide channel, or a high-temperature airflow on the outer surface of the door (50) is guided out from the air guide channel so that the door (50) can be quickly cooled, such that there is no need to set the thickness of the door (50) too great to prevent a user from being burnt when contacting the door (50), and the visibility of the door (50) of observing the inside of the cavity (20) will not be affected.

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本国际公布:

— 包括国际检索报告 (条约第21条(3))。

(57) 摘要: 一种加热烹调器, 包括: 底座 (10), 内部形成有下电器室; 腔体 (20), 设置于底座 (10), 内部形成有供食物放置的加热腔 (34), 加热腔 (34) 的一侧形成有供食物进出的开口; 门体 (50), 设置于腔体 (20) 上; 上盖 (70), 盖设于腔体 (20) 之上, 上盖 (70) 与腔体 (20) 之间围成上电器室; 下电器室和/或上电器室相对门体 (50) 的外表面形成导风风道; 下电器室或上电器室中设置有风扇 (74)。风扇 (74) 吹出的风沿导风风道流向门体 (50) 的外表面; 或者将门体 (50) 的外表面的高温气流从导风风道引出, 以使门体 (50) 可以快速冷却, 不需要将门体 (50) 的厚度设置的过厚就可防止用户接触门体 (50) 时被烫伤, 同时不会影响门体 (50) 观察腔体 (20) 内部时的可视性。

加热烹调器

5 本申请要求 2018 年 02 月 08 日在中国国家知识产权局提交的申请号为 201810130673.7、发明名称为“加热烹调器”的中国专利申请的优先权，其全部内容通过引用结合在本申请中。

技术领域

10 本发明涉及家用电器领域，具体而言，涉及一种加热烹调器。

背景技术

通常，如图 1 所示，微波炉等加热烹调器为长方体形状，具备用于放置待加热食物的加热腔以及能够从加热腔前方的开口封闭烹调腔的门体，
15 这种门体主要包括三层：内玻璃层、金属网孔层、外玻璃层。内玻璃层直接面对烹调腔内部；金属网孔层贴近内玻璃层而设置，用于防止微波从门体辐射到外界；外玻璃层相对金属网孔层隔离而设置，且为了防止用户接触外玻璃层时被烫伤，一般需要将外玻璃层相对金属网孔层隔开的距离设置在 0.6mm 以上，以使得来自烹调腔内部的热量不能直接传导到外玻璃层。

20 除了传统的长方体形状的加热烹调器外，现有技术中还出现了圆筒形的加热烹调器。圆筒形加热烹调器因其独特的外观能够给用户新的体验而受到用户欢迎。本发明人在实现圆筒形加热烹调器的过程中发现，一方面，为了提高通过门体观察烹调腔内部时的可视性，要求将门体设置得更薄，即内、外玻璃之间的距离尽可能小；而另一方面，为了防止用户接
25 触外玻璃层时被烫伤，需要将门体设置得足够厚，即内、外玻璃之间的距离足够大。如传统的长方体形状的加热烹调器那样，为了防止烫伤，门体的厚度已经难以设置得更薄，其可视性难以进一步提高。

发明内容

本发明旨在提供一种加热烹调器，其能够在保证用户接触门体时不被烫伤的前提下，进一步提高门体的可视性。

为实现上述目的，本发明的技术方案提供了一种加热烹调器，包括：底座，其内部形成有下电器室；腔体，其设置于底座，内部形成有供食物放置的加热腔，加热腔的一侧形成供食物进出的开口；门体，其设置于腔体上，用于封闭或打开开口；上盖，其盖设于腔体之上，上盖与腔体之间围成上电器室；下电器室和/或上电器室相对门体的外表面形成导风风道；下电器室或上电器室中设置有风扇，风扇通过导风风道从下电器室或上电器室向门体的外表面吹风，或者风扇通过导风风道从门体的外表面向下电器室或上电器室引风。

在该技术方案中，在烹调器产生的热量会使门体等部件处于高温状态，这样用户触摸门体或烹调器主体时容易造成烫伤，为了防止出现此种情况以及不会影响门体的可视性，就需要设计冷却结构对高温部件进行快速冷却，因此，在烹调器内设置风扇以及与风扇相配合的导风风道，实现门体的快速冷却，从而不需要将门体的厚度设置的过厚就可防止用户接触门体时被烫伤，同时不会影响门体观察腔体内部时的可视性。

另外，本发明提供的上述技术方案中的加热烹调器还可以具有如下附加技术特征：

在上述技术方案中，优选地，风扇设置于上电器室；上电器室中设置有圆盘状的顶部导风板，风扇设置于顶部导风板上，风扇发出的风由顶部导风板引导到导风风道。

在上述技术方案中，优选地，风扇设置于顶部导风板中央，顶部导风板的上表面设置由中心向圆周方向延伸的导风片。

在上述技术方案中，优选地，顶部导风板的边缘设置有第一风道；第一风道构成导风风道的至少一部分。

在上述技术方案中，优选地，加热烹调器还包括设有凸缘的圆筒状的顶部支撑板，顶部支撑板支撑于腔体之上，顶部导风板支撑于顶部支撑板之上，顶部支撑板的凸缘处与顶部导风板的第一风道对应的位置设置有第二风道；第一风道与第二风道构成导风风道的至少一部分。

在上述技术方案中，优选地，门体包括：形成为半圆筒形的外透视层；与外透视层适配的、形成为半圆筒形的内透视层；配置于外透视层与内透视层之间的、同样形成为半圆筒形的金属网孔层，其表面上形成多个通孔；外透视层、内透视层和金属网孔层构成门面；形成为圆环状的上侧可动导轨，其用于从上侧固定门面；上侧固定导轨，其形成为与上侧可动导轨适配的环状，用于从上侧和/或外侧支撑上侧可动导轨，且上侧可动导轨可相对上侧固定导轨移动；上侧固定导轨上设置有第三风道；上侧固定导轨套设于顶部支撑板外侧，且上侧固定导轨上的第三风道与顶部支撑板的凸缘处的第二风道至少部分正对；第一风道、第二风道及第三风道构成导风风道的至少一部分。

在上述技术方案中，优选地，上侧可动导轨上设有第四风道，第一风道、第二风道、第三风道及第四风道构成导风风道的至少一部分。

在上述技术方案中，优选地，上侧可动导轨上间隔设置多个第二凸起部，相邻两个第二凸起部之间的间隙形成第四风道。

在上述任一技术方案中，优选地，还包括至少一组定位组件，每组定位组件包括相互配合的定位柱和定位孔，定位柱和定位孔中的一个设于顶部支撑板上，另一个设于顶部导风板上。

在上述任一技术方案中，优选地，还包括至少一组连接组件，每组连接组件包括相互配合的导向孔和连接孔，导向孔和连接孔中的一个设于顶部支撑板上，另一个设于顶部导风板上。

本发明的附加方面和优点将在下面的描述部分中变得明显，或通过本发明的实践了解到。

附图说明

图 1 示出了现有加热烹调器的结构图；

图 2 示出了根据本发明的实施例的加热烹调器的闭合状态图；

图 3 示出了根据本发明的实施例的加热烹调器的打开状态图；

图 4 示出了根据本发明的实施例的加热烹调器的分解结构图；

图 5 示出了根据本发明的实施例的腔体的结构图；

图 6 示出了根据本发明的实施例的腔体的分解结构图；

图 7 示出了根据本发明的实施例的门体及导轨结构的结构图；

图 8 示出了根据本发明的实施例的门体及导轨结构的分解结构图；

图 9 示出了根据本发明的实施例的上侧可动导轨和上侧固定导轨的结
5 构图；

图 10 示出了根据本发明的实施例的上电器室的分解结构图；

图 11 示出了根据本发明的实施例的顶部导风板的结构图；

图 12 示出了根据本发明的实施例的顶部支撑板的部分结构图；

图 2 至图 12 中附图标记与部件名称之间的对应关系为：

10 底座，20 腔体，21 底壁，22 顶壁，23 后壁，24 搅拌腔，25 搅拌
腔盖板，26 左侧扼流齿，27 右侧扼流齿，28 上侧扼流齿，29 下侧扼流齿，
30 加强件，32 后支撑板，33 后侧外罩，34 加热腔，50 门体，50a 门面，
51 外透视层，52 内透视层，54 下侧可动导轨，57 上侧可动导轨，57a 第四
风道，572 第二凸起部，58 上侧固定导轨，58a 第三风道，59 门体驱动电
15 机，60 门体驱动齿轮，70 上盖，71 顶部装饰片，72 顶部支撑板，72a 第二
风道，722 定位柱，724 导向孔，73 顶部导风板，73a 第一风道，73b 导风
片，732 定位孔，734 连接孔，74 风扇，75 扬声器，76 语音功能模块，77
投影器，78 投影电源电路，80 发热管。

20 具体实施方式

为了能够更清楚地理解本发明的上述目的、特征和优点，下面结合附图和具体实施方式对本发明进行进一步的详细描述。需要说明的是，在不冲突的情况下，本申请的实施例及实施例中的特征可以相互组合。

在下面的描述中阐述了很多具体细节以便于充分理解本发明，但是，
25 本发明还可以采用其他不同于在此描述的方式来实施，因此，本发明的保护范围并不限于下面公开的具体实施例的限制。

如图 2 至图 12 所示，其中，图 2 为本发明实施例所涉及的加热烹调器的示意图。图 3 为门体 50 打开状态下的立体图。如图 2 及图 3 所示，加热烹调器主要具备底座 10，其内部可形成供电源板、磁控管、变频器等电器

件安装的下电器室（未图示）；腔体 20，其设置于底座 10，内部形成有供食物放置的加热腔 34，加热腔 34 的一侧形成为供食物进出的开口；门体 50，其设置于腔体 20 上，用于封闭或打开加热腔 34 的开口；上盖 70，其盖设于腔体 20 之上，内部可形成供风扇、语音控制模块等电器件安装的上电器室（未图示）。

具体地，如图 4 及图 7 至图 12 所示，下电器室和/或上电器室相对门体 50 的外表面形成导风风道；下电器室或上电器室中设置有风扇 74，风扇 74 通过导风风道从下电器室或上电器室向门体 50 的外表面吹风，或者风扇 74 通过导风风道从门体 50 的外表面向下电器室或上电器室引风。

在该实施例中，风扇 74 吹出的风沿导风风道流向门体 50 的外表面；或者将门体 50 的外表面的高温气流从导风风道引出，以使门体 50 可以快速冷却，不需要将门体的厚度设置的过厚就可防止用户接触门体 50 时被烫伤，同时不会影响门体 50 观察腔体 20 内部时的可视性。

在上述实施例中，优选地，如图 4 和图 10 所示，风扇 74 设置于上电器室；上电器室中设置有圆盘状的顶部导风板 73，风扇 74 设置于顶部导风板 73 上，风扇 74 发出的风由顶部导风板 73 引导到导风风道。

在该实施例中，通过顶部导风板 73 的导向作用，将风扇 74 吹出的风由顶部导风板 73 的中央向边缘流动，或者由顶部导风板 73 的边缘向中央流动；同时在风扇 74 的驱动作用下，以提高气流流动速度，使得电器件以及门体 50 可以快速冷却，提高冷却效率。

进一步地，如图 4、图 10 和图 11 所示，风扇 74 设置于顶部导风板 73 中央，顶部导风板 73 的上表面设置由中心向圆周方向延伸的导风片 73b。

在该实施例中，通过导风片 73b 形成顶部导风板 73 的中央与边缘之间的气体流动路径，实现顶部导风板 73 的导向作用。

在本发明的一些实施例中，如图 11 所示，顶部导风板 73 的边缘设置有第一风道 73a；第一风道 73a 构成导风风道的至少一部分。

在该实施例中，在风扇 74 的驱动作用下，门体 50 表面的高温气流通过位于顶部导风板 73 边缘处的第一风道 73a 排出；或者风扇 74 吹出的风从顶部导风板 73 边缘处的第一风道 73a 吹向门体 50，以使门体可以快速冷

却，提高加热烹调器的散热效率。

在本发明的另一些实施例中，如图 4、图 10 和图 12 所示，加热烹调器还包括设有凸缘的圆筒状的顶部支撑板 72，顶部支撑板 72 支撑于腔体 20 之上，顶部导风板 73 支撑于顶部支撑板 72 之上，顶部支撑板 72 的凸缘处与顶部导风板 73 的第一风道 73a 对应的位置设置有第二风道 72a；第一风道 73a 与第二风道 72a 构成导风风道的至少一部分。

在该实施例中，通过相配合的第一风道 73a 和第二风道 72a，形成用于气流流通的导风风道，将风扇 74 吹出的风沿第一风道 73a 和第二风道 72a 吹向炉门，以使门体 50 可以快速冷却，不需要将门体的厚度设置的过厚就可防止用户接触门体 50 时被烫伤，同时不会影响门体 50 观察腔体 20 内部时的可视性。

图 7 为本发明实施例所涉及的门体 50 及其关联结构的组装图。图 8 为本发明实施例所涉及的门体 50 及其关联结构的分解示意图。如图 7 及图 8 所示，门体 50 主要包括：形成为大致半圆筒形的外透视层 51；与该外透视层 51 适配的、同样形成为大致半圆筒形的内透视层 52；配置于外透视层 51 与内透视层 52 之间的、同样形成为大致半圆筒形的金属网孔层，其表面上形成众多通孔以防止微波加热功能下微波由加热腔 34 通过外透视层 51 与内透视层 52 透射出来，其与外透视层 51、内透视层 52 这两者构成门面 50a；形成为大致圆环状的上侧可动导轨 57，其用于从上侧固定上述门面 50a；上侧固定导轨 58，其形成为与上侧可动导轨 57 适配的环状，用于从上侧和/或外侧支撑上侧可动导轨 57，且上侧可动导轨 57 可相对上侧固定导轨 58 滑动或通过两者之间设置的多个辊轮（未图示）滚动。

需要说明的是，在图中，由于金属网孔层与外透视层 51、内透视层 52 紧密贴合，在图中并未具体示出其结构。

具体地，如图 9 所示，上侧固定导轨 58 上设置有第三风道 58a；上侧固定导轨 58 套设于顶部支撑板 72 外侧，且上侧固定导轨 58 上的第三风道 58a 与顶部支撑板 72 的凸缘处的第二风道 72a 至少部分正对；第一风道 73a、第二风道 72a 及第三风道 58a 构成导风风道的至少一部分。

在该实施例中，风扇 74 吹出的风依次沿第一风道 73a、第二风道 72a

及第三风道 58a 吹向门体 50，实现门体 50 的快速冷却；另外，将第三风道 58a 设于上侧固定导轨 58 上，还可实现将上侧固定导轨 58 和上侧可动导轨 57 相对转动而产生热量同时排出或冷空气对导轨进行冷却，解决了导轨结构的散热问题。

- 5 进一步地，上侧可动导轨 57 上设有第四风道 57a，第一风道 73a、第二风道 72a、第三风道 58a 及第四风道 57a 构成导风风道的至少一部分。

在该实施例中，通过第四风道 57a，将风扇 74 吹出的风的一部分导向门体 50，另一部分导向腔体，既实现了门体 50 的快速冷却，又实现了腔体 20 的快速冷却。

- 10 在上述任一实施例中，优选地，如图 9 所示，上侧可动导轨 57 上间隔设置多个第二凸起部 572，相邻两个第二凸起部 572 之间的间隙形成第四风道 57a。

- 在实施例中，通过在上侧可动导轨 57 上间隔设置多个第二凸起部 572，一方面减少两个导轨之间的接触面积，即减小接触面的滑动摩擦阻力，使得两个导轨的相对转动更加顺畅，同时减少两个导轨直接接触产生磨损；
15 另一方面，利用相邻两个第二凸起部 572 之间的间隙形成用于空气流通的第四风道 57a，结构更加简单、降低生产成本。

需要说明的是，第二凸起部 572 可以为设置在上侧可动导轨 57 表面的凸块或凸条，也可以是凸块和凸条的任意组合。

- 20 图 5 为本发明实施例所涉及的腔体 20 及其关联结构的组装图。图 6 为本发明实施例所涉及的腔体 20 及其关联结构的分解示意图。如图 5 及图 6 所示，腔体 20 主要包括：围成加热腔 34 的底壁 21、顶壁 22 及后壁 23；与后壁 23 重合且分隔而设置的、用于支撑顶壁 22 等部件的后支撑板 32 以及盖设于后支撑板 32 外侧的后侧外罩 33。对应于上述底座 10 可为圆形、
25 类圆形或圆角矩形等形状，腔体 20 可为圆柱形、类圆柱形或横截面为圆角矩形的柱体等形状，在本实施例中以腔体 20 是圆柱形为例进行说明。

在本实施例中，底壁 21 呈圆形板状，且其中央部分向底座 10 侧下凹而形成搅拌腔 24。搅拌腔 24 通过搅拌腔盖板 25 相对加热腔 34 隔开。搅拌腔盖板 25 由可透过微波的材质形成。后壁 23 呈大致半圆的弧形，沿底

壁 21 的外周而设置，顶壁 22 同样为圆形板状，其外周与后壁 23 连接，由此，底壁 21、顶壁 22 及后壁 23 形成为前侧（用户操作加热烹调器时面对的一侧）开口而后侧封闭的加热腔 34，该开口可由门体 50 封闭或打开。

对于具有微波加热功能的加热烹调器，即使门体 50 封闭了加热腔 34 的开口，微波仍可能由门体 50 与腔体 20 之间的缝隙泄露出来，为此，在本实施例中，在后壁 23 的左右两个边缘处分别竖直设置左侧扼流齿 26 及右侧扼流齿 27，在顶壁 22 的开口侧外周上方设置大致半环形的上侧扼流齿 28，在底壁 21 的开口侧外周下方设置大致半环形的下侧扼流齿 29。

后支撑板 32 呈大致半圆的弧形，设置于后侧，即开口侧的相反侧。相对于后侧，由于前侧不存在后支撑板 32 支撑等原因，前侧的底壁 21 部分及下侧扼流齿 29 容易受重物（如待加热的食物等）等挤压而变形，为此，在本实施例中，在前侧的底壁 21 部分及下侧扼流齿 29 下方增设加强件 30 以提高该部分的强度。

此外，可选地，如图 8 所示，还可在底座 10 上设置门体驱动电机 59，其上端设置门体驱动齿轮 60，门体驱动齿轮 60 可与下侧可动导轨 54 的环状内侧面上形成的齿啮合，这样一来，门体 50 可在门体驱动电机 59 的驱动下自动旋转。

图 4 为上盖 70、发热管 80 相对其他部件的位置示意图。图 10 为本发明实施例所涉及的上盖 70 及部分内部结构的分解示意图。如图 4 及图 10 所示，上盖 70 大致圆盘形状，形成为加热烹调器的顶部。上盖 70 可与半环状的顶部装饰片 71 配合，扣设在腔体 20。在上盖 70 与腔体 20 形成的上电器室内部，设置存在凸缘的圆筒状的顶部支撑板 72，其与前述的上侧固定导轨 58 固定连接。在顶部支撑板 72 的凸缘面上方，可设置圆盘状的顶部导风板 73。顶部导风板 73 用于将上电器室分成下侧的高温电器室与上侧的低温电器室。高温电器室用于供图 4 所示发热管 80 及其关联部件安装，为高温区域。低温电器室用于供顶部风扇 74、扬声器 75、语音功能模块 76、投影器 77、投影电源电路 78 等部件安装，为低温区域。其中，顶部风扇 74 用于对低温电器室等进行冷却，还可向发热管 80 吹风，以使得发热管 80 产生的热量更好地进入加热腔 34。

在上述任一实施例中，优选地，如图 11 和图 12 所示，还包括至少一组定位组件，每组定位组件包括相互配合的定位柱 722 和定位孔 732，定位柱 722 和定位孔 732 中的一个设于顶部支撑板 72 上，另一个设于顶部导风板 73 上。

- 5 在该实施例中，在对烹调器的顶部支撑板 72 和顶部导风板 73 进行连接时，首先通过定位组件中的定位柱 722 和定位孔 732 实现顶部导风板 73 在顶部支撑板 72 上的安装位置的确定，通过定位柱 722 和定位孔 732 的设置可以实现安装位置的精确定位，便于顶部导风板 73 的快速安装。

- 在上述任一实施例中，优选地，如图 11 和图 12 所示，还包括至少一
10 组连接组件，每组连接组件包括相互配合的导向孔 724 和连接孔 734，导向孔 724 和连接孔 734 中的一个设于顶部支撑板 72 上，另一个设于顶部导风板 73 上。

- 在该实施例中，通过连接组件中的导向孔 724 和连接孔 734 实现对于顶部支撑板 72 和顶部导风板 73 的紧固连接；当定位柱 722 与定位孔 732
15 配合且导向孔 724 与连接孔 734 相连时，顶部导风板 73 准确安装在顶部支撑板 72 上，实现了顶部支撑板 72 与顶部导风板 73 的固定连接。

- 在本发明中，术语“第一”、“第二”、“第三”仅用于描述的目的，而不能理解为指示或暗示相对重要性；术语“多个”则指两个或两个以上，除非另有明确的限定。术语“安装”、“相连”、“连接”、“固定”等术语均应做广义理解，例如，
20 “连接”可以是固定连接，也可以是可拆卸连接，或一体地连接；“相连”可以是直接相连，也可以通过中间媒介间接相连。对于本领域的普通技术人员而言，可以根据具体情况理解上述术语在本发明中的具体含义。

- 本发明的描述中，需要理解的是，术语“上”、“下”、“左”、“右”、“前”、“后”等指示的方位或位置关系为基于附图所示的方位或位置关系，仅是为了便于描述本发明和简化描述，而不是指示或暗示所指的装置或单元必须具有特定的方向、以特定的方位构造和操作，因此，不能理解为对本发明的限制。
25 述本发明和简化描述，而不是指示或暗示所指的装置或单元必须具有特定的方向、以特定的方位构造和操作，因此，不能理解为对本发明的限制。

 在本说明书的描述中，术语“一个实施例”、“一些实施例”、“具体实施例”等的描述意指结合该实施例或示例描述的具体特征、结构、材料或特点包含于本发明的至少一个实施例或示例中。在本说明书中，对上述术语的示意性表述

不一定指的是相同的实施或实例。而且，描述的具体特征、结构、材料或特点可以在任何的一个或多个实施例或示例中以合适的方式结合。

以上仅为本发明的优选实施例而已，并不用于限制本发明，对于本领域的技术人员来说，本发明可以有各种更改和变化。凡在本发明的精神和原则之内，
5 所作的任何修改、等同替换、改进等，均应包含在本发明的保护范围之内。

权 利 要 求 书

1. 一种加热烹调器，其特征在于，包括：

底座（10），其内部形成有下电器室；

5 腔体（20），其设置于所述底座（10），内部形成有供食物放置的加热腔（34），所述加热腔（34）的一侧形成有供食物进出的开口；

门体（50），其设置于所述腔体（20）上，用于封闭或打开所述开口；

上盖（70），其盖设于所述腔体（20）之上，所述上盖（70）与所述腔体（20）之间围成上电器室；

10 所述下电器室和/或所述上电器室相对所述门体（50）的外表面形成导风风道；

所述下电器室或所述上电器室中设置有风扇（74），所述风扇（74）通过所述导风风道从所述下电器室或所述上电器室向所述门体（50）的外表面吹风，或者所述风扇（74）通过所述导风风道从所述门体（50）的外表面向所述下电器室或所述上电器室引风。

2. 根据权利要求1所述的加热烹调器，其特征在于，所述风扇（74）设置于所述上电器室；

所述上电器室中设置有圆盘状的顶部导风板（73），所述风扇（74）设置于所述顶部导风板（73）上，所述风扇（74）吹出的风由所述顶部导风板（73）引导到所述导风风道。

3. 根据权利要求2所述的加热烹调器，其特征在于，

所述风扇（74）设置于所述顶部导风板（73）中央，所述顶部导风板（73）的上表面设置由中心向圆周方向延伸的导风片（73b）。

4. 根据权利要求2所述的加热烹调器，其特征在于，

25 所述顶部导风板（73）的边缘设置有第一风道（73a）；
所述第一风道（73a）构成所述导风风道的至少一部分。

5. 根据权利要求4所述的加热烹调器，其特征在于，

所述加热烹调器还包括设有凸缘的圆筒状的顶部支撑板（72），所述顶部支撑板（72）支撑于所述腔体（20）之上，所述顶部导风板（73）支

撑于所述顶部支撑板(72)之上,所述顶部支撑板(72)的凸缘处与所述顶部导风板(73)的所述第一风道(73a)对应的位置设置有第二风道(72a);

所述第一风道(73a)与所述第二风道(72a)构成所述导风风道的至少一部分。

- 5 6. 根据权利要求5所述的加热烹调器,其特征在于,所述门体(50)包括:

形成为半圆筒形的外透视层(51);

与所述外透视层(51)适配的、形成为半圆筒形的内透视层(52);

- 10 配置于所述外透视层(51)与所述内透视层(52)之间的、形成为半圆筒形的金属网孔层,其表面上形成多个通孔;

所述外透视层(51)、所述内透视层(52)和所述金属网孔层构成门面(50a);

形成为圆环状的上侧可动导轨(57),其用于从上侧固定所述门面(50a);

- 15 上侧固定导轨(58),其形成为与所述上侧可动导轨(57)适配的环状,用于从上侧和/或外侧支撑所述上侧可动导轨(57),且所述上侧可动导轨(57)可相对所述上侧固定导轨(58)移动;

所述上侧固定导轨(58)上设置有第三风道(58a);

- 20 所述上侧固定导轨(58)套设于所述顶部支撑板(72)外侧,且所述上侧固定导轨(58)上的所述第三风道(58a)与所述顶部支撑板(72)的凸缘处的所述第二风道(72a)至少部分正对;

所述第一风道(73a)、所述第二风道(72a)及所述第三风道(58a)构成所述导风风道的至少一部分。

- 25 7 根据权利要求6所述的加热烹调器,其特征在于,所述上侧可动导轨(57)上设有第四风道(57a),所述第一风道(73a)、所述第二风道(72a)、所述第三风道(58a)及所述第四风道(57a)构成所述导风风道的至少一部分。

8. 根据权利要求7所述的加热烹调器,其特征在于,所述上侧可动导轨(57)上间隔设置多个第二凸起部(572),相邻两个所述第二凸起部(572)

之间的间隙形成所述第四风道（57a）。

9. 根据权利要求 5 至 8 中任一项所述的加热烹调器，其特征在于，还包括至少一组定位组件，每组所述定位组件包括相互配合的定位柱（722）和定位孔（732），所述定位柱（722）和所述定位孔（732）中的一个设于
5 所述顶部支撑板（72）上，另一个设于所述顶部导风板（73）上。

10. 根据权利要求 5 至 8 中任一项所述的加热烹调器，其特征在于，还包括至少一组连接组件，每组所述连接组件包括相互配合的导向孔（724）和连接孔（734），所述导向孔（724）和所述连接孔（734）中的一个设于所述顶部支撑板（72）上，另一个设于所述顶部导风板（73）上。

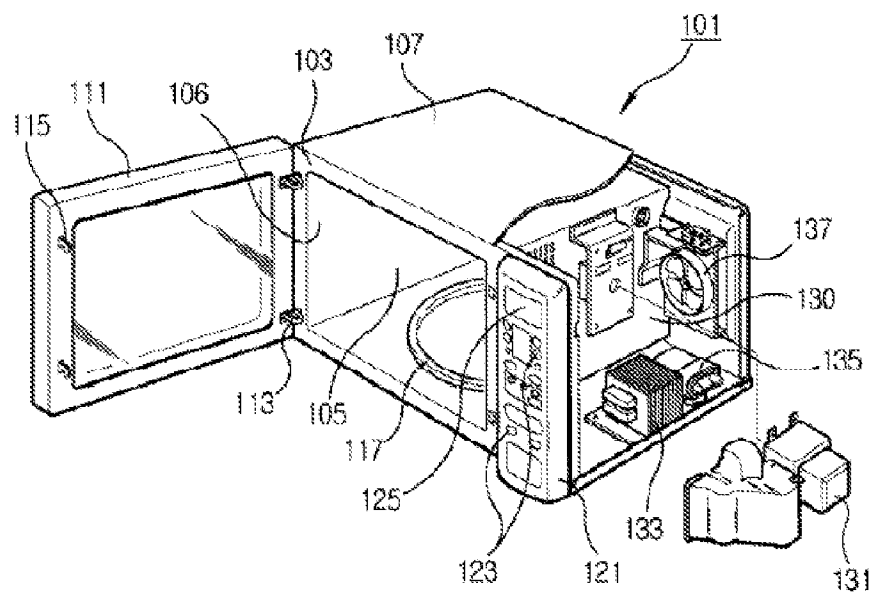


图 1

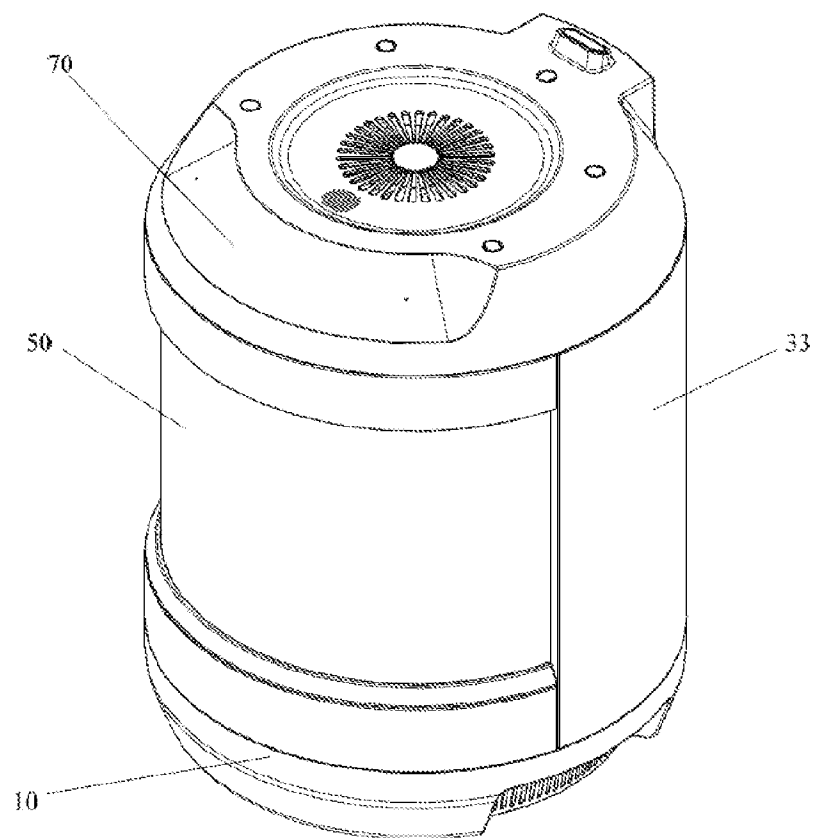


图 2

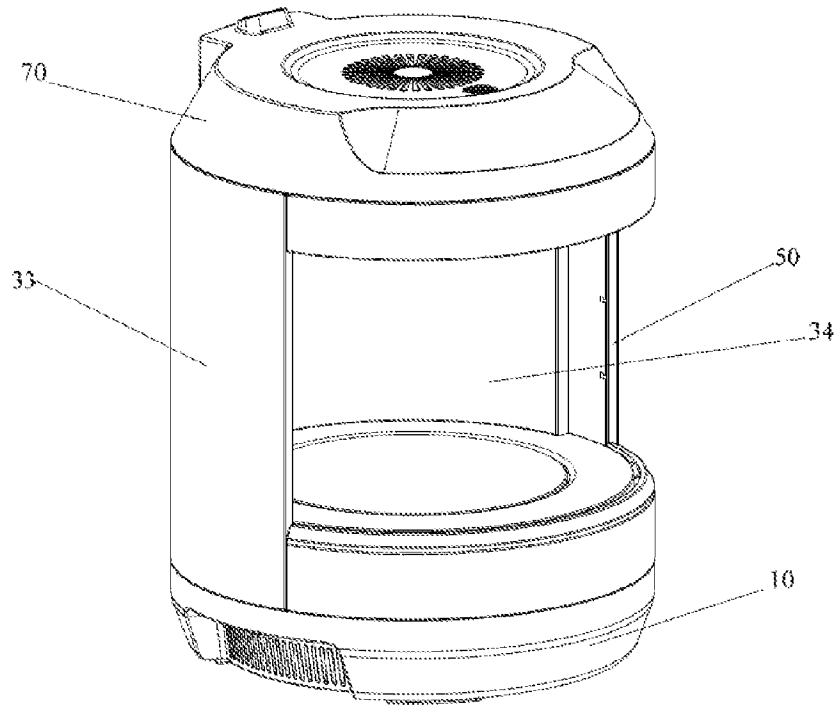


图 3

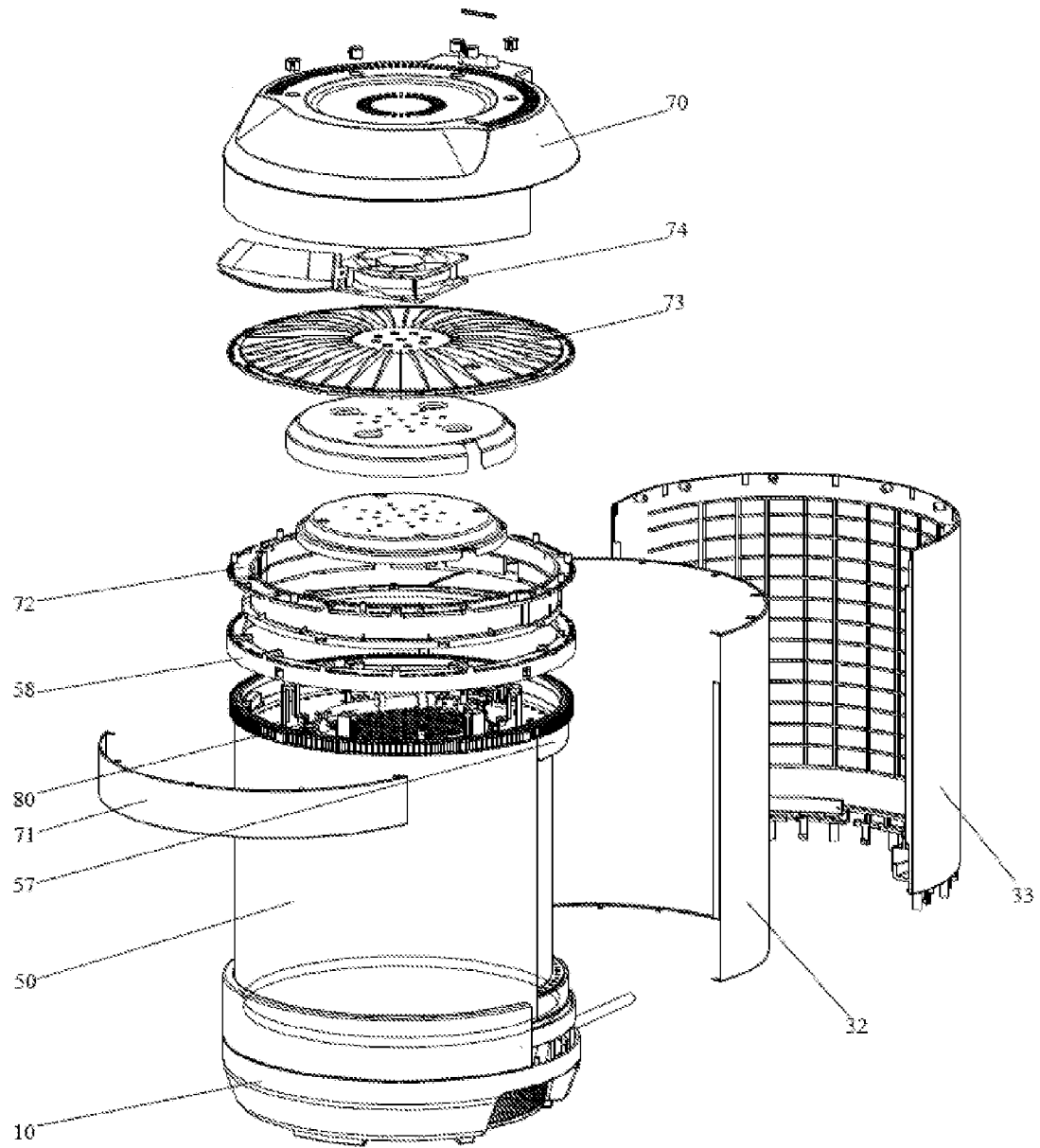


图 4

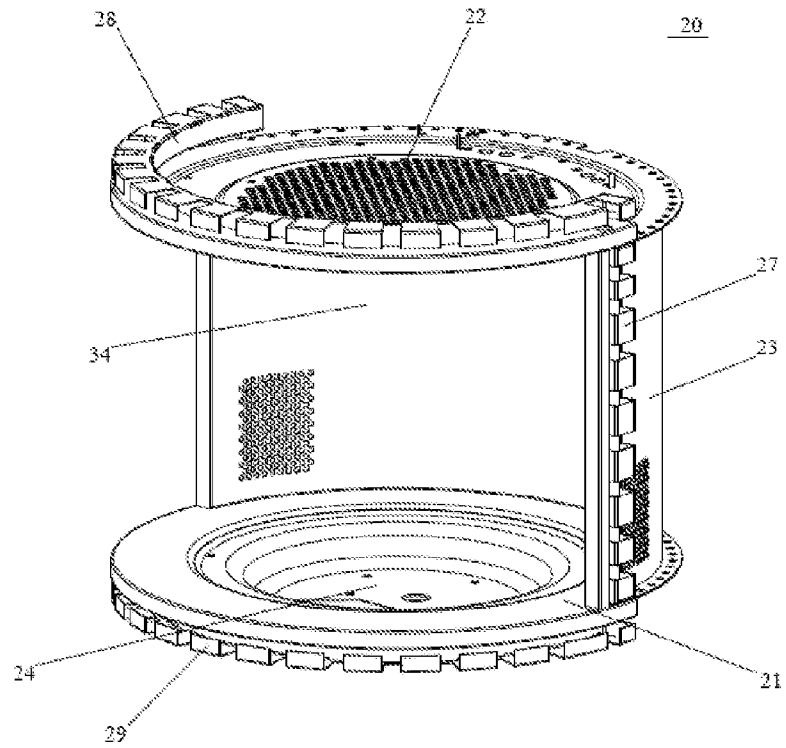


图 5

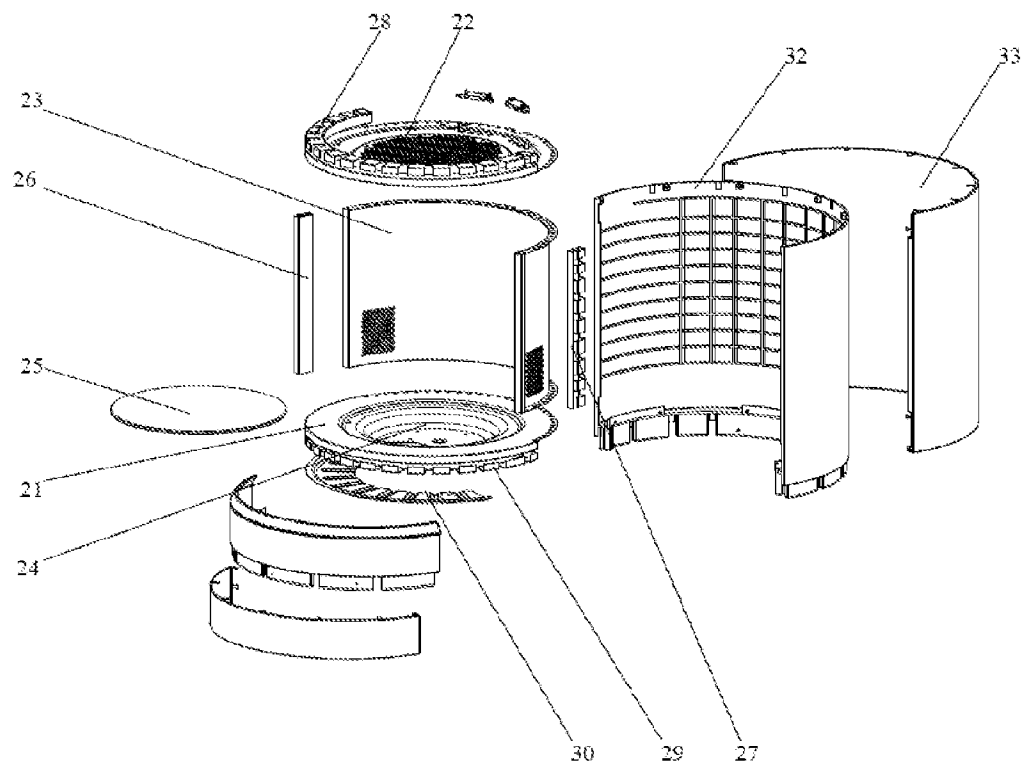


图 6

50

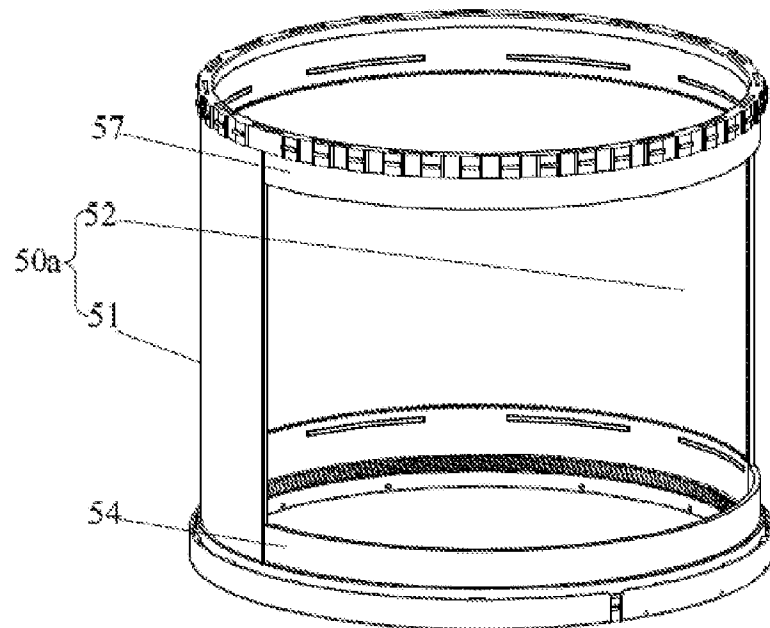


图 7

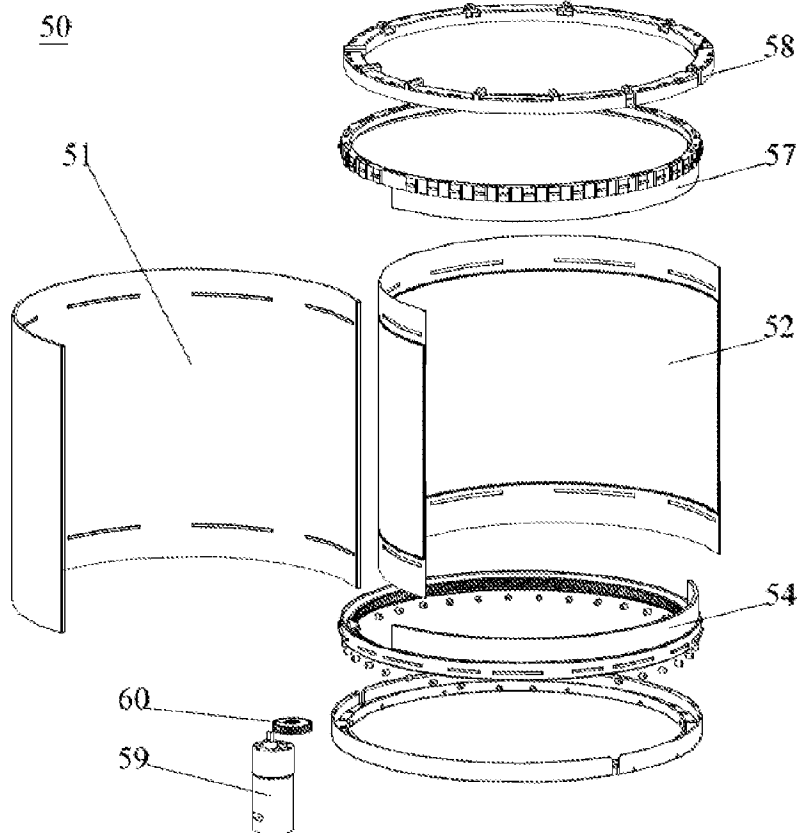


图 8

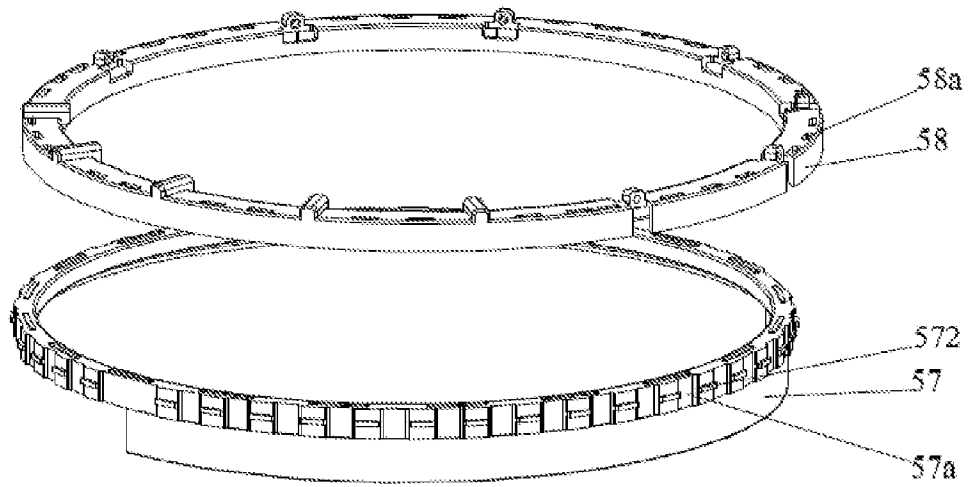


图 9

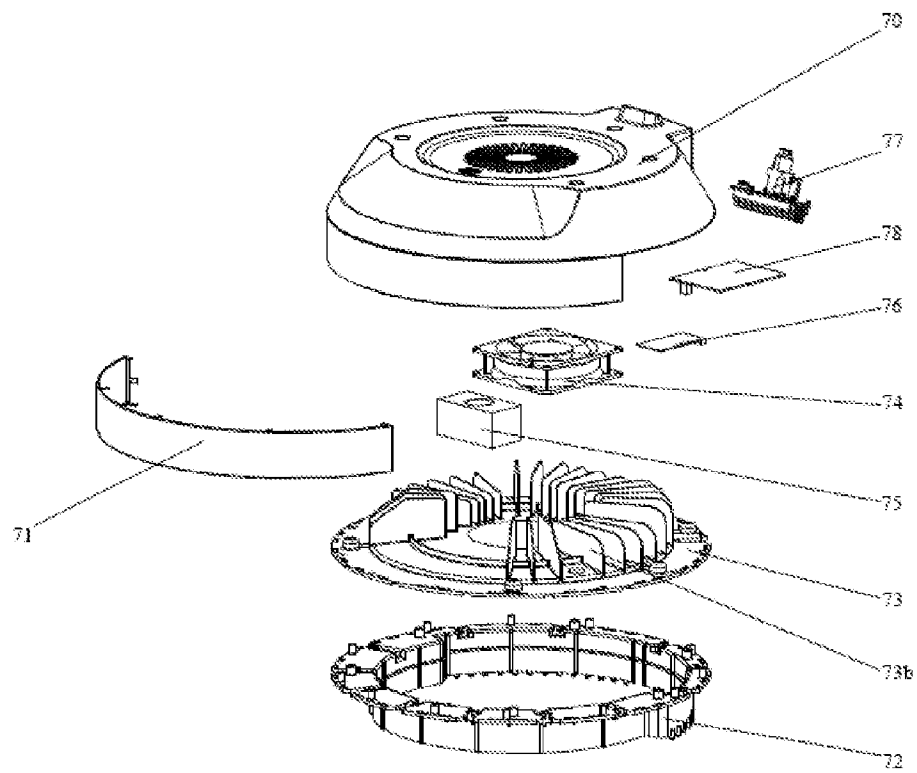


图 10

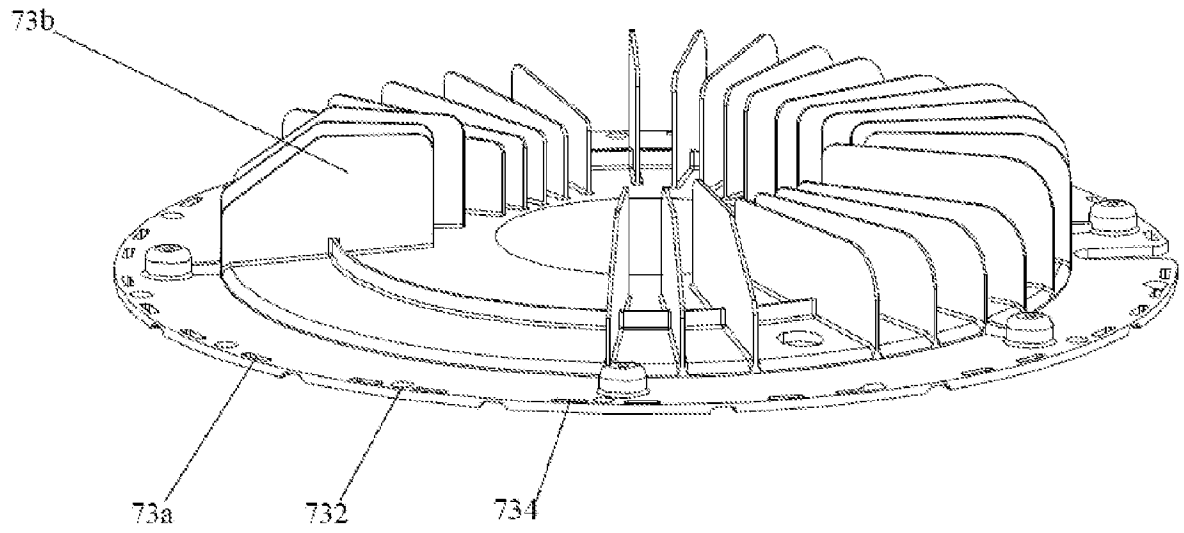


图 11

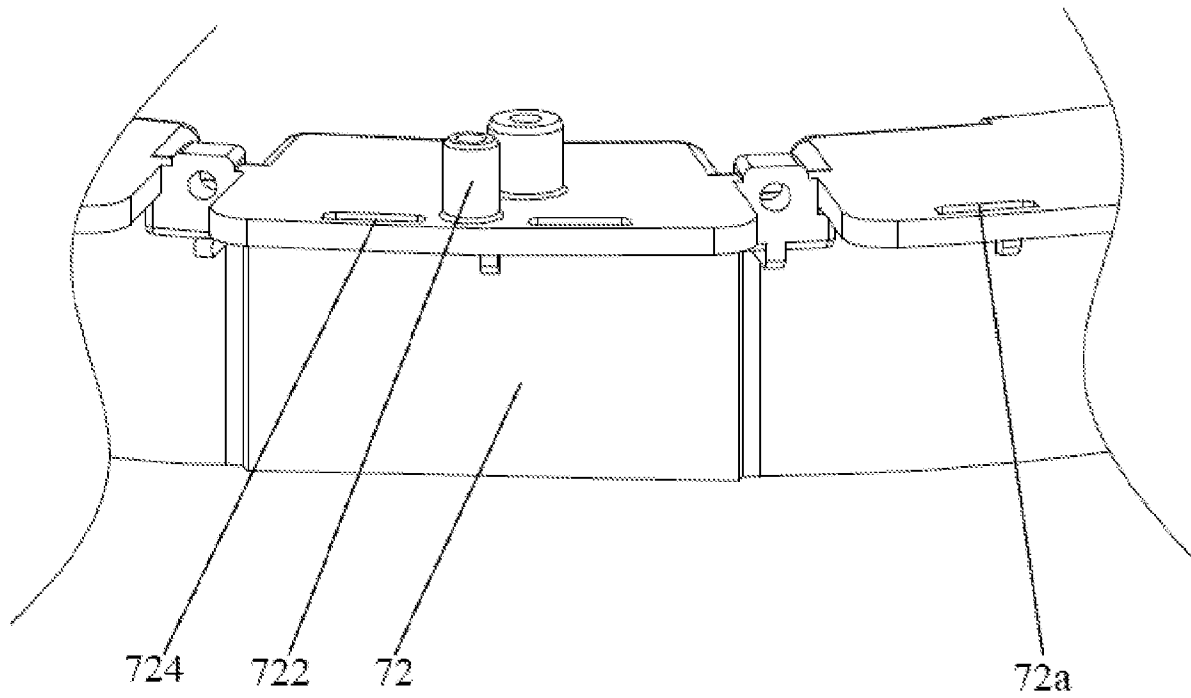


图 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/083780

A. CLASSIFICATION OF SUBJECT MATTER

F24C 7/02(2006.01)i; F24C 15/04(2006.01)i; H05B 6/64(2006.01)i

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;H05B;

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)

CNKI, CNPAT, WPI, EPODOC: 美的, 烹调, 微波炉, 烤箱, 加热腔, 腔体, 门, 盖, 电气室, 电器室, 导风, 风道, 风扇, 气流, 流道, 冷却, 风冷, 吹风, 防止, 避免, 烫; cooker, electr+, chamber, door, fan, air, flow, blow, guide, channel, cool, heat+, dissipat+, avoid, scald.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 106136951 A (MIDDLEBY COOKING SYSTEM MANUFACTURING (SHANGHAI) CORPORATION) 23 November 2016 (2016-11-23) description, paragraphs [0011]-[0013], and figures 1-3	1-4
Y	CN 203709860 U (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. ET AL.) 16 July 2014 (2014-07-16) description, paragraphs [0036]-[0046], and figures 1-2	1-4
A	CN 206324675 U (MIDDLEBY COOKING SYSTEM MANUFACTURING (SHANGHAI) CORPORATION) 14 July 2017 (2017-07-14) entire document	1-10
A	CN 205939292 U (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. ET AL.) 08 February 2017 (2017-02-08) entire document	1-10
A	US 2010065035 A1 (ARMSTRONG, J. ET AL.) 18 March 2010 (2010-03-18) entire document	1-10
A	US 2006219234 A1 (MAYTAG CORP.) 05 October 2006 (2006-10-05) entire document	1-10

☒ 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

“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

09 October 2018

Date of mailing of the international search report

31 October 2018

Name and mailing address of the ISA/CN

State Intellectual Property Office of the P. R. China
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100088
China

Facsimile No. (86-10)62019451

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/083780**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2008110449 A1 (GENERAL ELECTRIC COMPANY) 15 May 2008 (2008-05-15) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2018/083780

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	106136951	A	23 November 2016	None			
CN	203709860	U	16 July 2014	None			
CN	206324675	U	14 July 2017	None			
CN	205939292	U	08 February 2017	None			
US	2010065035	A1	18 March 2010	US	8141549	B2	27 March 2012
US	2006219234	A1	05 October 2006	CA	2502865	A1	29 September 2006
				US	7874289	B2	25 January 2011
US	2008110449	A1	15 May 2008	CA	2606955	A1	13 May 2008
				US	7650881	B2	26 January 2010
				CA	2606955	C	08 September 2015

A. 主题的分类 F24C 7/02(2006.01)i; F24C 15/04(2006.01)i; H05B 6/64(2006.01)i 按照国际专利分类(IPC)或者同时按照国家分类和IPC两种分类		
B. 检索领域 检索的最低限度文献(标明分类系统和分类号) F24C;H05B; 包含在检索领域中的除最低限度文献以外的检索文献 在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用)) CNKI, CNPAT, WPI, EPDOC:美的, 烹调, 微波炉, 烤箱, 加热腔, 腔体, 门, 盖, 电气室, 电器室, 导风, 风道, 风扇, 气流, 流道, 冷却, 风冷, 吹风, 防止, 避免, 烫; cooker, electr+, chamber, door, fan, air, flow, blow, guide, channel, cool, heat+, dissipat+, avoid, scald.		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
Y	CN 106136951 A (美得彼烹饪设备制造上海有限公司) 2016年 11月 23日 (2016 - 11 - 23) 说明书第[0011]-[0013]段, 附图1-3	1-4
Y	CN 203709860 U (广东美的厨房电器制造有限公司 等) 2014年 7月 16日 (2014 - 07 - 16) 说明书第[0036]-[0046]段, 附图1-2	1-4
A	CN 206324675 U (美得彼烹饪设备制造上海有限公司) 2017年 7月 14日 (2017 - 07 - 14) 全文	1-10
A	CN 205939292 U (广东美的厨房电器制造有限公司 等) 2017年 2月 8日 (2017 - 02 - 08) 全文	1-10
A	US 2010065035 A1 (ARMSTRONG, JAMES 等) 2010年 3月 18日 (2010 - 03 - 18) 全文	1-10
A	US 2006219234 A1 (MAYTAG CORP.) 2006年 10月 5日 (2006 - 10 - 05) 全文	1-10
☒ 其余文件在C栏的续页中列出。 ☒ 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其特殊理由而引用的文件(如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件 “T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件		
国际检索实际完成的日期 2018年 10月 9日		国际检索报告邮寄日期 2018年 10月 31日
ISA/CN的名称和邮寄地址 中华人民共和国国家知识产权局(ISA/CN) 中国北京市海淀区蓟门桥西土城路6号 100088 传真号 (86-10)62019451		受权官员 金伟华 电话号码 86-(10)-53962395

C. 相关文件		
类 型*	引用文件，必要时，指明相关段落	相关的权利要求
A	US 2008110449 A1 (GENERAL ELECTRIC COMPANY) 2008年 5月 15日 (2008 - 05 - 15) 全文	1-10

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2018/083780

检索报告引用的专利文件			公布日 (年/月/日)	同族专利			公布日 (年/月/日)
CN	106136951	A	2016年 11月 23日	无			
CN	203709860	U	2014年 7月 16日	无			
CN	206324675	U	2017年 7月 14日	无			
CN	205939292	U	2017年 2月 8日	无			
US	2010065035	A1	2010年 3月 18日	US	8141549	B2	2012年 3月 27日
US	2006219234	A1	2006年 10月 5日	CA	2502865	A1	2006年 9月 29日
				US	7874289	B2	2011年 1月 25日
US	2008110449	A1	2008年 5月 15日	CA	2606955	A1	2008年 5月 13日
				US	7650881	B2	2010年 1月 26日
				CA	2606955	C	2015年 9月 8日



Espacenet

Bibliographic data: WO2019157848 (A1) — 2019-08-22

GAS FRIED OVEN

Inventor(s): CAI MOUCAN [CN] ± (蔡谋灿)

Applicant(s): KE M O HOUSE CO LTD [CN] ± (凯灿贸易 (深圳) 有限公司)

Classification: - **international:** A47J37/04; A47J37/06
 - **cooperative:** A47J37/0641 (EP, US); A47J37/0664 (EP, US)

Application number: WO2018CN116998 20181122 Global Dossier

Priority number(s): CN201820257871U 20180213

Also published as: CN208640459 (U) US2019246835 (A1)

Abstract of WO2019157848 (A1)

Disclosed is an air fryer oven, comprising a pot body and a food bearing frame. The pot body has an air fryer cavity, the air fryer cavity has two opposite side walls, supports are provided on the side walls, and two ends of the food bearing frame are respectively placed on the two supports; an air fryer heating component and a drive motor are provided in the pot body, and the air fryer heating component is located above the air fryer cavity; the drive motor and one end of the food bearing frame are detachably connected for driving the food bearing frame to rotate. Both ends of the food bearing frame are placed directly on the supports, and the support can support one end of the food bearing frame, so that the food bearing frame can be removed from the air fryer cavity, so as to load foods on the food bearing frame. The food bearing frame can be driven to rotate by means of the drive motor, so that portions of the foods on the food bearing frame can be uniformly heated; moreover, a barbecue function is achieved.

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) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (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)。

本国际公布:

- 包括国际检索报告 (条约第21条(3))。

support can support one end of the food bearing frame, so that the food bearing frame can be removed from the air fryer cavity, so as to load foods on the food bearing frame. The food bearing frame can be driven to rotate by means of the drive motor, so that portions of the foods on the food bearing frame can be uniformly heated; moreover, a barbecue function is achieved.

(57) 摘要: 本发明公开了一种气炸烤箱, 包括锅体及食物承载架, 锅体具有气炸腔, 气炸腔具有相对的两个侧壁, 各侧壁上均设置有支架, 食物承载架的两端分别放置于两个支架上; 锅体内设置有气炸加热组件及驱动电机, 气炸加热组件位于气炸腔的上方; 驱动电机与食物承载架的一端可拆卸连接, 用以驱动食物承载架转动。食物承载架的两端均直接放置于支架, 支架可以对食物承载架的一端起到支撑作用, 使得食物承载架可以从气炸腔中取出, 以便在食物承载架上装入食物。利用气炸加热组件可以产生热量及空气流对食物进行气炸加工处理。通过驱动电机可以带动食物承载架进行转动, 使得食物承载架上的食物各个位置可以均匀受热, 同时实现烧烤功能。

本申请要求于 2018 年 2 月 13 日提交中国专利局、申请号为 201820257871.5 、发明名称为“一种气炸烤箱”的中国专利申请的优先权，上述在先申请的内容以引入的方式并入本文本中。

技术领域

本发明涉及厨房用具，尤其涉及一种气炸烤箱。

背景技术

在现有技术中，气炸烤箱通常利用气流的控制来实现对锅内食物的各个位置的加热，但该方式依然有食物的一些部位例如底部不能得到有效加热，因而不能保证食物的加热均匀度。

发明内容

本发明所要解决的技术问题在于，提供一种气炸烤箱，能够保证食物加热均匀度。

为了解决上述技术问题，本发明的实施例提供了一种气炸烤箱，所述气炸烤箱包括锅体及食物承载架，所述锅体具有一用于对食物进行加工的气炸腔，所述气炸腔具有相对的两个侧壁，两个所述侧壁上均设置有支架，所述食物承载架的两端分别放置于两个所述支架上；所述锅体内设置有气炸加热组件及驱动电机，所述气炸加热组件位于所述气炸腔的上方；所述驱动电机设置于一侧壁，所述驱动电机与所述食物承载架的一端可拆卸连接，用以驱动所述食物承载架转动，所述食物承载架的转动轴向为水平向。

其中，所述支架为长条形，其长度方向为水平向且垂直于所述食物承载架的转动轴向。

其中，所述支架的两端与侧壁固定连接，所述支架的中部与侧壁之间形成有间隙。

其中，所述支架为板状，其板面平行于竖直向；或者所述支架为杆状。

其中，两个所述侧壁分别为第一侧壁和第二侧壁，所述第一侧壁上设置的

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支架为第一支架，所述第二侧壁上设置的支架为第二支架；所述第一支架上设置有承载槽，所述食物承载架的一端转动设置于所述承载槽中；所述驱动电机设置在第二侧壁上，所述第二支架上设置有限位凸起，所述限位凸起与所述驱动电机相对设置，用于限制所述食物承载件另一端的位置。

其中，所述食物承载架包括承载架主体和两个连接端，两个所述连接端分别固定于所述承载架主体的两端；两个所述连接端的结构相同，均为柱状；两个所述连接端能够分别放置于两个所述支架上，所述连接端能够与所述驱动电机可拆卸式连接。

其中，所述连接端包括第一限位柱、圆柱、及第二限位柱，所述第一限位柱及所述第二限位柱分别位于所述圆柱的两端，所述第一限位柱与所述第二限位柱之间形成有环状的限位槽，所述限位槽的槽底面为所述圆柱的外表面；所述支架能够伸入至所述限位槽中并与所述圆柱相抵接。

其中，所述驱动电机的输出轴上设置有转接轴套，所述转接轴套沿轴向滑动连接于所述驱动电机的输出轴，且二者周向定位；所述食物承载架的另一端设置有传动轴；当所述转接轴套滑动至第一位置处时，所述转接轴套套设于所述传动轴，且所述传动轴与所述转接轴套周向定位；当所述转接轴套滑动至第二位置处时，所述转接轴套与所述传动轴相分离。

其中，所述承载架主体包括金属转笼、端板及端盖，所述端板固定连接至所述金属转笼的一端，所述端盖可拆卸地罩设于所述金属转笼的另一端；两个所述连接端分别固定连接至所述端板与所述端盖的外表面。

其中，所述锅体上设置有用带于带动所述转接轴套滑动的触发组件；所述触发组件包括触发件及扭簧，所述触发件的中部与所述锅体转动连接，所述触发件的一端与所述转接轴套相连，当所述触发件转动时，所述触发件能够带动所述转接轴套滑动；所述扭簧设置在所述触发件与所述锅体之间，用于提供弹力使得触发件转动进而使得所述转接轴套保持在第一位置处。

本发明实施例具有如下优点或有益效果：食物承载架的两端均直接放置于支架，支架可以对食物承载架的一端起到支撑作用，使得食物承载架可以从气炸腔中取出，以便在食物承载架上装入食物；利用气炸加热组件可以产生热量及空气流对食物进行气炸加工处理；通过驱动电机可以带动食物承载架进行转

动，使得食物承载架上的食物各个位置可以均匀受热，同时实现烧烤功能。

附图说明

为了更清楚地说明本发明实施例或现有技术中的技术方案，下面将对实施例或现有技术描述中所需要使用的附图作简单地介绍，显而易见地，下面描述中的附图仅仅是本发明的一些实施例，对于本领域普通技术人员来讲，在不付出创造性劳动的前提下，还可以根据这些附图获得其他的附图。

图 1 是本发明优选实施例提供的气炸烤箱的示意图；

图 2 是图 1 中气炸烤箱的立体图；

图 3 是图 1 中气炸烤箱另一角度的立体图；

图 4 是图 1 中气炸烤箱的部分结构示意图；

图 5 是图 4 中气炸烤箱的部分爆炸图；

图 6 是本发明中食物承载架的另一实施例。

具体实施方式

下面将结合本发明实施例中的附图，对本发明实施例中的技术方案进行清楚、完整地描述。

参见图 1-3，为本发明中优选实施例提供的一种气炸烤箱，气炸烤箱包括锅体 100 及食物承载架 200。锅体 100 具有一用于对食物进行加工的气炸腔 10，食物承载架 200 上可以放置各类食物，将食物承载架 200 放入气炸腔 10 中进行气炸加工处理。锅体 100 上铰接有门组件（图中未示出），以便开关气炸腔 10，将食物承载架 200 放入或者取出。

气炸腔 10 具有相对的两个侧壁 10a、10b，两个侧壁 10a、10b 上均设置有支架，即支架有两个，支架 11 与支架 12。食物承载架 200 的两端分别放置于两个支架 11、12 上。食物承载架 200 的两端均直接放置于支架 11、12，支架 11、12 可以对食物承载架 200 的一端起到支撑作用，使得食物承载架 200 可以从气炸腔 10 中取出，以便在食物承载架 200 上装入食物。

锅体 100 内设置有气炸加热组件 13 及驱动电机 14。气炸加热组件 13 位于气炸腔 10 的上方，利用气炸加热组件 13 可以产生热量及空气流对食物进行

气炸加工处理。

驱动电机 14 设置于一侧壁 10a、10b，驱动电机 14 与食物承载架 200 的一端可拆卸连接，用以驱动食物承载架 200 转动，食物承载架 200 的转动轴向为水平向。通过驱动电机 14 可以带动食物承载架 200 进行转动，使得食物承载架 200 上的食物各个位置可以均匀受热，同时实现烧烤功能。

为了便于描述，两个侧壁 10a、10b 分别为第一侧壁 10a 和第二侧壁 10b，第一侧壁 10a 上设置的支架为第一支架 11，第二侧壁 10b 上设置的支架为第二支架 12。

第一支架 11 和第二支架 12 均为长条形，其长度方向为水平向且垂直于食物承载架 200 的转动轴向。利用第一支架 11 和第二支架 12 的长度，可以形成滑轨，使得食物承载架 200 自气炸烤箱的入口处滑入到转动位置，方便食物承载架 200 的装入和取出。

第一支架 11 和第二支架 12 的两端与侧壁 10a、10b 固定连接，中部与侧壁 10a、10b 之间形成有间隙。利用间隙可以为食物承载架 200 的端部滑动留出空间。

第一支架 11 上设置有承载槽 110，食物承载架 200 的一端转动设置于承载槽 110 中。承载槽 110 可以限制食物承载架 200 一端的位置，利于其进行转动。在使用时，将食物承载架 200 的一端放置在第一支架 11 的承载槽 110 即可，取出时，将食物承载架 200 抬起取出即可，方便实现食物承载架 200 与第一侧壁 10a 之间的可拆卸地转动连接。

如图 2 所示，更具体的，第一支架 11 为板状，其板面为竖直向。第一支架 11 的两端与第一侧壁 10a 固定连接。如图 5 所示，第一支架 11 的上端面凹陷形成所述承载槽 110。在装入或取出食物承载架 200 时，可以沿第一支架 11 的长度进行滑动，以利于将食物承载架 200 的一端装入至承载槽 110 中。此外，在其他实施方式中，第一支架 11 还可以为杆状，其轴向垂直于所述食物承载架 200 的转动轴向。第一支架 11 的两端与第一侧壁 10a 固定连接。第一支架 11 的向下弯曲形成所述承载槽 110。

如图 1 所示，驱动电机 14 设置在第二侧壁 10b 上。如图 5 所示，第二支架 12 上设置有限位凸起 120，限位凸起 120 与驱动电机 14 相对设置，用于限

制食物承载件另一端的位置，使得食物承载件的另一端能够与驱动电机 14 相配合连接。本实施例中，第二支架 12 亦为板状，其板面平行于竖直向。当然在其他实施例中，第二支架 12 也可以为杆状。

在上述实施方式中，第一支架 11 与第二支架 12 均可以为板状或者杆状，在其他实施方式中，第一支架 11 和第二支架 12 也可以为侧壁 10a、10b 向气炸腔 10 内凸起形成的凸筋等结构。

如图 5 所示，食物承载架 200 包括承载架主体 21 和两个连接端 22，承载架主体 21 可以装载食物，两个连接端 22 用于将食物承载架 200 装入至气炸腔 10 中，两个连接端 22 能够分别放置于第一支架 11、第二支架 12 上，其中一个连接端 22 与驱动电机 14 可拆卸式相连，以实现食物承载架 200 整体的转动。

两个连接端 22 的结构相同，均为柱状，使得食物承载架 200 的两端均可以与驱动电机 14 进行传动连接，以方便将食物承载架 200 装入到气炸腔 10 中。此外，在其他实施方式中，两个连接端 22 的结构形状也可以不同。

连接端 22 包括第一限位柱 221、圆柱 220、及第二限位柱 222，第一限位柱 221 及第二限位柱 222 分别位于圆柱 220 的两端，第二限位柱 222 相对第一限位柱 221 远离承载架主体 21。第一限位柱 221 与第二限位柱 222 之间形成有环状的限位槽，限位槽的槽底面为圆柱 220 的外表面。第一支架 11 及第二支架 12 能够伸入至所述限位槽中并与圆柱 220 相抵接。利用圆柱 220 的圆弧形表面与第一支架 11 或第二支架 12 的配合可以实现食物承载架 200 的整体转动。第一支架 11 或第二支架 12 可以卡接在限位槽中，第一限位柱 221 及第二限位柱 222 分别位于第一支架 11 或第二支架 12 的两侧处。以限定食物承载架 200 在气炸腔 10 内的轴向位置。第二限位柱 222 可以用于与驱动电机 14 进行可拆卸式装配连接。

如图 4 及图 5 所示，驱动电机 14 的输出轴上设置有转接轴套 141，转接轴套 141 沿轴向滑动连接于驱动电机 14 的输出轴，且二者周向定位；当转接轴套 141 滑动至第一位置处时，转接轴套 141 套设于连接端 22，且连接端 22 与转接轴套 141 周向定位；当转接轴套 141 滑动至第二位置处时，转接轴套 141 与连接端 22 相分离。利用转接轴套 141 的滑动，可以实现驱动电机 14 与食物承载架 200 之间的可拆卸连接，且使用方便。此外，在其他实施方式中，

还可以利用其他方式，例如卡接、插接等结构实现驱动电机 14 与食物承载架 200 之间的可拆卸连接。

具体地，在本实施例中，转接轴套 141 与连接端 22 的第二限位柱 222 相配合连接。进一步，第二限位柱 222 为方柱状，转接轴套 141 上设置有方孔，利用方孔与方柱的配合可以使得第二限位柱 222 与转接轴套 141 周向固定。此外，在其他实施方式中，也可以是第二限位柱 222 为三角柱状，转接轴套 141 上设置有三角孔；或者转接轴套 141 与第二限位柱 222 为其他形状的配合，使得二者周向定位即可。同理，驱动电机 14 的输出轴与转接轴套 141 也可以为方柱与方孔的配合。

锅体 100 上设置有用带转接轴套 141 滑动的触发组件 15。利用触发组件 15 可以驱动转接轴套 141 滑动，以方便装入或取出食物承载架 200。触发组件 15 可以是电动触发组件 15，利用电磁机构带动转接轴套 141 滑动，或者利用气缸或气体可以实现直线运动的电动组件。触发组件 15 也可以是手动机械机构，使用者对触发组件 15 施力，以使得转接轴套 141 进行滑动。

本实施例中，触发组件 15 包括触发件 151 及扭簧 152，触发件 151 的中部与锅体 100 转动连接，触发件 151 的一端与转接轴套 141 相连，当触发件 151 转动时，触发件 151 带动转接轴套 141 滑动；扭簧 152 设置在触发件 151 与锅体 100 之间，用于提供弹力使得触发件 151 转动进而使得转接轴套 141 保持在第一位置处。需要装载或者取出食物承载装置时，使用者拨动触发件 151 的另一端，使得触发件 151 转动，触发件 151 的另一端带动转接轴套 141 滑动，使得转接轴套 141 与食物承载架 200 的第二限位柱 222 相分离，此时便可以将食物承载架 200 从气炸腔 10 中取出或者装入。利用扭簧 152 可以使得触发件 151 恢复至初始状态，以使得转接轴套 141 可以保持在第一位置处，无需使用者施加外力，转接轴套 141 与第二限位柱 222 保持在连接状态，从而利于驱动电机 14 驱动食物承载架 200 转动。此外，在其他实施方式中，触发组件 15 还可以包括触发件 151 和弹簧，触发件 151 滑动连接于锅体 100，弹簧连接在触发件 151 与锅体 100 之间，用于提供弹力使得触发件 151 滑动进而使得转接轴套 141 保持在第一位置处。需要装载或者取出食物承载装置时，使用者按动触发件 151 使得转接轴套 141 移动至第二位置即可。

在本实施例中，食物承载架 200 的承载架主体 21 可以为杆状，其上设置有叉具 25，可以利用叉具 25 固定食物。此处，在其他实施例中，食物承载架 200 的承载架主体 21 还可以为金属转笼状，如图 6 所示，承载架主体 21 包括金属转笼 21a、端板 21b 及端盖 21c，端板 21b 固定连接至金属转笼 21a 的一端，端盖 21b 可拆卸地罩设于金属转笼 21a 的另一端；两个连接端 22 分别固定连接至所述端板 21b 与所述端盖 21c 的外表面。食物可以收容至金属转笼 21a 内，在使用时，可以打开端盖 21c，待加工的食物放入至金属转笼 21a 与端板 21b 形成的空间中，再盖上端盖 21c，在将整个食物承载架 200 放入到气炸腔的第一支架和第二支架上。加工过程中，热量可以从金属转笼 21a 的网格空隙中进入到内部对食物进行加热，在驱动电机 14 的带动下，食物可以在金属转笼 21a 内翻转，使其受热均匀。食物承载架的具体结构并不局限于上述实施例，在其他实施方式中，食物承载架 200 还可以为其他可以容纳食物的形状。

以上的实施方式，并不构成对该技术方案保护范围的限定。任何在上述实施方式的精神和原则之内所作的修改、等同替换和改进等，均应包含在该技术方案的保护范围之内。

1、一种气炸烤箱，其特征在于，所述气炸烤箱包括锅体及食物承载架，所述锅体具有一用于对食物进行加工的气炸腔，所述气炸腔具有相对的两个侧壁，两个所述侧壁上均设置有支架，所述食物承载架的两端分别放置于两个所述支架上；所述锅体内设置有气炸加热组件及驱动电机，所述气炸加热组件位于所述气炸腔的上方；所述驱动电机设置于一侧壁，所述驱动电机与所述食物承载架的一端可拆卸连接，用以驱动所述食物承载架转动，所述食物承载架的转动轴向为水平向。

2、根据权利要求 1 所述的气炸烤箱，其特征在于，所述支架为长条形，其长度方向为水平向且垂直于所述食物承载架的转动轴向。

3、根据权利要求 2 所述的气炸烤箱，其特征在于，所述支架的两端与侧壁固定连接，所述支架的中部与侧壁之间形成有间隙。

4、根据权利要求 2 所述的气炸烤箱，其特征在于，所述支架为板状，其板面平行于竖直向；或者所述支架为杆状。

5、根据权利要求 1 所述的气炸烤箱，其特征在于，两个所述侧壁分别为第一侧壁和第二侧壁，所述第一侧壁上设置的支架为第一支架，所述第二侧壁上设置的支架为第二支架；所述第一支架上设置有承载槽，所述食物承载架的一端转动设置于所述承载槽中；所述驱动电机设置在第二侧壁上，所述第二支架上设置有限位凸起，所述限位凸起与所述驱动电机相对设置，用于限制所述食物承载件另一端的位置。

6、根据权利要求 1 所述的气炸烤箱，其特征在于，所述食物承载架包括承载架主体和两个连接端，两个所述连接端分别固定于所述承载架主体的两端；两个所述连接端的结构相同，均为柱状；两个所述连接端能够分别放置于两个所述支架上，所述连接端能够与所述驱动电机可拆卸式连接。

7、根据权利要求 6 所述的气炸烤箱，其特征在于，所述连接端包括第一限位柱、圆柱、及第二限位柱，所述第一限位柱及所述第二限位柱分别位于所述圆柱的两端，所述第一限位柱与所述第二限位柱之间形成有环状的限位槽，所述限位槽的槽底面为所述圆柱的外表面；所述支架能够伸入至所述限位槽中

并与所述圆柱相抵接。

8、根据权利要求 6 所述的气炸烤箱，其特征在于，所述承载架主体包括金属转笼、端板及端盖，所述端板固定连接至所述金属转笼的一端，所述端盖可拆卸地罩设于所述金属转笼的另一端；两个所述连接端分别固定连接至所述端板与所述端盖的外表面。

9、根据权利要求 1 所述的气炸烤箱，其特征在于，所述驱动电机的输出轴上设置有转接轴套，所述转接轴套沿轴向滑动连接于所述驱动电机的输出轴，且二者周向定位；所述食物承载架的另一端设置有传动轴；当所述转接轴套滑动至第一位置处时，所述转接轴套套设于所述传动轴，且所述传动轴与所述转接轴套周向定位；当所述转接轴套滑动至第二位置处时，所述转接轴套与所述传动轴相分离。

10、根据权利要求 9 所述的气炸烤箱，其特征在于，所述锅体上设置有用带于带动所述转接轴套滑动的触发组件；所述触发组件包括触发件及扭簧，所述触发件的中部与所述锅体转动连接，所述触发件的一端与所述转接轴套相连，当所述触发件转动时，所述触发件能够带动所述转接轴套滑动；所述扭簧设置在所述触发件与所述锅体之间，用于提供弹力使得触发件转动进而使得所述转接轴套保持在第一位置处。

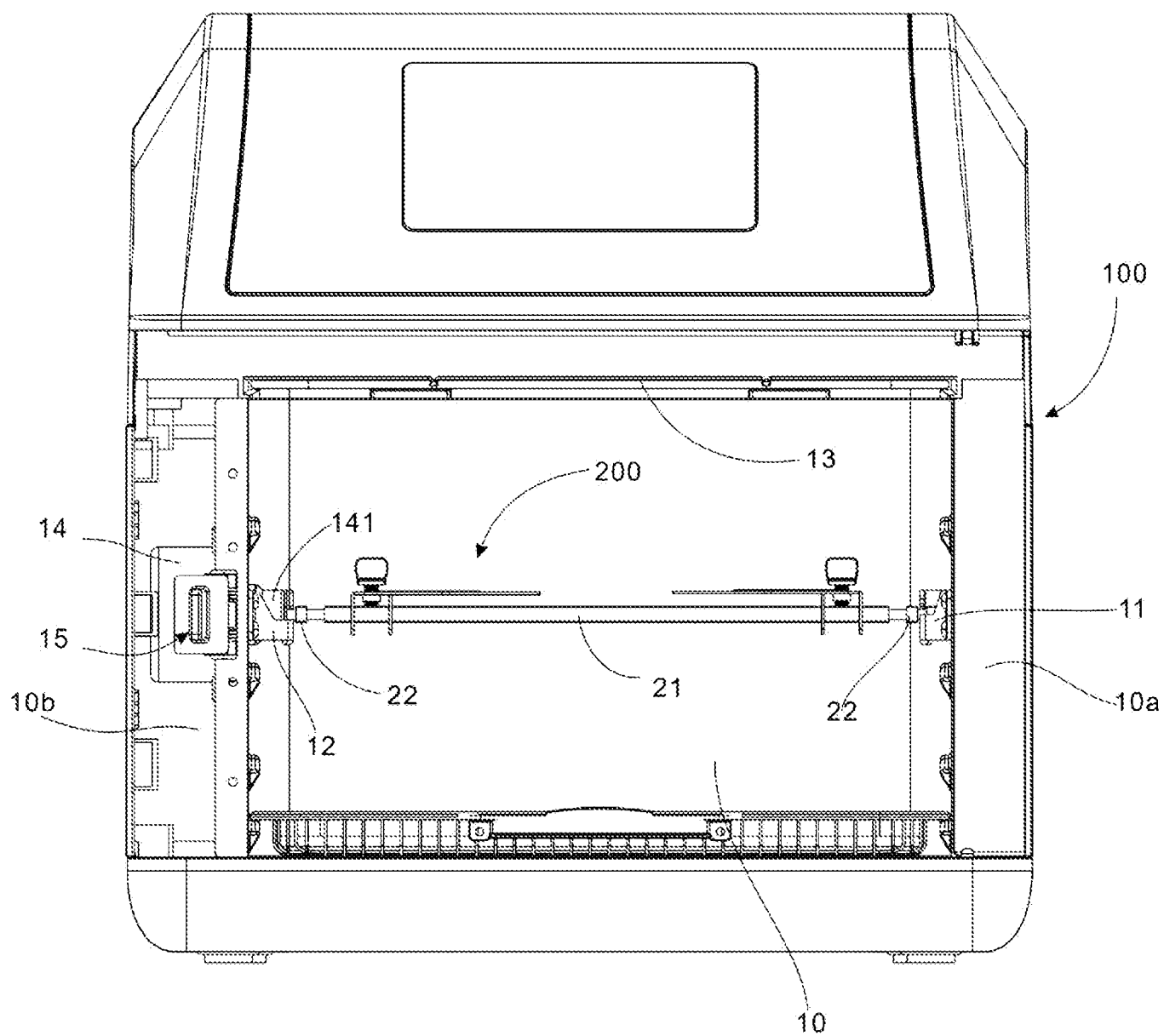


图 1

- 2/5 -

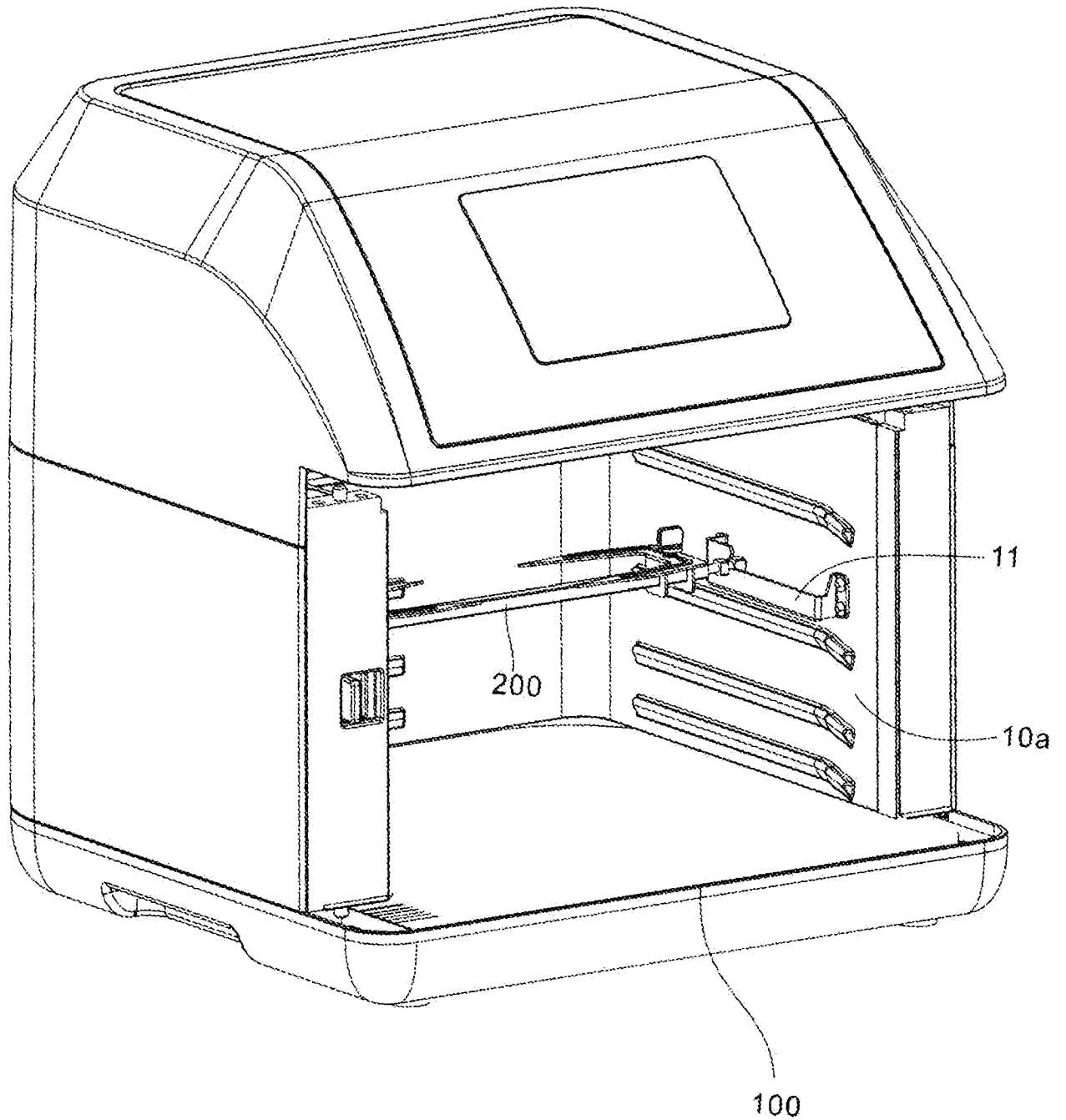


图 2

— 3/5 —

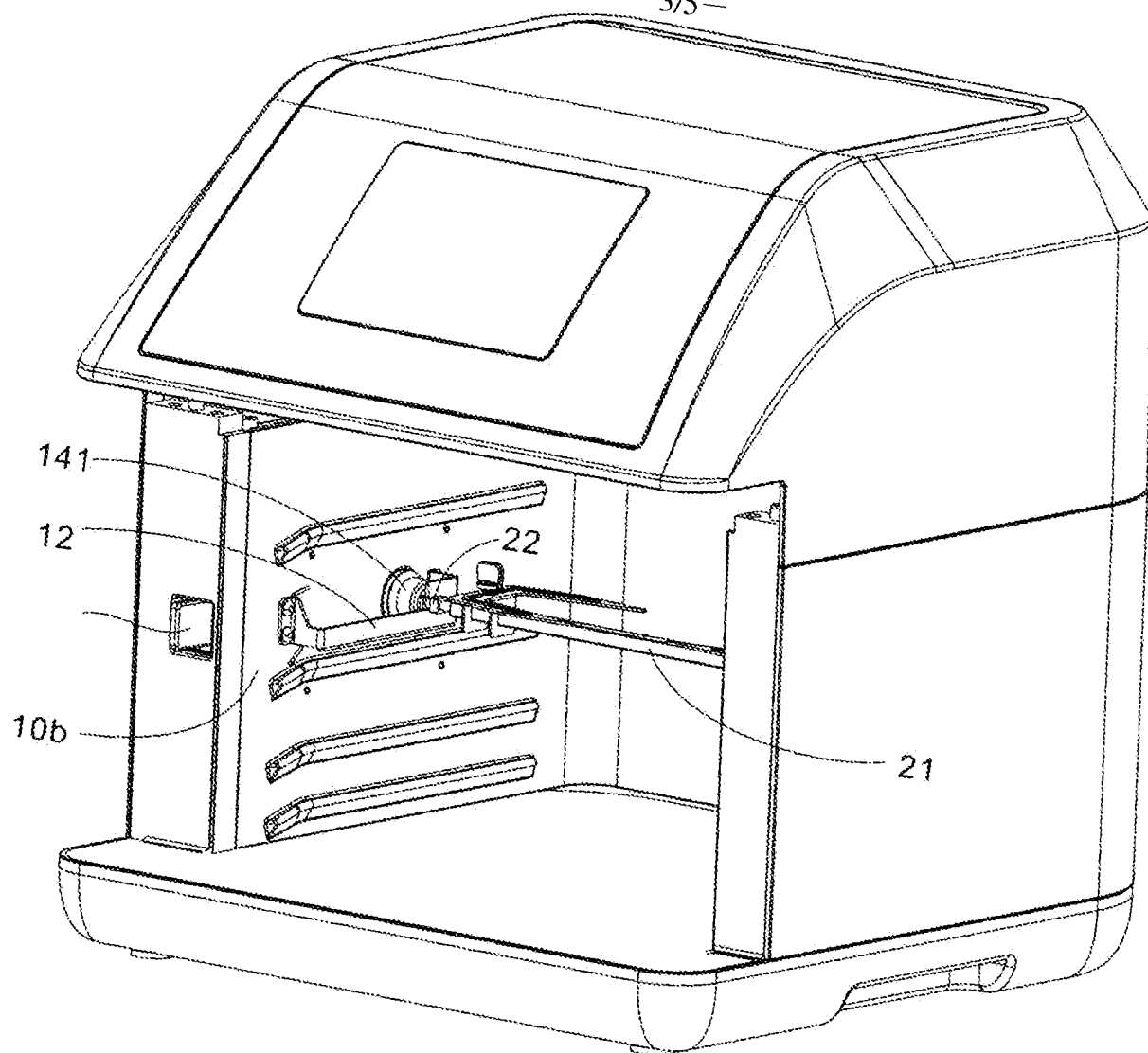


图 3

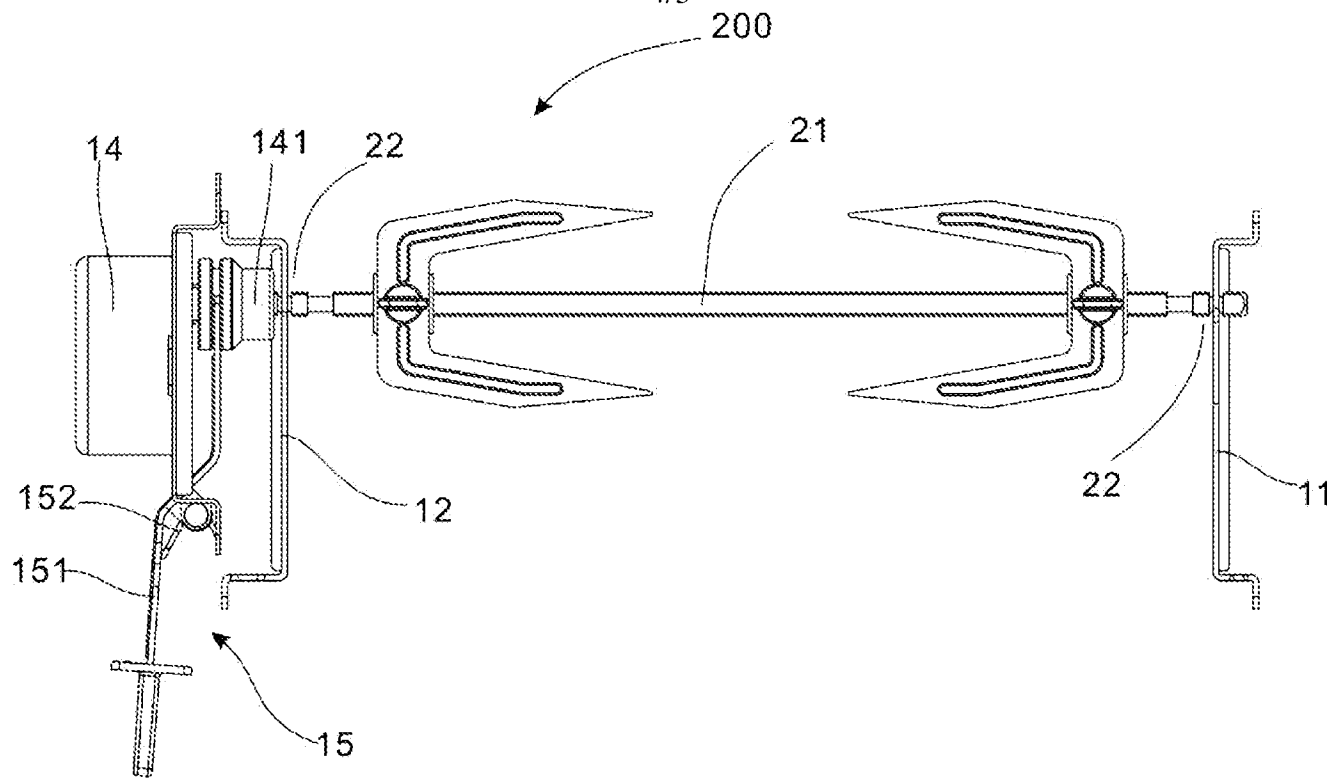


图 4

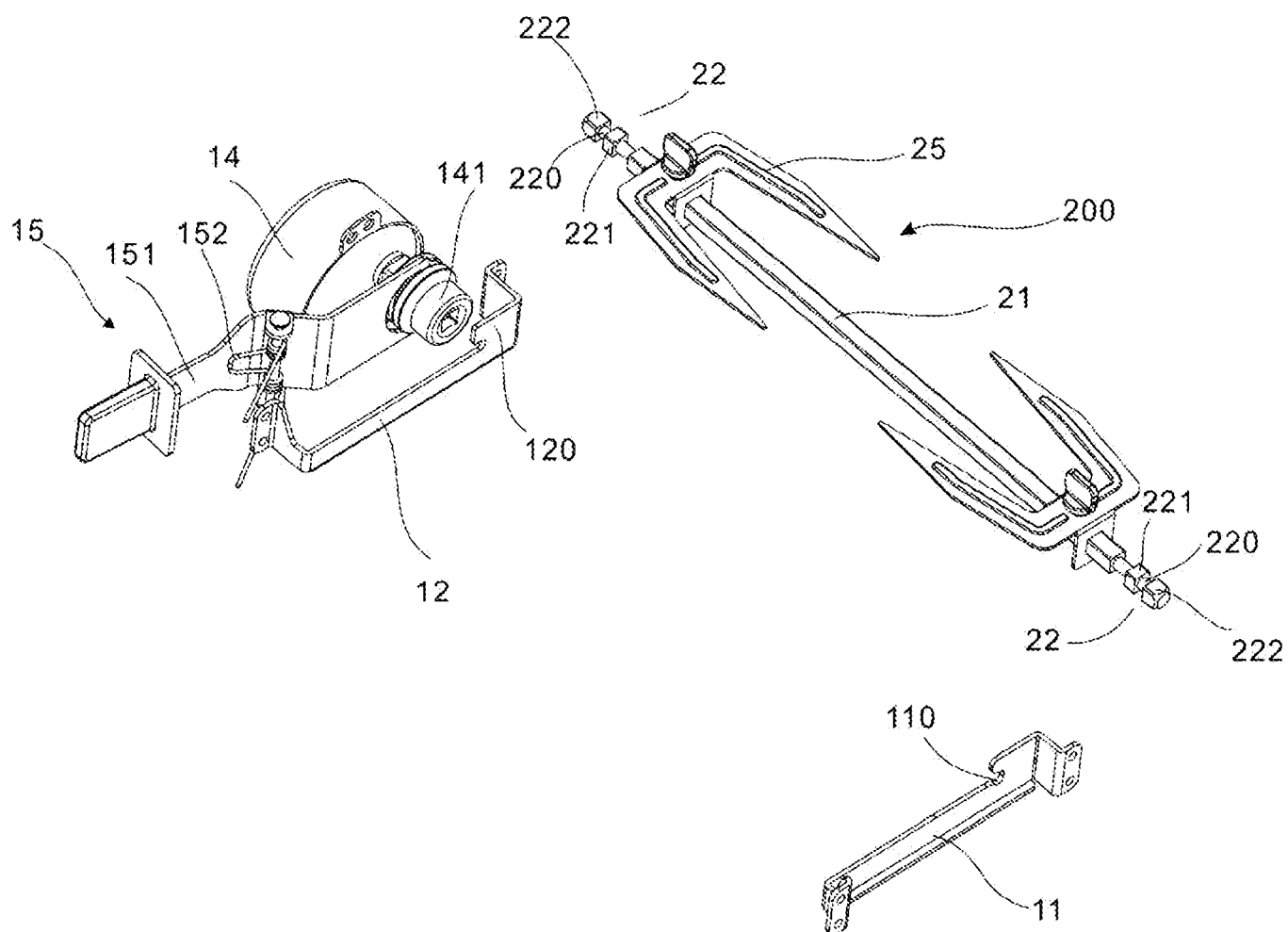


图 5

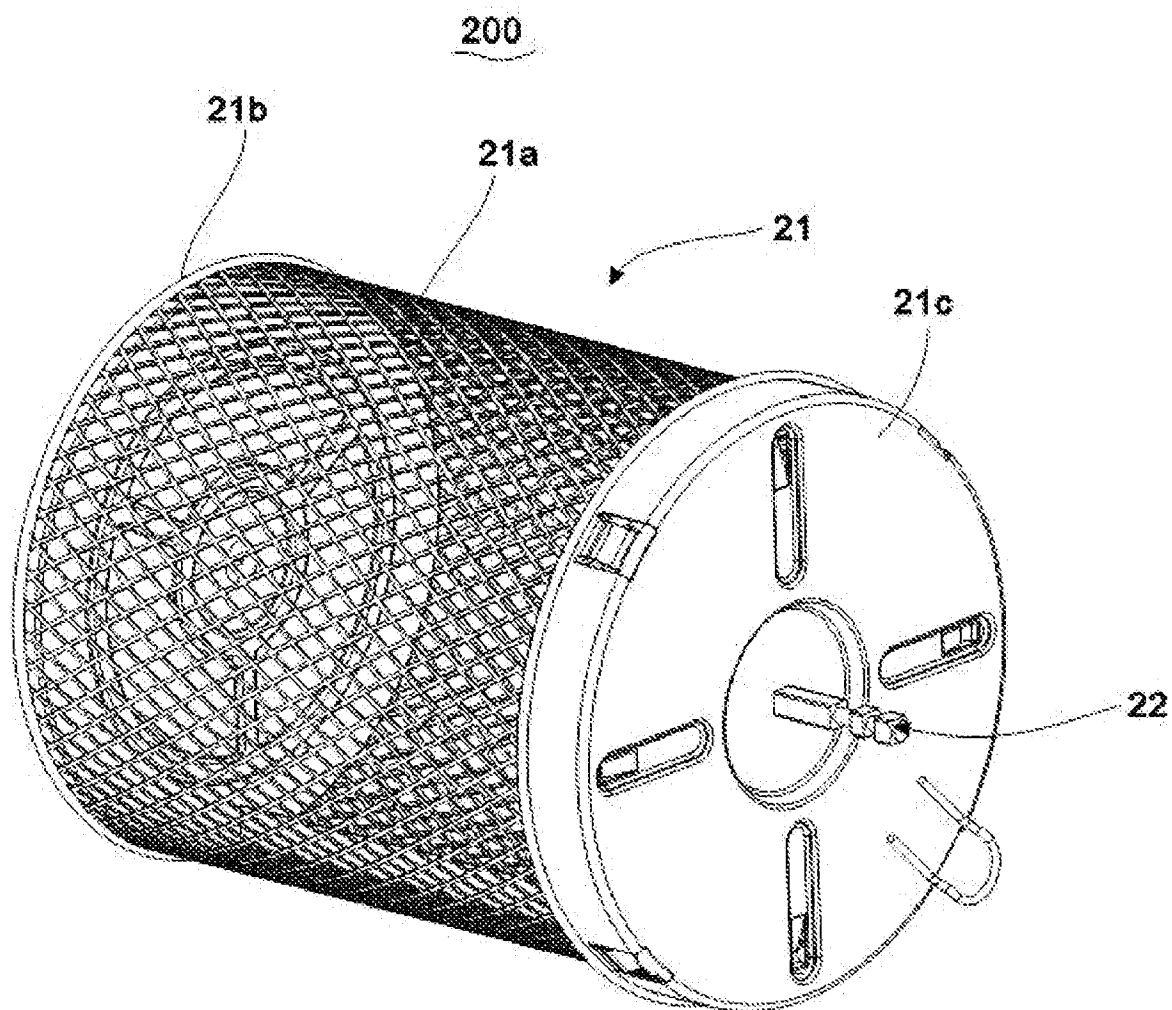


图 6

A. CLASSIFICATION OF SUBJECT MATTER

A47J 37/04(2006.01)i; A47J 37/06(2006.01)i

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)

A47J

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)

CNABS; CNTXT; CNKI; VEN; WOTXT; EPTXT; USTXT: 烤箱, 气炸, 旋转, 转动, 食物, 架, 叉, 滑, 移动, 滑动, 电机, 马达, 槽, 沟, 轴套, 连轴器, 联轴器, 分离, 分开, 簧, 取, 拿, 装, 拨, oven, fried, air, fry+, rotat+, revolv+, motor, slid+, mov+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 107049056 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. ET AL.) 18 August 2017 (2017-08-18) description, paragraphs [0003]-[0065], and figures 3 and 4	1-10
Y	CN 203059423 U (LI, QIAOZHI) 17 July 2013 (2013-07-17) description, paragraphs [0003]-[0082], and figures 1-20	1-10
Y	CN 200991163 Y (BIE, DAOTING) 19 December 2007 (2007-12-19) description, p. 3, line 25 to p. 6, line 19, and figure 11	9, 10
A	CN 1382415 A (CHEN, YINGFU) 04 December 2002 (2002-12-04) entire document	1-10
A	US 5994672 A (AIR FRY INC.) 30 November 1999 (1999-11-30) entire document	1-10

☐ 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

“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

19 January 2019

Date of mailing of the international search report

19 February 2019

Name and mailing address of the ISA/CN

State Intellectual Property Office of the P. R. China (ISA/
CN)
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing

100088
Page 607

Facsimile No. (86-10)62019451

Authorized officer

EX1006

Telephone No.

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	107049056	A	18 August 2017	CN	207492656	U	15 June 2018
CN	203059423	U	17 July 2013	None			
CN	200991163	Y	19 December 2007	None			
CN	1382415	A	04 December 2002	None			
US	5994672	A	30 November 1999	None			

A. 主题的分类

A47J 37/04(2006.01)i; A47J 37/06(2006.01)i

按照国际专利分类(IPC)或者同时按照国家分类和IPC两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

A47J

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))

CNABS;CNTXT;CNKI;VEN;WOTXT;EPTXT;USTXT: 烤箱, 气炸, 旋转, 转动, 食物, 架, 叉, 滑, 移动, 滑动, 电机, 马达, 槽, 沟, 轴套, 联轴器, 联轴器, 分离, 分开, 簧, 取, 拿, 装, 拨, oven, fried, air, fry+, rotat+, revolv+, motor, slid+, mov+

C. 相关文件

类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
Y	CN 107049056 A (广东美的厨房电器制造有限公司 等) 2017年 8月 18日 (2017 - 08 - 18) 说明书第[0003]-[0065]段, 附图3、4	1-10
Y	CN 203059423 U (李侨志) 2013年 7月 17日 (2013 - 07 - 17) 说明书第[0003]-[0082]段, 附图1-20	1-10
Y	CN 200991163 Y (别道庭) 2007年 12月 19日 (2007 - 12 - 19) 说明书第3页第25行-第6页第19行, 附图11	9、10
A	CN 1382415 A (陈英福) 2002年 12月 4日 (2002 - 12 - 04) 全文	1-10
A	US 5994672 A (AIR FRY INC) 1999年 11月 30日 (1999 - 11 - 30) 全文	1-10

☐ 其余文件在C栏的续页中列出。☒ 见同族专利附件。

* 引用文件的具体类型:

“A” 认为不特别相关的表示了现有技术一般状态的文件

“E” 在国际申请日的当天或之后公布的在先申请或专利

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“O” 涉及口头公开、使用、展览或其他方式公开的文件

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“&” 同族专利的文件

国际检索实际完成的日期

2019年 1月 19日

国际检索报告邮寄日期

2019年 2月 19日

ISA/CN的名称和邮寄地址

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李慧

电话号码 86-(0512)-88997223

Electronic Acknowledgement Receipt

EFS ID:	42197181
Application Number:	17159414
International Application Number:	
Confirmation Number:	3603
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Alicia Anne Hayter/Michelle Lombardo
Filer Authorized By:	Alicia Anne Hayter
Attorney Docket Number:	EUP1549US2
Receipt Date:	16-MAR-2021
Filing Date:	
Time Stamp:	17:11:05
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Foreign Reference	8PQ5517.PDF	1430318	no	23
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2	Foreign Reference	8PQ5529.PDF	1327806	no	21
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Page614			Total Files Size (in bytes): 41233288		
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

(12) DEMANDE INTERNATIONALE PUBLIÉE EN VERTU DU TRAITÉ DE COOPÉRATION EN MATIÈRE DE BREVETS (PCT)

(19) Organisation Mondiale de la
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A21B 1/52 (2006.01) A47J 37/06 (2006.01)
A47J 37/01 (2006.01) A21B 3/13 (2006.01)

(21) Numéro de la demande internationale :

PCT/FR2018/052722

(22) Date de dépôt international :

05 novembre 2018 (05.11.2018)

(25) Langue de dépôt :

français

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1760504 08 novembre 2017 (08.11.2017) FR

(71) Déposant : SEB S.A. [FR/FR] ; 112 Chemin du Moulin Carron, Campus SEB, 69130 ECULLY (FR).

(72) Inventeurs : VOLATIER, Sébastien ; 17 rue des Molidors, 21000 DIJON (FR). BLONDEL, Mathilde ; 2 chemin Heurtevent, 24700 LOUVIERS (FR).

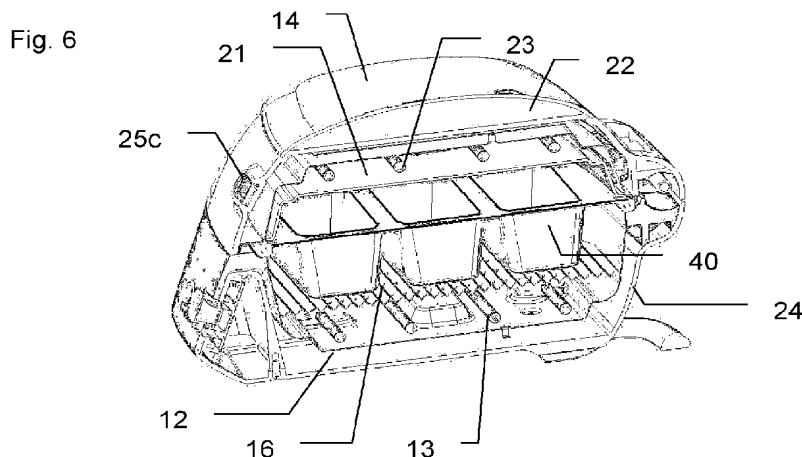
(74) Mandataire : SEB DEVELOPPEMENT - SOARES LUIS FILIPE ; 112 Chemin du Moulin Carron, Campus SEB, CS 90229, 69134 ECULLY CEDEX (FR).

(81) États désignés (sauf indication contraire, pour tout titre de protection nationale disponible) : 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, JO, 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) États désignés (sauf indication contraire, pour tout titre de protection régionale disponible) : ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), eurasien (AM, AZ, BY, KG, KZ, RU, TJ, TM), européen (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,

(54) Title: COOKING APPLIANCE FOR BAKING MIXES

(54) Titre : APPAREIL DE CUISSON POUR PREPARATIONS PATISSIERES



(57) Abstract: A cooking appliance for baking mixes comprises a base (10), a lid (20), and a removable mould (40), said cooking appliance being characterised in that the base (10) comprises: - a cooking plate (16) which is mounted so as to be movable relative to a cooking compartment portion of the base (10) in order to contact a bottom wall of the removable mould (40), and which is arranged between the bottom wall of the removable mould (40) received in the cooking space and heating means of the base (10); and - elastic return means, arranged to push the cooking plate (16) against the bottom wall of the removable mould (40).

(57) Abrégé : Appareil de cuisson pour préparations pâtisseries comprenant une embase (10) et un couvercle (20), un moule (40) amovible, ledit appareil de cuisson étant caractérisé en ce que l'embase (10) comprend: - une sole de cuisson (16) montée mobile par rapport à une portion de boîtier de cuisson de l'embase (10) pour contacter une paroi inférieure du moule (40) amovible, et agencée entre la paroi inférieure du moule (40) amovible reçu dans l'espace de cuisson et des moyens de chauffage de l'embase (10), - des moyens de rappel élastiques, agencés pour repousser la sole de cuisson (16) contre la paroi inférieure du moule (40) amovible.

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).

Publiée:

— avec rapport de recherche internationale (Art. 21(3))

B.1924

APPAREIL DE CUISSON POUR PREPARATIONS PATISSIERES

[0001] La présente invention concerne de manière générale un appareil de cuisson et en particulier un appareil de cuisson ménager pour cuire des préparations culinaires, telles que des gâteaux. Le produit décrit est un appareil de cuisson qui permet de réaliser, avec des programmes
5 préenregistrés et un programme manuel, des gâteaux, biscuits, meringues, tartes. Il permet également de réaliser une étape de fonte de chocolat ou de beurre pouvant être nécessaire pour certaines préparations pâtisseries.

[0002] Il est connu dans l'art antérieur le document EP0696430 qui décrit un appareil multifonction qui intègre un plat creux qui permet de
10 réaliser diverses préparations. L'appareil comprend des résistances électriques chauffantes et nécessite une quantité importante d'énergie pour chauffer les aliments à cuire. Ce défaut est aggravé avec une préparation pâtissière, car une grande quantité de pâte est à chauffer, ce qui accentue le besoin d'énergie électrique. De plus, les résistances électriques sont
15 embarquées sur une pièce mobile, ce qui procure une structure complexe au niveau de l'alimentation électrique, avec aussi un risque accru de défaillance des résistances électriques, car les rendre mobiles conduit à des chocs, ce qui peut endommager ces pièces.

[0003] Un but de la présente invention est de répondre aux
20 inconvénients de l'art antérieur mentionnés ci-dessus et en particulier, tout d'abord, de proposer un appareil de cuisson pour préparations pâtisseries qui présente une capacité à recevoir des préparations dans un moule interchangeable, tout en garantissant une cuisson homogène.

[0004] Pour cela un premier aspect de l'invention concerne un
25 appareil de cuisson pour préparations pâtisseries comprenant une embase et un couvercle articulé sur l'embase entre une première position relevée pour

- l'introduction d'une préparation pâtissière et une deuxième position abaissée pour former un boîtier de cuisson de la préparation pâtissière, le couvercle et l'embase comprenant chacun une portion du boîtier de cuisson et des moyens de chauffage ancrés sur la portion du boîtier de cuisson respective,
- 5 l'appareil de cuisson comprenant des moyens de positionnement et de maintien agencés pour positionner et maintenir un moule amovible, tel qu'un moule en silicone, dans une enceinte de cuisson formée à l'intérieur du boîtier de cuisson lorsque le couvercle est dans la deuxième position abaissée, ledit appareil de cuisson étant caractérisé en ce que l'embase
- 10 comprend :
- une sole de cuisson montée mobile par rapport à la portion de boîtier de cuisson de l'embase pour contacter une paroi inférieure du moule amovible, et agencée entre la paroi inférieure du moule amovible reçu dans l'espace de cuisson et les moyens de chauffage de l'embase,
 - 15 - des moyens de rappel élastiques, agencés pour repousser la sole de cuisson contre la paroi inférieure du moule amovible.

[0005] L'appareil de cuisson selon la mise en œuvre ci-dessus comprend une sole mobile et des moyens de rappel élastiques qui repoussent la sole de cuisson contre la paroi inférieure du moule, si bien que

20 la chaleur est bien distribuée par la sole de cuisson qui forme un écran et un répartiteur entre les moyens de chauffage et le moule. Les points chauds sont ainsi évités et les gâteaux sont cuits de manière homogène et précise. De plus, si le moule amovible est souple ou déformable (caractéristique souvent intrinsèque d'un moule en silicone), la sole de cuisson forme un

25 appui qui évite les déformations dues au poids de la pâte chargée dans le moule : les gâteaux ont alors un meilleur aspect et, par exemple, une épaisseur uniforme.

[0006] Avantageusement, la sole de cuisson comprend une pluralité de protubérances, agencées pour contacter la paroi inférieure du

30 moule amovible selon des lignes ou des points de contact. Le contact entre la

sole de cuisson et le moule est limité à des lignes ou des points de contact, ce qui évite de transmettre de la chaleur par conduction, afin d'éviter les points chauds.

[0007] Avantageusement, la sole de cuisson comprend une pluralité de perforations. La chaleur peut alors facilement être transmise par convection avec établissement d'un flux d'air entre les résistances et la paroi du moule.

[0008] Avantageusement, la sole de cuisson est une paroi métallique, telle qu'une paroi en aluminium.

[0009] Avantageusement, la sole de cuisson est une tôle gaufrée.

[0010] Avantageusement, le couvercle comprend une cuve interne agencée entre les moyens de chauffage et l'espace de cuisson. Une telle cuve permet de limiter le volume à chauffer, afin de nécessiter moins d'énergie et/ou de temps de chauffe.

[0011] Avantageusement, dans la deuxième position abaissée, la cuve interne du couvercle et le moule amovible reçu dans l'espace de cuisson forment une enceinte de cuisson. L'enceinte de cuisson contient alors l'espace de cuisson, avec les aliments à cuire.

[0012] Avantageusement, le couvercle et l'embase comprennent chacun un réflecteur, agencés pour former une enceinte de chauffe entourant les moyens de chauffage et l'espace de cuisson, lorsque le couvercle est dans la deuxième position abaissée. La chaleur est confinée, le volume à chauffer réduit, si bien que l'invention, pour un même volume de pâte à cuire et un encombrement extérieur similaire (l'ajout de réflecteurs ne nécessite pas beaucoup d'espace), permet de réduire notablement la quantité d'énergie requise, jusqu'à 50%, ainsi que le temps total de cuisson. L'appareil reste compact. Une telle enceinte de chauffe limite le volume total à chauffer ainsi que les pertes de chaleur vers le boîtier et l'extérieur de l'appareil de cuisson.

[0013] Avantageusement, dans la deuxième position abaissée, le réflecteur du couvercle et le réflecteur de l'embase forment une enceinte de chauffe fermée. L'enceinte de chauffe est alors un espace clos, dans la deuxième position du couvercle bien sûr, ce qui permet de limiter les pertes
5 d'énergie par convection par exemple. Bien entendu, dans le domaine des appareils domestiques de cuisson, un tel espace clos peut présenter quelques ouvertures ou espacements entre les réflecteurs, de l'ordre de quelques dixièmes de millimètre ou même jusqu'à un ou deux millimètres.

[0014] Avantageusement, les moyens de chauffage du
10 couvercle sont agencés entre la cuve interne du couvercle et le réflecteur du couvercle.

[0015] Avantageusement, les moyens de chauffage de l'embase sont agencés entre la sole de cuisson et le réflecteur de l'embase

[0016] Avantageusement, dans la deuxième position abaissée,
15 l'enceinte de chauffe présente un volume inférieur à 5.5 litres. Un tel volume limité permet de réduire le temps de cuisson et la quantité d'énergie.

[0017] Avantageusement, le réflecteur du couvercle et/ou de l'embase est métallique.

[0018] Avantageusement, les moyens de chauffage sont des
20 résistances chauffantes, autrement appelées résistances électriques.

[0019] Avantageusement, le couvercle est articulé sur l'embase selon une liaison pivot agencée sur une partie arrière de l'appareil, l'appareil comprenant des poignées latérales et une interface de commande sur une partie avant de l'appareil, l'appareil comprenant en outre au moins un événement
25 agencé pour évacuer de la vapeur d'eau depuis l'enceinte de cuisson vers l'extérieur du boîtier de cuisson, en partie arrière de l'appareil de cuisson. Lors de la cuisson d'un gâteau, une grande quantité d'eau doit être évacuée sous forme de vapeur d'eau, et l'invention prévoit un événement qui évite de laisser la vapeur d'eau chauffer des zones susceptibles d'être touchées par

l'utilisateur. En d'autres termes, l'évent est agencé pour évacuer de la vapeur d'eau générée lors de la cuisson ailleurs que vers l'avant (où se trouvent une poignée, une interface homme machine, et potentiellement l'utilisateur) ou les côtés de l'appareil (où se trouvent des poignées). Les parties de l'appareil
5 que l'utilisateur touche (poignées, interface homme machine...) sont donc éloignées de l'évent et des flux de vapeur chaude.

[0020] Avantageusement, l'évent est un conduit formé par un tube avec une première extrémité donnant dans l'enceinte de cuisson, et une deuxième extrémité donnant sur l'extérieur de l'appareil de cuisson. Le tube
10 traverse l'espace entre l'enceinte de cuisson et l'enceinte de chauffe, sans communiquer avec. La vapeur d'eau par exemple ne peut pas aller dans cet espace entre l'enceinte de cuisson et l'enceinte de chauffe, où se trouvent les moyens de chauffe, ce qui les préserve.

[0021] Avantageusement, le couvercle et/ou l'embase
15 comprennent chacun des moyens de mesure de température.

[0022] Avantageusement, l'appareil de cuisson pour préparations pâtisseries comprend des moyens de commande de cuisson agencés pour commander indépendamment la chauffe des moyens de chauffage du couvercle et la chauffe des moyens de chauffage de l'embase.
20 Cette mise en œuvre permet d'éviter un déséquilibre de chauffe car le besoin de chaleur est dissymétrique : beaucoup de chaleur à fournir du côté inférieur (l'embase) où se trouve la pâte à chauffer, et peu de besoin en haut (le couvercle) où se trouve majoritairement de l'air.

[0023] Avantageusement, la portion de boîtier de cuisson du
25 couvercle et de l'embase est formée par au moins un capot plastique. En d'autres termes, le boîtier externe n'est pas le réflecteur : ce dernier se trouve entre le boîtier externe et l'enceinte de cuisson.

[0024] Avantageusement, les moyens de rappel élastiques sont un ressort ancré sur l'embase, et la sole de cuisson est attachée au ressort.

La sole est directement tenue et positionnée par le ressort, ce qui procure une solution fiable et économique.

[0025] Alternativement ou en addition, l'appareil de cuisson comprend des moyens de guidage, tels que des pivots coulissants, agencés
5 pour guider la sole de cuisson.

[0026] D'autres caractéristiques et avantages de la présente invention apparaîtront plus clairement à la lecture de la description détaillée qui suit d'un mode de réalisation de l'invention donné à titre d'exemple nullement limitatif et illustré par les dessins annexés, dans lesquels :

- 10 - la figure 1 représente une vue de face d'un appareil de cuisson pour préparations pâtissières selon l'invention, comprenant une embase et un couvercle en position fermée ou abaissée sur l'embase ;
- la figure 2 représente l'appareil de cuisson pour préparations pâtissières de la figure 1 vu de dessus ;
- 15 - la figure 3 représente l'appareil de cuisson pour préparations pâtissières de la figure 1 en perspective, avec le couvercle en position ouverte ou relevée ;
- la figure 4 représente une vue de côté en coupe de l'appareil de cuisson pour préparations pâtissières de la figure 1 ;
- 20 - la figure 5 représente un détail de la figure 4 ;
- la figure 6 représente la vue en coupe de la figure 4 en perspective ;
- la figure 7 représente une sole de cuisson qui équipe l'appareil de cuisson pour préparations pâtissières des figures précédentes.

25 [0027] La figure 1 représente un appareil de cuisson pour préparations pâtissières reposant sur un support 100 (une table ou un plan de travail) et comprenant une embase 10 et un couvercle 20 en position abaissée ou fermée sur l'embase 10. Comme le montre la figure 3, le couvercle 20 peut également occuper une position ouverte ou relevée, pour
30 donner accès à une enceinte de cuisson. Dans la présente demande, la

position ouverte ou relevée est appelée première position relevée, et la position fermée ou abaissée est appelée deuxième position abaissée.

[0028] Pour pouvoir pivoter de la première position relevée à la deuxième position abaissée, le couvercle 20 est monté pivotant sur l'embase 10, par le biais d'une charnière située à l'arrière de l'appareil de cuisson pour préparations pâtissières, et qui définit un axe de pivotement 20a visible aux figures 2 et 3.

[0029] Comme le montrent les figures 1, 2 et 3, l'appareil de cuisson pour préparations pâtissières comprend un boîtier extérieur formé par une portion de boîtier de couvercle 24 et une portion de boîtier d'embase 14, toutes deux typiquement réalisées en matière plastique. Le couvercle 20 comprend aussi des poignées latérales 25a et 25b, et une poignée avant 25c, afin de permettre à l'utilisateur d'ouvrir et fermer aisément le couvercle 20.

[0030] L'appareil de cuisson pour préparations pâtissières est également équipé d'une interface homme machine 15 (ou d'une interface de commande) qui comprend par exemple un afficheur et des boutons de commande pour permettre à l'utilisateur de définir des cycles de cuisson et de démarrer / arrêter l'appareil de cuisson pour préparations pâtissières. Comme on le voit sur les figures 1 et 3, l'interface homme machine 15 est située sur l'embase 10, sur la face avant de l'appareil de cuisson pour préparations pâtissières.

[0031] La figure 3 représente l'appareil de cuisson pour préparations pâtissières avec le couvercle 20 en première position relevée, de sorte à rendre accessible un espace de cuisson où se trouve un moule 40 avec plusieurs empreintes, pour recevoir et faire cuire des portions de pâte à gâteau, pour préparer des petits gâteaux. Comme cela sera expliqué ci-dessous, le moule 40 est amovible pour être changé et/ou nettoyé aisément. Typiquement, le moule 40 est en matière silicone par exemple, et est souple, ou facilement déformable. Par exemple, sous le poids de la pâte chargée

dans les empreintes, il est fréquent que le moule 40 se déforme de plusieurs millimètres, surtout s'il n'est tenu que par sa périphérie.

[0032] La figure 3 montre aussi une cuve interne 21 du couvercle 20, qui vient en regard du moule 40 lorsque le couvercle 20 est en deuxième position abaissée, pour fermer un espace de cuisson.

[0033] En effet, la figure 4 et la figure 6 représentent une vue de côté en coupe de l'appareil de cuisson pour préparations pâtisseries, où l'on voit la cuve interne 21 du couvercle 20 qui est au-dessus et en regard du moule 40, afin de former une enceinte de cuisson fermée.

[0034] La figure 4 et la figure 6 montrent aussi un réflecteur 22 et une résistance électrique 23 embarqués sur le couvercle 20, ainsi qu'une résistance électrique 13 et un réflecteur 12 implantés dans l'embase 10. Le réflecteur 22 et le réflecteur 12 sont en regard l'un de l'autre, de sorte à former une enceinte de chauffe qui contient donc les résistances électriques 13 et 23 (formant des moyens de chauffe) et l'enceinte de cuisson formée par la cuve interne 21 et le moule 40. Typiquement, les réflecteurs 12 et 22 sont métalliques, avec au moins leur face interne agencée pour réfléchir un rayonnement de chauffage (paroi brillante, ou polie, ou lisse).

[0035] La figure 4 montre aussi une sole de cuisson 16 qui est montée sur un ressort 17 formant des moyens de rappel élastiques et qui repousse la sole de cuisson 16 contre la paroi inférieure du moule 40. En conséquence, la sole de cuisson 16 se trouve entre la résistance électrique 13 et le moule 40, si bien que la chaleur issue de la résistance électrique 13 est diffusée de manière homogène par la sole de cuisson 16 vers le moule 40. La chaleur bien répartie permet de cuire de manière homogène les gâteaux formés dans les empreintes du moule 40. Typiquement, la sole de cuisson 16 est une tôle métallique (aluminium, acier...) éventuellement revêtue, et ondulée ou gaufrée comme le montre la figure 7. La sole de cuisson 16 comprend également une multitude de perforations qui permettent

de laisser passer un flux d'air allant de la résistance électrique 13 au moule 40.

[0036] Le ressort 17 permet aussi de garantir que le moule 40 est soutenu par la sole de cuisson 16, même si sa hauteur varie. La fonction
5 de soutien limite les déformations du moule 40, et est assurée pour plusieurs hauteurs différentes de moules, qui peuvent donc être interchangeables sans perdre la fonction de soutien. Comme la sole de cuisson 16 est ondulée ou gaufree, le contact entre la sole de cuisson 16 avec le moule 40 se fait selon des lignes de contact, ce qui limite la conduction de chaleur et évite de
10 former des points chauds dans la pâte à cuire.

[0037] L'enceinte de chauffe formée par les réflecteurs 12 et 22 est donc un espace fermé qui englobe les moyens de chauffe et l'enceinte de cuisson sans les toucher, si bien que l'espace à chauffer est de faible volume et clos, ce qui limite la quantité d'énergie à fournir, ainsi que les pertes
15 thermiques. De plus, la structure à double paroi (enceinte de cuisson et enceinte de chauffe) permet de chauffer de manière homogène l'espace de cuisson contenu dans l'enceinte de cuisson, ce qui procure des gâteaux cuits de manière homogène et reproductible dans un appareil de cuisson pour préparations pâtisseries compact.

[0038] On peut aussi remarquer que les résistances électriques 13 et 23 se trouvent plus proches des réflecteurs 12 et 22 respectivement que du moule 40 et de la cuve interne 21 respectivement, toujours pour chauffer de manière homogène avec peu de points chauds l'espace de cuisson.

[0039] On peut prévoir par exemple un volume de l'enceinte de chauffe inférieur ou égal à 5.5 litres, et pour un gâteau de 1 kg soit environ 780 mL de pâte avant cuisson, on peut faire la comparaison suivante :

[0040] Dans un four de 38 litres il faudrait environ 9,5 minutes de préchauffe pour atteindre 200°C en chaleur tournante puis 50 minutes

pour atteindre une bonne cuisson à cœur dans un plat en aluminium soit une dépense énergétique totale de 0.888 kWh.

[0041] Dans l'appareil proposé, le plat est déposé à froid dans l'enceinte de cuisson et après 42 minutes on atteint une bonne cuisson à cœur soit une dépense énergétique totale de 0.301 kWh. La cuisson est donc
5 plus rapide et requiert moins d'énergie.

[0042] Un ou plusieurs événements 31 (visible sur la figure 5) sont nécessaires pour l'évacuation de la vapeur produite lors de la cuisson. Un gâteau, afin de former une croûte, ou des biscuits afin d'être croustillants,
10 doivent être desséchés en surface. La structure proposée par la présente invention consiste à traverser deux parois (enceinte de cuisson et enceinte de chauffe) pour évacuer cette vapeur d'eau. En effet la vapeur doit être dirigée vers l'extérieur du produit et ne pas risquer de stagner en contact avec des parties sensibles comme les éléments chauffants. De plus, la
15 structure proposée par la présente invention consiste à diriger la vapeur et l'air chauds vers des zones qui ne sont pas utilisées comme préhension par le consommateur, afin de ne pas le brûler.

[0043] En particulier, la figure 5 montre un événement 31, sous forme de tube, traverser la cuve interne 21 et le réflecteur 22 du couvercle 20 pour guider vapeur et air chauds vers l'arrière de l'appareil de cuisson pour préparations pâtisseries, à bonne distance donc des poignées 25a, 25b, 25c et de l'interface homme machine 15.

[0044] De manière avantageuse, on peut donc prévoir que le moule 40 (typiquement un moule souple en silicone par exemple) est
25 amovible, et la cuve interne 21 et/ou le réflecteur 12 de l'embase 10 comprennent des formes d'accostage ou empreintes pour accueillir le moule 40 et le positionner correctement dans l'enceinte de cuisson.

[0045] Enfin, il est prévu dans l'embase un palpeur de température qui permet de réguler les résistances électriques 13 et 23 en
30 même temps. La résistance électrique 23 du couvercle 20 est pourvue

également d'un limiteur pour éviter une surchauffe du couvercle 20 en cas de charge importante de produit dans le moule 40 de l'embase.

[0046] On comprendra que diverses modifications et/ou améliorations évidentes pour l'homme du métier peuvent être apportées aux
5 différents modes de réalisation de l'invention décrits dans la présente description sans sortir du cadre de l'invention défini par les revendications annexées.

REVENDICATIONS

1. Appareil de cuisson pour préparations pâtissières comprenant une embase (10) et un couvercle (20) articulé sur l'embase (10) entre une première position relevée pour l'introduction d'une préparation pâtissière et une deuxième position abaissée pour former un boîtier de cuisson de la préparation pâtissière,
- le couvercle (20) et l'embase (10) comprenant chacun une portion du boîtier (14, 24) de cuisson et des moyens de chauffage ancrés sur la portion du boîtier de cuisson respective,
- l'appareil de cuisson comprenant des moyens de positionnement et de maintien, agencés pour positionner et maintenir un moule (40) amovible, tel qu'un moule (40) en silicone, dans une enceinte de cuisson formée à l'intérieur du boîtier de cuisson lorsque le couvercle (20) est dans la deuxième position abaissée,
- ledit appareil de cuisson étant caractérisé en ce que l'embase (10) comprend :
- une sole de cuisson (16) montée mobile par rapport à la portion de boîtier de cuisson de l'embase (10) pour contacter une paroi inférieure du moule (40) amovible, et agencée entre la paroi inférieure du moule (40) amovible reçu dans l'espace de cuisson et les moyens de chauffage de l'embase (10),
 - des moyens de rappel élastiques, agencés pour repousser la sole de cuisson (16) contre la paroi inférieure du moule (40) amovible.
2. Appareil de cuisson pour préparations pâtissières selon la revendication précédente, dans lequel la sole de cuisson (16) comprend une pluralité de protubérances, agencées pour contacter la paroi inférieure du moule (40) amovible selon des lignes ou des points de contact.

3. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, dans lequel la sole de cuisson (16) comprend une pluralité de perforations.

4. Appareil de cuisson pour préparations pâtisseries selon l'une
5 des revendications précédentes, dans lequel la sole de cuisson (16) est une paroi métallique, telle qu'une paroi en aluminium.

5. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, dans lequel la sole de cuisson (16) est une tôle gaufrée.

10 6. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, dans lequel le couvercle (20) comprend une cuve interne agencée entre les moyens de chauffage et l'espace de cuisson.

7. Appareil de cuisson pour préparations pâtisseries selon la revendication précédente, dans lequel, dans la deuxième position abaissée,
15 la cuve interne (21) du couvercle (20) et le moule (40) amovible reçu dans l'espace de cuisson forment une enceinte de cuisson.

8. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, dans lequel le couvercle (20) et l'embase (10) comprennent chacun un réflecteur (12, 22), agencés pour former une
20 enceinte de chauffe entourant les moyens de chauffage et l'espace de cuisson, lorsque le couvercle (20) est dans la deuxième position abaissée.

9. Appareil de cuisson pour préparations pâtisseries selon la revendication précédente, dans lequel, dans la deuxième position abaissée, le réflecteur (22) du couvercle (20) et le réflecteur (12) de l'embase (10)
25 forment une enceinte de chauffe fermée.

10. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications 8 ou 9 dans leur dépendance à la revendication 6, dans lequel les moyens de chauffage du couvercle (20) sont agencés entre la cuve interne (21) du couvercle (20) et le réflecteur (22) du couvercle (20).

11. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications 8 à 10, dans lequel les moyens de chauffage de l'embase (10) sont agencés entre la sole de cuisson (16) et le réflecteur de l'embase (10).

5 12. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications 8 à 11, dans lequel, dans la deuxième position abaissée, l'enceinte de chauffe présente un volume inférieur à 5.5 litres.

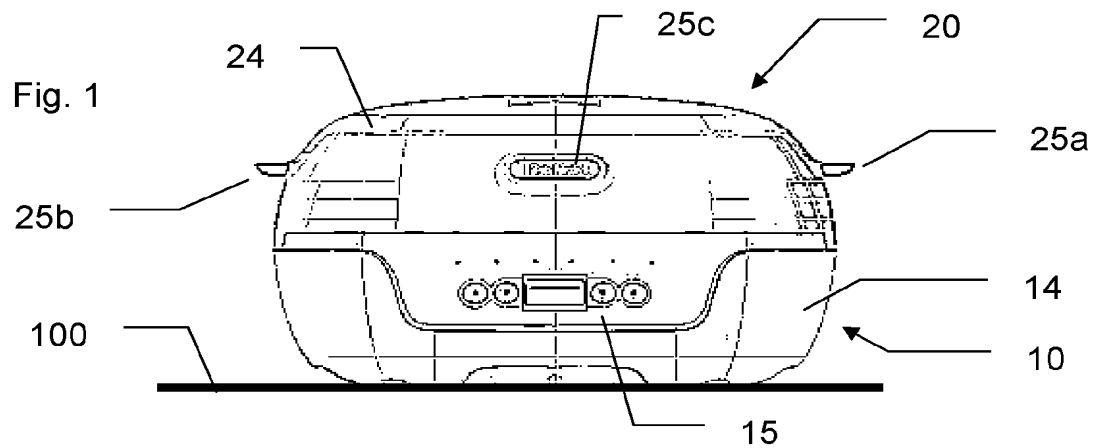
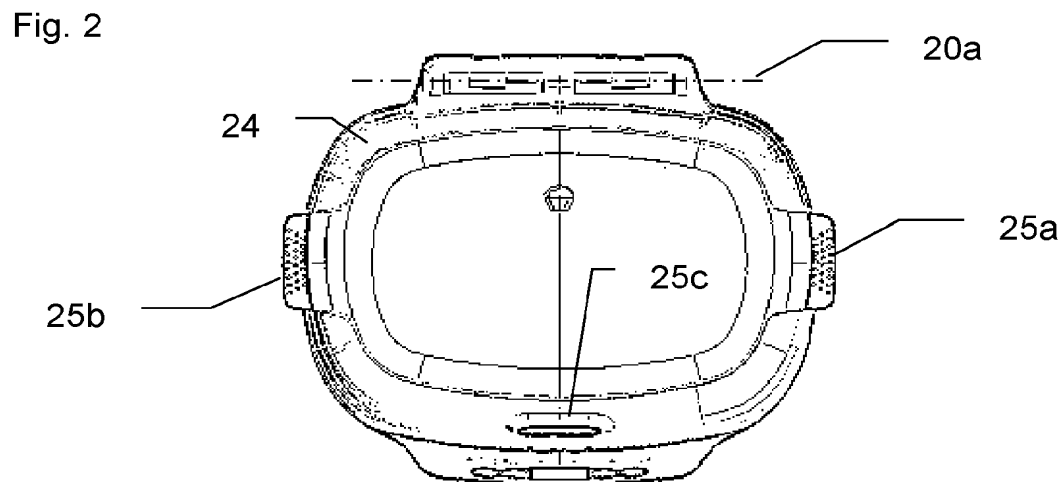
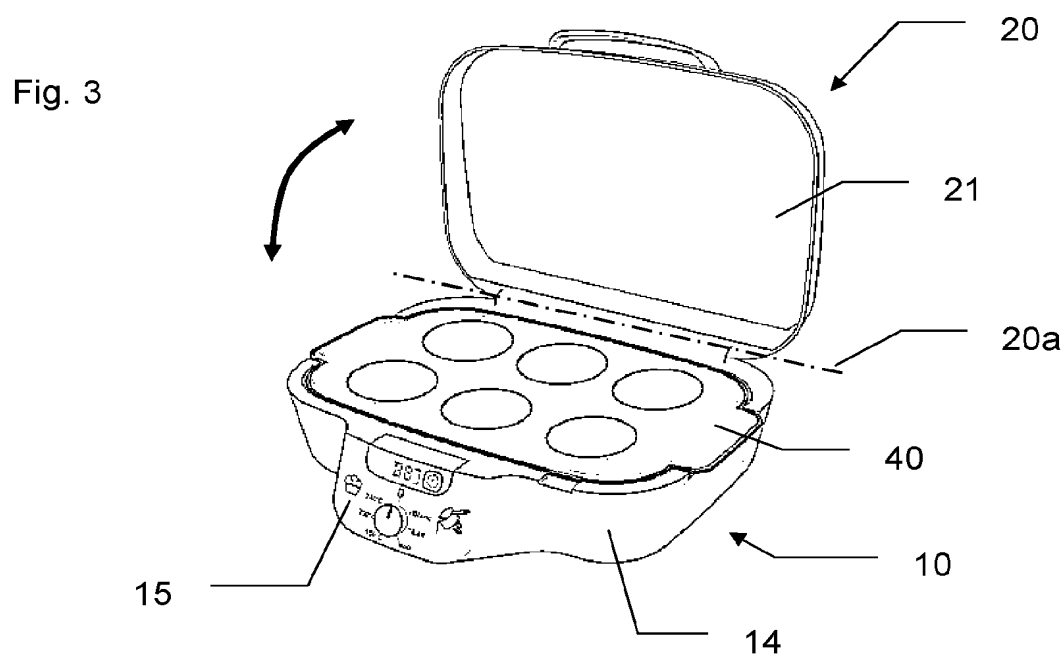
10 13. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, dans lequel le couvercle (20) et/ou l'embase (10) comprennent chacun des moyens de mesure de température.

15 14. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, comprenant des moyens de commande de cuisson agencés pour commander indépendamment la chauffe des moyens de chauffage du couvercle (20) et la chauffe des moyens de chauffage de l'embase (10).

15 15. Appareil de cuisson pour préparations pâtisseries selon l'une des revendications précédentes, dans lequel la portion de boîtier de cuisson (14, 24) du couvercle (20) et de l'embase (10) est formée par au moins un capot plastique.

20

1/3



2/3

Fig. 4

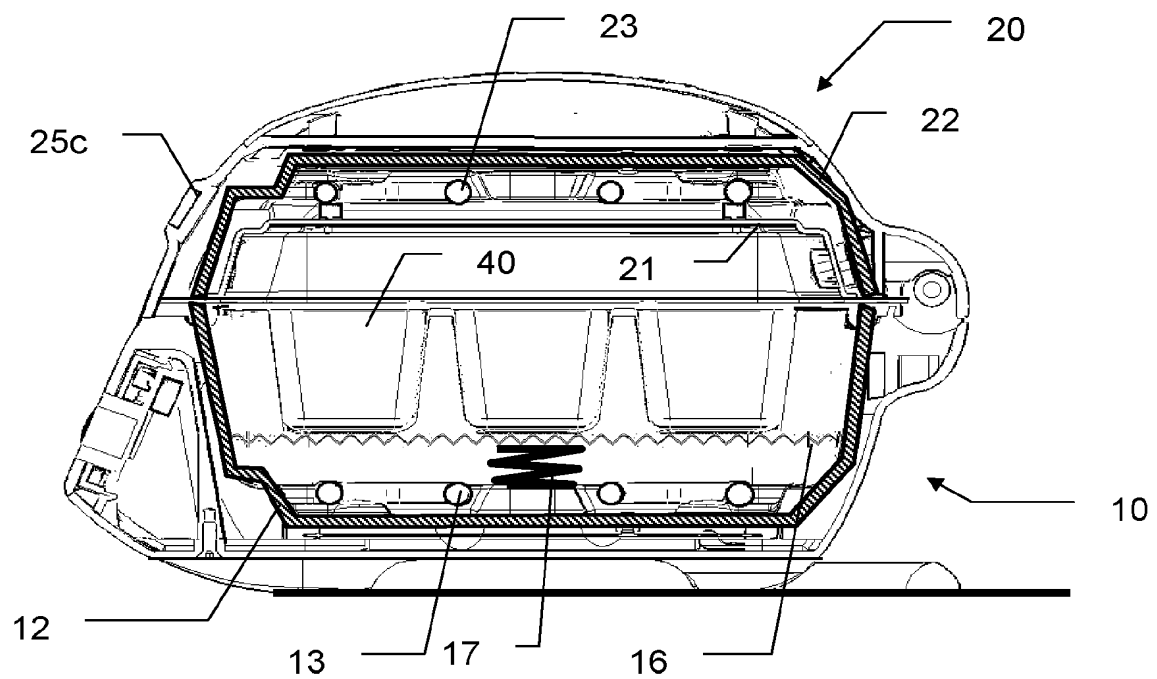
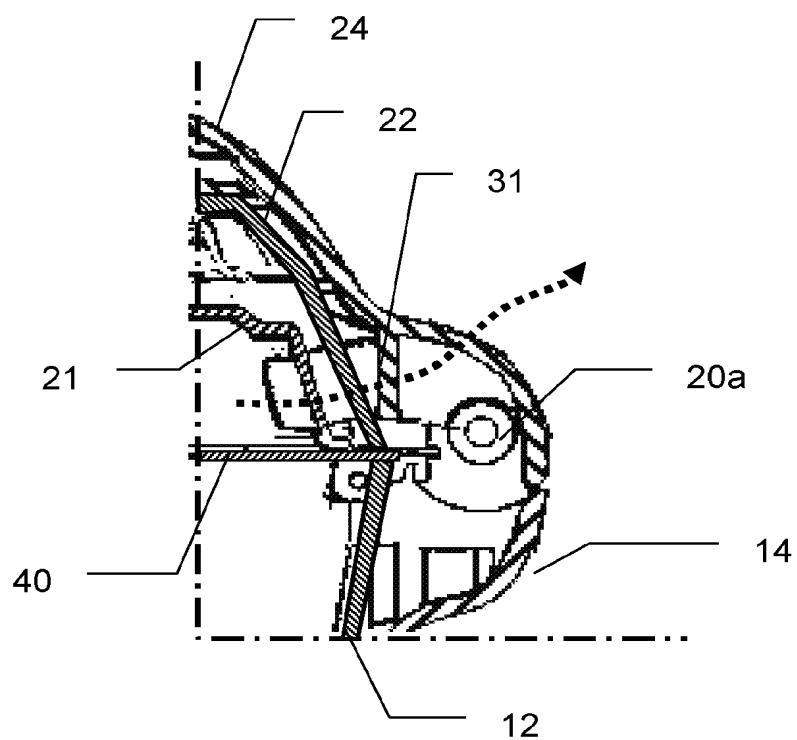


Fig. 5



3/3

Fig. 6

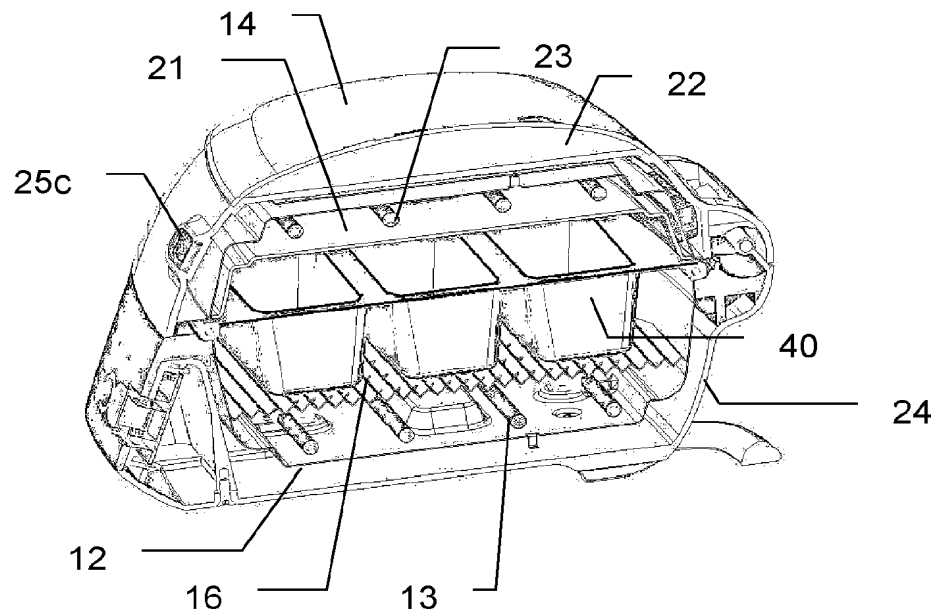
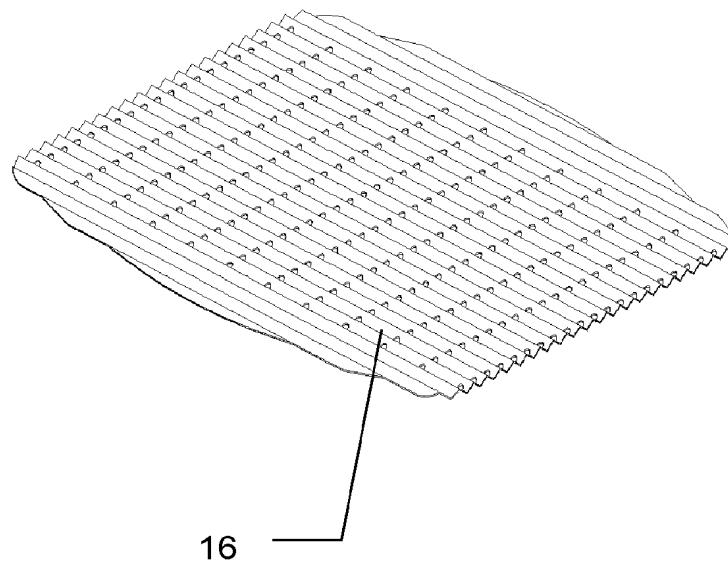


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No

PCT/FR2018/052722

A. CLASSIFICATION OF SUBJECT MATTER

INV. A21B1/52 A47J37/01 A47J37/06 A21B3/13
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)

A21B A47J

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)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 696 430 A1 (SOLAC ELECTRODOMESTICOS [ES]) 14 February 1996 (1996-02-14) figures 1-2 -----	1-15
A	WO 2015/082574 A1 (TEAM INTERNAT MARKETING S A [BE]) 11 June 2015 (2015-06-11) figure 1 -----	1-15
A	US 2006/272511 A1 (DREIMANN SAMANTHA [US] ET AL) 7 December 2006 (2006-12-07) figures 5-9 -----	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search

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Date of mailing of the international search report

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Authorized officer

Adant, Vincent

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0696430	A1	14-02-1996	AU 2848295 A	22-02-1996
			CA 2155620 A1	13-02-1996
			EP 0696430 A1	14-02-1996
			ES 2092953 A2	01-12-1996
			JP H08173326 A	09-07-1996

WO 2015082574	A1	11-06-2015	DE 102013020169 A1	18-06-2015
			EP 3076835 A1	12-10-2016
			KR 20160092009 A	03-08-2016
			WO 2015082574 A1	11-06-2015

US 2006272511	A1	07-12-2006	US 2006272511 A1	07-12-2006
			WO 2007142616 A2	13-12-2007

RAPPORT DE RECHERCHE INTERNATIONALE

Demande internationale n°

PCT/FR2018/052722

A. CLASSEMENT DE L'OBJET DE LA DEMANDE INV. A21B1/52 A47J37/01 A47J37/06 A21B3/13 ADD.		
Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB		
B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE Documentation minimale consultée (système de classification suivi des symboles de classement) A21B A47J		
Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche		
Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si cela est réalisable, termes de recherche utilisés) EPO-Internal		
C. DOCUMENTS CONSIDERES COMME PERTINENTS		
Catégorie*	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
A	EP 0 696 430 A1 (SOLAC ELECTRODOMESTICOS [ES]) 14 février 1996 (1996-02-14) figures 1-2 -----	1-15
A	WO 2015/082574 A1 (TEAM INTERNAT MARKETING S A [BE]) 11 juin 2015 (2015-06-11) figure 1 -----	1-15
A	US 2006/272511 A1 (DREIMANN SAMANTHA [US] ET AL) 7 décembre 2006 (2006-12-07) figures 5-9 -----	1-15
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> ☐ Voir la suite du cadre C pour la fin de la liste des documents </div> <div style="width: 45%;"> ☒ Les documents de familles de brevets sont indiqués en annexe </div> </div>		
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Date à laquelle la recherche internationale a été effectivement achevée <div style="text-align: center; font-weight: bold;">14 janvier 2019</div>	Date d'expédition du présent rapport de recherche internationale <div style="text-align: center; font-weight: bold;">22/01/2019</div>	
Nom et adresse postale de l'administration chargée de la recherche internationale Office Européen des Brevets, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Fonctionnaire autorisé <div style="text-align: center; font-weight: bold;">Adant, Vincent</div>	

RAPPORT DE RECHERCHE INTERNATIONALE

Renseignements relatifs aux membres de familles de brevets

Demande internationale n°

PCT/FR2018/052722

Document brevet cité au rapport de recherche		Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
EP 0696430	A1	14-02-1996	AU 2848295 A	22-02-1996
			CA 2155620 A1	13-02-1996
			EP 0696430 A1	14-02-1996
			ES 2092953 A2	01-12-1996
			JP H08173326 A	09-07-1996

WO 2015082574	A1	11-06-2015	DE 102013020169 A1	18-06-2015
			EP 3076835 A1	12-10-2016
			KR 20160092009 A	03-08-2016
			WO 2015082574 A1	11-06-2015

US 2006272511	A1	07-12-2006	US 2006272511 A1	07-12-2006
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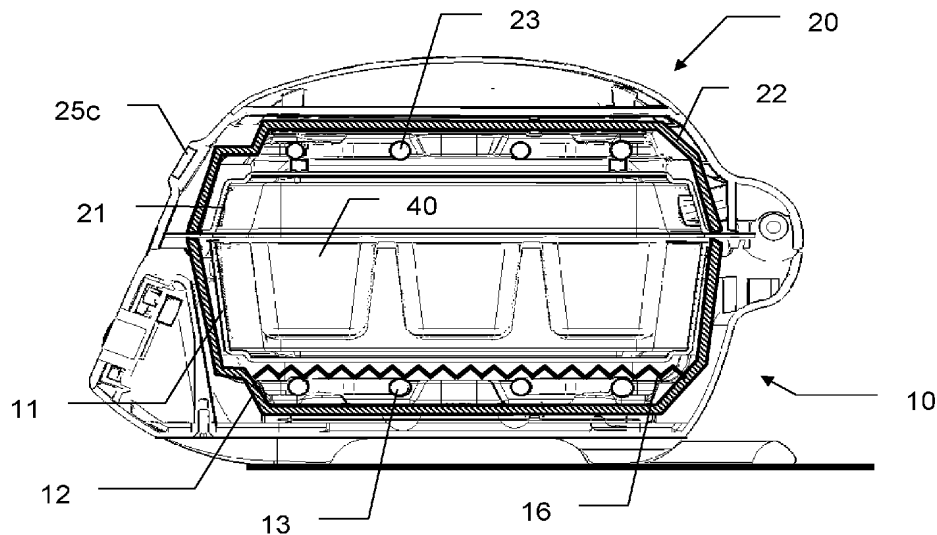
(74) Mandataire : SEB DEVELOPPEMENT - SOARES Luis
Filipe ; 112 Chemin du Moulin Carron, Campus SEB, CS
90229, 69134 ECULLY CEDEX (FR).

(81) États désignés (sauf indication contraire, pour tout titre de
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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, JO, 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,

(54) Title: COOKING APPLIANCE FOR PASTRY PREPARATIONS

(54) Titre : APPAREIL DE CUISSON POUR PRÉPARATIONS PATISSIÈRES

Fig. 4



(57) Abstract: The invention relates to a cooking appliance for pastry preparations, comprising a base (10) and a cover (20) hingedly connected to the base (10), characterised in that: - the cover (20) and the base (10) each comprise a reflector (12, 22) and an internal tank (11, 21); - in that, in a second lowered position of the cover (20): - the inner vessel (21) of the cover (20) and the inner vessel (11) of the base (10) form a cooking chamber arranged to receive a pastry preparation, - the reflector (22) of the cover (20) and the reflector (12) of the base (10) form a heating chamber surrounding the cooking chamber; - in that the means for heating the cover (20) and the base (10) are arranged between the heating chamber and the cooking chamber; - and in the second lowered position, the reflector (22) of the cover (20) and the reflector (12) of the base (10) form a closed heating chamber.

(57) Abrégé : Appareil de cuisson pour préparations pâtisseries comprenant une embase (10) et un couvercle (20) articulé sur l'embase (10), caractérisé: - en ce que le couvercle (20) et l'embase (10) comprennent chacun un réflecteur (12, 22) et une cuve interne (11, 21), - en ce que, dans une deuxième position abaissée du couvercle (20): - la cuve interne (21) du couvercle (20) et la cuve interne (11) de

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.

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l'embase (10) forment une enceinte de cuisson agencée pour recevoir une préparation pâtissière, - le réflecteur (22) du couvercle (20) et le réflecteur (12) de l'embase (10) forment une enceinte de chauffe entourant l'enceinte de cuisson, - en ce que des moyens de chauffage du couvercle (20) et de l'embase (10) sont disposés entre l'enceinte de chauffe et l'enceinte de cuisson - et en ce que dans la deuxième position abaissée, le réflecteur (22) du couvercle (20) et le réflecteur (12) de l'embase (10) forment une enceinte de chauffe fermée.

B.1866APPAREIL DE CUISSON POUR PREPARATIONS PATISSIERES

[0001] La présente invention concerne de manière générale un appareil de cuisson et en particulier un appareil de cuisson ménager pour cuire des préparations culinaires, telles que des gâteaux.

[0002] Il est connu dans l'art antérieur de tels dispositifs de cuisson, et le document EP0696430 décrit un appareil multifonction qui intègre un plat creux qui permet de réaliser diverses préparations. L'appareil comprend des résistances électriques chauffantes et nécessite une quantité importante d'énergie pour chauffer les aliments à cuire. Ce défaut est aggravé avec une préparation pâtissière, car une grande quantité de pâte est à chauffer, ce qui accentue le besoin d'énergie électrique.

[0003] Un but de la présente invention est de répondre aux inconvénients de l'art antérieur mentionnés ci-dessus et en particulier, tout d'abord, de proposer un appareil de cuisson pour préparations pâtissières, qui présente une efficacité énergétique améliorée.

[0004] Pour cela un premier aspect de l'invention concerne un appareil de cuisson pour préparations pâtissières comprenant une embase et un couvercle articulé sur l'embase entre une première position relevée pour permettre l'introduction d'une préparation pâtissière dans une enceinte de cuisson et une deuxième position abaissée pour former un boîtier de cuisson de la préparation pâtissière, le couvercle et l'embase comprenant chacun une portion du boîtier de cuisson et des moyens de chauffage, ledit appareil étant caractérisé :

- en ce que le couvercle et l'embase comprennent chacun en outre un réflecteur et une cuve interne,
- en ce que, dans la deuxième position abaissée :

- la cuve interne du couvercle et la cuve interne de l'embase forment l'enceinte de cuisson agencée pour recevoir la préparation pâtissière,
 - le réflecteur du couvercle et le réflecteur de l'embase forment une enceinte de chauffe entourant l'enceinte de cuisson,
- 5 - en ce que les moyens de chauffage du couvercle et de l'embase sont disposés entre l'enceinte de chauffe et l'enceinte de cuisson
- et en ce que dans la deuxième position abaissée, le réflecteur du couvercle et le réflecteur de l'embase forment une enceinte de chauffe fermée.

 [0005] L'enceinte de chauffe est alors un espace clos, dans la
10 deuxième position du couvercle, ce qui permet de limiter les pertes d'énergie par convection par exemple. Comme vu ci-dessus, dans le domaine des appareils domestiques de cuisson, un tel espace clos peut présenter quelques ouvertures ou espacements entre les réflecteurs, de l'ordre de quelques dixièmes de millimètre ou même jusqu'à un ou deux millimètres.

15 [0006] Selon la mise en œuvre ci-dessus, l'appareil de cuisson en position fermée comprend une enceinte de cuisson et une enceinte de chauffe, avec les moyens de chauffage agencés dans l'enceinte de chauffe, autour de l'enceinte de cuisson. La chaleur est ainsi confinée, le volume à chauffer réduit, si bien que l'invention, pour un même volume de pâte à cuire
20 et un encombrement extérieur similaire (l'ajout de réflecteurs ne nécessite pas beaucoup d'espace), permet de réduire notablement la quantité d'énergie requise, jusqu'à 50%, ainsi que le temps total de cuisson. L'appareil reste compact.

 [0007] Avantageusement, dans la deuxième position abaissée, la
25 cuve interne du couvercle et la cuve interne de l'embase présentent chacune un bord périphérique en regard l'un de l'autre et/ou en contact l'un avec l'autre. L'enceinte de cuisson est alors un espace clos, dans la deuxième position du couvercle bien sûr. Bien entendu, dans le domaine des appareils domestiques de cuisson, un tel espace clos peut présenter quelques ouvertures ou

espacements entre les cuves internes, de l'ordre de quelques dixièmes de millimètre ou même jusqu'à un ou deux millimètres.

[0008] Avantageusement, le couvercle est articulé sur l'embase
5 selon une liaison pivot agencée sur une partie arrière de l'appareil, l'appareil
comprenant des poignées latérales et une interface de commande sur une
partie avant de l'appareil, l'appareil comprenant en outre au moins un événement
agencé pour évacuer de la vapeur d'eau depuis l'enceinte de cuisson vers
l'extérieur du boîtier de cuisson, en partie arrière de l'appareil de cuisson. Lors
10 de la cuisson d'un gâteau, une grande quantité d'eau doit être évacuée sous
forme de vapeur d'eau, et l'invention prévoit un événement qui évite de laisser la
vapeur d'eau chauffer des zones susceptibles d'être touchées par l'utilisateur.
En d'autres termes, l'événement est agencé pour évacuer de la vapeur d'eau
générée lors de la cuisson ailleurs que vers l'avant (où se trouvent une
15 poignée, une interface homme machine, et potentiellement l'utilisateur) ou les
côtés de l'appareil (où se trouvent des poignées). Les parties de l'appareil que
l'utilisateur touche (poignées, interface homme machine...) sont donc
éloignées de l'événement et des flux de vapeur chaude.

[0009] Avantageusement, l'événement est un conduit formé par un
20 tube avec une première extrémité donnant dans l'enceinte de cuisson, et une
deuxième extrémité donnant sur l'extérieur de l'appareil de cuisson. Le tube
traverse l'espace entre l'enceinte de cuisson et l'enceinte de chauffe, sans
communiquer avec. La vapeur d'eau par exemple ne peut pas aller dans cet
espace entre l'enceinte de cuisson et l'enceinte de chauffe, où se trouvent les
25 moyens de chauffe, ce qui les préserve.

[0010] Avantageusement, dans la deuxième position abaissée,
un espace entre les réflecteurs et les cuves internes est un espace fermé.
L'événement ne communique pas ni ne donne sur cet espace inter enceintes.

[0011] Avantageusement, dans le couvercle et dans l'embase, le
30 réflecteur est agencé à une distance prédéterminée de la cuve interne. En

d'autres termes, le réflecteur ne touche pas la cuve de cuisson, pour limiter les conductions de chaleur.

[0012] Avantageusement, la cuve interne de l'embase est amovible. Cela permet de proposer plusieurs modèles interchangeables de cuve interne de l'embase, pour varier les moules et possibilités de préparations.

[0013] Avantageusement, les moyens de chauffage sont des résistances chauffantes, autrement appelées résistances électriques.

[0014] Avantageusement, le couvercle et/ou l'embase comprennent des moyens de mesure de température de leur cuve interne respective.

[0015] Avantageusement, l'appareil de cuisson pour préparations pâtisseries comprend des moyens de commande de cuisson agencés pour commander indépendamment la chauffe des moyens de chauffage du couvercle et la chauffe des moyens de chauffage de l'embase. Cette mise en œuvre permet d'éviter un déséquilibre de chauffe car le besoin de chaleur est dissymétrique (beaucoup de chaleur à fournir du côté inférieur (l'embase) où se trouve la pâte à chauffer, et peu de besoin en haut (le couvercle) où se trouve majoritairement de l'air.

[0016] Avantageusement, le réflecteur du couvercle et/ou de l'embase est métallique.

[0017] Avantageusement, dans la deuxième position abaissée, l'enceinte de chauffe présente un volume inférieur à 5.5 litres. Un tel volume limité permet de réduire le temps de cuisson et la quantité d'énergie.

[0018] Avantageusement, la portion de boîtier de cuisson du couvercle et de l'embase est formée par au moins un capot plastique. En d'autres termes, le boîtier externe n'est pas le réflecteur : ce dernier se trouve entre le boîtier externe et l'enceinte de cuisson.

[0019] Avantageusement, dans le couvercle et/ou l'embase, les moyens de chauffage sont agencés plus proches du réflecteur que de la cuve interne. Cette mise en œuvre permet d'éviter des points chauds sur la cuve interne, de sorte à obtenir une préparation cuite de manière homogène.

5 [0020] Avantageusement, la cuve interne de l'embase est en métal revêtu d'un traitement de surface anti adhérent.

[0021] Avantageusement, l'appareil de cuisson pour préparations pâtisseries comprend des moyens de positionnement et de maintien, agencés pour positionner et maintenir un moule amovible, tel qu'un moule en silicone,
10 dans l'enceinte de cuisson.

[0022] Avantageusement, l'appareil de cuisson pour préparations pâtisseries comprend une sole de cuisson, et les moyens de chauffage de l'embase sont agencés entre la sole de cuisson et le réflecteur de l'embase. Une telle sole de cuisson, agencée dans l'embase, permet de répartir la
15 chaleur de manière homogène sur l'enceinte de cuisson, et permet d'éviter des points chauds sur la cuve interne, de sorte à obtenir une préparation cuite de manière homogène.

[0023] Avantageusement, la sole de cuisson comprend une pluralité de protubérances, formant des lignes ou des points de contact pour
20 supporter un moule amovible reçu dans l'enceinte de cuisson.

[0024] Avantageusement, la sole de cuisson comprend une pluralité de perforations. Cela permet un échange de chaleur par convection.

[0025] Avantageusement, la sole de cuisson est une paroi métallique, telle qu'une paroi en aluminium.

25 [0026] Avantageusement, la sole de cuisson est une tôle gaufrée.

[0027] D'autres caractéristiques et avantages de la présente invention apparaîtront plus clairement à la lecture de la description détaillée qui suit d'un mode de réalisation de l'invention donné à titre d'exemple nullement limitatif et illustré par les dessins annexés, dans lesquels :

- la figure 1 représente une vue de face d'un appareil de cuisson pour préparations pâtissières selon l'invention, comprenant une embase et un couvercle en position fermée ou abaissée sur l'embase ;
- la figure 2 représente l'appareil de cuisson pour préparations
5 pâtissières de la figure 1 vu de dessus ;
- la figure 3 représente l'appareil de cuisson pour préparations pâtissières de la figure 1 en perspective, avec le couvercle en position ouverte ou relevée ;
- la figure 4 représente une vue de côté en coupe de l'appareil de
10 cuisson pour préparations pâtissières de la figure 1 ;
- la figure 5 représente un détail de la figure 4.

[0028] On entend par préparation pâtissière aussi bien une préparation culinaire sucrée que salée.

[0029] La figure 1 représente un appareil de cuisson pour
15 préparations pâtissières reposant sur un support 100 (une table ou un plan de travail) et comprenant une embase 10 et un couvercle 20 en position abaissée ou fermée sur l'embase 10. Comme le montre la figure 3, le couvercle 20 peut également occuper une position ouverte ou relevée, pour donner accès à une enceinte de cuisson. Dans la présente demande, la position ouverte ou relevée
20 est appelée première position relevée, et la position fermée ou abaissée est appelée deuxième position abaissée.

[0030] Pour pouvoir pivoter de la première position relevée à la deuxième position abaissée, le couvercle 20 est monté pivotant sur l'embase 10, par le biais d'une charnière située à l'arrière de l'appareil de cuisson pour
25 préparations pâtissières, et qui définit un axe de pivotement 20a visible figures 2 et 3.

[0031] Comme le montrent les figures 1, 2 et 3, l'appareil de cuisson pour préparations pâtissières comprend un boîtier extérieur formé par une portion de boîtier de couvercle 24 et une portion de boîtier d'embase 14,
30 toutes deux typiquement réalisées en matière plastique. Le couvercle 20

comprend aussi des poignées latérales 25a et 25b, et une poignée avant 25c, afin de permettre à l'utilisateur d'ouvrir et fermer aisément le couvercle 20.

[0032] L'appareil de cuisson pour préparations pâtissières est également équipé d'une interface homme machine 15 (ou d'une interface de commande) qui comprend par exemple un afficheur et des boutons de commande pour permettre à l'utilisateur de définir des cycles de cuisson et de démarrer / arrêter l'appareil de cuisson pour préparations pâtissières. Comme on le voit sur les figures 1 et 3, l'interface homme machine 15 est située sur l'embase 10, sur la face avant de l'appareil de cuisson pour préparations pâtissières.

[0033] La figure 3 représente l'appareil de cuisson pour préparations pâtissières avec le couvercle 20 en première position relevée, de sorte à rendre accessible un espace de cuisson où se trouve un moule 40 avec plusieurs empreintes, pour recevoir et faire cuire des portions de pâte à gâteau, pour préparer des petits gâteaux. Comme cela sera expliqué ci-dessous, le moule 40 est amovible pour être changé et/ou nettoyé aisément.

[0034] La figure 3 montre aussi une cuve interne 21 du couvercle 20, qui vient en regard du moule 40 lorsque le couvercle 20 est en deuxième position abaissée, pour fermer un espace de cuisson.

[0035] En effet, la figure 4 représente une vue de côté en coupe de l'appareil de cuisson pour préparations pâtissières, où l'on voit la cuve interne 21 du couvercle 20 qui est au-dessus du moule 40, et en regard d'une cuve interne 11 de l'embase 10, afin de former une enceinte de cuisson fermée.

[0036] La figure 4 montre aussi un réflecteur 22 et une résistance électrique 23 embarqués sur le couvercle 20, ainsi qu'une résistance électrique 13 et un réflecteur 12 implantés dans l'embase 10. Le réflecteur 22 et le réflecteur 12 sont en regard l'un de l'autre, de sorte à former une enceinte de chauffe qui contient donc les résistances électriques 13 et 23 (formant des moyens de chauffe) et l'enceinte de cuisson formée par les cuves internes 11

et 21. Typiquement, les réflecteurs 12 et 22 sont métalliques, avec au moins leur face interne agencée pour réfléchir un rayonnement de chauffage (paroi brillante, ou polie, ou lisse).

[0037] L'enceinte de chauffe est donc un espace fermé qui englobe les moyens de chauffe et l'enceinte de cuisson sans les toucher, si bien que l'espace à chauffer est de faible volume et clos, ce qui limite la quantité d'énergie à fournir, ainsi que les pertes thermiques. De plus, la structure à double paroi (enceinte de cuisson et enceinte de chauffe) permet de chauffer de manière homogène l'espace de cuisson contenu dans l'enceinte de cuisson, ce qui procure des gâteaux cuits de manière homogène et reproductible dans un appareil de cuisson pour préparations pâtisseries compact.

[0038] On peut aussi remarquer que les résistances électriques 13 et 23 se trouvent plus proches des réflecteurs 12 et 22 respectivement que des cuves internes 11 et 21 respectivement, toujours pour chauffer de manière homogène avec peu de points chauds l'espace de cuisson.

[0039] On peut prévoir par exemple un volume de l'enceinte de chauffe inférieur ou égal à 5.5 litres, et pour un gâteau de 1 kg soit environ 780 ml de pâte avant cuisson, on peut faire la comparaison qui suit.

[0040] Dans un four de 38 litres il faudrait environ 9,5 minutes de préchauffe pour atteindre 200°C en chaleur tournante puis 50 minutes pour atteindre une bonne cuisson à cœur dans un plat en aluminium soit une dépense énergétique totale de 0.888 kWh.

[0041] Dans l'appareil proposé, le plat est déposé à froid dans l'enceinte de cuisson et après 42 mn on atteint une bonne cuisson à cœur soit une dépense énergétique totale de 0.301 kWh. La cuisson est donc plus rapide et requiert moins d'énergie.

[0042] Un ou plusieurs événements 31 (visible figure 5) sont nécessaires pour l'évacuation de la vapeur produite lors de la cuisson. Un

gâteau afin de former une croûte, ou des biscuits afin d'être croustillants doivent être desséchés en surface. La structure proposée par la présente invention consiste à traverser deux parois (enceinte de cuisson et enceinte de chauffe) pour évacuer cette vapeur d'eau. En effet la vapeur doit être dirigée
5 vers l'extérieur du produit et ne pas risquer de stagner en contact avec des parties sensibles comme les éléments chauffants. De plus, la structure proposée par la présente invention consiste à diriger la vapeur et l'air chauds vers des zones qui ne sont pas utilisées comme préhension par le consommateur, afin de ne pas le brûler.

10 [0043] En particulier, la figure 5 montre un évent 31, sous forme de tube, traverser la cuve interne 21 et le réflecteur 22 du couvercle 20 pour guider vapeur et air chauds vers l'arrière de l'appareil de cuisson pour préparations pâtissières, à bonne distance donc des poignées 25a, 25b, 25c et de l'interface homme machine 15.

15 [0044] De manière avantageuse, on peut donc prévoir que le moule 40 (typiquement un moule souple en silicone par exemple) est amovible, et la cuve interne 11 et/ou le réflecteur 12 de l'embase 10 comprennent des formes d'accostage ou empreintes pour accueillir le moule 40 et le positionner correctement dans l'enceinte de cuisson.

20 [0045] On peut prévoir également que la cuve interne 11 de l'embase soit elle-même amovible pour pouvoir la nettoyer ou l'échanger avec une autre cuve interne de forme différente.

[0046] On peut aussi prévoir une sole de cuisson 16 visible sur la figure 4 et positionnée entre la résistance électrique 13 et la cuve interne 11
25 de l'embase 10 pour homogénéiser encore plus la chauffe de la cuve interne 11. La sole de cuisson 16 est typiquement une tôle ondulée, ou gaufrée en métal avec de multiples perforations pour laisser un flux d'air s'installer entre la résistance électrique 13 et la cuve interne 11.

[0047] On peut prévoir cette sole de cuisson 16 amovible, et
30 même de la dimensionner pour qu'elle puisse alternativement se positionner

comme montré sur la figure 4 ou sous le moule 40 afin d'apporter un support. Dans ce dernier cas, la sole de cuisson 16 peut être accueillie directement dans la cuve interne 11, ou alors la cuve interne 11 est retirée et la sole de cuisson 16 est placée à une hauteur adéquate en s'accrochant sur le réflecteur 12 par exemple.

[0048] Enfin, la cuve interne 11 de l'embase entre en contact avec un palpeur de température qui permet de réguler les résistances électriques 13 et 23 en même temps. La résistance électrique 23 du couvercle 20 est pourvue également d'un limiteur pour éviter une surchauffe du couvercle 20 en cas de charge importante de produit dans la cuve interne 11 de l'embase.

[0049] On comprendra que diverses modifications et/ou améliorations évidentes pour l'homme du métier peuvent être apportées aux différents modes de réalisation de l'invention décrits dans la présente description sans sortir du cadre de l'invention.

15

REVENDICATIONS

1. Appareil de cuisson pour préparations pâtisseries comprenant une embase
5 (10) et un couvercle (20) articulé sur l'embase (10) entre une première position relevée pour permettre l'introduction d'une préparation pâtissière dans une enceinte de cuisson et une deuxième position abaissée pour former un boîtier de cuisson de la préparation pâtissière, le couvercle (20) et l'embase (10) comprenant chacun une portion du boîtier de cuisson et
10 des moyens de chauffage, ledit appareil étant caractérisé :
- en ce que le couvercle (20) et l'embase (10) comprennent chacun en outre un réflecteur (12, 22) et une cuve interne (11, 21),
 - en ce que, dans la deuxième position abaissée :
 - la cuve interne (21) du couvercle (20) et la cuve interne (11) de
15 l'embase (10) forment l'enceinte de cuisson agencée pour recevoir la préparation pâtissière,
 - le réflecteur (22) du couvercle (20) et le réflecteur (12) de l'embase (10) forment une enceinte de chauffe entourant l'enceinte de cuisson,
 - 20 - en ce que les moyens de chauffage du couvercle (20) et de l'embase (10) sont disposés entre l'enceinte de chauffe et l'enceinte de cuisson
 - et en ce que dans la deuxième position abaissée, le réflecteur (22) du couvercle (20) et le réflecteur (12) de l'embase (10) forment une enceinte de chauffe fermée.
- 25 2. Appareil de cuisson pour préparations pâtisseries selon la revendication 1 dans lequel, dans la deuxième position abaissée, la cuve interne (21) du couvercle (20) et la cuve interne (11) de l'embase (10) présentent chacune un bord périphérique en regard l'un de l'autre et/ou en contact l'un avec l'autre.

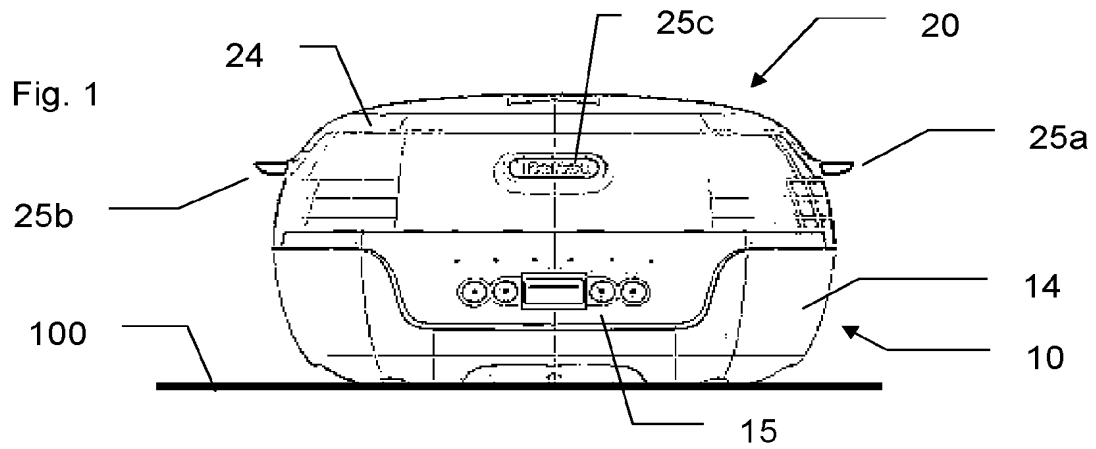
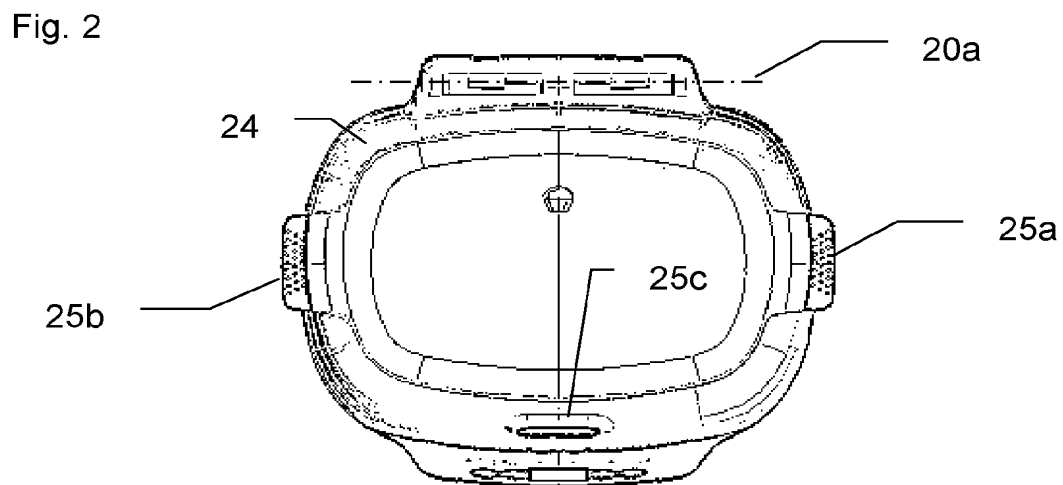
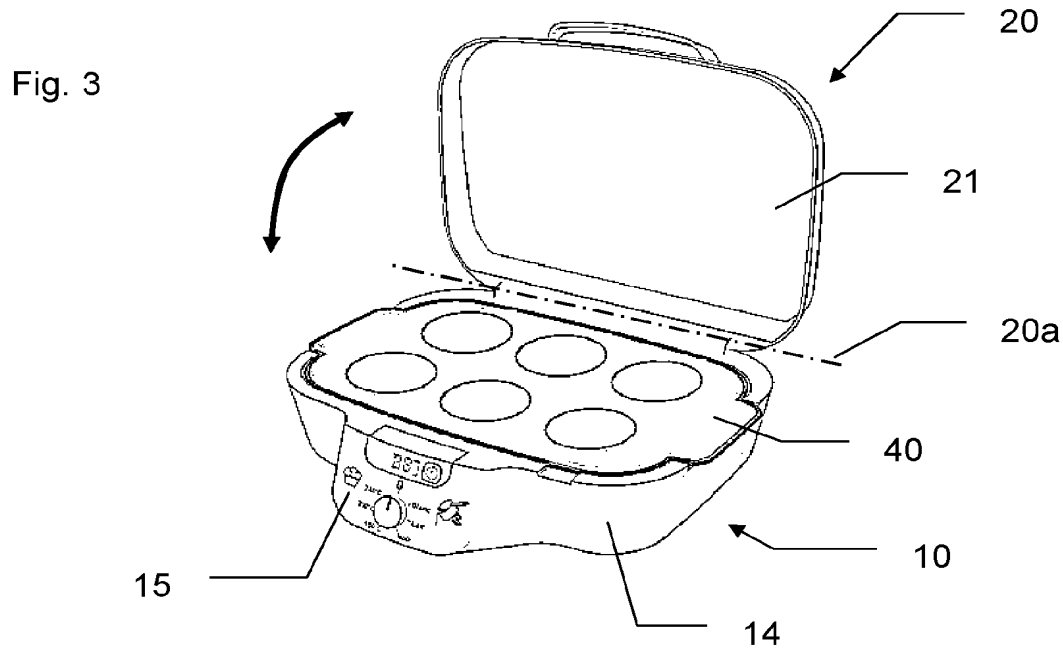
- 12 -

3. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes, dans lequel le couvercle (20) est articulé sur l'embase (10) selon une liaison pivot agencée sur une partie arrière de l'appareil, l'appareil comprenant des poignées latérales (25a, 25b) et une interface de commande (15) sur une partie avant de l'appareil, l'appareil comprenant en outre au moins un évent (31) agencé pour évacuer de la vapeur d'eau depuis l'enceinte de cuisson vers l'extérieur du boîtier de cuisson, en partie arrière de l'appareil de cuisson.
4. Appareil de cuisson pour préparations pâtissières selon la revendication précédente dans lequel l'évent (31) est un conduit formé par un tube avec une première extrémité donnant dans l'enceinte de cuisson, et une deuxième extrémité donnant sur l'extérieur de l'appareil de cuisson.
5. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes, dans lequel, dans la deuxième position abaissée, un espace entre les réflecteurs (12, 22) et les cuves internes (11, 21) est un espace fermé.
6. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes, dans lequel la cuve interne (11) de l'embase (10) est amovible.
7. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes, dans lequel le couvercle (20) et/ou l'embase (10) comprennent des moyens de mesure de température de leur cuve interne (11, 21) respective.
8. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes comprenant des moyens de commande de cuisson agencés pour commander indépendamment la chauffe des moyens de chauffage du couvercle (20) et la chauffe des moyens de chauffage de l'embase (10).

- 13 -

9. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes, dans lequel, dans la deuxième position abaissée, l'enceinte de chauffe présente un volume inférieur à 5.5 litres.
10. Appareil de cuisson pour préparations pâtissières selon l'une des
5 revendications précédentes, dans lequel dans le couvercle (20) et/ou l'embase (10), les moyens de chauffage sont agencés plus proches du réflecteur (12, 22) que de la cuve interne (11, 21).
11. Appareil de cuisson pour préparations pâtissières selon l'une des
10 revendications précédentes, comprenant des moyens de positionnement et de maintien, agencés pour positionner et maintenir un moule (40) amovible, tel qu'un moule en silicone, dans l'enceinte de cuisson.
12. Appareil de cuisson pour préparations pâtissières selon l'une des revendications précédentes, comprenant une sole de cuisson (16), dans lequel les moyens de chauffage de l'embase (10) sont agencés entre la sole
15 de cuisson (16) et le réflecteur (12) de l'embase (10).
13. Appareil de cuisson pour préparations pâtissières selon la revendication précédente, dans lequel la sole de cuisson (16) comprend une pluralité de perforations.
14. Appareil de cuisson pour préparations pâtissières selon l'une des
20 revendications 12 ou 13, dans lequel la sole de cuisson (16) est une paroi métallique, telle qu'une paroi en aluminium.

1/2



2/2

Fig. 4

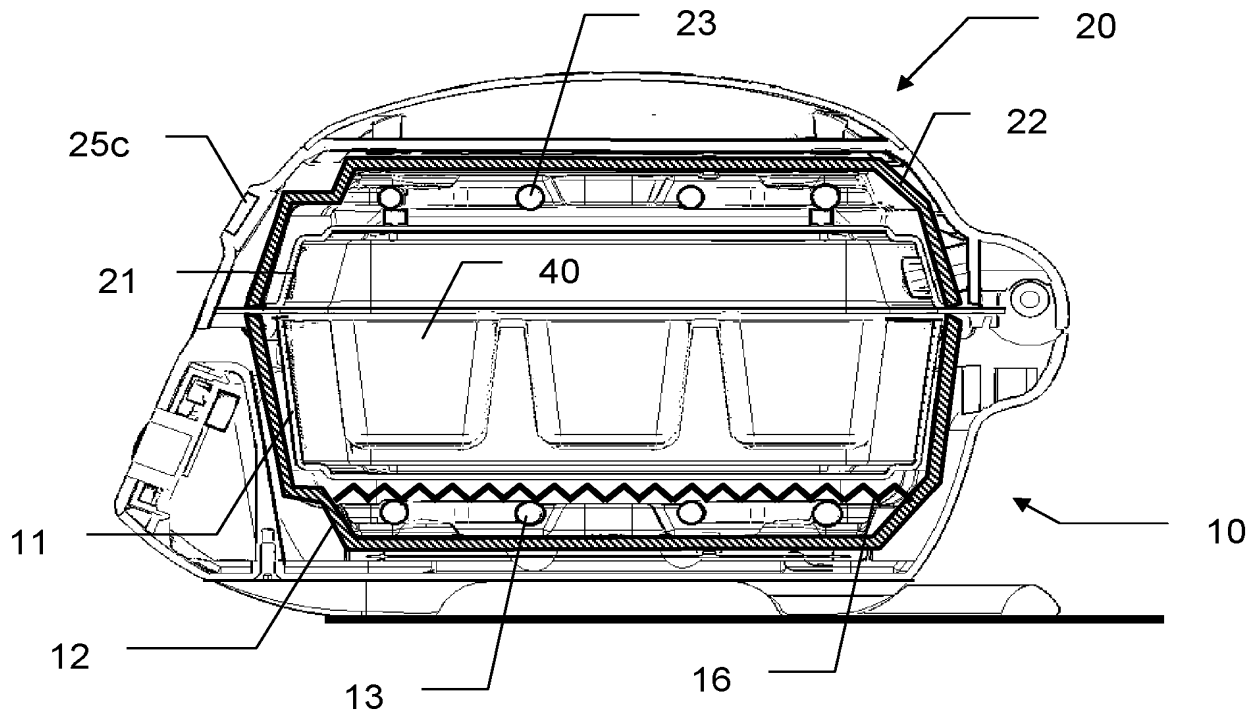
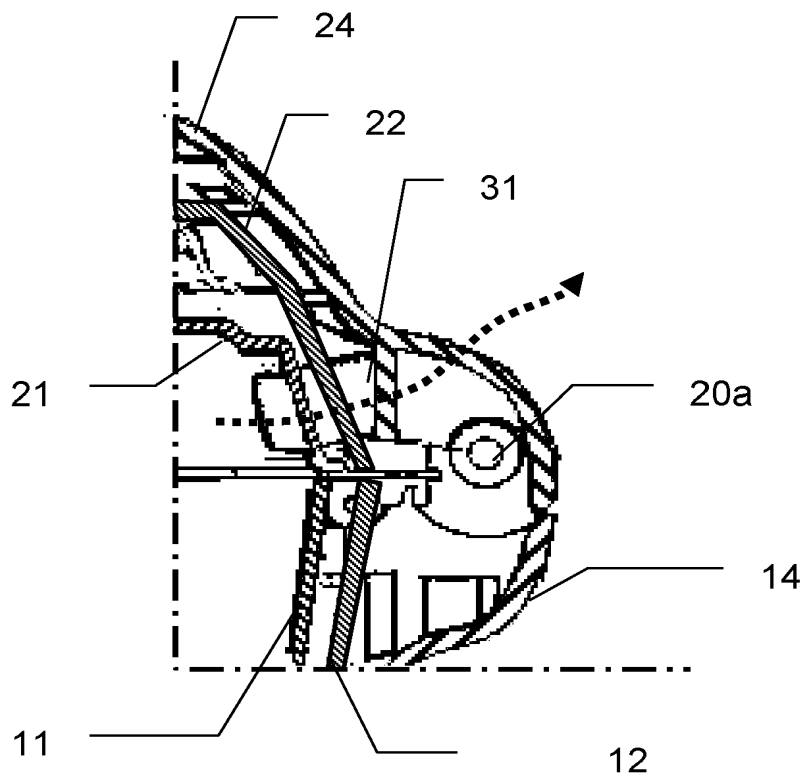


Fig. 5



INTERNATIONAL SEARCH REPORT

International application No

PCT/FR2018/052723

A. CLASSIFICATION OF SUBJECT MATTER

INV. F24C7/06 A47J37/06
ADD.

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

B. FIELDS SEARCHED

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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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 791 524 A1 (SEB SA [FR]) 6 October 2000 (2000-10-06) page 5, lines 16-19; claim 1; figures 1-2 page 4, lines 7-9 -----	1-14
A	WO 02/21985 A1 (SEB SA [FR]; PATENOTRE YVES [FR]) 21 March 2002 (2002-03-21) figure 1 -----	1-14
A	WO 2014/076511 A1 (MAVRIDIS VASILEIOS [GR]) 22 May 2014 (2014-05-22) figures 1-2 -----	1-14
A	DE 10 2014 227046 A1 (WMF CONSUMER ELECTRIC GMBH [DE]) 30 June 2016 (2016-06-30) figure 2 -----	1-14



Further documents are listed in the continuation of Box C.



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Date of the actual completion of the international search

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Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/FR2018/052723

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2791524	A1	06-10-2000	NONE	

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			WO 2014076511 A1	22-05-2014

DE 102014227046	A1	30-06-2016	NONE	

A. CLASSEMENT DE L'OBJET DE LA DEMANDE
 INV. F24C7/06 A47J37/06
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Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE

Documentation minimale consultée (système de classification suivi des symboles de classement)
 A47J F24C

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si cela est réalisable, termes de recherche utilisés)
 EPO-Internal

C. DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie*	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
X	FR 2 791 524 A1 (SEB SA [FR]) 6 octobre 2000 (2000-10-06) page 5, lignes 16-19; revendication 1; figures 1-2 page 4, lignes 7-9 -----	1-14
A	WO 02/21985 A1 (SEB SA [FR]; PATENOTRE YVES [FR]) 21 mars 2002 (2002-03-21) figure 1 -----	1-14
A	WO 2014/076511 A1 (MAVRIDIS VASILEIOS [GR]) 22 mai 2014 (2014-05-22) figures 1-2 -----	1-14
A	DE 10 2014 227046 A1 (WMF CONSUMER ELECTRIC GMBH [DE]) 30 juin 2016 (2016-06-30) figure 2 -----	1-14



Voir la suite du cadre C pour la fin de la liste des documents



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"&" document qui fait partie de la même famille de brevets

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RAPPORT DE RECHERCHE INTERNATIONALE

Renseignements relatifs aux membres de familles de brevets

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Document brevet cité au rapport de recherche		Date de publication	Membre(s) de la famille de brevet(s)	Date de publication
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DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, 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,
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SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
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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).

(54) Title: MULTI-FUNCTION CONVERTIBLE COOKING APPLIANCE

(57) Abstract: The present invention relates to a multi-function convertible cooking appliance used for cooking, comprising in its most basic form, at least one lower body, at least two side walls rotatably connected to two opposite edge portions of the lower body, at least one rear wall rotatably connected, at least one front door connected to the lower body, at least one upper wall connected to two opposite upper portions of the side walls, and heaters used for heating, provided on at least one of the front and rear surfaces of the lower body, rear wall and the upper wall.

WO 2019/129598 A1

Description**MULTI-FUNCTION CONVERTIBLE COOKING APPLIANCE**

[0001] TECHNICAL FIELD

[0002] The present invention relates to a multi-function convertible cooking appliance which can be converted to cooking appliances such as an oven, cooking range, contact grill or barbecue thanks to being foldable.

[0003] PRIOR ART

[0004] In the state of the art, there are kitchen type cooking ranges having at least one heater on an upper surface and used to heat a container placed thereon, kitchen type ovens used for cooking in an enclosed space, as well as contact grills formed by attaching by means of hinges two metal parts in between which food products are cooked. Such type of kitchen appliances are characterized by cooking food products through a heater provided on at least one surface. However, discretely such appliances occupy a large space in a kitchen and create problems in processes such as moving out of a home. In addition, each appliance has a separate cost for a user, and using each appliance separately adversely affects a user's ergonomics.

[0005] State of the art patent document no.US2015/0289715 mentions a foldable oven toaster having a metal body, with the function of warming or cooking the food products therein by being heated by means of camp fire, propane barbecue or any heater.

[0006] State of the art patent document no. WO2015/161110 (A1) mentions using a thin film structure as the heating member in contact grills.

[0007] In the state of the art, there is no system or structure having electrical heater, combining three separate functions, and is of foldable characteristic.

[0008] PROBLEMS SOLVED BY THE INVENTION

[0009] The aim of the present invention is to realize a multi-function convertible cooking appliance which can be used as a contact grill, oven, cooking range and barbecue by means of being folded.

[0010] Another aim of the present invention is to realize a multi-function convertible cooking appliance occupying a small space, enabling effective

heating with the minimum number of heaters, and achieving maximum energy efficiency.

[0011] DETAILED DESCRIPTION OF THE INVENTION

[0012] The multi-function convertible cooking appliance used for cooking, comprises

- at least one lower body,
- at least two side walls comprising of a first wall and a second wall foldable on each other, rotatably connected to two opposite edge portions of the lower body,
- at least one rear wall connected between two opposite side walls so as to be rotatable about an edge of the lower body,
- at least one front door connected on the body between two opposite side walls,
- at least one upper wall connected to two opposite upper portions of the side walls, and
- heaters used for heating, provided on at least one of the front and/or rear surfaces of the lower body, rear wall and the upper wall.

[0013] The cooking appliance of the invention comprising of two side walls placed on a lower body, a rear wall and a front door provided between the side walls, an upper wall connected to the side walls complementing the cubical structure, and heaters provided on the walls. A lower body is provided in the cooking appliance of the invention, and the side walls, the rear wall and the front door are connected to the lower body so as to be foldable into the lower body. The lower body rests stationary, and the heaters act as an oven, a cooking range, a contact grill or a barbecue thanks to the sliding and folding movements of the side walls, the rear wall, the front door and the upper wall.

[0014] In the cooking appliance of the invention, the side walls comprise two parts, namely a first wall rotatably connected to the lower body, and at least one second wall connected to the first wall and the upper wall, and the first part and the second part are able to fold about their connection portions. The first wall and the second wall can be closed into the lower body by a folding motion by moving the side walls downwards. The rear

wall is rotatably connected on the lower body and can be optionally closed onto the lower body. The front door is connected on the lower body by means of a sliding mechanism, and if preferred, the front door can be closed into a seat provided on the front surface of the lower body by means of a rotational and sliding motion.

- [0015] In the cooking appliance of the invention, a cubical structure forms by the side walls the front door and the rear wall extending preferably vertically on the lower body and the upper wall covering the upper portion thereof. The cooking appliance heats a substance (e.g. a food product, etc.) placed in the internal compartment and acts as an oven, by activation of at least one of the heaters provided on the internal portions of the lower body, the rear wall and the upper wall.
- [0016] The cooking appliance of the invention assumes a shape such that the upper wall is disposed on the upper portion of the lower body by rotationally closing the rear wall and foldingly closing the side walls on the lower body, and placing the front door into the seat provided on the lower body. In this manner, a container (a cooking pot, pan, etc.) placed on a heater is heated by activating the heater provided on the external portion of the upper wall and the assembly acts as a cooking range.
- [0017] In the cooking appliance of the invention, by placing the front door in the seat of the lower body and foldingly closing the side walls and therefore closing the upper wall into the lower body, the rear wall rests vertically. The rear wall is thus enabled to press on the upper wall by a rotational motion, and the assembly acts as a contact grill by heating and compressing a food product (a toast, etc.) placed in between the rear wall and the upper wall upon activating the heater provided on the rear wall. In the contact grill configuration, upon activating the external heater of the upper wall and the heater of the rear wall heat is dissipated from both sides and the assembly acts as a barbecue.
- [0018] In an embodiment of the invention, each of the rear wall and the opposite side walls are connected to the lower body by means of a hinge, and become capable of rotating easily thanks to the hinges. In another embodiment of the invention, the first wall and the second wall are

connected to each other by means of a hinge.

- [0019] In an embodiment of the invention, an additional door is provided on the front door, and when the appliance functions as a cooking range, food products can be placed therein through this additional door.
- [0020] In an embodiment of the invention, the front door is made of glass.
- [0021] In an embodiment of the invention, the front door is connected on the lower body by means of a hinge and bolt assembly.
- [0022] In an embodiment of the invention, a control unit is provided which is used for activating the heaters.
- [0023] In an embodiment of the invention, buttons are provided on the lower body or on a remote controller, and the control unit activates related heaters upon a user selecting a related structure (e.g. the oven, cooking range, contact grill, or the barbecue).
- [0024] Upon selection of the oven, the control unit activates the heaters provided on the internal portions of the lower body, rear wall and the upper wall.
- [0025] Upon selection of the cooking range, the control unit activates the heaters provided on the external portion of the upper wall.
- [0026] Upon selection of the contact grill, the control unit activates the heaters provided at the rear wall portion.
- [0027] Upon selection of the barbecue, the control unit activates the heaters provided at the external portions of the rear wall and the upper wall.

Claims

1. A multi-function convertible cooking appliance used for cooking, **comprising**
 - at least one lower body,
 - at least two side walls comprising a first wall and a second wall foldable on each other, rotatably connected to two opposite edge portions of the lower body,
 - at least one rear wall connected between two opposite side walls so as to be rotatable about an edge of the lower body,
 - at least one front door connected on the lower body between two opposite side walls,
 - at least one upper wall connected to two opposite upper portions of the side walls, and
 - heaters used for heating, provided on at least one of the front and/or rear surfaces of the lower body, rear wall and the upper wall.
2. A cooking appliance according to claim 1, **comprising** a rear wall and a side wall, each connected on the lower body by means of a hinge.
3. A cooking appliance according to claim 1, **comprising** a first wall and a second wall connected to each other by means of a hinge.
4. A cooking appliance according to claim 1, **comprising** at least one additional door which is provided on the front door and can be opened and closed.
5. A cooking appliance according to claim 1, **comprising** a front door made of glass.
6. A cooking appliance according to claim 1, **comprising** a front door connected on the lower body by means of a hinge and bolt assembly.
7. A cooking appliance according to claim 1, **comprising** a control unit used for activating the heaters.
8. A cooking appliance according to claim 1 or 7, **comprising** buttons provided on the lower body or on a remote controller for a user selecting the functions.
9. A cooking appliance according to claim 8 or 9, **comprising** a control unit activating the related heaters upon a user selecting one of the options of oven, cooking range, contact grill or barbecue by means of the buttons.
10. A cooking appliance according to claim 7, 8 or 9, **comprising** a control unit activating the heaters provided at the internal portions of the lower body, rear

wall and the upper wall upon selection of the oven.

11. A cooking appliance according to claim 7, 8 or 9, **comprising** a control unit activating the heater provided at the external portion of the upper wall upon selection of the cooking range.
12. A cooking appliance according to claim 7, 8 or 9, **comprising** a control unit activating the heater provided at the rear wall portion upon selection of the contact grill.
13. A cooking appliance according to claim 7, 8 or 9, **comprising** a control unit activating the heaters provided at the external portions of the rear wall and the upper wall upon selection of the barbecue.
14. A cooking appliance according to claim 1, **comprising** a heater provided on the front and rear surfaces of the lower body, rear wall and the upper wall.

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. F24C1/16 F24C7/10 A47J37/07
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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F24C A47J F24B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 812 839 A (HELGESON P) 28 May 1974 (1974-05-28) figures 2,3,8 -----	1-14
Y	US 4 569 327 A (VELTEN S DEAN [US]) 11 February 1986 (1986-02-11) figures 1,2 -----	1-14
A	US 3 698 376 A (WEBB LOUIS R) 17 October 1972 (1972-10-17) figure 1 -----	1-14
A	US 1 396 059 A (REPPETTO HARVEY B) 8 November 1921 (1921-11-08) figures 1-6 -----	1-14
A	US 4 714 013 A (TELFER TERRENCE D [US]) 22 December 1987 (1987-12-22) figure 1 -----	1-14



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"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

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/086039

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 3812839	A	28-05-1974	NONE	
US 4569327	A	11-02-1986	NONE	
US 3698376	A	17-10-1972	NONE	
US 1396059	A	08-11-1921	NONE	
US 4714013	A	22-12-1987	NONE	

Published:

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

DESCRIPTION**PORTABLE DUAL FUNCTION BARBEQUE**

The present invention relates to a special design barbeque providing the
5 novelty of dual function, i.e. a baking oven underside and a barbeque apparatus
topside.

The invention will become apparent with reference to the accompanying
drawings, in which it is illustrated.

Figures 1a-c show the barbeque lid, the baking plate and the baking oven,
10 respectively.

Figure 2 shows the front view of the portable dual function barbeque in
section.

In order to achieve the purpose of this novelty, the device shown in
Fig.1a-c has been devised, which consists of the following parts:

15 The baking plate, Fig.1b, carrying at the upper side wavy grooves (7) for
the grease to flow under the food to the grease collection receptacle (15) and
borders (6) at the three sides extending upwardly to maintain the temperature, as
long as baking is performed in open air. The lower part of the baking plate is flat
for uniform temperature distribution with four circumferential borders (5)
20 extending downwardly to keep a large part of the heat at the base of the baking
plate, Fig.1b, the remainder being driven downwards to achieve the operation of
the baking oven, Fig.1c.

The downwardly extending borders (5) have four semicircular notches (8)
for seating on the support rods (17) of the plate which are fastened at the two
25 longitudinal sides (9) of the baking oven, Fig.1c, the latter having four sides (9)
elevating up to the level of the baking plate, Fig.1b, a perimeter gap formed
therebetween so as to preserve the combustion and maintain the maximum
temperature inside the baking oven, Fig.1c.

Of the four sides of the oven (9), one operates as an oven drawer (14)
30 where the food is placed and at the same time inspection and safe replacement of
the combustion units is conducted, the receptacles being installed for safe transport
and operation within sheet metal holes (11), the sheet secured at the centre of the
base of the baking oven drawer (14).

Inside the oven there is the grease collector (15).

At the bottom outside the oven, Fig.1c, there are four adjustable legs (16) for levelling the barbeque.

Finally, the upper part is the lid (1), Fig.1a which has four safety-locks (4), a transfer handle (3) and two fastening points (2a) to fasten the shoulder strap (2) for transportation.

In its application the present invention functions as follows:

Unlock the lid (1), Fig.1a, and remove it. Then the drawer (14) of the baking oven, Fig.1c, is opened and the combustion units (12) are installed in the predetermined places (10). On both sides thereof, food can be placed for baking.

The combustion units (12) are lit up and the drawer is closed (14). Within 4-5 minutes, the baking plate, Fig.1b, is heated and food baking may start on it.

Depending on the desired amount of food for baking, one to four combustion units (12) may be used.

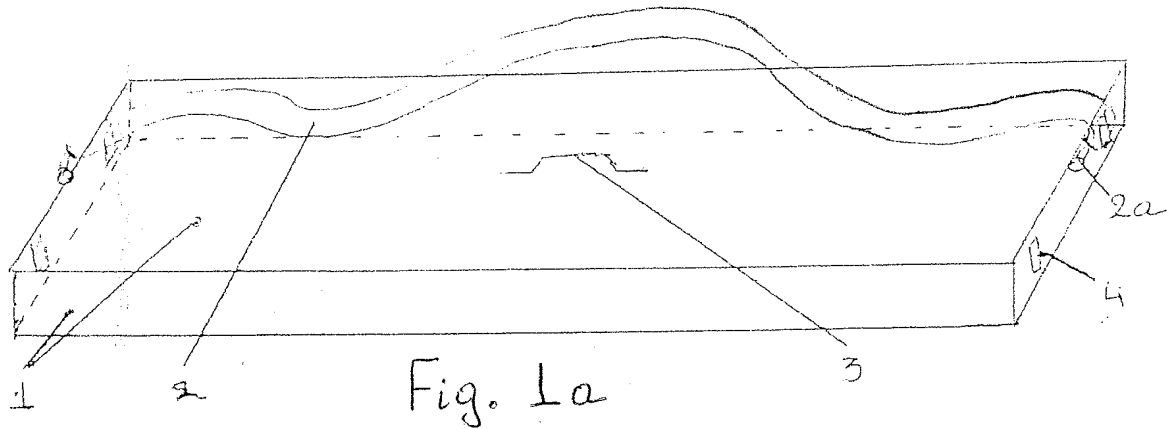
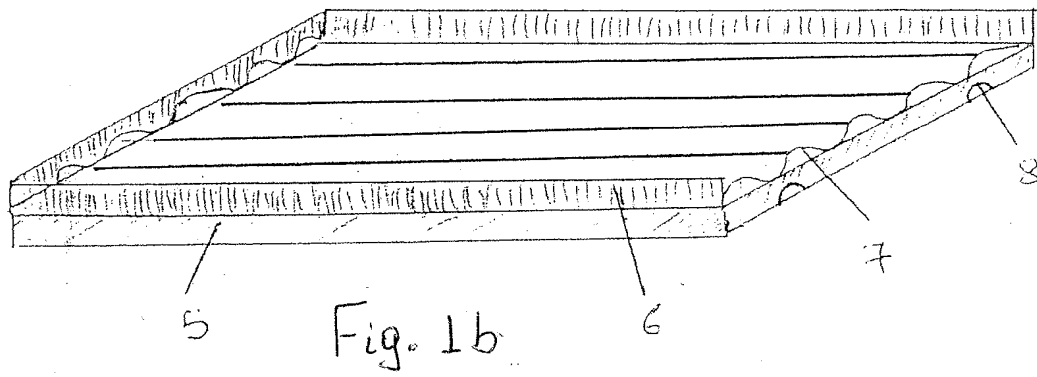
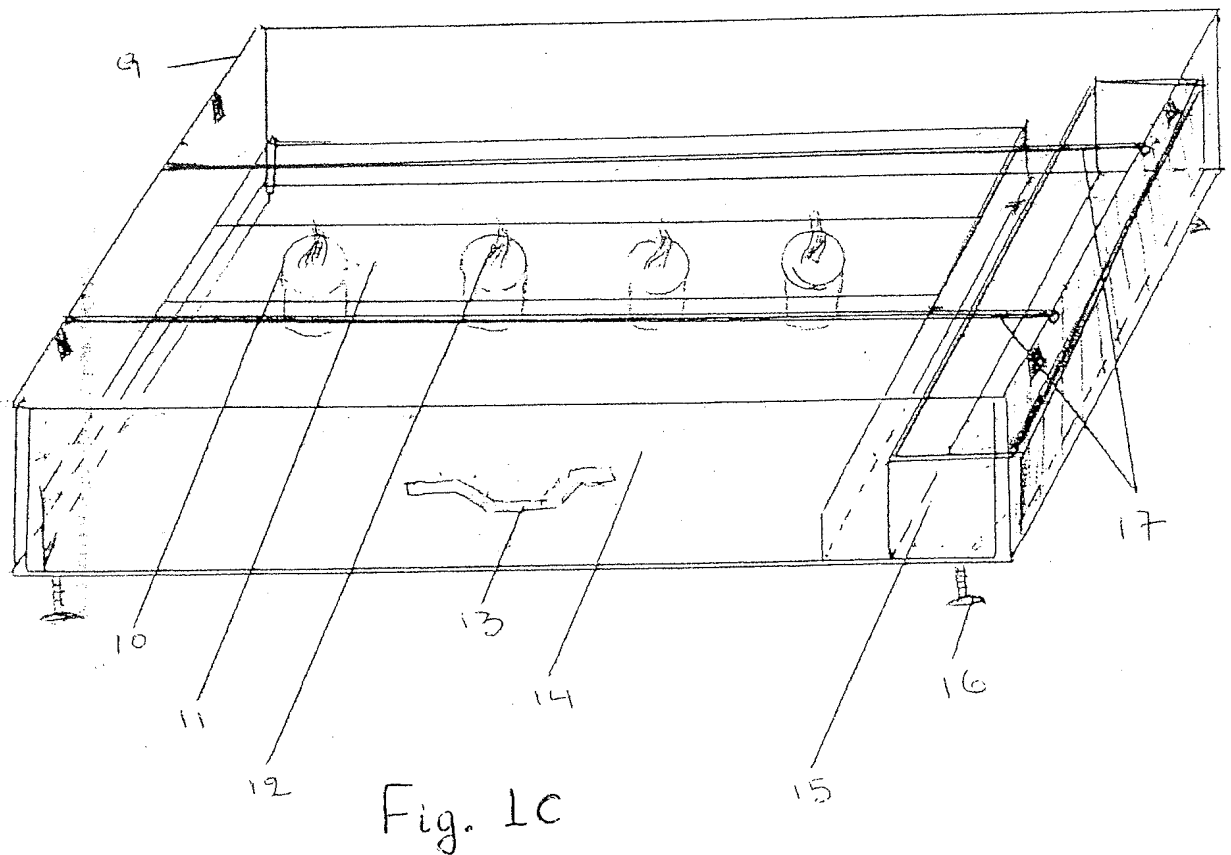
The baking plate of the portable dual function barbeque is exactly at the proper height from the flame (21) while also providing the ideal gap around the baking plate and the sides of the oven (9) to achieve the maintenance of combustion as also the maintenance of the maximum temperature inside the oven, wherein the oxygenated air (18) enters through the outer perimeter gap, following the path near the oven side (9) downwards (19) and then from the lower point (20), approaches and feeds the flame (21), allowing for the hot air to circulate in the rest of the room, the air course starting from the base of the baking plate and in a horizontal path outwards encountering the downwardly extending borders which divert the hot gas flow downwardly (25) to avoid the perpendicular encounter and cut off of the introductory course of the oxygenated air (18). The other advantage of this deflection is that the hot air stays for much longer in the oven, which can then act as food baking oven with a fairly satisfactory temperature.

CLAIMS

1. A portable dual function barbeque consisting of a baking plate seated on horizontal positioning rods (17), a baking oven, within which there is an oven drawer (14) and a grease collection receptacle (15), and a lid (1), characterized in
5 that at the centre of the bottom of the oven drawer (14) there is a combustion unit support base (11) with four holes (10) for the safe instalment of combustion units (12), the remainder empty space intended for food baking.

2. Portable dual function barbeque according to claim 1, characterized by said food baking plate, which is mounted on the support rods (17), the plate carrying at
10 its upper part along its entire length wavy grooves (7) for the flow of the grease while baking the food, the grease flowing into the grease collector (15), the perimeter of the upper part having three upwardly extending borders (6) for maintaining the temperature during baking in open air, while at the lower part the base is flat for equal temperature distribution and has four downwardly extending
15 borders (5) at the perimeter to maintain the temperature and to cause the remainder heat to transfer downwards to the baking oven, the two lateral downwardly extended borders being each equipped with two semicircular notches (8) for mounting the baking plate on the two rods (17), where the two semicircular notches (8) located above the grease collector (15) have a higher opening and
20 above them is located the side of the baking plate lacking upwardly extending edge, whereby the plate is appropriately tilted for the grease to flow in the grease collector (15).

3. Portable dual function barbeque according to claims 1 and 2, characterized in that said lid (1) closes the barbeque and has four safety-locks (4), a transfer
25 handle (3) and a transportation belt (2) which is secured at the two fastening points (5).



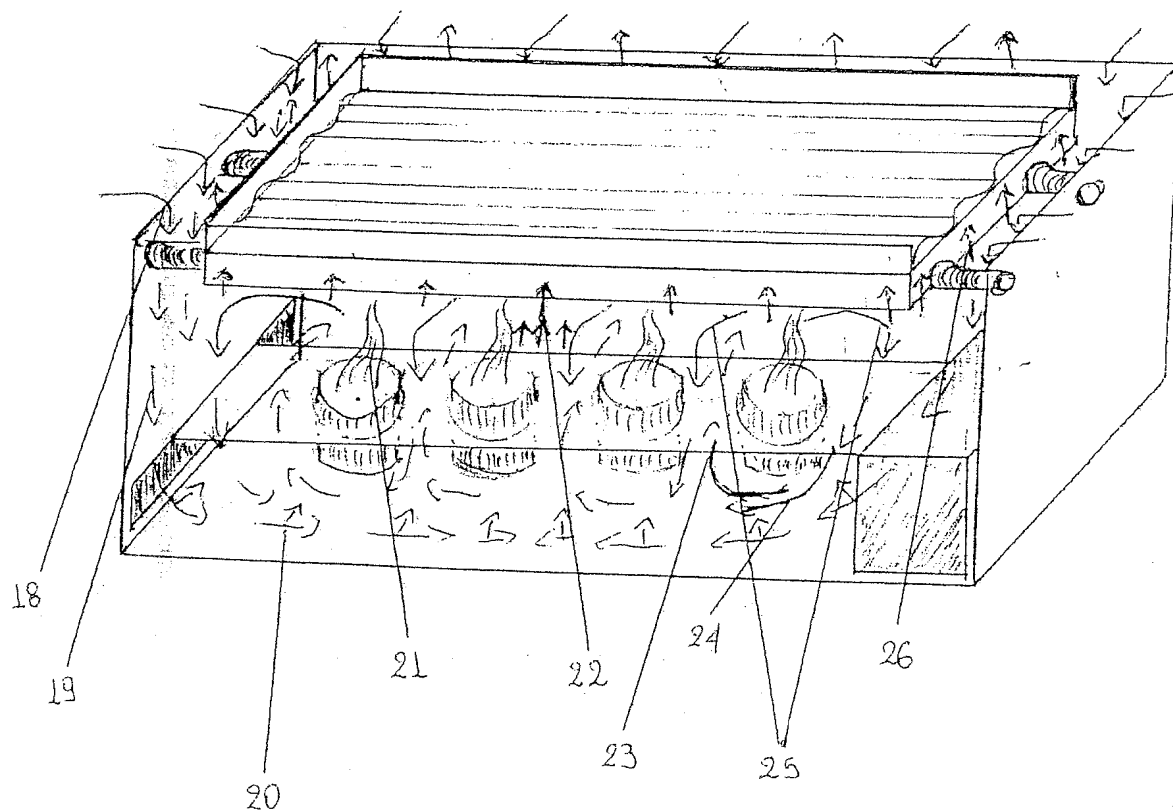


Fig. 2

INTERNATIONAL SEARCH REPORT

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47J

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	CN 202 477 407 U (ZHENGWEI CHEN) 10 October 2012 (2012-10-10)	1
A	figures 1-3 paragraph [0016] - paragraph [0017] abstract the whole document	2,3
A	----- US 2014/290498 A1 (CHEN J; CHEN Y; XU L; ZOU Y) 2 October 2014 (2014-10-02) figures 3, 4, 10-12 paragraph [0034] - paragraph [0035] ----- -/-	1-3



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

"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

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 NL - 2280 HV Rijswijk
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 Fax: (+31-70) 340-3016

Authorized officer

Ulubay, Can

INTERNATIONAL SEARCH REPORT

International application No

PCT/GR2019/000031

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>Anonymous: "BBQ-TORO Edelstahl Grillplatte, BBQ Plancha, rechteckig, 26 x 43,4 cm, universal und massiv, Grillblech, Bratplatte für Holzkohle-, Gasgrill und mehr",</p> <p>19 October 2016 (2016-10-19), XP055599478, Amazon.de</p> <p>Retrieved from the Internet: URL: https://www.amazon.de/Grillplatte-rechteckig-Grillblech-Bratplatte-Holzkohle/dp/B074TFYW62/ref=sr_1_14?_mk_de_DE=AMAZON&crd=F6931B80NV35&keywords=plancha+grillplatte&qid=1561470332&s=gateway&srefix=plancha,aps,208&sr=8-14 [retrieved on 2019-06-25] figure 1 the whole document</p> <p>-----</p>	1-3
A	<p>KR 2009 0058116 A (HONG JI UN [KR]) 9 June 2009 (2009-06-09) figures 4, 5 the whole document</p> <p>-----</p>	1-3
A	<p>GB 2 461 402 A (PLUM PRODUCTS LTD [GB]) 6 January 2010 (2010-01-06) claim 5; figures 2, 6</p> <p>-----</p>	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GR2019/000031

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
CN 202477407	U	10-10-2012	NONE	
US 2014290498	A1	02-10-2014	CN 104068754 A	01-10-2014
			US 2014290498 A1	02-10-2014
KR 20090058116	A	09-06-2009	NONE	
GB 2461402	A	06-01-2010	GB 2461402 A	06-01-2010
			WO 2010001135 A1	07-01-2010

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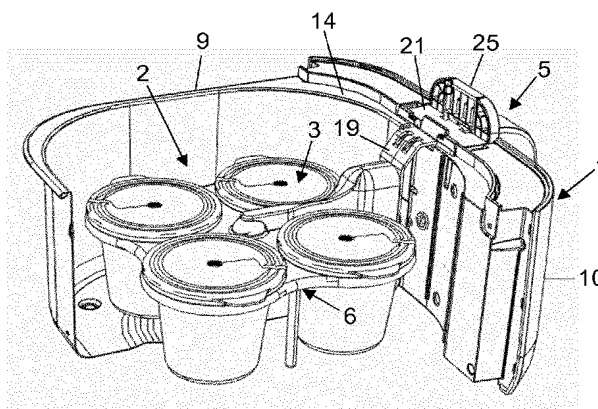
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90229, 69134 ECULLY CEDEX (FR).

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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, JO, 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,

(54) Title: COOKING APPLIANCE OF THE HOT AIR DEEP-FAT FRYER TYPE WITH COOKING ACCESSORIES FOR VARIOUS FOOD PREPARATIONS

(54) Titre : APPAREIL DE CUISSON DU TYPE FRITEUSE A AIR CHAUD AVEC ACCESSOIRES DE CUISSON POUR DIVERSES PREPARATIONS ALIMENTAIRES

Figure 1



(57) Abstract: The invention relates to a cooking appliance of the hot air deep-fat fryer type, comprising a vat (1), a basket (4) and at least one accessory (2), the basket or the at least one accessory being able to be detachably positioned in the vat, characterised in that said appliance comprises a handling system (5) configured to be detachably assembled with the basket or with the at least one accessory so as to allow either the pan or the at least one accessory to be handled so that it can be introduced into the vat and removed from the vat. Said accessory (2) can comprise at least one verrine (3) and a support (6) for the at least one verrine, for preparing verrines. This accessory can also comprise a grill for preparing snacks, a plate for preparing grilled food, a cake mould and/or skewers for preparing kebabs.

(57) Abrégé : L'invention concerne un appareil de cuisson du type friteuse à air chaud, comprenant une cuve (1), un panier (4) et au moins un accessoire (2), le panier ou l'au moins un accessoire pouvant être positionné de manière amovible dans la cuve, caractérisé en ce que ledit appareil comprend un système de manipulation (5) configuré pour être assemblé de manière amovible avec le panier ou avec l'au moins un accessoire de sorte à permettre la manipulation soit du panier soit de l'au moins un accessoire pour son insertion dans la cuve et son retrait de la cuve. Cet accessoire (2) peut comprendre au moins une verrine (3) et un support (6) de l'au moins une verrine, pour la préparation de verrines. Cet accessoire peut également comprendre une grille pour la préparation de snacking, une plaque pour la préparation de grillade, un moule à gâteau et/ou des pics pour la préparation de brochettes.

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) États désignés (*sauf indication contraire, pour tout titre de protection régionale disponible*) : ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), eurasien (AM, AZ, BY, KG, KZ, RU, TJ, TM), européen (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).

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APPAREIL DE CUISSON DU TYPE FRITEUSE A AIR CHAUD AVEC
ACCESSOIRES DE CUISSON POUR DIVERSES PREPARATIONS
ALIMENTAIRES

5

Domaine technique

La présente invention concerne un appareil de cuisson du type friteuse à air chaud. L'invention vise en particulier à accessoriser ledit appareil pour
10 permettre la préparation de diverses recettes au moyen de divers modes de cuisson, par exemple la préparation de verrines chaudes, de brochettes, des plats de type snacking, des gâteaux, etc.

Etat de la technique

15 Les appareils de cuisson du type friteuse à air chaud sont connus de l'homme du métier. De tels appareils permettent de réduire fortement la quantité de matière grasse, voire de la supprimer complètement, pendant la cuisson des aliments qui peuvent être d'origine végétale ou animale, par exemple des frites, des légumes, de la viande ou du poisson. En effet, la cuisson s'effectue avec
20 peu ou pas d'huile grâce à de l'air chaud circulant dans une chambre de cuisson, ce qui permet de consommer des aliments plus diététiques, croustillants à l'extérieur et moelleux à l'intérieur. Etant donné la réduction ou la suppression de l'huile pour la cuisson, ces appareils dégagent moins d'odeurs et de graisses ; leur nettoyage est en outre simplifié.

25

Un appareil de cuisson du type friteuse à air chaud comprend généralement une cuve qui reçoit un panier dans lequel sont disposés des aliments à cuire. Une fois les aliments disposés dans le panier et celui-ci positionné dans la cuve, l'appareil de cuisson peut être fermé pour former une chambre de cuisson
30 incorporant la cuve, le panier et les aliments. De l'air chaud est ensuite pulsé dans cette chambre au moyen d'un système de soufflage d'air chaud présent sur ledit appareil, la circulation de l'air chaud assurant ainsi la cuisson des

aliments. Une poignée de manipulation est fixée au panier afin de pouvoir extraire celui-ci de la cuve sans se brûler et retirer les aliments en fin de cuisson.

- 5 Certains appareils de cuisson de type friteuse à air chaud comprennent des accessoires complémentaires permettant d'étendre les fonctions de ces appareils. En effet, la cuisson se faisant au moyen de l'air chaud soufflé dans la chambre, il est possible d'envisager l'utilisation de ces appareils pour d'autres préparations culinaires. Par exemple, la friteuse à air chaud de la marque
- 10 ACTIFRY®, développée par la demanderesse, prévoit un accessoire pour la préparation de verrines chaudes et un accessoire pour la préparation de snackings. L'accessoire pour la préparation de verrines chaudes comprend quatre verrines et un support comportant quatre zones de réception de ces quatre verrines. Cet accessoire pour la préparation de verrines chaudes est
- 15 placé dans la cuve de la friteuse à air chaud en lieu et place du panier qui est habituellement disposé dans cette cuve pour recevoir les aliments à cuire. De même, l'accessoire pour la préparation de snacking peut comprendre une grille placée soit en lieu et place du panier habituellement disposé dans la cuve, soit au-dessus du panier.

20 Résumé de l'invention

- La présente invention met en œuvre un appareil de cuisson de type friteuse à air chaud qui comporte au moins un accessoire de cuisson, la conception dudit appareil facilitant la manipulation de l'au moins un accessoire de cuisson en
- 25 toute sécurité, sans risque de se brûler. Un autre but de la présente invention est de permettre la mise en œuvre d'une gamme étoffée d'accessoires de cuisson, chaque accessoire de cuisson pouvant être placé dans une cuve et manipulé très aisément et en toute sécurité. Dans la suite de la description, le terme accessoire est employé pour définir l'accessoire de cuisson.

30

Selon l'invention, l'appareil de cuisson de type friteuse à air chaud, comprend une cuve, un panier et au moins un accessoire. Le panier ou l'au moins un accessoire peuvent être positionnés, l'un ou l'autre, de manière amovible dans

la cuve ; en d'autres termes, soit le panier est placé dans la cuve soit l'accessoire est placé dans la cuve.

Bien entendu, l'appareil de cuisson selon l'invention comprend d'autres caractéristiques semblables aux appareils de cuisson traditionnels qui permettent de constituer une chambre de cuisson intégrant la cuve avec le panier ou l'accessoire une fois ledit appareil fermé, un système de soufflage d'air chaud incorporé dans ledit appareil permettant de pulser de l'air chaud dans cette chambre. L'air chaud pulsé circule dans la chambre et dans la cuve qui contient le panier ou l'accessoire, assurant ainsi la cuisson des aliments placés dans le panier ou dans l'accessoire.

Selon l'invention, l'appareil de cuisson comprend un système de manipulation configuré pour être assemblé de manière amovible avec le panier ou avec l'au moins un accessoire de sorte à permettre la manipulation soit du panier soit de l'au moins un accessoire pour son insertion dans la cuve et son retrait de la cuve. Cela permet de manipuler en toute sécurité, au moyen d'un seul et même ustensile, tant le panier que l'accessoire une fois la cuisson des aliments réalisée.

Selon l'invention, le système de manipulation comprend une poignée de manipulation et un premier dispositif d'assemblage agencé entre la poignée de manipulation et le panier ou l'accessoire pour assembler de manière amovible la poignée de manipulation avec le panier ou avec l'accessoire. Selon une réalisation, ce premier dispositif d'assemblage comprend au moins deux pattes de support fixées respectivement sur le panier et sur l'au moins un accessoire ; en d'autres termes, ce premier dispositif d'assemblage comprend une patte de support sur le panier et une patte de support sur chacun des accessoires. En outre, un logement est agencé sur un corps fixé à la poignée de manipulation pour recevoir l'une ou l'autre des pattes de support, des premiers moyens de verrouillage permettant la solidarisation de la patte de support logée dans le corps. Selon une réalisation, ces premiers moyens de verrouillage comprennent au moins une gâche agencée sur chaque patte de support, au moins un pêne

agencé dans le corps pour s'engager dans l'au moins une gâche lorsque la patte de support est logée dans le corps et un mécanisme d'actionnement de l'au moins un pêne.

- 5 Selon l'invention, l'appareil de cuisson comprend un corps principal, la cuve étant amovible du corps principal. En outre, le système de manipulation comprend un second dispositif d'assemblage agencé entre la cuve et la poignée de manipulation pour assembler de manière amovible la poignée de manipulation avec la cuve, ladite poignée de manipulation étant assemblée ou
10 non avec le panier ou avec l'un des accessoires. Selon une mise en œuvre bien connue sur les appareils de cuisson traditionnels avec une cuve amovible, l'insertion de la cuve dans le corps et son retrait de celui-ci s'effectue à la manière d'un tiroir, en tirant ou en poussant sur la poignée de manipulation. Cette insertion de la cuve dans le corps à la manière d'un tiroir permet de
15 fermer l'appareil de cuisson et de constituer la chambre de cuisson, intégrant ladite cuve. Bien entendu, l'invention reste applicable aux appareils de cuisson de type friteuse à air chaud avec cuve fixe.

- Ainsi, le système de manipulation comprend une seule poignée de manipulation
20 qui peut être fixée sur le panier seulement, sur l'au moins un accessoire seulement, sur la cuve seulement, à la fois sur le panier et sur la cuve, ou à la fois sur l'accessoire et sur la cuve. Grâce aux premier et second dispositifs d'assemblage, le système de manipulation permet soit de manipuler concomitamment la cuve avec le panier ou l'accessoire incorporé dans celle-ci,
25 soit de manipuler le panier ou l'accessoire seul, libéré et dégagé de la cuve, soit de manipuler la cuve seule, libérée et dégagée du panier ou de l'accessoire, de sorte à permettre un premier mode de cuisson d'aliments dans le panier incorporé dans la cuve, au moins un second mode de cuisson d'aliments au moyen de l'au moins un accessoire incorporé dans la cuve et un troisième
30 mode de cuisson d'aliments directement dans la cuve, le panier et l'accessoire étant extraits de celle-ci. En d'autres termes, le système de manipulation permet de modifier la configuration de l'appareil de cuisson pour utiliser celui-ci :

- soit comme un appareil de cuisson traditionnel (premier mode de cuisson), la capacité de cuisson étant définie par le volume du panier dans lequel sont placés les aliments à cuire, la manipulation du panier assujetti ou non à la cuve s'effectuant grâce au système de manipulation,
- soit comme un appareil de cuisson à capacité de cuisson augmentée (troisième mode de cuisson), les aliments à cuire étant alors placés directement dans la cuve qui peut être manipulée aisément sans le panier et sans l'accessoire grâce au système de manipulation, afin d'être insérée dans le corps principal de l'appareil et retirée dudit corps principal une fois les aliments cuits,
- soit comme un appareil de cuisson adapté au type d'accessoire utilisé (au moins un deuxième mode de cuisson), la manipulation de l'accessoire assujetti ou non à la cuve s'effectuant grâce au système de manipulation.

Selon une réalisation, le second dispositif d'assemblage comprend le corps solidaire de la poignée de manipulation, une zone de réception agencée sur la cuve pour recevoir ce corps et des seconds moyens de verrouillage permettant la solidarisation du corps logé dans la zone de réception. Selon une réalisation, les seconds moyens de verrouillage comprennent une ouverture agencée sur la zone de réception, un loquet agencé sur le corps et un mécanisme d'actionnement du loquet.

Selon une réalisation de l'appareil de cuisson objet de l'invention, l'au moins un accessoire est un accessoire de réchauffage. Cet accessoire comprend au moins un récipient et un support de l'au moins un récipient. En outre, le système de manipulation est configuré pour être assemblé de manière amovible avec le panier ou avec le support réceptionnant l'au moins un récipient. En complément, le support peut comprendre un système de stabilisation permettant de le maintenir stable une fois sorti de la cuve et posé sur un plan, par exemple une table ou un plan de cuisine, afin d'avoir les mains libres durant le retrait de l'au moins un récipient dudit support.

Selon une première réalisation, l'accessoire de réchauffage est conçu pour la préparation de verrines chaudes ; dans ce cas le récipient est une verrine. De préférence, cet accessoire comprend quatre ou cinq verrines, le support
5 comprenant respectivement quatre ou cinq zones de réception des verrines. On peut envisager d'autres réalisations avec deux ou trois verrines, voire avec plus de cinq verrines, et autant de zones de réception des verrines sur le support.

Selon une seconde réalisation, l'accessoire de réchauffage est conçu pour
10 réchauffer des plats plus consistants ; dans ce cas le récipient est un bac ou un bol. De préférence, cet accessoire comprend un bac ou un bol, le support comprenant respectivement une zone de réception du bac ou du bol. On pourrait envisager d'autres réalisations, par exemple avec deux bacs ou deux bols et deux zones de réceptions des bacs ou des bols sur le support.

15 Selon une réalisation de l'appareil de cuisson objet de l'invention, l'au moins un accessoire est conçu pour la préparation de plats de type snacking. Cet accessoire comprend une grille munie d'un contour, le système de manipulation étant configuré pour être assemblé de manière amovible avec le panier ou avec
20 le contour de la grille.

Selon une réalisation de l'appareil de cuisson objet de l'invention, l'au moins un accessoire est conçu pour la préparation de plats de type grillade. Cet accessoire comprend une plaque, au lieu d'une grille, la plaque étant également
25 munie d'un contour, le système de manipulation étant configuré pour être assemblé de manière amovible avec le panier ou avec le contour de la plaque.

Selon une réalisation de l'appareil de cuisson objet de l'invention, l'au moins un accessoire est conçu pour la préparation de gâteaux. Cet accessoire comprend
30 un moule à gâteau muni d'un contour, le système de manipulation étant configuré pour être assemblé de manière amovible avec le panier ou avec le contour du moule à gâteau.

Selon une réalisation, l'au moins un accessoire de l'appareil de cuisson objet de l'invention comprend un support filaire formant un bord périphérique, le système de manipulation étant configuré pour être assemblé de manière amovible avec le panier ou avec le support filaire. Ce support filaire permet la réception d'un ou plusieurs ustensiles complémentaires. En complément, le support filaire peut comprendre un système de stabilisation permettant de le maintenir stable une fois sorti de la cuve et posé sur un plan, par exemple une table ou un plan de cuisine, afin d'avoir les mains libres durant le retrait du ou des ustensiles complémentaires.

10

Selon une première mise en œuvre d'un ustensile complémentaire, l'accessoire comprend au moins un pic, le support filaire comprenant au moins une paire de cavités sur laquelle prend appui le pic. De préférence, l'accessoire comprend quatre à huit pics, de préférence six pics, et quatre à huit paires de cavités, de préférence six paires de cavités, chaque pic prenant appui sur une paire de cavités. Ainsi, l'accessoire permet la préparation de brochettes.

15

Selon une seconde mise en œuvre d'ustensiles complémentaires, l'accessoire comprend une grille et/ou une plaque et/ou un moule à gâteau. La grille et/ou la plaque et/ou le moule à gâteau sont configurés pour prendre appui sur le bord périphérique du support filaire. Ainsi, l'accessoire permet la préparation de plats de type snacking et grillade lorsque l'ustensile complémentaire utilisé est la grille ou la plaque et l'accessoire permet la préparation de gâteaux lorsque l'ustensile complémentaire utilisé est le moule à gâteau. Selon cette mise en œuvre, la grille, la plaque et/ou le moule à gâteau comprennent chacun un contour muni d'un rebord, le contour s'engageant dans le support filaire jusqu'à ce que le rebord vienne en butée contre le bord périphérique.

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Brève description des figures

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La description ci-après met en évidence les caractéristiques et avantages de la présente invention. Cette description s'appuie sur des figures, parmi lesquelles :

- La figure 1 illustre un accessoire de réchauffage pour la préparation de verrines, placé dans la cuve de l'appareil de cuisson de type friteuse à air chaud selon l'invention ;
- La figure 2 illustre un panier placé dans la cuve en lieu et place d'un accessoire,
- La figure 3 illustre l'accessoire de préparation de verrines avec le système de manipulation fixé à celui-ci,
- La figure 4 illustre le support de verrines seul,
- Les figures 5 à 6 illustrent le système de manipulation seul, selon deux angles de vue différents,
- Les figures 7 et 8 illustrent un premier mode de réalisation des premiers moyens de verrouillage sur le premier dispositif d'assemblage,
- Les figures 9 et 10 illustrent un second mode de réalisation des premiers moyens de verrouillage sur le premier dispositif d'assemblage,
- Les figures 11 à 13 mettent en évidence le premier dispositif d'assemblage entre la poignée de manipulation et le panier ou l'accessoire et le second dispositif d'assemblage entre la poignée de manipulation et la cuve ;
- Les figures 14 et 15 illustrent un autre accessoire selon l'invention, constituant une grille ;
- Les figures 16 à 21 illustrent un autre accessoire selon l'invention, constituant un support filaire conçu pour réceptionner des pics, une grille et un moule à gâteau
- La figure 22 illustre un autre accessoire de réchauffage pour des plats plus consistants.

Description détaillée

Dans la description suivante, les mêmes références sont utilisées pour décrire les caractéristiques identiques ou similaires selon les diverses variantes de conception de l'appareil de cuisson de type friteuse à air chaud.

La description suivante et les figures 1 à 20 s'attachent à mettre en évidence les caractéristiques essentielles de l'invention qui portent sur divers accessoires

et sur le système de manipulation dont la conception permet notamment son assemblage soit sur le panier soit sur l'un des accessoires, pour les manipuler l'un ou l'autre. Les autres caractéristiques (système de soufflage d'air chaud ; corps avec chambre dans laquelle sont insérés la cuve et le panier ...) déjà
5 connues des appareils de cuisson traditionnels ne sont pas détaillées ci-après ; l'homme du métier pourra se référer aux friteuses à air chaud existant déjà sur le marché.

Comme le montrent les figures 1 et 2, l'appareil de cuisson comprend une cuve
10 1 dans laquelle peut être positionné soit un accessoire 2 (figure 1) soit un panier 4 (figure 2). Sur cette figure 1, l'accessoire 2 est un accessoire pour la préparation de verrines 3. La manipulation de l'accessoire 2 ou du panier 4 s'effectue grâce à un système de manipulation 5 qui, outre le fait de permettre une manipulation de l'accessoire 2 ou du panier 4 seul pour le placer dans la
15 cuve 1 ou le retirer de ladite cuve 1, permet de fixer ledit accessoire 2 ou ledit panier 4 en position dans ladite cuve 1 de sorte à manipuler concomitamment la cuve 1 avec l'accessoire 2 ou avec le panier 4 lors de son insertion dans le corps principal (non illustré) de l'appareil de cuisson et lors de son retrait dudit corps principal, à la manière d'un tiroir. Ce système de manipulation 5 permet
20 également de manipuler la cuve 1 seule, sans l'accessoire 2 et sans le panier 4, comme cela apparaîtra plus en détail ci-après.

Sur la figure 3, le système de manipulation 5 est fixé à l'accessoire 2. L'accessoire 2 comprend quatre verrines 3 et un support 6 qui comporte quatre
25 zones de réception 7 de ces verrines 3, comme illustré en figure 4. Ces zones de réception 7 sont formées par des ouvertures 8 sur le support 6 dans lesquelles viennent se loger les verrines 3. La forme des ouvertures 8 est adaptée à la forme des verrines 3. Sur les figures 3 et 4, ces formes sont circulaires mais on pourrait prévoir des formes carrées, par exemple.

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Comme l'illustrent les figures 1, 2, 11 et 13, la cuve 1 comprend un premier contenant 9, une façade 10, une zone de réception 11 munie dans sa partie

inférieure 11a d'une ouverture 12 et une encoche 13 agencée sur le rebord supérieur 14 du premier contenant 9.

Comme l'illustrent les figures 2, 11 et 12, le panier 4 comprend un deuxième
5 contenant 15 et une première patte de support 16 fixée sur le côté avant 15a dudit deuxième contenant 15.

Comme l'illustrent les figures 3 et 4, le support 6 comprend un plateau 17 muni
des ouvertures 8, ce plateau 17 étant prolongé vers l'avant par un bras 18 sur
10 lequel est fixée une seconde patte de support 19, de conception identique à la première patte de support 16 sur le panier 4.

Comme l'illustrent les figures 5 et 6, le système de manipulation 5 comprend
une poignée de manipulation 20 et un corps 21 formés d'une seule et même
15 pièce, la poignée de manipulation 20 étant fixée à la face avant 21a du corps 21.

Lorsque le panier 4 ou l'accessoire 2 est placé dans la cuve 1, le corps 21 est
logé dans la zone de réception 11 et la première ou seconde patte de support
20 16, 19 vient en appui contre l'encoche 13 agencée sur le rebord supérieur 14 du premier contenant 9 de la cuve 1.

Comme illustré aux figures 1, 2, 5, 6, 11 et 12, le corps 21 intègre un loquet 22
monté en liaison pivot 23 et comportant à son extrémité inférieure une tête 24
25 formant un crochet, ladite tête 24 étant saillante de la face inférieure 21b du corps 21. L'extrémité supérieure 22a du loquet 22 est fixée à un bouton de commande 25 accessible sur la face avant 21a du corps 21. Lorsque le corps 21 est inséré dans la zone de réception 11 sur la cuve 1, la tête 24 du loquet 22 pénètre dans l'ouverture 12 illustrée à la figure 13 et vient se loger sous le
30 contour arrière 12a de l'ouverture 12. L'actionnement du bouton de commande 25 permet de faire pivoter le loquet 22 pour déplacer la tête 24 dans l'axe de l'ouverture 12, permettant ainsi le retrait du corps 21 en dehors de la zone de réception 11. Un ressort 26 assure le rappel du loquet 22 en position de

- verrouillage, avec la tête 24 disposée sous le contour arrière 12a de l'ouverture 12, comme illustré en figure 11, une fois le corps 21 introduit dans la zone de réception 11 et le bouton de commande 25 relâché. Deux doigts 27, 28 sont agencés sur les côtés latéraux 21c, 21d du corps 21, comme l'illustrent les figures 5 et 6. Ces doigts 27, 28 se positionnent dans des encoches de guidage 29, 30 agencées sur les côtés latéraux 11b, 11c de la zone de réception 11 de sorte à caler le corps 21 en translation d'avant en arrière vis-à-vis de la zone de réception 11.
- 10 Tel qu'illustré aux figures 1 à 12, le système de manipulation 5 peut être détaché de la première patte de support 16 fixée au deuxième contenant 15 ou de la seconde patte de support 19 fixée au support de verrines 6. Pour cela, le corps 21 comprend sur ses côtés latéraux 21c, 21d deux gâchettes 31, 32 (voir figures 5 et 6) qui sont saillantes desdits côtés latéraux 21c, 21d et formées au
- 15 moyen d'une seule et même pièce d'actionnement 33 (voir figures 7 et 9) montée en liaison pivot 34 à l'intérieur dudit corps 21 (voir figures 11 et 12). Sur le mode de réalisation des figures 7 et 8, la pièce d'actionnement 33 comprend deux pênes 35, 36 et les première et seconde pattes de support 16, 19 comprennent chacune deux gâches 37, 38 formées par deux encoches sur les
- 20 côtés latéraux 39a, 39b d'une partie recourbée 16a, 19a disposées à l'avant de ladite patte de support 16, 19. Sur le mode de réalisation des figures 9 et 10, la pièce d'actionnement 33 comprend un seul pêne 40 et les première et seconde pattes de support 16, 19 comprennent une seule gâche 41 formée par un orifice sur la partie recourbée 16a, 19a de ladite patte de support 16, 19. Le corps 21
- 25 comprend sur sa face supérieure 21e un logement 42, illustré en figures 5 et 6, dans lequel peut pénétrer la partie recourbée 16a, 19a de la patte de support 16, 19. Lorsque la partie recourbée 16a, 19a de la patte de support 16, 19 est insérée dans le logement 42, le ou les pênes 35, 36, 40 de la pièce d'actionnement 33 s'engagent dans la ou les gâches 37, 38, 41, ce qui
- 30 verrouille le corps 21 avec la patte de support 16, 19 du panier 4 ou du support 6 de verrines. L'activation de l'une ou l'autre des gâchettes 31, 32 permet de dégager le ou les pênes 35, 36, 40 de la ou des gâches 37, 38, 41, comme le montre la figure 12 (sur laquelle la pièce d'actionnement 33 correspond au

mode de réalisation des figures 9 et 10), permettant ainsi l'extraction de la partie recourbée 16a, 19a de la patte de support 16, 19 en dehors du corps 21. Le rappel du ou des pènes 35, 36, 40 dans une position active illustrée en figure 11 est assurée par le ressort 26.

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Ainsi, le corps 21 auquel est fixée la poignée de manipulation 20, peut être assemblé de manière amovible avec le panier 4 ou avec le support 6 des verrines 3 grâce à un premier dispositif d'assemblage 43 mis en œuvre au moyen de la pièce d'actionnement 33 dans le corps 21 qui comporte le ou les pènes 35, 36, 40 et de la partie recourbée 16a, 19a de la patte de support 16, 19 qui comporte la ou les gâches 37, 38, 41, le ou les pènes 35, 36, 40 montés en rappel par ressort 26 et la ou les gâches 37, 38, 41 assurant le verrouillage du corps 21 avec la patte de support 16, 19. De même, le corps 21 peut être assemblé avec la cuve 1 grâce un second dispositif d'assemblage 44 mis en œuvre au moyen du corps 21 incorporant le loquet 22 et de la zone de réception 11 comportant l'ouverture 12, la tête 24 du loquet 22 et le contour arrière 12a de l'ouverture 12 assurant le verrouillage du corps 21 dans la zone de réception 11. Grâce à ces deux dispositifs d'assemblage 43, 44, le système de manipulation 5 peut être assemblé avec le panier 4 seulement, avec la cuve 1 seulement, avec le support 6 seulement, concomitamment avec le panier 4 et la cuve 1 ou concomitamment avec le support 6 et la cuve 1.

Tel qu'illustré aux figures 3 et 4, le support 6 comporte deux pieds 45, 46 qui s'étendent vers le bas en dessous du plateau 17 de manière à être positionnés plus bas que le fond de chaque verrine 3 positionnée sur ce support 6. Lorsque le support 6 est assemblé avec le système de manipulation 5, les extrémités inférieures 45a, 46a des pieds 45, 46 sont disposées dans un même plan que l'extrémité inférieure 20a de la poignée de manipulation 20, de sorte à pouvoir stabiliser le système de manipulation 5 assemblé avec le support 6 sur un plan de cuisine ou sur une table.

La description ci-dessus s'appuyant sur les figures 1 à 13 fait référence à un accessoire 2 pour la préparation de verrines 3. L'appareil de cuisson objet de

l'invention peut comprendre d'autres accessoires 2 en substitution ou en complément de celui décrit précédemment.

A titre d'exemple, sur les figures 14 et 15, l'accessoire 2 est constitué d'une grille 47 pour la préparation de plats de type snacking. Cette grille 47 est munie d'un contour 48 et d'une plaque grillagée 49. Sur la partie avant 48a du contour 48 est fixée la patte de support 19 qui s'engage et se verrouille dans le corps 21 comme décrit précédemment en regard des figures 1 à 13, afin d'assembler la grille 47 avec le système de manipulation 5. La plaque grillagée 49 et le contour 48 peuvent être fixés ensemble ; on peut au contraire prévoir un assemblage amovible entre la plaque grillagée 49 et le contour 48 afin de faciliter le nettoyage de ladite plaque grillagée 49. En regard de ces figures 14 et 15, il est possible de remplacer la plaque grillagée 49 par une plaque pleine (non illustrée), fixe ou amovible vis-à-vis du contour 48, dans ce cas l'accessoire 2 est constitué d'une plaque (non illustrée) pour la préparation de grillade. Sur le même principe, il est également possible de remplacer la grille 47 par un moule à gâteau (non illustré) muni d'un contour et d'un fond, ledit contour étant fixé à la patte de support 19 de manière semblable au contour 48 de la grille 47.

Selon un autre exemple illustré aux figures 16 à 21, l'accessoire 2 comprend un support filaire 50 formant un bord périphérique 51. La partie avant 51a du bord périphérique 51 est fixée à la patte de support 19 qui s'engage et se verrouille dans le corps 21, comme décrit précédemment en regard des figures 1 à 13, afin d'assembler ce support filaire 50 avec le système de manipulation 5. Sur la partie avant 51a et la partie arrière 51b du bord périphérique 51 sont agencées six paires de cavités 52 à 57, chaque paire de cavités 52 à 57 permettant la réception d'un pic 58, les deux extrémités 58a, 58b du pic prenant appui sur une paire de cavités 52 à 57, comme illustré aux figures 16 à 18. Ainsi, l'accessoire 2 permet la préparation de brochettes. Le nombre de paires de cavités sur le bord périphérique 51 et le nombre de pics 58 peuvent varier, de préférence entre quatre et huit, selon les dimensions de la cuve 1 de l'appareil de cuisson.

Comme illustré aux figures 16, 19 et 20, cet accessoire 2 peut comprendre, en complément ou en substitution des pics 58, une grille 59 munie d'un contour 60 et d'un fond grillagé 61. Le fond grillagé 61 peut être fixe ou amovible vis-à-vis du contour 60, notamment pour faciliter son nettoyage. Un rebord 62 est formé en partie supérieure du contour 60 ; le contour 60 est dimensionné pour s'engager à l'intérieur du bord périphérique 51 du support filaire 50, tandis que le rebord 62 est dimensionné pour venir en butée contre ledit bord périphérique 51 de manière à maintenir la grille 59 sur le support filaire 50. Ainsi, l'accessoire 2 permet la préparation de plat de type snacking. Il est possible de prévoir, en complément ou en substitution des pics 58 et/ou de la grille 59, une plaque (non illustrée) de conception similaire à ladite grille 59, le fond de la plaque étant toutefois plein au lieu d'être grillagé. Cette plaque permet notamment la préparation de grillades. Il est également possible de prévoir, en complément ou en substitution des pics 58, de la grille 59 et/ou de la plaque, un moule à gâteau 63, illustré en figure 21, dont la conception s'apparente à celle de ladite grille 59, c'est-à-dire avec un contour 64 et un bord périphérique 65, le contour 64 du moule à gâteau 63 étant simplement plus haut que le contour 60 de la grille 59 afin de réceptionner convenablement la pâte à gâteau sans risque de déborder dudit moule. Dans une variante d'accessoire 2 ne prévoyant pas la réception de pics 58, mais simplement d'une grille 59, d'une plaque et/ou d'un moule à gâteau, le bord périphérique 51 du support filaire 50 pourra être conçu sans les paires de cavités 52 à 57.

Comme l'illustre la figure 21, le support filaire 50 peut comprendre en complément deux pieds 67 (un seul illustré sur la figure 21) d'une conception similaire à celle des pieds 45, 46 sur le support 6 illustrés en figures 3 et 4, afin de stabiliser ledit support filaire 50 le temps du retrait des pics 58, de la grille 59, de la plaque ou du moule à gâteau 63.

Sur la figure 22, l'accessoire 2 est un accessoire de réchauffage, au même titre que l'accessoire 2 pour la préparation de verrines 3 illustré en figures 1, 3 et 4, le récipient étant toutefois un bac 66 ou un bol au lieu d'être une verrine 3. Sur la figure 22, l'accessoire 2 comprend un seul bac 66 et le support 6 comprend

une seule ouverture 8 pour la formation d'une seule zone de réception 7 adaptée audit bac 66. Ainsi le volume du bac 66 permet le réchauffage de plats consistants. On pourrait toutefois prévoir un accessoire 2 avec deux bacs 66 ayant un volume de moitié de celui illustré en figure 22 et deux zones de

5 réception 7 adaptées sur le support 6.

La description ci-dessus met en évidence l'objet de l'invention. Celle-ci n'a aucun caractère limitatif, des variantes peuvent être envisagées sans sortir du cadre de l'invention. A titre d'exemple, on pourrait prévoir un appareil de

10 cuisson qui comporte une cuve fixe fermée par un couvercle pour constituer une chambre de cuisson dans laquelle est soufflé de l'air chaud, le panier 4 ou l'accessoire 2 se positionnant dans la cuve de manière similaire au mode de réalisation décrit précédemment. Dans ce cas, cependant, le système de manipulation 5 n'aura pas besoin d'être verrouillé avec la cuve 1 lorsque le

15 corps 21 vient se loger dans la zone de réception 11.

B.1995

REVENDICATIONS

- 5 1. Appareil de cuisson du type friteuse à air chaud, comprenant une cuve (1), un panier (4) et au moins un accessoire (2), le panier ou l'au moins un accessoire pouvant être positionné de manière amovible dans la cuve, caractérisé en ce que ledit appareil comprend un système de manipulation (5) configuré pour être assemblé de manière amovible avec
- 10 le panier ou avec l'au moins un accessoire de sorte à permettre la manipulation soit du panier soit de l'au moins un accessoire pour son insertion dans la cuve et son retrait de la cuve.
2. Appareil de cuisson selon la revendication 1, dans lequel le système de manipulation (5) comprend une poignée de manipulation (20) et un
- 15 premier dispositif d'assemblage (43) agencé entre la poignée de manipulation et le panier (4) ou l'accessoire (2) pour assembler de manière amovible la poignée de manipulation avec le panier ou avec l'accessoire.
3. Appareil de cuisson selon la revendication 2, dans lequel le premier
- 20 dispositif d'assemblage (43) comprend au moins deux pattes de support (16, 19) fixées respectivement sur le panier (4) et sur l'au moins un accessoire (2), un logement (42) agencé sur un corps (21) fixé à la poignée de manipulation (20) pour recevoir l'une ou l'autre des pattes de support et des premiers moyens de verrouillage permettant la
- 25 solidarisation de la patte de support (16, 19) logée dans le corps (21).
4. Appareil de cuisson selon la revendication 3, dans lequel les premiers moyens de verrouillage comprennent au moins une gâche (37, 38, 41) agencée sur chaque patte de support (16, 19), au moins un pêne (35, 36, 40) agencé dans le corps (21) pour s'engager dans l'au moins une
- 30 gâche lorsque la patte de support est logée dans le corps et un mécanisme (26, 33) d'actionnement de l'au moins un pêne.
5. Appareil de cuisson selon l'une quelconque des revendications 2 à 4, lequel comprend un corps principal, la cuve (1) étant amovible du corps

- principal, le système de manipulation (5) comprenant un second dispositif d'assemblage (44) agencé entre la cuve (1) et la poignée de manipulation (20) pour assembler de manière amovible la poignée de manipulation (20) avec la cuve, ladite poignée de manipulation étant
5 assemblée ou non avec le panier ou avec l'un des accessoires.
6. Appareil de cuisson selon la revendication 5 rattachée à l'une quelconque des revendications 3 ou 4, dans lequel le second dispositif d'assemblage (44) comprend le corps (21) solidaire de la poignée de manipulation (20), une zone de réception (11) agencée sur la cuve (1)
10 pour recevoir le corps (21) et des seconds moyens de verrouillage permettant la solidarisation du corps logé dans la zone de réception.
7. Appareil de cuisson selon la revendication 6, dans lequel les seconds moyens de verrouillage comprennent une ouverture (12) agencée sur la zone de réception (11), un loquet (22) agencé sur le corps (21) et un
15 mécanisme (23, 25, 26) d'actionnement du loquet.
8. Appareil de cuisson selon l'une quelconque des revendications 1 à 7, dans lequel l'au moins un accessoire (2) est un accessoire de réchauffage comprenant au moins un récipient et un support de l'au moins un récipient, le système de manipulation (5) étant configuré pour
20 être assemblé de manière amovible avec le panier (4) ou avec le support (6) réceptionnant l'au moins un récipient.
9. Appareil de cuisson selon la revendication 8, dans lequel le récipient est une verrine (3).
10. Appareil de cuisson selon la revendication 9, dans lequel l'accessoire (2)
25 comprend quatre ou cinq verrines (3), le support (6) comprenant respectivement quatre ou cinq zones de réception (7) des verrines.
11. Appareil de cuisson selon la revendication 8, dans lequel le récipient est un bac (66).
12. Appareil de cuisson selon la revendication 11, dans lequel
30 l'accessoire (2) comprend un bac (66), le support (6) comprenant respectivement une zone de réception (7) du bac.
13. Appareil de cuisson selon l'une quelconque des revendications 8 à 12, dans lequel le support (6) comprend un système de stabilisation (45, 46)

permettant de le maintenir stable une fois sorti de la cuve (1) et posé sur un plan.

- 5 14. Appareil de cuisson selon l'une quelconque des revendications 1 à 7, dans lequel l'au moins un accessoire (2) comprend une grille (47), une plaque et/ou un moule à gâteau, la grille, la plaque et le moule à gâteau étant munis chacun d'un contour, le système de manipulation (5) étant configuré pour être assemblé de manière amovible avec le panier (4) ou avec le contour de la grille.
- 10 15. Appareil de cuisson selon l'une quelconque des revendications 1 à 7, dans lequel l'au moins un accessoire (2) comprend un support filaire (50) formant un bord périphérique (51), le système de manipulation (5) étant configuré pour être assemblé de manière amovible avec le panier (4) ou avec le support filaire.
- 15 16. Appareil de cuisson selon la revendication 15, dans lequel l'accessoire comprend au moins un pic (58), le support filaire (50) comprenant au moins une paire de cavités (52 à 57) sur laquelle prend appui le pic.
- 20 17. Appareil de cuisson selon la revendication 16, dans lequel l'accessoire (2) comprend quatre à huit pics (58), de préférence six pics, et quatre à huit paires de cavités (52 à 57), de préférence six paires de cavités, chaque pic prenant appui sur une paire de cavités.
- 25 18. Appareil de cuisson selon l'une quelconque des revendications 15 à 17, dans lequel l'accessoire (2) comprend une grille (59) et/ou une plaque et/ou un moule à gâteau, la grille et/ou, la plaque et/ou le moule à gâteau étant chacun configurés pour prendre appui sur le bord périphérique (51) du support filaire (50).
- 30 19. Appareil de cuisson selon la revendication 18, dans lequel la grille (59), la plaque et/ou le moule à gâteau comprennent chacun un contour (60) muni d'un rebord (62), le contour s'engageant dans le support filaire (50) jusqu'à ce que le rebord (62) vienne en butée contre le bord périphérique (51).
20. Appareil de cuisson selon l'une quelconque des revendications 15 à 19, dans lequel le support filaire (50) comprend un système de

stabilisation (67) permettant de le maintenir stable une fois sorti de la cuve (1) et posé sur un plan.

1/8

Figure 1

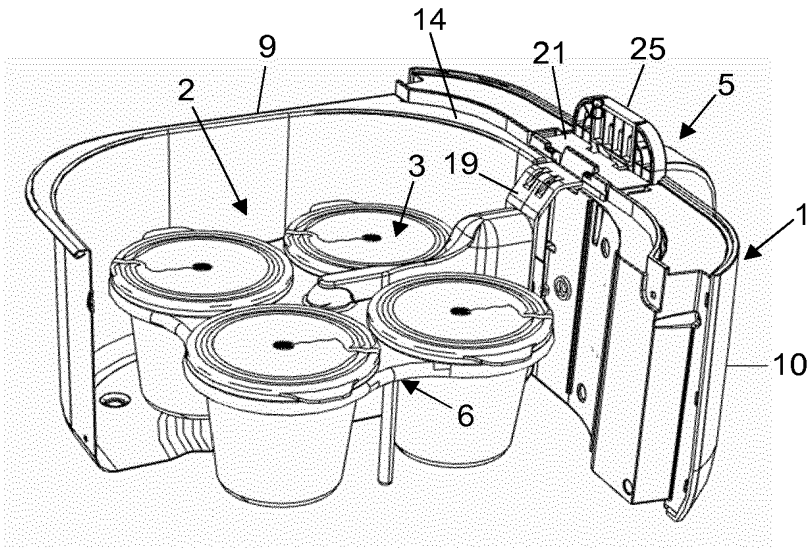
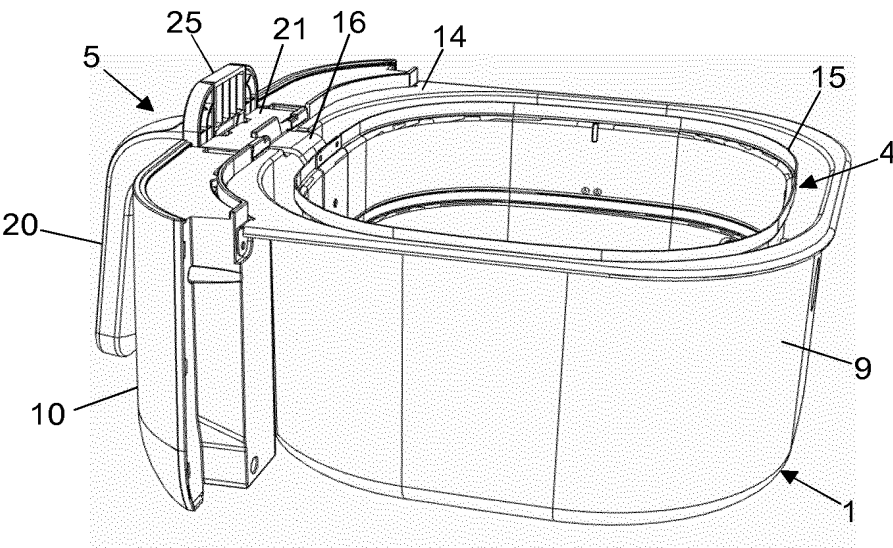


Figure 2



2/8

Figure 3

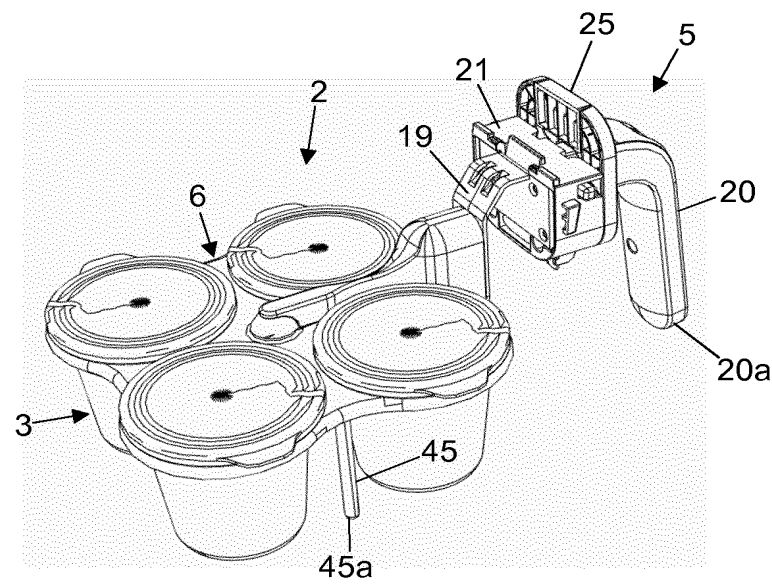


Figure 4

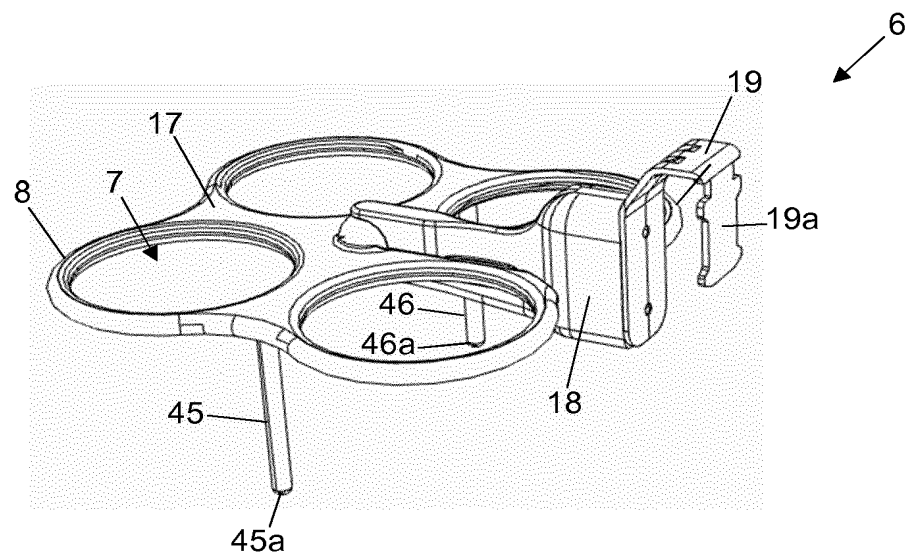


Figure 5

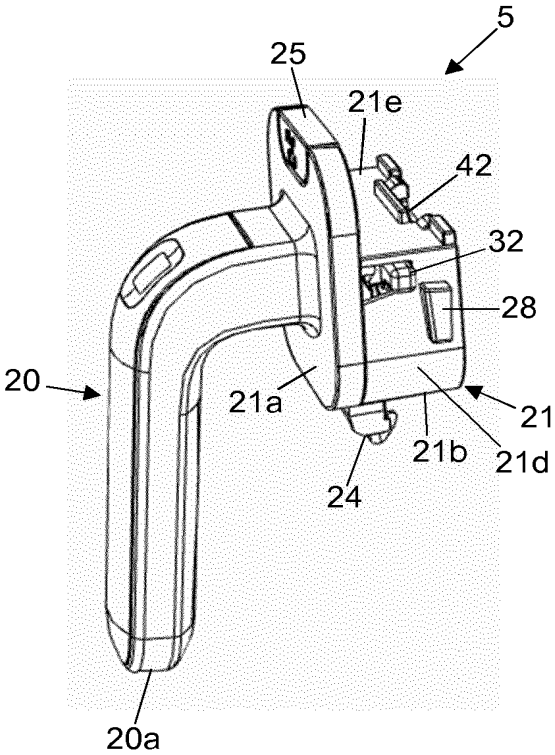


Figure 6

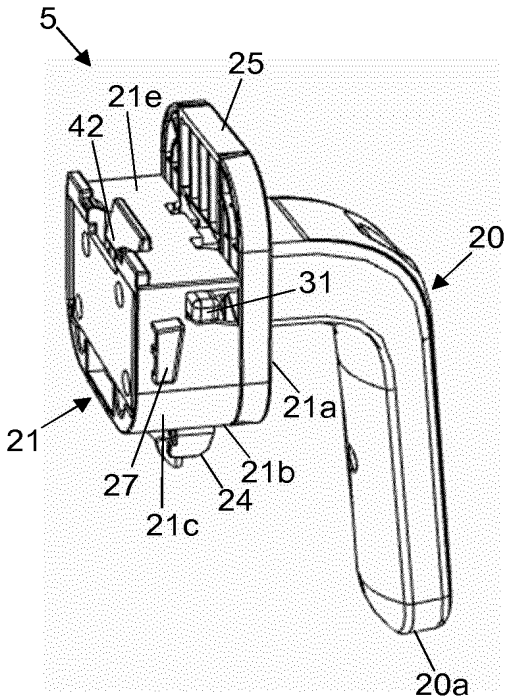


Figure 7

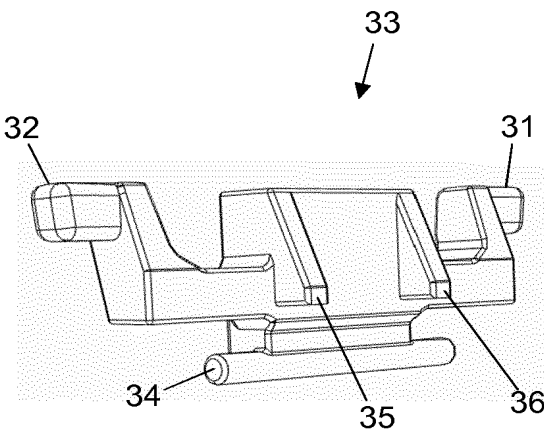
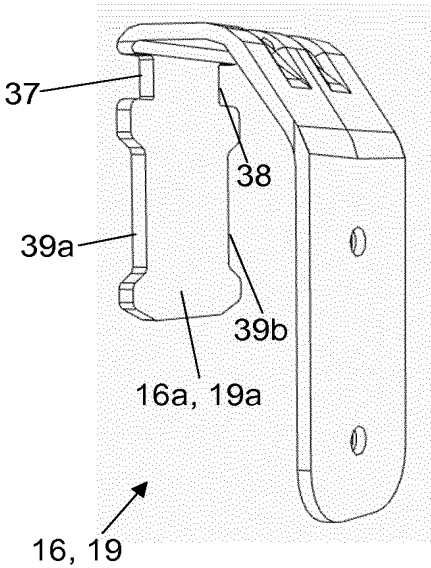


Figure 8



4/8

Figure 10

Figure 9

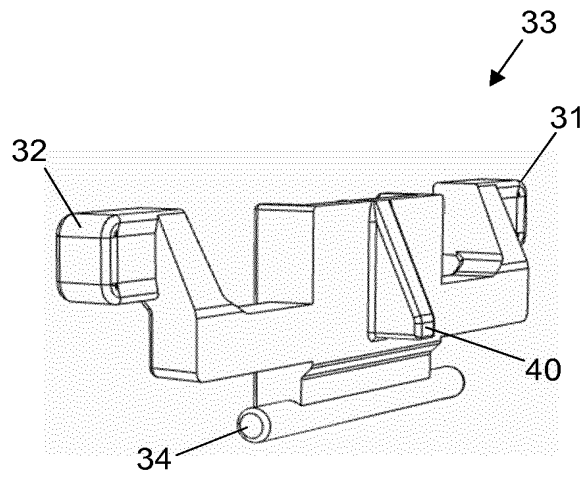
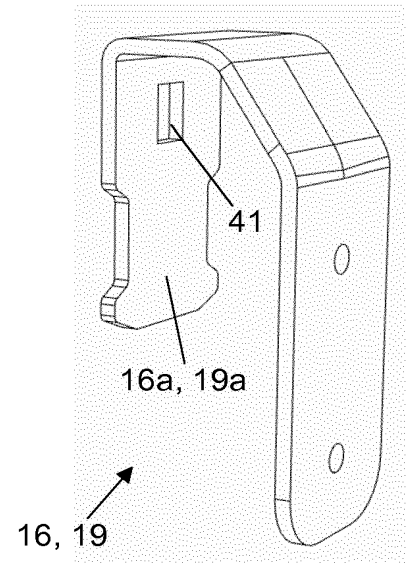
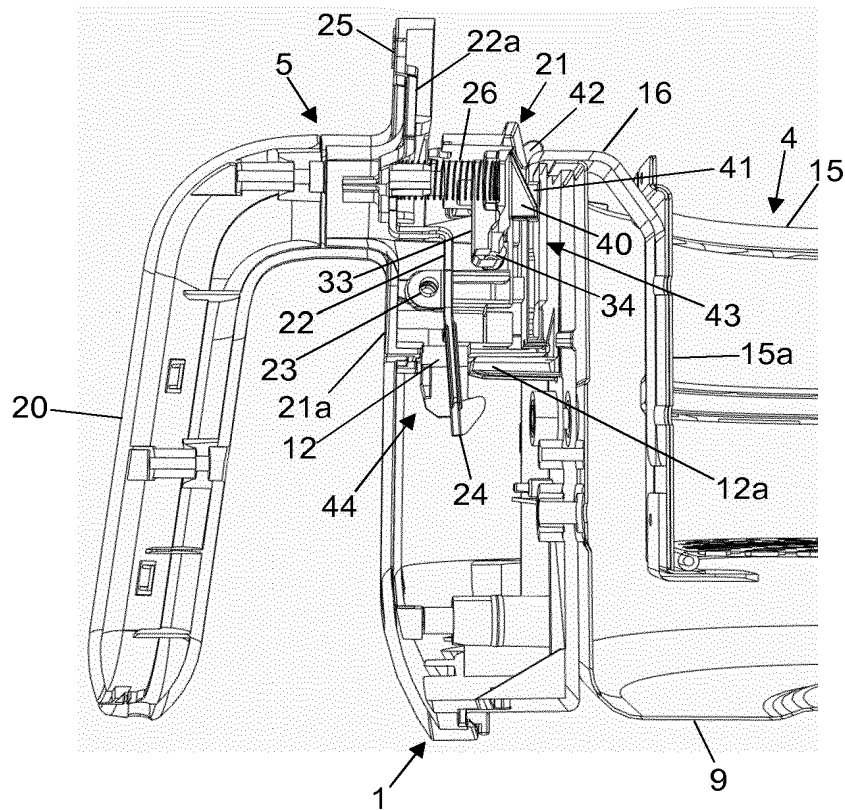


Figure 11



5/8

Figure 12

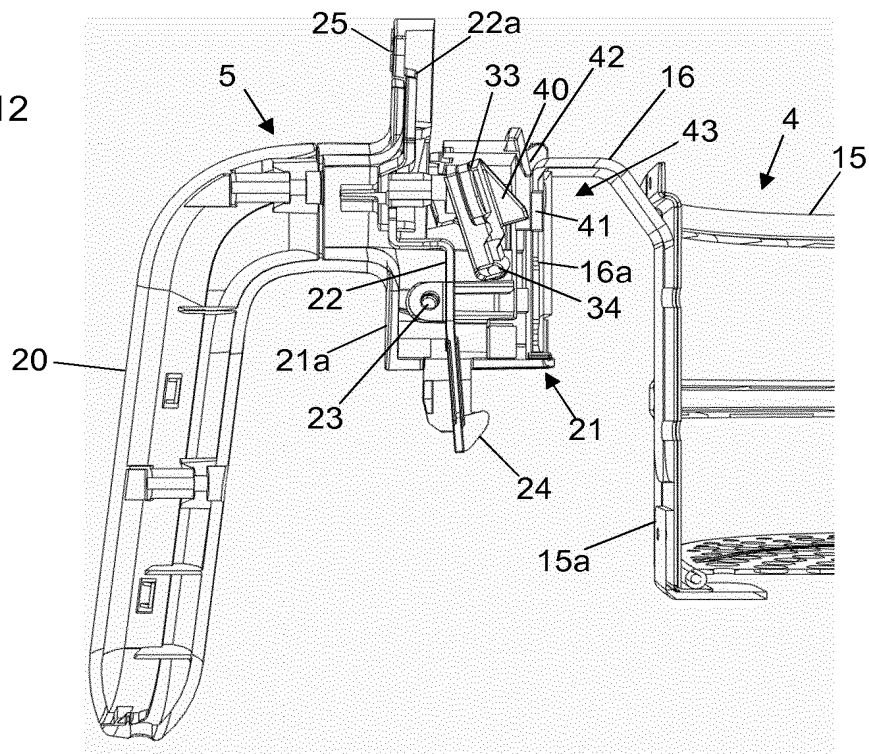
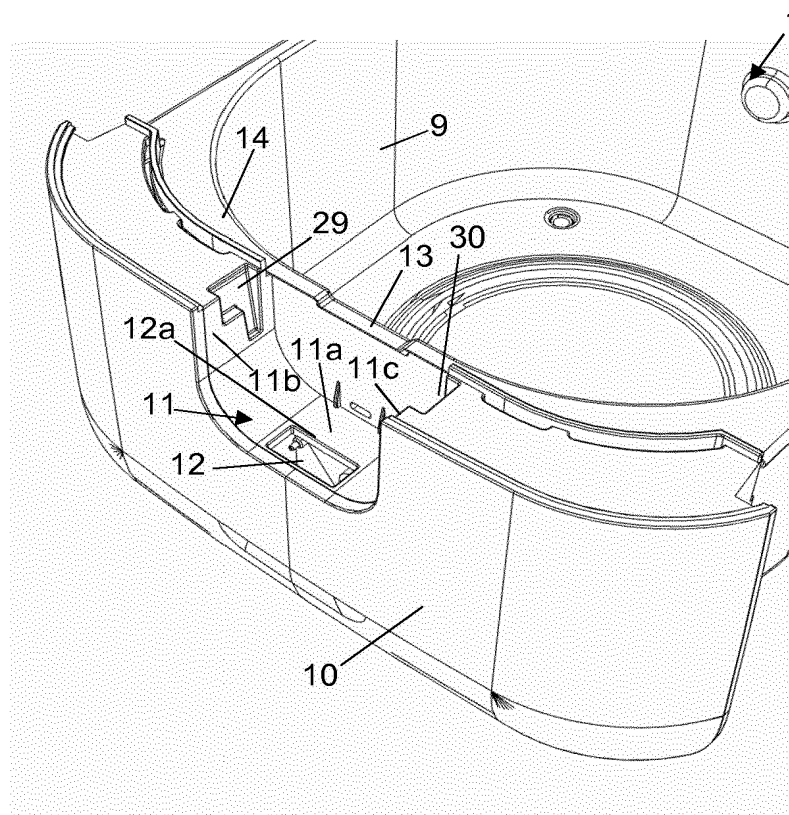


Figure 13



6/8

Figure 14

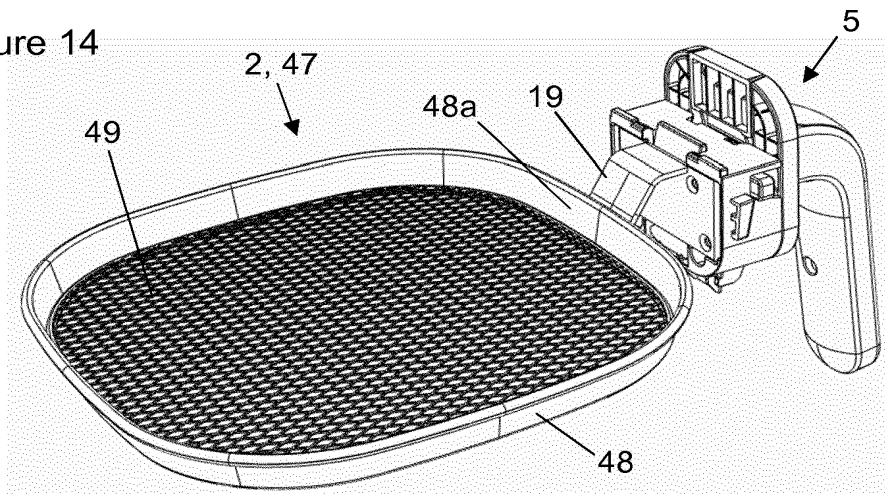


Figure 15

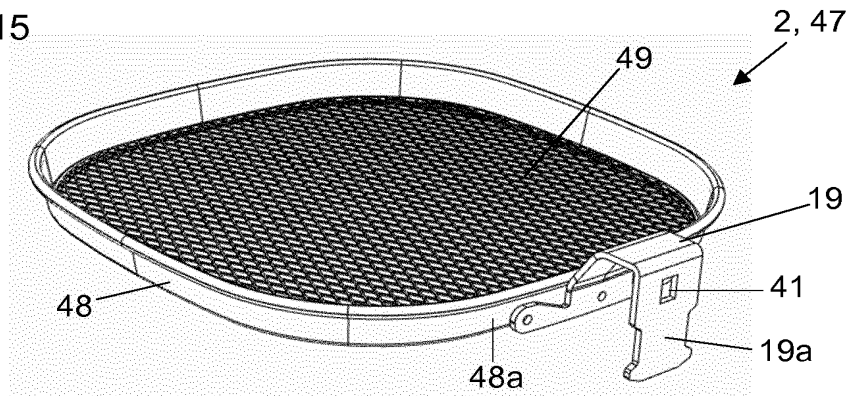
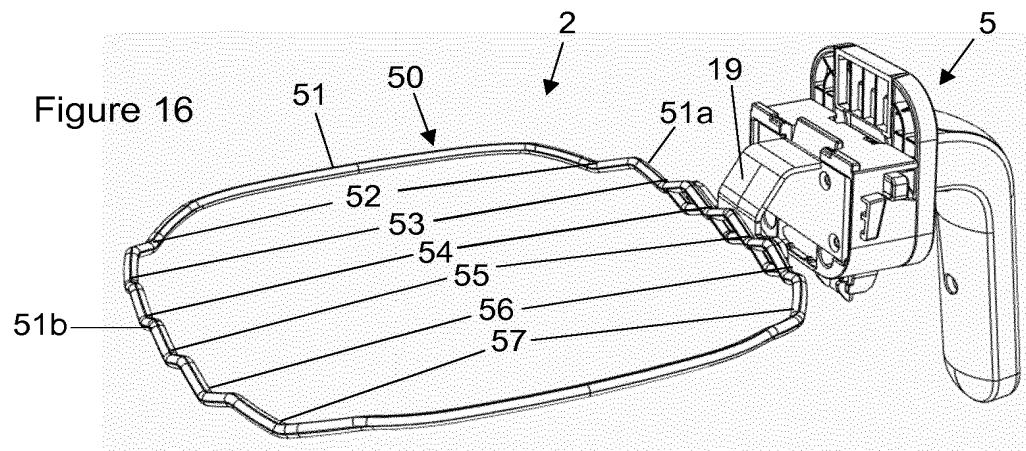
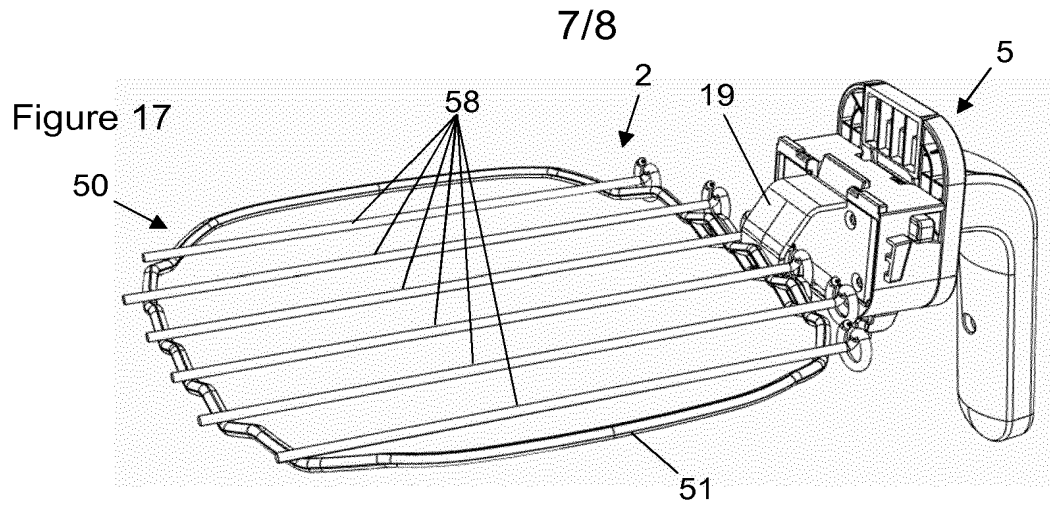
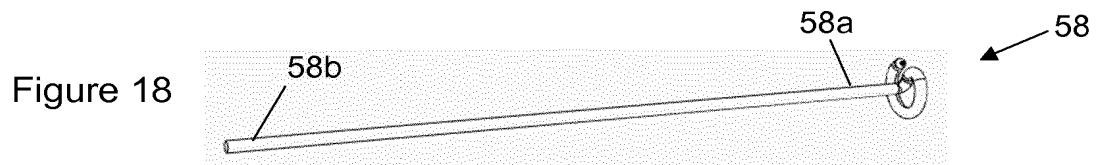
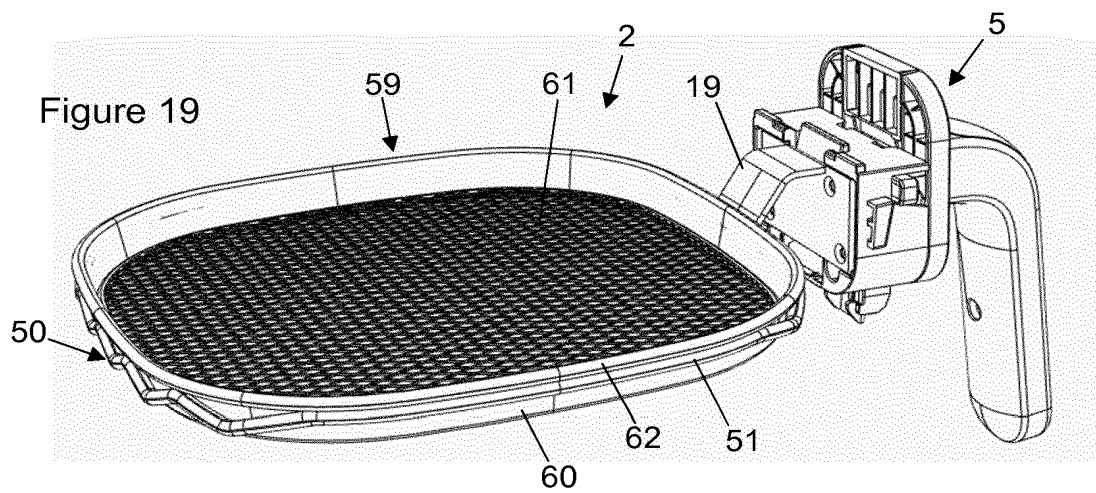
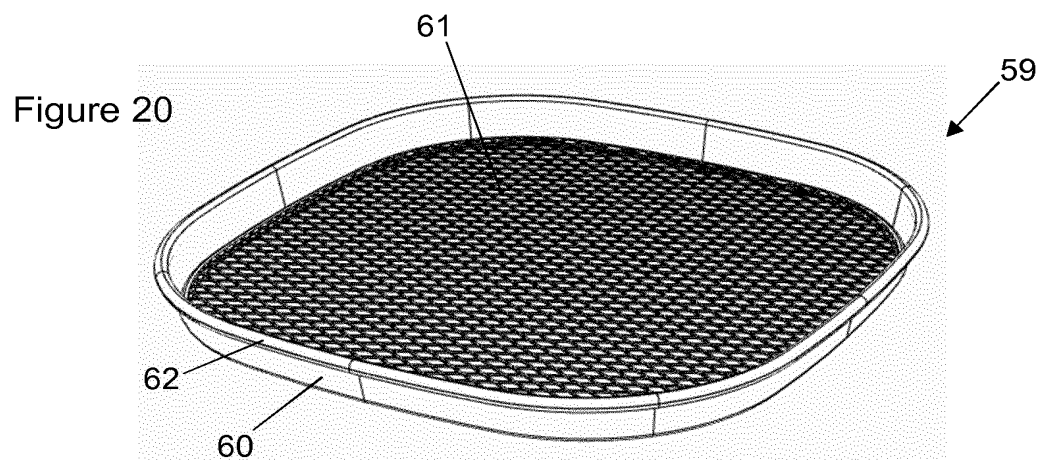


Figure 16





8/8

Figure 21

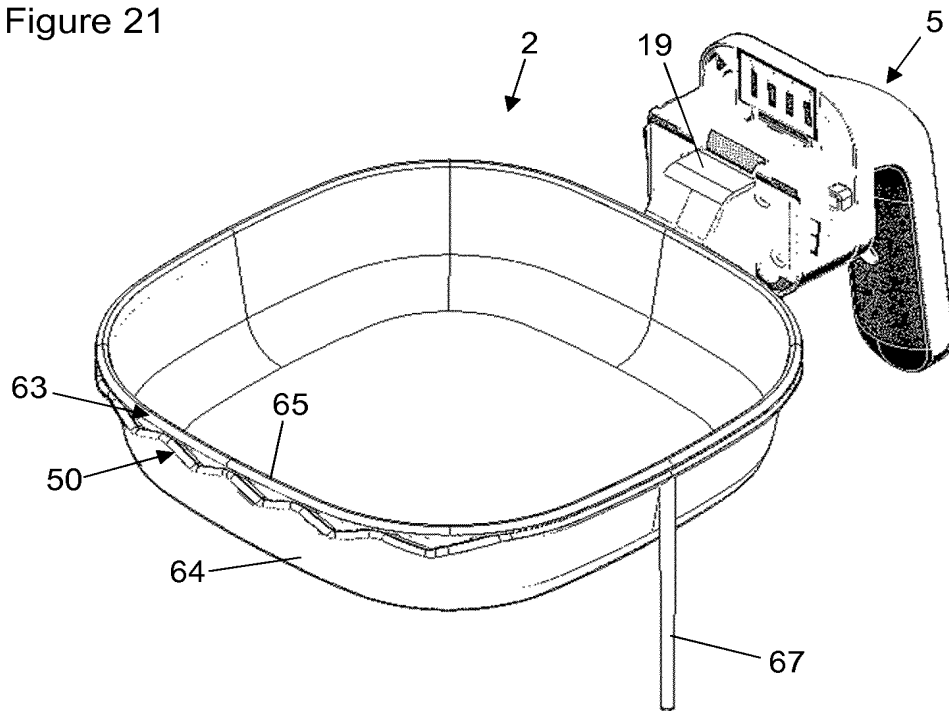
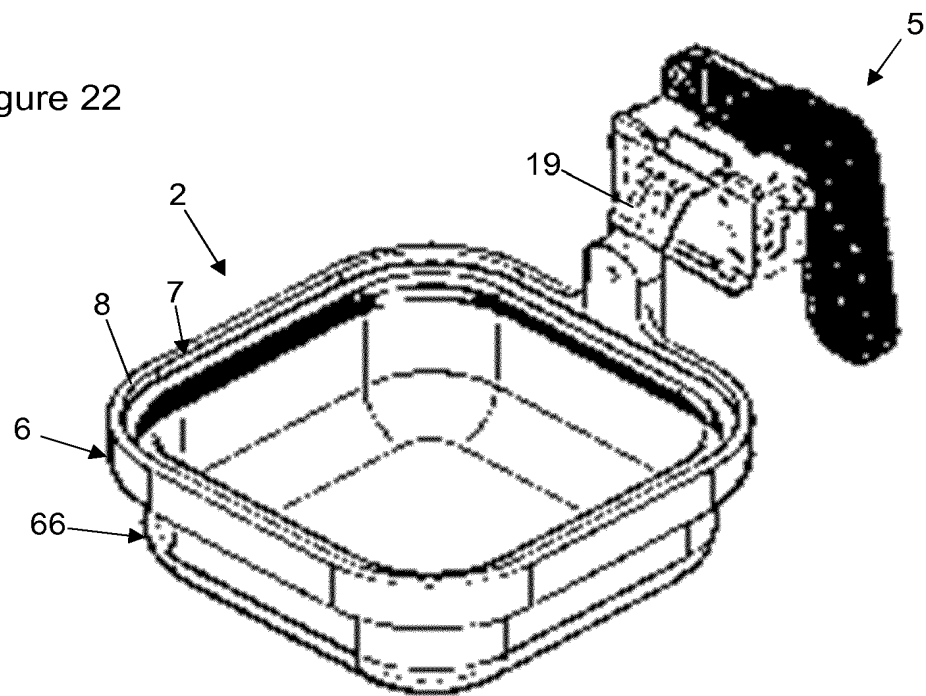


Figure 22



INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2019/068628

A. CLASSIFICATION OF SUBJECT MATTER**A47J 36/16**(2006.01)i; **A47J 37/06**(2006.01)i; **A47J 45/07**(2006.01)i

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)

A47J

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 A	US 2014366746 A1 (TSAI MO-TSAN [CN]) 18 December 2014 (2014-12-18) paragraphs [0001], [0004] - [0006], [0024] - [0037]; claims; figures	1-9,11,14,15 10,12,13,16-20
X A	FR 2871042 A1 (SEB SA [FR]) 09 December 2005 (2005-12-09) page 5, line 22 - page 7, line 3 page 9, line 3 - page 12, line 23 page 14, line 8 - page 16, line 18; claims; figures	1,2,5 3,4,6-20
X A	WO 2012123464 A1 (SEB SA [FR]; REINER GUILLAUME [FR]; BIZARD JEAN-CLAUDE [FR]) 20 September 2012 (2012-09-20) page 1, line 4 - page 1, line 16 page 7, line 11 - page 9, line 27 page 10, line 28 - page 15, line 24; claims; figures	1,2,14,15 3-13,16-20
X A	WO 2017085679 A1 (DE' LONGHI APPLIANCES S R L CON UNICO SOCIO [IT]) 26 May 2017 (2017-05-26) page 5, line 24 - page 7, line 33; claims; figures	1,2,15 3-14,16-20
A	CN 206213917 U (JOYOUNG CO LTD) 06 June 2017 (2017-06-06) paragraphs [0024] - [0056]; claims; figures	1-20

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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“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

02 August 2019

Date of mailing of the international search report

13 August 2019

Name and mailing address of the ISA/EP

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Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/EP2019/068628

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
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				EP	2685875	A1	22 January 2014
				FR	2972619	A1	21 September 2012
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				EP	3376921	A1	26 September 2018
				US	2018325322	A1	15 November 2018
				WO	2017085679	A1	26 May 2017
CN	206213917	U	06 June 2017	NONE			

RAPPORT DE RECHERCHE INTERNATIONALE

Demande internationale n°

PCT/EP2019/068628

A. CLASSEMENT DE L'OBJET DE LA DEMANDE

INV. A47J36/16 A47J37/06 A47J45/07
ADD.

Selon la classification internationale des brevets (CIB) ou à la fois selon la classification nationale et la CIB

B. DOMAINES SUR LESQUELS LA RECHERCHE A PORTE

Documentation minimale consultée (système de classification suivi des symboles de classement)
A47J

Documentation consultée autre que la documentation minimale dans la mesure où ces documents relèvent des domaines sur lesquels a porté la recherche

Base de données électronique consultée au cours de la recherche internationale (nom de la base de données, et si cela est réalisable, termes de recherche utilisés)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERES COMME PERTINENTS

Catégorie*	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
X A	US 2014/366746 A1 (TSAI MO-TSAN [CN]) 18 décembre 2014 (2014-12-18) alinéas [0001], [0004] - [0006], [0024] - [0037]; revendications; figures -----	1-9,11, 14,15 10,12, 13,16-20
X A	FR 2 871 042 A1 (SEB SA [FR]) 9 décembre 2005 (2005-12-09) page 5, ligne 22 - page 7, ligne 3 page 9, ligne 3 - page 12, ligne 23 page 14, ligne 8 - page 16, ligne 18; revendications; figures ----- -/--	1,2,5 3,4,6-20



Voir la suite du cadre C pour la fin de la liste des documents



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"&" document qui fait partie de la même famille de brevets

Date à laquelle la recherche internationale a été effectivement achevée

2 août 2019

Date d'expédition du présent rapport de recherche internationale

13/08/2019

Nom et adresse postale de l'administration chargée de la recherche internationale

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C(suite). DOCUMENTS CONSIDERES COMME PERTINENTS		
Catégorie*	Identification des documents cités, avec, le cas échéant, l'indication des passages pertinents	no. des revendications visées
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RAPPORT DE RECHERCHE INTERNATIONALE

Renseignements relatifs aux membres de familles de brevets

Demande internationale n°

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(54) Title: DUAL BAKING AND COOKING MECHANISM

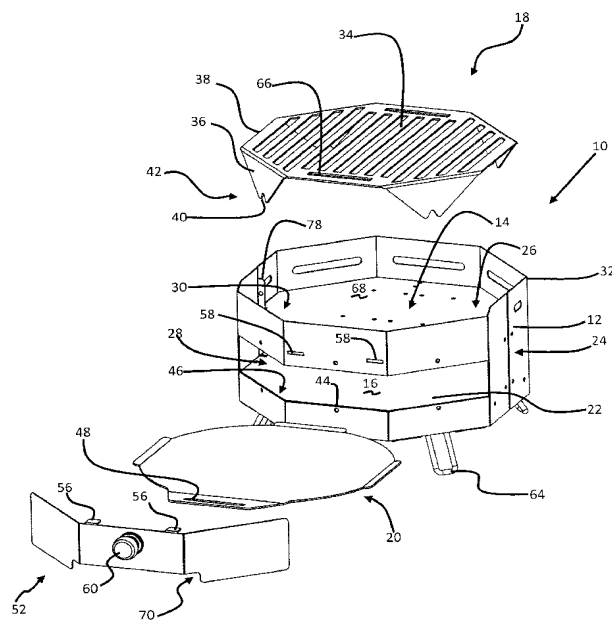


FIGURE 1

(57) **Abstract:** A cooking device (10) which includes a body (12) that defines a fuel zone (14), a baking zone (16) located underneath the fuel zone (14), a grilling platform (18) locatable above the fuel zone (14), and a tray member (20) for transporting food that is being cooked and which is movable between a first position at which the tray member (20) overlies the fuel zone (14), and a second position at which the tray member (20) is located inside the baking zone (16).

DUAL BAKING AND COOKING MECHANISM

BACKGROUND OF THE INVENTION

[0001] The invention relates to a portable cooking device

[0002] Outdoor cooking differs substantially from kitchen-based cooking, the most obvious
5 difference being a lack of an easily-defined kitchen area. As a result, campers and backpackers have developed various techniques and specialised equipment for preparing food in outdoor environments.

[0003] Outdoor cooking methods most often used are direct heating, boiling, frying, grilling and roasting. These techniques require only rudimentary, and common-sensical, tools.

10 [0004] Other cooking methods such as baking, however, present a challenge. A current method of baking which can be employed outdoors to make breads, pies and other items requires the use of a sheet pan placed over a furnace.

[0005] The pan is however generally large and cannot be easily transported, or is restrictive in the sense that the pan is designed to achieve baking only.

15 [0006] It is an aim of the current invention to address at least partially the aforementioned issues.

SUMMARY OF INVENTION

[0007] The invention provides a cooking device which includes a body that defines a fuel zone, a baking zone located underneath the fuel zone, a grilling platform locatable above the
20 fuel zone, and a tray member for supporting food that is being cooked and which is movable between a first position at which the tray member overlies the fuel zone, and a second position at which the tray member is located inside the baking zone.

[0008] The body may include a base, a wall extending from the base, and a sheet opposing the base and connected to the wall thereby to enclose an inner cavity within the body.

[0009] The inner cavity may define the baking zone.

5 [0010] A rim may surround an upper surface of the sheet thereby defining the fuel zone on the upper surface of the sheet.

[0011] The wall may have an opening formed therein whereby access is gained to the baking zone.

[0012] The grilling platform may include a grid which may be supported above the fuel zone e.g. on the rim or on the upper surface of the sheet.

10 [0013] The height of the grilling platform, above the fuel zone, may be adjustable.

[0014] A closure may be provided to seal off the baking zone.

[0015] A handle may be provided which is detachably engageable with the tray member to facilitate transportation of the tray member.

15 [0016] The tray member may be dimensioned to fit as required, onto the grilling platform, or within the inner cavity i.e. the baking zone. Preferably the grilling platform, the inner cavity and the tray member have substantially the same shape in plan, and dimensions.

BRIEF DESCRIPTION OF THE DRAWINGS

[0017] The invention is further described by way of example with reference to the accompanying drawings in which:

20 Figure 1 is an exploded perspective view of components of a cooking device according to the invention;

Figure 2 is a perspective view of the assembled cooking device in Figure 1 in a first configuration where a tray member is located on a grilling platform;

Figure 3 is a perspective view of the cooking device in Figure 2 in a second configuration where the tray member is located in a baking zone of the cooking device;

5 Figure 4 is a plan view of the cooking device illustrating the grilling platform in Figure 3;

Figures 5 and 6 are perspective views of the cooking device showing the tray member in different positions; and

Figures 7 is a front view of the cooking device of Figure 3.

DESCRIPTION OF PREFERRED EMBODIMENT

10 **[0018]** Figure 1 is an exploded view in perspective showing components of a cooking device 10 according to the invention. The cooking device 10 includes a body 12 which defines a fuel zone 14 located above a baking zone 16. A grilling platform 18 is locatable over the fuel zone 14 and a tray member 20 is provided for transporting food that is being cooked by the cooking device 10 from the grilling platform 18 to the baking zone 16 and vice versa.

15 **[0019]** The body 12 comprises a base plate 22 with a wall 24 surrounding the base 22. A sheet 26 is spaced from, and opposes, the base plate 22. A cavity 28 is formed between the base 22, the wall 24 and the sheet 26 and demarcates the baking zone 16. A number of spaced apart small ribs 30 extend upwardly from the sheet 26, adjacent an inner surface of the wall 24 which has a rim 32 which extends above and surrounds an upper surface 34 of
20 the sheet 26.

[0020] The grilling platform 18 comprises a grid 36 with support members 38 extending downwardly from an edge 40 of the grid at spaced intervals. Each support member 38 has a slot 4 formed in a lower lip 44 thereof.

[0021] The baking zone 16 is accessible through an opening 46 which is formed in a part of the wall 24.

[0022] The tray member 20 can be inserted into the baking zone 16 via the opening 44 and is supported within the baking zone on an upper surface 22A of the base plate 22.

5 [0023] The tray member 20 has a projection 48 in which is formed an elongate aperture 50 which is configured to receive a handle 52 (see Figure 3).

[0024] A closure 54 is provided to seal off the opening 46 in the wall 24. The closure 54 has a projection 56 which are insertable into slots 58 formed in the wall 24 at locations above the opening 46.

10 [0025] The closure 54 has a handle 60 to facilitate gripping and handling of the closure.

[0026] The body 12 has ground-engaging feet 64.

[0027] The grilling platform 18 includes an elongate aperture 66 which is similar to the aperture 50 in the tray member and which is configured to receive the handle 60 to facilitate adjustment or movement of the grilling platform.

15 [0028] In use of the cooking device 10 a fuel source, such as charcoal, is placed in the fuel zone 14 and is set alight to generate heat.

[0029] The grid 36 is placed over the ignited fuel in the fuel zone 14. A height of the grid can be adjusted by placing the grid in a first lower position at which the support members 38 bear directly on an upper surface 68 of the sheet 26, or alternatively the grid 36 can be rotated
20 slightly and elevated relative to the fuel zone so that the slots 42 of the support members 38 rest on respective upper edges of the ribs 30.

[0030] Food is placed on the tray member 20 which is then positioned either in the baking zone 16 or so that it overlies the grid 36. Typically, the food is first placed on the grid to allow it to be cooked from below using the heat generated by the fuel source. After the food is cooked to some extent, the food can be moved into the baking zone 16 thereby to cook from above, thus simulating a baking method of cooking.

[0031] The closure 54 (see Figure 3) is used to seal the opening 46 to prevent heat from escaping from the baking zone 16, so that the temperature in this zone can be increased.

[0032] In the Figure 3 configuration a gap 70 is formed between a lower edge of the closure 54 and an opposing surfaced of the sheet 26 so that the projection 48 of the tray member 20, which includes the aperture 50, can protrude therefrom. This allows the handle 52 to be engaged with the aperture 50 when necessary.

[0033] The aforementioned method of cooking is particularly advantageous when cooking foods such as pizza or potato bake because the heat coming from the top of the baking zone 16 is similar to that in an oven grill, thereby allowing the upper surface of the food to become grilled and so improving the texture and taste of the meal.

[0034] The device 10 thus caters for a variety of cooking methods.

[0035] The body, which is metallic, is conveniently hexagonal to facilitate its manufacture. The grilling platform and the tray member have complementary shapes.

CLAIMS

1. A cooking device which includes a body that defines a fuel zone, a baking zone located underneath the fuel zone, a grilling platform locatable above the fuel zone, and a tray member for transporting food that is being cooked and which is movable
5 between a first position at which the tray member overlies the fuel zone, and a second position at which the tray member is located inside the baking zone.
2. A cooking device according to claim 1 wherein the grilling platform includes a grid which is supported above the fuel zone.
3. A cooking device according to claim 1 wherein the wall includes an opening through
10 which the tray member is movable into or out of the baking zone, the cooking device further including a closure which is removably engageable with the opening.
4. A cooking device according to claim 3 wherein the tray member includes a projection which extends from the baking zone when the tray member is inside the baking zone and which projection includes a formation with which a handle is removably
15 engageable.
5. A cooking device which includes a base plate, a wall which surrounds and which extends upwardly from the base plate, a sheet which is spaced above the base plate and which is fixed to an inner surface of the wall thereby to define a baking zone between the sheet and the base plate, surrounded by a part of the wall, a tray
20 member, an opening in the wall through which the tray member is insertable into the baking zone, a closure which is removably engageable with the opening, and a grilling platform which is positioned above an upper surface of the sheet whereby a

fuel zone is formed between said upper surface and the grilling platform, and wherein the tray member is movable so that it overlies the grilling platform.

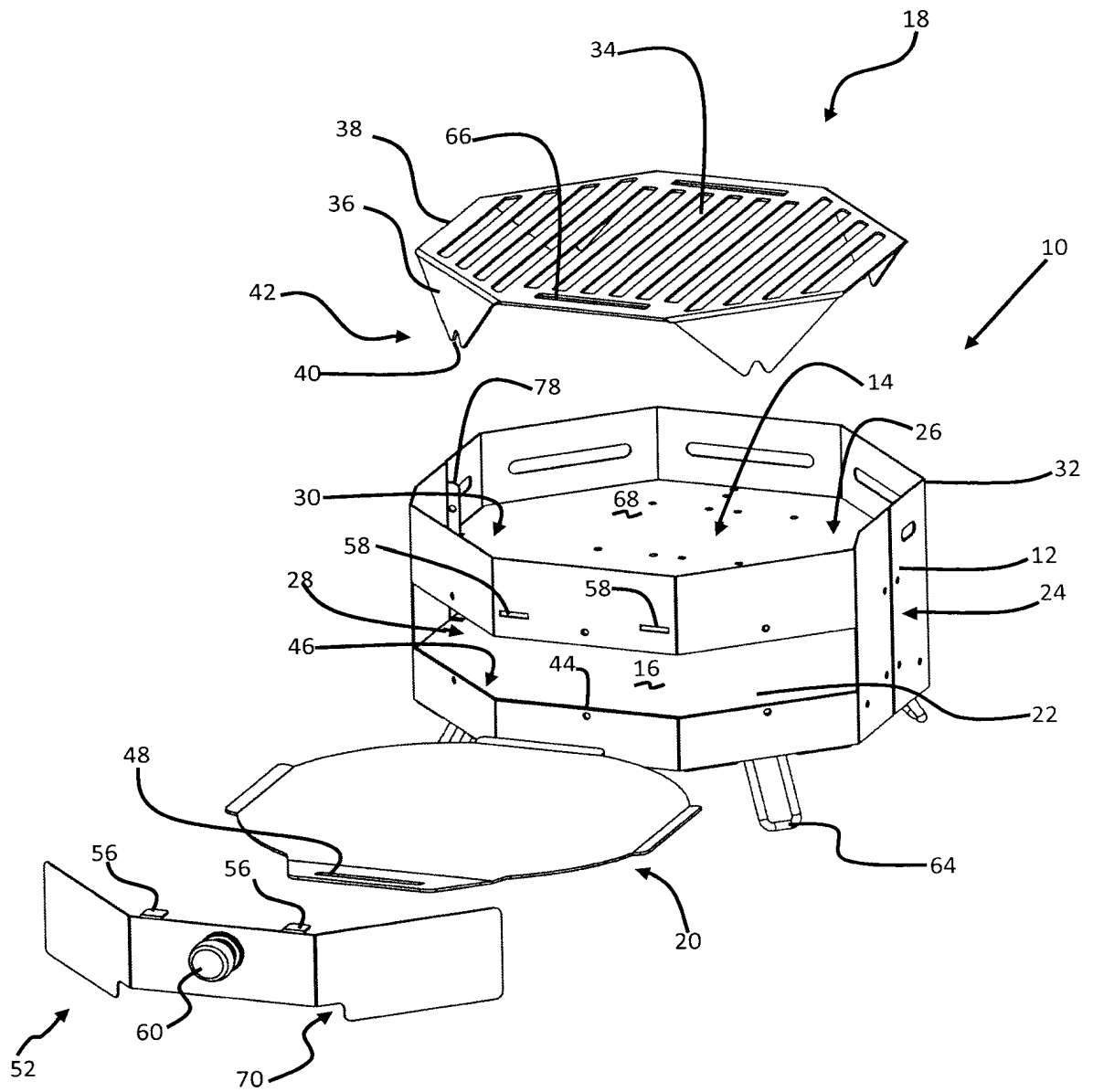


FIGURE 1

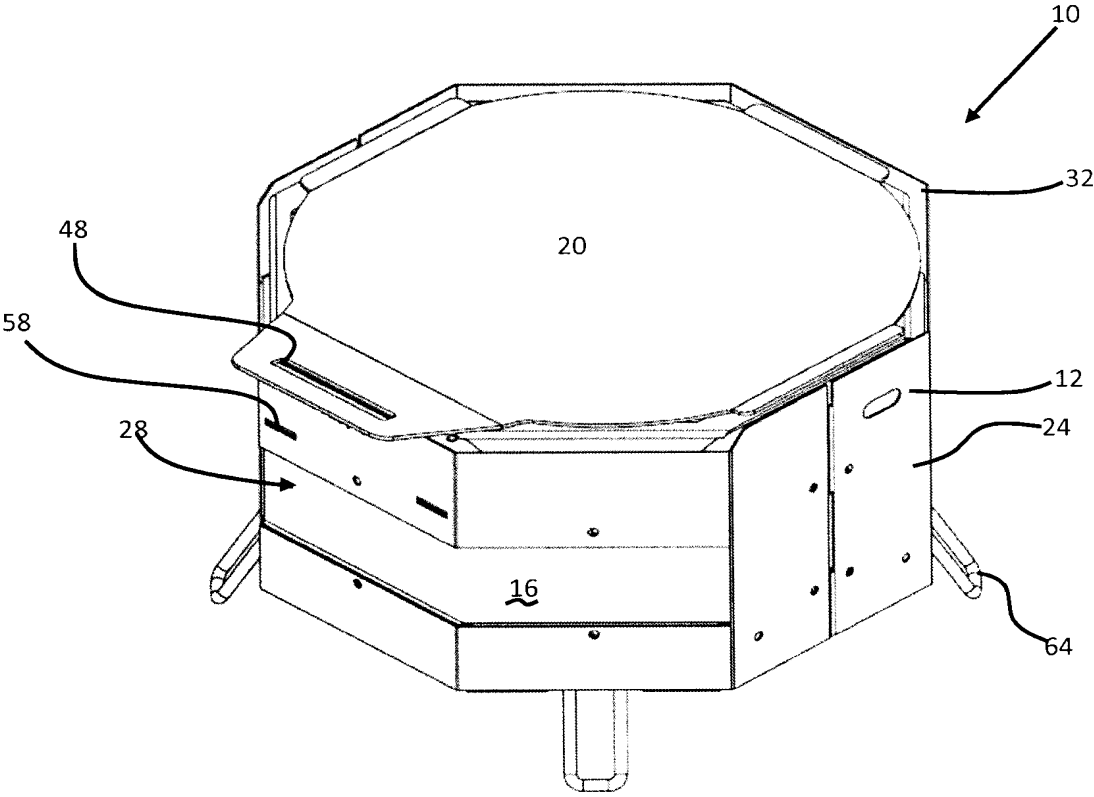


FIGURE 2

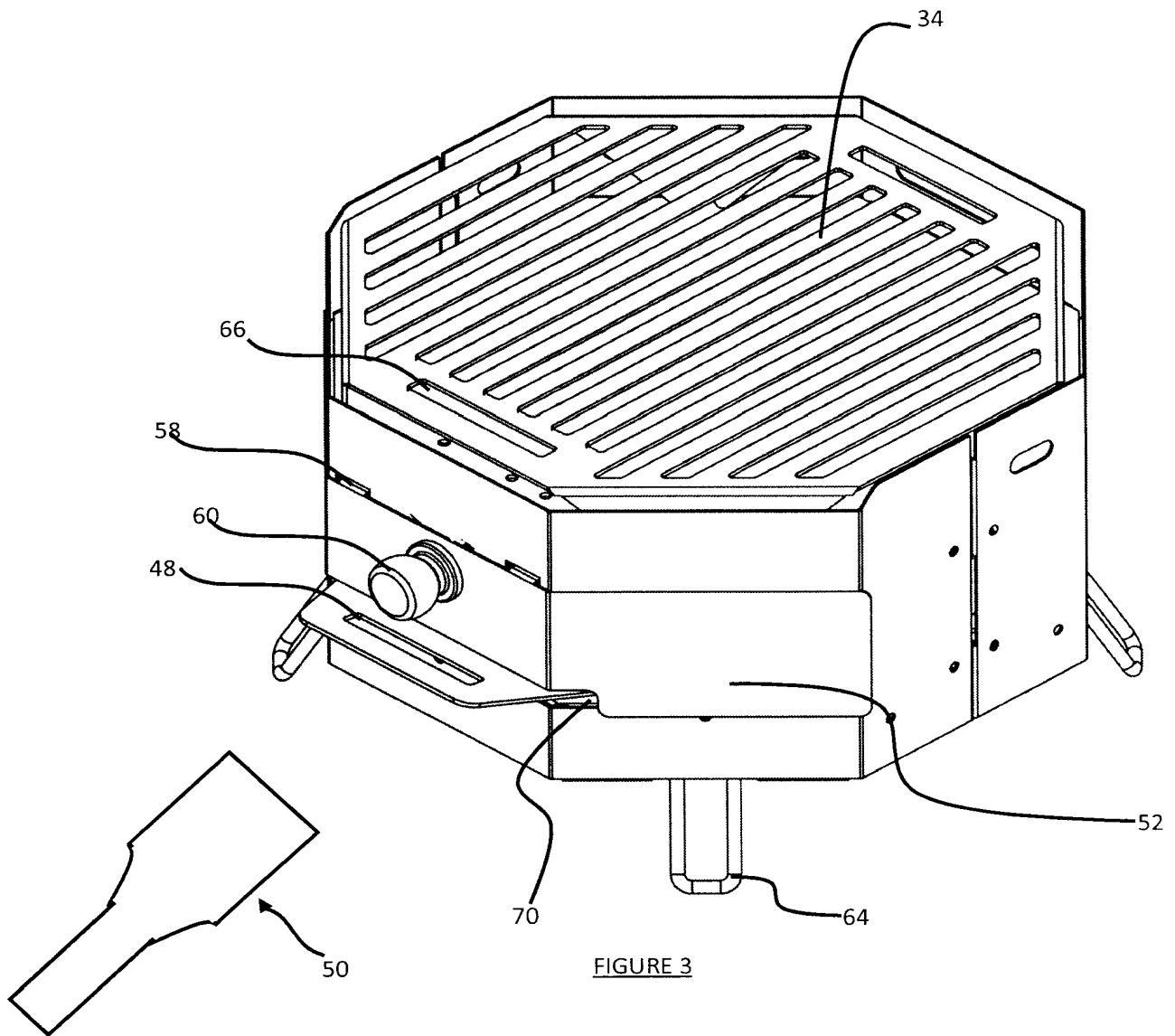


FIGURE 3

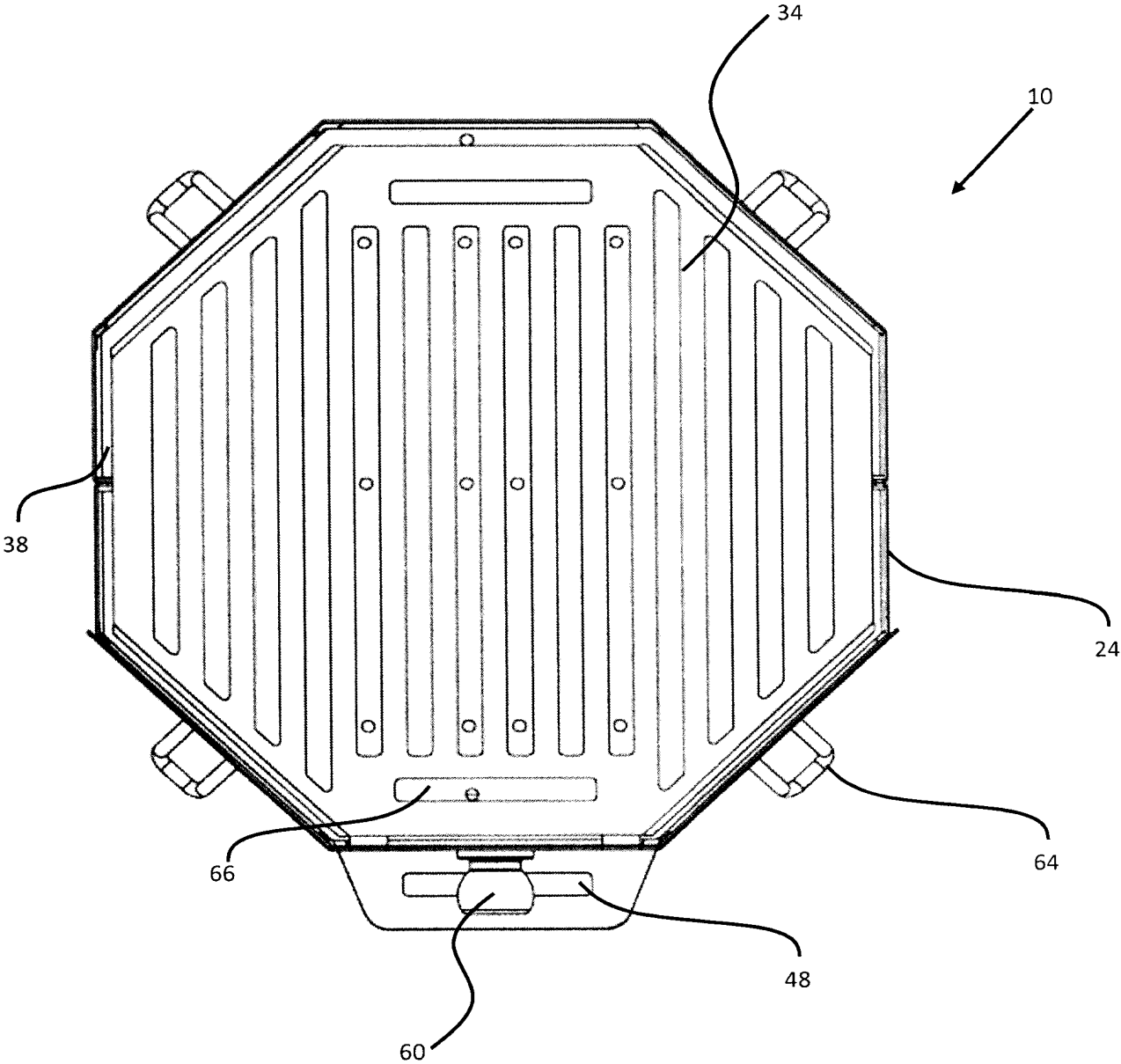


FIGURE 4

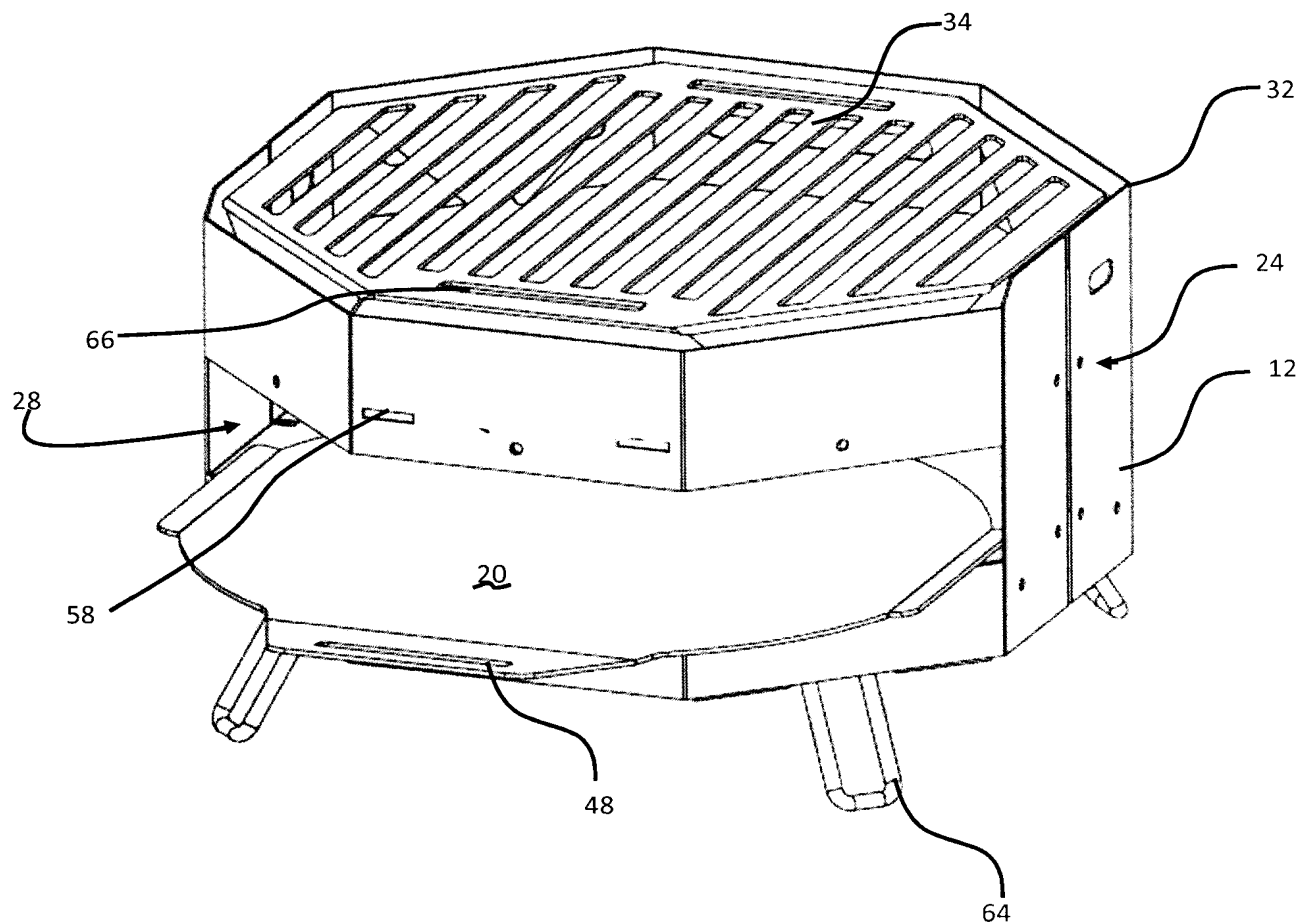


FIGURE 5

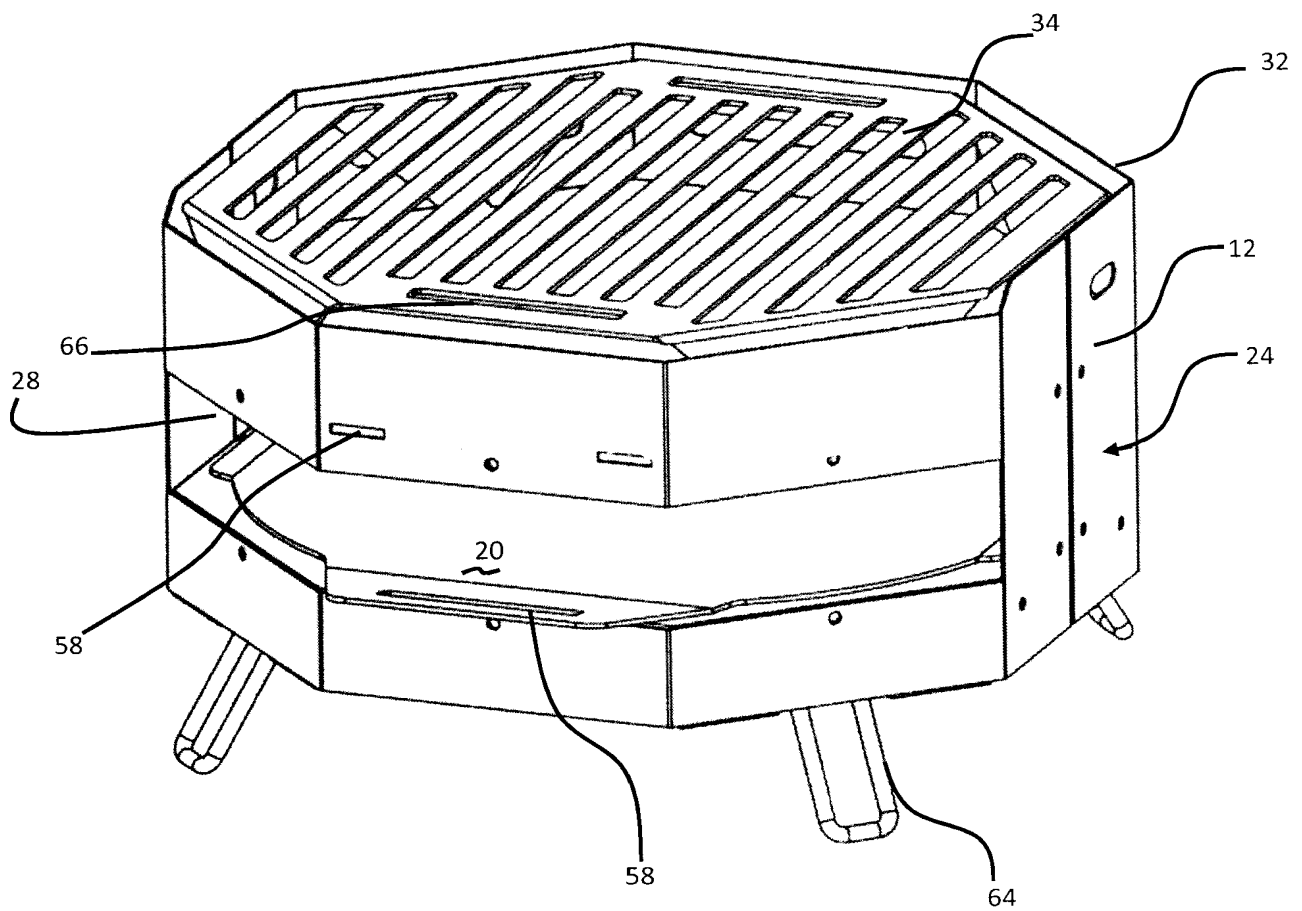


FIGURE 6

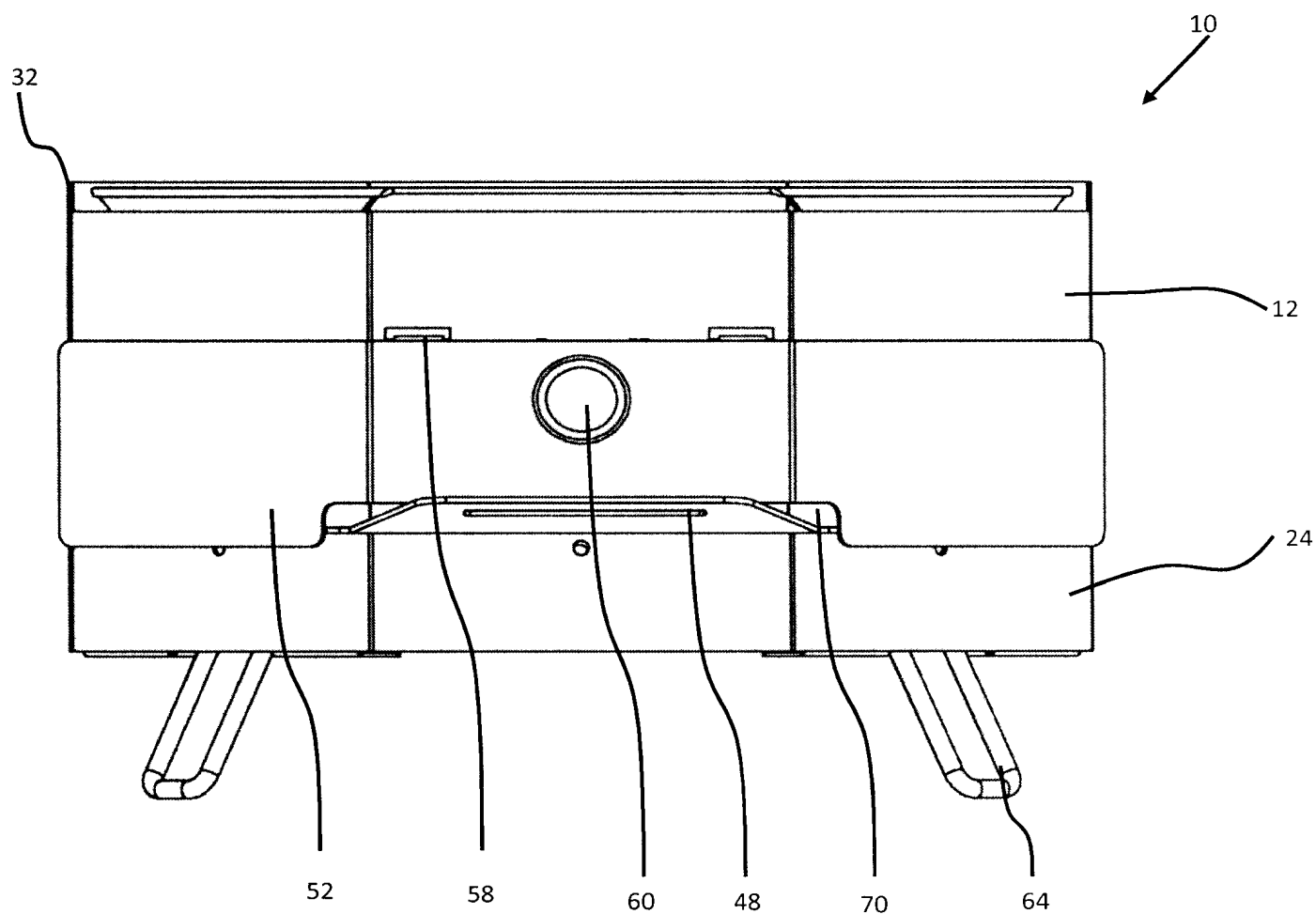


FIGURE 7

INTERNATIONAL SEARCH REPORT

International application No

PCT/ZA2019/050043

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A47J37/07 A47J37/06
 ADD.

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

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Minimum documentation searched (classification system followed by classification symbols)

A47J

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	JP 2005 114239 A (KATO MASAHIRO) 28 April 2005 (2005-04-28) paragraphs [0017], [0027] - [0056]; claims; figures -----	1-5
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A		1-4
A	JP H08 173328 A (AICHI SYST KK) 9 July 1996 (1996-07-09) paragraphs [0010] - [0018]; claims; figures -----	1-5
A	US 3 851 639 A (BEDDOE J) 3 December 1974 (1974-12-03) column 3, line 20 - column 8, line 57; claims; figures -----	1-5



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

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

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"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

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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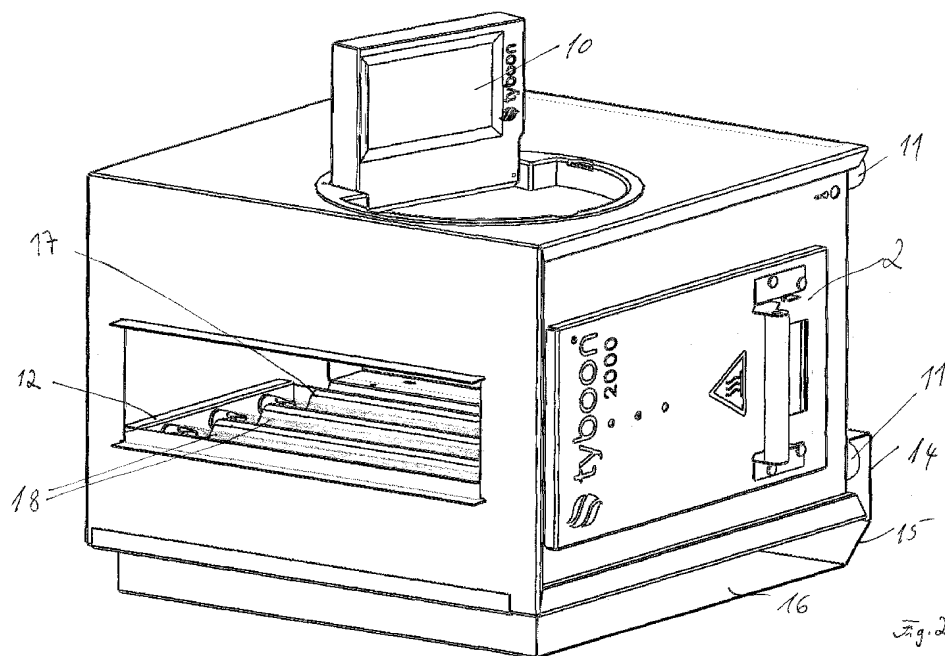
(72) Erfinder: **KAMMERER, Rolf**; An der Bundesstraße 10, 75196 Remchingen (DE).

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(54) Title: TILTABLE RADIATING GRILL

(54) Bezeichnung: KIPPBARER STRAHLUNGSGRILL



(57) Abstract: The invention relates to a radiating grill comprising a housing (1) which surrounds a cooking compartment, radiating means (14) arranged in the housing (1) on opposite sides of the cooking compartment, a pull-out part n element (2) which supports a holder (3) for items to be grilled and, in a position in which it is inserted into the housing (1), closes an opening on the front side of the housing (1), and a tank (4) for collecting fluid dripping from grilled items supported by the holder (3), in a first position of the radiating grill. According to the invention, the radiating grill comprises an outlet opening (6) through which, in the first position of the radiating grill, steam coming from the grilled items supported by the holder (3) can escape from the cooking compartment, and support elements (12) for supporting a plate which slides into the cooking compartment through the outlet opening (6) for cooking pizza or similar, in a

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Veröffentlicht:

— mit internationalem Recherchenbericht (Artikel 21 Absatz 3)

second position of the radiating grill, which differs from the first position by tilting 90°.

(57) Zusammenfassung: Beschrieben wird ein Strahlungsgrill mit einem Gehäuse (1), das einen Garraum umgibt, in dem Gehäuse (1) auf gegenüberliegenden Seiten des Garraums angeordneten Strahlern (14), einem Auszug (2), der eine Halterung (3) für Grillgut trägt und in einer in das Gehäuse (1) eingeschobenen Position eine Öffnung an der Vorderseite des Gehäuses (1) verschließt, und einer Wanne (4), um in einer ersten Stellung des Strahlungsgrills Flüssigkeit aufzufangen, die von Grillgut abtropft, das von der Halterung (3) gehalten wird. Erfindungsgemäß hat der Strahlungsgrill eine Abzugsöffnung (6) durch die in der ersten Stellung des Strahlungsgrills Dunst aus dem Garraum entweichen kann, der von Grillgut ausgeht, das von der Halterung (3) gehalten wird, und Stützelemente (12), um in einer zweiten Stellung des Strahlungsgrills, die sich von der ersten Stellung durch Kippen um 90° unterscheidet, eine durch die Abzugsöffnung (6) in den Garraum geschobene Platte zum Garen von Pizza oder ähnlichem zu halten.

Kippbarer Strahlungsgrill

Beschreibung

Die Erfindung geht von einem Strahlungsgrill mit den im Oberbegriff des Anspruchs 1 angegebenen Merkmalen aus, wie er aus der DE 10 2015 100 587 A1 bekannt ist.

- 5 In einem Strahlungsgrill wird Grillgut durch Einwirkung von Strahlung im infraroten und sichtbaren Spektralbereichen gegart, die durch einen oder mehrere Strahler erzeugt wird. Ein Vorteil von Strahlungsgrills besteht darin, dass die Strahler schon nach sehr kurzer Zeit so viel Strahlungsenergie abgeben können, dass Grillgut sehr schnell gegart wird.

10

Bei Strahlungsgrills, wie sie aus der DE 10 2015 100 587 A1 bekannt sind, wird Grillgut, z.B. ein Steak, nicht wie in herkömmlichen Grills liegend, sondern stehend gegart, indem es von zwei seitlich angeordneten Strahlern angestrahlt wird. Fett und Flüssigkeit können deshalb vom Grillgut abtropfen und in einer Wanne
15 aufgefangen werden. In Kombination mit raschen Garzeiten wird so ein besonders

guter Geschmack erreicht. Vorteilhaft können derartige Strahlungsgrills vielseitig zum Garen von Grillgut verwendet werden, das mit einer Halterung stehend zwischen seitlich angeordneten Strahlern gehalten werden kann.

- 5 Aufgabe der vorliegenden Erfindung ist es, einen Weg aufzuzeigen, wie ein solcher Strahlungsgrill noch vielseitiger verwendet werden kann.

Diese Aufgabe wird durch einen Strahlungsgrill mit den in Anspruch 1 angegebenen Merkmalen gelöst. Vorteilhafte Weiterbildungen der Erfindung sind
10 Gegenstand von Unteransprüchen.

Ein erfindungsgemäßer Strahlungsgrill kann vorteilhaft in zwei unterschiedlichen Stellungen verwendet werden. In einer ersten Stellung des Strahlungsgrills wird Grillgut wie bei dem aus der DE 10 2015 100 587 A1 bekannten Strahlungsgrill
15 seitlich von zwei gegenüberliegenden Seiten bestrahlt, beispielsweise indem es klemmend von Gittern einer Halterung gehalten wird. In der ersten Stellung des Strahlungsgrills kann Dunst aus dem Garraum durch eine Abzugsöffnung an einer Oberseite des Strahlungsgrills abziehen. In einer zweiten Stellung des Strahlungsgrills ist dieser um 90° gekippt, so dass die Abzugsöffnung nun nicht
20 mehr oben an dem Gehäuse, sondern in einer seitlich Wand des Gehäuses angeordnet ist. In der zweiten Stellung des Strahlungsgrills kann dann eine Platte oder ein Gitter durch die Abzugsöffnung in den Garraum geschoben werden. Der Strahlungsgrill weist dazu Stützelemente auf, um in der zweiten Stellung des Strahlungsgrills eine solche Platte in dem Garraum zu halten. Die Platte bzw. auf
25 der Platte liegende Speisen werden dann in dem Garraum von oben und ggf. unten bestrahlt. Vorteilhaft kann der Strahlungsgrill so auch zum Zubereiten von Pizza oder Flammkuchen verwendet werden.

Die Stützelemente zum Halten einer durch die Abzugsöffnung in den Garraum
30 geschobenen Platte können beispielsweise als Leisten ausgebildet sein, die an dem Gehäuse angebracht sind und sich ausgehend von der Abzugsöffnung in den Garraum hinein erstrecken.

Ein erfindungsgemäßer Strahlungsgrill kann also in seiner ersten Stellung stehend und in seiner zweiten Stellung liegend verwendet werden. Da ein erfindungsgemäßer Strahlungsgrill zwei unterschiedliche Gebrauchsstellungen hat, sind bevorzugt an zwei unterschiedlichen Gehäusewänden, die jeweils in der ersten bzw. zweiten Stellung des Strahlungsgrills den Gehäuseboden bilden, 5 Standelemente angebracht. Beispielsweise können als Standelemente an dem Gehäuse angebrachte Füße oder eine Auflagefläche, etwa ein Sockel, vorgesehen sein. Bevorzugt ist dabei, dass die Standelemente eine Luftzirkulation zwischen einem Untergrund, auf dem der Strahlungsgrill positioniert ist, und der dem Untergrund, z.B. einer Tischplatte, jeweils in der ersten bzw. zweiten Stellung 10 des Strahlungsgrills zugewandten Gehäusewand ermöglichen.

Eine vorteilhafte Weiterbildung der Erfindung sieht vor, dass der Strahlungsgrill eine Kipphilfe aufweist, die es einem Benutzer erleichtert, den Strahlungsgrill 15 durch Kippen von seiner ersten Stellung in die zweite Stellung zu bringen und umgekehrt. Die Kipphilfe kann an dem Gehäuse des Strahlungsgrills angebracht oder in dieses integriert sein. Die Kipphilfe erleichtert das Kippen des Strahlungsgrills aus der ersten in die zweite Position, indem sie in einer Zwischenposition eine Standfläche, mit welcher der Strahlungsgrill auf dem 20 Untergrund lastet, bildet. Bevorzugt weist die Kipphilfe dazu eine Schrägfläche auf, die sich von einem in der ersten Stellung des Strahlungsgrills unteren Rand des Strahlungsgrills aus schräg nach oben erstreckt. Die Schrägfläche verläuft bevorzugt in einem Winkel von 30° bis 60° zu einer der Gehäusewände, die in der ersten bzw. zweiten Stellung des Strahlungsgrills dessen Boden bilden. 25 Besonders bevorzugt schließt die Schrägfläche mit einer Gehäusewand, die sich in Richtung von der Wanne zu der Abzugsöffnung hin erstreckt, einen Winkel von 40° bis 50° ein.

Eine weitere vorteilhafte Weiterbildung der Erfindung sieht vor, dass der 30 Strahlungsgrill an einer Seite, die in seiner zweiten Stellung einen Boden bildet, einen Drehteller aufweist. In der zweiten Stellung liegt der Strahlungsgrill auf dem Drehteller und ist somit auf ihm drehbar.

Eine weitere vorteilhafte Weiterbildung der Erfindung sieht vor, dass der Strahlungsgrill einen Deckel zum Verschließen der Abzugsöffnung aufweist. Der Deckel zum Verschließen der Abzugsöffnung kann beispielsweise schwenkbar an dem Gehäuse angebracht sein. Bevorzugt weist der Deckel Durchbrüche auf, 5 beispielsweise Schlitz, so dass auch bei geschlossenem Deckel in der ersten Stellung des Strahlungsgrills Dunst aus dem Garraum abziehen kann. Der Deckel kann Klappen oder Schieber aufweisen, um die Durchbrüche bei Bedarf zu verschließen.

10 Als Alternative zu einem schwenkbar am Gehäuse angebrachten Deckel kann auch ein abnehmbarer Deckel, z.B. ein aufgesetzter oder aufgesteckter Deckel, verwendet werden. Je nach Gebrauch des Strahlungsgrills in seiner ersten bzw. zweiten Stellung können dann unterschiedliche Deckel verwendet werden, beispielsweise in der ersten Stellung ein Deckel mit Durchbrüchen, durch die 15 Dunst aus dem Garraum entweichen kann, und für die zweite Stellung des Strahlungsgrills ein Deckel ohne Öffnungen.

Weitere Einzelheiten und Vorteile der Erfindung werden an einem Ausführungsbeispiel unter Bezugnahme auf die beigefügten Zeichnungen 20 erläutert. Es zeigen:

Fig. 1 ein Ausführungsbeispiel eines erfindungsgemäßen Strahlungsgrills in seiner ersten Stellung mit geöffnetem Auszug;

25 Fig. 2 der Strahlungsgrill in seiner zweiten Stellung; und

Fig. 3 der Strahlungsgrill in seiner zweiten Stellung mit eingeschobener Platte.

Der in Fig.1 dargestellte Strahlungsgrill hat ein im Wesentlichen quaderförmiges 30 Gehäuse 1, das einen Garraum umgibt, in dem Grillgut von gegenüberliegend angeordneten Strahlern, beispielsweise Halogenstrahlern, seitlich angestrahlt wird. Zur besseren Ausnutzung der Strahlungsleistung sind den Strahlern jeweils Reflektoren zu geordnet, beispielsweise aus Keramik, insbesondere Aluminiumoxid. Um Grillgut zwischen den Strahlern zu halten, ist an einem Auszug

2 eine abnehmbare Halterung 3 vorgesehen. In Fig. 1 ist der Auszug 2 in einer ausgefahrenen Position dargestellt. In seiner eingefahrenen Position verschließt der Auszug 2 eine Öffnung an der Vorderseite des Gehäuses 1.

- 5 Die Halterung 3 kann Grillgut beispielsweise klemmend halten und zu diesem Zweck zwei Gitter aufweisen, deren Abstand zu einander verstellbar ist. Fett und andere Flüssigkeiten, die von Grillgut, das von der Halterung 3 gehalten wird, abtropfen, werden von einer Wanne 4 aufgefangen. Dabei kann der Auszug 2 eine Rinne 5 unter der Halterung 3 aufweisen, über die abtropfende Flüssigkeit zu einer
10 außerhalb des Gehäuses 1 angeordneten Wanne 4 gelangt, beispielsweise einer an dem Auszug einhakten Wanne 4. Alternativ ist es auch möglich, eine Wanne zum Auffangen abtropfender Flüssigkeit unter der Halterung 3 an dem Auszug 2 oder in dem Gehäuse 1 anzuordnen. Die Halterung 3 kann von dem Auszug 2 abgenommen werden, beispielsweise indem sie in Kerben 21 eines Trägers 20
15 gesteckt ist. Die Halterung 3 kann somit von dem Strahlungsgrill entfernt werden, etwa für Reinigungszwecke.

- Dunst kann aus dem Garraum durch eine Abzugsöffnung 6 entweichen. Im eingeschobenen Zustand des Auszugs 2 befindet sich die Halterung 3 dann
20 zwischen der Abzugsöffnung 6 und einer Wanne oder Rinne 5 zum Auffangen von Flüssigkeit, die von Grillgut abtropfen kann, das von der Halterung gehalten wird. Die Gehäusewand, in der die Abzugsöffnung 6 vorgesehen ist, grenzt also mit ihren Längsseiten an Gehäuseseiten an, denen die Strahler zum beidseitigen bestrahlen von Grillgut zugeordnet sind, und mit einer Schmalseite an die
25 Vorderseite des Gehäuses 1 an, die durch den Auszug 2 verschlossen wird. Die Abzugsöffnung 6 kann mit einem Deckel 8 verschlossen werden, der bevorzugt Durchbrüche 9, beispielsweise Langlöcher, aufweist, durch die Dunst abziehen kann.

- 30 Zur Steuerung des Strahlungsgrills kann an einer weiteren Gehäusewand eine Steuerung 10 angebracht sein, beispielsweise ein Sensorbildschirm. Die Steuerung 10 kann beispielsweise an einer Gehäusewand angebracht sein, die sowohl an die durch den Auszug 2 verschließbare Vorderseite als auch an die die Abzugsöffnung 6 aufweisende Gehäuseseite angrenzt.

Der Strahlungsgrill steht in seiner in Fig. 1 gezeigten Stellung auf Standelementen 11. Die Standelemente 11 ermöglichen vorzugsweise eine Luftzirkulation unter dem Strahlungsgrill. Wie Fig. 1 zeigt, sind die Standelemente 11 an einer Gehäusewand angebracht, die der die Abzugsöffnung 2 aufweisenden Gehäusewand gegenüber liegt und an die von dem Auszug 2 verschließbare Stirnseite angrenzt.

Die in Fig. 1 gezeigte Stellung des Strahlungsgrills wird im Folgenden als erste Stellung bezeichnet. Neben dieser ersten Stellung, die auch als stehende Stellung bezeichnet werden kann, kann der Strahlungsgrill in einer zweiten Stellung verwendet werden, in der er in den Figuren 2 und 3 dargestellt ist und die auch als liegende Stellung bezeichnet werden kann.

In seiner zweiten Stellung kann die Abzugsöffnung 6 als Zugang zum Garraum des Strahlungsgrills verwendet werden, insbesondere um eine Platte oder ein Gitter in den Garraum zu schieben, beispielsweise um Pizza oder Flammkuchen zu zubereiten. Speisen auf der Platte oder dem Gitter können dann von den Strahlern 18, denen jeweils Keramikreflektoren 17 zugeordnet sind, von oben und unten angestrahlt werden. Um eine solche Platte oder ein Gitter zu halten, weist der Strahlungsgrill Stützelemente 12 auf. Anstelle einer einfachen Platte können beispielsweise auch zwei durch Seitenwände verbundene Platten in den Garraum geschoben werden, beispielsweise Glasplatten 13, wie in Fig. 3 gezeigt.

Wenn der Strahlungsgrill in der zweiten Stellung verwendet werden soll, wird die Halterung 3 von dem Auszug 2 abgenommen, so dass der Garraum für eine Platte genutzt werden kann, auf der z.B. Pizza zubereitet werden kann. Wanne 4 und, sofern vorhanden, Rinne 5 sind ebenfalls von dem Auszug 2 abnehmbar, so dass auch diese Komponenten entfernt werden können, wenn der Strahlungsgrill in seiner zweiten Stellung verwendet werden soll.

Der Deckel 8 kann abnehmbar ausgebildet sein, so dass für die zweite Stellung des Strahlungsgrills ein anderer Deckel verwendet werden kann, der z.B. keine Durchbrüche aufweist. Eine andere Möglichkeit besteht darin, einen schwenkbar

angebrachten Deckel 8 einzusetzen, wie dies bei dem Ausführungsbeispiel der Fig. 3 gezeigt ist.

Der Strahlungsgrill gelangt von der ersten Stellung in die zweite Stellung, indem er um 90° gekippt wird. Um das Kippen zu erleichtern, weist der Strahlungsgrill eine Kipphilfe 14 auf, die beispielsweise aus Blech hergestellt und an dem Gehäuse 1 angebracht sein kann. Die Kipphilfe kann aber auch in das Gehäuse 1 integriert sein. Die Kipphilfe 14 weist vorteilhaft eine Schrägfläche 15 auf, auf welcher der Strahlungsgrill in einer Zwischenposition beim Kippen von seiner ersten in seine zweite Stellung ruht. Diese Schrägfläche 15 schließt mit der Horizontalen in der ersten Stellung sowie mit der Horizontalen in der zweiten Stellung einen Winkel zwischen 30° und 60°, vorzugsweise 40° bis 50°, ein. Die Schrägfläche 15 bildet einen Streifen, der sowohl in der ersten als auch in der zweiten Stellung am jeweils dann unteren Rand des Strahlungsgrills angeordnet ist. Der Streifen hat eine Breite von wenigstens 2 cm, beispielsweise 3 bis 6 cm.

Möchte man den Strahlungsgrill aus der ersten in die zweite Position bringen, wird er in einem ersten Schritt soweit gekippt, dass er auf der Kipphilfe 14 lastet, beispielsweise auf der Schrägfläche 15. Die Kipphilfe kann anstelle des Streifens aber auch eine gekrümmte Fläche aufweisen, auf welcher der Strahlungsgrill beim Kippen lastet. In einem zweiten Schritt wird der Strahlungsgrill dann aus seiner Zwischenposition, in der er auf der Kipphilfe 14 lastet, dann in seine zweite Stellung gekippt.

In der zweiten Stellung liegt der Strahlungsgrill auf einem Sockel 16, der von einem Blech gebildet sein kann, das auch die Kipphilfe 14 bildet. Zwischen dem Sockel 16 und der nächstgelegenen Gehäusewand kann ein Luftspalt sein, wie in Fig. 2 und 3 gezeigt. Der Sockel kann eine Drehscheibe aufweisen, so dass der Strahlungsgrill in seiner zweiten Stellung auf der Drehscheibe drehbar ist.

30

Bezugszeichenliste

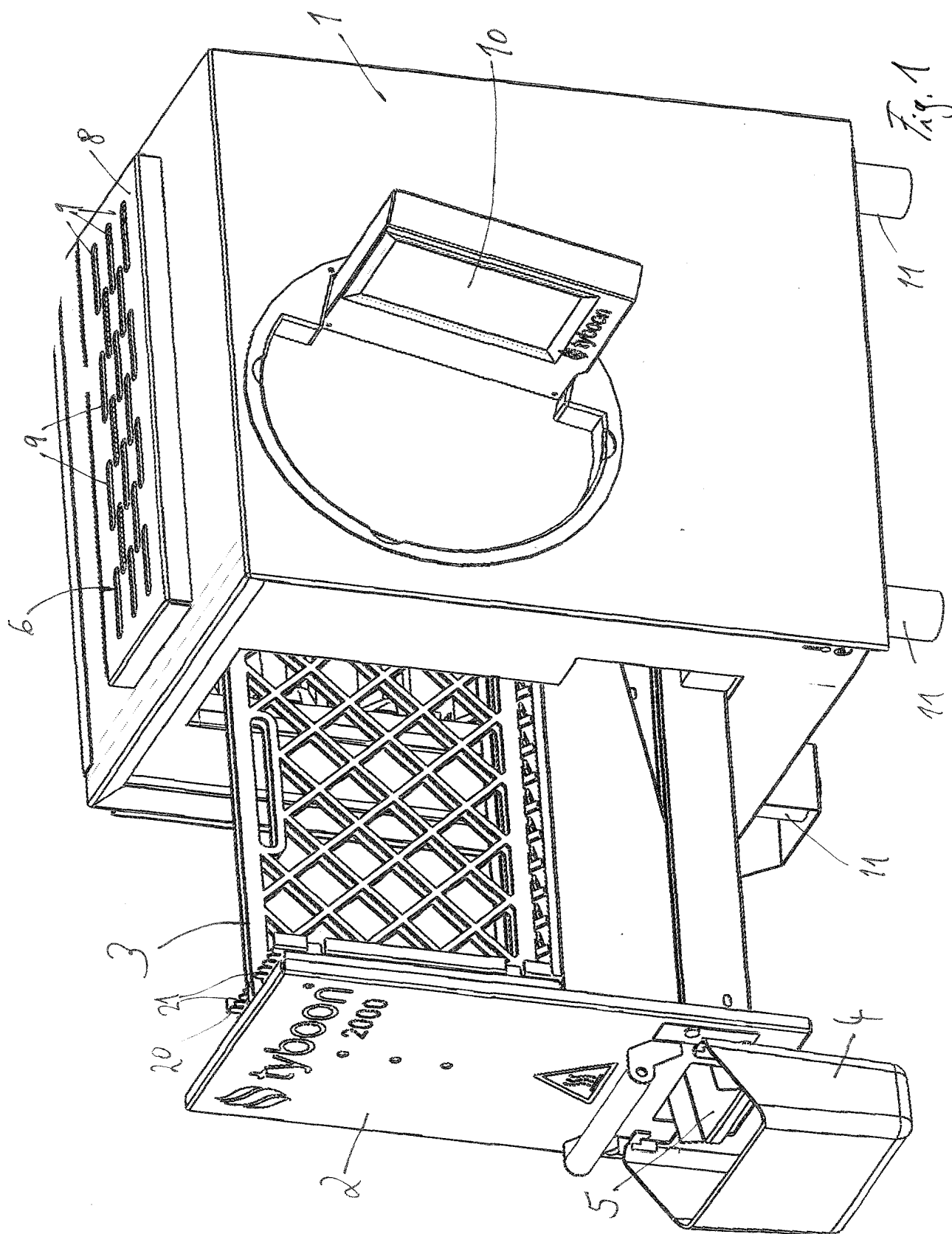
- 1 Gehäuse
- 2 Auszug
- 3 Halterung
- 4 Wanne
- 5 Rinne
- 6 Abzugsöffnung
- 8 Deckel
- 9 Durchbrüche
- 10 Steuerung
- 11 Standelemente
- 13 Glasplatte
- 14 Kipphilfe
- 15 Schrägfläche
- 16 Sockel
- 17 Keramikreflektor
- 20 Träger
- 21 Kerbe

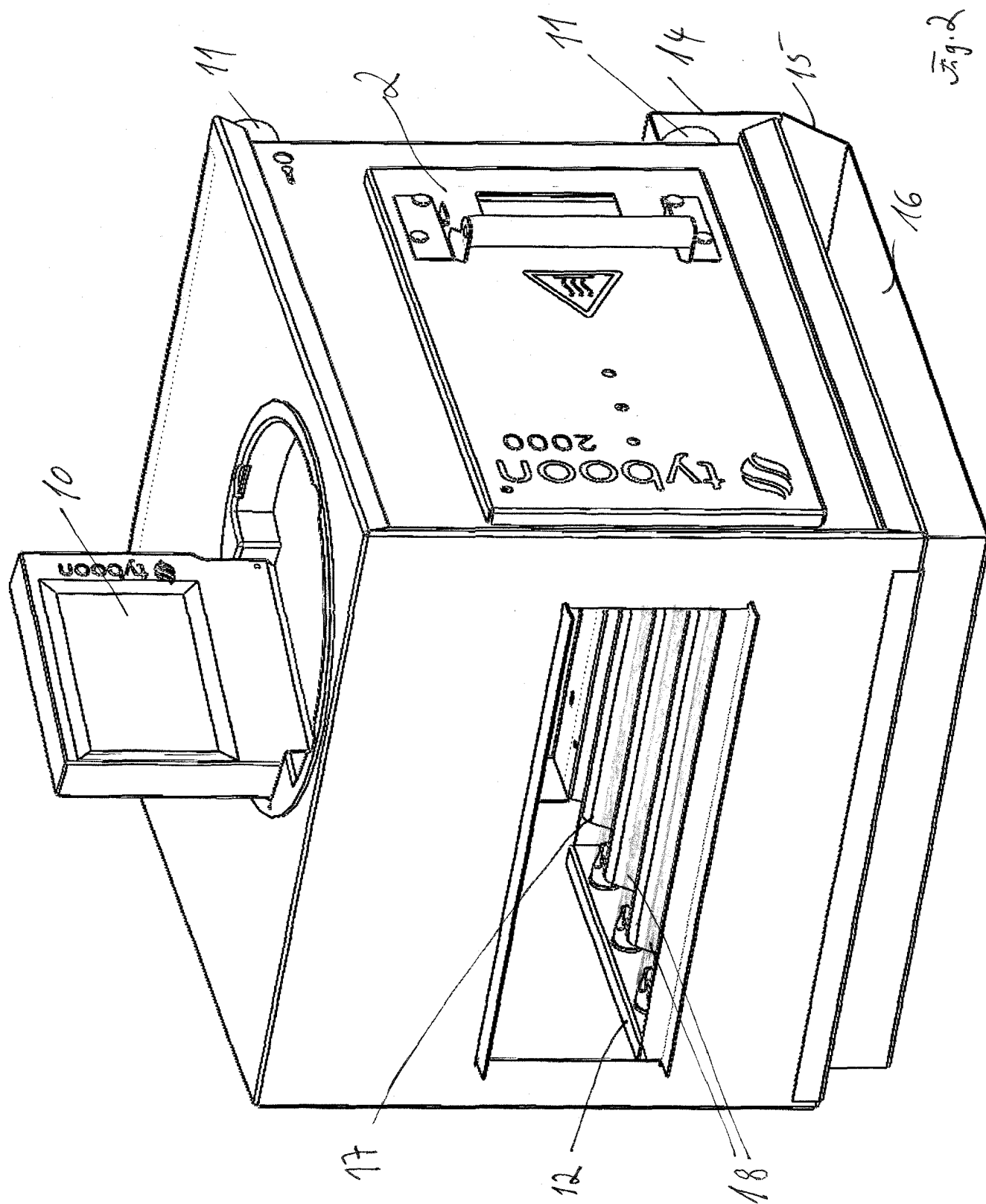
Patentansprüche

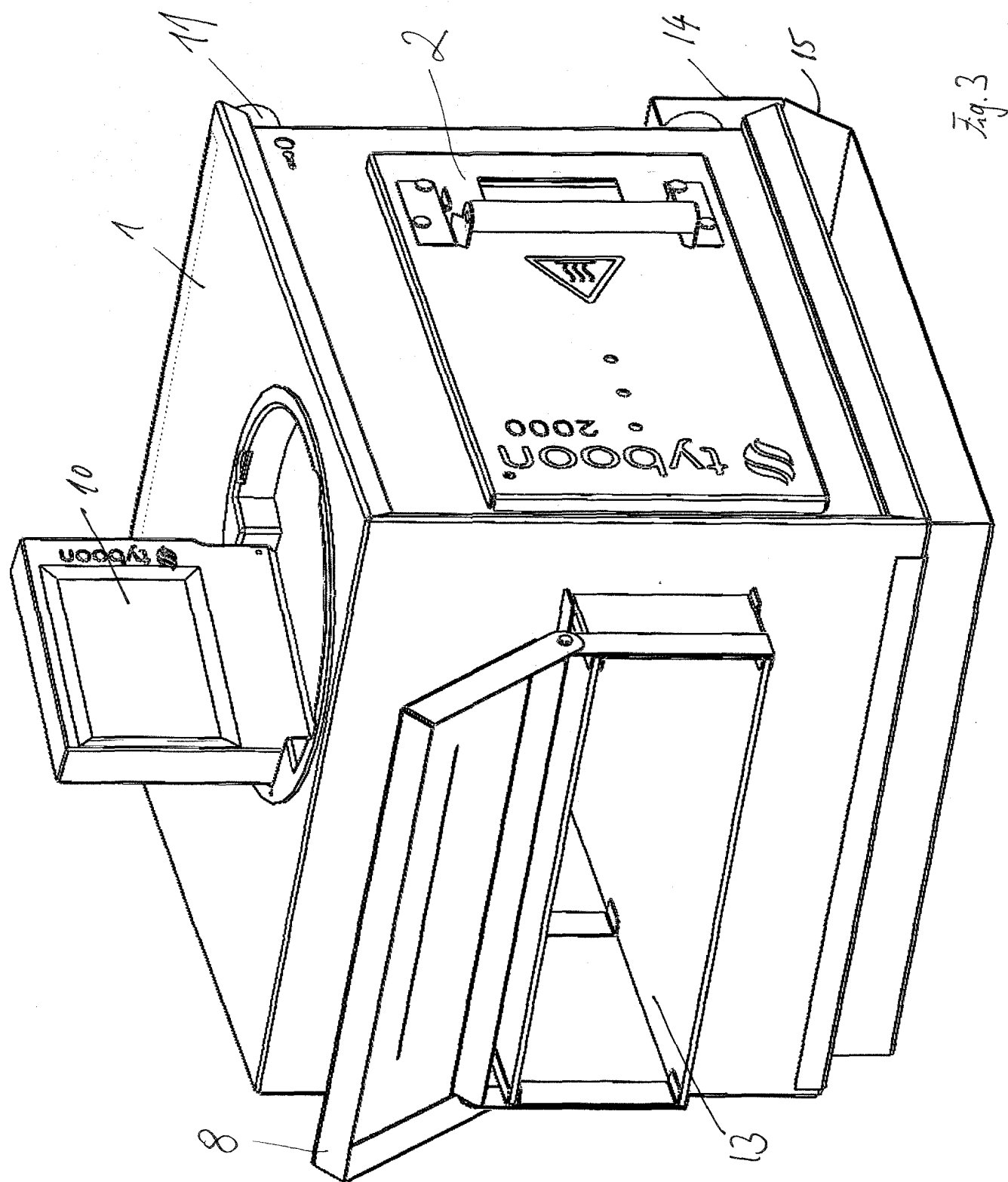
1. Strahlungsgrill mit
einem Gehäuse (1), das einen Garraum umgibt,
5 in dem Gehäuse (1) auf gegenüberliegenden Seiten des Garraums
angeordneten Strahlern (14),
einem Auszug (2), der eine Halterung (3) für Grillgut trägt und in einer in das
Gehäuse (1) eingeschobenen Position eine Öffnung an der Vorderseite des
Gehäuses (1) verschließt, und
10 einer Wanne (4), um in einer ersten Stellung des Strahlungsgrills Flüssigkeit
aufzufangen, die von Grillgut abtropft, das von der Halterung (3) gehalten wird,
gekennzeichnet durch
eine Abzugsöffnung (6) durch die in der ersten Stellung des Strahlungsgrills
Dunst aus dem Garraum entweichen kann, der von Grillgut ausgeht, das von
15 der Halterung (3) gehalten wird, und
Stützelemente (12), um in einer zweiten Stellung des Strahlungsgrills, die sich
von der ersten Stellung durch Kippen um 90° unterscheidet, eine durch die
Abzugsöffnung (6) in den Garraum geschobene Platte zum Garen von Pizza
oder ähnlichem zu halten.
20
2. Strahlungsgrill nach Anspruch 1, dadurch gekennzeichnet, dass das Gehäuse
(1) an einer Seite, die sich in Richtung von der Wanne (5) zu der Abzugsöffnung
(6) hin erstreckt, eine Kipphilfe (14) trägt, auf welcher der Strahlungsgrill in einer
Zwischenposition beim Kippen von seiner ersten in seine zweite Stellung ruht.
25
3. Strahlungsgrill nach Anspruch 2 dadurch gekennzeichnet, dass die Kipphilfe
(14) eine Schrägfläche (15) bildet, auf welcher der Strahlungsgrill in einer
Zwischenposition beim Kippen von seiner ersten in seine zweite Stellung ruht.
- 30 4. Strahlungsgrill nach Anspruch 3, dadurch gekennzeichnet, dass die
Schrägfläche (15) mit einer Gehäusewand, die in der ersten Stellung des
Strahlungsgrills einen Boden bildet, einen Winkel von 30° bis 60° einschließt.

5. Strahlungsgrill nach Anspruch 3 oder 4, dadurch gekennzeichnet, dass die Schrägfläche (15) ein Streifen ist, der eine Breite von wenigstens 2 cm hat.
6. Strahlungsgrill nach einem der Ansprüche 2 bis 5, dadurch gekennzeichnet, dass die Kipphilfe (14) an eine Auflagefläche (16) angrenzt, auf der der Strahlungsgrill in seiner zweiten Stellung liegt.
7. Strahlungsgrill nach einem der vorstehenden Ansprüche, gekennzeichnet durch einen Deckel (8) zum Verschließen der Abzugsöffnung (6), wobei der Deckel Durchbrüche, vorzugsweise Schlitze aufweist.
8. Strahlungsgrill nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, dass das Gehäuse (1) an einer der Abzugsöffnung (6) gegenüberliegenden Wand eine oder mehrere Standelemente (11) aufweist, auf denen der Strahlungsgrill in seiner ersten Stellung steht.
9. Strahlungsgrill nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, dass Halterung (3) und Wanne (4) an dem Auszug (2) abnehmbar angebracht sind, vorzugsweise durch Einstecken oder Einhaken.

20







INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2019/070853

A. CLASSIFICATION OF SUBJECT MATTER A47J 37/06 (2006.01)i; A47J 37/04 (2006.01)i 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) A47J 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	BBQ aus Baden. "Tyboon Grill - Unboxing, Erklärung & Tests" YouTube, 20 June 2018 (2018-06-20), page 1, Retrieved from the Internet: https://www.youtube.com/watch?v=_Xh6VWJW23U [retrieved on 2019-09-30] XP054979731	1,7-9
A	sequences 0:50-1:20 min. sequences 1:55-2:30 min. sequences 3:50-4:00 min. sequences 4:40-4:50 min. sequences 6:00-6:15 min. sequences 7:20-7:38 min. sequences 10:15-11:00 min. sequences 13:45-14:00 min.	2-6
A	US 2017191670 A1 (THABIT KHALID OMAR [SA]) 06 July 2017 (2017-07-06) figure 6 claim 1 the whole document	1-9
☒ 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 "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 01 October 2019		Date of mailing of the international search report 09 October 2019
Name and mailing address of the ISA/EP European Patent Office p.b. 5818, Patentlaan 2, 2280 HV Rijswijk Netherlands Telephone No. (+31-70)340-2040 Facsimile No. (+31-70)340-3016		Authorized officer Ulubay, Can Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/EP2019/070853**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 102015100587 A1 (KAEMMERER GMBH [DE]) 24 September 2015 (2015-09-24) cited in the application figure 1 claims 1-15 the whole document	1-9
A	DE 202015106661 U1 (KAEMMERER GMBH [DE]) 14 January 2016 (2016-01-14) figures 1, 2 claim 1 the whole document	1-9

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/EP2019/070853

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
US	2017191670	A1	06 July 2017	NONE	
DE	102015100587	A1	24 September 2015	NONE	
DE	202015106661	U1	14 January 2016	DE 112016005599 A5	25 October 2018
				DE 202015106661 U1	14 January 2016
				WO 2017097780 A1	15 June 2017

A. KLASSIFIZIERUNG DES ANMELDUNGSGEGENSTANDES
 INV. A47J37/06 A47J37/04
 ADD.

Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikationssymbole)
 A47J

Recherchierte, aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

EPO-Internal, WPI Data

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
X	BBQ aus Baden: "Tyboon Grill - Unboxing, Erklärung & Tests", YouTube, 20. Juni 2018 (2018-06-20), Seite 1, XP054979731, Gefunden im Internet: URL: https://www.youtube.com/watch?v=_Xh6VWJW23U [gefunden am 2019-09-30]	1,7-9
A	Sequenzen 0:50-1:20 Min. Sequenzen 1:55-2:30 Min. Sequenzen 3:50-4:00 Min. Sequenzen 4:40-4:50 Min. Sequenzen 6:00-6:15 Min. Sequenzen 7:20-7:38 Min. Sequenzen 10:15-11:00 Min. Sequenzen 13:45-14:00 Min. ----- -/-	2-6



Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen



Siehe Anhang Patentfamilie

* Besondere Kategorien von angegebenen Veröffentlichungen :

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Datum des Abschlusses der internationalen Recherche

1. Oktober 2019

Absendedatum des internationalen Recherchenberichts

09/10/2019

Name und Postanschrift der Internationalen Recherchenbehörde
 Europäisches Patentamt, P.B. 5818 Patentlaan 2
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Bevollmächtigter Bediensteter

Ulubay, Can

C. (Fortsetzung) ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	US 2017/191670 A1 (THABIT KHALID OMAR [SA]) 6. Juli 2017 (2017-07-06) Abbildung 6 Anspruch 1 das ganze Dokument	1-9
A	----- DE 10 2015 100587 A1 (KAEMMERER GMBH [DE]) 24. September 2015 (2015-09-24) in der Anmeldung erwähnt Abbildung 1 Ansprüche 1-15 das ganze Dokument	1-9
A	----- DE 20 2015 106661 U1 (KAEMMERER GMBH [DE]) 14. Januar 2016 (2016-01-14) Abbildungen 1, 2 Anspruch 1 das ganze Dokument -----	1-9

INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen

PCT/EP2019/070853

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
US 2017191670 A1	06-07-2017	KEINE	
DE 102015100587 A1	24-09-2015	KEINE	
DE 202015106661 U1	14-01-2016	DE 112016005599 A5	25-10-2018
		DE 202015106661 U1	14-01-2016
		WO 2017097780 A1	15-06-2017

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(54) Title: HEATING DEVICE OF TOASTER

(54) 发明名称: 多士炉的发热装置

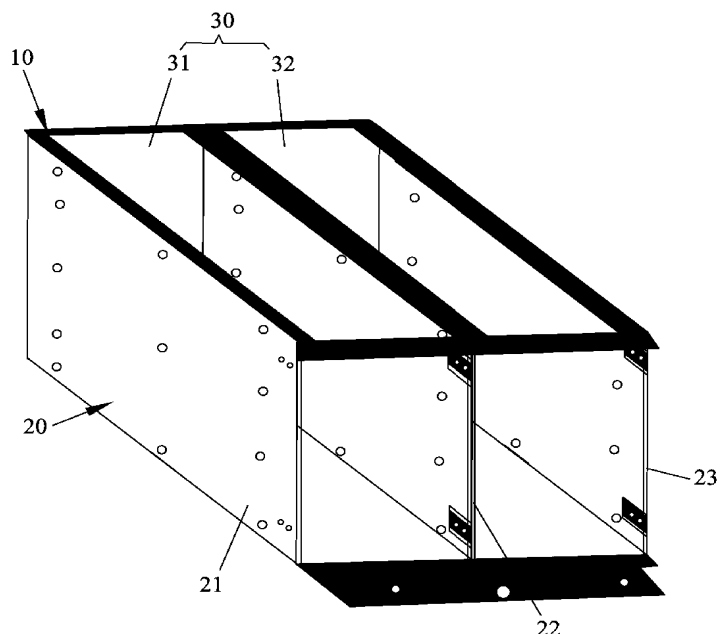


图4

(57) Abstract: Disclosed is a heating device of a toaster, the heating device comprising a frame, two side electric heating plates mounted at lateral sides of the frame, and a middle electric heating plate arranged between the two side electric heating plates, wherein a baking chamber for baking sliced bread is formed between every two adjacent electric heating plates; each of the electric heating plates comprises a base plate and a heating metal film; in each of the two side electric heating plates, only a surface, facing the baking chamber, of the base plate is bonded with the heating metal film; and in the middle electric heating plate, both the front and back sides

PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL,
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of the base plate are bonded with the heating metal film. In this way, it can be ensured that both sides of each baking chamber have a heating metal film so as to improve the efficiency of baking sliced bread, and there is no heating metal film on a surface, facing away from the baking chamber, of the corresponding base plate so as to avoid energy consumption and loss caused by unnecessary heating. Moreover, because the electric heating plates are made by means of bonding and fixing the heating metal films to the base plates, the heating device has a nice appearance, is uniform in heating, has a stable performance, and is easy to machine and form.

(57) 摘要: 本发明公开一种多士炉的发热装置, 包括框架、安装在框架边侧位置的二侧电热板、设于二侧电热板之间的中间电热板, 每相邻的两电热板之间构成用于烘烤面包片的烘烤室, 各电热板均包括基板和发热金属膜, 其中二侧电热板仅在其基板朝向烘烤室的表面粘合发热金属膜, 中间电热板分别在其基板的正反两个面均粘合发热金属膜。这样, 可以保证每个烘烤室两面均具有发热金属膜, 可以提高对面包片的烘烤效率, 而背向烘烤室的相应基板表面上无发热金属膜, 避免不必要的加热升温导致能耗损失。此外, 由于采用发热金属膜粘贴固定在基板的方式制成电热板, 不但外形整洁美观, 而且发热均匀, 性能稳定, 易加工成型。

说明书

发明名称：多士炉的发热装置

技术领域

- [1] 本发明涉及多士炉领域技术，尤其是指一种多士炉的发热装置。

背景技术

- [2] 常见的多士炉的电热板是以云母片为基板，在云母片上缠绕发热丝，为了固定发热丝或防止发热丝受热膨胀，会在云母片上用云母压条压住发热丝，把云母片和云母压条固定在一起。
- [3] 如专利号为CN 203138129 U的实用新型专利，其在左侧板和右侧板上均设置有电热板，电热板上缠绕有若干根发热丝。绕发热丝时，是由电热板的正面绕到反面，穿过整个反面后再绕到正面，如此反复。当通电时，这种电热板无论是正面还是反面均正常发热，然而实际上只有朝向烘烤腔的一面发热量才能被有效利用，背向烘烤腔的一面其发热量基本被浪费，导致功耗损失严重。
- [4] 有鉴于此，如图1和图2所示，市面上有一些厂家对多士炉的电热板进行改造，使发热丝1大部分绕在电热板2的正面3，只有少部分显露在电热板的反面4。绕发热丝时，是由电热板的正面绕到反面，从第一个凹槽5处折弯再从同一侧的第二个凹槽6返回到电热板正面，所制成电热板反面的绕线结构可参见图2。这种绕线方式可以有效降低不必要的功耗损失，然而仍然有少部分功耗被浪费掉。

发明内容

- [5] 有鉴于此，本发明针对现有技术存在之缺失，其主要目的是提供一种多士炉的发热装置，其外形整洁美观，发热均匀，节能，性能稳定，易加工成型，从而克服现有技术的不足。
- [6] 为实现上述目的，本发明采用如下之技术方案：
- [7] 一种多士炉的发热装置，包括框架、安装在框架边侧位置的二侧电热板、设于二侧电热板之间的中间电热板，每相邻的两电热板之间构成用于烘烤面包片的烘烤室，各电热板均包括基板和发热金属膜，其中二侧电热板仅在其基板朝向烘烤室的表面粘合发热金属膜，中间电热板分别在其基板的正反两个面均粘合

发热金属膜。

- [8] 作为一种优选方案，所述二侧电热板是指左侧电热板和右侧电热板，分别安装在框架的最左边侧和最右边侧，该左侧电热板与中间电热板之间构成第一烘烤室，该右侧电热板和中间电热板之间构成第二烘烤室，所述左侧电热板仅在其基板朝向第一烘烤室的表面粘合发热金属膜，右侧电热板仅在其基板朝向第二烘烤室的表面粘合发热金属膜。
- [9] 作为一种优选方案，各电热板的基板为云母板。
- [10] 作为一种优选方案，各电热板中发热金属膜的发热电路在其基板的表面来回延伸形成蛇形均匀排布结构。
- [11] 作为一种优选方案，各电热板中发热金属膜的发热电路首末端均设置有电源接点。
- [12] 作为一种优选方案，各电热板的上端和下端均设有多个可以卡合在框架上的凸位。
- [13] 作为一种优选方案，各发热金属膜的表面覆盖一层导热板，使发热金属膜位于基板与导热板之间形成夹芯结构。
- [14] 作为一种优选方案，所述导热板为云母板。
- [15] 作为一种优选方案，所述导热板的厚度小于基板的厚度。
- [16] 作为一种优选方案，所述导热板的厚度为0.1mm到0.2mm。
- [17] 本发明与现有技术相比具有明显的优点和有益效果，具体而言，由上述技术方案可知，采用发热金属膜粘贴固定在基板的方式制成电热板，发热金属膜有的电路布线方式可以多种多样，疏密和粗细可以自由控制，不但外形整洁美观，而且发热均匀，性能稳定，易加工成型。尤其是，只在中间电热板的两面均布设发热金属膜，而对于二侧电热板，只在朝向烘烤室的表面布设发热金属膜，而在背向烘烤室的表面无发热金属膜，可以最大限度节能，既满足面包片的烘烤功率，又降低了功耗损失。

附图说明

- [18] 图1是传统电热板的正面示意图。
- [19] 图2是传统电热板的反面示意图。

- [20] 图3是本发明之实施例的发热装置第一种视角图。
- [21] 图4是本发明之实施例的发热装置第二种视角图。
- [22] 图5是本发明之实施例的左侧电热板反面视图。
- [23] 图6是本发明之实施例的左侧电热板正面视图。
- [24] 图7是本发明之实施例的左侧电热板左视图。
- [25] 图8是本发明之实施例的中间电热板反面视图。
- [26] 图9是本发明之实施例的中间电热板正面视图。
- [27] 图10是本发明之实施例的中间电热板左视图。
- [28] 图11是本发明之实施例的右侧电热板正面视图。
- [29] 图12是本发明之实施例的右侧电热板反面视图。
- [30] 图13是本发明之实施例的右侧电热板左视图。
- [31] 附图标识说明：
- [32] 10、框架 20、电热板
- [33] 21、左侧电热板 211、左基板
- [34] 212、左发热金属膜 22、中间电热板
- [35] 221、中间基板 222、中间发热金属膜
- [36] 23、右侧电热板 231、右基板
- [37] 232、右发热金属膜 24、电源接点
- [38] 25、导热板 26、铆钉
- [39] 27、凸位 30、烘烤室
- [40] 31、第一烘烤室 32、第二烘烤室。

具体实施方式

- [41] 请参照图3和图4所示，其显示出了本发明之较佳实施例的具体结构，是一种多士炉的发热装置，包括框架10和安装在框架10中的电热板20，相邻两电热板20之间构成用于烘烤面包片的烘烤室30。使用时，将面包片放入烘烤室30内，电热板20发热对面包加热烘烤。其中，所述电热板20可以有多片，电热板20的数量越多，所构成的烘烤室30越多，一次性可以烤更多的面包片。
- [42] 本实施例，参见图3和图4，电热板20的数量有3片，分别为左侧电热板21、中

间电热板22、右侧电热板23，二侧电热板分别安装在框架的最左边侧和最右边侧，中间电热板设于二侧电热板之间。该左侧电热板21和中间电热板22之间构成第一烘烤室31，该右侧电热板23和中间电热板22之间构成第二烘烤室32。各电热板20均包括基板和发热金属膜，其中左侧电热板21仅在其基板朝向第一烘烤室31的表面粘合发热金属膜，右侧电热板23仅在其基板朝向第二烘烤室32的表面粘合发热金属膜，中间电热板22分别在其基板的正反两个面均粘合发热金属膜。这样，可以保证每个烘烤室30两面均具有发热金属膜，可以提高对面包片的烘烤效率，而背向烘烤室30的相应基板表面上无发热金属膜，避免不必要的加热升温导致能耗损失。

[43] 图5至图7是左侧电热板21的具体结构，所述左侧电热板21的结构包括左基板211和左发热金属膜212，该左发热金属膜212粘合于左基板211朝向第一烘烤室31的表面。亦即左基板211的反面无发热金属膜，仅在左基板211的正面粘合发热金属膜。

[44] 图8至图10是中间电热板22的具体结构，所述中间电热板22的结构包括中间基板221和两片中间发热金属膜222，两片中间发热金属膜222分别粘合于该中间基板221的两面，分别朝向第一烘烤室31和第二烘烤室32。亦即中间基板221的正面和反面均有发热金属膜。

[45] 图11至图13是右侧电热板23的具体结构，所述右侧电热板23的结构包括右基板231和右发热金属膜232，该右发热金属膜232粘合于右基板231朝向第二烘烤室32的表面。亦即右基板231的反面无发热金属膜，仅在右基板231的正面粘合发热金属膜。

[46] 本实施例中，各电热板20的基板为云母板。选用云母板作为基板，是一种优质的绝缘材料，具有无毒，无味，耐高温，导热性能好的优点，适用于在多士炉中进行应用。

[47] 参见图6、图8、图9、图11所示，各电热板20中发热金属膜的发热电路在其基板的表面来回延伸形成蛇形均匀排布结构，能够使发热均匀，性能稳定。还需要说明的是，发热电路的长度、间隙、粗细在实际应用中可依据需要而自由设计。以及，发热电路的排布延伸方式不限于附图，还可以依据需求绕成其它的

各种形状。

- [48] 各电热板20中发热金属膜的发热电路首末端均设置有电源接点24。这些电源接点24可以方便地实现接线，实现电热板20中发热金属膜的发热电路的导电。选材时，发热金属膜为电阻膜，在通电后能够发热。
- [49] 除此之外，还可以在各发热金属膜的表面覆盖一层导热板25，利用多个铆钉26使导热板25与基板相连接，这样发热金属膜位于基板与导热板25之间形成夹芯结构。一方面，可以利用导热板25将发热金属膜压住，防止发热金属膜受热膨胀从基板中脱落。另一方面，导热板25的设置可以使发热金属膜的热量均匀化，面包片烘烤热量均匀口感更好，不会将面包片的局部烤焦。本实施例中，所述导热板25为云母板，所述导热板的厚度小于基板的厚度，实际生产中，导热板的厚度选择0.1mm到0.2mm为宜。从而薄的导热板允许热量散发，而更厚的基板具有隔热功能。需要说明的是，附图中的导热板25绘制时为局部结构，是为了更好地展示发热金属膜的排布，实际上是导热板25铺设覆盖于发热金属膜的整面。
- [50] 还有，各电热板20的上端和下端均设有多个可以卡合在框架10上的凸位27，这些凸位27的形状和数据可以依据实际需求而设定。
- [51] 本发明之电热板20的产生成型工艺如下：选取云母板作为基板，将整片无空洞的发热金属膜通过粘胶层粘合在云母板上，再通过蚀刻或者雕刻去除发热金属膜的一部分，以形成来回延伸的发热电路。最后在表面铺上导热板25，在导热板25与基板之间打上多个铆钉26，使发热金属膜形成夹芯结构，注意铆钉26的位置应该避让开发热电路。
- [52] 装配时，将中间电热板22安装在框架10的中间，将框内的内部空分一分为二，然后，左侧电热板21和右侧电热板23分别安装于框架10的左右两侧，左侧电热板21有发热金属膜的一面朝向第一烘烤室31，右侧电热板23有发热金属膜的一面朝向第二烘烤室32，则两个烘烤室30的左右两面均有发热金属膜，能够提高对面包片的烘烤效率。
- [53] 使用时，将面包片放入烘烤室30内，旋动定时旋钮，即开始烘烤面包片。由于本发明示例中的多士炉有2个烘烤腔，因此一次性可以烤2片面包。

- [54] 本发明的设计重点在于，由于在多士炉框加的边侧位置安装二侧电热板、在二侧电热板之间安装中间电热板，每相邻的两电热板之间构成用于烘烤面包片的烘烤室，各电热板均包括基板和发热金属膜，其中二侧电热板仅在其基板朝向烘烤室的表面粘合发热金属膜，中间电热板分别在其基板的正反两个面均粘合发热金属膜。这样，可以保证每个烘烤室30两面均具有发热金属膜，可以提高对面包片的烘烤效率，而背向烘烤室30的相应基板表面上无发热金属膜，避免不必要的加热升温导致能耗损失。
- [55] 以上所述，仅是本发明的较佳实施例而已，并非对本发明的技术范围作任何限制，故凡是依据本发明的技术实质对以上实施例所作的任何细微修改、等同变化与修饰，均仍属于本发明技术方案的范围。

权利要求书

- [权利要求 1] 一种多士炉的发热装置，包括框架、安装在框架边侧位置的二侧电热板、设于二侧电热板之间的中间电热板，每相邻的两电热板之间构成用于烘烤面包片的烘烤室，其特征在于：各电热板均包括基板和发热金属膜，其中二侧电热板仅在其基板朝向烘烤室的表面粘合发热金属膜，中间电热板分别在其基板的正反两个面均粘合发热金属膜。
- [权利要求 2] 根据权利要求1所述的多士炉的发热装置，其特征在于：所述二侧电热板是指左侧电热板和右侧电热板，分别安装在框架的最左侧和最右边侧，该左侧电热板与中间电热板之间构成第一烘烤室，该右侧电热板和中间电热板之间构成第二烘烤室，所述左侧电热板仅在其基板朝向第一烘烤室的表面粘合发热金属膜，右侧电热板仅在其基板朝向第二烘烤室的表面粘合发热金属膜。
- [权利要求 3] 根据权利要求1所述的多士炉的发热装置，其特征在于：各电热板的基板为云母板。
- [权利要求 4] 根据权利要求1所述的多士炉的发热装置，其特征在于：各电热板中发热金属膜的发热电路在其基板的表面来回延伸形成蛇形均匀排布结构。
- [权利要求 5] 根据权利要求1所述的多士炉的发热装置，其特征在于：各电热板中发热金属膜的发热电路首末端均设置有电源接点。
- [权利要求 6] 根据权利要求1所述的多士炉的发热装置，其特征在于：各电热板的上端和下端均设有多个可以卡合在框架上的凸位。
- [权利要求 7] 根据权利要求1所述的多士炉的发热装置，其特征在于：各发热金属膜的表面覆盖一层导热板，使发热金属膜位于基板与导热板之间形成夹芯结构。
- [权利要求 8] 根据权利要求7所述的多士炉的发热装置，其特征在于：所述导热板为云母板。
- [权利要求 9] 根据权利要求7所述的多士炉的发热装置，其特征在于：所述导热

板的厚度小于基板的厚度。

[权利要求 10]

根据权利要求7所述的多士炉的发热装置，其特征在于：所述导热板的厚度为0.1mm到0.2mm。

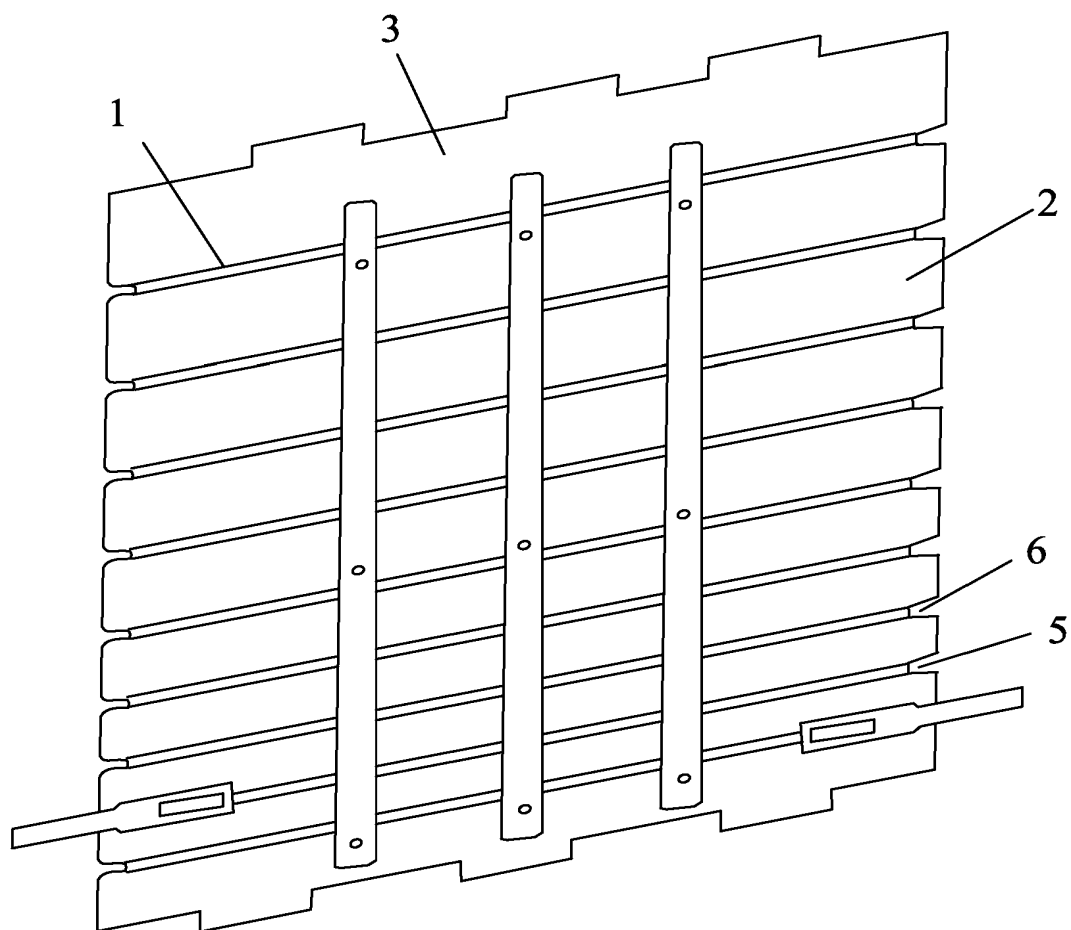


图1

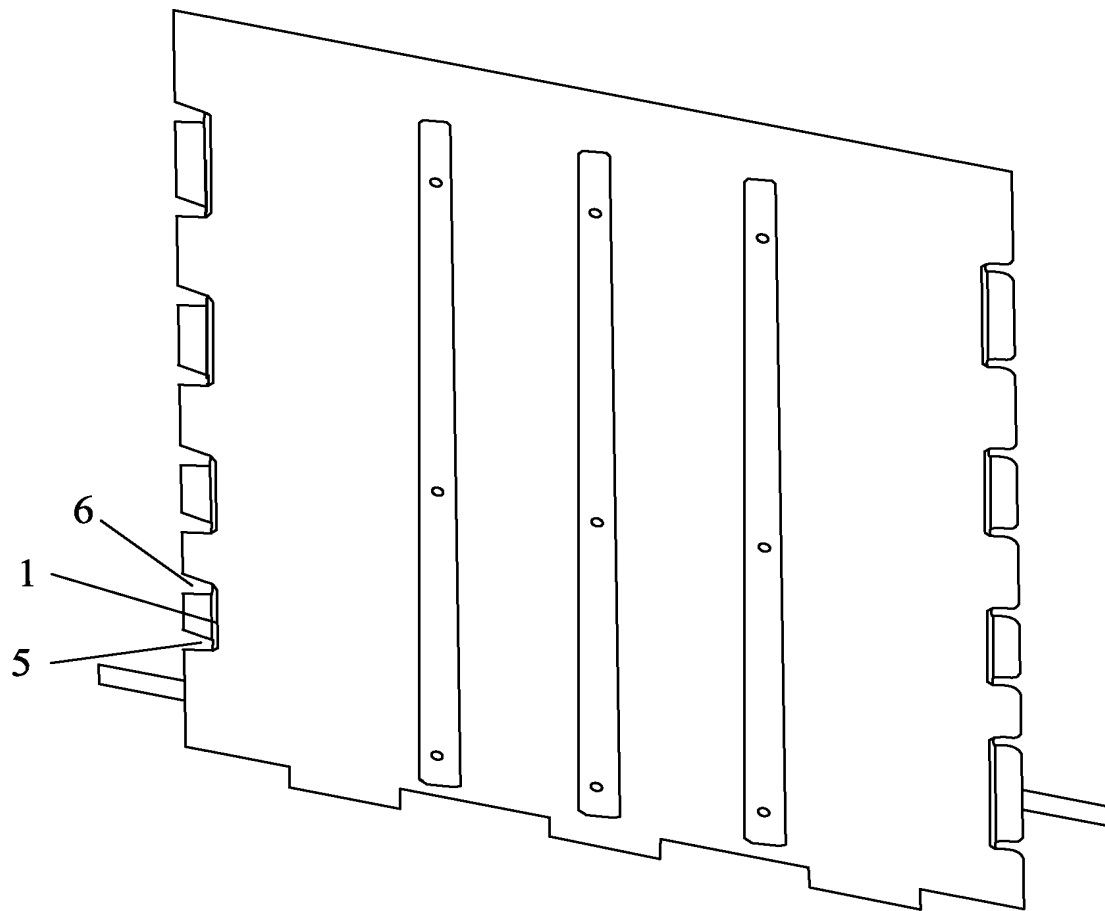


图2

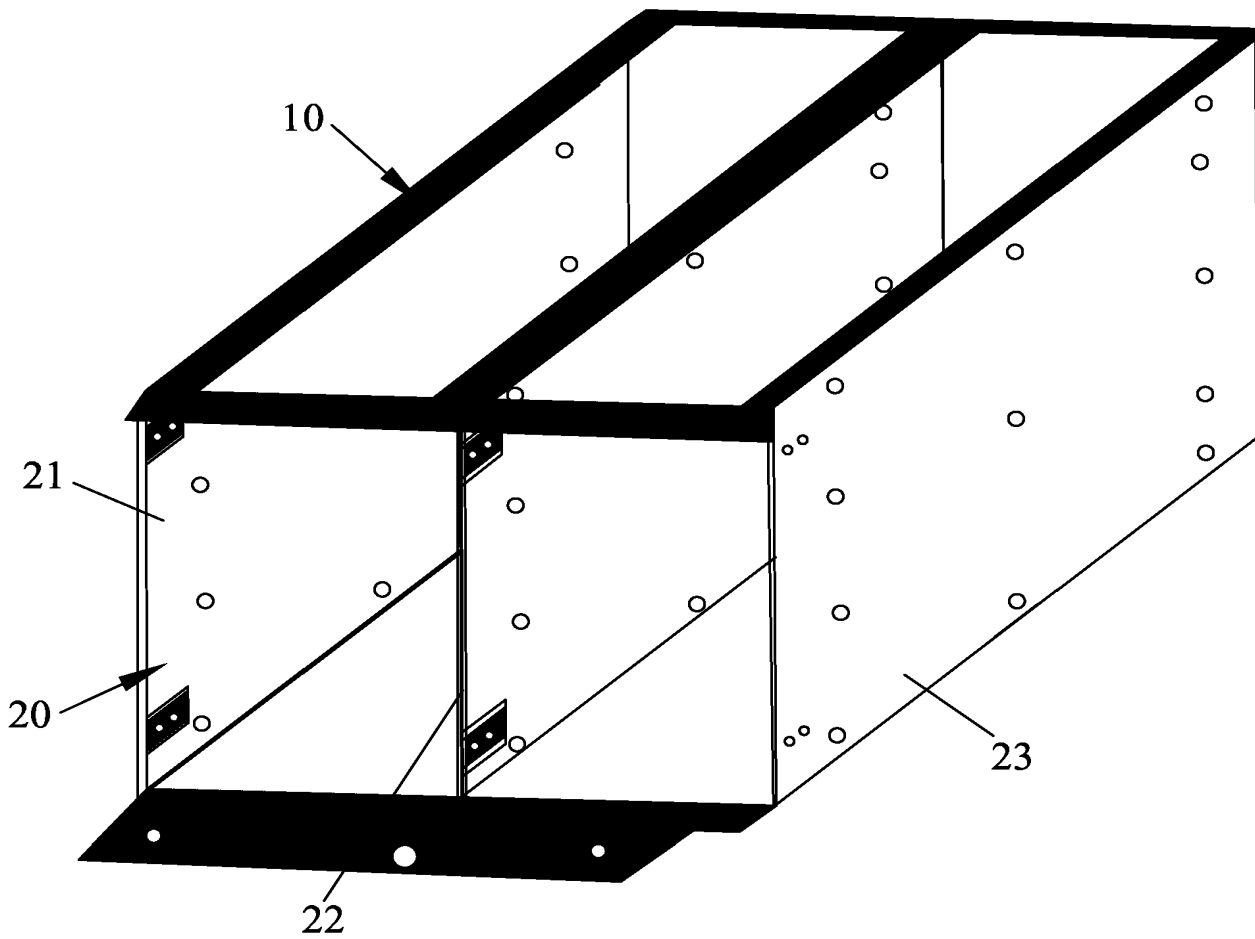


图3

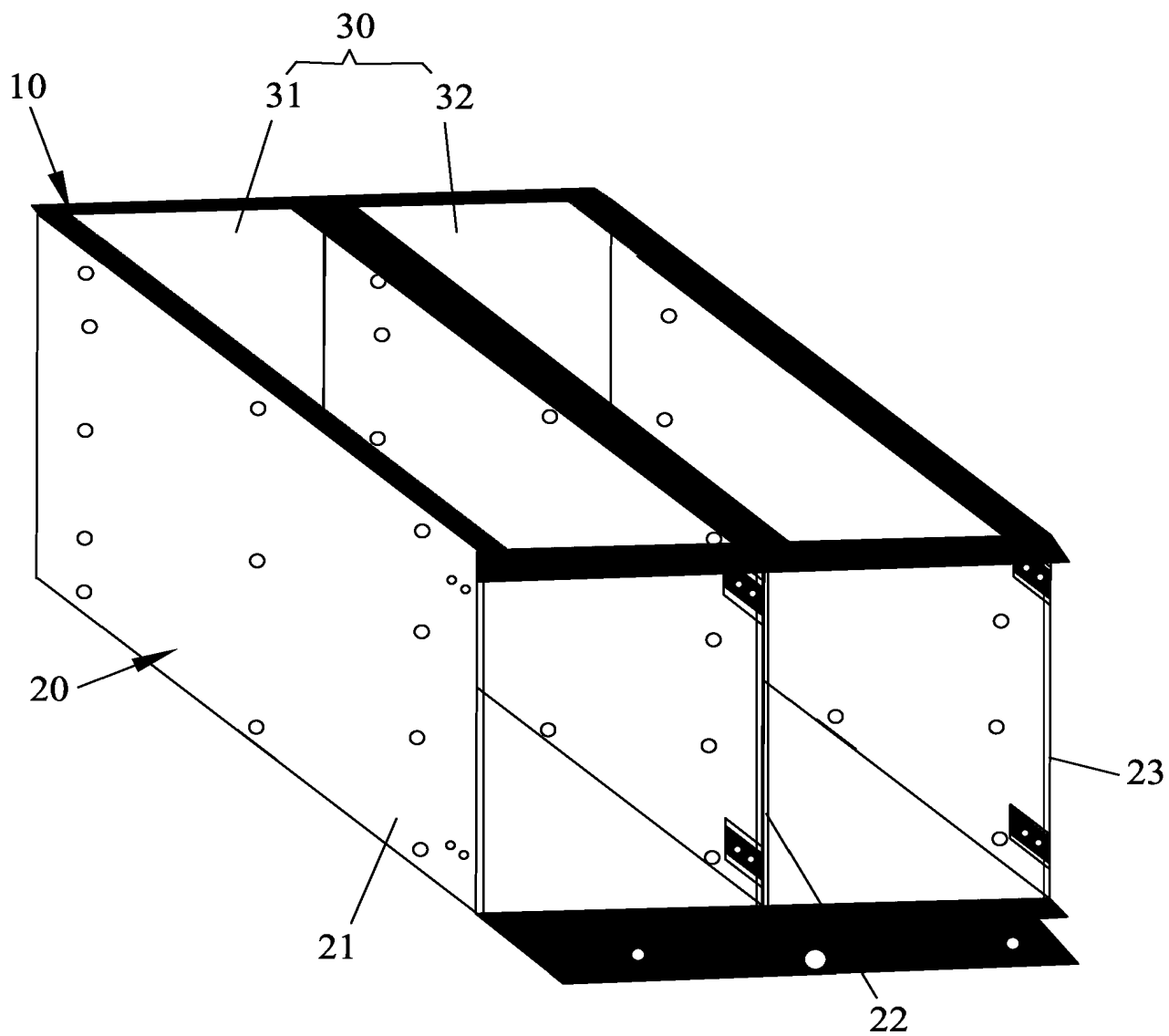


图4

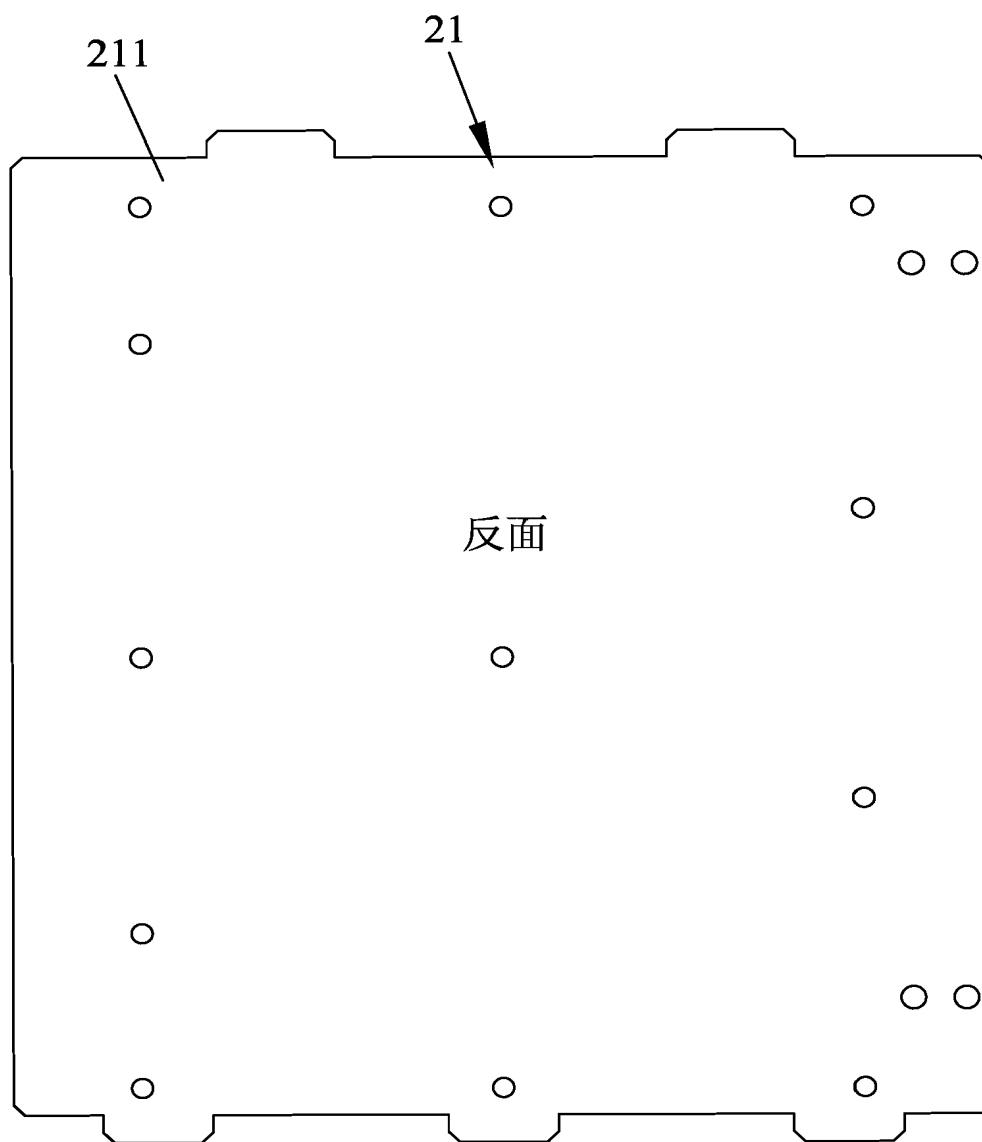


图5

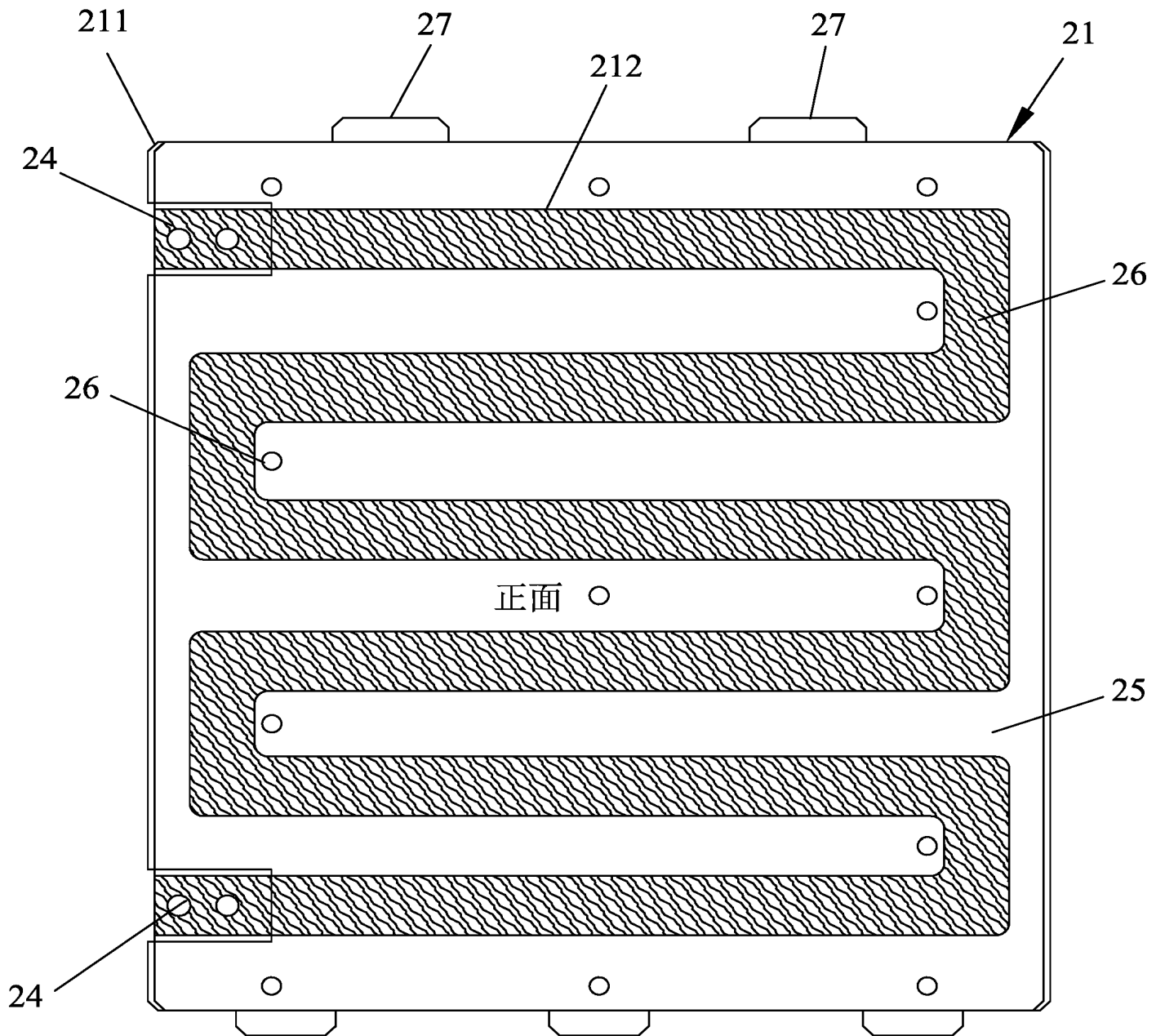


图6

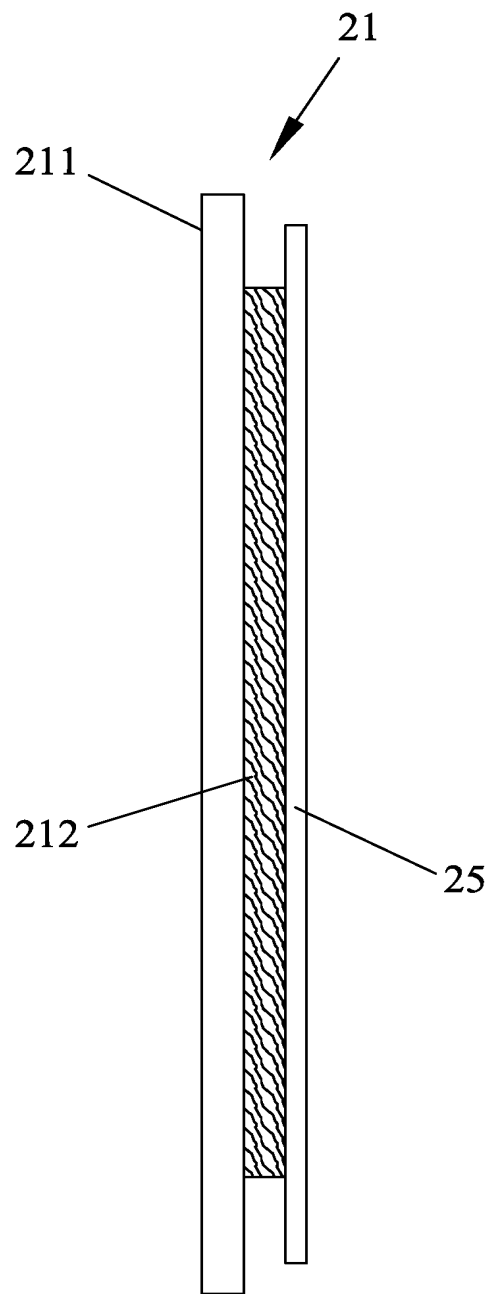


图7

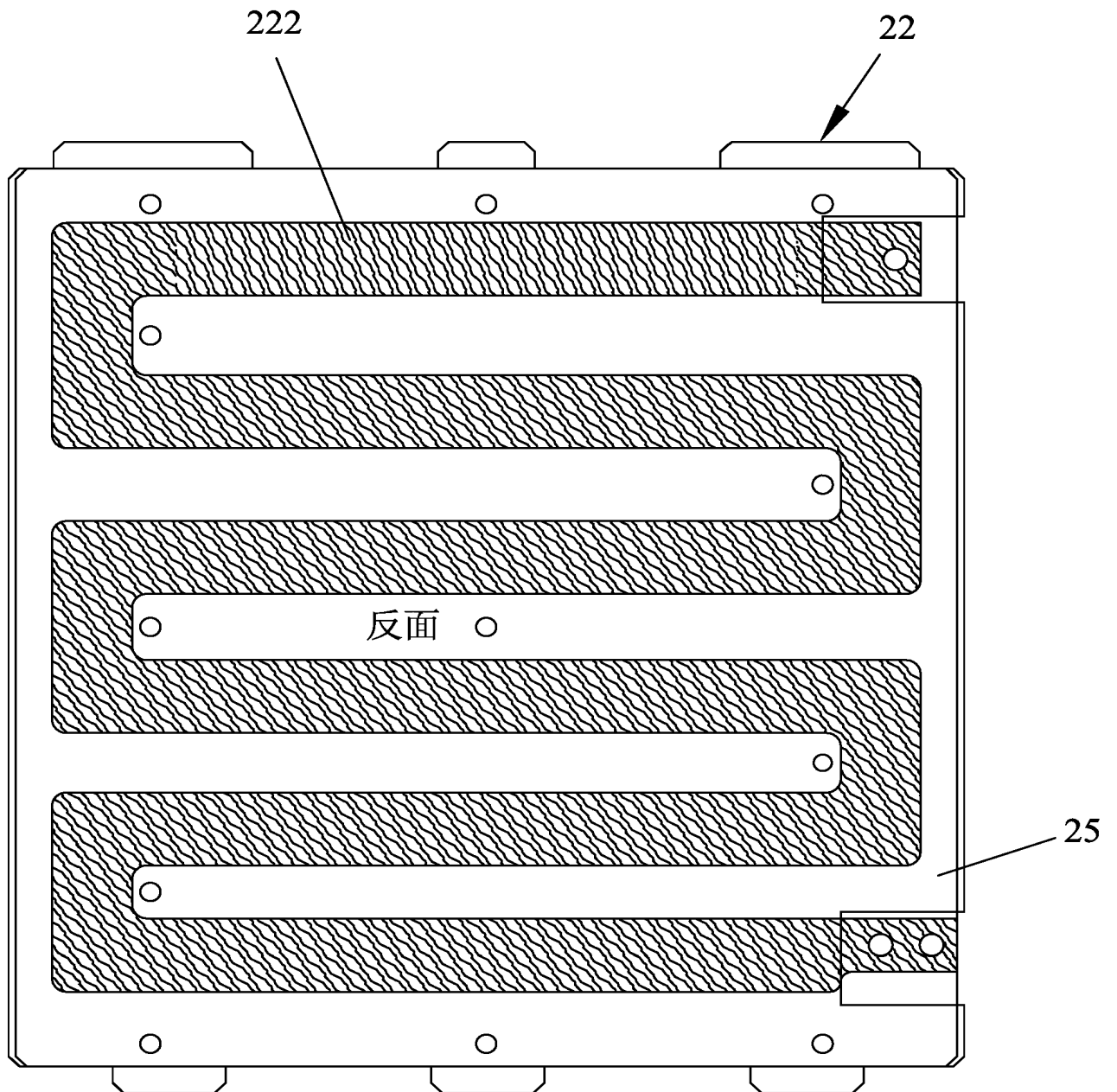


图8

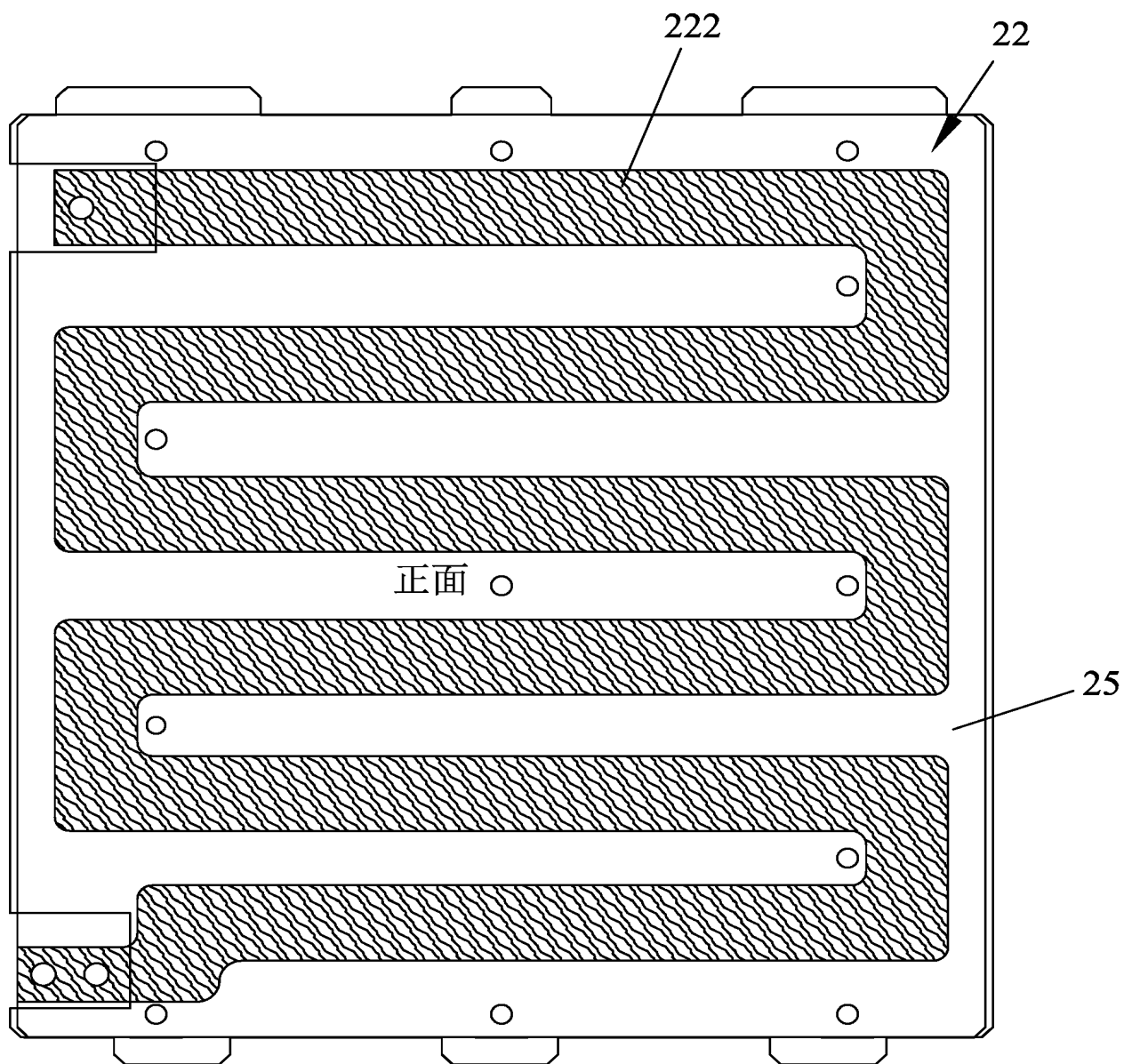


图9

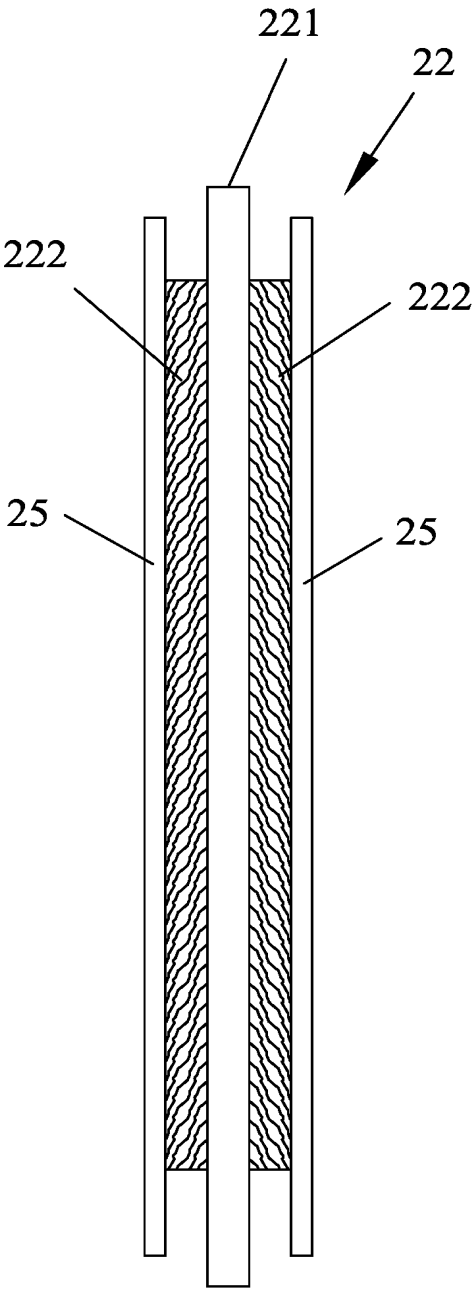


图10

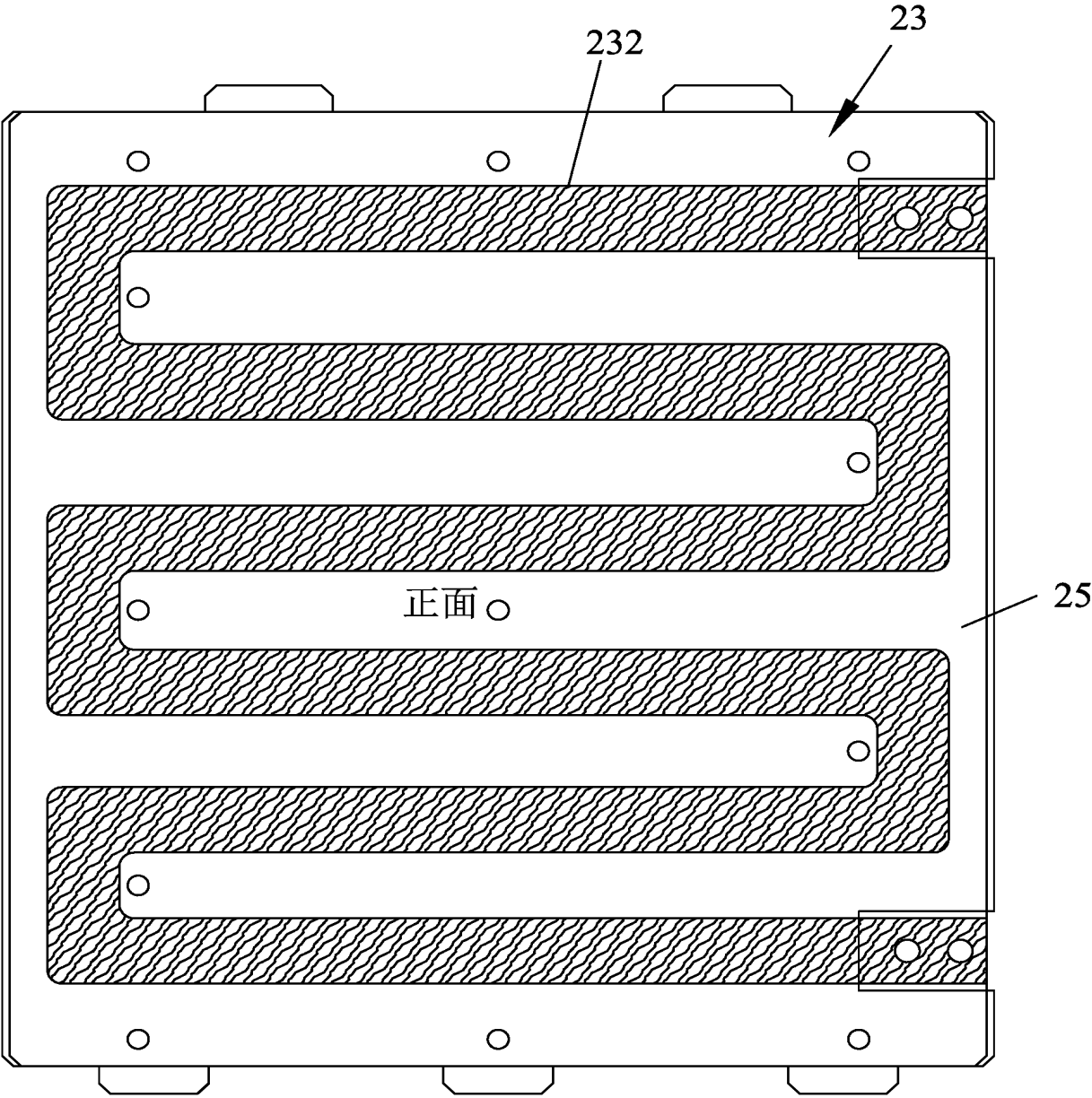


图11

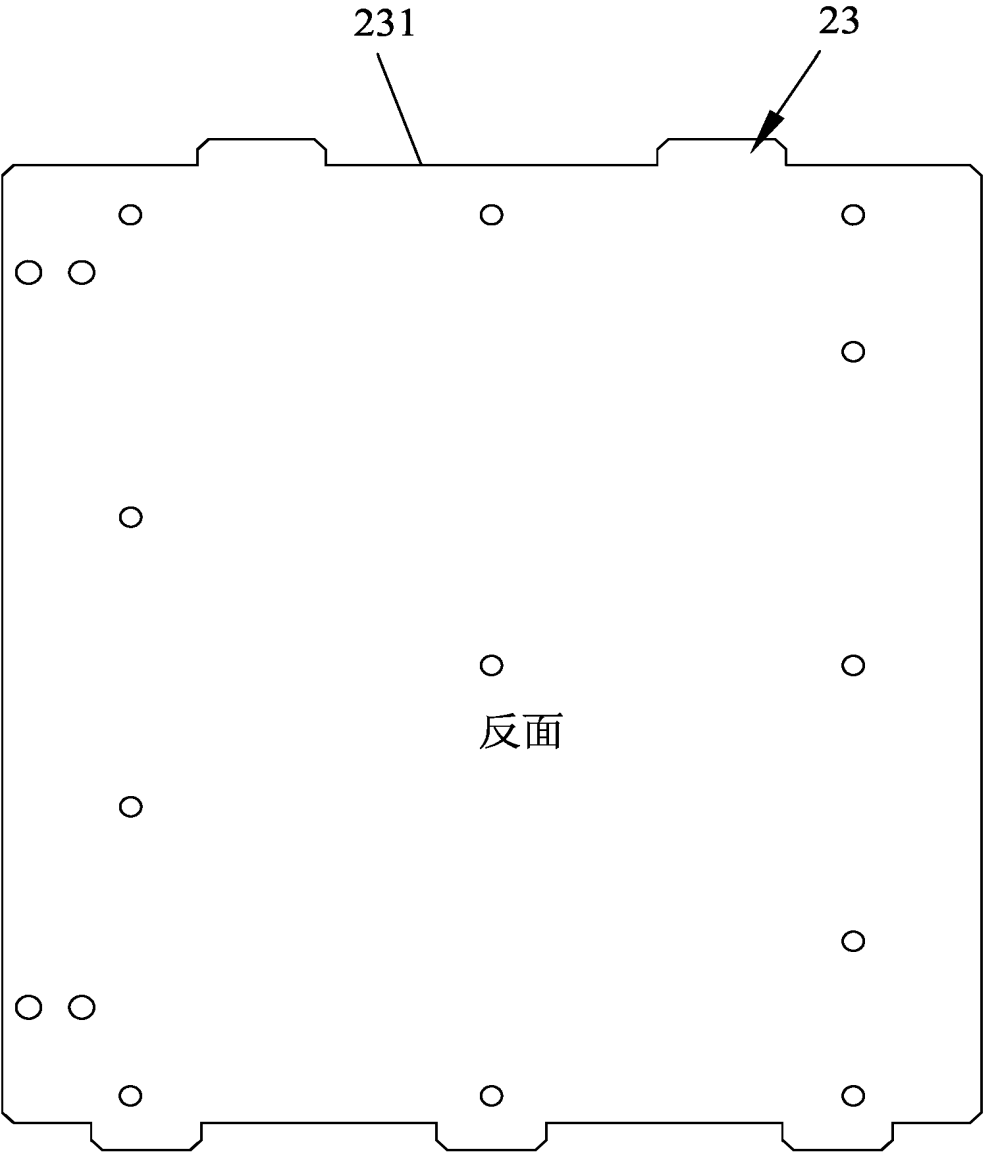


图12

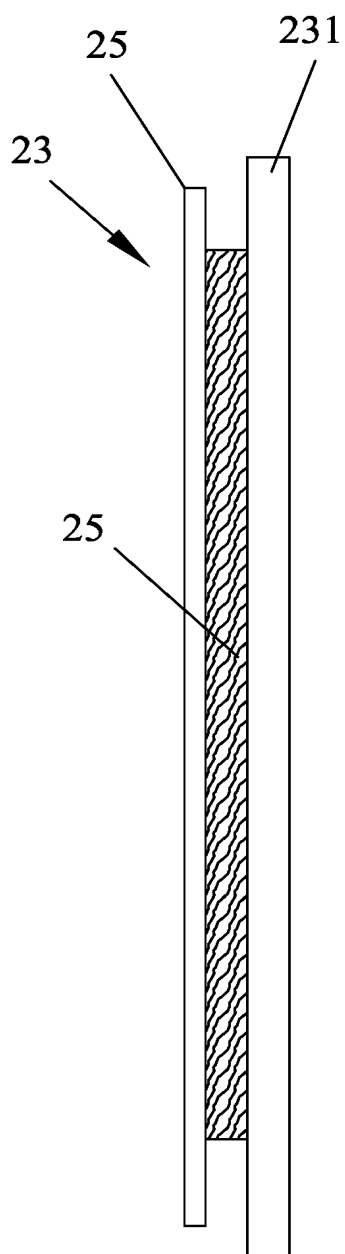


图13

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/110932

A. CLASSIFICATION OF SUBJECT MATTER		
A47J 37/08(2006.01)i		
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)		
A47J; H05B		
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)		
CNABS, DWPI, SIPOABS, CNKI, CNTXT: 锦逸, 多士炉, 吐司炉, 发热, 电热板, 烤, 金属膜, 加热丝, toaster, heat+, fuse, hot, plate, electric, bak+, metal, film		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 108836136 A (DONGGUAN CITY JINYI ELECTRONIC TECHNOLOGY CO., LTD.) 20 November 2018 (2018-11-20) claims 1-10	1-10
Y	CN 201905758 U (GUANGDONG XINBAO ELECTRICAL APPLIANCES HOLDINGS CO., LTD.) 27 July 2011 (2011-07-27) description, paragraphs [0016]-[0018], and figures 1-3	1-10
Y	CN 206807806 U (ANHUI ANZE ELECTRIC CO., LTD.) 26 December 2017 (2017-12-26) description, paragraph [0017], and figures 1-3	1-10
A	CN 86201986 U (LUO, SHOUXING) 12 November 1986 (1986-11-12) entire document	1-10
☐ 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 "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
26 June 2019		05 July 2019
Name and mailing address of the ISA/CN		Authorized officer
State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China		
Facsimile No. (86-10)62019451		Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2018/110932

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	108836136	A	20 November 2018	None	
CN	201905758	U	27 July 2011	None	
CN	206807806	U	26 December 2017	None	
CN	86201986	U	12 November 1986	None	

A. 主题的分类 A47J 37/08(2006.01)i 按照国际专利分类(IPC)或者同时按照国家分类和IPC两种分类		
B. 检索领域 检索的最低限度文献(标明分类系统和分类号) A47J; H05B 包含在检索领域中的除最低限度文献以外的检索文献 在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用)) CNABS, DWPI, SIPOABS, CNKI, CNTXT: 锦逸, 多士炉, 吐司炉, 发热, 电热板, 烤, 金属膜, 加热丝, toaster, heat+, fuse, hot, plate, electric, bak+, metal, film		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
E	CN 108836136 A (东莞市锦逸电子科技有限公司) 2018年 11月 20日 (2018 - 11 - 20) 权利要求1-10	1-10
Y	CN 201905758 U (广东新宝电器股份有限公司) 2011年 7月 27日 (2011 - 07 - 27) 说明书第[0016]-[0018]段, 图1-3	1-10
Y	CN 206807806 U (安徽安泽电工有限公司) 2017年 12月 26日 (2017 - 12 - 26) 说明书第[0017]段, 图1-3	1-10
A	CN 86201986 U (骆寿星) 1986年 11月 12日 (1986 - 11 - 12) 全文	1-10
☐ 其余文件在C栏的续页中列出。 ☒ 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件(如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件 “T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件		
国际检索实际完成的日期 2019年 6月 26日		国际检索报告邮寄日期 2019年 7月 5日
ISA/CN的名称和邮寄地址 中国国家知识产权局 (ISA/CN) 中国北京市海淀区蓟门桥西土城路6号 100088 传真号 (86-10)62019451		授权官员 顾静 电话号码 86-(010)-62411659

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2018/110932

检索报告引用的专利文件			公布日 (年/月/日)	同族专利	公布日 (年/月/日)
CN	108836136	A	2018年 11月 20日	无	
CN	201905758	U	2011年 7月 27日	无	
CN	206807806	U	2017年 12月 26日	无	
CN	86201986	U	1986年 11月 12日	无	

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国际局

(43) 国际公布日
2020 年 5 月 22 日 (22.05.2020)



(10) 国际公布号
WO 2020/098748 A1

(51) 国际专利分类号:
A47J 37/06 (2006.01) *F24C 7/08* (2006.01)
F24C 7/02 (2006.01) *A23L 5/10* (2016.01)

GROUP CO., LTD.) [CN/CN]; 中国广东省佛山市顺德区北滘镇美的大道6号美的总部大楼B区26-28楼, Guangdong 528311 (CN)。

(21) 国际申请号: PCT/CN2019/118523

(22) 国际申请日: 2019 年 11 月 14 日 (14.11.2019)

(25) 申请语言: 中文

(26) 公布语言: 中文

(30) 优先权:
201811355454.5 2018 年 11 月 14 日 (14.11.2018) CN

(71) 申请人: 广东美的厨房电器制造有限公司 (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD.) [CN/CN]; 中国广东省佛山市顺德区北滘镇永安路6号, Guangdong 528311 (CN)。美的集团股份有限公司 (MIDEA

(72) 发明人: 党子建 (DANG, Zijian); 中国广东省佛山市顺德区北滘镇永安路6号, Guangdong 528311 (CN)。伍宝君 (WU, Baojun); 中国广东省佛山市顺德区北滘镇永安路6号, Guangdong 528311 (CN)。虞治坤 (YU, Zhikun); 中国广东省佛山市顺德区北滘镇永安路6号, Guangdong 528311 (CN)。

(74) 代理人: 北京润平知识产权代理有限公司 (RUNPING & PARTNERS); 中国北京市海淀区北四环西路9号银谷大厦515室, Beijing 100190 (CN)。

(54) Title: FOOD BAKING METHOD AND FOOD BAKER

(54) 发明名称: 食物烤制方法和食物烤制器

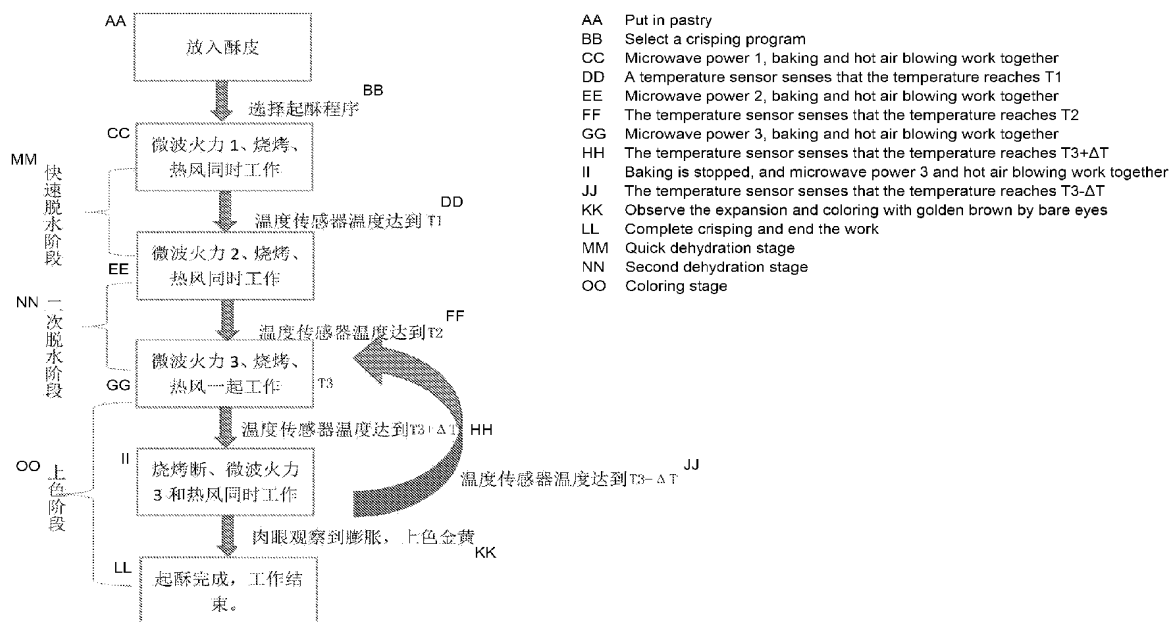


图 1

(57) Abstract: A food baking method and a food baker. The food baking method comprises: a microwave unit, at first power, and a baking cavity temperature increasing unit heat food for first set time t1, to enable the temperature in a baking cavity to reach a first set temperature T1; after the first set temperature T1 is reached, the microwave unit, at second power, and the baking cavity temperature increasing unit continue to heat the food to be baked in the baking cavity for second set time t2, to enable the temperature in the baking cavity to be second set temperature T2; in a coloring stage, the microwave unit, at third power, and the baking cavity temperature

(81) 指定国(除另有指明, 要求每一种可提供的国家保护): 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, JO, 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) 指定国(除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (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)。

本国际公布:

— 包括国际检索报告(条约第21条(3))。

increasing unit continue to heat for third set time t3, to enable the temperature in the baking cavity to be third set temperature T3; and then the microwave unit continues to heat at the third power, and the baking cavity temperature increasing unit compensates the temperature in the baking cavity for fourth set time t4, to keep the temperature in the baking cavity stabilized at fourth set temperature T4, so that the baking time is greatly shortened.

(57) 摘要: 一种食物烤制方法和食物烤制器。食物烤制方法包括: 微波单元以第一功率和烤腔内温度加热单元对食物加热第一设定时间t1, 使烤腔内的温度达到第一设定温度T1; 在达到第一设定温度T1后, 微波单元以第二功率和烤腔内温度加热单元继续对烤腔内的待烤食物加热第二设定时间t2, 使烤腔内的温度处于第二设定温度T2; 在上色阶段中: 微波单元以第三功率和烤腔内温度加热单元继续加热第三设定时间t3, 使烤腔内的温度处于第三设定温度T3; 然后, 微波单元继续以第三功率加热同时烤腔内温度加热单元对烤腔内的温度进行补偿加热第四设定时间t4, 使得烤腔内的温度稳定在第四设定温度T4, 以极大缩短烤制时间。

食物烤制方法和食物烤制器

相关申请的交叉引用

本申请要求申请日为 2018 年 11 月 14 日，申请号为 201811355454.5，
5 名称为食物烤制方法和食物烤制器的中国专利申请的优先权，其全部内容
作为参考结合于本申请。

技术领域

本发明涉及食物烤制技术领域，具体地，涉及一种食物烤制方法和一
10 种食物烤制器。

背景技术

随着生活品质的提升，各种家庭烤肉例如烤鸡、烤牛肉、烤鸡腿等以及
酥类点心越来越多出现在家庭中，丰富了家庭餐桌。

15 通常，酥类点心除了去烘焙店，蛋糕店买之外，越来越多的消费者希
望在家里亲手烤制。而家庭烤制酥类点心一般是从超市买预处理的冷冻酥
皮，解冻后用烤箱烘烤。

但是，烤箱由于只有上部发热管工作，烤制时腔体内温度低，烤制时
间长，一般要 30 分钟左右，并且烤制的点心外部整体起酥上色，内部并未
20 起酥，导致口感较差，另外，由于点心内部并未起酥，而点心整体外表起
酥导致起酥层次不分明，失败率较高，相品较差。

发明内容

本发明的目的是提供一种食物烤制方法，该食物烤制方法能够通过烤
25 腔内温度加热单元对烤腔内的温度进行补偿，以极大缩短食物烤制时间，
并且能够使得烤制的食物具有良好的口感和相品，比如可以使得酥类点心

内部起酥，使得点心内外起酥层次分明，且外表金黄，提升口感和品相。

为了实现上述目的，本发明提供一种食物烤制方法，包括：快速脱水阶段：微波单元以第一功率和烤腔内温度加热单元对放置在烤腔内的待烤制食物加热第一设定时间 t_1 ，使所述烤腔内的温度达到第一设定温度 T_1 ；

- 5 二次脱水阶段：在所述烤腔内的温度达到第一设定温度 T_1 后，所述微波单元以第二功率和所述烤腔内温度加热单元继续对所述烤腔内的所述待烤食物加热第二设定时间 t_2 ，使所述烤腔内的温度处于第二设定温度 T_2 ；二次脱水阶段完成后，开始上色阶段，其中，在上色阶段中：所述微波单元以第三功率和所述烤腔内温度加热单元继续加热第三设定时间 t_3 ，使所述烤腔内的温度处于第三设定温度 T_3 ；然后，所述微波单元继续以所述第三功率加热同时所述烤腔内温度加热单元对所述烤腔内的温度进行补偿加热第四设定时间 t_4 ，使得所述烤腔内的温度稳定在第四设定温度 T_4 。

- 通过上述技术方案，由于通过两次脱水阶段，微波单元和烤腔内温度加热单元的共同加热可以使得食物内部的水分子大量快速蒸发和烤制上色同时进行，然后通过烤腔内温度加热单元对烤腔内的温度进行补偿加热，使得烤腔内的温度稳定在第四设定温度，同时与微波单元协同加热，以缩短食物烤制时间，并且能够使得烤制的食物具有良好的口感和品相，比如，在烤制酥类点心时，通过温度补偿和微波单元的辅助脱水能够使得酥类点心内部起酥，使得点心内外起酥层次分明，且外表金黄，提升口感和品相。

进一步地，所述第一功率、所述第二功率和所述第三功率依次降低。

进一步地，所述第一设定温度 T_1 小于所述第二设定温度 T_2 ，所述第二设定温度 T_2 小于所述第三设定温度 T_3 。

进一步地， $T_4 = T_3 \pm \Delta T$ 。

- 25 更进一步地， ΔT 为 2°C - 3°C 。

另外，所述烤腔内温度加热单元包括第一烤腔内温度加热单元和第二

烤腔内温度加热单元，其中，所述烤腔内的温度高于 T_4 时，所述第一烤腔内温度加热单元停止加热，所述微波单元和所述第二烤腔内温度加热单元继续加热，以使得所述烤腔内的温度下降，并在所述烤腔内的温度低于 T_4 时，所述第一烤腔内温度加热单元重新开始加热，所述微波单元和所述第二烤腔内温度加热单元继续加热。

进一步地，所述第一烤腔内温度加热单元为烧烤单元，所述第二烤腔内温度加热单元为热风单元。

进一步地，所述第一设定温度 T_1 、所述第一设定时间 t_1 、所述第二设定温度 T_2 、所述第二设定时间 t_2 、所述第三设定温度 T_3 、所述第三设定时间 t_3 、所述第四设定温度 T_4 、所述第四设定时间 t_4 中的至少一者能够调整；

在 $T_4 = T_3 \pm \Delta T$ 时，所述 ΔT 能够调整。

此外，本发明提供一种食物烤制器，该食物烤制器包括：用于放置待烤制食物的烤腔、用于对放置在所述烤腔内的待烤制食物进行烤制的烤腔内温度加热单元和微波单元、用于检测所述烤腔内温度的温度传感器、和控制单元，其中，所述烤腔内温度加热单元、所述微波单元和所述温度传感器与所述控制单元连接；其中，所述控制单元能够使得所述食物烤制器能够实现以上任意所述的食物烤制方法。

如上所述的，该食物烤制器的整体品质得到提升，能够提升人们的食物烤制体验。

进一步地，所述食物烤制器为变频微波炉。

本发明的其它特征和优点将在随后的具体实施方式部分予以详细说明。

附图说明

附图是用来提供对本发明的进一步理解，并且构成说明书的一部分，

与下面的具体实施方式一起用于解释本发明，但并不构成对本发明的限制。
在附图中：

图 1 是本发明具体实施方式提供的一种食物烤制方法的简易流程框图；

图 2 是本发明具体实施方式提供的一种食物烤制方法的标准温度时间
5 的示意图；

图 3 是本发明具体实施方式提供的食物烤制方法的一种食物烤制的温度曲线图；

图 4 是本发明具体实施方式提供的食物烤制方法的另一种食物烤制的温度曲线图。

10

具体实施方式

以下结合附图对本发明的具体实施方式进行详细说明。应当理解的是，此处所描述的具体实施方式仅用于说明和解释本发明，并不用于限制本发明。

15 需要说明的是，本申请中提到的温度的单位都为℃。

参考图 1-图 4 所示的，本发明提供的食物烤制方法可以用于烤制任何需要烤制的食物，比如肉类食物例如烤鸡或烤鸭，或者面类食物，或者其他食物例如酥类点心、土豆或红薯，比如，可以作为酥类点心的快速起酥方法。

20 本发明提供的食物烤制方法，包括：快速脱水阶段：微波单元以第一功率和烤腔内温度加热单元对放置在烤腔内的待烤制食物加热第一设定时间 t_1 ，使烤腔内的温度达到第一设定温度 T_1 ；二次脱水阶段：在烤腔内的温度达到第一设定温度 T_1 后，微波单元以第二功率和烤腔内温度加热单元继续对烤腔内的待烤食物加热第二设定时间 t_2 ，使烤腔内的温度处于第二
25 设定温度 T_2 ；二次脱水阶段完成后，开始上色阶段，其中，在上色阶段中：微波单元以第三功率和烤腔内温度加热单元继续加热第三设定时间

t3, 使烤腔内的温度处于第三设定温度 T3; 然后, 微波单元继续以第三功率加热同时烤腔内温度加热单元对烤腔内的温度进行补偿加热第四设定时间 t4, 使得烤腔内的温度稳定在第四设定温度 T4。

在该食物烤制方法中, 由于通过两次脱水阶段, 微波单元和烤腔内温度加热单元的共同加热可以使得食物内部的水分子大量快速蒸发和烤制上色同时进行, 然后通过烤腔内温度加热单元对烤腔内的温度进行补偿加热, 使得烤腔内的温度稳定在第四设定温度, 同时与微波单元协同加热, 以缩短食物烤制时间, 并且能够使得烤制的食物具有良好的口感和品相, 比如, 在烤制酥类点心时, 通过温度补偿和微波单元的辅助脱水能够使得酥类点心内部起酥, 使得点心内外起酥层次分明, 且外表金黄, 提升口感和品相。

另外, 在本发明的食物烤制方法的整个过程中, 微波单元的功率可以相同。或者, 考虑到在快速脱水阶段对食物内部的快速大量过水, 为了避免食物过干, 优选地, 第一功率、第二功率和第三功率依次降低, 比如, 在图 1 中, 微波火力 1 小于微波火力 2 小于微波火力 3。

另外, 在本发明的食物烤制方法中, 第一设定温度 T1、第二设定温度 T2 和第三设定温度 T3 可以相同, 此时, 转换阶段需要根据每个阶段的烤制时间来确定, 也就是, 快速脱水阶段完成第一设定时间 t1 后即进入二次脱水阶段, 同理, 完成第二设定时间 t2 后即进入上色阶段, 其中, 在上色阶段, 完成第三设定时间 t3 后, 微波单元继续以第三功率加热同时烤腔内温度加热单元对烤腔内的温度进行补偿加热第四设定时间 t4。

或者, 为了能够快速烤制食物, 使得烤腔内的温度能够更易于烤制食物, 第一设定温度 T1 小于第二设定温度 T2, 第二设定温度 T2 小于第三设定温度 T3, 也就是, $T1 < T2 < T3$ 。此时, 在温度传感器检测到烤腔内的温度达到阶段转换的设定温度时, 即可通过控制单元控制进入下一烤制阶段。

另外，第四设定温度 T_4 可以为某一具体的温度数值，比如可以等于或大于第二设定温度 T_3 ，或者，为了便于控制，第四设定温度 T_4 可以为某一温度范围，因此，范围温度更便于温度传感器检测传输烤腔内的实时温度。

- 5 另外，根据烤制需求，第四设定温度 T_4 可以高于第三设定温度 T_3 ，或者，第四设定温度 $T_4 = T_3 \pm \Delta T$ ，这样，第三设定时间 t_3 完成后，烤腔内温度加热单元即可平稳地加热，以将烤腔内的温度保持在 $T_3 \pm \Delta T$ 。

当然，为了使得烤腔内的温度基本保持平稳，使得温差不至于过大，优选地， ΔT 为 1°C - 3°C ，优选地为 2°C - 3°C 。

- 10 此外，烤腔内温度加热单元可以为单一的加热部件，或者，为了更易于对烤腔内的温度进行补偿加热，使得烤腔内的温度稳定在第三设定温度 T_4 ，优选地，烤腔内温度加热单元包括第一烤腔内温度加热单元和第二烤腔内温度加热单元，其中，烤腔内的温度高于 T_4 时，第一烤腔内温度加热单元停止加热，微波单元和第二烤腔内温度加热单元继续加热，以使得烤腔内的温度下降，并在烤腔内的温度低于 T_4 时，第一烤腔内温度加热单元重新开始加热，微波单元和第二烤腔内温度加热单元继续加热。这样，通过第一烤腔内温度加热单元和第二烤腔内温度加热单元的这种配合加热，可以在降低功耗的同时将烤腔内的温度稳定在适合的烤制温度内，同时，通过微波单元的加热，可以使得食物内部更易于烤制，比如，在烤制酥类点心时，更易于使内部起酥，并且外表上色金黄。
- 15
- 20

- 当然，第一烤腔内温度加热单元和第二烤腔内温度加热单元可以相同，也可以不相同，比如，为了更易于食物的烤制上色，优选地，第一烤腔内温度加热单元为烧烤单元，第二烤腔内温度加热单元为热风单元。这样，烧烤单元主要提升烤腔内的温度，而热风单元可以主要用于食物表皮的上色加热。
- 25

当然，为了能够更好地烤制不同类型的食物，优选地，在食物烤制过

程中，第一设定温度 T1、第一设定时间 t1、第二设定温度 T2、第二设定时间 t2、第三设定温度 T3、第三设定时间 t3、第四设定温度 T4、第四设定时间 t4 中的至少一者能够调整；在 $T4=T3\pm\Delta T$ 时， ΔT 能够调整。这样，可以根据不同类型的食物，来相应地调整各个烤制参数，以更好地对所需食物烤制上色。

比如，在图 3 所示的荷花酥快速起酥的温度曲线图中，可以看出，大约 7-9 分钟即可完成荷花酥点心的烤制。而在图 4 所示的可颂快速起酥温度曲线图中，可以看出，大约 7 分半左右即可完成可颂的烤制。因此，通过本发明的食物烤制方法，可以极大缩短食物烤制时间，并且能够使得烤制的食物具有良好的口感和品相，比如可以使得酥类点心内部起酥，使得点心内外起酥层次分明，且外表金黄，提升口感和品相。

最后，本发明提供一种食物烤制器，该食物烤制器包括：用于放置待烤制食物的烤腔、用于对放置在烤腔内的待烤制食物进行烤制的烤腔内温度加热单元和微波单元、用于检测烤腔内温度的温度传感器、和控制单元，其中，烤腔内温度加热单元、微波单元和温度传感器与控制单元连接；其中，控制单元能够使得食物烤制器能够实现以上任意所述的食物烤制方法。如上的，该食物烤制器的整体品质得到提升，能够提升人们的食物烤制体验。

当然，该烤腔内温度加热单元可以包括烧烤单元和热风单元，比如设置在烤腔顶部的烤制发热管和设置在烤腔背部的热风发热管。

该食物烤制器可以为变频微波炉，或者其他的烤箱。

以上结合附图详细描述了本发明的优选实施方式，但是，本发明并不限于上述实施方式中的具体细节，在本发明的技术构思范围内，可以对本发明的技术方案进行多种简单变型，这些简单变型均属于本发明的保护范围。

另外需要说明的是，在上述具体实施方式中所描述的各个具体技术特

征，在不矛盾的情况下，可以通过任何合适的方式进行组合。为了避免不必要的重复，本发明对各种可能的组合方式不再另行说明。

此外，本发明的各种不同的实施方式之间也可以进行任意组合，只要其不违背本发明的思想，其同样应当视为本发明所公开的内容。

权利要求

1. 一种食物烤制方法，其特征在于，包括：

快速脱水阶段：微波单元以第一功率和烤腔内温度加热单元对放置在烤腔内的待烤制食物加热第一设定时间 t_1 ，使所述烤腔内的温度达到第一
5 设定温度 T_1 ；

二次脱水阶段：在所述烤腔内的温度达到第一设定温度 T_1 后，所述微波单元以第二功率和所述烤腔内温度加热单元继续对所述烤腔内的所述待烤食物加热第二设定时间 t_2 ，使所述烤腔内的温度处于第二设定温度 T_2 ；

二次脱水阶段完成后，开始上色阶段，

10 其中，在上色阶段中：所述微波单元以第三功率和所述烤腔内温度加热单元继续加热第三设定时间 t_3 ，使所述烤腔内的温度处于第三设定温度 T_3 ；然后，所述微波单元继续以所述第三功率加热同时所述烤腔内温度加热单元对所述烤腔内的温度进行补偿加热第四设定时间 t_4 ，使得所述烤腔内的温度稳定在第四设定温度 T_4 。

15 2. 根据权利要求 1 所上述的食物烤制方法，其特征在于，所述第一功率、所述第二功率和所述第三功率依次降低。

3. 根据权利要求 1 所述的食物烤制方法，其特征在于，所述第一设定温度 T_1 小于所述第二设定温度 T_2 ，所述第二设定温度 T_2 小于所述第三设定温度 T_3 。

20 4. 根据权利要求 1 所述的食物烤制方法，其特征在于， $T_4 = T_3 \pm \Delta T$ 。

5. 根据权利要求 4 所述的食物烤制方法，其特征在于， ΔT 为 2°C - 3°C 。

6. 根据权利要求 1 所述的食物烤制方法，其特征在于，所述烤腔内温度加热单元包括第一烤腔内温度加热单元和第二烤腔内温度加热单元，其中，所述烤腔内的温度高于 T_4 时，所述第一烤腔内温度加热单元停止加
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热，所述微波单元和所述第二烤腔内温度加热单元继续加热，以使得所述烤腔内的温度下降，并在所述烤腔内的温度低于 T_4 时，所述第一烤腔内温度加热单元重新开始加热，所述微波单元和所述第二烤腔内温度加热单元继续加热。

5 7. 根据权利要求 6 所述的食物烤制方法，其特征在于，所述第一烤腔内温度加热单元为烧烤单元，所述第二烤腔内温度加热单元为热风单元。

 8. 根据权利要求 1-7 中任意一项所述的食物烤制方法，其特征在于，
所述第一设定温度 T_1 、所述第一设定时间 t_1 、所述第二设定温度 T_2 、所述
10 第二设定时间 t_2 、所述第三设定温度 T_3 、所述第三设定时间 t_3 、所述第四
设定温度 T_4 、所述第四设定时间 t_4 中的至少一者能够调整；

 在 $T_4 = T_3 \pm \Delta T$ 时，所述 ΔT 能够调整。

 9. 一种食物烤制器，其特征在于，包括：用于放置待烤制食物的烤
腔、用于对放置在所述烤腔内的待烤制食物进行烤制的烤腔内温度加热单
元和微波单元、用于检测所述烤腔内温度的温度传感器、和控制单元，其
15 中，所述烤腔内温度加热单元、所述微波单元和所述温度传感器与所述控
制单元连接；

 其中，所述控制单元能够使得所述食物烤制器能够实现根据权利要求
1-8 中任意一项所述的食物烤制方法。

 10. 根据权利要求 9 所述的食物烤制器，其特征在于，所述食物烤制
20 器为变频微波炉。

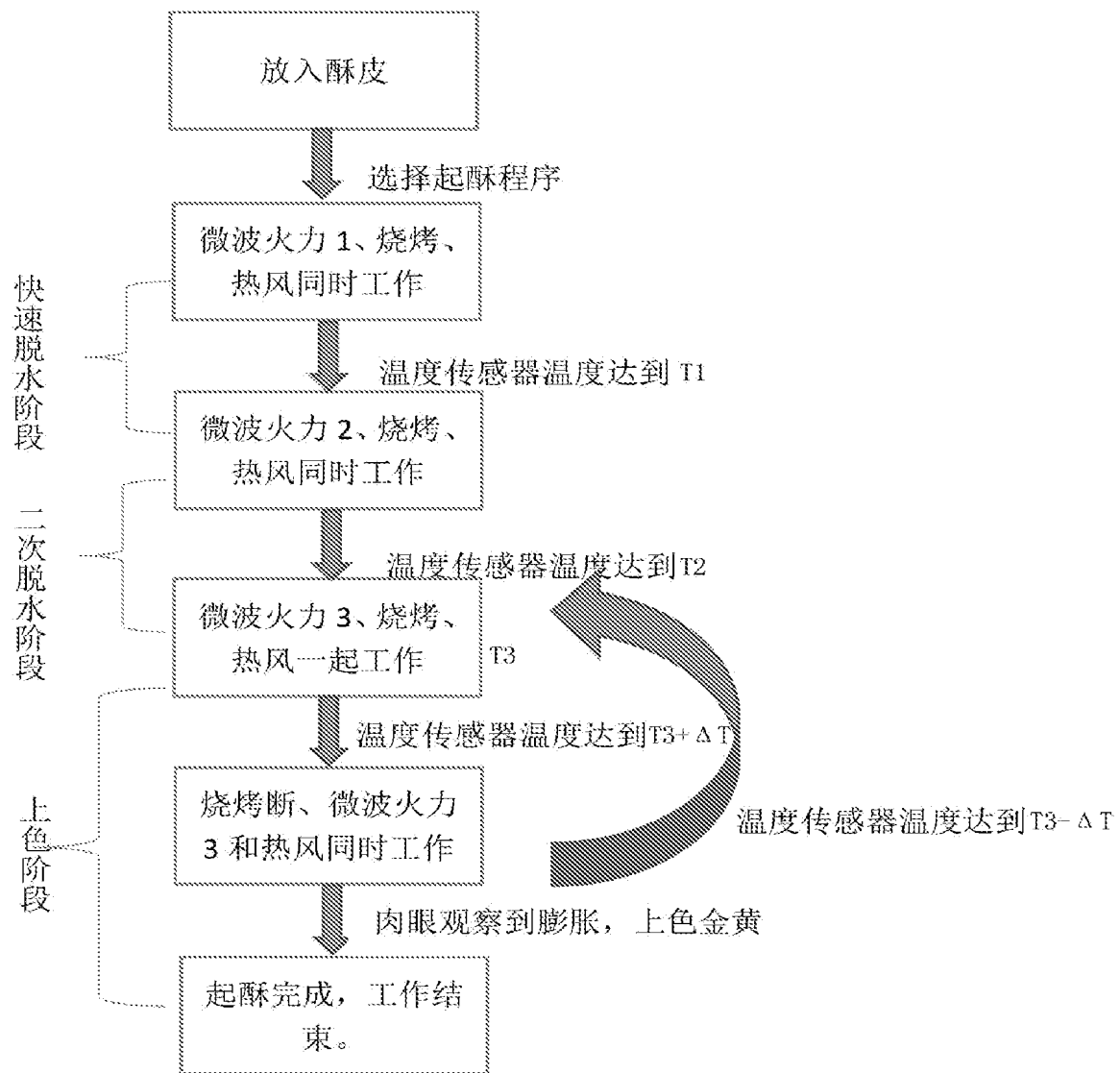


图 1

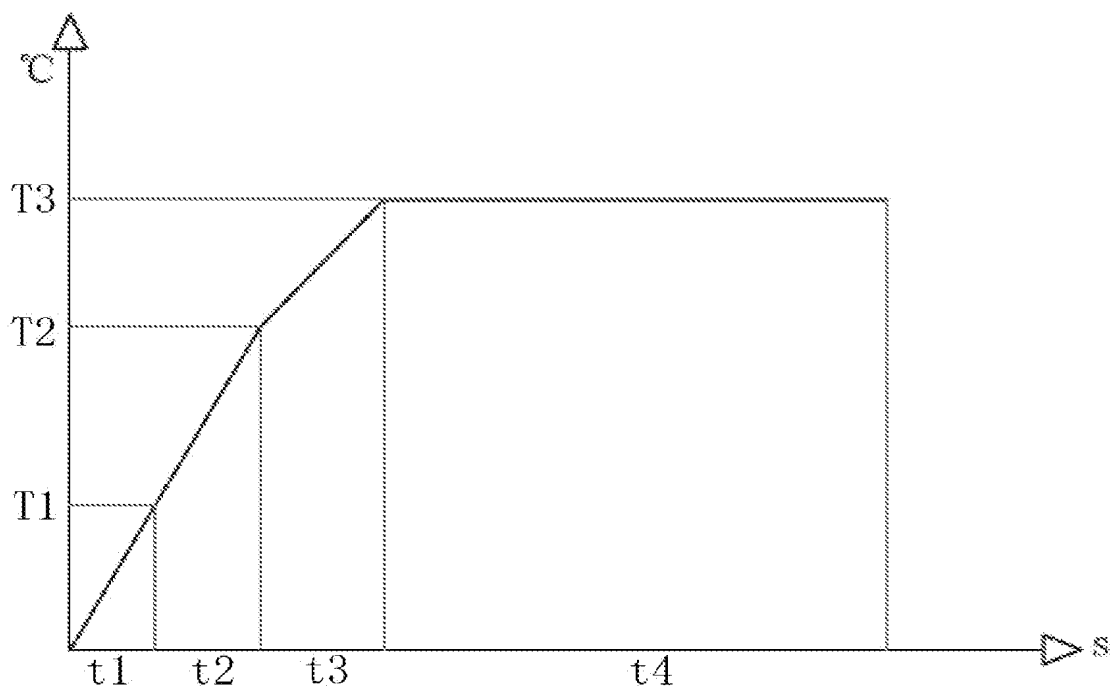


图 2

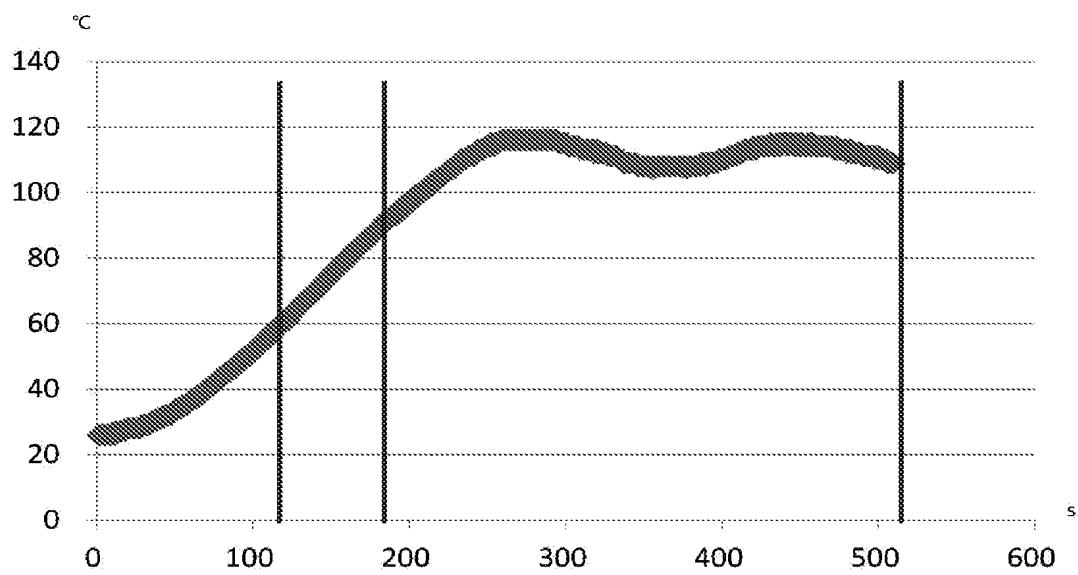


图 3

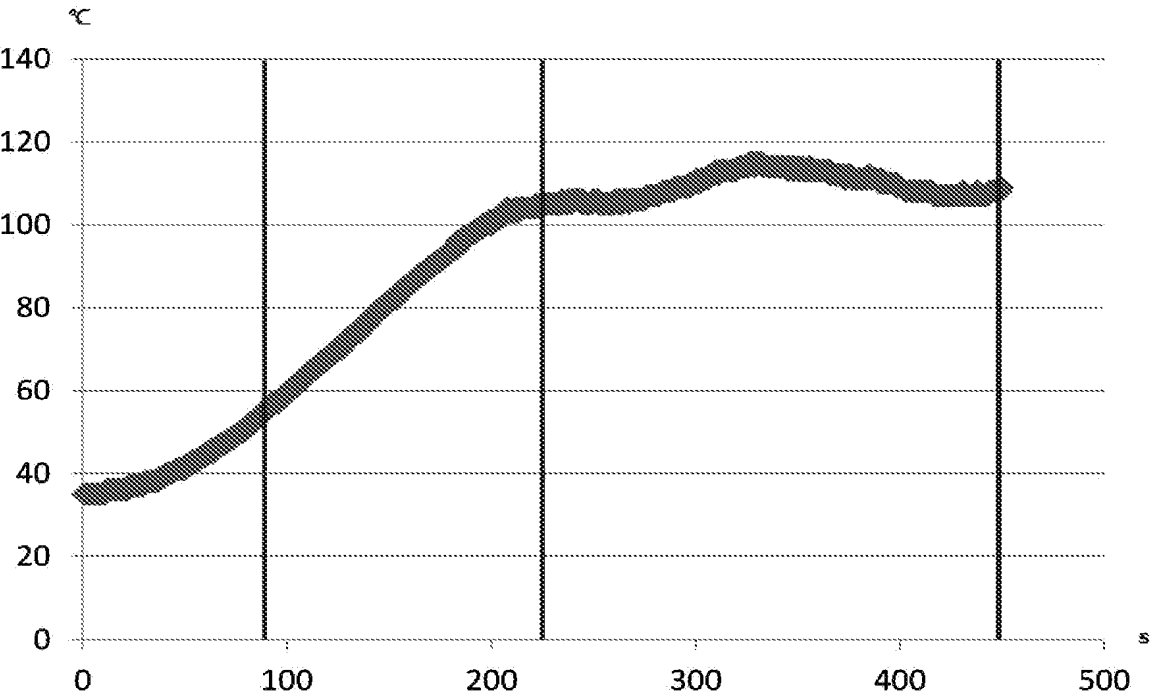


图 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/118523

A. CLASSIFICATION OF SUBJECT MATTER

A47J 37/06(2006.01)i; F24C 7/02(2006.01)i; F24C 7/08(2006.01)i; A23L 5/10(2016.01)i

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)

A47J, F24C, A23L

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)

CNABS, VEN: 功率, 脱水, 上色, 加热, 电热, 烤箱, 烤制, 烧烤, 烘烤, 时间, 温度, 微波, power, dehydrat+, dried, dry+, heat+, grill+, roast, barbecu+, bak+, tim+, temperature, microwav+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 108201368 A (QINGDAO HAIER SMART KITCHEN APPLIANCE CO., LTD.) 26 June 2018 (2018-06-26) description, paragraphs 47-74, and figures 1 and 2	1-10
Y	CN 105167633 A (LIU, Xiye) 23 December 2015 (2015-12-23) description, paragraphs 17-28, and figures 1-4	1-10
A	CN 104006422 A (HEFEI ROYALSTAR SANYO ELECTRIC APPLIANCE CO., LTD.) 27 August 2014 (2014-08-27) entire document	1-10
A	CN 101280931 A (PANASONIC APPLIANCES MICROWAVE OVEN (SHANGHAI) CO., LTD.) 08 October 2008 (2008-10-08) entire document	1-10
A	JP 6096720 B2 (TOSHIBA HOME TECHNOLOGY CORPORATION) 15 March 2017 (2017-03-15) entire document	1-10
A	CN 101988711 A (PANASONIC APPLIANCES MICROWAVE OVEN (SHANGHAI) CO., LTD.) 23 March 2011 (2011-03-23) entire document	1-10

☒ 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

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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

26 January 2020

Date of mailing of the international search report

19 February 2020

Name and mailing address of the ISA/CN

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Facsimile No. (86-10)62019451

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/118523**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 109567614 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD.; MIDEA GROUP CO., LTD.) 05 April 2019 (2019-04-05) claims 1-10	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/118523

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	108201368	A	26 June 2018	None	
CN	105167633	A	23 December 2015	None	
CN	104006422	A	27 August 2014	CN 104006422	B 24 February 2016
CN	101280931	A	08 October 2008	CN 101280931	B 05 October 2011
JP	6096720	B2	15 March 2017	JP 2016011763	A 21 January 2016
CN	101988711	A	23 March 2011	CN 101988711	B 29 October 2014
CN	109567614	A	05 April 2019	None	

国际检索报告

国际申请号

PCT/CN2019/118523

A. 主题的分类

A47J 37/06(2006.01)i; F24C 7/02(2006.01)i; F24C 7/08(2006.01)i; A23L 5/10(2016.01)i

按照国际专利分类(IPC)或者同时按照国家分类和IPC两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

A47J, F24C, A23L

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用))

CNABS, VEN 功率, 脱水, 上色, 加热, 电热, 烤箱, 烤制, 烧烤, 烘烤, 时间, 温度, 微波, power, dehydrat+, dried, dry+, heat+, grill+, roast, barbecu+, bak+, tim+, temperature, microwav+

C. 相关文件

类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
Y	CN 108201368 A (青岛海尔智慧厨房电器有限公司) 2018年 6月 26日 (2018 - 06 - 26) 说明书47-74段, 附图1-2	1-10
Y	CN 105167633 A (刘西叶) 2015年 12月 23日 (2015 - 12 - 23) 说明书17-28段, 附图1-4	1-10
A	CN 104006422 A (合肥荣事达三洋电器股份有限公司) 2014年 8月 27日 (2014 - 08 - 27) 全文	1-10
A	CN 101280931 A (上海松下微波炉有限公司) 2008年 10月 8日 (2008 - 10 - 08) 全文	1-10
A	JP 6096720 B2 (東芝ホームテクノ株式会社) 2017年 3月 15日 (2017 - 03 - 15) 全文	1-10
A	CN 101988711 A (上海松下微波炉有限公司) 2011年 3月 23日 (2011 - 03 - 23) 全文	1-10
PX	CN 109567614 A (广东美的厨房电器制造有限公司 美的集团股份有限公司) 2019年 4月 5日 (2019 - 04 - 05) 权利要求1-10	1-10

☐ 其余文件在C栏的续页中列出。☒ 见同族专利附件。

* 引用文件的具体类型:

“A” 认为不特别相关的表示了现有技术一般状态的文件

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“&” 同族专利的文件

国际检索实际完成的日期

2020年 1月 26日

国际检索报告邮寄日期

2020年 2月 19日

ISA/CN的名称和邮寄地址

中国国家知识产权局(ISA/CN)

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传真号 (86-10)62019451

授权官员

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电话号码 62085824

PCT/ISA/210 表(第2页) (2015年1月)

国际检索报告
关于同族专利的信息

国际申请号

PCT/CN2019/118523

检索报告引用的专利文件			公布日 (年/月/日)	同族专利	公布日 (年/月/日)
CN	108201368	A	2018年 6月 26日	无	
CN	105167633	A	2015年 12月 23日	无	
CN	104006422	A	2014年 8月 27日	CN	104006422 B 2016年 2月 24日
CN	101280931	A	2008年 10月 8日	CN	101280931 B 2011年 10月 5日
JP	6096720	B2	2017年 3月 15日	JP	2016011763 A 2016年 1月 21日
CN	101988711	A	2011年 3月 23日	CN	101988711 B 2014年 10月 29日
CN	109567614	A	2019年 4月 5日	无	

PCT/ISA/210 表(同族专利附件) (2015年1月)



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BUL (TR).

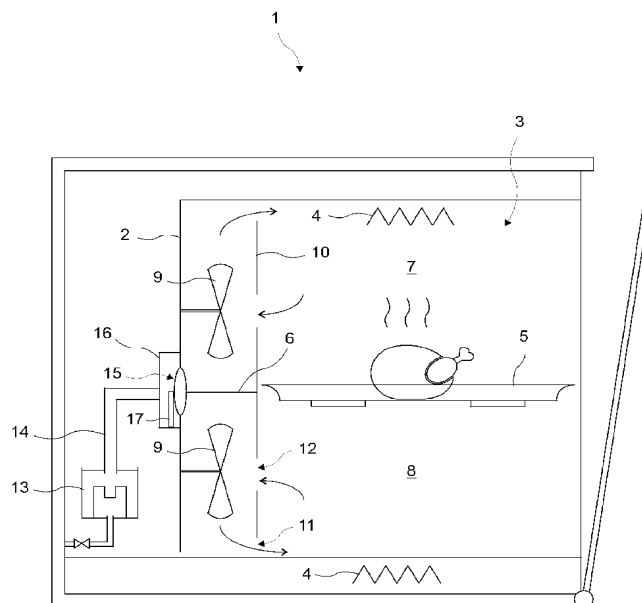
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Ankara Asfalti Uzeri, Tuzla, 34950 ISTANBUL (TR).

(81) Designated States (*unless otherwise indicated, for every
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DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP,
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MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
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SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN,
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GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ,

(54) Title: AN OVEN COMPRISING A STEAM GENERATOR

Figure 1



(57) **Abstract:** The present invention relates to an oven (1) comprising an upper partition (7) and a lower partition (8) which are separated from each other by means of a separator (5) or a tray (6) and which allow the cooking of different types of foodstuffs in the cooking cavity (3); two fans (9) one being used for the upper partition (7) and the other for the lower partition (8), which are disposed on the rear portion of the cooking cavity (3) and which move the heated air; a fan covering plate (10) which is disposed at the rear side of the cooking cavity (3) in front of the fans (9); a steam generator (13) which is disposed at the rear portion of the casing (2) and which is activated in the steam cooking program; a steam supply line (14) which transfers the generated steam into the cooking cavity (3); and at least one steam outlet orifice (15) which is arranged on the rear wall of the casing (2) and which enables the generated steam to be delivered into the cooking cavity (3) by means of the fans (9).

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).

Published:

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

Description**AN OVEN COMPRISING A STEAM GENERATOR**

- [0001] The present invention relates to an oven which has the function of cooking by convection as well as the function of steam cooking.
- [0002] In ovens wherein the cooking is performed by convention, at least one heater and at least one fan are provided. A fan covering plate is provided in front of the rear wall of the oven casing which is composed of the walls enclosing the cooking cavity wherein the cooking process is performed. The hot air heated by the heater and moved by the fan is delivered into the cooking cavity through the blowing holes arranged on the fan covering plate, and the air delivered into the cooking cavity is sucked by means of the suction holes back into the fan compartment remaining between the fan covering plate and the casing rear wall, thus carrying out the cooking of the foodstuff. In case of unbalanced blowing of the air, problems of regional burning or undercooking may arise on the foodstuff.
- [0003] The ovens with the function of steam cooking are gradually preferred more thanks to advantages such as high capacity thermal energy, efficient heat transfer, prevention of humidity loss on the foodstuff, maintaining vitamin, mineral and folic acid content, prevention of the formation of carcinogenic acrylamide, etc. The cooking cavity of the oven can be separated into the partitions by means of a separator or a tray, and thus two simultaneous cooking processes can be performed in said partitions under different temperature and humidity conditions. In combi-ovens having both the steam cooking function and conventional heaters, some problems may arise when the cooking cavity is divided into two partitions for carrying out cooking processes in said partitions under different humidity conditions. Different amounts of steam required by the partitions may not be delivered or it becomes impossible to carry out steam cooking in one partition while performing steam-free cooking in the other.
- [0004] In the Patent Application No. WO2016147420 (A1), the steam generated by the steam generator in a cooking device is delivered through channels so as to be supplied into the cooking cavity via two different areas.
- [0005] The aim of the present invention is the realization of an oven with steam

cooking function wherein separate cooking processes can be simultaneously carried out in two separate partitions under different temperature and humidity conditions.

- [0006] The oven realized in order to attain the aim of the present invention comprises an upper partition and a lower partition which are separated from each other by means of a separator or a tray and which allow the cooking of different types of foodstuffs in the cooking cavity. The oven further comprises a steam generator which carries out the steam cooking process. The steam generated by the steam generator is delivered into the cooking cavity through a steam supply line. The steam is delivered into the cooking cavity through at least one steam outlet orifice arranged on the rear wall of the casing. An electromechanic steam control valve, which enables the steam to be directed to the upper partition and/or the lower partition, is provided at the steam outlet orifice, and different foodstuffs can be cooked in the upper partition and the lower partition under different humidity conditions.
- [0007] The oven realized in order to attain the aim of the present invention is illustrated in the attached figures, where:
- [0008] Figure 1 - is the schematic view of the oven of the present invention.
- [0009] Figure 2 - is the schematic views showing the positions of the rotary steam control valve.
- [0010] Figure 3 - is the schematic views showing the positions of the rotary steam control valve in an embodiment of the present invention.
- [0011] Figure 4 - is the schematic views showing the positions of the sliding steam control valve.
- [0012] The elements illustrated in the figures are numbered as follows:
1. Oven
 2. Casing
 3. Cooking cavity
 4. Heater
 5. Separator
 6. Tray
 7. Upper partition

8. Lower partition
9. Fan
10. Fan covering plate
11. Blowing hole
12. Suction hole
13. Steam generator
14. Steam supply line
15. Steam outlet orifice
16. Steam control valve
17. Shutter

[0013] I: First position

[0014] II: Second position

[0015] III: Third position

[0016] IV: Fourth position

[0017] The oven (1) comprises a cooking cavity (3) which is provided in a casing (2) and wherein the cooking process is performed; at least one heater (4) which provides the heating of the air inside the cooking cavity (3); an upper partition (7) and a lower partition (8) which are separated from each other by means of a separator (5) or a tray (6) and which allow the cooking of different types of foodstuffs in the cooking cavity (3); two fans (9) one being used for the upper partition (7) and the other for the lower partition (8), which are disposed on the rear portion of the cooking cavity (3) and which move the heated air; a fan covering plate (10) which is disposed at the rear side of the cooking cavity (3) in front of the fans (9); a plurality of blowing holes (11) which are arranged on the fan covering plate (10) and through which the fans (9) blow air into the cooking cavity (3); a plurality of suction holes (12) through which the fans (9) suck the air inside the cooking cavity (3); a steam generator (13) which is disposed at the rear portion of the casing (2) and which is activated in the steam cooking program; a steam supply line (14) which transfers the generated steam into the cooking cavity (3); and at least one steam outlet orifice (15) which is arranged on the rear wall of the casing (2) and which enables the generated steam to be delivered into the cooking cavity (3) by means of

the fans (9).

- [0018] The oven (1) of the present invention comprises a steam control valve (16) which is mounted on the rear wall of the casing (2) between the steam supply line (14) and the steam outlet orifice (15), which enables the steam generated by the steam generator (13) to be guided to the upper partition (7) and/or the lower partition (8) by the fans (9) through the blowing holes (11), and which interrupts the steam delivery into the upper partition (7) and/or the lower partition (8).
- [0019] The steam control valve (16) enables the steam to be directed to only the upper partition (7) or only the lower partition (8) or to both the upper partition (7) and the lower partition (8) by the fans (9) through the blowing holes (11) depending on the steam cooking program selected by the user. The steam control valve (16) interrupts the steam delivery into the upper partition (7) and/or the lower partition (8) when the steam-free cooking program is selected or the required amount of steam is supplied.
- [0020] In an embodiment of the present invention, the steam control valve (16) is an electromechanic valve having a solenoid actuator (not shown in figures).
- [0021] The steam control valve (16) comprises a shutter (17) which is actuated by means of the solenoid actuator so as to open/close the steam outlet orifice (15).
- [0022] In an embodiment of the present invention, the oven (1) comprises two circular steam outlet orifices (15) which are positioned on the rear wall of the casing (2) one above the other, one being aligned with the upper side of the separator (5) or the tray (6) and delivering steam into the upper partition (7) and the other being aligned with the lower side of the separator (5) or the tray (6) and delivering steam into the lower partition (8) (Figure 2).
- [0023] In this embodiment, the steam control valve (16) is circular, and comprises a segment-shaped between 90° - 180° , or preferably semicircular segment-shaped shutter (17) which opens/closes the steam outlet orifices (15) at the angular positions to which the shutter (17) is brought by being rotated around the central axis perpendicular to the circular plane by the

solenoid actuator.

- [0024] At the angular positions to which the shutter (17) is brought by being rotated around the central axis, the circular steam control valve (16) enables the steam to be supplied into the upper partition (7) by means of the fan (9) and the blowing holes (11) through the steam outlet orifice (15) arranged at the upper side of the separator (5) or the tray (6) and/or enables the steam to be supplied into the lower partition (8) by means of the fan (9) and the blowing holes (11) through the steam outlet orifice (15) arranged at the lower side of the separator (5) or the tray (6).
- [0025] In an embodiment of the present invention, the oven (1) comprises a single steam outlet orifice (15), and the steam is supplied into the upper partition (7) through the semicircular section of the steam outlet orifice (15) remaining at the upper side of the separator (5) or the tray (6) and/or into the lower partition (8) through the semicircular section of the steam outlet orifice (15) remaining at the lower side of the separator (5) or the tray (6) (Figure 3).
- [0026] In this embodiment, the steam control valve (16) comprises a segment-shaped between 90° - 180° , preferably quadrant segment-shaped shutter (17), which opens/closes the upper semicircular section and/or the lower semicircular section of the steam outlet orifice (15) at the angular positions to which the shutter (17) is brought by being rotated around the central axis perpendicular to the circular plane by the solenoid actuator (Figure 3).
- [0027] In another embodiment of the present invention, the steam control valve (16) comprises a quadrilateral shutter (17) which slidably moves in the linear direction and which opens/closes the steam outlet orifice (15) at the positions to which the shutter (17) is brought by being moved upwards/downwards. By moving the shutter (17) upwards/downwards by means of the solenoid actuator, the steam outlet orifice (15) is opened/closed, thus supplying steam into the upper partition (7) and/or the lower partition (8) (Figure 4).
- [0028] The shutter (17) in the steam control valve (16) can be brought to four different positions in order to direct the steam to the upper partition (7)

and/or the lower partition (8) by means of the steam control valve (16) (Figure 2, Figure 3, Figure 4). In the first position (I) of the steam control valve (16), the upper steam outlet orifice (15) is closed by the shutter (17), thus the steam passes through the lower steam outlet orifice (15) and the steam is supplied only into the lower partition (8). In the second position (II) of the steam control valve (16), the lower steam outlet orifice (15) is closed by the shutter (17), thus the steam passes through the upper steam outlet orifice (15) and the steam is supplied only into the upper partition (7).

[0029] In the third position (III) of the steam control valve (16), the shutter (17) opens both steam outlet orifices (15), thus the steam passes through both steam outlet orifices (15) and the steam is supplied into both the upper partition (7) and the lower partition (8). In the fourth position (IV) of the steam control valve (16), the shutter (17) closes both steam outlet orifices (15), and the steam flow into the upper partition (7) and the lower partition (8) is interrupted. In the oven (1) comprising the steam generator (13), the cooking cavity (3) is divided into sections, that is the upper partition (7) and the lower partition (8) by means of the separator (5) or the tray (6), and different temperature and humidity conditions can be provided in the upper partition (7) and the lower partition (8) by means of the steam control valve (16). Saving in time and energy is provided by simultaneously cooking two different foodstuffs.

Claims

1. An oven (1) **comprising** a cooking cavity (3) which is provided in a casing (2) and wherein the cooking process is performed; at least one heater (4); an upper partition (7) and a lower partition (8) which are separated from each other by means of a separator (5) or a tray (6) and which allow the cooking of different types of foodstuffs in the cooking cavity (3); two fans (9) one being used for the upper partition (7) and the other for the lower partition (8), which are disposed on the rear portion of the cooking cavity (3) and which move the heated air; a fan covering plate (10) which is disposed at the rear side of the cooking cavity (3) in front of the fans (9); a plurality of blowing holes (11) which are arranged on the fan covering plate (10); a plurality of suction holes (12); a steam generator (13) which is disposed at the rear portion of the casing (2); a steam supply line (14) which transfers the generated steam into the cooking cavity (3); and at least one steam outlet orifice (15) which is arranged on the rear wall of the casing (2) and which enables the generated steam to be delivered into the cooking cavity (3) by means of the fans (9),
- **characterized by** a steam control valve (16) which is mounted on the rear wall of the casing (2) between the steam supply line (14) and the steam outlet orifice (15), and which enables the steam generated by the steam generator (13) to be guided to the upper partition (7) and/or the lower partition (8) by the fans (9) through the blowing holes (11).
2. An oven (1) as in Claim 1, **characterized by** the steam control valve (16) which is an electromechanic valve having a solenoid actuator.
3. An oven (1) as in Claim 1 or 2, **characterized by** the steam control valve (16) comprising a shutter (17) which is actuated by means of the solenoid actuator so as to open/close the steam outlet orifice (15).
4. An oven (1) as in Claim 1 or 2, **characterized by** two circular steam outlet orifices (15) one being aligned with the upper side of the separator (5) or the tray (6) and delivering steam into the upper partition (7) and the other being aligned with the lower side of the separator (5) or the tray (6) and delivering steam into the lower partition (8).
5. An oven (1) as in Claim 3 or 4, **characterized by** the steam control valve (16) comprising a segment-shaped shutter (17) which opens/closes the steam

outlet orifices (15) at the angular positions to which the shutter (17) is brought by being rotated around the central axis.

6. An oven (1) as in Claim 1 or 2, **characterized by** a circular steam outlet orifice (15) wherein the steam is supplied into the upper partition (7) through the semicircular section of the steam outlet orifice (15) remaining at the upper side of the separator (5) or the tray (6) and/or into the lower partition (8) through the semicircular section of the steam outlet orifice (15) remaining at the lower side of the separator (5) or the tray (6).
7. An oven (1) as in Claim 6, **characterized by** the steam control valve (16) comprising a segment-shaped shutter (17) which opens/closes the upper semicircular section and/or the lower semicircular section of the steam outlet orifice (15) at the angular positions to which the shutter (17) is brought by being rotated around the central axis.
8. An oven (1) as in Claim 1 or 2, **characterized by** the steam control valve (16) comprising a quadrilateral shutter (17) which slidably moves in the linear direction and which closes the steam outlet orifice (15) at the positions to which the shutter (17) is brought.

Figure 1

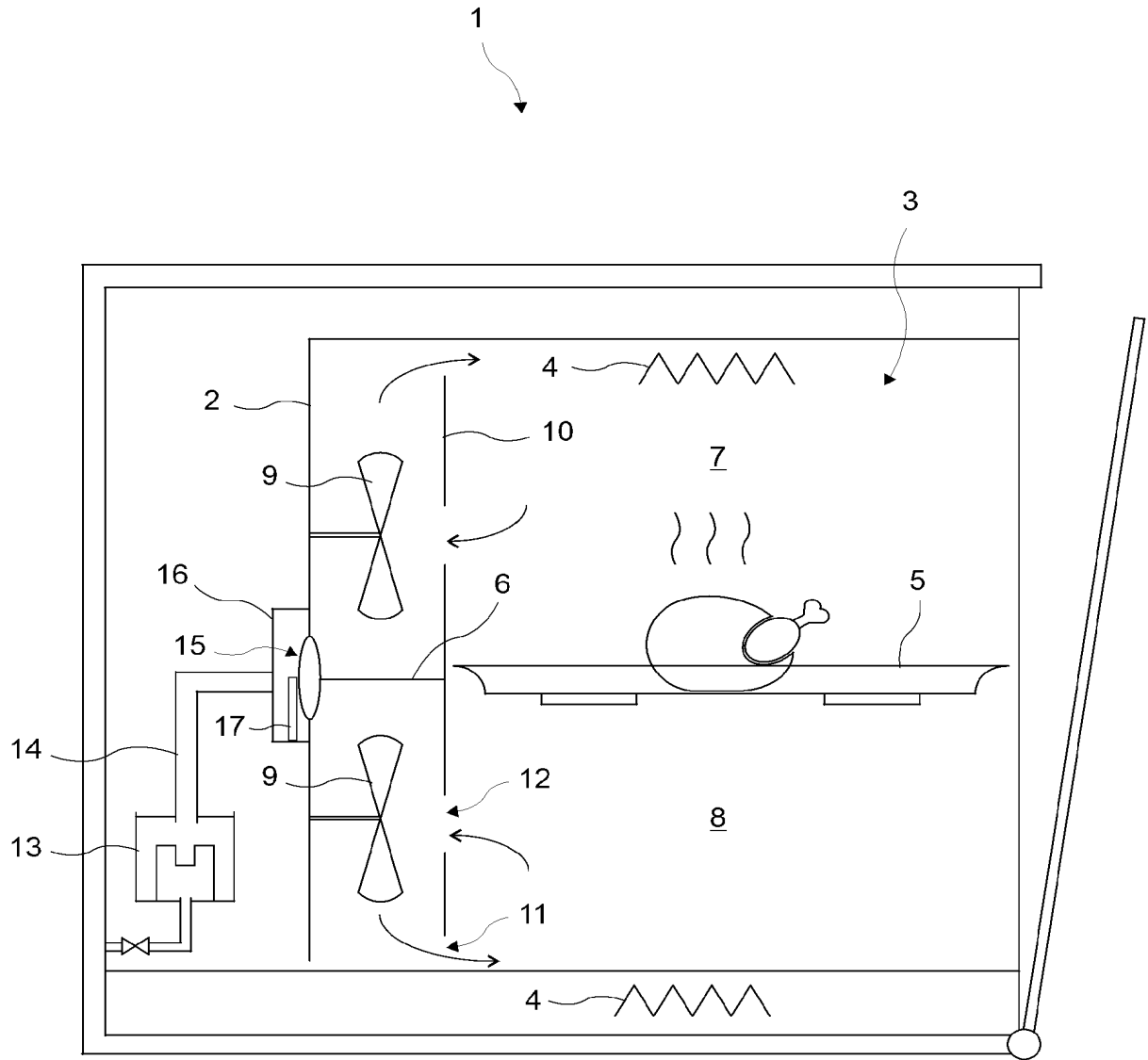


Figure 2

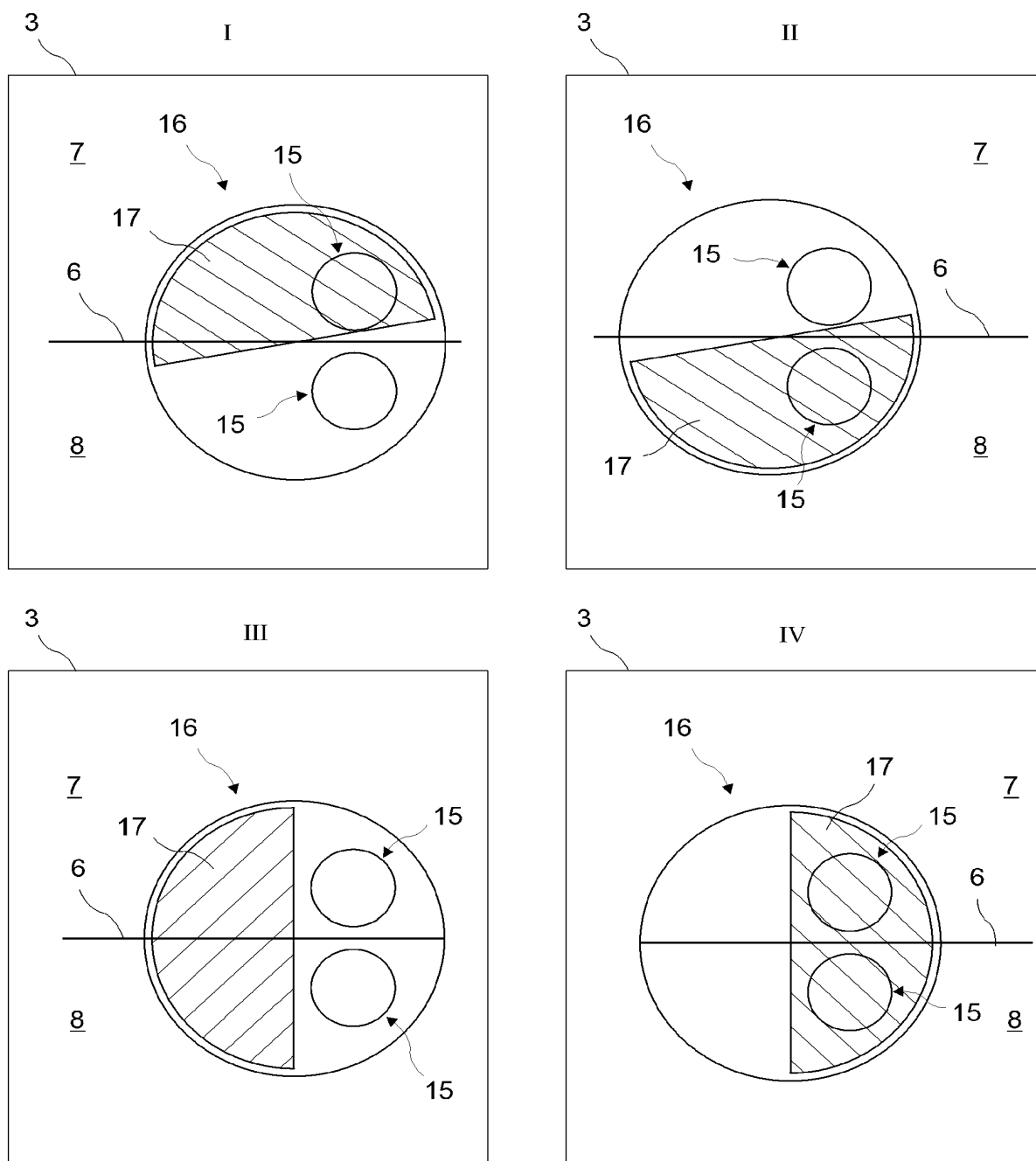


Figure 3

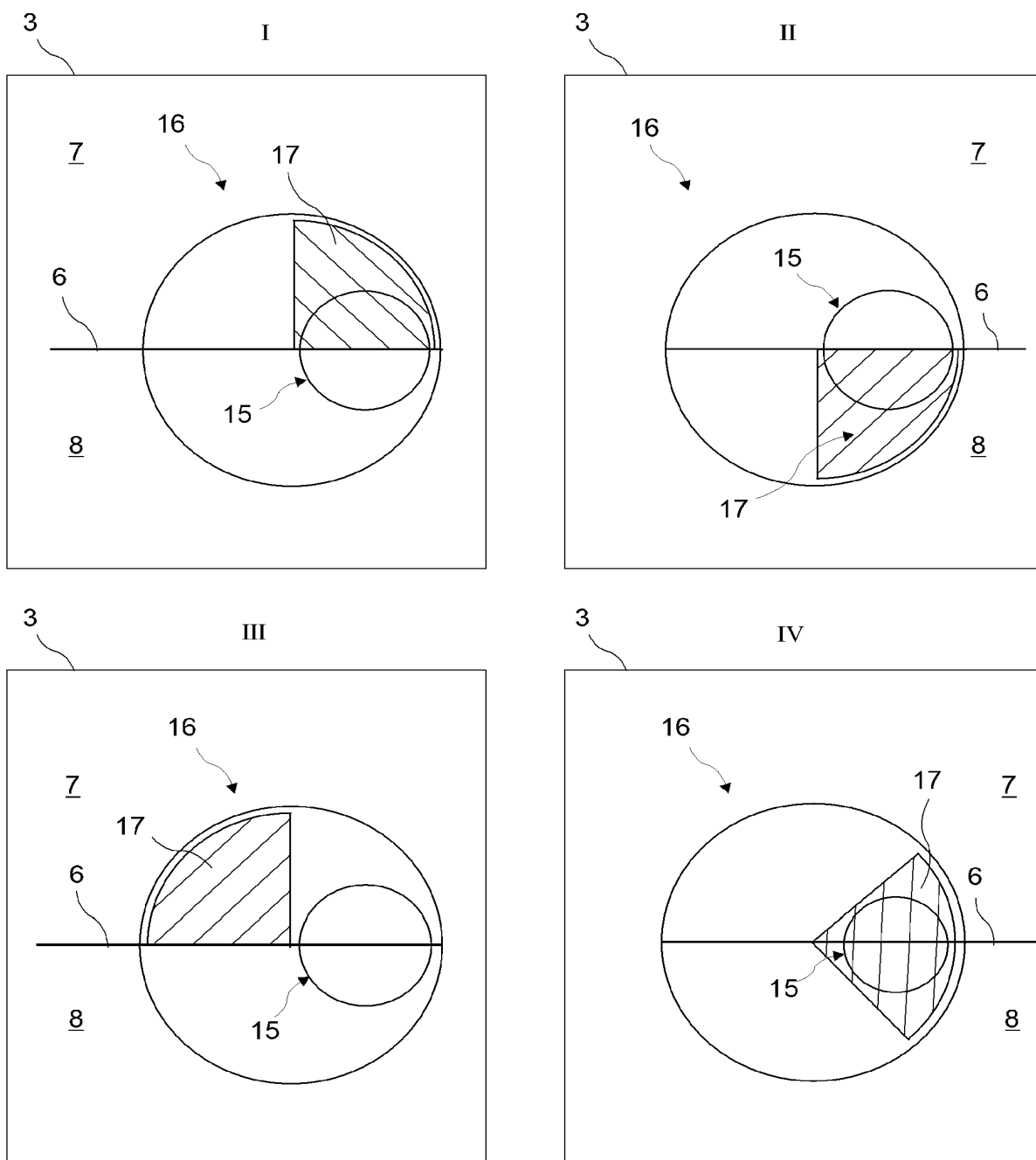
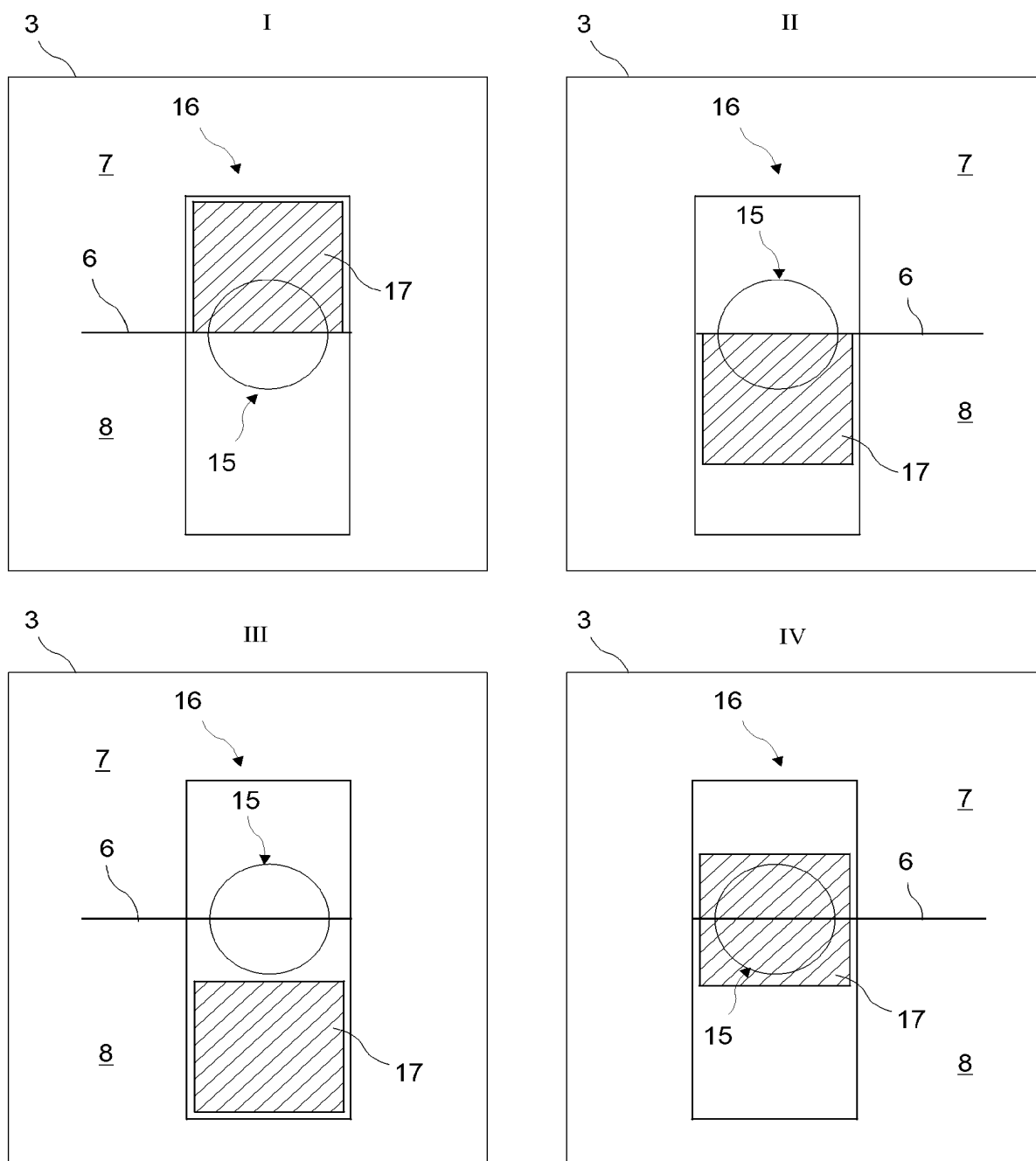


Figure 4



INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2019/079966

A. CLASSIFICATION OF SUBJECT MATTER
INV. F24C15/32 F24C15/18
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 A21B

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	DE 10 2007 039379 A1 (RATIONAL AG [DE]) 26 February 2009 (2009-02-26) figure 1 paragraphs [0033] - [0038] -----	1-8
X	DE 39 09 283 A1 (ELOMA GMBH [DE]) 18 October 1990 (1990-10-18) figures 1-4 -----	1-8
X	GB 2 260 832 A (JACKMAN NICHOLAS ANTHONY [IE]; TOOLE OLIVER O [IE]) 28 April 1993 (1993-04-28) figure 1 page 4, lines 1-9 -----	1-8
X	US 2018/055269 A1 (RECKNER MICHAEL B [US]) 1 March 2018 (2018-03-01) figures 1-5 ----- -/--	1-8

☒ 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

"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

4 February 2020

Date of mailing of the international search report

11/02/2020

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2017/164778 A1 (UTSUMI TAKASHI [JP] ET AL) 15 June 2017 (2017-06-15) figures 1-3	1-8
A	----- EP 1 275 333 A1 (IMP WERKE OHG [DE]) 15 January 2003 (2003-01-15) figure 2 paragraph [0012] -----	1-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/079966

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 102007039379 A1	26-02-2009	NONE	
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GB 2260832 A	28-04-1993	NONE	
US 2018055269 A1	01-03-2018	NONE	
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		US 2017164778 A1	15-06-2017
		WO 2016035592 A1	10-03-2016
EP 1275333 A1	15-01-2003	AT 306207 T	15-10-2005
		DE 10132581 A1	30-01-2003
		DE 50204507 D1	17-11-2005
		EP 1275333 A1	15-01-2003
		US 2003010221 A1	16-01-2003

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国际局

(43) 国际公布日
2020 年 6 月 11 日 (11.06.2020)



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(25) 申请语言: 中文

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(54) Title: STEAMING AND BAKING INTEGRATED MACHINE

(54) 发明名称: 蒸烤组合机

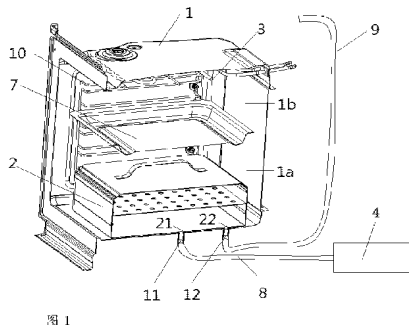


图 1

(57) Abstract: A steaming and baking integrated machine. An accommodating cavity is provided in a housing (1); a steaming vessel (2) is provided inside the accommodating cavity, and is used for dividing the accommodating cavity into a steaming area (1a) and a roasting area (1b); a heating pipe (3) is provided inside the roasting area (1b), and is used for roasting food located in the roasting area (1b); the bottom wall of the housing (1) is provided with a steam inlet (11). By providing a steaming vessel, the accommodating cavity is divided into a steaming area (1a) and a roasting area (1b), the steaming area (1a) and the roasting area (1b) work independently, steaming is performed in the steaming area (1a), and roasting is performed in the roasting area (1b). Two different foods can be processed at the same time in the steaming area (1a) and the roasting area (1b), thereby effectively overcoming the defect of low work efficiency caused by a steaming and baking integrated machine being capable of performing simultaneous steaming and roasting on one food only.

(57) 摘要: 一种蒸烤组合机, 壳体 (1) 内部设置有容纳腔; 蒸制器皿 (2) 设置在容纳腔内部, 用以将容纳腔分割成蒸制区 (1a) 和烧烤区 (1b); 烧烤区 (1b) 内部设置有烤盘 (7); 烧烤区 (1b) 内部设置有发热管 (3), 用以对位于烧烤区 (1b) 内部的食材进行烤制; 壳体 (1) 的底壁设置有蒸汽进气口 (11)。通过设置蒸制器皿, 将容纳腔分割成蒸制区 (1a) 和烧烤区 (1b), 蒸制区 (1a) 和烧烤区 (1b) 独立工作, 在蒸制区 (1a) 内部进行蒸制工作, 在烧烤区 (1b) 进行烤制工作。可以在蒸制区 (1a) 和烧烤区 (1b) 同时对两种不同的食材进行同时加工, 从而有效地解决了烧烤组合机只能在一种食材上进行同时蒸制和烤制的工作、导致工作效率较低的缺陷。

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(84) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (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)。

本国际公布:

— 包括国际检索报告 (条约第21条(3))。

蒸烤组合机

相关申请

本申请要求 2018 年 12 月 05 日申请的，申请号为 201811482221.1，名称为“一种蒸烤组合机”的中国专利申请的优先权，在此将其全文引入作为参考。

技术领域

本申请涉及厨房电器技术领域，具体涉及一种蒸烤组合机。

背景技术

随着生活水平的提高，许多人对家庭用品的要求也在不断提高，因此需要提供一种家用电器以集成多种不同产品的功能。

先前技术中公开了一种食品蒸烤装置，包括烤锅，以及设置在烤锅内部的蒸汽喷头，蒸汽喷头的下方设置有蒸汽发生装置，在使用过程中，烤锅和蒸汽喷头同时启动，对位于烤锅内部的食材同时进行烤制和蒸制。但是，上述的烤制和蒸制动作同时作用在同一食材上，整个装置的功能受限。

发明内容

因此，本申请要解决的技术问题在于克服食品蒸烤装置功能受限的缺陷。

为此，本申请提供一种蒸烤组合机，包括：壳体，其内部设置有容纳腔；蒸制器皿，设置在所述容纳腔内部，用以将所述容纳腔分割成蒸制区和烧烤区，所述烧烤区内部设置有烤盘；所述烧烤区内部设置有发热管，用以对位于所述烧烤区内部的食材进行烤制；所述壳体的底壁设置有蒸汽进气口，所述蒸制器皿的底壁上与所述蒸汽进气口相对应的位置设置有进汽孔，蒸汽发生器连接在所述蒸汽进气口上，通过所述蒸汽进气口将蒸汽导入所述进汽孔中。

在一实施例中，所述的蒸烤组合机，还包括蒸汽出气口，设置在所述壳体的底壁上，所述蒸制器皿与所述蒸汽出气口相对应的部位设置有出汽孔，用以导出位于所述蒸制器皿内部的蒸汽。

在一实施例中，在进汽孔与所述出汽孔上分别设置有朝向所述蒸汽进气口或所述蒸汽出气口方向延伸的翻边，所述翻边分别嵌入所述蒸汽进气口和所述蒸汽出气口中。

在一实施例中，为了起到密封效果，在所述翻边与所述蒸汽进气口之间、所述翻边与所述蒸汽出气口之间分别设置有密封圈。

本在一实施例中，在蒸汽发生器与所述蒸汽进气口之间连接有进气管，所述蒸汽出气口上连接有出气管，从而起到将蒸汽导入或引出的作用。

在一实施例中，所述蒸制器皿包括：底座，其上设置有所述进汽孔和所述出汽孔；以及，盖子，扣设在所述底座上，与所述底座形成封闭空间。所述蒸制器皿内部设置有蒸盘，所述蒸盘用以放置食材。

在一实施例中，所述壳体底部位置处设置有集水槽，用以容纳所述蒸制区产生的冷凝水。

在一实施例中，为了起到绝热的作用，在所述蒸制器皿与所述烧烤区相对应的位置设置有绝热层，用以防止所述烧烤区与所述蒸制区之间发生热交换。

本申请同时提供了绝热层的一种代替方式，在蒸制器皿与所述烤盘之间设置有隔热板。

本申请技术方案，具有如下优点：

1.本申请提供的蒸烤组合机，包括：壳体，其内部设置有容纳腔；蒸制器皿，设置在所述容纳腔内部，用以将所述容纳腔分割成蒸制区和烧烤区，所述烧烤区内部设置有烤盘；所述烧烤区内部设置有发热管，用以对位于所述烧烤区内部的食材进行烤制；所述壳体的底壁设置有蒸汽进气口，所述蒸制器皿的底壁上与所述蒸汽进气口相对应的位置设置有进汽孔，蒸汽发生器连接在所述蒸汽进气口上，通过所述蒸汽进气口将蒸汽导入所述进汽孔中。

本申请中，通过设置蒸制器皿，将容纳腔分割成蒸制区和烧烤区，蒸制区和烧烤区独立工作，在蒸制区（蒸制器皿）内部进行蒸制工作，在烧烤区进行烤制工作。通过上述的设置方式，可以在蒸制区（蒸制器皿）和烧烤区同时对两种不同的食材进行同时加工，从而有效地解决了烧烤组合机只能在一种食材上进行同时蒸制和烤制的工作、导致工作效率较低的缺陷。

2.本申请提供的蒸烤组合机，还包括蒸汽出气口，设置在所述壳体的底壁上，所述蒸制器皿与所述蒸汽出气口相对应的部位设置有出汽孔，用以导出位于所述蒸制器皿内部的蒸汽。

蒸汽通过蒸汽发生器产生，然后打入蒸制区内部，上述的方式将蒸汽从外部导入，而不是传统的从内部产生，首先有利于提高蒸制区自身对于空间的利用效率，同时可以避免蒸汽发生装置设置在蒸制区内部时，对蒸制区内部的食材造成影响。

3.本申请提供的蒸烤组合机，在进汽孔与所述出汽孔上分别设置有朝向所述蒸汽进气口或所述蒸汽出气口方向延伸的翻边，所述翻边分别嵌入所述蒸汽进气口和所述蒸汽出气口中。通过将蒸汽进气口设置在底壁位置，可以使进入蒸制区内部的蒸汽自发运动至蒸制区的各个位置，避免出现死角，从而有效地提高蒸汽的利用率。

同时，通过设置翻边，可以使蒸制器皿与壳体之间进行有效对接，有助于将传递至蒸汽进气口的蒸汽稳定地导入到蒸制器皿内部。同时也有助于将蒸汽出气口位置的蒸汽导出到蒸制器皿外侧。

4.本申请提供的蒸烤组合机，所述壳体位于所述蒸制区底部的位置处设置有集水槽。

由于蒸汽遇冷后容易冷凝产生冷凝水，因此为了防止冷凝水囤积在蒸制区内部对蒸制工作产生影响，将冷凝水导出至集水槽内部，从而有效地降低冷凝水产生的影响。

5.本申请提供的蒸烤组合机，所述蒸制器皿与所述烧烤区相对应的位置设置有绝热层，用以防止所述烧烤区与所述蒸制区之间发生热交换。当烧烤区与蒸制区之间通过绝热层进行分隔时，各自区域内部的热量不会发生相互影响，从而确保两个区域中烹饪工作的独立性，有利于确保蒸制或烤制得到的食品的口感。

6.本申请提供的蒸烤组合机，所述蒸制器皿包括：底座，其上设置有所述进汽孔和所述出汽孔；以及，盖子，扣设在所述底座上，与所述底座形成封闭空间。所述蒸制器皿内部设置有蒸盘，所述蒸盘用以放置食材。

通过设置具有密闭腔体的蒸制器皿，可以将进入蒸制区内部的蒸汽进行收集，从而将导入的蒸汽聚拢作用在蒸制器皿内部的食材上，有效提高蒸汽的利用效率。

附图说明

为了更清楚地说明本申请具体实施方式或现有技术中的技术方案，下面将对具体实施方式或现有技术描述中所需要使用的附图作简单地介绍，显而易见地，下面描述中的附图是本申请的一些实施方式，对于本领域普通技术人员来讲，在不付出创造性劳动的前提下，还可以根据这些附图获得其他的附图。

图1为本申请提供的所述蒸烤组合机的剖视图；

图2为图1所示的蒸烤组合机中所述壳体的剖视图；

图3为图1所示的蒸烤组合机中所述蒸制器皿的结构剖视图；

图4为本申请提供的所述蒸烤组合机中所述蒸制器皿的翻边的放大示意图。

附图标记说明：

1-壳体；11-蒸汽进气口；12-蒸汽出气口；1a-蒸制区；1b-烧烤区；2-蒸制器皿；21-

进汽孔；22-出汽孔；23-翻边；24-密封圈；25-盖子；26-蒸盘；27-底座；3-发热管；4-蒸汽发生器；7-烤盘；8-进气管；9-出气管；10-烤盘架。

具体实施方式

下面将结合附图对本申请的技术方案进行清楚、完整地描述，显然，所描述的实施例是本申请一部分实施例，而不是全部的实施例。基于本申请中的实施例，本领域普通技术人员在没有做出创造性劳动前提下所获得的所有其他实施例，都属于本申请保护的范围。

在本申请的描述中，需要说明的是，术语“中心”、“上”、“下”、“左”、“右”、“竖直”、“水平”、“内”、“外”等指示的方位或位置关系为基于附图所示的方位或位置关系，仅是为了便于描述本申请和简化描述，而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作，因此不能理解为对本申请的限制。此外，术语“第一”、“第二”、“第三”仅用于描述目的，而不能理解为指示或暗示相对重要性。

在本申请的描述中，需要说明的是，除非另有明确的规定和限定，术语“安装”、“相连”、“连接”应做广义理解，例如，可以是固定连接，也可以是可拆卸连接，或一体地连接；可以是机械连接，也可以是电连接；可以是直接相连，也可以通过中间媒介间接相连，可以是两个元件内部的连通。对于本领域的普通技术人员而言，可以根据具体情况理解上述术语在本申请中的具体含义。

此外，下面所描述的本申请不同实施方式中所涉及的技术特征只要彼此之间未构成冲突就可以相互结合。

实施例

本实施例提供一种蒸烤组合机，如图1所示，包括：壳体1，其内部设置有容纳腔；蒸制器皿2，设置在所述容纳腔内部，用以将所述容纳腔分割成蒸制区1a和烧烤区1b，所述烧烤区1b内部设置有烤盘7；所述烧烤区1b内部设置有发热管3，用以对位于所述烧烤区1b内部的食材进行烤制；所述壳体1的底壁设置有蒸汽进气口11，所述蒸制器皿2的底壁上与所述蒸汽进气口11相对应的位置设置有进汽孔21，蒸汽发生器4连接在所述蒸汽进气口11上，通过所述蒸汽进气口11将蒸汽导入所述进汽孔21中。

通过设置蒸制器皿2，将容纳腔分割成蒸制区1a和烧烤区1b，蒸制区1a和烧烤区1b独立工作，在蒸制区1a（蒸制器皿2）内部进行蒸制工作，在烧烤区1b进行烤制工作。通过上述的设置方式，可以在蒸制区1a（蒸制器皿2）和烧烤区1b同时对两种不同的食材进行同时加工，从而有效地解决了烧烤组合机只能在一种食材上进行同时蒸制和烤制的工作、导致工作效率较低的缺陷。

本实施例中，发热管 3 与外部电源相连接，其产生的热量作用在烤盘 7 上方并对烤盘 7 上的食材进行烤制。

同时，本实施例中，为了放置烤盘 7，在壳体 1 内壁上设置有烤盘架 10，通过烤盘架 10 可以在壳体 1 内部竖直方向设置多个不同的烤盘 7。

本实施例提供的所述的蒸烤组合机，如图 1 和图 2 所示，还包括蒸汽出气口 12，设置在所述壳体 1 的底壁上，所述蒸制器皿 2 与所述蒸汽出气口 12 相对应的部位设置有出汽孔 22，用以导出位于所述蒸制器皿 2 内部的蒸汽。

蒸汽通过蒸汽发生器 4 产生，然后打入蒸制区 1a 内部，上述的方式将蒸汽从外部导入，而不是传统的从内部产生，首先有利于提高蒸制区 1a 自身对于空间的利用效率，同时可以避免蒸汽发生装置设置在蒸制区 1a 内部时，对蒸制区 1a 内部的食材造成影响。

本实施例中，如图 4 所示，在进汽孔 21 与所述出汽孔 22 上分别设置有朝向所述蒸汽进气口 11 或所述蒸汽出气口 12 方向延伸的翻边 23，所述翻边 23 分别嵌入所述蒸汽进气口 11 和所述蒸汽出气口 12 中。

同时，为了起到密封效果，如图 4 所示，在所述翻边 23 与所述蒸汽进气口 11 之间、所述翻边 23 与所述蒸汽出气口 12 之间分别设置有密封圈 24，密封圈 24 自身具有一定的弹性，当夹设在翻边 23 下方时，可以起到密封翻边 23 与蒸汽出（进）气口之间的缝隙的作用。

本实施例中，在蒸汽发生器 4 与所述蒸汽进气口 11 之间连接有进气管 8，所述蒸汽出气口 12 上连接有出气管 9，从而起到将蒸汽导入或引出的作用。通过设置蒸汽进气口 11 与蒸汽进气管 8 相连接，可以将蒸汽发生器 4 内部产生的蒸汽顺利地导入到蒸制器皿 2 内部，从而提高蒸制器皿 2 的工作效率。

如图 3 和图 4 所示，本实施例提供的所述蒸制器皿 2 包括：底座 27，其上设置有所述进汽孔 21 和所述出汽孔 22；以及，盖子 25，扣设在所述底座 27 上，与所述底座 27 形成封闭空间。所述蒸制器皿 2 内部设置有蒸盘 26，所述蒸盘 26 用以放置食材。

此外，所述壳体 1 底部位置处设置有集水槽（图中未示出），用以容纳所述蒸制区 1a 产生的冷凝水。

同时，为了起到绝热的作用，在所述蒸制器皿 2 与所述烧烤区 1b 相对应的位置设置有绝热层，用以防止所述烧烤区 1b 与所述蒸制区 1a 之间发生热交换。

作为可代替的实施方式，本实施例中可以直接在蒸制器皿 2 与所述烤盘 7 之间设置有隔热板。绝热层和隔热板均采用常见的绝热材料制成，在本实施例中不进行过多描述。

本实施例提供的蒸烤组合机的装配方式如下：

将底座 27 的进汽孔 21 和出汽孔 22 分别对准壳体 1 的蒸汽进气口 11 和蒸汽出气口 12, 然后将蒸盘 26 安装在底座 27 上, 最后将盖子 25 盖在蒸盘 26 上方。然后将烤盘 7 插入到壳体 1 的烤盘架 10 上即可。

显然, 上述实施例仅仅是为清楚地说明所作的举例, 而并非对实施方式的限定。对于所属领域的普通技术人员来说, 在上述说明的基础上还可以做出其它不同形式的变化或变动。这里无需也无法对所有的实施方式予以穷举。而由此所引伸出的显而易见的变化或变动仍处于本申请创造的保护范围之内。

权利要求

1、一种蒸烤组合机，其特征在于，包括：

壳体（1），其内部设置有容纳腔；

蒸制器皿（2），设置在所述容纳腔内部，用以将所述容纳腔分割成蒸制区（1a）和烧烤区（1b），所述烧烤区（1b）内部设置有烤盘（7）；

所述烧烤区（1b）内部设置有发热管（3），用以对位于所述烧烤区（1b）内部的食材进行烤制；

所述壳体（1）的底壁设置有蒸汽进气口（11），所述蒸制器皿（2）的底壁上与所述蒸汽进气口（11）相对应的位置设置有进汽孔（21），蒸汽发生器（4）连接在所述蒸汽进气口（11）上，通过所述蒸汽进气口（11）将蒸汽导入所述进汽孔（21）中。

2、根据权利要求 1 所述的蒸烤组合机，所述进汽孔（21）上设置有朝向所述蒸汽进气口（11）方向延伸的翻边（23），所述翻边（23）嵌入所述蒸汽进气口（11）中。

3、根据权利要求 2 所述的蒸烤组合机，其特征在于，所述翻边（23）与所述蒸汽进气口（11）之间设置有密封圈（24）。

4、根据权利要求 3 所述的蒸烤组合机，其特征在于，所述蒸汽发生器（4）与所述蒸汽进气口（11）之间连接有进气管（8）。

5、根据权利要求 1 所述的蒸烤组合机，其特征在于，还包括：蒸汽出气口（12），设置在所述壳体（1）的底壁上，所述蒸制器皿（2）与所述蒸汽出气口（12）相对应的部位设置有出汽孔（22），用以导出位于所述蒸制器皿（2）内部的蒸汽。

6、根据权利要求 5 所述的蒸烤组合机，其特征在于，所述出汽孔（22）上设置有朝向所述蒸汽出气口（12）方向延伸的翻边（23），所述翻边（23）嵌入所述蒸汽出气口（12）中。

7、根据权利要求 6 所述的蒸烤组合机，其特征在于，所述翻边（23）与所述蒸汽出气口（12）之间设置有密封圈（24）。

8、根据权利要求 7 所述的蒸烤组合机，其特征在于，所述蒸汽出气口（12）上连接有出气管（9）。

9、根据权利要求 5-8 任一所述的蒸烤组合机，其特征在于，所述蒸制器皿（2）包括：底座（27），其上设置有所述进汽孔（21）和所述出汽孔（22）；以及，盖子（25），扣设在所述底座（27）上，与所述底座（27）形成封闭空间。

10、根据权利要求 9 所述的蒸烤组合机，其特征在于，所述蒸制器皿（2）内部设置

有蒸盘（26），所述蒸盘（26）用以放置食材。

11、根据权利要求 10 所述的蒸烤组合机，其特征在于，所述壳体（1）底部位置处设置有集水槽，用以容纳所述蒸制区（1a）产生的冷凝水。

12、根据权利要求 11 所述的蒸烤组合机，其特征在于，所述蒸制器皿（2）与所述烧烤区（1b）相对应的位置设置有绝热层，用以防止所述烧烤区（1b）与所述蒸制区（1a）之间发生热交换。

13、根据权利要求 11 所述的蒸烤组合机，其特征在于，所述蒸制器皿（2）与所述烤盘（7）之间设置有隔热板。

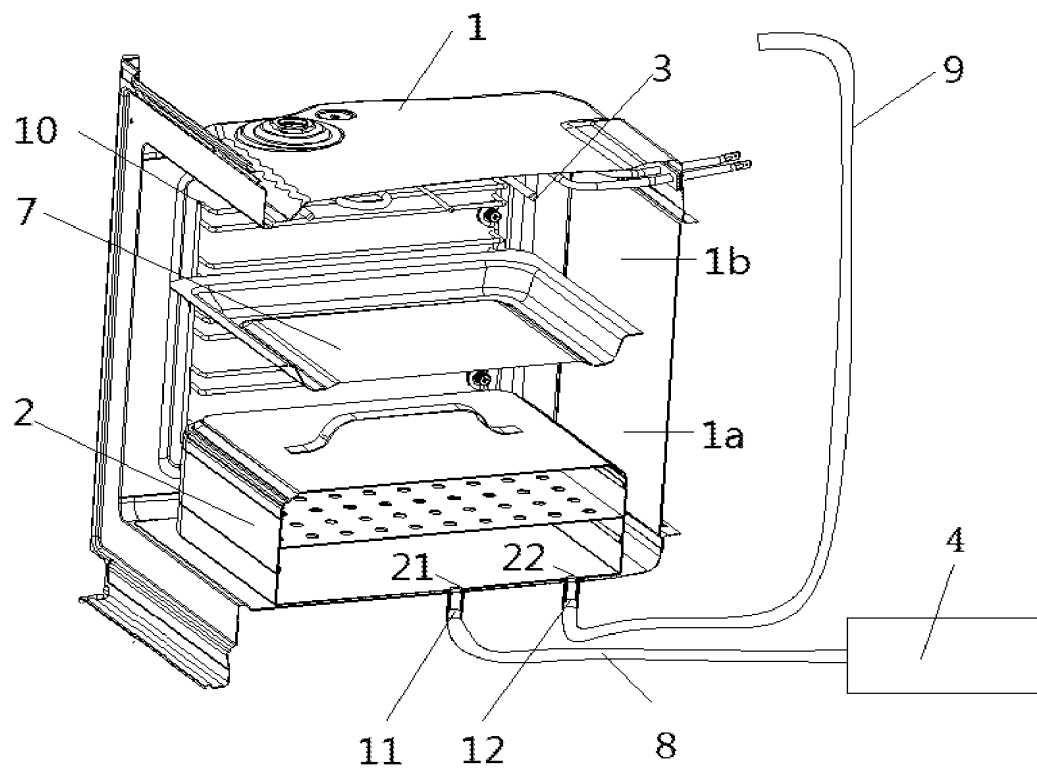


图 1

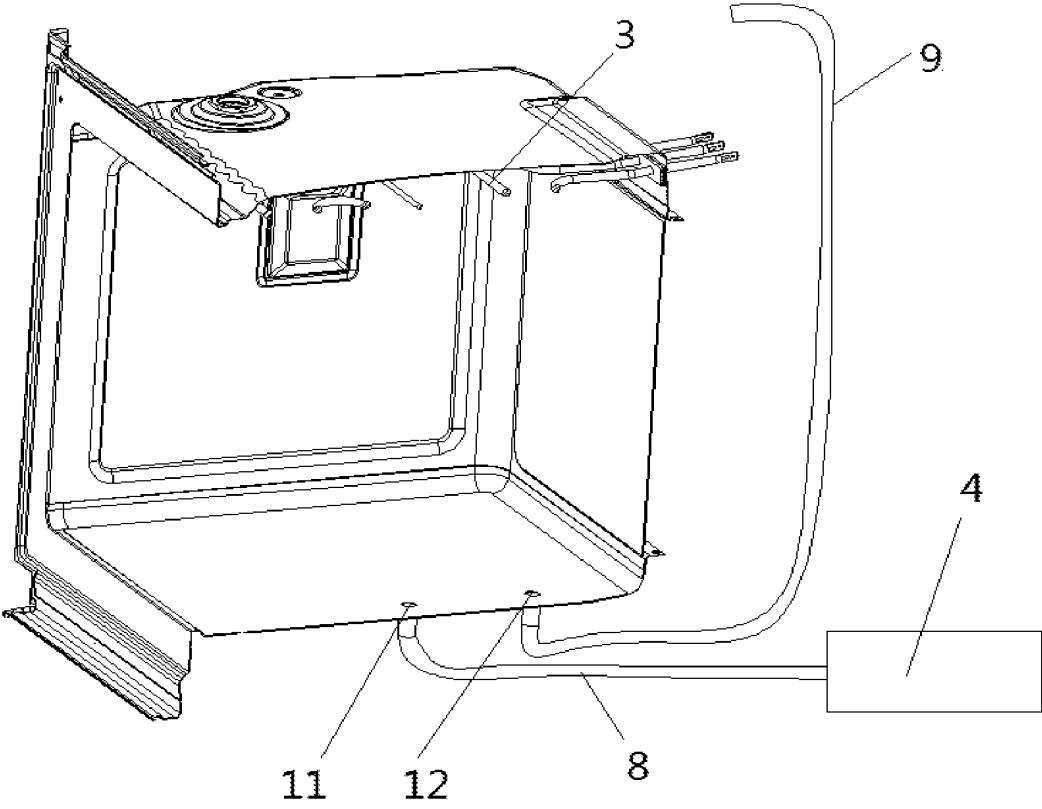


图 2

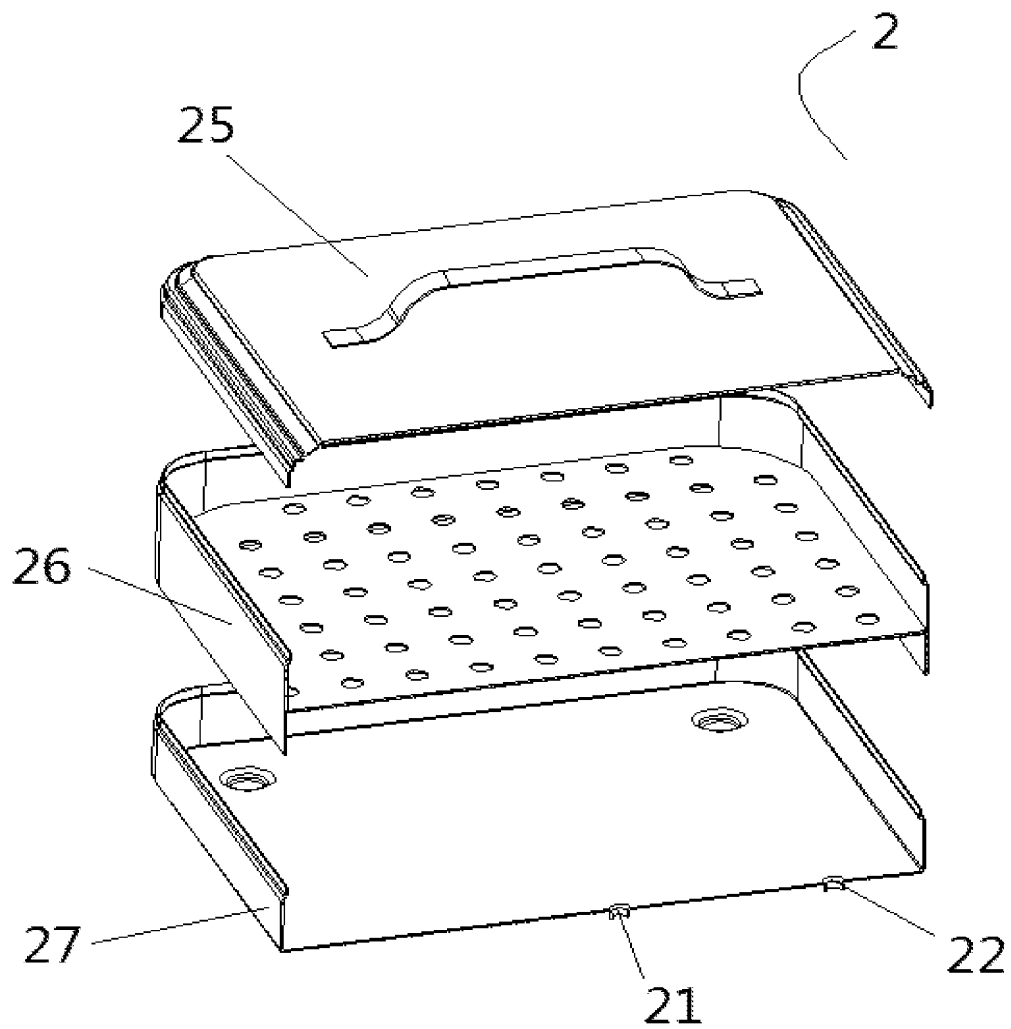


图 3

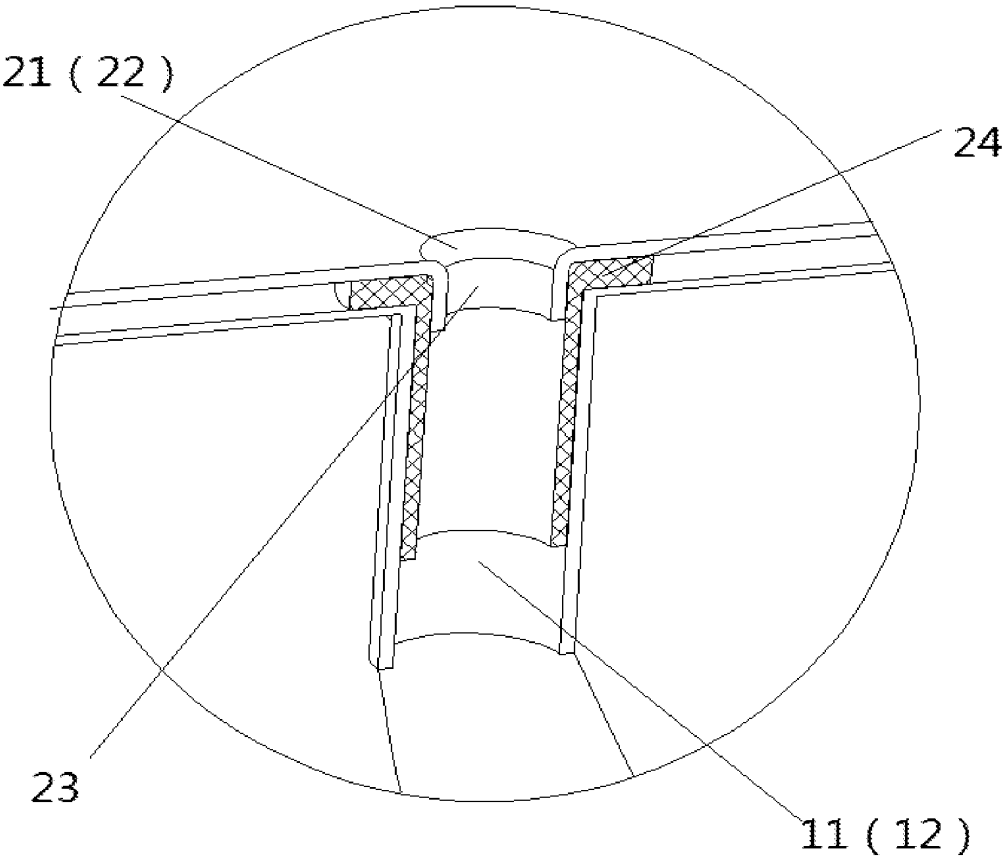


图 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/099874

A. CLASSIFICATION OF SUBJECT MATTER

A47J 27/04(2006.01)i

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)

A47J27,A47J37,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)

CNABS, CNTXT, VEN: 宁波方太厨具有限公司, 蒸箱烤箱, 蒸烤, 蒸, 烤, 翻边, 密封圈, steam, oven, toast, braise, braize, bake, grill, airproof ring, edge curl, edge roll

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 108236354 A (NINGBO FOTILE KITCHEN WARE CO., LTD.) 03 July 2018 (2018-07-03) description, paragraphs 5-64, and figures 1-9	1-13
Y	CN 108236354 A (NINGBO FOTILE KITCHEN WARE CO., LTD.) 03 July 2018 (2018-07-03) description, paragraphs 5-64 and figures 1-9	2-4, 6-7
Y	CN 206166672 U (JOYOUNG CO., LTD.) 17 May 2017 (2017-05-17) description, paragraph 34	2-4, 6-7
Y	CN 206586803 U (NINGBO FOTILE KITCHEN WARE CO., LTD.) 27 October 2017 (2017-10-27) description, paragraphs 0002-0030	1-13
PX	CN 109512272 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 March 2019 (2019-03-26) description, paragraphs 0002-0045	1-13
PX	CN 109567568 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 05 April 2019 (2019-04-05) description, paragraphs 0004-0049, and figures 1-6	1-13

☒ 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

“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

08 November 2019

Date of mailing of the international search report

18 November 2019

Name and mailing address of the ISA/CN

China National Intellectual Property Administration
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Facsimile No. (86-10)62019451

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/099874**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 206386973 U (ANHUI HUALING KITCHEN EQUIPMENT CO., LTD.) 08 August 2017 (2017-08-08) entire document	1-13
A	CN 109512272 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 March 2019 (2019-03-26) entire document	1-13
A	CN 206354874 U (ZHUHAI JIABAO DE SCIENCE & TECHNOLOGY CO., LTD.) 28 July 2017 (2017-07-28) entire document	1-13
A	DE 102018004617 A1 (BECKER, F. et al.) 13 December 2018 (2018-12-13) entire document	1-13
A	KR 101134472 B1 (RINNAI KOREA CORP.) 19 April 2012 (2012-04-19) entire document	1-13

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/099874

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	108236354	A	03 July 2018	WO	2018113038	A1	28 June 2018
CN	206166672	U	17 May 2017	None			
CN	206586803	U	27 October 2017	None			
CN	109512272	A	26 March 2019	None			
CN	109567568	A	05 April 2019	None			
CN	206386973	U	08 August 2017	None			
CN	206354874	U	28 July 2017	None			
DE	102018004617	A1	13 December 2018	DE	202017003189	U1	29 June 2017
KR	101134472	B1	19 April 2012	None			

A. 主题的分类 A47J 27/04 (2006.01) i 按照国际专利分类 (IPC) 或者同时按照国家分类和 IPC 两种分类		
B. 检索领域 检索的最低限度文献 (标明分类系统和分类号) A47J27, A47J37, F24C 包含在检索领域中的除最低限度文献以外的检索文献 在国际检索时查阅的电子数据库 (数据库的名称, 和使用的检索词 (如使用)) CNABS, CNTXT, VEN: 宁波方太厨具有限公司, 蒸箱烤箱, 蒸烤, 蒸, 烤, 翻边, 密封圈, steam, oven, toast, braise, braize, bake, grill, airproof ring, edge curl, edge roll		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
X	CN 108236354 A (宁波方太厨具有限公司) 2018年 7月 3日 (2018 - 07 - 03) 说明书第5段至64段、附图1-9	1-13
Y	CN 108236354 A (宁波方太厨具有限公司) 2018年 7月 3日 (2018 - 07 - 03) 说明书第5段至64段、附图1-9	2-4, 6-7
Y	CN 206166672 U (九阳股份有限公司) 2017年 5月 17日 (2017 - 05 - 17) 说明书第34段	2-4, 6-7
Y	CN 206586803 U (宁波方太厨具有限公司) 2017年 10月 27日 (2017 - 10 - 27) 说明书第0002-0030段	1-13
PX	CN 109512272 A (珠海格力电器股份有限公司) 2019年 3月 26日 (2019 - 03 - 26) 说明书第0002-0045段	1-13
PX	CN 109567568 A (珠海格力电器股份有限公司) 2019年 4月 5日 (2019 - 04 - 05) 说明书第0004-0049段、附图1-6	1-13
A	CN 206386973 U (安徽华菱西厨装备股份有限公司) 2017年 8月 8日 (2017 - 08 - 08) 全文	1-13
A	CN 109512272 A (珠海格力电器股份有限公司) 2019年 3月 26日 (2019 - 03 - 26) 全文	1-13
☒ 其余文件在C栏的续页中列出。 ☒ 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件 (如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件 “T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件		
国际检索实际完成的日期 2019年 11月 8日		国际检索报告邮寄日期 2019年 11月 18日
ISA/CN的名称和邮寄地址 中国国家知识产权局 (ISA/CN) 中国北京市海淀区蓟门桥西土城路6号 100088 传真号 (86-10)62019451		授权官员 杨雪 电话号码 62085838

C. 相关文件		
类 型*	引用文件，必要时，指明相关段落	相关的权利要求
A	CN 206354874 U (珠海家宝德科技有限公司) 2017年 7月 28日 (2017 - 07 - 28) 全文	1-13
A	DE 102018004617 A1 (BECKER FRANK等) 2018年 12月 13日 (2018 - 12 - 13) 全文	1-13
A	KR 101134472 B1 (RINNAI KOREA CORP) 2012年 4月 19日 (2012 - 04 - 19) 全文	1-13

国际检索报告
关于同族专利的信息

国际申请号

PCT/CN2019/099874

检索报告引用的专利文件			公布日 (年/月/日)	同族专利			公布日 (年/月/日)
CN	108236354	A	2018年 7月 3日	WO	2018113038	A1	2018年 6月 28日
CN	206166672	U	2017年 5月 17日	无			
CN	206586803	U	2017年 10月 27日	无			
CN	109512272	A	2019年 3月 26日	无			
CN	109567568	A	2019年 4月 5日	无			
CN	206386973	U	2017年 8月 8日	无			
CN	206354874	U	2017年 7月 28日	无			
DE	102018004617	A1	2018年 12月 13日	DE	202017003189	U1	2017年 6月 29日
KR	101134472	B1	2012年 4月 19日	无			

(12) 按照专利合作条约所公布的国际申请

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(71) 申请人: 广东美控电子科技有限公司 (GUANGDONG MEIKONG ELECTRONIC TECHNOLOGY CO., LTD.) [CN/CN]; 中国广东省广州市番禺区化龙镇金盛四路 31 号 (北车间) 301 孙连成, Guangdong 511434 (CN)。

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(81) 指定国(除另有指明, 要求每一种可提供的国家保护): 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, JO, 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) 指定国(除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (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)。

(54) **Title:** MULTI-DECK ELECTRIC OVEN HAVING DIFFERENT TEMPERATURE REGIONS CAPABLE OF PERFORMING UNIFORMLY CONTROLLED REGION-BASED HEATING

(54) 发明名称: 多温区分部加热均匀控温多层电烤箱

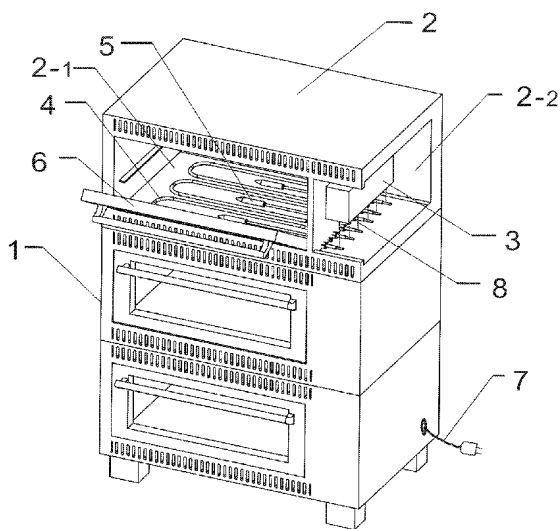


图1

(57) **Abstract:** A multi-deck electric oven having different temperature regions capable of performing uniformly controlled region-based heating, comprising a multi-deck oven body (1), a first deck oven (2), a controller (3), electric heaters (4), temperature sensors (5), a first deck oven door (6), and a power input (7), wherein the first deck oven (2) is disposed on the top portion of the multi-deck oven body (1). The apparatus can repeat the same operation simply by pressing one button, ensure consistent quality and appearance of baked food, and eliminate operations of turning and moving food during baking, so as to improve the quality of baked food and operational safety and reduce processing costs, and facilitates energy conservation and environmental protection.

(57) **摘要:** 一种多温区分部加热均匀控温多层电烤箱, 包括多层烤箱主体(1)、第一层烤箱(2)、控制器(3)、电加热器(4)、温度传感器(5)、第一层烤箱前门(6)、电源输入(7), 所述多层烤箱主体(1)上端设置有第一层烤箱(2)。该装置可多次重复一键式操作, 保证烘焙出的食品品质和外观一致, 免去烘焙过程中翻盘调转食品操作过程, 提高烘焙出的食品质量和操作过程安全性, 节能环保, 降低加工成本。

WO 2020/118993 A1

本国际公布：

— 包括国际检索报告(条约第21条(3))。

多温区分部加热均匀控温多层电烤箱

技术领域

[0001] 本实用新型属食品加工机械领域，具体涉及一种多温区分部加热均匀控温多层电烤箱。

背景技术

[0002] 目前,市面上食品烘焙大多采用平炉烤箱,由于这种烤炉的设计原理,使得烤炉内会有局部温差,食品上色会不均匀,所以往往会在烘烤过程中时进行翻盘的操作,使得食品上色均匀,特别是烤面包和烤蛋糕,最忌讳的一点就是在烘培的过程中随意的打开烤箱的门,只要门一打开,外面的冷空气就会伺机进入烤箱内部,本来设定好的温度也就无济于事了,内部进入冷空气后发起的面包或者蛋糕就会受冷而抽缩,但为了烘焙的食品受热一致色泽均匀,还必须翻盘调转食品,所以操作翻盘调转食品时动作必须快,还要小心热气烫伤,由于受操作者技能水平限制使得烘焙出的食品的品质不一,质量和安全难以得到保障。另外由于烘培的过程中打开烤箱的门热损失很大,浪费了大量电能,也增加了成本。

发明概述

技术问题

[0003] 本实用新型的目的是克服现有技术的不足,提供一种操作简单,烘焙一种食品一次设定好,可多次重复一键式操作,保证烘焙出的食品品质和外观一致,免去烘焙过程中翻盘调转食品操作过程,提高烘焙出的食品质量和操作过程安全,简化操作程序,降低操作人员的操作技能和劳动强度,节能环保,降低成本的多温区分部加热均匀控温多层电烤箱。

问题的解决方案

技术解决方案

[0004] 为了解决上术存在的技术问题,本实用新型采用下述技术方案:包括多层烤箱主体、第一层烤箱、控制器、电加热器、温度传感器、第一层烤箱前门、电源

输入，所述多层烤箱主体上端设置有第一层烤箱，所述第一层烤箱由烘烤区和控制区组成，所述烘烤区内层为食品级不锈钢钢板制成，所述第一层烤箱外层为装饰不锈钢板制成，包括烘烤区和控制区中间隔断，内外层中间均采用耐高温保温隔热材料填充，所述第一层烤箱烘烤区内上端和下端分别水平并列一定间隔距离均匀固定设置有多组电加热器，所述每一组电加热器中间水平固定设置有温度传感器，所述第一层烤箱控制区一侧设置有控制器，所述控制器通过导线分别与电加热器和温度传感器一端相连接，所述第一层烤箱前端设置有手动开或关的第一层烤箱前门，所述第一层烤箱前门设置有开门断电功能，所述多层烤箱主体下端一侧设置有电源输入。

[0005] 所述多层烤箱主体1由多层烤箱单元组成，所述每一层烤箱单元可分别控制设定加热时间和加热温度。

[0006] 所述控制器可分别设定每一组电加热器加热时间。

[0007] 所述控制器可分别设定每一组电加热器加热温度

发明的有益效果

有益效果

[0008] 由于采用上术技术方案，本实用新型的多温区分部加热均匀控温多层电烤箱具有这样的有益效果，即降低的操作人员的操作技能同时也减轻了工作人员的劳动强度，保证了烘焙出食品的品质基本一致，并提高了生产效率，减少了热损失提高了能源的利用率，减少废气的排放，减少了对环境的影响，节能环保。

对附图的简要说明

附图说明

[0009] 图1是本实用新型第一层烤箱部分剖开的结构示意图。

[0010] 图中：多层烤箱主体1、第一层烤箱2、控制器3、电加热器4、温度传感器5第一层烤箱前门6、电源输入7、导线8。

实施该发明的最佳实施例

本发明的最佳实施方式

[0011] 下面结合附图与具体实施方式对本实用新型作进一步详细描述：

- [0012] 所述多层烤箱主体1上端设置有第一层烤箱2，所述第一层烤箱2由烘烤区2-1和控制区2-2组成，所述烘烤区2-1内层为食品级不锈钢钢板制成，所述第一层烤箱2外层为装饰不锈钢板制成，包括烘烤区2-1和控制区2-2中间隔断，内外层中间均采用耐高温保温隔热材料填充，所述第一层烤箱2烘烤区2-1内上端和下端分别水平并列一定间隔距离均匀固定设置有多组电加热器4，所述每一组电加热器4中间水平固定设置有温度传感器5，所述第一层烤箱2控制区2-2一侧设置有控制器3，所述控制器3通过导线8分别与电加热器4和温度传感器5一端相连接，所述第一层烤箱2前端设置有手动开或关的第一层烤箱前门6，所述第一层烤箱前门6设置有开门断电功能，所述多层烤箱主体1下端一侧设置有电源输入7。
- [0013] 所述多层烤箱主体1由多层烤箱单元组成，所述每一层烤箱单元可分别控制设定加热时间和加热温度。
- [0014] 所述控制器3可分别设定每一组电加热器4加热时间。
- [0015] 所述控制器3可分别设定每一组电加热器4加热温度。
- [0016] 通常一组电加热器4和温度传感器5为一个加热区，可通过控制器3进行加热时间和加热温度的设定，每一个加热区的加热时间和加热温度都会不一样，例如靠近前门的加热区，加热时间和加热温度要比里边加热区的加热时间长加热温度高，因为靠近前门的地方热损失比较大，通过对每个加热区分别控制加热时间和加热温度来实现烤箱内加热温度的均恒，不同的食物烘焙时吸收热量也是不一样的，食物的厚薄也会引起加热温度偏差，这样都可以分别通过对多个加热区加热时间和加热温度的控制来实现均匀加热，由于对每一个加热区精准的加热时间和加热温度的设定，可实现一种需要烘焙的食品只需将食物放进去和最后烘焙完成取出的操作过程，烘焙过程中不需要开门，也不需要翻盘调转食物等操作，可大幅度提高所烘焙食品的品质，降低对操作人员操作技能的要求，减轻工作人员的劳动强度，提高了生产效率，减少热损失提高了能源的利用率，减少废气的排放，减少了对环境的影响。当一次性设定好同一种食品烘焙的加热程序后，可重复进行多次一键式操作烘焙，使每一次烘焙的食品品质保持一样，而多层烤箱的每一层可分别设定为不同烘焙食品的加热程序，可大批量加工生产出品质相同烘焙食品，降低对操作者技能要求，大幅度降低生产成

本，这对商业性生产加工十分重要。常规的烘焙过程中需要翻盘调转食物来保证烘焙食品受热均匀保证品质，要求动作必须快，还要小心热气烫伤，只有掌握一定的操作技能才能保证安全，由于采用本实用新型技术免去了上术操作过程，提高了生产加工过程的安全性。

[0017]

权利要求书

- [权利要求 1] 一种多温区分部加热均匀控温多层电烤箱，包括多层烤箱主体（1）、第一层烤箱（2）、控制器（3）、电加热器（4）、温度传感器（5）、第一层烤箱前门（6）、电源输入（7），其特征是，所述多层烤箱主体（1）上端设置有第一层烤箱（2），所述第一层烤箱（2）由烘烤区（2-1）和控制区（2-2）组成，所述烘烤区（2-1）内层为食品级不锈钢钢板制成，所述第一层烤箱（2）外层为装饰级不锈钢板制成，包括烘烤区（2-1）和控制区（2-2）中间隔断，内外层中间均采用耐高温保温隔热材料填充，所述第一层烤箱（2）烘烤区（2-1）内上端和下端分别水平并列一定间隔距离均匀固定设置有多组电加热器（4），所述每一组电加热器（4）中间水平固定设置有温度传感器（5），所述第一层烤箱（2）控制区（2-2）一侧设置有控制器（3），所述控制器（3）通过导线（8）分别与电加热器（4）和温度传感器（5）一端相连接，所述第一层烤箱（2）前端设置有手动开或关的第一层烤箱前门（6），所述第一层烤箱前门（6）设置有开门断电功能，所述多层烤箱主体（1）下端一侧设置有电源输入（7）。
- [权利要求 2] 根据权利要求1所述多温区分部加热均匀控温多层电烤箱，其特征是，所述多层烤箱主体（1）由多层烤箱单元组成，所述每一层烤箱单元可分别控制设定加热时间和加热温度。
- [权利要求 3] 根据权利要求1所述多温区分部加热均匀控温多层电烤箱，其特征是，所述控制器（3）可分别设定每一组电加热器（4）加热时间。
- [权利要求 4] 根据权利要求1所述多温区分部加热均匀控温多层电烤箱，其特征是，所述控制器（3）可分别设定每一组电加热器（4）加热温度。

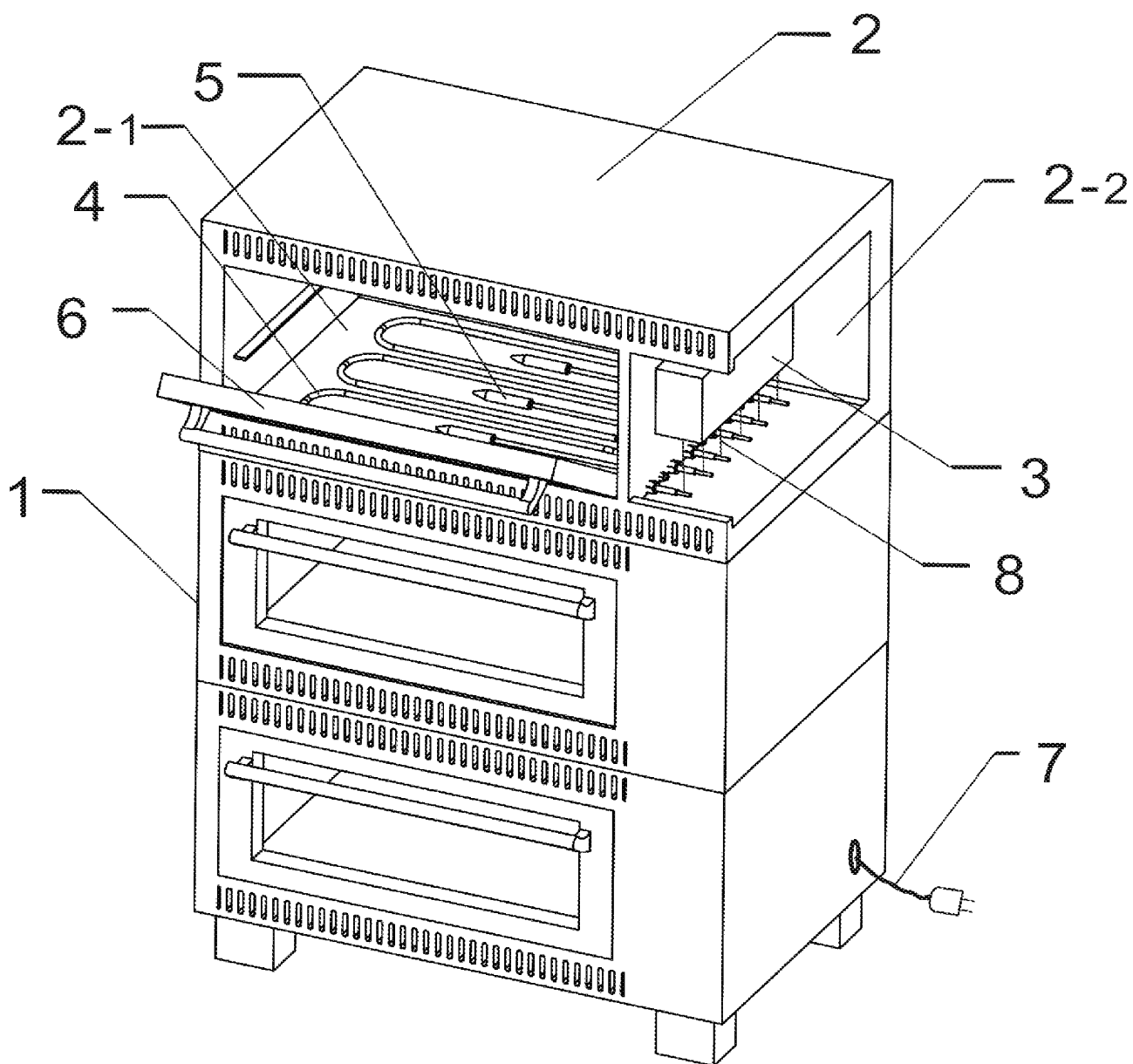


图1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/082829

A. CLASSIFICATION OF SUBJECT MATTER

A47J 37/06(2006.01)i

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)

A47J

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)

VEN; CNABS, CNTXT, CNKI: 烤箱, 温区, 温控, 传感器, oven, temp+, pickup, sensor

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 107595152 A (SHANGHAI CHUNMI ELECTRONIC TECHNOLOGY CO., LTD.) 19 January 2018 (2018-01-19) description, paragraphs [0010]-[0020]	1-4
A	CN 206007019 U (ZHEJIANG LANTE ELECTRICAL APPLIANCE CO., LTD.) 15 March 2017 (2017-03-15) entire document	1-4
A	CN 108814329 A (CHIZHOU DAHONG INFORMATION TECHNOLOGY CO., LTD.) 16 November 2018 (2018-11-16) entire document	1-4
A	CN 205758361 U (WANG, Baozhong) 07 December 2016 (2016-12-07) entire document	1-4
A	CN 202020314 U (QIU, Muzhen) 02 November 2011 (2011-11-02) entire document	1-4
A	JP 2013078286 A (HAMADA, Y.) 02 May 2013 (2013-05-02) entire document	1-4

☐ 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

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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

14 May 2019

Date of mailing of the international search report

24 May 2019

Name and mailing address of the ISA/CN

China National Intellectual Property Administration
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Facsimile No. (86-10)62019451

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/082829

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	107595152	A	19 January 2018	None	
CN	206007019	U	15 March 2017	None	
CN	108814329	A	16 November 2018	None	
CN	205758361	U	07 December 2016	None	
CN	202020314	U	02 November 2011	None	
JP	2013078286	A	02 May 2013	None	

A. 主题的分类 A47J 37/06 (2006.01) i 按照国际专利分类 (IPC) 或者同时按照国家分类和 IPC 两种分类		
B. 检索领域 检索的最低限度文献 (标明分类系统和分类号) A47J 包含在检索领域中的除最低限度文献以外的检索文献 在国际检索时查阅的电子数据库 (数据库的名称, 和使用的检索词 (如使用)) VEN; CNABS, CNTXT, CNKI: 烤箱, 温区, 温控, 传感器, oven, temp+, pickup, sensor		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
X	CN 107595152 A (上海纯米电子科技有限公司) 2018年 1月 19日 (2018 - 01 - 19) 说明书第[0010-0020]段	1-4
A	CN 206007019 U (浙江兰特电器有限公司) 2017年 3月 15日 (2017 - 03 - 15) 全文	1-4
A	CN 108814329 A (池州市达宏信息技术有限公司) 2018年 11月 16日 (2018 - 11 - 16) 全文	1-4
A	CN 205758361 U (王宝忠) 2016年 12月 7日 (2016 - 12 - 07) 全文	1-4
A	CN 202020314 U (邱木圳) 2011年 11月 2日 (2011 - 11 - 02) 全文	1-4
A	JP 2013078286 A (HAMADA YOSHIHISA) 2013年 5月 2日 (2013 - 05 - 02) 全文	1-4
☐ 其余文件在C栏的续页中列出。 ☒ 见同族专利附件。		
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(54) Title: STEAMING AND ROASTING COMBINATION MACHINE

(54) 发明名称: 蒸烤组合机

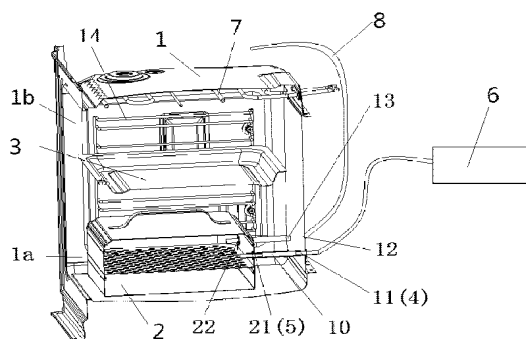


图 1

(57) Abstract: The present application provides a steaming and roasting combination machine. By setting a vessel connected to a steam generating device, the whole device can independently perform steaming work, meanwhile roasting work can be performed inside the combination machine. Through the above setting manner, two different food materials can be processed simultaneously in the steaming area (vessel) and the roasting area (roasting tray), therefore, the defect that the barbecue combination machine in the prior art can only perform simultaneous steaming and roasting work on one type of food material, resulting in lower working efficiency. Meanwhile, by setting a steam connection pipe, steam can be injected into the vessel as much as possible, therefore, it is beneficial to improve the efficiency of using steam, and the stability of the work of the vessel can be ensured at the same time.

(57) 摘要: 本申请提供一种蒸烤组合机, 通过设置器皿, 同时器皿连接蒸汽发生装置, 使得整个装置可以独立进行蒸制工作, 同时在组合机内部可以进行烤制工作。通过上述的设置方式, 可以在蒸制区 (器皿) 和烤制区 (烤盘) 同时对两种不同的食材进行同时加工, 从而有效地解决了现有技术中的烧烤组合机只能在一种食材上进行同时蒸制和烤制的工作、导致工作效率较低的缺陷。同时, 通过设置蒸汽连接管, 可以将蒸汽尽可能全部打入到器皿内部, 从而有利于提高蒸汽的使用效率, 同时可以确保器皿工作的稳定性。

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本国际公布:

— 包括国际检索报告 (条约第21条(3))。

蒸烤组合机

相关申请

本申请要求 2018 年 12 月 18 日申请的，申请号为 201811551096.5，名称为“一种蒸烤组合机”的中国专利申请的优先权，在此将其全文引入作为参考。

技术领域

本申请涉及厨房电器技术领域，具体涉及一种蒸烤组合机。

背景技术

随着生活水平的提高，许多人对家庭用品的要求也在不断提高，因此需要提供一种家用电器以集成多种不同产品的功能。

现有技术中公开了一种食品蒸烤装置，包括烤锅，以及设置在烤锅内部的蒸汽喷头，蒸汽喷头的下方设置有蒸汽发生装置，在使用过程中，烤锅和蒸汽喷头同时启动，对位于烤锅内部的食材同时进行烤制和蒸制。但是，上述的烤制和蒸制动作同时作用在同一食材上，整个装置的功能受限。

发明内容

因此，本申请要解决的技术问题在于克服现有技术中的食品蒸烤装置功能受限的缺陷。

为此，本申请提供一种蒸烤组合机，包括：壳体，所述壳体上设置有供蒸汽流入的蒸汽流入孔，所述蒸汽流入孔上设置有第一蒸汽接头；器皿，设置在所述壳体内部或外部，所述器皿的侧壁上设置有供蒸汽进入的进汽孔，所述进汽孔与所述蒸汽流入孔相对设置，所述进汽孔上设置有第二蒸汽接头；所述第一蒸汽接头与所述第二蒸汽接头之间连接有蒸汽连接管；烤盘，设置在所述壳体内部，所述壳体内与所述烤盘相对应的位置设置有发热管，用以对位于所述烤盘内部的食材进行烤制。

壳体的内壁上设置有烤盘架，所述烤盘安装在所述烤盘架上；所述器皿设置在所述烤盘下方。

在一实施例中，在壳体上设有供蒸汽流出的蒸汽流出孔。

在一实施例中，在蒸汽流出孔上设置有排汽装置，当所述器皿内部压力大于设定压力

时，所述排汽装置打开。

在一实施例中，器皿的侧壁上设有供蒸汽流出的出汽孔。

蒸汽流出孔上连接有排气管，所述排汽装置通过所述蒸汽流出孔与所述排气管相连接。

器皿的侧壁上设有供蒸汽流出的出汽孔，所述出汽孔上设置有所述第二蒸汽接头，所述蒸汽流出孔设置有所述第一蒸汽接头，所述第一蒸汽接头与所述第二蒸汽接头之间设置有所述蒸汽连接管。

第一蒸汽接头和/或所述第二蒸汽接头焊接在所述器皿上。

在一实施例中，器皿包括：底座，其上设置有所述进汽孔和所述出汽孔；以及，盖子，扣设在所述底座上，与所述底座形成封闭空间。

器皿内部设置有蒸盘，所述蒸盘用以放置食材。

器皿与所述烤盘相对应的部位、和/或所述烤盘与所述器皿相对应的部位设置有隔热层，用以防止所述器皿和所述烤盘之间发生热交换。

器皿与所述烤盘之间设置有隔热板。

蒸烤组合机还包括蒸汽发生装置，所述蒸汽发生装置通过软管连接所述蒸汽流入孔。

本申请技术方案，具有如下优点：

1.本申请提供的蒸烤组合机，壳体上设置有供蒸汽流入的蒸汽流入孔，所述蒸汽流入孔上设置有第一蒸汽接头；器皿设置在所述壳体内部或外部，所述器皿的侧壁上上设置有供蒸汽进入的进汽孔，所述进汽孔与所述蒸汽流入孔相对设置，所述进汽孔上设置有第二蒸汽接头；所述第一蒸汽接头与所述第二蒸汽接头之间连接有蒸汽连接管；烤盘，设置在所述壳体内部，所述壳体内与所述烤盘相对应的位置设置有发热管，用以对位于所述烤盘内部的食材进行烤制。

本申请中，通过设置器皿，同时器皿连接蒸汽发生装置，使得整个装置可以独立进行蒸制工作，同时在组合机内部可以进行烤制工作。通过上述的设置方式，可以在蒸制区（器皿）和烤制区（烤盘）同时对两种不同的食材进行同时加工，从而有效地解决了现有技术中的烧烤组合机只能在一种食材上进行同时蒸制和烤制的工作、导致工作效率较低的缺陷。

同时，通过设置蒸汽连接管，可以将蒸汽尽可能全部打入到器皿内部，从而有利于提高蒸汽的使用效率，同时可以确保器皿工作的稳定性。

2.本申请提供的蒸烤组合机，所述壳体上设有供蒸汽流出的蒸汽流出孔，所述器皿上设有供蒸汽流出的出汽孔，所述出汽孔与所述蒸汽流出孔相对应，且所述出汽孔上设置有

蒸汽排气管。

器皿上设置有供蒸汽进入的进汽孔，以及供蒸汽流出的出汽孔，通过设置出汽孔，可以防止内部器皿内部压力过大，进而影响器皿的正常工作。

3.本申请提供的蒸烤组合机，器皿与所述烤盘相对应的部位、和/或所述烤盘与所述器皿相对应的部位设置有隔热层，用以防止所述器皿和所述烤盘之间发生热交换。

当器皿与烤盘之间通过绝热层进行分隔时，各自区域内部的热量不会发生相互影响，从而确保烤盘和器皿之间的烹饪工作的独立性，有利于确保蒸制或烤制得到的食品的口感。

附图说明

为了更清楚地说明本申请具体实施方式或现有技术中的技术方案，下面将对具体实施方式或现有技术描述中所需要使用的附图作简单地介绍，显而易见地，下面描述中的附图是本申请的一些实施方式，对于本领域普通技术人员来讲，在不付出创造性劳动的前提下，还可以根据这些附图获得其他的附图。

图1为本申请实施例1中提供的所述蒸烤组合机的结构示意图；

图2为本申请提供的第一蒸汽接头、第二蒸汽接头和蒸汽连接管之间的连接示意图；

图3为本申请实施例1中提供的所述蒸烤组合机中所述器皿的结构示意图；

图4为本申请实施例1中提供的所述蒸烤组合机中篦子与蒸盘分体设置的结构示意图；

图5为本申请实施例1中提供的所述壳体的内部结构示意图；

图6为本申请实施例2中提供的蒸烤组合机中所述器皿位于外侧的示意图。

附图标记说明：

1-壳体；1a-蒸制区；1b-烧烤区；11-蒸汽流入孔；12-蒸汽流出孔；2-器皿；21-进汽孔；22-出汽孔；23-底座；24-盖子；25-蒸盘；251-篦子；3-烤盘；4-第一蒸汽接头；5-第二蒸汽接头；6-蒸汽发生装置；7-发热管；8-排气管；10-蒸汽连接管；13-排汽装置；14-烤盘架。

具体实施方式

下面将结合附图对本申请的技术方案进行清楚、完整地描述，显然，所描述的实施例是本申请一部分实施例，而不是全部的实施例。基于本申请中的实施例，本领域普通技术人员在没有做出创造性劳动前提下所获得的所有其他实施例，都属于本申请保护的范围。

在本申请的描述中,需要说明的是,术语“中心”、“上”、“下”、“左”、“右”、“竖直”、“水平”、“内”、“外”等指示的方位或位置关系为基于附图所示的方位或位置关系,仅是为了便于描述本申请和简化描述,而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作,因此不能理解为对本申请的限制。此外,术语“第一”、“第二”、“第三”仅用于描述目的,而不能理解为指示或暗示相对重要性。

在本申请的描述中,需要说明的是,除非另有明确的规定和限定,术语“安装”、“相连”、“连接”应做广义理解,例如,可以是固定连接,也可以是可拆卸连接,或一体地连接;可以是机械连接,也可以是电连接;可以是直接相连,也可以通过中间媒介间接相连,可以是两个元件内部的连通。对于本领域的普通技术人员而言,可以根据具体情况理解上述术语在本申请中的具体含义。

此外,下面所描述的本申请不同实施方式中所涉及的技术特征只要彼此之间未构成冲突就可以相互结合。

实施例 1

本实施例提供一种蒸烤组合机,如图 1 和图 5 所示,包括:壳体 1,其内部设置有烧烤区 1b 和蒸制区 1a,所述壳体的侧壁上设置有供蒸汽流入的蒸汽流入孔和供容纳腔内蒸汽流出的蒸汽流出孔 12;器皿 2 设置在所述蒸制区内部,所述器皿上设置有供蒸汽进入的进汽孔 21;烤盘 3 设置在所述烧烤区 1b 内部,所述壳体内与所述烤盘相对应的位置设置有发热管 7,用以对位于所述烤盘内部的食材进行烤制。如图 1 和图 2 所示,在蒸汽流入孔 11 上设置有第一蒸汽接头 4;在进汽孔 21 上设置有第二蒸汽接头 5;在第一蒸汽接头 4 与所述第二蒸汽接头 5 之间连接有蒸汽连接管 10。

如图 2 所示,第一蒸汽接头 4 和第二蒸汽接头 5 自身呈空心设置,同时第一蒸汽接头和第二蒸汽接头均采用硬性材质制成,确保在与蒸汽连接管 10 的连接过程中不会发生变形。

同时,如图 1 所示,为了实现器皿内部的压力平衡,在器皿 2 上设置有供蒸汽流出的出汽孔 22,蒸汽通过出汽孔 22 流出。

进一步地,为了更好地控制蒸汽的流出量,在出汽孔 22 上设置有排汽装置 13。当器皿内部的蒸汽量达到一定值后才开启排气装置 13。

本实施例中,在壳体上同时设有供蒸汽流出的蒸汽流出孔 12,蒸汽流出孔 12 与出汽孔 22 之间相对设置。通过排气装置 13 排出的蒸汽通过蒸汽流出孔 12 排出至外界大气中。本实施例中,如图 1 所示,在出汽孔 22 上设置有排气管 8,通过排气管 8 将蒸汽排出至外界。

同时,如图1所示,本实施例中,为了放置烤盘,在壳体内壁上设置有烤盘架14,通过烤盘架可以在壳体内部竖直方向设置多个不同的烤盘。

本实施例中,通过设置器皿2,将容纳腔分割成蒸制区1a和烧烤区1b,蒸制区1a和烧烤区1b独立工作,在蒸制区1a内部进行蒸制工作,在烧烤区1b进行烤制工作。通过上述的设置方式,可以在蒸制区1a(器皿2)和烤制区同时对两种不同的食材进行同时加工,从而有效地解决了现有技术中的烧烤组合机只能在一种食材上进行同时蒸制和烤制的工作、导致工作效率较低的缺陷。

本实施例中,所述蒸汽进气口和所述蒸汽出气口设置在所述壳体的侧壁上,如图1所示,蒸汽进气口和所述蒸汽出气口只要设置在侧壁上即可,并不限于图1中显示的位置。

本实施例中提供的器皿2的结构如图3所示,包括:底座23,其上设置有所述进汽孔21和所述出汽孔22,底座23自身能够盛接冷凝水;以及盖子24,扣设在所述底座23上,与所述底座23形成封闭空间,同时在器皿2内部设置有蒸盘25,所述蒸盘25用以放置食材。当盖子24盖设在底座23上后,可以形成一个密闭的烹饪空间。本实施例中,底座23设置在蒸盘25的下方,能够更好地盛接从蒸盘25中流下的冷凝水。

在图3中提供的器皿中,蒸盘25与底座23之间分体设置。作为可变型的实施方式,如图4所示,而在图中提供的器皿中,蒸盘25与底座23之间一体成型设置。同时,位于蒸盘25内部的篦子251自身既可以固定在蒸盘25内部,也可以与蒸盘25分体存在,该种设置方式详见图4。

本实施例中,在器皿2与烤盘3相对应的部位或所述烤盘3与所述器皿2相对应的部位设置有隔热层(图中未示出),用以防止所述器皿2和所述烤盘3之间发生热交换。具体地,隔热层既可以设置在烤盘3的底部,也可以设置在器皿2的顶部,可以二者选其一,也可以同时兼顾,只要能够实现隔热的功能即可。

作为可变型的实施方式,可以直接在器皿2与烤盘3之间设置有隔热板(图中未示出),在隔热板上设置隔热材料,从而起到隔绝热量的作用。

本实施例中,隔热材料自身采用常见的隔热材料制成,因此在本实施例中不进行过多描述。

如图1所示,本实施例中提供的蒸烤组合机还包括蒸汽发生装置6,所述蒸汽发生装置6通过软管连接所述蒸汽流入孔11。蒸汽发生装置6与蒸汽流入孔11之间通过软管进行连接,软管与密封胶圈相连接。

在用户使用过程中,首先将器皿2放入壳体1内部,然后将烤盘3放在器皿2的顶部,然后分别启动蒸汽发生装置6和发热管7,在器皿2内部对其内部的第一种食材进行蒸制,

在烤盘上对位于其上的第二种食材进行烤制。两种食材的烹饪工作相互独立，互不干涉。

本实施例中，所有管路均采用高温硅胶管制成。

实施例 2

本实施例是在实施例 1 的基础上做出的，本实施例中，如图 6 所示，将器皿 2 直接放置与壳体 1 的外侧，通过图 6 中的内容可知，在壳体 1 的前端位置设置有第一蒸汽接头 4，蒸汽连接管 10 连接在所述器皿 2 的第二蒸汽接头 5 上。同时，在器皿 2 上设置有出汽孔 22，其上连接有排汽装置 13。

显然，上述实施例仅仅是为清楚地说明所作的举例，而并非对实施方式的限定。对于所属领域的普通技术人员来说，在上述说明的基础上还可以做出其它不同形式的变化或变动。这里无需也无法对所有的实施方式予以穷举。而由此所引伸出的显而易见的变化或变动仍处于本申请创造的保护范围之内。

权利要求

1.一种蒸烤组合机，其特征在于，包括：

壳体（1），所述壳体（1）上设置有供蒸汽流入的蒸汽流入孔（11），所述蒸汽流入孔（11）上设置有第一蒸汽接头（4）；

器皿（2），设置在所述壳体（1）内部或外部，所述器皿（2）的侧壁上上设置有供蒸汽进入的进汽孔（21），所述进汽孔（21）与所述蒸汽流入孔（11）相对设置，所述进汽孔（21）上设置有第二蒸汽接头（5）；

所述第一蒸汽接头（4）与所述第二蒸汽接头（5）之间连接有蒸汽连接管（10）；

烤盘（3），设置在所述壳体（1）内部，所述壳体（1）内与所述烤盘（3）相对应的位置设置有发热管（7），用以对位于所述烤盘（3）内部的食材进行烤制。

2.根据权利要求1所述的蒸烤组合机，其特征在于，所述壳体（1）的内壁上设置有烤盘架，所述烤盘（3）安装在所述烤盘架上；所述器皿（2）设置在所述烤盘（3）下方。

3.根据权利要求2所述的蒸烤组合机，其特征在于，所述壳体（1）上设有供蒸汽流出的蒸汽流出孔（12）。

4.根据权利要求3所述的蒸烤组合机，其特征在于，所述蒸汽流出孔（12）上设置有排汽装置，当所述器皿（2）内部压力大于设定压力时，所述排汽装置打开。

5.根据权利要求3所述的蒸烤组合机，其特征在于，所述器皿（2）的侧壁上设有供蒸汽流出的出汽孔（22）。

6.根据权利要求5所述的蒸烤组合机，其特征在于，所述蒸汽流出孔（12）上连接有排气管（8），所述排汽装置通过所述蒸汽流出孔（12）与所述排气管（8）相连接。

7.根据权利要求3所述的蒸烤组合机，其特征在于，所述器皿（2）的侧壁上设有供蒸汽流出的出汽孔（22），所述出汽孔（22）上设置有所述第二蒸汽接头，所述蒸汽流出孔（12）设置有所述第一蒸汽接头，所述第一蒸汽接头与所述第二蒸汽接头之间设置有所述蒸汽连接管。

8.根据权利要求1或7所述的蒸烤组合机，其特征在于，所述第一蒸汽接头和/或所述第二蒸汽接头焊接在所述器皿上。

9.根据权利要求7所述的蒸烤组合机，其特征在于，所述器皿（2）包括：

底座（23），其上设置有所述进汽孔（21）和所述出汽孔（22）；以及，

盖子（24），扣设在所述底座（23）上，与所述底座（23）形成封闭空间。

10.根据权利要求9所述的蒸烤组合机，其特征在于，所述器皿（2）内部设置有蒸盘

(25)，所述蒸盘（25）用以放置食材。

11.根据权利要求 10 所述的蒸烤组合机，其特征在于，所述器皿（2）与所述烤盘（3）相对应的部位、和/或所述烤盘（3）与所述器皿（2）相对应的部位设置有隔热层，用以防止所述器皿（2）和所述烤盘（3）之间发生热交换。

12.根据权利要求 11 所述的蒸烤组合机，其特征在于，所述器皿（2）与所述烤盘（3）之间设置有隔热板。

13.根据权利要求 1 所述的蒸烤组合机，其特征在于，还包括蒸汽发生装置（6），所述蒸汽发生装置（6）通过软管连接所述蒸汽流入孔（11）。

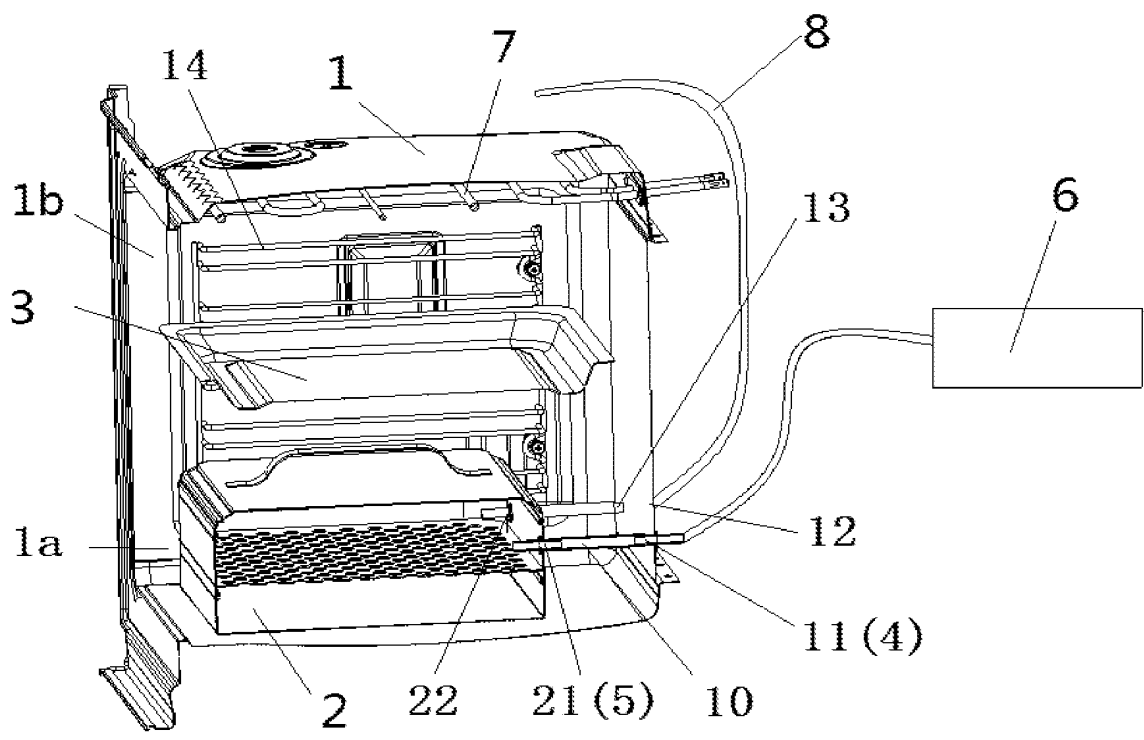


图 1

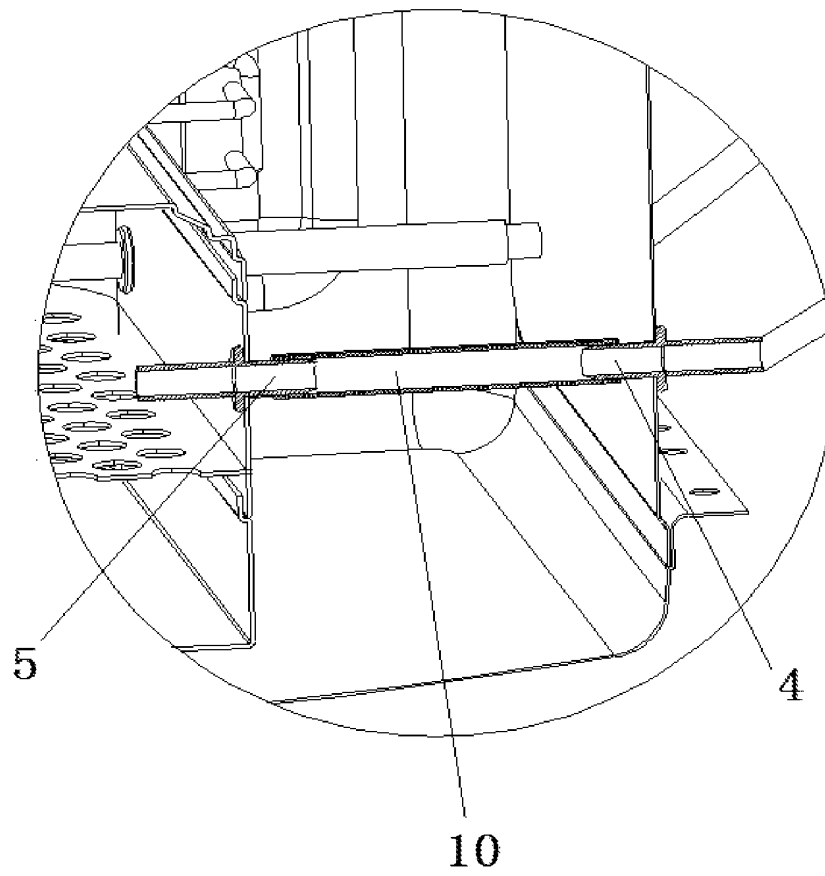


图 2

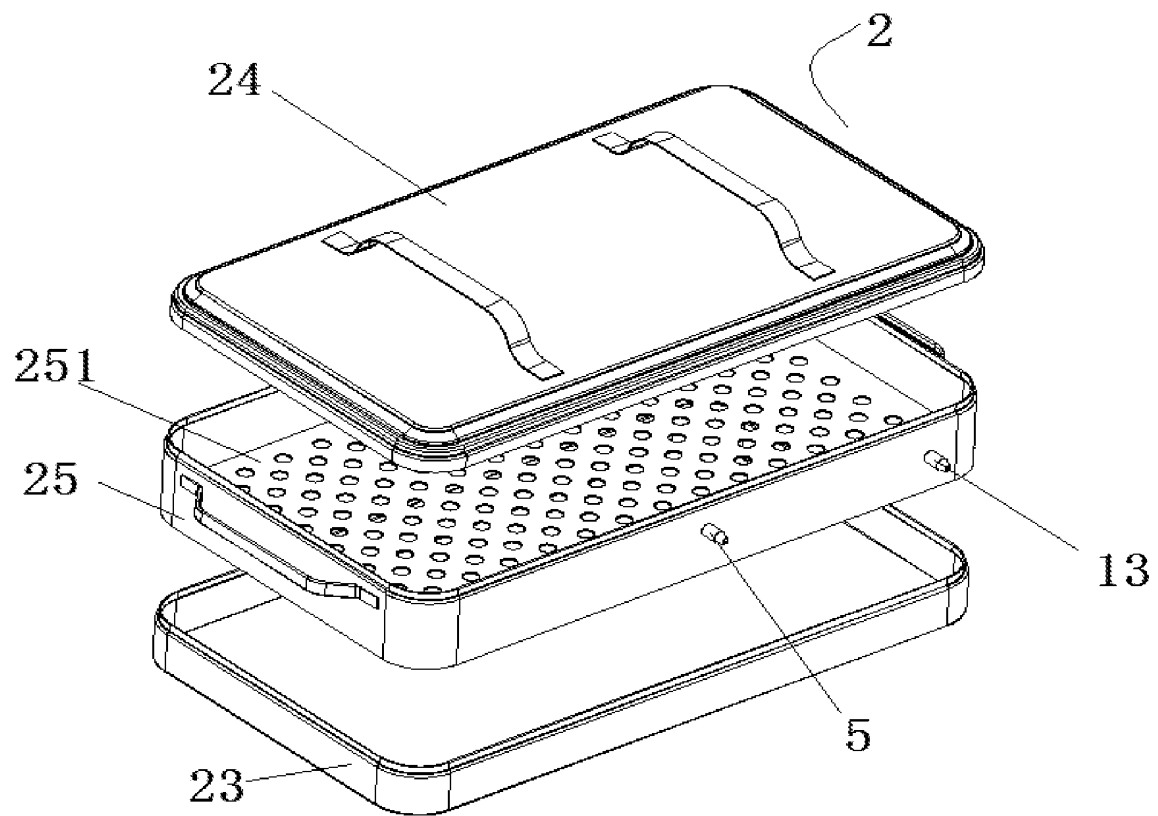


图 3

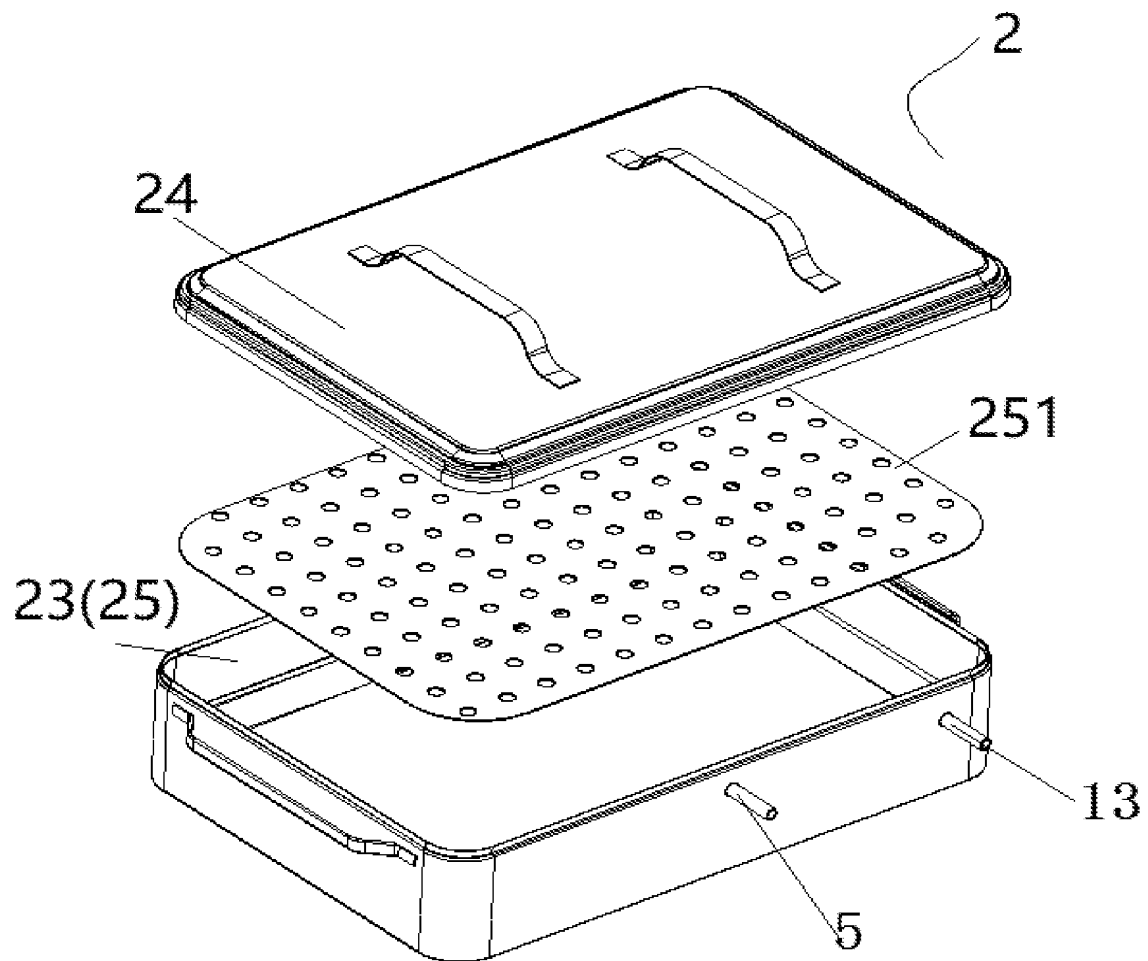


图 4

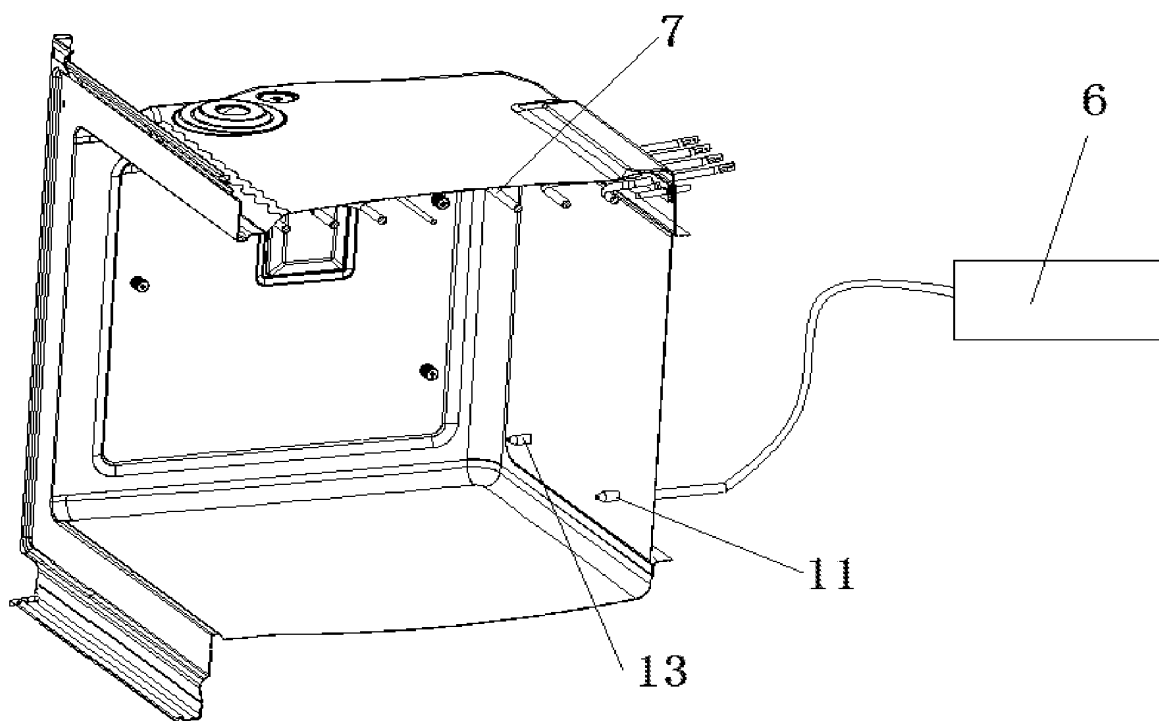


图 5

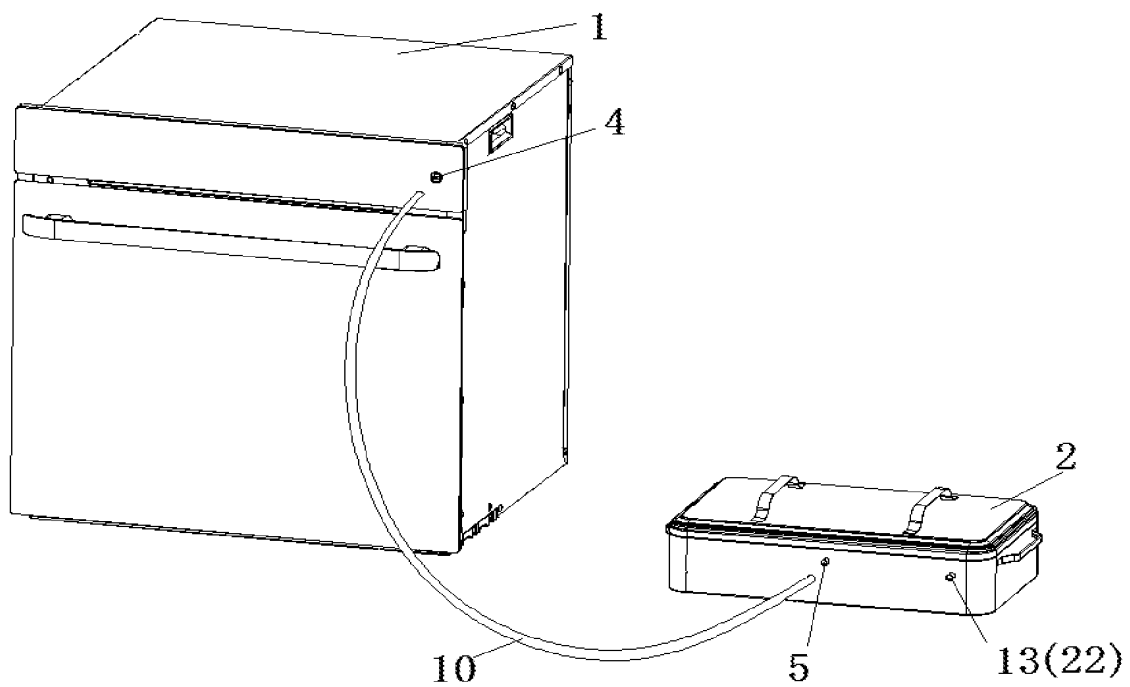


图 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/099875

A. CLASSIFICATION OF SUBJECT MATTER

A47J 27/04(2006.01)i; A47J 36/38(2006.01)i; A47J 37/06(2006.01)i

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)

A47J

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)

CNABS; CNTXT; CNKI; VEN; USTXT; WOTXT; EPTXT: 蒸, 烤, 烤箱, 组合, 一体, 二合一, 二和一, 内, 外, 取出, 蒸汽, 蒸气, 管, 孔, 压力, 隔热, steam+, bak+, combine?, inside, outside, out, pipe, hole, pressure, heat, insulat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 109512273 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 March 2019 (2019-03-26) description, paragraphs [0005]-[0057], and figures 1-6	1-13
Y	CN 201046071 Y (HUANG, Chaolong) 16 April 2008 (2008-04-16) description, page 1, line 14 to page 4, line 10, and figures 1-4	1-13
Y	CN 206338780 U (GUANGDONG XINBAO ELECTRICAL APPLIANCES HOLDINGS CO., LTD.) 18 July 2017 (2017-07-18) description, paragraphs [0029]-[0035], and figures 1-4	1-13
A	CN 201119382 Y (HUANG, Chaolong) 24 September 2008 (2008-09-24) entire document	1-13
A	CN 102549337 A (SHARP CORPORATION) 04 July 2012 (2012-07-04) entire document	1-13

☐ 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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“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

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“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

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Date of mailing of the international search report

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Name and mailing address of the ISA/CN

China National Intellectual Property Administration
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Facsimile No. (86-10)62019451

Authorized officer

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/099875

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	109512273	A	26 March 2019	None			
CN	201046071	Y	16 April 2008	None			
CN	206338780	U	18 July 2017	None			
CN	201119382	Y	24 September 2008	None			
CN	102549337	A	04 July 2012	WO	2011043468	A1	14 April 2011
				US	8850968	B2	07 October 2014
				JP	2011080712	A	21 April 2011
				US	2012199015	A1	09 August 2012
				JP	4707758	B2	22 June 2011
				CN	102549337	B	21 January 2015

A. 主题的分类 A47J 27/04(2006.01)i; A47J 36/38(2006.01)i; A47J 37/06(2006.01)i 按照国际专利分类(IPC)或者同时按照国家分类和IPC两种分类		
B. 检索领域 检索的最低限度文献(标明分类系统和分类号) A47J 包含在检索领域中的除最低限度文献以外的检索文献 在国际检索时查阅的电子数据库(数据库的名称, 和使用的检索词(如使用)) CNABS;CNTXT;CNKI;VEN;USTXT;WOTXT;EPTXT:蒸, 烤, 烤箱, 组合, 一体, 二合一, 二和一, 内, 外, 取出, 蒸汽, 蒸气, 管, 孔, 压力, 隔热, steam+, bak+, combine?, inside, outside, out, pipe, hole, pressure, heat, insulat+		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
PX	CN 109512273 A (珠海格力电器股份有限公司) 2019年 3月 26日 (2019 - 03 - 26) 说明书第[0005]-[0057]段, 附图1-6	1-13
Y	CN 201046071 Y (黄朝龙) 2008年 4月 16日 (2008 - 04 - 16) 说明书第1页第14行-第4页第10行, 附图1-4	1-13
Y	CN 206338780 U (广东新宝电器股份有限公司) 2017年 7月 18日 (2017 - 07 - 18) 说明书第[0029]-[0035]段, 附图1-4	1-13
A	CN 201119382 Y (黄朝龙) 2008年 9月 24日 (2008 - 09 - 24) 全文	1-13
A	CN 102549337 A (夏普株式会社) 2012年 7月 4日 (2012 - 07 - 04) 全文	1-13
☐ 其余文件在C栏的续页中列出。 ☒ 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件(如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件 “T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件		
国际检索实际完成的日期 2019年 9月 27日		国际检索报告邮寄日期 2019年 10月 29日
ISA/CN的名称和邮寄地址 中国国家知识产权局 (ISA/CN) 中国北京市海淀区蓟门桥西土城路6号 100088 传真号 (86-10)62019451		受权官员 密雅荣 电话号码 86-(0512)-88997315

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2019/099875

检索报告引用的专利文件			公布日 (年/月/日)	同族专利			公布日 (年/月/日)
CN	109512273	A	2019年 3月 26日	无			
CN	201046071	Y	2008年 4月 16日	无			
CN	206338780	U	2017年 7月 18日	无			
CN	201119382	Y	2008年 9月 24日	无			
CN	102549337	A	2012年 7月 4日	WO	2011043468	A1	2011年 4月 14日
				US	8850968	B2	2014年 10月 7日
				JP	2011080712	A	2011年 4月 21日
				US	2012199015	A1	2012年 8月 9日
				JP	4707758	B2	2011年 6月 22日
				CN	102549337	B	2015年 1月 21日



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(21) International Application Number:
PCT/EP2020/050474

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10 January 2020 (10.01.2020)

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STANDARDS**; High Tech Campus 5, 5656 AE Eindhoven
(NL).

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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, JO, 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, ST, SV, SY, TH, TJ, TM, TN, TR,
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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).

Declarations under Rule 4.17:

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

Published:

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

(54) Title: A COOKING APPARATUS

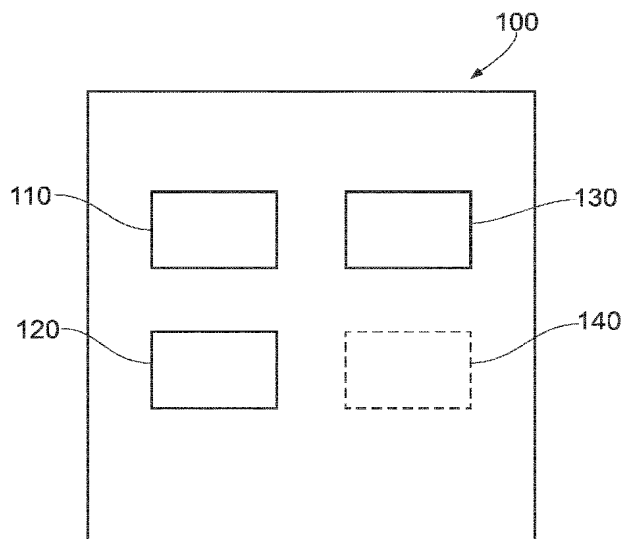


FIG. 1

(57) **Abstract:** A cooking apparatus (100) comprising: a housing (110); a cooking compartment (120) arranged at the housing, the cooking compartment being configured to form a first enclosed space in which food item can be received; a heating unit (130) arranged inside a second enclosed space in the housing, wherein the cooking compartment comprises an air inlet through which air can enter from a side of the cooking compartment, and an air outlet through which air can exit from an opposite side of the cooking compartment, and wherein the air inlet and the air outlet are connected to the second enclosed space such that air heated by the heating unit can circulate between the second enclosed space and the cooking compartment.

A COOKING APPARATUS

FIELD OF THE INVENTION

The present disclosure relates to a cooking apparatus, and in particular a cooking apparatus having both convection heating and steam cooking functionalities.

5 BACKGROUND OF THE INVENTION

Steam cooking apparatus, such as steam ovens, have been increasingly popular because of their ability to retain moisture and flavor in foods compared to conventional ovens and microwave ovens. It is much easier to avoid problems such as overcooking, drying, and shrinkage of food using steam cooking. Moreover, nutrients such as vitamins and minerals
10 are less prone to degradation when foods are cooked with steam, compared to many other cooking methods. However, currently available steam ovens, like normal convection ovens, are typically big and expensive. Moreover, typical configurations of steam ovens make them difficult to clean.

15 SUMMARY OF THE INVENTION

There are a number of disadvantages associated with the currently available cooking apparatuses that are capable of convection heating and/or steam cooking. For example, as mentioned above, currently available steam ovens typically have a large size and are expensive to manufacture. In addition, current available cooking ovens have
20 configurations that make them difficult to be cleaned thoroughly.

To better address one or more of the concerns mentioned earlier, in a first aspect, there is provided a cooking apparatus. The cooking apparatus comprises a housing; a cooking compartment arranged at the housing, the cooking compartment being configured to form a first enclosed space in which food item can be received; a heating unit arranged inside
25 a second enclosed space in the housing, wherein the cooking compartment comprises an air inlet through which air can enter from a side of the cooking compartment, and an air outlet through which air can exit from an opposite side of the cooking compartment, and wherein the air inlet and the air outlet are connected to the second enclosed space such that air heated

by the heating unit can circulate between the second enclosed space and the cooking compartment.

In some embodiments, the cooking apparatus according may further comprise a fan configured to generate an air flow at the second enclosed space so as to facilitate the air flow circulation between the second enclosed space and the cooking compartment.

In some embodiments, the cooking compartment may comprise: a receptacle having a top opening; and a covering element configured to be coupled to the receptacle to cover the top opening of the receptacle so as to form the first enclosed space. In these embodiments, the air inlet and the air outlet may be arranged at opposite sides of the receptacle.

In some embodiments, the cooking apparatus may further comprise a cooking compartment sealing unit arranged at the receptacle and/or the covering element. In these embodiments, the cooking compartment sealing unit may be configured form a seal between the receptacle and the covering element when the covering element is coupled to the receptacle.

In some embodiments, when the covering element is coupled to the receptacle, a first gap and a second gap may be formed between the covering element and the receptacle. In these embodiments, when the cooking compartment is located at the housing, the first gap may form the air inlet and the second gap may form the air outlet.

In some embodiments, the covering element may have a dome shape. In some embodiments, the covering element may be at least partially transparent.

In some embodiments, the cooking apparatus may further comprise a water reservoir configured to store water, the water reservoir being connected to the heating unit such that water can be delivered from the water reservoir to the heating unit for steam generation. In these embodiments, the cooking apparatus may further comprise a water pump configured to pump water from the water reservoir to the heating unit.

In some embodiments, the cooking compartment may be removable from the housing, and the second enclosed space may be formed when the cooking compartment is located at the housing.

In some embodiments, the cooking apparatus may further comprise a housing sealing unit configured to form a seal between the cooking compartment and the housing when the cooking compartment is located in the housing.

In some embodiments, the cooking compartment may further comprise one or more handles.

In some embodiments, the heating unit may comprise a heating plate.

In some embodiments, the heating unit may comprise a tubular heater, and in these embodiments, the cooking apparatus may further comprise an upper plate arranged in the second enclosed space above the tubular heater, and a lower plate arranged in the second enclosed space between the tubular heater and a bottom of the housing.

According to the aspects and embodiments described above, the limitations of existing techniques are addressed. In particular, the above-described aspects and embodiments provide a cooking apparatus that is compact and cheap to manufacture. There is thus provided an improved cooking apparatus. These and other aspects of the disclosure will be apparent from and elucidated with reference to the embodiment(s) described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the embodiments, and to show more clearly how they may be carried into effect, reference will now be made, by way of example only, to the accompanying drawings, in which:

Fig. 1 is a block diagram of a cooking apparatus according to an embodiment;

Fig. 2A is an exploded view diagram of a cooking apparatus according to another embodiment;

Fig. 2B is a cross-sectional view diagram of the cooking apparatus of Fig. 2A;

Fig. 3 is a cross-sectional view diagram of a cooking apparatus according to another embodiment;

Fig. 4 is a cross-sectional view diagram of a cooking apparatus according to another embodiment;

Fig. 5 is a cross-sectional view diagram of a cooking apparatus according to another embodiment; and

Fig. 6 is a cross-sectional view diagram of a cooking apparatus according to another embodiment.

DETAILED DESCRIPTION OF EMBODIMENTS

As noted above, there is provided a cooking apparatus which addresses the existing problems.

Fig. 1 is a block diagram of a cooking apparatus 100 according to an embodiment. The cooking apparatus 100 can include at least one of a convection heating function and a steam cooking function. Therefore, in some embodiments, the cooking

apparatus 100 may be a combined convection and steam oven. The cooking apparatus 100 comprises a housing 110, a cooking compartment 120, a heating unit 130, and a fan 140. The cooking compartment 120 is arranged at the housing 110, and it is configured to form a first enclosed space in which food item can be received. The heating unit 130 is arranged inside a
5 second enclosed space in the housing 110.

In addition, the cooking compartment 120 comprises an air inlet through which air can enter from a side of the cooking compartment 120, and an air outlet through which air can exit from an opposite side of the cooking compartment 120. The air inlet and the air outlet are connected to the second enclosed space where the heating unit 130 is
10 located. In this way, the air heated by the heating unit 130 can circulate between the second enclosed space and the cooking compartment 120. Moreover, the fan 140 is configured to generate an air flow at the second enclosed space so as to facilitate the air flow circulation between the second enclosed space and the cooking compartment 120.

The cooking compartment 120 may be removable from the housing 110 in
15 some embodiments. In this case, the second enclosed space may be formed when the cooking compartment 120 is located at the housing 110. A housing sealing unit may be provided to form a seal between the cooking compartment 120 and the housing 110 when the cooking compartment 120 is located at the housing 110. In addition, in some embodiments, the cooking compartment 120 may further comprise one or more handles. The one or more
20 handles allow easy removal of the cooking compartment 120 from the housing 110.

The cooking compartment 120 may comprise a receptacle (e.g. a food tray) having a top opening and a covering element (e.g. a lid) configured to be coupled to the receptacle to cover the top opening of the receptacle so as to form the first enclosed space. In these embodiments, the air inlet and the air outlet may be arranged at opposite sides of the
25 receptacle. The covering element may have a dome shape so as to allow accommodation of larger-sized food items in the cooking compartment 120. Also, the covering element may be at least partially transparent to allow a user to easily view a cooking process of the food items received in the cooking compartment 120.

In some embodiments, when the covering element is coupled to the receptacle,
30 a first gap and a second gap may be formed between the covering element and the receptacle. In these embodiments, when the cooking compartment 120 is located at the housing 110, the first gap may form the air inlet and the second gap may form the air outlet.

Furthermore, a cooking compartment sealing unit may be provided to form a seal between the receptacle and the covering element when the covering element is coupled

to the receptacle. The cooking compartment sealing unit may be arranged at the receptacle and/or the covering element to achieve the sealing effect.

Although not shown in the drawing, the cooking apparatus 100 may further comprise a water reservoir configured to store water. In these embodiments, the water reservoir may be connected to the heating unit 130 such that water can be delivered from the water reservoir to the heating unit 130 for steam generation. The generated steam can then also be circulated between the second enclosed space and the cooking compartment (e.g. along the air flow generated by the fan 140). Moreover, although not shown in the drawing, the cooking apparatus 100 may further comprise a water pump configured to pump water from the water reservoir to the heating unit 130.

In some embodiments, the heating unit 130 may comprise a heating plate. The shape of a flat heating plate maximizes a surface area for convection heating. Also, as mentioned above, in some embodiments the cooking apparatus 100 may include components for steam generation. In these embodiments, the shape of the flat heating plate would also maximize a surface area for steam generation.

In alternative embodiments, the heating unit 130 may comprise a tubular heater. In these embodiments, the cooking apparatus 100 may further comprise an upper plate arranged in the second enclosed space above the tubular heater, and a lower plate arranged in the second enclosed space between the tubular heater and a bottom of the housing 110. The upper and lower plates provide heat insulation between the tubular heater and the rest of the cooking apparatus, especially the cooking compartment 120 and the bottom of the housing 110.

Although not shown in the drawing, the cooking apparatus 100 may further comprise at least one user interface. A user interface may be for use in providing a user of the cooking apparatus 100 with information relating to the cooking apparatus 100 (e.g. an on/off status of the cooking apparatus 100, a cooking temperature setting of the cooking apparatus 100, an operation mode of the cooking apparatus 100). Alternatively or in addition, a user interface may be configured to receive a user input. For example, a user interface may allow a user of the cooking apparatus 100 to manually enter instructions, data, or information. In these embodiments, a control unit may be provided and configured to acquire the user input from one or more user interfaces.

A user interface may be any user interface that enables the rendering (or output or display) of information to a user of the cooking apparatus 100. Alternatively or in addition, a user interface may be any user interface that enables a user of the cooking

apparatus 100 to provide a user input, interact with and/or control the cooking apparatus 100. For example, the user interface may comprise one or more switches, one or more buttons, a keypad, a keyboard, a touch screen or an application (for example, on a tablet or smartphone), a display screen, a graphical user interface (GUI) or other visual rendering component, one or more speakers, one or more microphones or any other audio component, one or more lights, a component for providing tactile feedback, or any other user interface, or combination of user interfaces.

Although not shown in the drawing, the cooking apparatus 100 may further comprise a control unit. The control unit may be configured to control the fan 140 to generate the air flow at the second enclosed space. More specifically, the control unit may be configured to control a speed of the fan 140. Alternatively or additionally, the control unit may be configured to control power supply to the heating unit 130. This control may be based on a measured temperature in the cooking compartment 120 (e.g. via a control loop). Alternatively or additionally, in embodiments where a water reservoir is provided at the cooking apparatus 100, the control unit may be configured to control the water delivery between the water reservoir and the heating unit 130. The control unit can comprise one or more processors, processing units, multi-core processor or modules that are configured or programmed to control the cooking apparatus 100 in the manner described herein. In particular implementations, the control unit can comprise a plurality of software and/or hardware modules (e.g. image analysis software) for performing such control.

The control unit can be implemented in numerous ways, with software and/or hardware, to perform the various functions described below. The control unit may comprise one or more microprocessors or digital signal processor (DSPs) that may be programmed using software or computer program code to perform the required functions and/or to control components of the control unit to effect the required functions. The control unit may be implemented as a combination of dedicated hardware to perform some functions (e.g. amplifiers, pre-amplifiers, analog-to-digital convertors (ADCs) and/or digital-to-analog convertors (DACs)) and a processor (e.g., one or more programmed microprocessors, controllers, DSPs and associated circuitry) to perform other functions. Examples of components that may be employed in various embodiments of the present disclosure include, but are not limited to, conventional microprocessors, DSPs, application specific integrated circuits (ASICs), and field-programmable gate arrays (FPGAs).

It will be appreciated that Fig. 1 only shows the components required to illustrate an aspect of the cooking apparatus 100, and in a practical implementation, the

cooking apparatus 100 may comprise alternative or additional components to those shown. For example, the cooking apparatus 100 may comprise a battery or other power supply for powering the cooking apparatus 100 or means for connecting the cooking apparatus 100 to a mains power supply.

5 Fig. 2A is an exploded view diagram of a cooking apparatus 200 according to another embodiment, and Fig. 2B is a cross-sectional view diagram of the cooking apparatus 200 of Fig. 2A. As shown in Fig. 2A, the cooking apparatus 200 in the present embodiment comprises a housing 210, a cooking compartment 220, a heating unit 230, and a fan 240.

10 Although the cooking compartment 220 is arranged at the housing 210, it is also removable from the housing 210 in the present embodiment such that the inner surfaces of the housing 210 as well as the heating unit 230 (which is located inside the housing 210) can be cleaned without significant obstruction. Also, since the cooking compartment 220 is removable in this embodiment, it can be used for serving food directly at the table. The cooking compartment 220 comprises a receptacle 222 and a covering element 224. The
15 receptacle 222 has a top opening through which food items can be received and removed, and the covering element 224 is configured to be coupled to the receptacle 222 to cover the top opening of the receptacle 222. A protrusion 270 is arranged at the top side of the covering element 224 so as to allow a user to lift the covering element 224 up easily to remove it away from the receptacle 222. This way, the user can introduce and/or remove food item(s) to and
20 from the receptacle 222 easily by removing the covering element 224.

In addition, the cooking compartment 220 comprises an air inlet 250 and an air outlet 252 which are respectively arranged on opposite sides of the receptacle 222 such that an air flow path within the cooking apparatus 200 can be established in a straightforward manner, as will be described in more detail below. The cooking compartment 220 further
25 comprises two handles 260 arranged at opposite sides of the receptacle 222 so as to facilitate removal of the cooking compartment 220 from the housing 210. As shown in Fig. 2, the covering element 224 in the present embodiment comprises raised circumferential edge which at least engages with the two handles 260 when the covering element 224 is coupled to the receptacle 222. This particular configuration of the covering element 224 enables heated
30 air and/or generated steam to be more specifically directed towards the food item(s) received therein so as to speed up the cooking process as well as to achieve an even heat distribution within the cooking compartment 220.

In the present embodiment, an actuation unit 212 and a display unit 214 are provided at a top surface of the housing 210. The actuation unit 212 may be configured such

that upon actuation of the actuation unit 212, the cooking apparatus 200 can be switched on/off. Alternatively, the actuation unit 212 may be implemented as a dial for controlling a temperature level associated with the heating unit 230. The display unit 214 may be configured to display information relevant to the operation of the cooking apparatus 200, such as an on/off status of the cooking apparatus 200, a cooking temperature setting of the cooking apparatus 200, an operation mode of the cooking apparatus 200, etc. In some embodiments, the actuation unit 212 and the display unit 214 may be regarded as part of a user interface of the cooking apparatus 200.

In the cross-sectional view of the cooking apparatus 200 as provided in Fig. 2B, it is shown that when the covering element 224 is coupled to the receptacle 222, a first enclosed space 2A is formed at the cooking compartment 220. Also, when the cooking compartment 220 is located at the housing 210, a second enclosed space 2B is formed within the housing 210. Specifically, it is shown in Fig. 2B that the second enclosed space 2B is partly formed by the housing 210 and partly formed by an outer wall of the receptacle 222 of the cooking compartment 220. Also, the heating unit 230 comprises a heating plate located inside the second enclosed space 2B and directly beneath the cooking compartment 220 when the cooking compartment 220 is located at the housing 210.

As mentioned above with reference to Fig. 2A, the cooking compartment 220 comprises an air inlet 250 and an air outlet 252 which are respectively arranged on opposite sides of the receptacle 222. It is further illustrated in Fig. 2B that the air inlet 250 is arranged at the receptacle 222 such that when the cooking compartment 220 (and in this case, at least the receptacle 222) is located at the housing 210, air can enter from the second enclosed space 2B through the air inlet 250 and into the receptacle 222 (and therefore the first enclosed space 2A). Furthermore, the air outlet 252 is arranged at the receptacle 222 such that when the cooking compartment 220 (and in this case, at least the receptacle 222) is located at the housing 210, air can exit from the receptacle 222 (and therefore the first enclosed space 2A) at a side opposite from where air enters, i.e. through the air outlet 252 which is opposite to the air inlet 250, and into the second enclosed space 2B. As a result, when the receptacle 222 (with or without the covering element 224) is located at the housing 210, the air inlet 250 and the air outlet 252 can be regarded as being connected to the second enclosed space 2B. Accordingly, air heated by the heating unit 230 in the second enclosed space 2B can be circulated between the second enclosed space 2B and the cooking compartment 220. The air flow circulation (denoted by the arrows in Fig. 2B) can be facilitated by an air flow generated by the fan 240, which is located adjacent to the second enclosed space 2B.

As illustrated in Fig. 2B, the cooking apparatus 200 in this embodiment further comprises a water reservoir 280 which is connected to the heating unit such that water stored in the water reservoir 280 can be delivered to the heating unit 230 for steam generation.

Therefore, in this embodiment, the generated steam can also be carried in the air flow circulation from the second enclosed space 2B to the cooking compartment 220 via the air flow generated by the fan 240. Once the generated steam enters the cooking compartment 220 through the air inlet 250, it can be used for steam cooking the food item(s) received in the receptacle 222.

It will be appreciated that Fig. 2A and Fig. 2B only show the components required to illustrate an aspect of the cooking apparatus 200, and in a practical implementation, the cooking apparatus 200 may comprise alternative or additional components to those shown.

Fig. 3 is a cross-sectional view diagram of a cooking apparatus 300 according to another embodiment. The cooking apparatus 300 in the present embodiment is similar to the cooking apparatus 200 of Fig. 2 in that it also comprises a housing 310, a cooking compartment 320, a heating unit 330, a fan 340, and a water reservoir 380.

Similar to the cooking compartment 220 of Fig. 2, the cooking compartment 320 in the present embodiment is also removable from the housing 310 so that the inner surfaces of the housing 210 as well as the heating unit 230 (which is located inside the housing 210) can be cleaned without significant obstruction. Also, the cooking compartment 320 comprises a receptacle 322 and a covering element 324. The receptacle 322 has a top opening through which food items can be received, and the covering element 324 is configured to be coupled to the receptacle 322 to cover the top opening of the receptacle 322. A protrusion 370 is arranged at the top side of the covering element 324 so as to allow a user to lift the covering element 324 up easily to remove it away from the receptacle 322. This way, the user can introduce and/or remove food item(s) to and from the receptacle 322 simply by removing the covering element 324.

When the covering element 324 is coupled to the receptacle 322, a first enclosed space 3A is formed at the cooking compartment 320. Also, when the cooking compartment 320 is located at the housing 310, a second enclosed space 3B is formed within the housing 310. Specifically, the second enclosed space 3B is partly formed by the housing 310 and partly formed by an outer wall of the receptacle 322 of the cooking compartment 320. Also, the heating unit 330 comprises a heating plate located inside the second enclosed

space 3B and directly beneath the cooking compartment 320 when the cooking compartment 320 is located at the housing 310.

Furthermore, the covering element 324 of the cooking compartment 320 in this embodiment comprises a raised circumferential edge which engages with a part of the housing 310 when the covering element 324 is coupled to the receptacle 322. Therefore, when the receptacle 322 is located at the housing 310 and when the covering element 324 is coupled to the receptacle 322, a first gap and a second gap are formed between the covering element 324 and the receptacle 322. The first gap in this case serves as an air inlet 350 of the cooking compartment 320 and the second gap serves as an air outlet 352 of the cooking compartment 320. Also, the air inlet 350 and the air outlet 352 are arranged on opposite sides of the cooking compartment 320 such that an air flow path within the cooking apparatus 300 can be established in a straightforward manner. In more detail, the air inlet 350 is arranged at the cooking compartment 320 such that when the cooking compartment 320 is located at the housing 310, air can enter from the second enclosed space 3B through the air inlet 350 and into the cooking compartment 320 (and therefore the first enclosed space 3A). Furthermore, the air outlet 352 is arranged at the cooking compartment 320 such that when the cooking compartment 320 is located at the housing 310, air can exit from the cooking compartment 320 (and therefore the first enclosed space 3A) at a side opposite from where air enters, i.e. through the air outlet 352 which is opposite to the air inlet 350, and into the second enclosed space 3B. As a result, when the cooking compartment 320 is located at the housing 310, the air inlet 350 and the air outlet 352 can be regarded as being connected to the second enclosed space 3B. Accordingly, air heated by the heating unit 330 in the second enclosed space 3B can be circulated between the second enclosed space 3B and the cooking compartment 320. The air flow circulation (denoted by the arrows in Fig. 3) can be facilitated by an air flow generated by the fan 340, which is located adjacent to the second enclosed space 3B.

In this embodiment, the water reservoir 380 is connected to the heating unit 330 such that water stored in the water reservoir 380 can be delivered to the heating unit 330 for steam generation. Therefore, in this embodiment, the generated steam can also be carried in the air flow circulation from the second enclosed space 3B to the cooking compartment 320 via the air flow generated by the fan 340. Once the generated steam enters the cooking compartment 320 through the air inlet 350, it can be used for steam cooking the food item(s) received in the receptacle 322.

It will be appreciated that Fig. 3 only shows the components required to illustrate an aspect of the cooking apparatus 300, and in a practical implementation, the cooking apparatus 300 may comprise alternative or additional components to those shown.

Fig. 4 is a cross-sectional view diagram of a cooking apparatus 400 according to another embodiment. The cooking apparatus 400 in the present embodiment is similar to the cooking apparatus 300 of Fig. 3 in that it also comprises a housing 410, a cooking compartment 420, a heating unit 430, a fan 440, and a water reservoir 480. Furthermore, similar to the cooking compartment 320 of Fig. 3, the cooking compartment 420 of the cooking apparatus 400 in this embodiment also comprises a receptacle 422 and a covering element 424, both components being removable from the housing 410. The functionalities of the protrusion 470 provided at the covering element 424, the heating unit 430, the fan 440, and the water reservoir 480 are the same as those described with reference to Fig. 3, and therefore description of these components will be omitted for brevity.

When the covering element 424 is coupled to the receptacle 422, a first enclosed space 4A is formed at the cooking compartment 420. Also, when the cooking compartment 420 is located at the housing 410, a second enclosed space 4B is formed within the housing 410. Specifically, the second enclosed space 4B is partly formed by the housing 410 and partly formed by an outer wall of the receptacle 422 of the cooking compartment 420. Also, the heating unit 430 comprises a heating plate located inside the second enclosed space 4B and directly beneath the cooking compartment 420 when the cooking compartment 420 is located at the housing 410.

The difference between the cooking apparatus 400 of Fig. 4 and the cooking apparatus 300 of the Fig. 3 is that while the covering element 324 of Fig. 3 comprises a raised circumferential edge which engages with a part of the housing 310 when it is coupled to the receptacle 322, the covering element 424 of this embodiment has a generally flat shape and is configured such that at least a part of its circumferential edge engages with a part of the housing 410 when the covering element 424 is coupled to the receptacle 422. In this arrangement, when the covering element 424 is coupled to the receptacle 422 (by way of engaging with a part of the housing 410), a first gap and a second gap are formed on opposite sides between the covering element 424 and the receptacle 422. The first gap in this case serves as an air inlet 450 of the cooking compartment 420 and the second gap serves as an air outlet 452 of the cooking compartment 420. Similar to the cooking apparatus 300 of Fig. 3, since the air inlet 450 and the air outlet 452 are arranged on opposite sides of the cooking

compartment 420, an air flow path can be established within the cooking apparatus 400 in a straightforward manner.

In more detail, the air inlet 450 is arranged at the cooking compartment 420 such that when the cooking compartment 420 is located at the housing 410, air can enter from the second enclosed space 4B through the air inlet 450 and into the cooking compartment 420 (and therefore the first enclosed space 4A). Furthermore, the air outlet 452 is arranged at the cooking compartment 420 such that when the cooking compartment 420 is located at the housing 410, air can exit from the cooking compartment 420 (and therefore the first enclosed space 4A) at a side opposite from where air enters, i.e. through the air outlet 452 which is opposite to the air inlet 450, and into the second enclosed space 4B. As a result, when the cooking compartment 420 is located at the housing 410, the air inlet 450 and the air outlet 452 can be regarded as being connected to the second enclosed space 4B. Accordingly, air heated by the heating unit 430 in the second enclosed space 4B can be circulated between the second enclosed space 4B and the cooking compartment 420. The air flow circulation (denoted by the arrows in Fig. 4) can be facilitated by an air flow generated by the fan 440, which is located adjacent to the second enclosed space 4B.

Comparing the cooking compartment 320 of Fig. 3 and the cooking compartment 420 of Fig. 4, the cooking compartment 420 of Fig. 4 provides a larger first enclosed space 4A for accommodating food item(s). Nevertheless, in comparison with the cooking compartment 420 of Fig. 4, the cooking compartment 320 of Fig. 3 is configured such that heated air and/or generated steam is more specifically directed towards the food item(s) received therein by way of the shape of the covering element 424 so as to speed up the cooking process.

It will be appreciated that Fig. 4 only shows the components required to illustrate an aspect of the cooking apparatus 400, and in a practical implementation, the cooking apparatus 400 may comprise alternative or additional components to those shown.

Fig. 5 is a cross-sectional view diagram of a cooking apparatus 500 according to another embodiment. The cooking apparatus 500 in the present embodiment is similar to the cooking apparatus 200 of Fig. 2A and Fig. 2B in that it also comprises a housing 510, a cooking compartment 520, a heating unit 530, a fan 540, and a water reservoir 580. Furthermore, similar to the cooking compartment 220 of Fig. 2A and Fig. 2B, the cooking compartment 520 of the cooking apparatus 500 in this embodiment also comprises a receptacle 522 and a covering element 524, both components being removable from the housing 510. The functionalities of the protrusion 570 provided at the covering element 524,

the fan 540, and the water reservoir 580 are the same as those described with reference to Fig. 2A and Fig. 2B, and therefore description of these components will be omitted for brevity.

Similar to the cooking compartment 220 of Fig. 2A and Fig. 2B, the cooking compartment 520 in this embodiment comprises an air inlet 550 and an air outlet 552 which are respectively arranged on opposite sides of the receptacle 522 such that an air flow path within the cooking apparatus 500 can be established in a straightforward manner.

The cooking compartment 520 further comprises two handles 560 arranged at opposite sides of the receptacle 522 so as to facilitate removal of the cooking compartment 220 from the housing 510. Moreover, the covering element 524 in the present embodiment comprises a raised circumferential edge which at least engages with the two handles 560 when the covering element 524 is coupled to the receptacle 522. This particular configuration of the covering element 524 enables heated air and/or generated steam to be more specifically directed towards the food item(s) received therein so as to speed up the cooking process.

When the covering element 524 is coupled to the receptacle 522, a first enclosed space 5A is formed at the cooking compartment 520. Also, when the cooking compartment 520 is located at the housing 510, a second enclosed space 5B is formed within the housing 510. Specifically, it is shown in Fig. 5 that the second enclosed space 5B is partly formed by the housing 510 and partly formed by an outer wall of the receptacle 522 of the cooking compartment 520.

As shown in Fig. 5, the air inlet 550 is arranged at the receptacle 522 such that when the cooking compartment 520 (and in this case, at least the receptacle 522) is located at the housing 510, air can enter from the second enclosed space 5B through the air inlet 550 and into the receptacle 522 (and therefore the first enclosed space 5A). Furthermore, the air outlet 552 is arranged at the receptacle 522 such that when the cooking compartment 520 (and in this case, at least the receptacle 522) is located at the housing 510, air can exit from the receptacle 522 (and therefore the first enclosed space 5A) at a side opposite from where air enters, i.e. through the air outlet 552 which is opposite to the air inlet 550, and into the second enclosed space 5B. As a result, when the receptacle 522 (with or without the covering element 524) is located at the housing 510, the air inlet 550 and the air outlet 552 can be regarded as being connected to the second enclosed space 5B.

The difference between the cooking apparatus 500 of Fig. 5 and the cooking apparatus 200 of Fig. 2A and Fig. 2B is that while the heating unit 230 of Fig. 2A and Fig. 2B comprises a heating plate, the heating unit 530 of this embodiment comprises a tubular

heater. The air heated by the tubular heater of the heating unit 530 in the second enclosed space 5B can be circulated between the second enclosed space 5B and the cooking compartment 520 via the air inlet 550 and the air outlet 552. The air flow circulation (denoted by the arrows in Fig. 5) can be further facilitated by an air flow generated by the fan 540, which is located adjacent to the second enclosed space 5B.

Furthermore, another difference between the cooking apparatus 500 of Fig. 5 and the cooking apparatus 200 of Fig. 2A and Fig. 2B is that the cooking apparatus 500 in this embodiment further comprises an upper plate 592 arranged in the second enclosed space 5B above the tubular heater of the heating unit 530, and a lower plate 594 arranged in the second enclosed space between the tubular heater of the heating unit 530 and a bottom of the housing 510. The upper plate 592 provides heat insulation between the heating unit 540 and the cooking compartment 520, while the lower plate 594 provides heat insulation between the heating unit 540 and the bottom of the housing 510. For this purpose, the upper plate 592 and the lower plate 594 may be made of heat insulating material(s). In addition, the upper plate 592 also provides a barrier between the cooking compartment 520 and the second enclosed space 5B so as to prevent objects (e.g. food items) from falling into the second enclosed space, especially when the cooking compartment 520 is not located at the housing 510 or is being removed from the housing 510.

It will be appreciated that Fig. 5 only shows the components required to illustrate an aspect of the cooking apparatus 500, and in a practical implementation, the cooking apparatus 500 may comprise alternative or additional components to those shown.

Fig. 6 is a cross-sectional view diagram of a cooking apparatus according to another embodiment. The cooking apparatus 600 in the present embodiment is similar to the cooking apparatuses 200 of Fig. 2A and Fig. 2B in that it also comprises a housing 610, a cooking compartment 620, a heating unit 630, a fan 640, and a water reservoir 680. Furthermore, similar to the cooking compartment 220 of Fig. 2A and Fig. 2B, the cooking compartment 620 of the cooking apparatus 600 in this embodiment also comprises a receptacle 622 and a covering element 624, both components being removable from the housing 610. The functionalities of the protrusion 670 provided at the covering element 624, the heating unit 630, the fan 640, and the water reservoir 680 are the same as those described with reference to Fig. 2, and therefore description of these components will be omitted for brevity.

Similar to the cooking compartment of Fig. 2A and Fig. 2B, the cooking compartment 620 in this embodiment comprises an air inlet 650 and an air outlet 652 which

are respectively arranged on opposite sides of the receptacle 622 such that an air flow path within the cooking apparatus 600 can be established in a straightforward manner. The cooking compartment 620 further comprises two handles 660 arranged at opposite sides of the receptacle 622 so as to facilitate removal of the cooking compartment 620 from the housing 610.

When the covering element 624 is coupled to the receptacle 622, a first enclosed space 6A is formed at the cooking compartment 620. Also, when the cooking compartment 620 is located at the housing 610, a second enclosed space 6B is formed within the housing 610. Specifically, it is shown in Fig. 6 that the second enclosed space 6B is partly formed by the housing 610 and partly formed by an outer wall of the receptacle 622 of the cooking compartment 620. Also, the heating unit 630 comprises a heating plate located inside the second enclosed space 6B and directly beneath the cooking compartment 620 when the cooking compartment 620 is located at the housing 610.

As shown in Fig. 6, the air inlet 650 is arranged at the receptacle 622 such that when the cooking compartment 620 (and in this case, at least the receptacle 622) is located at the housing 610, air can enter from the second enclosed space 6B through the air inlet 650 and into the receptacle 622 (and therefore the first enclosed space 6A). Furthermore, the air outlet 652 is arranged at the receptacle 622 such that when the cooking compartment 620 (and in this case, at least the receptacle 622) is located at the housing 610, air can exit from the receptacle 622 (and therefore the first enclosed space 6A) at a side opposite from where air enters, i.e. through the air outlet 652 which is opposite to the air inlet 650, and into the second enclosed space 6B. As a result, when the receptacle 622 (with or without the covering element 624) is located at the housing 610, the air inlet 650 and the air outlet 652 can be regarded as being connected to the second enclosed space 6B.

The difference between the cooking apparatus 600 of Fig. 6 and the cooking apparatus 200 of the Fig. 2A and Fig. 2B is that while the covering element 224 of Fig. 2 comprises a raised circumferential edge which at least engages with the two handles 260 when the covering element 224 is coupled to the receptacle 222, the covering element 624 of this embodiment has a generally dome shape and is configured such that at least a part of its circumferential edge engages with the handles 660 of the receptacle 622 when the covering element 624 is coupled to the receptacle 622. This particular configuration of the cooking compartment 620 allows its capacity to be maximized for accommodating more food items.

It will be appreciated that Fig. 6 only shows the components required to illustrate an aspect of the cooking apparatus 600, and in a practical implementation, the cooking apparatus 600 may comprise alternative or additional components to those shown.

There is thus provided an improved cooking apparatus which overcomes the
5 existing problems.

Variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure and the appended claims. In the claims, the word “comprising” does not exclude other elements or steps, and the indefinite article “a” or “an” does not exclude a plurality. A
10 single processor or other unit may fulfil the functions of several items recited in the claims. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. Any reference signs in the claims should not be construed as limiting the scope.

CLAIMS:

1. A cooking apparatus (100, 200, 300, 400, 500, 600) comprising:
a housing (110, 210, 310, 410, 510, 610);
a cooking compartment (120, 220, 320, 420, 520, 620) arranged at the
housing, the cooking compartment being configured to form a first enclosed space in which
5 food item can be received;
a heating unit (130, 230, 330, 430, 530, 630) arranged inside a second
enclosed space in the housing,
wherein the cooking compartment comprises an air inlet (250, 350, 450, 550,
650) through which air can enter from a side of the cooking compartment, and an air outlet
10 (252, 352, 452, 552, 652) through which air can exit from an opposite side of the cooking
compartment,
wherein the air inlet (250, 350, 450, 550, 650) and the air outlet (252, 352,
452, 552, 652) are disposed on opposite sides of the cooking compartment, and
wherein the air inlet and the air outlet are connected to the second enclosed
15 space such that air heated by the heating unit can circulate between the second enclosed
space and the cooking compartment.

2. The cooking apparatus (100, 200, 300, 400, 500, 600) according to claim 1,
further comprising a fan (140, 240, 340, 440, 540, 640) configured to generate an air flow at
20 the second enclosed space so as to facilitate the air flow circulation between the second
enclosed space and the cooking compartment (120, 220, 320, 420, 520, 620).

3. The cooking apparatus (200, 300, 400, 500, 600) according to claim 1 or claim
2, wherein the cooking compartment (220, 320, 420, 520, 620) comprises:
25 a receptacle (222, 322, 422, 522, 622) having a top opening; and
a covering element (224, 324, 424, 524, 624) configured to be coupled to the
receptacle to cover the top opening of the receptacle so as to form the first enclosed space.

4. The cooking apparatus (200, 300, 400, 500, 600) according to claim 3, wherein the air inlet (250, 350, 450, 550, 650) and the air outlet (252, 352, 452, 552, 652) are arranged at opposite sides of the receptacle (222, 322, 422, 522, 622).

5. The cooking apparatus (200, 300, 400, 500, 600) according to claim 3 or claim 4, further comprising a cooking compartment sealing unit arranged at the receptacle (222, 322, 422, 522, 622) and/or the covering element (224, 324, 424, 524, 624), wherein the cooking compartment sealing unit is configured form a seal between the receptacle and the covering element when the covering element is coupled to the receptacle.

6. The cooking apparatus (300, 400) according to claim 3, wherein when the covering element (324, 424) is coupled to the receptacle (322, 422), a first gap and a second gap are formed between the covering element and the receptacle, and wherein when the cooking compartment (320, 420) is located at the housing, the first gap forms the air inlet and the second gap forms the air outlet.

7. The cooking apparatus (600) according to any one of claims 3 to 6, wherein the covering element (624) has a dome shape.

8. The cooking apparatus (200, 300, 400, 500, 600) according to any one of claims 3 to 7, wherein the covering element (224, 324, 424, 524, 624) is at least partially transparent.

9. The cooking apparatus (200, 300, 400, 500, 600) according to any one of the preceding claims, further comprising a water reservoir (280, 380, 480, 580, 680) configured to store water, the water reservoir being connected to the heating unit (230, 330, 430, 530, 630) such that water can be delivered from the water reservoir to the heating unit for steam generation.

10. The cooking apparatus (200, 300, 400, 500, 600) according to claim 9, further comprising a water pump configured to pump water from the water reservoir (280, 380, 480, 580, 680) to the heating unit (230, 330, 430, 530, 630).

11. The cooking apparatus (100, 200, 300, 400, 500, 600) according to any one of the preceding claims, wherein the cooking compartment (120, 220, 320, 420, 520, 620) is removable from the housing (110, 210, 310, 410, 510, 610), and the second enclosed space is formed when the cooking compartment is located at the housing.

5

12. The cooking apparatus (100, 200, 300, 400, 500, 600) according to claim 11, further comprising a housing sealing unit configured to form a seal between the cooking compartment (120, 220, 320, 420, 520, 620) and the housing (110, 210, 310, 410, 510, 610) when the cooking compartment is located in the housing.

10

13. The cooking apparatus (200, 300, 400, 500, 600) according to any one of the preceding claims, wherein the cooking compartment (220, 320, 420, 520, 620) further comprises one or more handles (260, 360, 460, 560, 660).

15

14. The cooking apparatus (200, 300, 400, 600) according to any one of the preceding claims, wherein the heating unit (230, 330, 420, 630) comprises a heating plate.

15. The cooking apparatus (500) according to any one of the preceding claims, wherein the heating unit (530) comprises a tubular heater, and wherein the cooking apparatus further comprises an upper plate (592) arranged in the second enclosed space above the tubular heater, and a lower plate (594) arranged in the second enclosed space between the tubular heater and a bottom of the housing (510).

20

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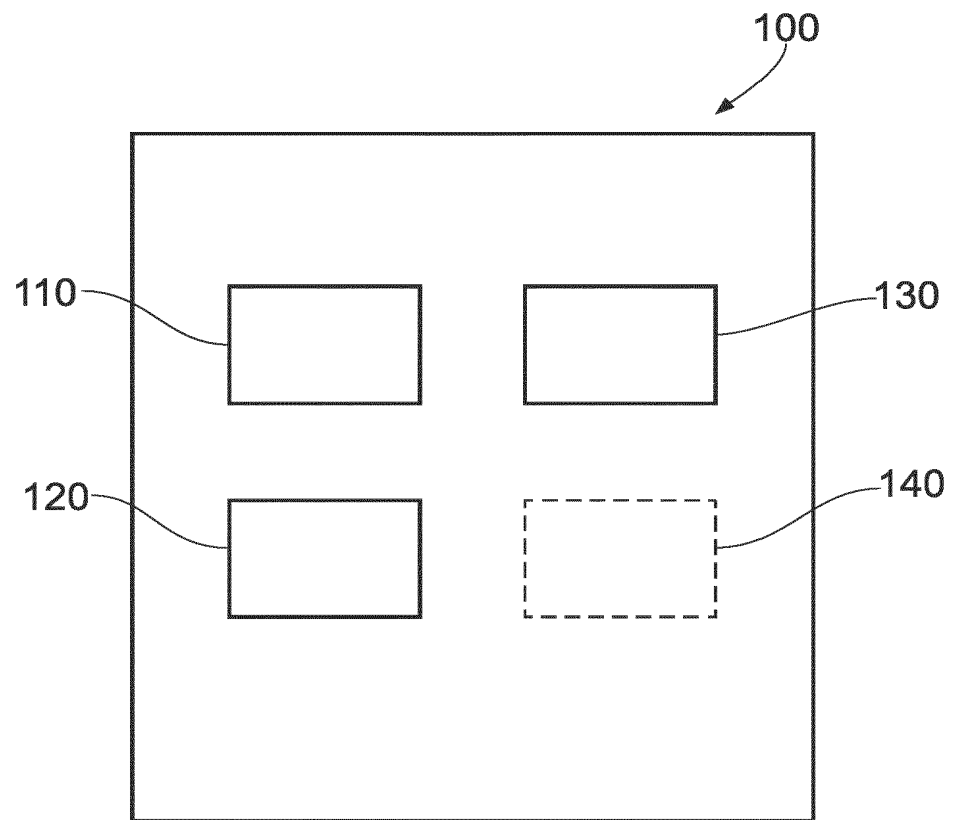


FIG. 1

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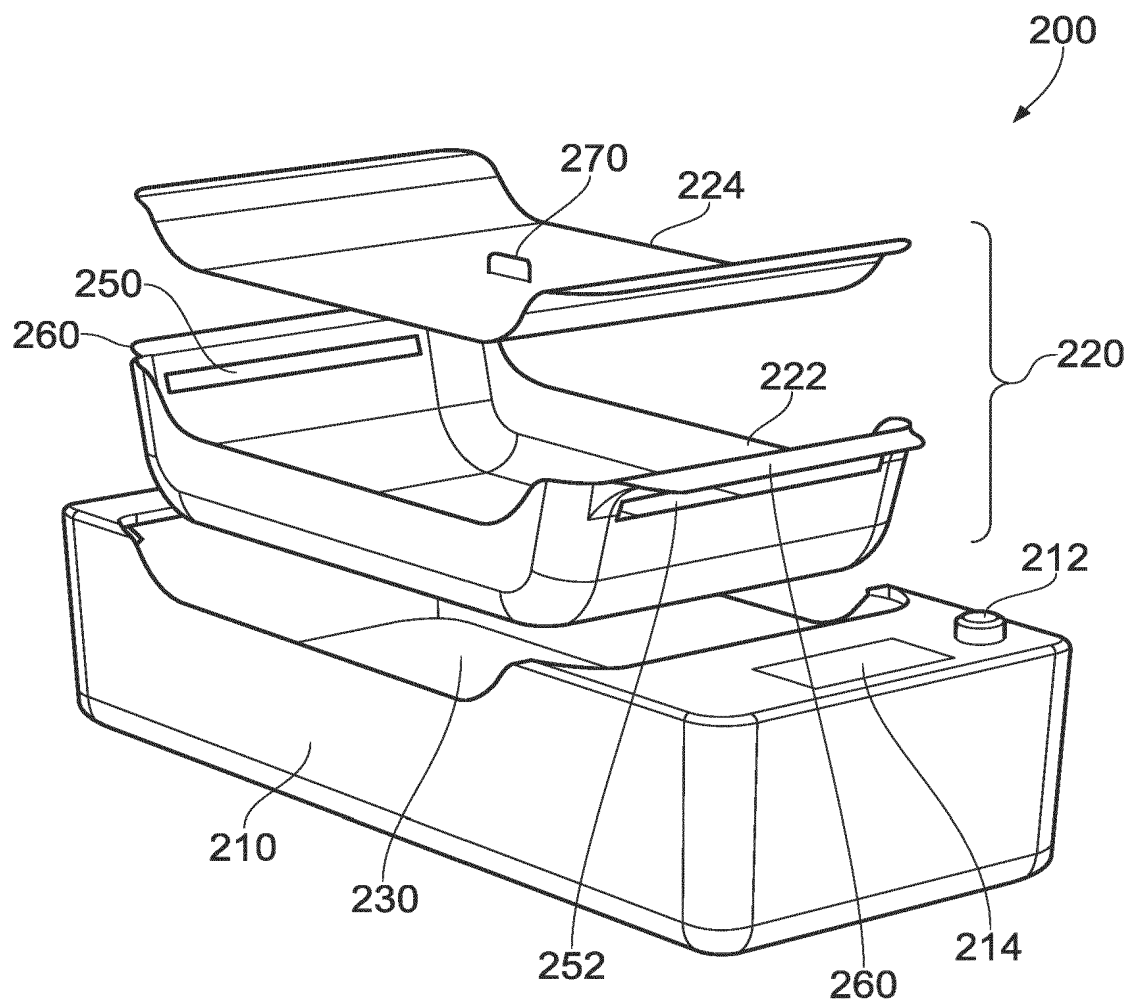


FIG. 2A

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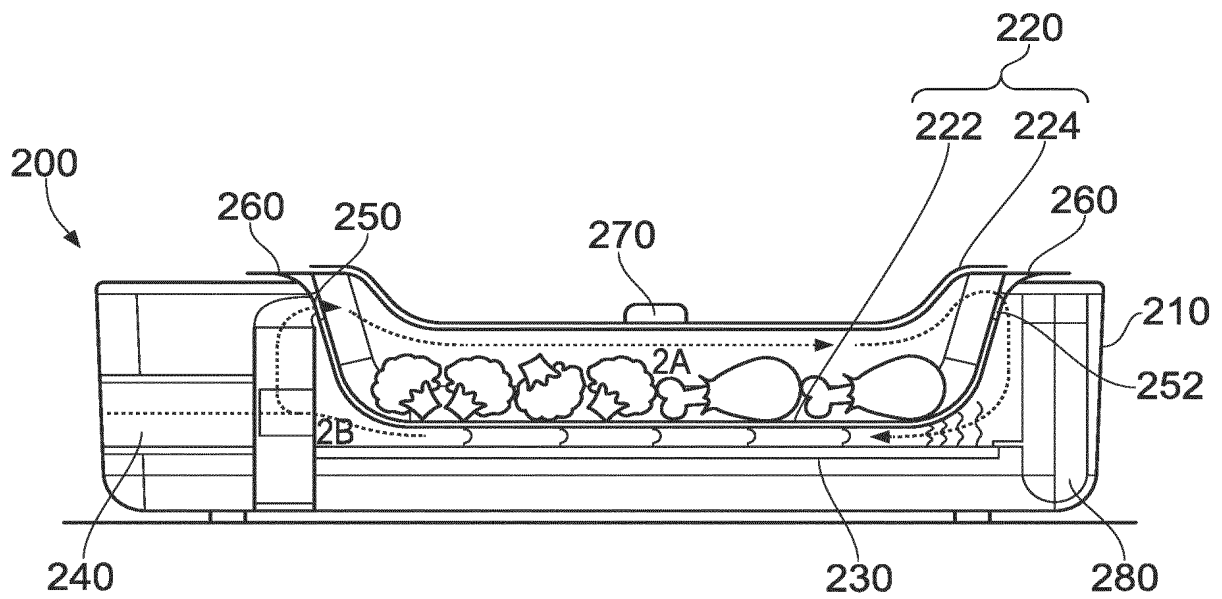


FIG. 2B

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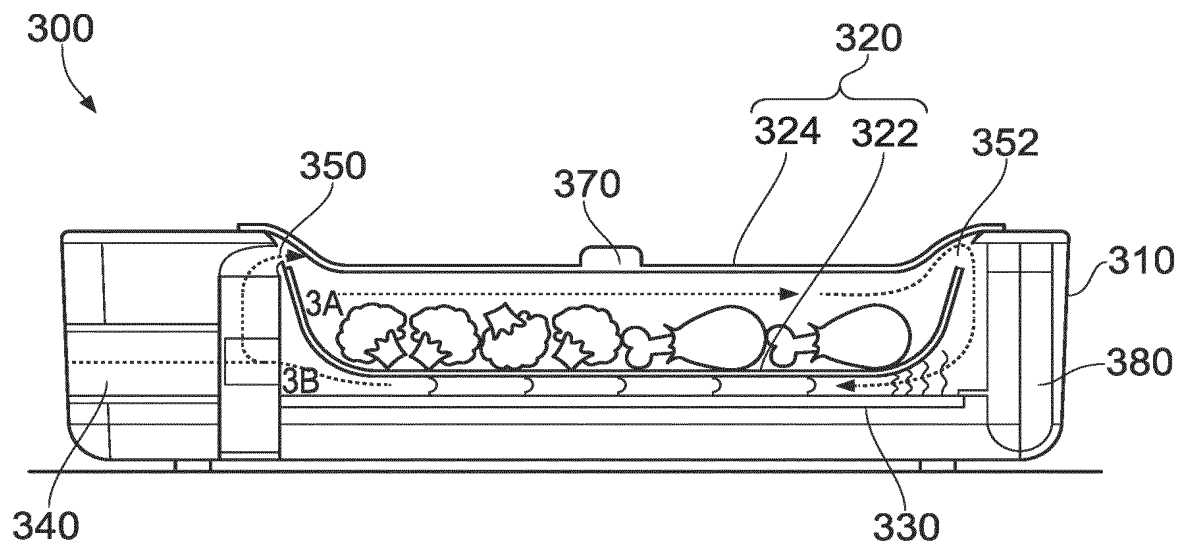


FIG. 3

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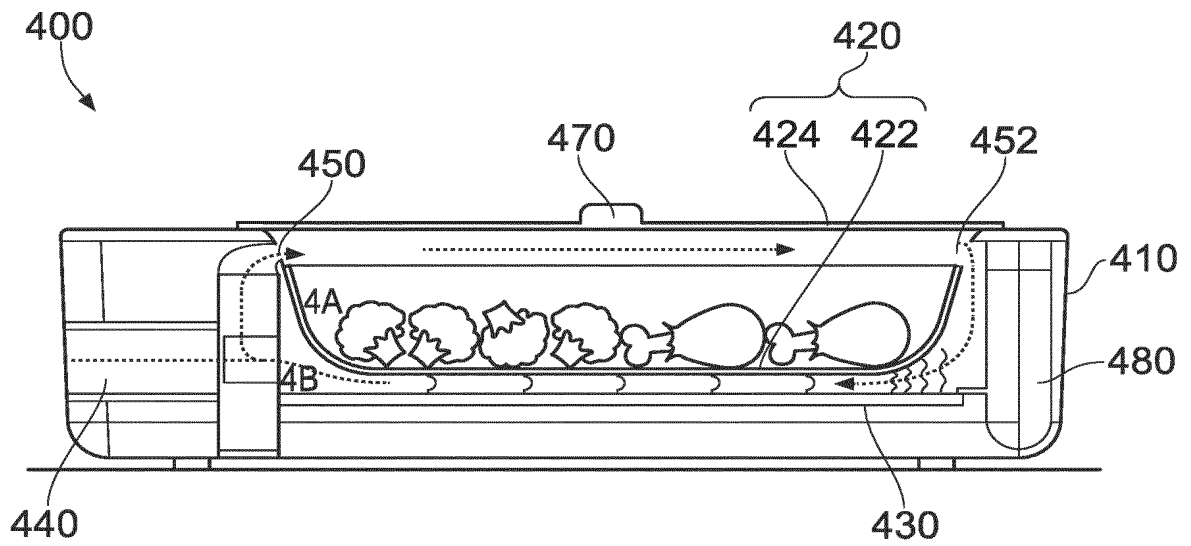


FIG. 4

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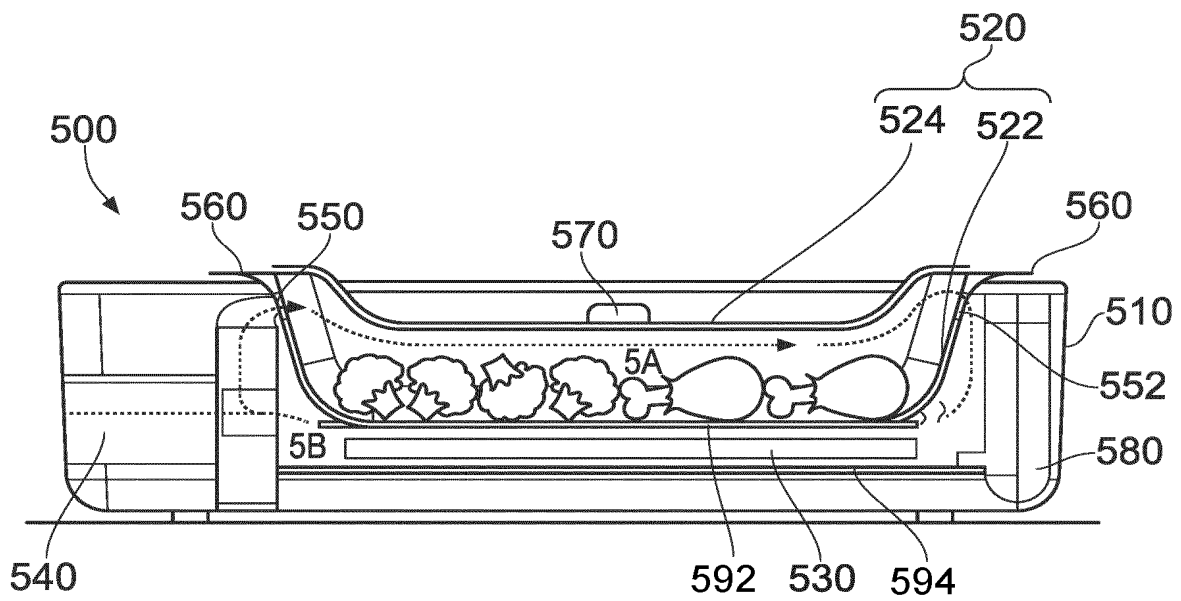


FIG. 5

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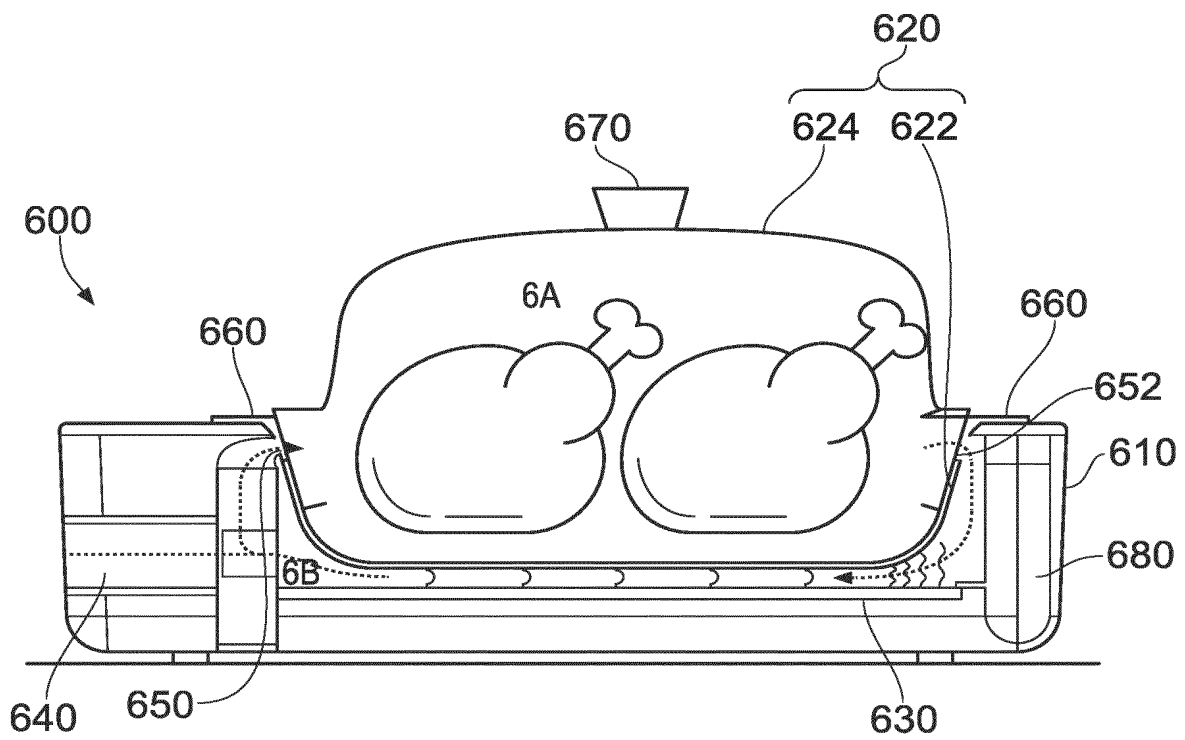


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. A47J37/06
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)

A47J

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 A	US 2015/201806 A1 (YOSHIDOME AKIHIRO [JP]) 23 July 2015 (2015-07-23) paragraphs [0014], [0027] - [0042]; figure 1 -----	1-4,6-8, 11,13,14 10,12,15
X	US 2008/163764 A1 (PAYEN JEAN-MARC [FR] ET AL) 10 July 2008 (2008-07-10) paragraphs [0034] - [0159]; figures -----	1-5,7,8, 14
X	KR 2009 0054551 A (KIM JE KYUNG [KR]) 1 June 2009 (2009-06-01) paragraphs [0020] - [0042]; figures -----	1,2,9
X	CN 108 577 581 A (SHENZHEN MINGXIANG ELECTRIC APPLIANCE CO LTD) 28 September 2018 (2018-09-28) paragraphs [0024] - [0031]; figure 1 ----- -/--	1-4,7,8, 11,13,14



Further documents are listed in the continuation of Box C.



See patent family annex.

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"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

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2020/050474

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	WO 2014/195192 A1 (KONINKL PHILIPS NV [NL]) 11 December 2014 (2014-12-11) page 12, line 19 - page 21, line 22; figures -----	1-3,11, 13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a
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(54) Title: STEAM COOKING APPARATUS

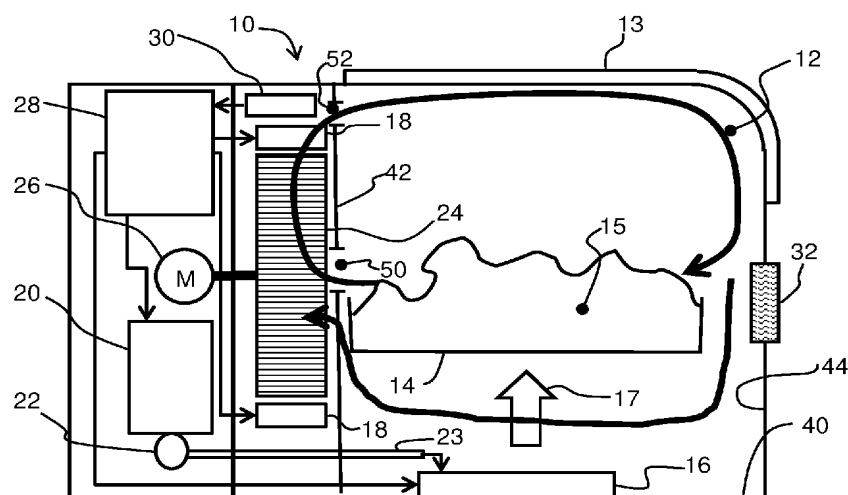


FIG. 1

(57) **Abstract:** A cooking apparatus is for cooking using steam. A circulation system comprising an extraction vent in a rear wall of the cooking chamber. A delivery vent arrangement for delivering air to the food chamber has a vent at a top region of a rear wall area, and optionally also vents at side wall areas. The rear wall delivery vent may have a set of flow guiding fins. In combination, these features ensure a flow of how air/steam over the entire surface of the underside of the lid.

Published:

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

Steam cooking apparatus

FIELD OF THE INVENTION

This invention relates to a steam cooker, also referred to as a steamer.

BACKGROUND OF THE INVENTION

Steam cooking (also referred to as steaming) is commonly known as one of the healthiest cooking methods. In particular, steam cooking is often preferred over other cooking methods such as boiling, frying and baking because it results in a lower amount of nutrient destruction.

This is because steam cooking operates at a lower temperature, typically below 100 degrees Celsius, but nevertheless enables short cooking times due to the wet steam environment. The presence of water as the cooking medium causes a leaching out of water soluble nutrients when boiling, and this is greatly reduced by steam cooking.

However, steam cooking has some disadvantages, such as steamed up viewing windows making it difficult to inspect the cooking process.

There is a need for a steam cooker which addresses this issue.

SUMMARY OF THE INVENTION

The invention is defined by the claims.

According to examples in accordance with an aspect of the invention, there is provided a steam cooking apparatus, comprising:

a food chamber comprising a base, a rear wall area, first and second opposing side wall areas and a front wall area;

a transparent lid;

a heating arrangement;

a water reservoir;

a circulation system comprising an extraction vent in the rear wall area through which air is drawn from inside the food chamber, and a delivery vent arrangement for delivering air to the food chamber,

wherein the delivery vent arrangement comprises:

a first delivery vent at a top region of the rear wall area above the extraction vent and extending across at least half of the width of the rear wall area and/or at least half a width of the transparent lid.

By providing a delivery vent at the top of the rear wall, above the extraction vent, a circulatory flow is generated which passes under the lid. In this way, the lid is heated with a continuous flow, thereby reducing condensation on the lid to prevent steaming up of the viewing window formed by the transparent lid.

The first delivery vent is for example in series with a set of flow guiding fins.

The apparatus may comprise a second delivery vent at a top region of the first side wall area and a third delivery vent at a top region of the second side wall area.

The first delivery vent enables a flow of the delivered air (which includes, or is saturated with, steam) to pass over the full area of the underside of the lid.

The design of the flow guiding fins, in combination with the design of the second and third vents, assists in ensuring a flow remains at the top of the food chamber until it reaches the rear wall area, thereby flowing over the full area of the lid.

The first delivery vent may extend up to the full width of the rear wall area. Preferably, the first delivery vent extends across the at least half of the width of the transparent lid (or equivalently the transparent portion of a lid having a transparent portion).

The term "transparent lid" should thus be understood as meaning the whole lid if it is entirely transparent, or just the transparent portion if the lid has a transparent window and a significant non-transparent frame.

The flow guiding fins are preferably upright, so that they provide control of the lateral flow direction. For example, when there are first to third flow delivery vents, the flow guiding fins influence the way the flow from the first vent interacts with the flow from the second and third vents. In particular, the flow guiding fins provide a more uniform flow across the underside of the transparent lid, by redirecting the direction of the flow from the circulation system.

The transparent lid is for example inclined downwardly from the rear wall area towards the front wall area. The aim of the design is to prevent condensation of steam at the transparent section of the lid via heating. The incline means that the air flowing out of the vent or vents expands and drops down towards the intake section of the fan. The inclined lid follows this path for a longer distance than a horizontal lid. The resulting tapered cooking chamber (tapered along flow direction) maintains the flow speed near the surface of the lid at a higher level, supporting a more even heat distribution.

The first delivery vent for example comprises a slot extending widthwise across the rear wall area, and the flow guiding fins extend from top to bottom of the slot.

Thus, the flow guiding fins may be part of the slot in the rear wall area. However, they may instead be part of the underside of the lid or they may be mounted over
5 (instead of inside) the slot.

The first delivery vent may for example comprise 1 to 10 flow guiding fins.

The first delivery vent may comprises a lower shelf on which the flow guiding fins are located. This lower shelf serves to direct flow such that it is flat or directed upwardly, thereby directed along or towards the underside of the lid.

10 The first delivery vent may also comprise comprises an upper shelf, wherein the flow guiding fins are sandwiched between the lower shelf and the upper shelf. The use of upper and lower shelves provides further control of the characteristics of the flow.

The second and third delivery vents may each also comprise a lower shelf. Again, this lower shelf directs the flow from these side vents across or towards the underside
15 of the lid.

The lower shelves of the first, second and third delivery vents may form a continuous ridge.

A controller is preferably provided and is adapted to control the heating arrangement to heat water from the water reservoir to create steam. The circulation system
20 preferably comprises a fan. The airflow is defined by the characteristics of the circulation system including a fan motor speed and fan dimensions.

The cooking apparatus preferably further comprises a water dosing system for delivering water to the heating arrangement. A continuous or pulsed delivery of water and a cyclic control of the heating arrangement may for example be used to maintain a cooking
25 temperature in a desired range. A feed arrangement is for example provided to feed water from the water reservoir into contact with a heated surface of the first heater. This surface is then used to induce evaporation.

The transparent lid is preferably openable and is thus used both for inserting and removing food and for inspection during cooking.

30 As mentioned above, the delivery vent arrangement is preferably adapted to create a flow over the full area of an underside of the lid. However, in addition, the delivery vent arrangement may be adapted to prevent localized flow rotation within the food chamber.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiment(s) described hereinafter.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention, and to show more clearly how it may be carried into effect, reference will now be made, by way of example only, to the accompanying drawings, in which:

Figure 1 shows a cooking apparatus;

Figure 2 shows the food chamber opened up to show the rear wall area and the first and second side wall areas;

Figure 3 shows a first example of a design of the first vent in more detail to show the flow guiding fins;

Figure 4 shows a second example of a design of the first vent;

Figure 5 shows one more detailed example of a design of the first vent;

Figure 6 shows that the second and third delivery vents may each also comprise a lower shelf;

Figure 7 shows a slightly different vent design;

Figure 8 shows how a sloped top may further assist in providing flow across the transparent lid; and

Figures 9A and 9B show the benefit of the flow guiding fins.

Figures 10 to 20 each show different designs with the food chamber opened up to show the rear wall area and the first and second side wall areas.

DETAILED DESCRIPTION OF THE EMBODIMENTS

The invention will be described with reference to the Figures.

It should be understood that the detailed description and specific examples, while indicating exemplary embodiments of the apparatus, systems and methods, are intended for purposes of illustration only and are not intended to limit the scope of the invention. These and other features, aspects, and advantages of the apparatus, systems and methods of the present invention will become better understood from the following description, appended claims, and accompanying drawings. It should be understood that the Figures are merely schematic and are not drawn to scale. It should also be understood that the same reference numerals are used throughout the Figures to indicate the same or similar parts.

The invention provides a cooking apparatus for cooking using steam. A circulation system comprises an extraction vent in a rear wall of the cooking chamber. A delivery vent arrangement for delivering air to the food chamber has a vent at least at a top region of a rear wall area. There may also be vents in side wall areas. The rear wall delivery vent may have a set of flow guiding fins. In combination, these features ensure a flow of how
5 air/steam over the entire surface of the underside of the lid.

Figure 1 shows a a cooking apparatus 10, comprising a food chamber 12 in which a food basket 14 is mounted. The food chamber has a viewing window 13 which may also be the openable lid of the apparatus. Food 15 to be cooked is placed on the food basket
10 which then places the food near the center of the food chamber. The food basket has air permeable side walls and optionally an air permeable base so that air and steam can circulate through the basket to the food.

There is a heating arrangement which in this example comprises a first heater 16 and a second heater 18. The first heater is used to generate steam (shown as arrow 17)
15 from water which is delivered from a water reservoir 20 by a dosing system 22. The dosing system provides water to a feed arrangement 23 which delivers water to a surface of the first heater 16 to generate steam.

The dosing system may deliver a constant flow of water during cooking or a regularly pulsed delivery of water (so needing no feedback control), but it could also be
20 controlled dynamically during cooking using feedback from a humidity sensor.

A circulation system is provided in the form of a fan 24 and motor 26. The circulation system circulates the steam generated by the first heater 16 around the food chamber. The second heater 18 is along the circulation path and thereby further heats the steam to create a high temperature dry steam environment. The circulation system thus
25 moves the saturated air inside the chamber to the food to increase convection and also assists in producing a homogeneous temperature field of all parts inside the cooking chamber, including the viewing window. This is to avoid condensation.

The invention relates to a particular design of the circulation system, described below.

The apparatus is controlled by a controller 28, which controls the heating arrangement 16, 18 and optionally also the dosing system 22. The controller receives temperature information from a temperature sensor 30. The temperature of interest is the temperature at the center of the food chamber, where the food is located. However, the temperature sensor, which may be a negative temperature coefficient (NTC) temperature
30

sensor, may be located anywhere in the food chamber, with a known correlation between the temperature at the sensor location and the temperature in the middle of the chamber.

The temperature is for example regulated by switching on and off the second heater 18 of the heating arrangement by the controller. The temperature of the first heater, for steam generation, is regulated by a thermostat again by cycling on and off. These two control mechanisms may be independent.

The cooking chamber is vented to the ambient surroundings by vents 32. Thus, the cooking chamber remains at substantially atmospheric pressure during use.

The controller 28 controls the heating arrangement to heat water from the water reservoir to create steam using the first heater 16, and to further heat the steam to create heated steam at a temperature around 100 degrees.

The applicant has also proposed (but not yet published) an approach in which the second heater further heats the steam for example to 120 degrees Celsius, or in the range 110 to 120 degrees Celsius. This approach may also be adopted.

The circulation system circulates the heated steam around the food chamber. The vent or vents of the cooking chamber maintain the pressure at ambient pressure, and thus steam can escape when the maximum possible absolute humidity is reached (for the particular operating temperature), which would otherwise result in an increase in pressure.

The release mechanism provided by the vent or vents means that the steam delivery rate does not need to be controlled, and instead there can be a preset water delivery rate to the first heater 16. The controller may for example implement a control sequence which determines particular points of time when steam generation starts and/or ends. By way of example, a time-delayed start may be used for steam generation. The device is for example in a waiting mode for certain time e.g. 2 minutes from the start or else waiting until the cooking chamber temperature reaches 100°C. Water is then added to the first water heater 16. This pre-heating improves the avoidance of condensation at the window of the transparent lid as discussed below.

The invention relates to the extraction of air and steam from the food chamber 12.

The food chamber 12 comprises a base 40, a rear wall area 42, first and second opposing side wall areas and a front wall area 44. These together define a closed chamber.

Figure 2 shows the food chamber opened up to show the rear wall area 42 and the first and second side wall areas 46, 48 for a first example of vent arrangement.

The circulation system draws air out of the food chamber through an extraction vent 50 in the rear wall area 42. This vent leads to the fan blades.

A delivery vent arrangement for delivering air (and steam) comprises a first delivery vent 52 at a top region of the rear wall area 42 above the extraction vent 50. It extends across at least half of the width of the rear wall area 42, preferably across more than 60%, 70% or 80% of that width. It preferably also extends across at least half of the width of the transparent lid. It may extend across a width corresponding to (or slightly larger than) a full width of the transparent lid (i.e. the transparent portion of the lid over across which a flow is to be created) but there will be some expansion of the width of the air flow from the first delivery vent, so the first delivery vent may not need to extend across the full lid width to achieve flow across the full underside of the lid.

In this example, a second delivery vent 54 is at a top region of the first side wall area 46 and a third delivery vent 56 is at a top region of the second side wall area 48.

These vents are the only entry points for air/steam driven by the circulation system. Thus, it is possible through design of the vents and fan to control the circulation of air and steam within the food chamber in a reliable and repeatable way.

The second and third delivery vents for example extend across at least 30% the width of the respective side wall area, preferably across more than 40%, 50% or 60% of that width. By way of example, the second and third vents extend across about 50% of the width.

The vents may be at the very top of the respective rear or side wall areas or they may be spaced from the top, for example by up to 15% of the height of the the food chamber.

Note that the term side wall "area" is used because the shape (from above) may not be a polygon, but instead may be a more curved shaped thus not having precisely defined sides, front and back. However, the shape (from above) is generally square or rectangular, so that corresponding front, back and sides may be readily identified. However, this does not imply that other shapes are not possible. Even a circle may be considered to have sides, a front and back by dividing it into quadrants.

This arrangement of vents enables a flow of the delivered air to pass over the full area of the underside of the lid 13. The viewing window area of the lid 13 has increased heat losses compared to an insulated wall so it is desirable for the window to be exposed to the flow created by the circulation system to maintain the viewing window above the dew point.

In some examples, the first delivery vent comprises a set of flow guiding fins, not shown in Figure 2.

Figure 3 shows an example of a design of the first vent 52 in more detail to show the flow guiding fins 60.

5 The flow guiding 60 fins are upright, so that they provide control of the lateral flow direction. In this way, they influence the way the flow from the first vent 52 interacts with the flow from the second and third vents 54, 56. In this example, the first delivery vent comprises a slot 62 extending widthwise across the rear wall area 42, and the flow guiding fins extend from top to bottom of the slot. They may be in front of the slot (as shown, so
10 only extend across the slot at their ends) or they may be recessed within the slot.

The purpose of the flow guiding fins is to improve the flow over the underside of the lid. In particular, the flow from the fan 24 will have different flow exit directions at different positions along the slot. The flow guiding fins are used to redirect the flows so that a more parallel set of flow streams is guided across the underside of the lid.

15 There may be 1 to 10 of the flow guiding fins 60.

The first delivery vent 52 has a lower shelf 64 on which the flow guiding fins 60 are located. This lower shelf 64 serves to direct flow such that it is flat or directed upwardly, thereby direct along or towards the underside of the lid 13.

20 The design of the flow guiding fins 60, in combination with the design of the second and third vents when used, ensures a flow remains at the top of the food chamber until it reaches the rear wall area, thereby flowing over the full area of the lid.

As shown in Figure 4, the first delivery vent 52 may also comprise an upper shelf 66, wherein the flow guiding fins 60 are sandwiched between the lower shelf 64 and the upper shelf 66. The use of upper and lower shelves provides further control of the
25 characteristics of the flow. In particular, there is control of the lateral flow direction as well as the flow direction in the up-down direction.

Figure 5 shows one more detailed example of a design of the first vent 52.

It has four flow guiding fins 60a to 60d. The top image shows the slot 62 from in front. The fins 60 extend back behind the slot rather than projecting forward as in Figures
30 3 and 4. However, they still have a lower shelf and an upper shelf, but recessed behind the rear wall area 42.

The bottom image shows the design of the flow guiding fins from above. It shows that they are directed to provide a lateral flow redirection, based on the local flow conditions created by the fan. Different fins are at different angles to the normal. The aim is

to create a set of flow streams which extend at 90 degrees to the rear wall. Thus, the flow guiding fins are adapted to straighten the flow directions from the directions created by the fan towards this normal direction. The flow guiding fins adapt the flow output from the fan so that regions of the underside of the lid which would, in the absence of the fins, not be exposed to a significant flow will be subject to a flow.

The example shows fins at 55, 60 and 65 degrees to the plane of the rear wall area 42, hence at 35, 30 and 25 degrees to the normal, for the purposes of straightening the flow.

The depth of the fins (in the normal direction) is shown to be 15mm. The height of the fins is also 15mm. The overall length of the slot is shown as 200mm and the fins are shown as distributed non-uniformly along the slot. Of course, they may be distributed uniformly instead. The slot length is chosen to be equal to or larger than the half of width of the transparent lid, specifically the width of the transparent part.

The second and third delivery vents may each also comprise a lower shelf as shown in Figure 6.

The second vent 54 has a second lower shelf 70 and the third vent 56 has a third lower shelf 72. Again, the lower shelves direct the flow from the side vents across or towards the underside of the lid.

The lower shelves of the first, second and third delivery vents may form a continuous ridge as is shown in Figure 6.

The second and third vents may also comprise guiding fins of the type explained above with reference to the first vent.

Figure 7 shows a slightly different vent design. The rear wall has the first delivery vent 52 across the top and it also has side vents 80 extending in the top-to-bottom direction. These are used to create a desired overall flow within the food chamber.

Figure 8 shows that the top of the cooking apparatus, and hence the top and the underside of the lid, are sloped downwardly away from the rear wall area 42. This may further assist in retaining flow across and against the full area of the underside of the transparent lid 13.

Thus, in combination, the flow guiding fins and the slope of the lid ensure air is guided over the whole surface. The slope is for example 10 degrees as shown in Figure 8, for example in the range 5 degrees to 20 degrees.

The aim of the overall design is to limit and preferably even prevent condensation of steam at the transparent section of the lid via heating. Specific heating

parameters (humidity and temperature levels e.g. $<120^{\circ}\text{C}$ for specific cooking programs) are dictated by the cooking process, giving specific restrictions to the heating up of the lid surface. Some of these heating parameters will not allow complete prevention of condensation but the arrangement of the invention will at least provide an improvement.

5 The heat is distributed via an air flow, so an even distribution of the airflow is preferably provided across the inner surface of the transparent lid. The incline means that the air flowing out of the vent or vents expands and drops down towards the intake section of the fan. The inclined lid follows this path for a longer distance than a horizontal lid. The resulting tapered cooking chamber (tapered along the flow direction) maintains the flow speed near the
10 surface of the lid at a higher level, supporting a more even heat distribution. The optimal shape of the lid could be curved, or a planar inclined glass plate may be used to give lower cost.

 Figures 9A and 9B show the benefit of the flow redirection achieved using the flow guiding fins. They show a view from above of the flow conditions (the arrows) on the
15 surface of the underside of the lid.

 Figure 9A shows the flow with no flow guiding fins, and it shows regions where there is little or no flow and a hence non-uniform flow distribution. Figure 9B shows the improvement with the flow guiding fins, and shows a more laminar and uniform flow over the underside of the lid.

20 The example above makes use of two heaters, but there could be a single heater for generating steam and for heating the circulatory flow.

 As mentioned above, another approach for avoiding condensation has been proposed (but not yet published) by the applicant, which involves cooking using steam heated above 100 degrees Celsius. This steam is relatively dry (even when close to the maximal
25 humidity level that is possible at the elevated temperature).

 The heated steam is circulated in manner shown above so that the steam in part performs a drying function. The result is shorter cooking times and also increased nutrient retention because the nutrients are not washed away by large amounts of water used in the cooking process. In particular, washing out of water-soluble vitamins is reduced.

30 This enables the surfaces of the cooking chamber to be maintained more easily above the dew point at the operating temperature, pressure and humidity level, so that no condensation at a surface of the cooking chamber (such as a viewing window) takes place.

 A side effect of the circulation of saturated air at an elevated temperature (such as 120 degrees Celsius) compared to wet steam at around 100 degrees Celsius is that the heat

transfer rate to food due to condensation and convection is increased. As a result, the time to cook the food is decreased compared to standard steam cooking and also increased nutrient retention because the nutrients are not washed away by large amounts of water used in the cooking process. In particular, washing out of water-soluble vitamins is reduced.

5 The delivery vent design described above may be combined with the use of overheated steam.

 The examples above make use of a combination of three vents, as well as flow guiding fins.

10 However, as a minimum, there is only the first delivery vent 52 at a top region of the rear wall area 42 above the extraction vent 50 and extending across at least half of the width of the rear wall area 42 and/or at least half the width of the transparent lid.

 Some further examples will be shown to illustrate how the different design features used in the examples above may be combined or omitted.

15 The same reference numbers are used in Figures 10 to 20 as in Figures 1 to 9 and the description of those components will not be repeated. Figures 10 to 20 each show the food chamber opened up to show the rear wall area and the first and second side wall areas.

 Figure 10 shows an example with only the first delivery vent 52.

20 Figure 11 shows an example with only the first delivery vent, and in which it is also not a continuous slot, but is divided into a set of slots 52a, 52b, 52c. In the particular example of Figure 11, they have progressively decreasing slot height from one side of the rear wall area 42 to the other. This is just an example to show that the airflow conditions may be controlled additionally using different designs of opening, instead of or as well as the use of fins.

25 Figure 12 shows an example with only the first delivery vent, and in which it is again not a continuous slot, but is divided into a set of slots 52a to 52e. In this case, they have progressively decreasing slot width from one side of the rear wall area 42 to the other.

30 Figure 13 shows an example with only the first delivery vent, and in which it is divided into a set of circular openings 52a to 52l. In this case, they have progressively decreasing diameter width from one side of the rear wall area 42 to the other (but in three groups of four, with each group being of the same diameter).

 It will be seen from these examples that the first delivery vent does not need to extend in an uninterrupted manner across the width of the rear wall. It may be formed as a series of openings, which as a whole extend across a desired width as explained above.

The uneven first delivery vent shape may be selected having regard to the flow delivered by the fan. In particular, the fan introduces an airflow which is unevenly distributed across the lid surface. The distribution depends on rotation direction of the fan. A diffusor may be provided at the air exit of the fan (not shown) to compensate the uneven air distribution. The use of irregular vent openings enable restrictions to be implemented into the flow to influence the pressure distribution and to direct the airflow in a better way. Thus, the fins and the particular design of the vent openings together create a desired flow distribution.

Figure 14 shows an example with only the first delivery vent, and in which it has a shelf 64.

Figure 15 shows an example with only the first delivery vent, and in which it is formed as a series of notches 52a - 52f, with open tops leading to the top of the rear wall portion 42.

Figure 16 shows an example with only the first delivery vent, but in which the rear wall portion 42 and the side wall portions 46, 48 have the shelves 64, 70, 72. Thus, even without a vent (and without flow guiding fins) the shelf may be used to provide a flow directing function.

Figure 17 shows an example with the three vents 52, 80 in the rear wall portion 42 as in the example of Figure 7, but with no vents in the side wall portions. -

The open views above show rectangular side wall portions, and hence correspond to a horizontal top.

For completeness, Figures 18 to 20 show more clearly the side wall portions 46, 48 with sloping tops to correspond to the inclined lid explained with reference to Figure 8.

Figure 18 corresponds to Figure 14 but with non-rectangular side wall portions.

Figure 19 corresponds to Figure 16 but with non-rectangular side wall portions.

Figure 20 corresponds to Figure 17 but with non-rectangular side wall portions.

Of course, all of the designs shown in Figures 2, 6, 7 and 10 to 17 may be applied to a design with an inclined top.

As discussed above, embodiments make use of a controller. The controller can be implemented in numerous ways, with software and/or hardware, to perform the various functions required. A processor is one example of a controller which employs one or more

microprocessors that may be programmed using software (e.g., microcode) to perform the required functions. A controller may however be implemented with or without employing a processor, and also may be implemented as a combination of dedicated hardware to perform some functions and a processor (e.g., one or more programmed microprocessors and
5 associated circuitry) to perform other functions.

Examples of controller components that may be employed in various embodiments of the present disclosure include, but are not limited to, conventional microprocessors, application specific integrated circuits (ASICs), and field-programmable gate arrays (FPGAs).

10 In various implementations, a processor or controller may be associated with one or more storage media such as volatile and non-volatile computer memory such as RAM, PROM, EPROM, and EEPROM. The storage media may be encoded with one or more programs that, when executed on one or more processors and/or controllers, perform the required functions. Various storage media may be fixed within a processor or controller or
15 may be transportable, such that the one or more programs stored thereon can be loaded into a processor or controller.

Variations to the disclosed embodiments can be understood and effected by those skilled in the art in practicing the claimed invention, from a study of the drawings, the disclosure and the appended claims. In the claims, the word "comprising" does not exclude
20 other elements or steps, and the indefinite article "a" or "an" does not exclude a plurality. A single processor or other unit may fulfill the functions of several items recited in the claims. The mere fact that certain measures are recited in mutually different dependent claims does not indicate that a combination of these measures cannot be used to advantage. A computer program may be stored/distributed on a suitable medium, such as an optical storage medium
25 or a solid-state medium supplied together with or as part of other hardware, but may also be distributed in other forms, such as via the Internet or other wired or wireless telecommunication systems. Any reference signs in the claims should not be construed as limiting the scope.

CLAIMS:

1. A steam cooking apparatus (10), comprising:
a food chamber (12) comprising a base (40), a rear wall area (42), first and second opposing side wall areas (46,48) and a front wall area (44);
a transparent lid (13);
5 a heating arrangement (16, 18);
a water reservoir (20);
a circulation system (24, 26) comprising an extraction vent (50) in the rear wall area through which air is drawn from inside the food chamber, and a delivery vent arrangement for delivering air to the food chamber,
10 wherein the delivery vent arrangement comprises:
a first delivery vent (52) at a top region of the rear wall area (42) above the extraction vent (50) and extending across at least half of the width of the rear wall area (42) and/or at least half a width of the transparent lid.
- 15 2. The steam cooking apparatus as claimed in claim 1, wherein the transparent lid is inclined downwardly from the rear wall area towards the front wall area.
3. The steam cooking apparatus as claimed in claim 1 or 2, wherein the first delivery vent is in series with a set of flow guiding fins (60), wherein the flow guiding fins
20 (60) are upright.
4. The steam cooking apparatus as claimed in claim 3, wherein the first delivery vent (52) comprises a slot extending (62) widthwise across the rear wall area, and the flow guiding fins (60) extend from top to bottom of the slot, within or in front of the slot.
25
5. The steam cooking apparatus as claimed in any one of claims 3 to 4, wherein the first set of flow guiding fins comprises 1 to 10 flow guiding fins.

6. The steam cooking apparatus as claimed in any one of claims 3 to 5, wherein the first delivery vent (52) comprises a lower shelf (64) on which the flow guiding fins are located.

5 7. The steam cooking apparatus as claimed in claim 6, wherein the first delivery vent (52) comprises an upper shelf (66), wherein the flow guiding fins (60) are sandwiched between the lower shelf and the upper shelf.

8. The steam cooking apparatus as claimed in any one of claims 1 to 7, further
10 comprising:
a second delivery vent (54) at a top region of the first side wall area; and
a third delivery vent (56) at a top region of the second side wall area.

9. The steam cooking apparatus as claimed in claim 8, wherein the second and
15 third delivery vents (54,56) each comprise a lower shelf (70,72).

10. The steam cooking apparatus as claimed in claim 6 and claim 9, wherein the
lower shelves (64, 70,72) of the first, second and third delivery vents form a continuous
ridge.
20

11. The steam cooking apparatus as claimed in any one of claims 1 to 10,
comprising a controller (28) adapted to control the heating arrangement to heat water from
the water reservoir to create steam.

25 12. The steam cooking apparatus as claimed in any one of claims 1 to 11, further
comprising a water dosing system (22) for delivering water to the heating arrangement.

13. The steam cooking apparatus as claimed in any one of claims 1 to 12,
comprising a feed arrangement (23) for providing water from the water reservoir into contact
30 with a heated surface of the first heater.

14. The steam cooking apparatus as claimed in any one of claims 1 to 13, wherein
the transparent lid (13) is openable.

15. The steam cooking apparatus as claimed in any one of claims 1 to 14, wherein the delivery vent arrangement is adapted to:

create a flow over the full area of an underside of the transparent lid (13)

and/or

5 prevent localized flow rotation within the food chamber.

1/11

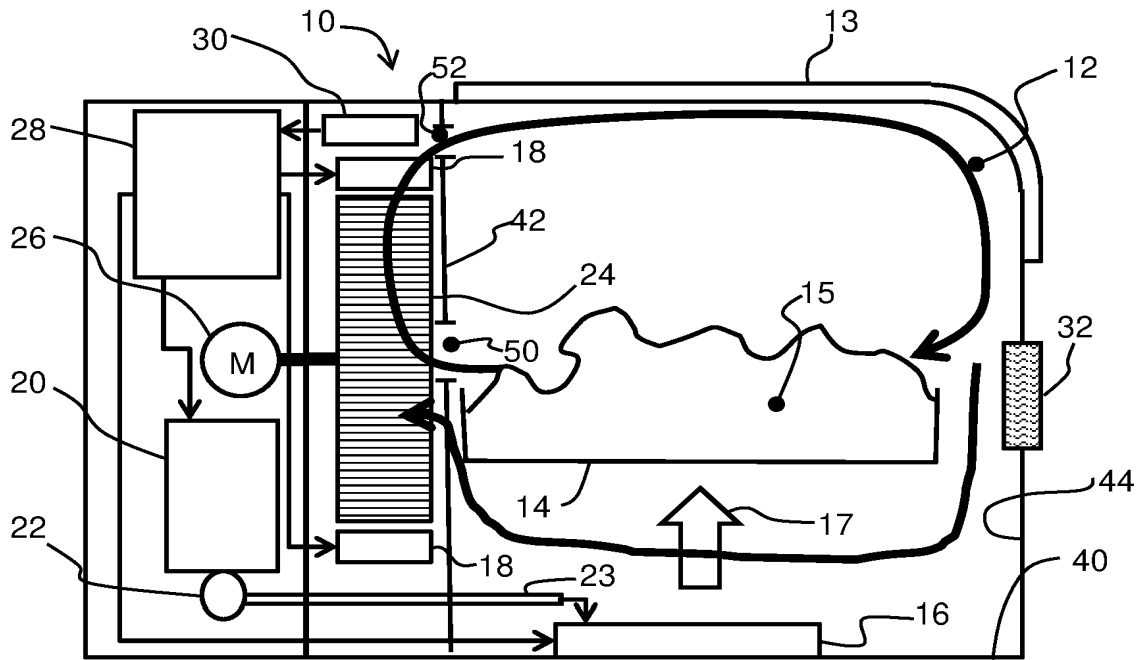


FIG. 1

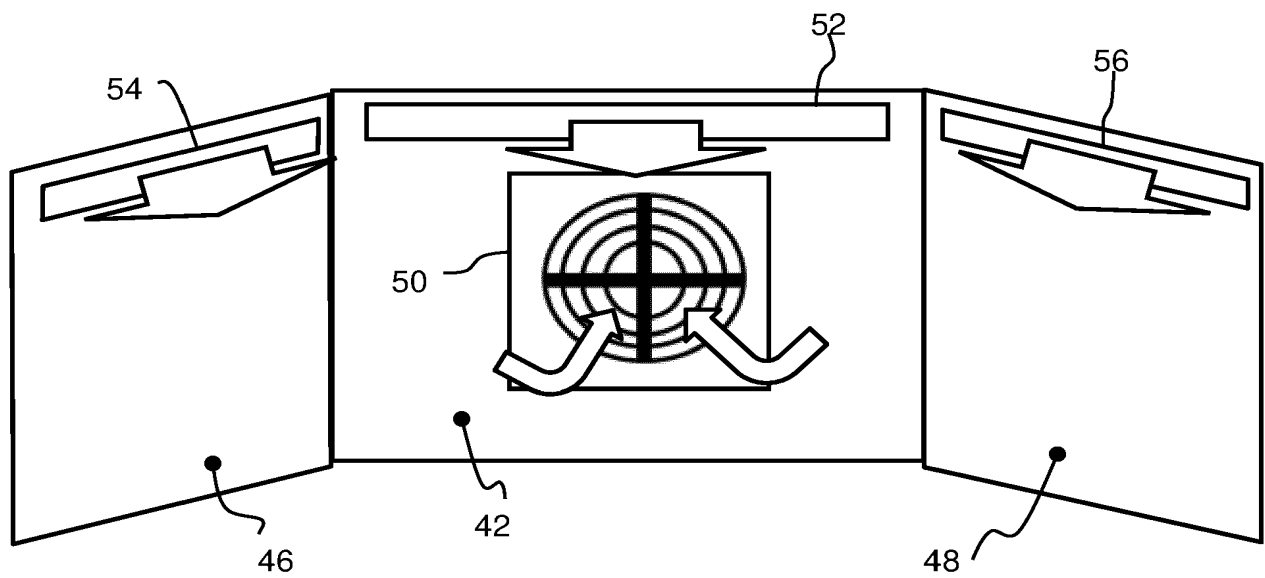


FIG. 2

2/11

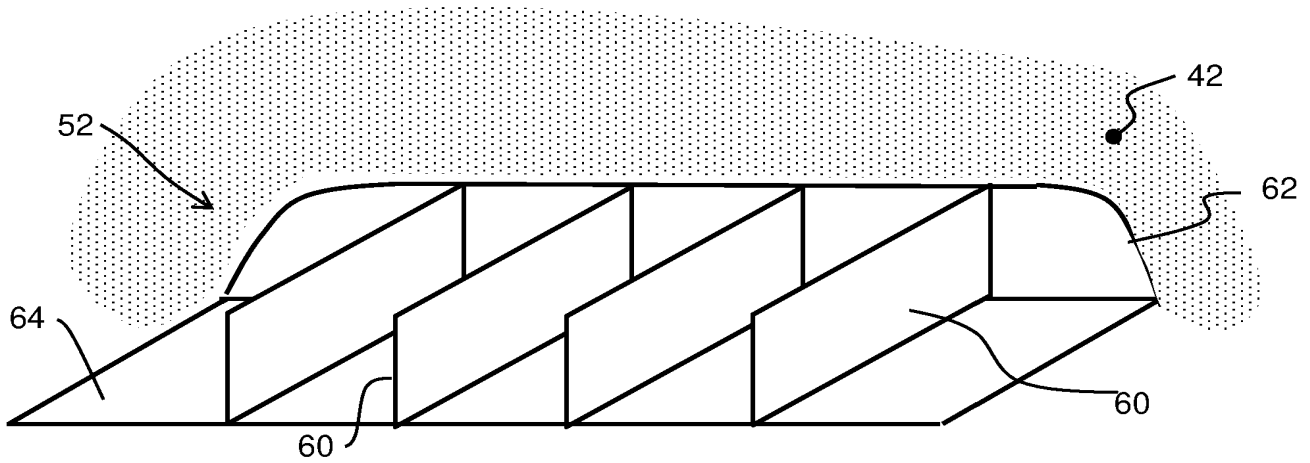


FIG. 3

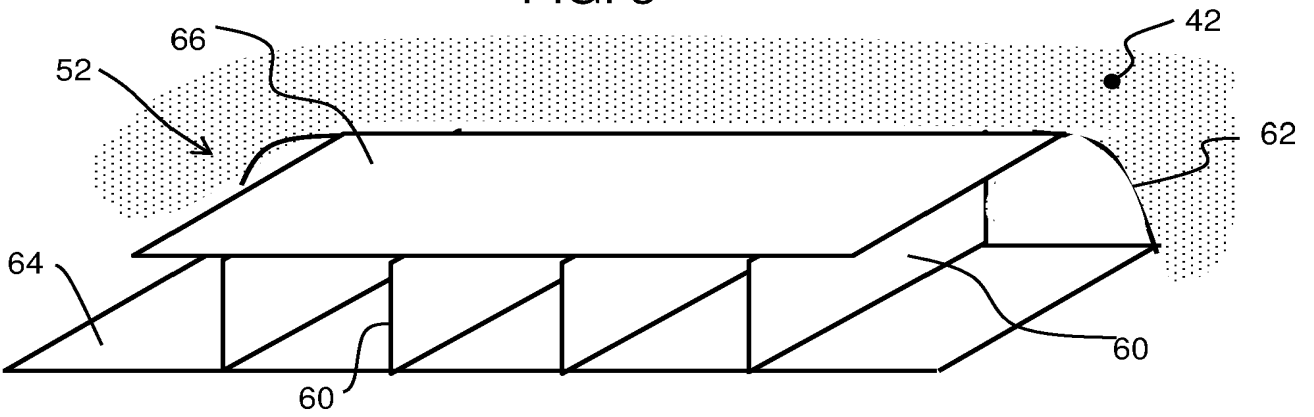


FIG. 4

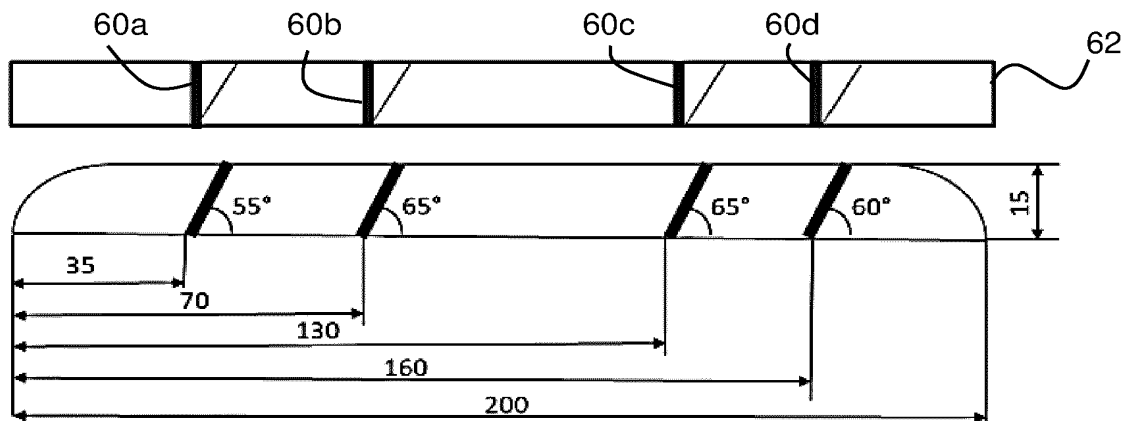


FIG. 5

3/11

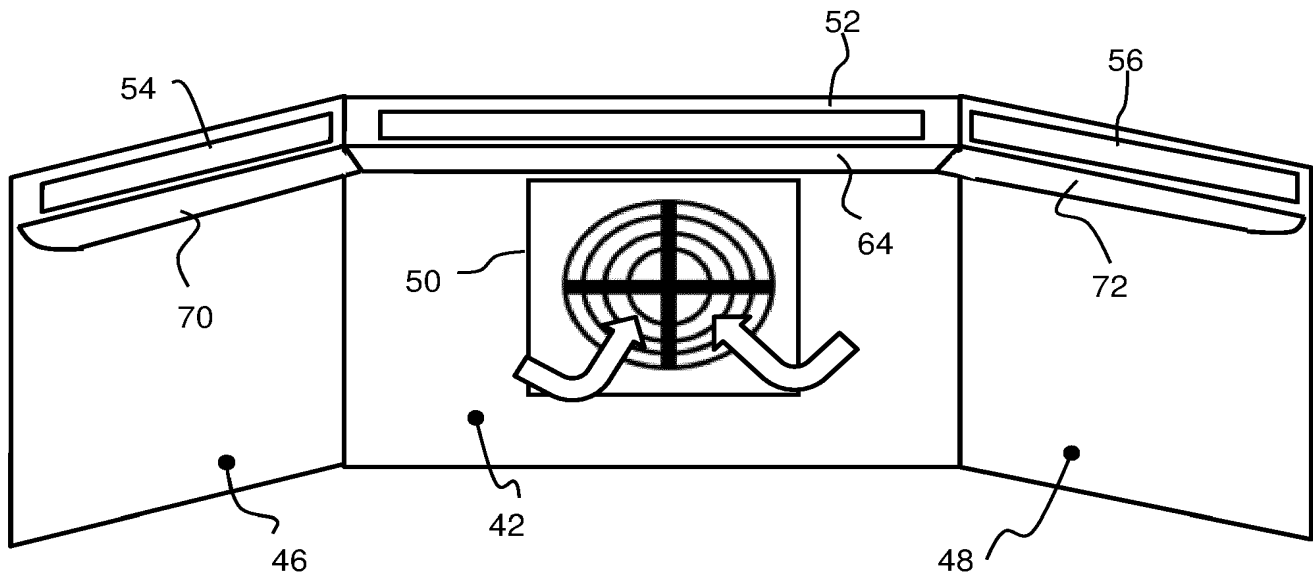


FIG. 6

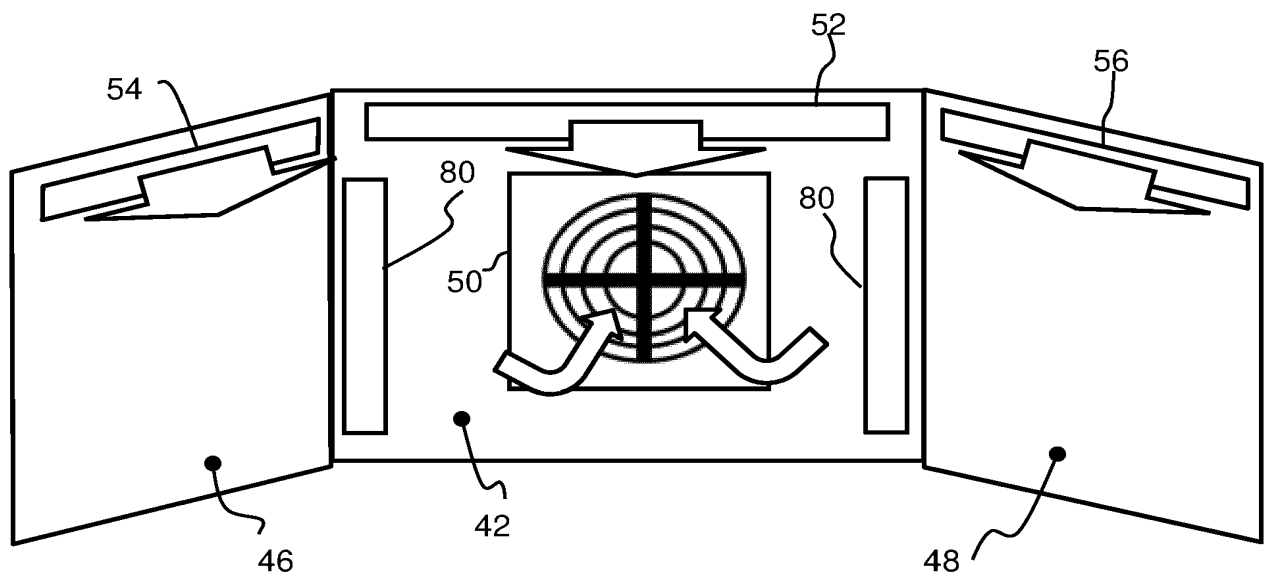


FIG. 7

4/11

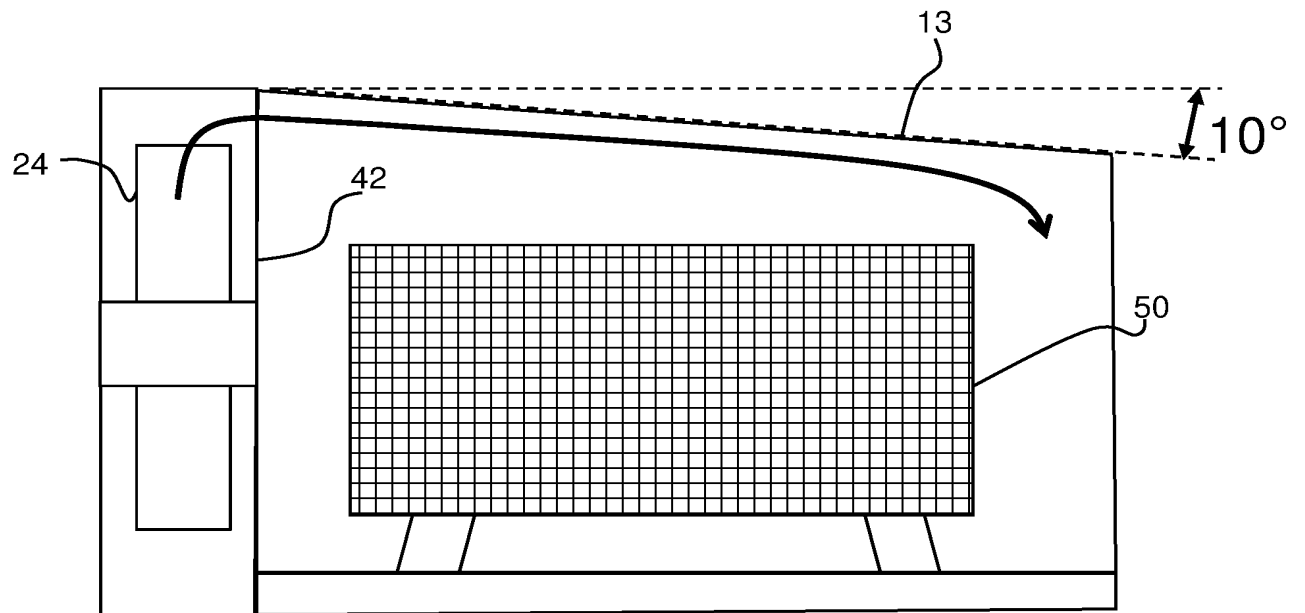


FIG. 8

5/11

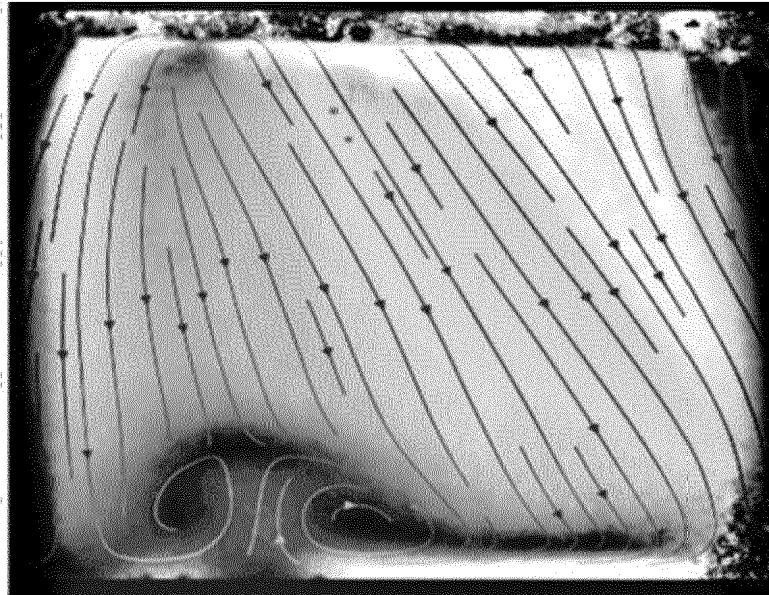


FIG. 9A

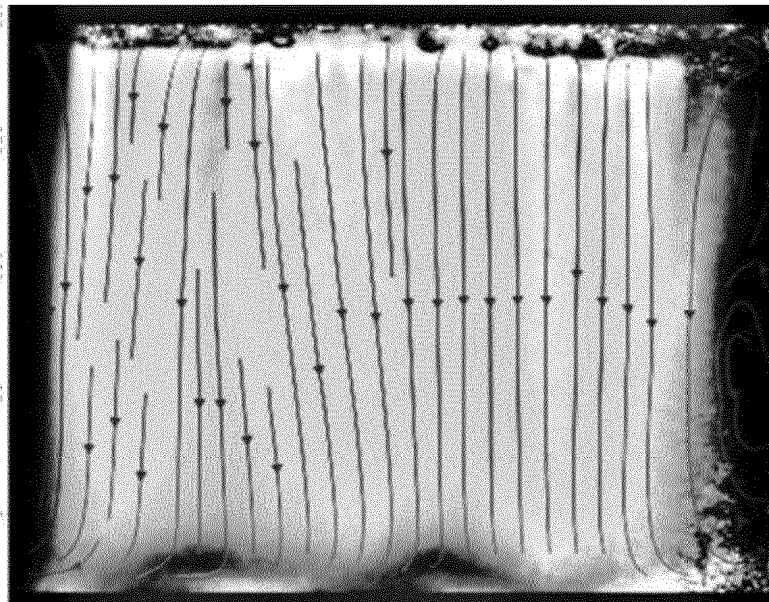


FIG. 9B

6/11

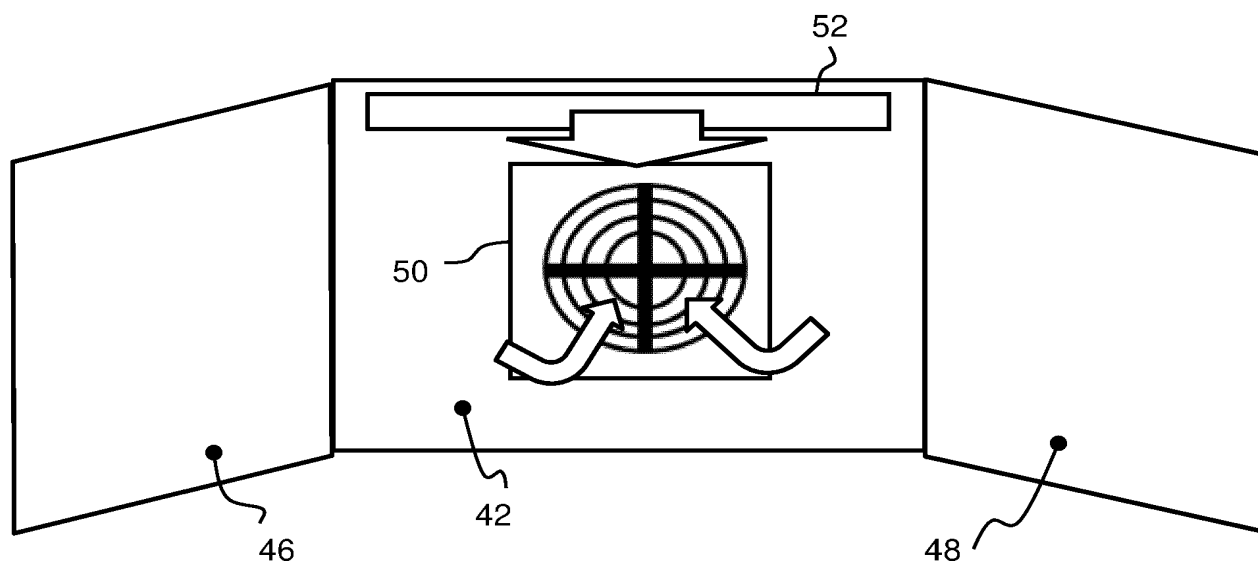


FIG. 10

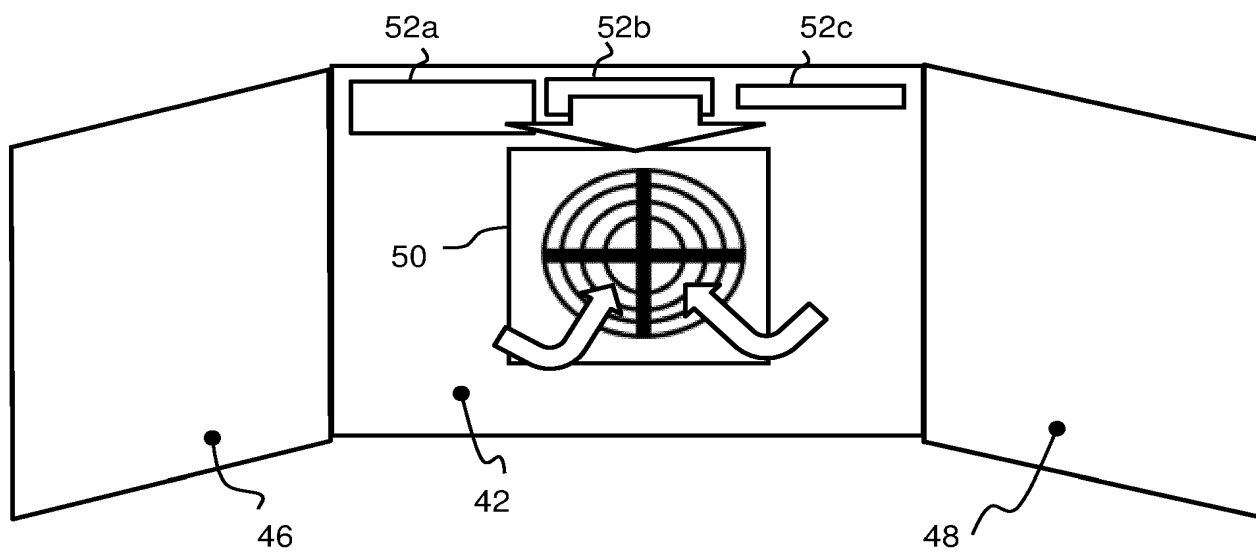


FIG. 11

7/11

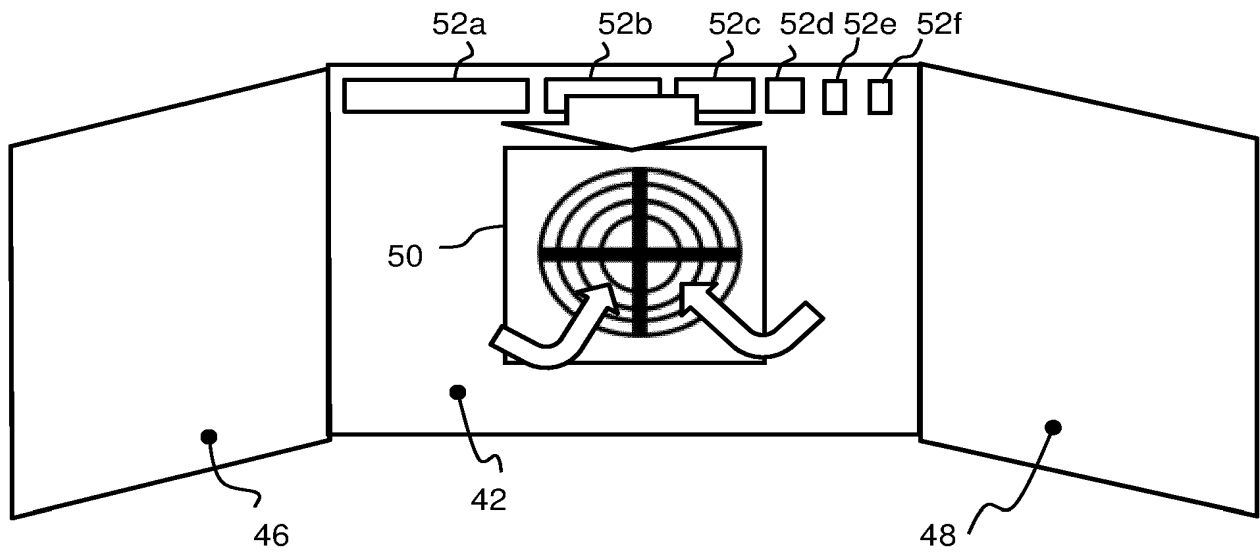


FIG. 12

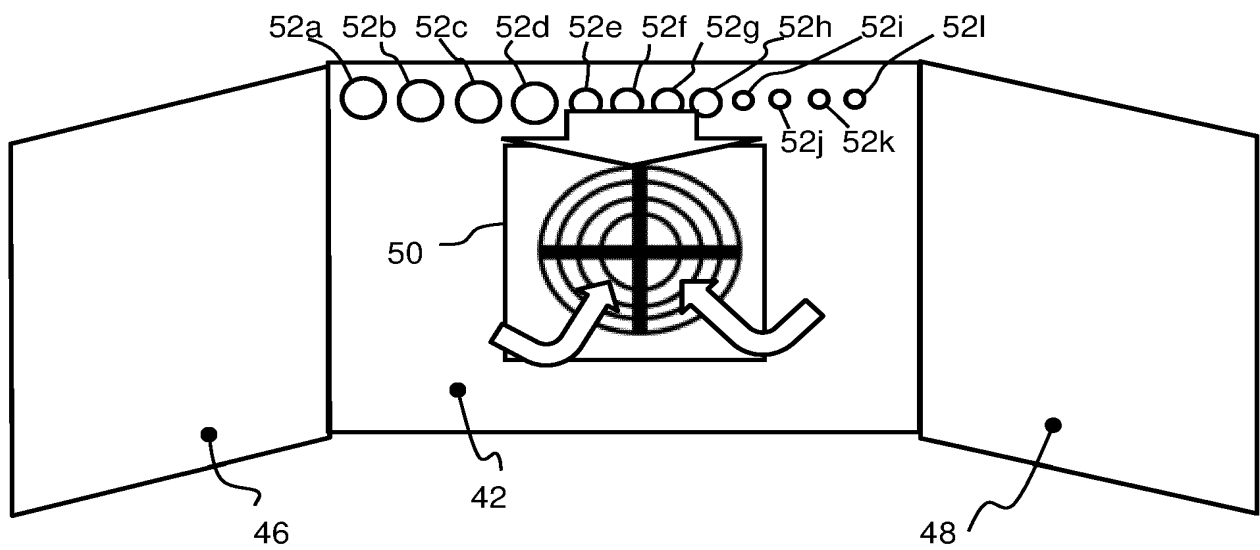


FIG. 13

8/11

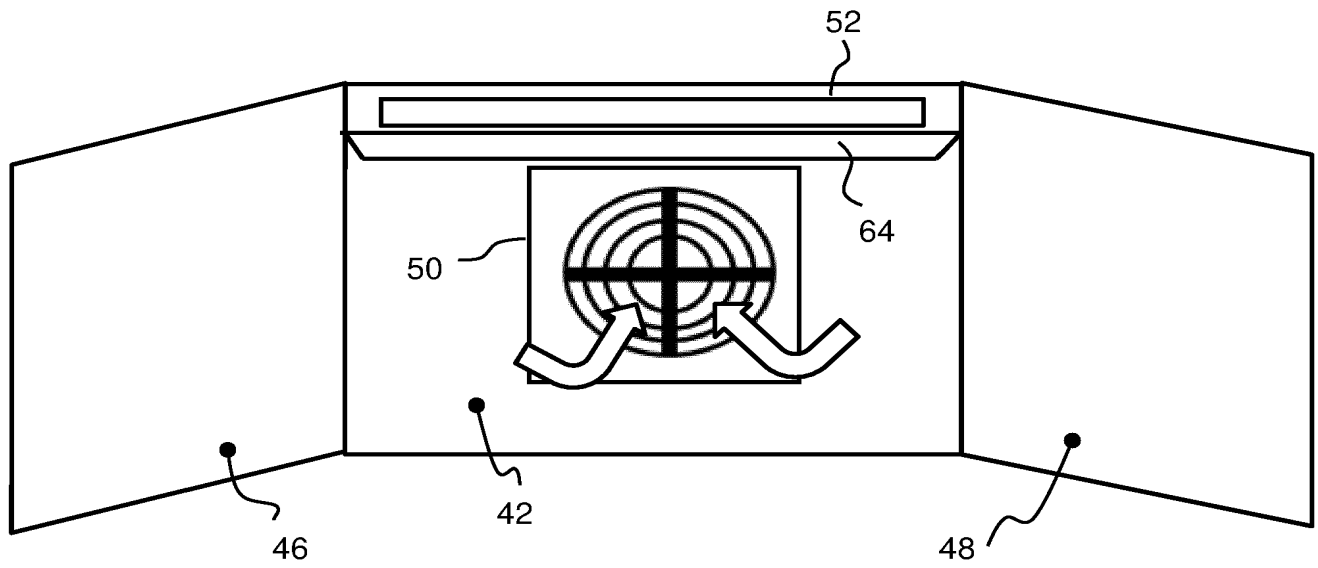


FIG. 14

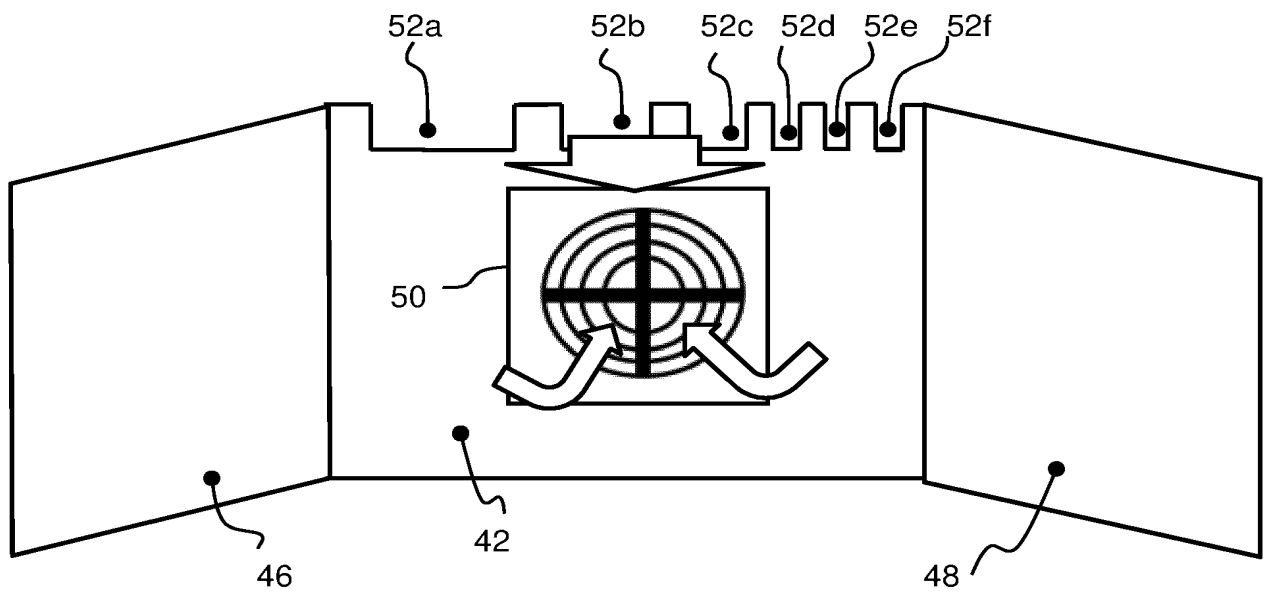


FIG. 15

9/11

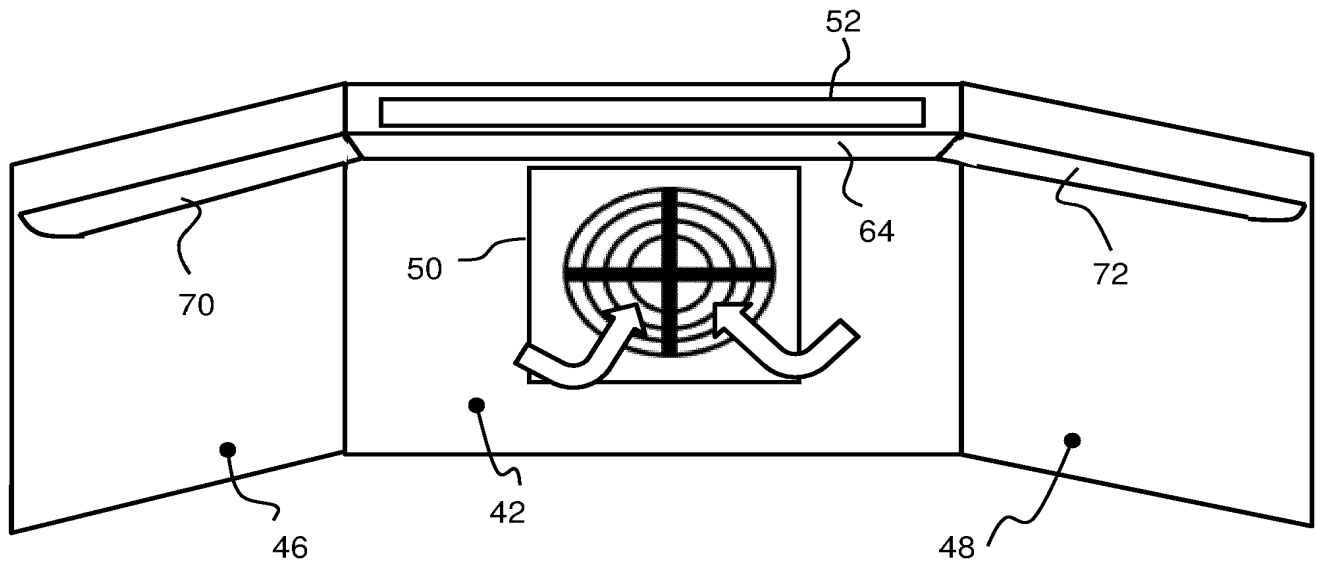


FIG. 16

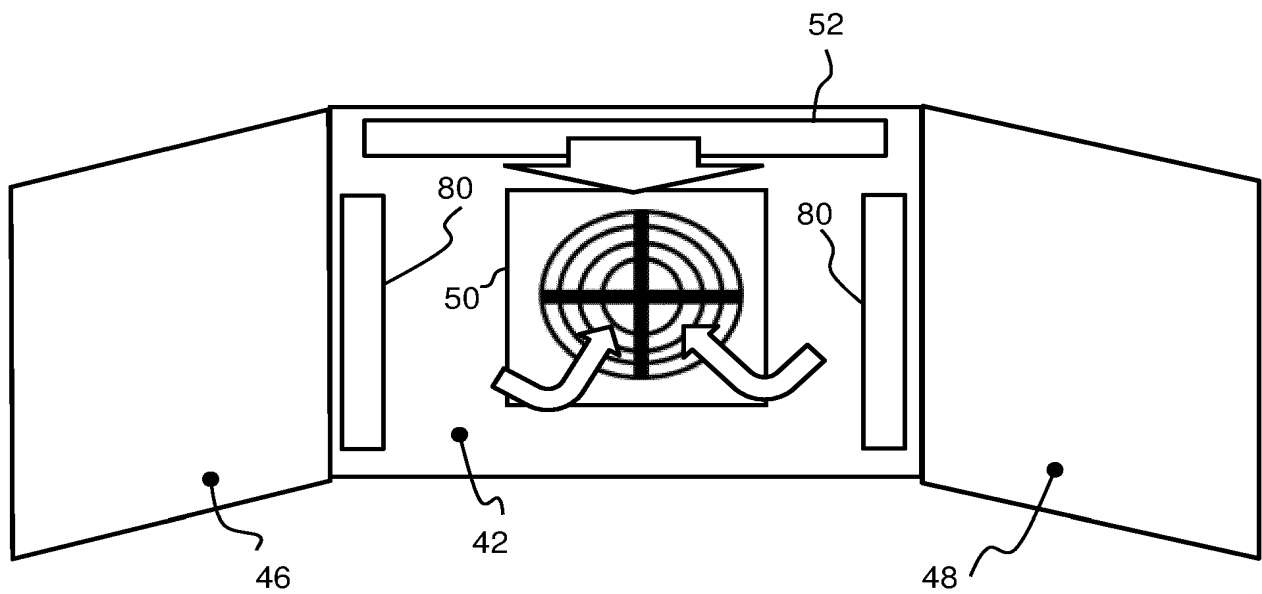


FIG. 17

10/11

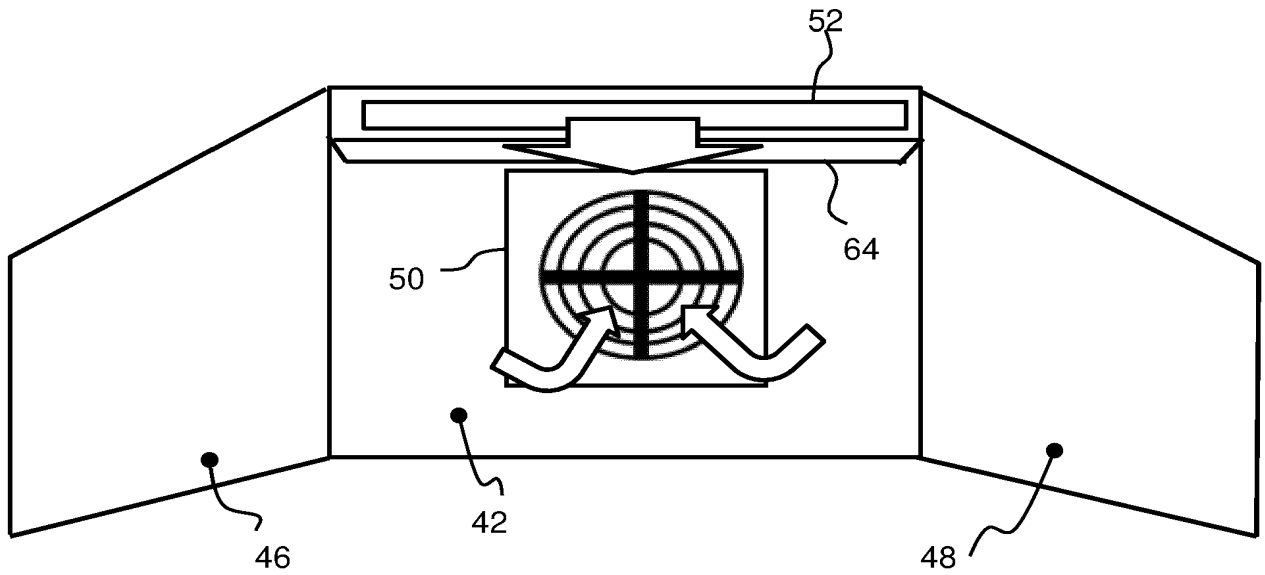


FIG. 18

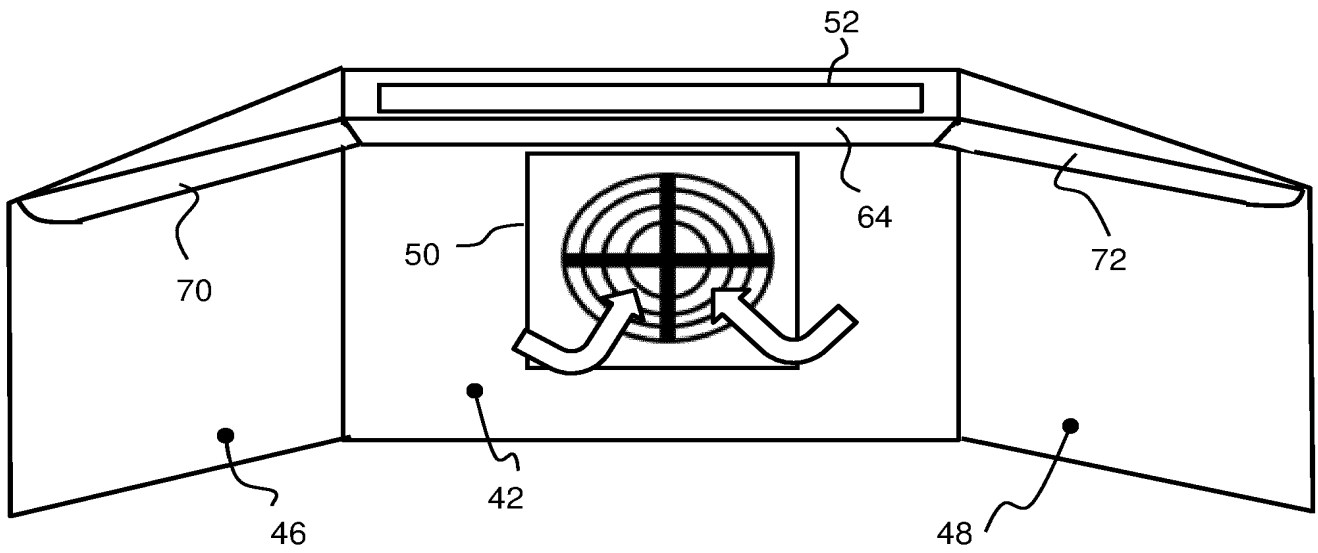


FIG. 19

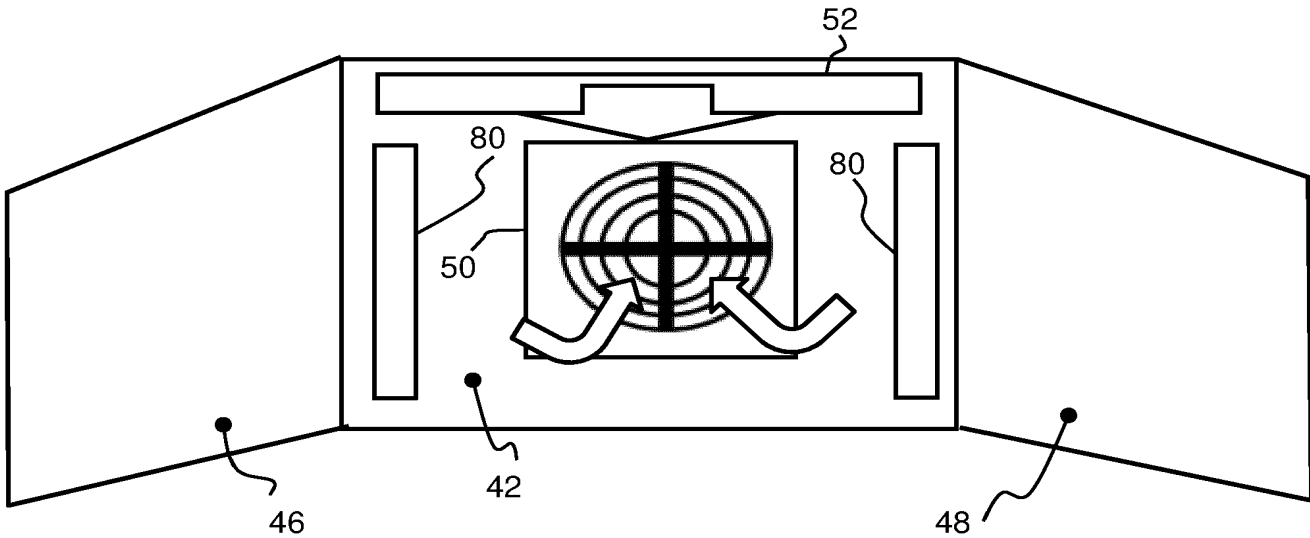


FIG. 20

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2020/050540

A. CLASSIFICATION OF SUBJECT MATTER

INV. A47J27/04 A47J37/06 F24C15/32
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)

A47J F24C A21B

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.
A	TW M 555 930 U (ROUND SHINE INDUSTRIAL CO LTD [TW]) 21 February 2018 (2018-02-21) abstract; figures -----	1-15
A	JP S57 163505 U (N.A.) 15 October 1982 (1982-10-15) figures -----	1-15
A	EP 2 083 223 A1 (SHARP KK [JP]) 29 July 2009 (2009-07-29) paragraphs [0017], [0018], [0056], [0057]; figure 4 -----	1-15
A	US 2010/006086 A1 (IWAMOTO MASAYUKI [JP]) 14 January 2010 (2010-01-14) paragraphs [0035], [0036]; figure 1 ----- -/--	1-15



Further documents are listed in the continuation of Box C.



See patent family annex.

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"&" document member of the same patent family

Date of the actual completion of the international search

23 March 2020

Date of mailing of the international search report

14/04/2020

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2020/050540

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	JP S57 52426 A (TOKYO SHIBAURA ELECTRIC CO) 27 March 1982 (1982-03-27) figures -----	1-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2020/050540

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(51) International Patent Classification:

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A47J 36/26 (2006.01) A23L 5/00 (2016.01)
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English

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(54) Title: MULTI-MEAL COLD STORAGE AND COOKING APPLIANCE AND SYSTEM

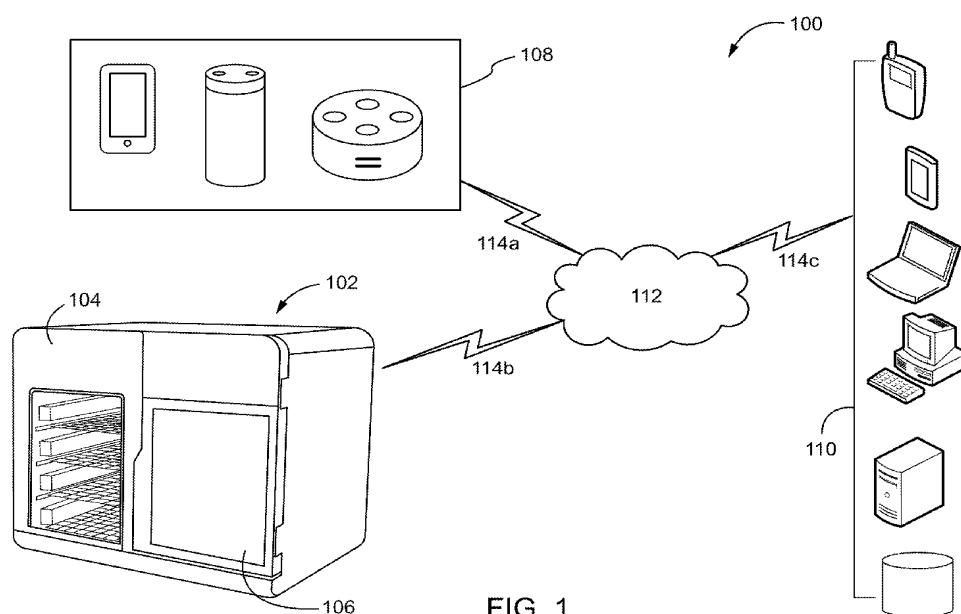


FIG. 1

(57) Abstract: The present disclosure relates to an appliance. In one embodiment, the appliance has an enclosed structure which includes a first portion configured to receive one or more meal cartridges, and store and preserve the meal cartridges at a selected temperature range; a second portion; and transfer mechanism configured to transfer at least one meal cartridge in the first portion to the second portion within the enclosed structure in response to a command input for cooking the at least one meal cartridge. The second portion is configured to accept the at least one meal cartridge, receive a cooking instruction command including a cooking duration and temperature determined for the at least one meal cartridge, and cook the at least one meal cartridge based upon the cooking duration and temperature.

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MULTI-MEAL COLD STORAGE AND COOKING APPLIANCE AND SYSTEM

Cross-Reference to Related Application

[0001] This application claims priority to U.S. Provisional Patent Application No. 62/806,298, filed February 15, 2019, the content of which is herein incorporated by reference.

Field of Technology

[0002] The present disclosure generally relates to an appliance, and more particularly relates to a combination smart kitchen appliance comprising a multi-item/meal cold storage and hot cooking area with automatic transfer from the cold storage to the hot cooking area via, *e.g.*, a command from Internet Of Things (IOT) connectivity.

Background

[0003] Preparing and cooking a meal can be time consuming and often requires constant human intervention and attention. Certain current smart kitchen appliances may cook one meal and use sous vide style of cooking. An example of a self-contained oven design may keep a singular meal cold using a water bath that is temperature controlled. Upon receiving a command to cook the meal, the water bath may be heated to a set time and temperature according to a desired doneness of the meal. For some smart cooking appliances, it may still require a person to take a food item from a refrigerator, move it to a hot plate or cooking device, and look up and set a cooking time and temperature.

[0004] Accordingly, it is desirable to have an appliance that is configured to cook multiple items without human intervention, such that a person need not be home or in the kitchen to select a meal from cold storage and cook it, look up cook times and temperatures for different food products, or spend time preparing and cooking one or more meals.

Summary

[0005] The present disclosure generally discloses an appliance having an enclosed structure. The enclosed structure may comprise a first portion configured to receive one or more meal cartridges, and store and preserve the meal cartridges at a selected temperature range. The enclosed structure may also comprise a second portion and a transfer mechanism configured to transfer at least one meal cartridge from the first portion to the second portion within the

enclosed structure in response to a command input for cooking the at least one meal cartridge. The second portion may be configured to: accept the at least one meal cartridge, receive a cooking instruction command wherein the cooking instruction command comprises a cooking duration and temperature determined for the at least one meal cartridge, and cook the at least one meal cartridge based upon the cooking duration and temperature.

[0006] In one embodiment, the first portion may comprise a plurality of removable shelves configured to store the meal cartridges. The selected temperature range for the first portion may be from about -10 degrees Fahrenheit to about 40 degrees Fahrenheit. The second portion may be configured to heat up to about 1000 degrees Fahrenheit.

[0007] In a further embodiment, the disclosed appliance may comprise modules configured to detect: a cooking status of the at least one meal cartridge in the second portion, a presence or absence of any meal cartridge on each shelf of the first portion, an indication of a network connectivity status, an operating status of the appliance, or an operating status of the second portion.

[0008] In yet another embodiment, the disclosed appliance may comprise an interface configured to display one or more of: the cooking status of the at least one meal cartridge in the second portion, the presence or absence of any meal cartridge on each shelf of the first portion, the indication of the internet connectivity status, the operating status of the appliance, and the operating status of the second portion.

[0009] Moreover, the interface of the appliance may comprise at least one button selected from a reset button, a cancel button, a pause/resume button, a reheat button, and a sync button of the appliance.

[0010] The transfer mechanism may be configured to sequentially transfer two or more meal cartridges from the first portion to the second portion within the enclosed structure in response to receiving the cooking instruction commands for cooking the two or more meal cartridges. The second portion may be configured to receive a cooking sequence of the two or more meal cartridges, and accept and cook the two or more meal cartridges in accordance with the cooking sequence and the cooking duration and temperature determined for each of the two or more meal cartridges.

[0011] The disclosed appliance may further comprise means for opening the at least one meal cartridge prior to transferring the at least one meal cartridge from the first portion to the second portion.

[0012] In addition, each of the meal cartridges may be associated with a unique identifier, and the appliance may further comprise a module for detecting the unique identifier associated with each meal cartridge when the first portion receives each meal cartridge.

[0013] In one embodiment, the second portion may be configured to detect the unique identifier associated with each meal cartridge when the second portion receives each meal cartridge from the first portion.

[0014] The disclosed appliance may further comprise insulation means for thermally insulating the first portion from the second portion of the appliance. The second portion may comprise a convection heater, and a fan assembly. The cooking temperature and cooking duration may be controlled by an oven that is controlled by at least one processor of the appliance. In one embodiment, the oven may comprise a browning element configured to warm the at least one meal cartridge upon detecting that the at least one meal cartridge has not been taken out of the second portion after being cooked.

[0015] In yet another embodiment, the first portion and the second portion of the appliance may be separated by a divider comprising at least one of a door, a slider, or a roller. The divider may further comprise guides configured to engage the at least one meal cartridge when transferring the at least one meal cartridge from the first portion to the second portion. The second portion may comprise an elevator tray with opening means for extracting the at least one meal cartridge from the first portion. The elevator tray may be further configured to select the at least one meal cartridge chosen by the cooking instruction command by moving vertically within the second portion and transferring the at least one meal cartridge to an oven contained in the second portion, wherein the elevator tray is configured to form the bottom of the oven.

[0016] In another embodiment, the first portion may comprise a compressor and an oven, and the appliance comprises a vent from the compressor to the oven. The compressor may generate heat as it operates and that heat is vented to the oven via the vent to maintain the oven at a preselected temperature. The first portion may further comprise at least one of a camera, an RF ID tag, or barcode reader device. The second portion may further comprise means for detecting a fire within the second portion.

[0017] Furthermore, the second portion may comprise means for disposing of waste from the at least one meal cartridge. The interface may be configured to interact with third party applications via application programming interface (API) synch or account linking. The second portion may comprise at least one of an oven, a pressure cooker, a microwave, or a steam oven. In one embodiment, the second portion may further comprise a plurality of

sections configured to independently cook different ingredients of a meal at different temperatures.

[0018] The above simplified summary of example aspects serves to provide a basic understanding of the present disclosure. This summary is not an extensive overview of all contemplated aspects, and is intended to neither identify key or critical elements of all aspects nor delineate or otherwise limit the scope of any or all aspects of the present disclosure. Its sole purpose is to present one or more aspects in a simplified form as a prelude to the more detailed description of the disclosure that follows. To the accomplishment of the foregoing, the one or more aspects of the present disclosure include the features described and exemplary pointed out in the claims.

Brief Description of the Drawings

[0019] The accompanying drawings, which are incorporated into and constitute a part of this specification, illustrate one or more example aspects of the present disclosure and, together with the detailed description, serve to explain their principles and implementations.

[0020] Fig. 1 illustrates a system deployed in a communication network for controlling a smart appliance having a multi-item/meal cold storage and hot cooking area with automatic transfer from the cold storage to the hot cooking area in response to a cooking instruction command, according to an exemplary aspect of present disclosure;

[0021] Fig. 2 illustrates a simplified diagram of the system of Fig. 1, according to an exemplary aspect;

[0022] Fig. 3 illustrates a front view of the smart appliance of Fig. 1, according to an exemplary aspect;

[0023] Fig. 4 illustrates a rear view of the smart appliance of Fig. 1, according to an exemplary aspect;

[0024] Fig. 5 illustrates a flow chart of a method implemented in the system of Fig. 1, according to an exemplary aspect; and

[0025] Figs. 6-19 illustrate a general example of how the smart appliance of Fig. 1 stores, transfers, and cooks a premade meal cartridge, according to an exemplary aspect.

Detailed Description

[0026] Various aspects of examples of embodiments will be described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to promote a thorough understanding of one or more aspects of the embodiments described herein. It may be evident in some or all instances, however, that any aspects described below can be practiced without adopting the specific design details described below and one of skill in the art would understand how to depart from the specific examples described below.

[0027] According to an embodiment, Fig. 1 generally illustrates a system 100 that may be implemented for refrigerating and storing multiple premade meals, and cooking a selected premade meal without requiring human intervention. Unlike aforementioned prior approaches, a smart appliance 102 of system 100 may allow a user to have multiple choices with respect to a meal the user wishes to cook. Not only do premade meals used in connection with smart appliance 102 eliminate the time spent preparing food, these meals may also allow the user options and the ability to use smart appliance 102 multiple times before having to restock it. As will be described fully below, system 100 allows the user to use real world data (*e.g.*, traffic, travel time, sports events, *etc.*) to have the food ready at a potentially dynamic time. For example, the user may desire to have the food ready when the user gets home from work based on traffic or around half time of the Super Bowl. For example, a dynamic time may be achieved when a user sends a cooking instruction command to the appliance when leaving work. The appliance may communicate, for example, with a user's smartphone or automobile GPS to automatically adjust the cooking time so that the user's desired food item is prepared upon arrival at home. That dynamic cooking time can be adjusted, for example, by altering a temperature set point in the oven, or replacing the meal back into the cooling portion depending on the estimated length of time until the user will want to consume the meal. The dynamic cooking time can increase or decrease the cooking from the initially estimated time. For example, if a user wishes to eat a meal at 6 PM and leaves work at 5:30 PM with a typical commute of 30 minutes and a initially-estimated cook time of 25 minutes, the device may wait until 5:30 to begin cooking the meal. If that user encounters a delay that would cause the user to be 15 minutes late, the device can dynamically increase the cooking time so that it is ready to eat when the user arrives home. The device can also assess variable such as traffic, travel time, a delay to arrive, *etc.*, to

determine that the meal will be best prepared by using the initially estimated time and then maintaining an oven setting to keep the food warm until the user is ready to consume it.

[0028] In one aspect, system 100 may be configured to utilize one click reorders and notify the user when the user should reorder based on how many premade meals the user has used. The user may also enable an auto-reorder function, so the user needs not to be involved.

[0029] As shown in Fig. 1, smart appliance 102 of system 100 may comprise a conjoined freezer portion 104 and an oven portion 106 within an enclosed structure (*e.g.*, an appliance housing structure). Oven portion 106 may comprise a plurality of sections that may be independently heated to differing temperatures and for differing cooking times, such that the oven portion may independently cook different ingredients of a meal at different temperatures and for different times. These sections may be oriented vertically relative to one another (*e.g.*, on different shelves) or in a horizontal orientation such that a single shelf may contain several partitioned sections capable of maintaining differing temperatures. In one embodiment, the freezer portion 104 may define a cold food storage area having, *e.g.*, multiple trays or shelves of food storage, on one side within the housing of smart appliance 102. The freezer portion 104 may be configured to receive one or more meal cartridges, and store and preserve these meal cartridges at a selected temperature range. For example, the user may manually load the freezer portion 104 by placing multiple premade meal cartridges on respective food storage shelves. These meal cartridges may have uniform or different sizes. Each meal cartridge may be associated with a unique identifier. Smart appliance 102 may contain a detector to read and/or identify the unique identifier. For example, an onboard barcode scanner of smart appliance 102 may be configured to detect the unique identifier associated with each meal cartridge upon its insertion into the freezer portion 104. Some embodiments may use a camera, radio frequency identification (RFID) reader, or the like to detect the meal cartridge selected by the user. This may trigger an upload of food data to, *e.g.*, a connected cloud system (*e.g.*, computing server system 110) and corresponding user profile. The user may use a suitable computing device 108 (*e.g.*, a smart device or connected smart home device) to command smart appliance 102 to cook one or more of the available meal cartridges. In some embodiments, a user may select a serving size (*e.g.*, number of intended diners) and the appliance may choose to cook one or more selected food cartridges depending on that selection and their dynamic time. For example, a user may communicate that two diners would like a pasta dish and the cooking portion may choose to cook two pasta meal cartridges or, instead, choose to cook one larger meal cartridge so that the cooking time and cooked

meal cartridge quality is optimized.

[0030] In one aspect, smart appliance 102 and various computing devices may be configured to communicate with computing server system 110 via a communication network 112 using suitable network connections and protocols 114a, 114b, and 114c. A communication network (*e.g.*, communication network 112) may refer to a geographically distributed collection of computing devices or data points interconnected by communication links and segments for transporting signals and data therebetween. A protocol (*e.g.*, protocols 114a, 114b, and 114c) may refer to a set of rules defining how computing devices and networks may interact with each other, such as frame relay, internet protocol (IP), transmission control protocol (TCP), user datagram protocol (UDP), hypertext transfer protocol (HTTP). Many types of communication networks are available, ranging from local area networks (LANs), wide area networks (WANs), cellular networks, to overlay networks and software-defined networks (SDNs), a packet data network (*e.g.*, the Internet), mobile telephone networks (*e.g.*, cellular networks, such as 4G or 5G), Plain Old Telephone (POTS) networks, and wireless data networks (*e.g.*, Institute of Electrical and Electronics Engineers (IEEE) 802.11 family of standards known as Wi-Fi[®], WiGig[®], IEEE 802.16 family of standards known as WiMax[®], IEEE 802.15.4 family of standards, a Long Term Evolution (LTE) family of standards, a Universal Mobile Telecommunications System (UMTS) family of standards, peer-to-peer (P2P) networks, virtual private networks (VPN), Bluetooth, Near Field Communication (NFC), or any other suitable network.

[0031] For example, communication network 112 may be a LAN configured to connect each, any, and all computing devices and smart appliance 102 deployed within a user's home over dedicated private communications links. Communication network 112 may be a WAN configured to connect computing devices deployed within the user's home and other geographically dispersed computing devices and networks over long-distance communications links, such as common carrier telephone lines, optical light paths, synchronous optical networks (SONET), or synchronous digital hierarchy (SDH) links. The Internet may be used to connect disparate devices and networks throughout the world, providing global communication among nodes (a node of an Internet has an IP address) on various networks. These nodes may communicate over the communication network 112 by exchanging discrete frames or packets of data according to protocols 114a-114c, such as TCP/IP. Communication network 112 may be further interconnected by an intermediate network node, such as a router and/or gateway device, to extend the effective size of each

network.

[0032] In another aspect, system 100 may employ a cloud-based communication network 112 for providing computing services using shared resources. Cloud computing may generally include Internet-based computing in which computing resources are dynamically provisioned and allocated to each connected computing device or other devices on-demand, from a collection of resources available via the network or the cloud. Cloud computing resources may include any type of resource, such as computing, storage, and networking. For instance, resources may include service devices (firewalls, deep packet inspectors, traffic monitors, load balancers, *etc.*), compute/processing devices (servers, CPUs, GPUs, random access memory, caches, *etc.*), and storage devices (*e.g.*, network attached storages, storage area network devices, hard disk drives, solid-state devices, *etc.*). In addition, such resources may be used to support virtual networks, virtual machines, databases, applications, *etc.*

[0033] Cloud computing resources accessible via communication network 112 may include a private cloud, a public cloud, and/or a hybrid cloud. For example, a private cloud may be a cloud infrastructure operated by an enterprise for use by the enterprise, while a public cloud may refer to a cloud infrastructure that provides services and resources over a network for public use. In a hybrid cloud computing environment which uses a mix of on-premises, private cloud and third-party, public cloud services with orchestration between the two platforms, data and applications may move between private and public clouds for greater flexibility and more deployment options.

[0034] In accordance with an aspect, computing server system 110 of the present disclosure may be cloud-based and may comprise at least one of personal computers, servers, server farms, laptops, tablets, mobile devices, smart phones, smart watches, fitness tracker devices, cellular devices, gaming devices, media players, network enabled printers, routers, wireless access points, network appliances, storage systems, gateway devices, smart home devices, virtual or augmented reality devices, or any other suitable devices that are deployed in the same or different communication network of smart appliance 102 and computing device 108. As will be described fully below, computing server system 110 may be configured to provide functionalities for any connected devices such as sharing data or provisioning resources among multiple client devices, or performing computations for each connected client device.

[0035] As will be described fully below, upon receipt of a command over the communication network 112, a partition (not shown in Fig. 1) between the freezer portion 104 and oven

portion 106 inside smart appliance 102 may be configured to open from the freezer portion 104 to an elevator shaft (not shown) which may be located below an oven in the oven portion 106. An oven bottom may be configured to move down the elevator shaft to an appropriate shelf level of the freezer portion 104 of a user selected food item/meal corresponding to the received command. In one embodiment, transfer mechanism (*e.g.*, a pusher or a puller) in the freezer portion 104 may be configured to slide the selected food item onto the oven bottom in the elevator shaft. Alternatively, the transfer mechanism (*e.g.*, the pusher or the puller) may be configured to be attached to the elevator. The oven bottom may be configured to move up to reseal the oven and start cooking the food item positioned in the oven. Simultaneously with the oven bottom resealing the oven, the partition between the freezer and oven portions 104, 106 may be configured to reseal the freezer portion 104. The cook time and temperature of the food item in the oven may be determined and set based on information retrieved from a database, such as a manufacture database or a proprietary database, online associated with the food item. The user may be notified of the different states of the food item (*e.g.*, prepare, cooking, ready, error, *etc.*). Upon detecting that the food item has been cooked to a desired state, the oven bottom may be configured to move down and wait for the user to pull the food item out through a door of the oven portion 106. During this time, a browning element in the oven portion 106 may be used as a warmer to keep the food item warm.

[0036] In some embodiments, a transfer mechanism may hold a meal cartridge by the top and convey the meal cartridge to an oven located at the bottom of the unit. In some embodiments, the transfer mechanism may encompass the meal cartridge and itself act as the housing of an oven portion. In some embodiments, a transfer mechanism may transport a meal cartridge connected to a freezer portion. Some embodiments may include heating portions that are not ovens. In some embodiments, an appliance can comprise a heating portion that comprises an oven, an air fryer, a broiler, a sous vide device, a pressure cooker, a steamer, and the like. In some embodiments, an oven, an air fryer, a broiler, a sous vide device, a pressure cooker, a steamer, and the like may be incorporated into a unitary structure or may be one or more different structures to which the transfer mechanism can convey one or more meal cartridges. In some embodiments, a transfer mechanism and/or elevator shaft may be positioned within the heating portion. For example, in one embodiment, an appliance can comprise a cooling portion and a heating portion and the heating portion comprises a transfer mechanism comprising an elevator shaft.

[0037] Referring to Fig. 2, smart appliance 102 of system 100 may include at least one

processor 202 configured to control and execute a plurality of modules including a transceiver module 204, a first portion controlling module 206, a transfer mechanism controlling module 208, a second portion controlling module 210, and an interface 212. The term “module” as used herein refers to a real-world device, component, or arrangement of components and circuitries implemented using hardware, such as by an application specific integrated circuit (ASIC) or field-programmable gate array (FPGA), for example, or as a combination of hardware and software, such as by a microprocessor system and a set of instructions to implement the module’s functionality, which (while being executed) transform the microprocessor system into a special-purpose device. A module may also be implemented as a combination of the two, with certain functions facilitated by hardware alone, and other functions facilitated by a combination of hardware and software. Each module may be realized in a variety of suitable configurations, and should not be limited to any example implementation exemplified herein.

[0038] Memory 214, which is coupled to the processor 202, may be configured to store at least a portion of information obtained by smart appliance 102. In one aspect, memory 214 may be a non-transitory machine readable medium configured to store at least one set of data structures or instructions (*e.g.*, software) embodying or utilized by at least one of the techniques or functions described herein. It should be appreciated that the term “non-transitory machine readable medium” may include a single medium or multiple media (*e.g.*, a centralized or distributed database, and/or associated caches) configured to store the at least one instruction. The term “machine readable medium” may include any medium that is capable of storing, encoding, or carrying instructions for execution by all modules of smart appliance 102 and that cause these modules to perform at least one of the techniques of the present disclosure, or that is capable of storing, encoding or carrying data structures used by or associated with such instructions. Non-limiting machine readable medium examples may include solid-state memories, and optical and magnetic media. Specific examples of machine readable media may include: non-volatile memory, such as semiconductor memory devices (*e.g.*, Electrically Programmable Read-Only Memory (EPROM), Electrically Erasable Programmable Read-Only Memory (EEPROM)) and flash memory devices; magnetic disks, such as internal hard disks and removable disks; magneto-optical disks; Random Access Memory (RAM); Solid State Drives (SSD); and CD-ROM and DVD-ROM disks. These components can be integrated with systems and methods of the present application to achieve devices and methods capable of solving problems associated with prior art ovens. By

incorporating and integrating computing components with the freezer and heating elements as set forth herein, for example, this provides a fully automated cooking system that can be configured and altered in real-time and on a dynamic basis based on the user's conditions (*e.g.*, traffic, distance from work, time until ready to eat, *etc.*) to produce a optimally cooked meal without user intervention or proximity to the device.

[0039] In accordance with aspects of the present application, transceiver module 204 may be configured by processor 202 of smart appliance 102 to communicate various information and data with computing device 108 (*e.g.*, a smart device or connected smart home device) and computing server system 106. For example, after a user inserts at least one meal cartridge into the freezer portion 104 of smart appliance 102, transceiver module 204 may be configured to transmit identifying information of the inserted meal cartridge to computing server system 106, such that cooking temperature and duration of the meal cartridge may be obtained by computing server system 106 and transmitted to the transceiver module 204. Further, transceiver module 204 may be configured to receive signals indicating the operating status of the smart appliance 102 and different states of the food item being cooked by the oven portion 106, and transmit, *e.g.*, notifications to computing server system 106 when the food item is ready.

[0040] Further, a first portion controlling module 206 may be configured by processor 202 of smart appliance 102 to control various functionalities of freezer portion 104 which comprises at least one removable shelf for storing premade meal cartridges that may be available in uniform or different sizes and package shapes. In some embodiments, a user may prepare her own custom meal cartridges to load into the appliance. The freezer portion 104 can also comprise one or more doors for accessing or inserting one or more meal cartridges on the one or more removable shelves. Upon detecting that at least one meal cartridge has been inserted and placed on a removable shelf, module 106 may be configured to refrigerate (and/or freeze) and preserve the meal cartridge at a selected temperature range. One example selected temperature range may be from about -10 degrees Fahrenheit to about 55 degrees Fahrenheit. In accordance with one aspect of the present disclosure, a meal cartridge may be associated with a unique identifier, and module 206 may include a detector configured to detect the unique identifier associated with each meal cartridge when the freezer portion 104 receives each meal cartridge. An example unique identifier may comprise at least one of: a Quick Response (QR), a barcode communication code, a near field communication code, logo recognition, visual recognition (*e.g.*, using a camera), digicode, and a Radio Frequency

Identification (RFID) communication code. Freezer portion 104 may be configured to have a detector such as an identification scanning module or device, such as a camera, an RF ID tag, barcode reader device, or the like to obtain the unique identifier of each meal cartridge upon its insertion. A freezer portion 104 may further refer to any portion of the appliance capable of cooling. In some embodiments, a freezer portion (*i.e.*, cooling portion) 104 may comprise multiple shelves. In some embodiments, the multiple shelves may be cooled to different temperatures. In certain embodiments, one or more shelves may be cooled to a temperature below freezing while one or more shelves are cooled to a temperature above freezing (*e.g.*, refrigerated). As such, as used in certain embodiments herein, the term “freezer portion” can be used interchangeably with “cooling portion” because the temperature of that range is configurable depending upon a user’s desired storage condition. Certain embodiments may comprise individually isolated shelves that allow for each shelf to be held at a different or same temperature.

[0041] In response to receiving a command input from computing server system 110 for cooking a meal cartridge in freezer portion 104 (*e.g.*, after receiving a user’s cooking instruction command), a transfer mechanism controlling module 208 may be configured by processor 202 of smart appliance 102 to transfer one or more meal cartridges from freezer portion 104 to oven portion 106. For example, after transceiver module 204 receives cooking temperature and duration of the meal cartridge in accordance with the command input, module 208 may be configured to open a divider (*e.g.*, a door, a slider or a roller) between the freezer portion 104 and the oven portion 106. Such divider may comprise guides (such as slots that guide the edges of the meal cartridge) configured to engage the selected meal cartridge when transferring it from the freezer portion 104 to the oven portion 106. It should be appreciated that proper insulation (*e.g.*, aerogel) may be implemented to thermally insulate the freezer portion 104 from the oven portion 106 of smart appliance 102 and ensure both portions operate at the appropriate temperature ranges during use. Certain embodiments may comprise insulation between one or more shelves housed in a freezer portion. Thereafter, the selected meal cartridge may be opened prior to its transfer to the oven portion 106. For example, flash film may be used for foods packaged in the meal cartridge that needs to be exposed to a browning element of the oven portion 106 and aluminum overlay may be used for foods that need steaming. After the top package surface of the meal cartridge is slit open by opening means, *e.g.*, knives implemented within smart appliance 102, an elevator tray within the oven portion 106 may be configured to move down vertically and stop at the

freezer shelf height of the meal cartridge indicated in the cooking instruction command and extract it from the freezer portion 104. Such extraction may use either pull or push force. In one embodiment, a toothed belt and fingers may be implemented to push the meal cartridge onto the elevator tray which also forms the bottom of an oven enclosure of the oven portion 106. Thereafter, the elevator tray may be configured to move to seal the oven portion 106, and a second portion controlling module 210 may be configured by processor 202 of smart appliance 102 to start cooking the meal cartridge in the oven portion 106 in accordance with the cooking instruction command. In some embodiments, the elevator tray moves up vertically so that the bottom of the elevator tray forms the bottom of the oven enclosure of the oven portion 106, and in some embodiments, the elevator tray may move downward to form the top of an oven portion during cooking. In some embodiments, the oven portion may be considered only an aspect of a second portion of the device (*e.g.*, having a first portion comprising a cooling portion, and a second portion comprising an oven portion). The transfer mechanism (*e.g.*, the pusher or the puller) may be configured to be attached to the elevator or in the elevator shaft.

[0042] In one aspect, the oven portion 106 may comprise an oven configured to heat up to about 1000 degrees Fahrenheit (though it may operate at ranges between such as between about 100 and 500 degrees Fahrenheit, between about 100 and 750 degrees Fahrenheit, between about 250 and 750 degrees Fahrenheit, between about 100 and 1000 degrees Fahrenheit, and ranges therebetween), and a browning element configured to warm, cook, broil, and/or sear a cooked meal cartridge that has not been taken out by the user immediately for consumption. In some embodiments, the oven portion may partially heat and/or cook a meal cartridge and then complete the cooking (*e.g.*, by browning) depending on the determined dynamic cooking time. The second portion controlling module 210 may be configured to detect the unique identifier associated with each meal cartridge when it moves onto the elevator tray of the oven portion 106 or is otherwise conveyed by the elevator tray as set forth herein. After identifying the meal cartridge, module 210 may start a timer and control the oven to cook the meal cartridge at a cooking duration and temperature specified in the cooking instruction command. Once the timer is done, module 210 may configure the elevator tray to move along its elevator shaft. Accordingly, transceiver module 204 may be configured to send a signal to computing server system 110 to indicate that the food is ready. Meanwhile, the browning element may be configured to start warming the food until the user opens a door to the oven portion 106 to access the cook meal cartridge. In one aspect, module

210 may be configured to dispose waste from the meal cartridge being cooked and detect fire in the oven portion 106, such as by including a chute or compartment to guide the waste outside the appliance or into a removable compartment that can be periodically emptied by a user.

[0043] In one embodiment, the oven portion 106 may be configured to detect a fire within the oven chamber using any suitable technologies. For example, one or more sensors (*e.g.*, a camera using vision technology, a built-in thermometer, a smoke detector, a fire sensor, a heat detector, a combined heat and smoke detector, a vapor sensor, a gas sensor, or any suitable sensor) may be installed in the oven portion 106 and controlled by processor 202 for detecting, *e.g.*, rapid uncontrolled heat increase, abnormal gas/smoke accumulation, or other emergency condition. An alert or a signal may be generated by the processor 202 and transmitted to the computing device 108 and/or remote computing server system 110 in response to detecting a fire in the oven portion 106, such that the user may receive a text message, e-mail, automated telephone call, or the like immediately.

[0044] In an embodiment, a number of cooking instruction commands may be received by transceiver module 204 of smart appliance 102. As a result, transfer mechanism controlling module 208 may be configured by processor 202 to sequentially transfer two or more meal cartridges from the freezer portion 104 to the oven portion 106. Accordingly, second portion controlling module 210 may be configured to receive a cooking sequence of multiple meal cartridges, and accept and cook multiple meal cartridges in accordance with the cooking sequence and the cooking duration and temperature determined for each of the multiple meal cartridges.

[0045] In accordance with aspects of the present disclosure, smart appliance 102 also comprises sensors or modules configured to detect: a cooking status of the at least one meal cartridge in the second portion, a presence or absence of any meal cartridge on each shelf of the first portion, an indication of a network connectivity status, or an operating status of the appliance. Accordingly, an interface 212 of smart appliance 102 may be configured to display one or more of: the cooking status of a meal cartridge in the oven portion 106, the presence or absence of any meal cartridge on each shelf of the freezer portion 104, the indication of the communication network connectivity status, or the operating status of smart appliance 102. For example, the interface 212 may comprise a reset button, a cancel button, a pause/resume button, a reheat button, and a sync button of smart appliance 102. Further, the interface 212 may be configured to interact with third party companies via application programming

interface (API) synch or account linking, thereby facilitating integration with smart home services including, but not limited to, Alexa, Siri, Microsoft services (*e.g.*, Cortana) and Google services (*e.g.*, Google Assistant), Samsung services (*e.g.*, Bixby) and the like. The interface 212 may also be configured to interact with any suitable diet and exercise smartphone apps and websites such as MyFitnessPal, Fitbit and the like.

[0046] While the present disclosure has been described with respect to a limited number of embodiments, those skilled in the art will appreciate numerous modifications and variation therefrom. For example, a second portion comprising an oven portion may also (or instead) comprise a pressure cooker, slow cooker, infrared cooker, oil fryer, a microwave, a steam oven, a sous vide, a smoker, air fryer or some appropriate closed vessel systems. Some embodiments may not comprise a sous vide. Some embodiments may not comprise an oil fryer. Some embodiments may not comprise a slow cooker. Some embodiments may not comprise a pressure cooker. Some embodiments may not comprise an infrared cooker. Some embodiments may not comprise a microwave. Some embodiments may not comprise a steam oven. Some embodiments may not comprise an air fryer. Some embodiments may comprise combinations of these heating devices. For instance, some embodiments may include cooking a meal cartridge in a sous vide portion at a temperature that produces steam and use that steam to steam a separate meal cartridge. In some embodiments, a second portion may comprise a crock pot that heats a meal cartridge, wherein the crock pot may be insulated and removable from the appliance, such that a user may transport a cooked meal cartridge while maintaining its temperature. In some embodiments, the appliance may alter cooking times and conditions based on its location, *e.g.*, by considering elevation, humidity, ambient temperature, *etc.* Some embodiments may also allow for configuration of the cooking instruction command, such that a user may define specific food preferences. For instance, a user that likes al dente pasta may choose to have her pasta cooked to that extent. In instances where a user prefers a rare steak (or medium, medium rare, well done, *etc.*), the user can select that preference in the cooking instruction command and the appliance will cook the meal cartridge to that desired condition. The appliance may comprise machine learning (such as artificial intelligence) so that a user may provide feedback of the appliance's satisfaction of the user's cooking preference via a connected device and the appliance can adapt to those preferences and further modify its operation to suit those preferences.

[0047] As further shown in Fig. 2, computing device 108 of system 100 may include at least one processor 216 configured to control and execute a plurality of modules including a

transceiver module 218, a user interface 220, and a notification generation module 222. Memory 224 (similar to memory 214), which is coupled to the processor 216, may be configured to store at least a portion of information obtained by computing device 108 and data structures or instructions (*e.g.*, software) embodying or utilized by at least one of the techniques or functions described herein. As described above, computing device 108 may be in the form of a mobile smart device or a connected smart home device configured to allow a user to command smart appliance 102 to cook at least one available meal cartridge in the freezer portion 104. For example, after the user loads the freezer portion 104 of smart appliance 102 with at least one meal cartridge, the unique identifier associated with the meal cartridge may be detected and transmitted to computing server system 110 which in turn generates and transmits information representing the food and cartridge ID to the transceiver module 218 of the computing device 108. As a result, food options may be displayed or presented to the user via user interface 220, such that the user may select a meal choice now or later. In one embodiment, the user may make a meal choice via a 3rd party linked smart home device such as Alexa, Siri, Microsoft services (*e.g.*, Cortana) and Google services (*e.g.*, Google Assistant), Samsung services (*e.g.*, Bixby) and the like which may be configured to directly communicate with its corresponding server system. User interface 220 may interact with 3rd party companies via application programming interface (API) synch or account linking. Moreover, based at least upon various information received via the transceiver module 218, a notification generation module 222 may be configured by processor 210 of computing device 108 to generate and transmit notifications to the user indicating the cooking status of a selected meal, and when the selected meal will be ready. Such notifications may be generated based on the dynamic cooking time.

[0048] As described above, computing server system 110 may be Cloud-based and configured to obtain, via *e.g.*, a transceiver module 228 controlled by processor 226, identifying information of each and all meal cartridges (*e.g.*, unique identifier associated with each meal cartridge) inserted into the freezer portion 104 of smart appliance 102. In response to receiving a meal choice selected by the user, cooking instruction command determination module 230 may be configured by processor 226 to query related databases for cooking duration and temperature of one or more selected meal cartridges. The user may choose to cook a particular selected meal cartridge using smart appliance 102 now or at a later time. In the former case, command determination module 230 may generate a signal to command the transfer mechanism controlling module 208 of smart appliance 102 to commence a food

transfer from the freezer portion 104 to the oven portion 106 and set the oven portion 106 based on the cooking duration and temperature obtained from related databases with respect to the selected meal cartridge. Meanwhile, a notification generation module 232 may be configured by processor 226 to generate notifications to computing device 108 indicating the commencement of the cooking process and estimate of when the food will be ready. However, if the user indicates that she prefers the food to be ready at a later time, command determination module 230 may be configured to determine a food transfer time from the freezer portion 104 to the oven portion 106 and the cooking duration of the selected meal cartridge, and generate a signal to smart appliance 102 to commence the transfer and cooking process at a time taking into consideration the food transfer time and cooking duration, such that the food will be fully cooked by the user defined time. Similarly, notifications regarding the cooking status of the selected meal cartridge may be generated and transmitted by notification generation module 232 to user computing device 108. In one aspect, if the 3rd party linked smart home service providers such as Alexa, Siri, and Google Assistant is used by the user, computing server system 110 may be configured to communicate with the corresponding 3rd party server to indicate the cooking the status of the food, such that the user may be informed when the food is ready for consumption.

[0049] Memory 234 (similar to memory 214, 224), which is coupled to the processor 226, may be configured to store at least a portion of information obtained by computing server system 110 and data structures or instructions (*e.g.*, software) embodying or utilized by at least one of the techniques or functions described herein.

[0050] Referring now to Figs. 3 and 4, diagrams outlining the internal components of smart appliance 102 are illustrated, according to aspects of the present disclosure. Specifically, the freezer portion 104 may be positioned in a first portion on one side (*e.g.*, the left side when looking at the front of the appliance 102) within the housing of smart appliance 102 and use an electronic control unit (ECU) 302 to control a plurality of components comprising a compressor 304, a condenser 306, a convection fan 308, a Peltier unit, a radiator, and an evaporator 310 to preserve multiple shelves or trays 312 inserted and placed on multiple removable shelves at a selected temperature range. In one aspect, the ECU 302 may control the compressor 304 to compress a refrigerant, control the condenser 306 to convert highly compressed refrigerant from a gaseous state into a liquid state, and control the evaporator 310 to evaporate the refrigerant condensed by the condenser 306. The convection fan 308 may be configured to guide air through the condenser 306 thereby facilitating the transfer of the heat

of compression from condenser coils to the ambient air and drawing air across the compressor 304 into the oven portion 106 and venting. A barcode scanner 314 such as a camera or RFID reader, or any suitable identifier detecting device, may be installed in an appropriate position of the freezer portion 104, such that each meal cartridge is identified via its unique identifier upon its insertion into the freezer portion 104.

[0051] In one embodiment, the smart appliance 102 may be configured to detect the presence or absence of a premade meal cartridge on any shelf or tray 312 of the freezer portion 104. For example, at least one proximity sensor, laser/optical sensor, or any suitable sensor may be implemented within the freezer portion 104 and controlled by processor 202 for monitoring the status of all shelves or trays 312 using electromagnetic field, light or sound. Alternatively, individual ultrasonic, infrared, weight, or physical button sensor may be installed on each shelf or tray 312 of the freezer portion 104 for detecting the presence or absence of a premade meal cartridge thereon.

[0052] Transfer mechanism 316 may involve either pushing or pulling each selected meal cartridge from the freezer portion 104 to oven portion 106 in response to a command input for cooking the selected meal cartridge. In one aspect, one or more motors 318 may be used and controlled by the ECU 302 to push each meal cartridge to an elevator tray of the oven portion 106 via a toothed belt and fingers. Alternatively, a meal cartridge may be pulled from the freezer portion 104 to oven portion 106. In one embodiment, the transfer mechanism 316 relating to the pulling may be attached to the elevator or located in the freezer portion 104.

[0053] Oven portion 106 may be positioned within the housing in a second portion of smart appliance 102 (*e.g.*, the right side when looking at the front of the appliance 102) and may comprise an oven chamber. As shown in Figs. 3 and 4, an oven chamber may be positioned above a lift elevator 320 but this positioning can be altered as described herein. The bottom of the oven chamber may be configured to move with the lift elevator 320 along a conveyor such as a slide rail. As described previously, the bottom of the oven chamber may be configured to stop at the freezer shelf height of a user selected meal cartridge in the freezer portion 104, accept the meal cartridge via the transfer mechanism, and move to seal the oven chamber. Oven heat source may be positioned remote to the oven chamber and hot air can be blown or sucked into the oven chamber during use. The oven portion 106 may also comprise a browning element situated over a cooked meal cartridge (*e.g.*, 2 inches above) to keep it warm, while also allowing enough proximity to broil and/or brown the contents of a meal cartridge. Exhaust of the oven portion 106 may be blown or sucked out by a fan and directed

away from the freezer portion 104. In some embodiments, freezer portion 104 is cooled using the compressor 304, wherein the heat generated by the compressor 304 is conveyed to the oven portion to maintain the oven portion 106 at a predetermined temperature and/or provide cooking heat. Lift elevator 320 of oven portion 106 may use a toothed belt and motor positioned to minimize the overall height of the elevator. Corner guides may be used to stabilize platform while the elevator moves vertically.

[0054] In one particular embodiment, the oven portion 106 of smart appliance 102 may be configured to include a number of sections designed for independently cooking different ingredients of a meal at different temperatures. For example, a first cooking section of the oven portion 106 may be configured to cook proteins, a second cooking section for pasta, rice, or grains, and a third cooking section for vegetables. In one aspect, each cooking section of the oven portion 106 may be controlled by processor 202 for temperature adjustment in accordance with the user's preference for doneness.

[0055] A partition between the freezer portion 104 and oven portion 106 may comprise a partition door 322, a slider, an accordion or roller-type door, flaps or a roller that may be movable when a selected meal cartridge is transferred therebetween. Some embodiments may comprise a dual door system that introduces an air gap between a first (*e.g.*, cooling) portion and a second (*e.g.*, oven) portion. In some embodiments, the appliance 102 may comprise dual doors with a gap between that can insulate one portion from another portion to allow a freezer portion to remain at a temperature lower than the temperature in a second (*e.g.*, oven) portion. In one embodiment, separate access doors may be implemented for the freezer portion 104 and oven portion 106, such that a user may insert one or more meal cartridges into the freezer portion 104 and access cooked food from oven portion 106 through each respective door.

[0056] Smart appliance 102 may comprise a freezer, an oven, and a transfer mechanism. Although a small footprint is preferred, example external dimensions may be up to 18 inches wide by 12 inches deep by 15 inches high. Premade meal cartridges may be used and each package may have dimensions up to 7.5 inches wide by 6.5 inches deep 1.6 inches high. Meal cartridges may be either removed from their box or may not have a box prior to insertion into the freezer. Further, meal cartridges may not require the freezer portion 104 to open it, slice it open, or modify the meal cartridges in any way prior to cooking. It should be appreciated that various embodiments or configurations of shapes and sizes of the smart appliance 102 and the premade meal cartridges may be contemplated in accordance with aspects disclosed herein.

[0057] Smart appliance 102 may be configured to cook at least one meal at a time upon a user command. Alternatively, smart appliance 102 may be configured to support cooking multiple meal cartridges.

[0058] Smart appliance 102 may operate on the power provided by a standard U.S. kitchen outlet (*e.g.*, 120 V, 15 Amps), though one of skill in the art would understand how to modify the device to use different (*e.g.*, European) power standards. In one embodiment, smart appliance 102 may be controlled over Wi-Fi from an app or webpage, and configured to be insulated to prevent defrosting the stored meal cartridges while cooking.

[0059] Smart appliance 102 may have the following onboard human interfaces: visual indication that a meal cartridge is cooking; visual indication that a freezer shelf is empty; visual indication that a freezer shelf is occupied; visual indication of the network connectivity status such as active, down, connecting; a reset button of the appliance; a synch button of the appliance; visual indication of an error, along with push buttons to control the device; visual indication that the oven portion 106 of the smart appliance 102 is still hot and is cooling, or that a self-cleaning of the oven portion 106 is occurring.

[0060] Freezer portion 104 requirements: may have internal dimensions of 8 inches wide by 7 inches deep by 7 inches high; may support a “soft freeze” of $27^{\circ}\text{F} \pm 3^{\circ}\text{F}$; may support a defrost cycle to prevent frost build up on the interior of the freezer, may operate in a temperature range from about -10 degrees Fahrenheit to about 40 degrees Fahrenheit. When the temperature is set in a freezer portion or any individual shelf, the temperature may not fluctuate from its set-point more than ± 2 degrees Fahrenheit. In some embodiments, that temperature fluctuation may be no more than ± 0.5 , ± 1 , ± 2 , ± 3 , ± 4 , ± 5 , ± 10 , degrees Fahrenheit and ranges therebetween. Freezer portion 104 may contain a camera or barcode reader on each shelf to read the unique identifier associated with each meal cartridge. In some embodiments, the freezer portion may comprise a single camera or barcode reader. In one embodiment, a pusher mechanism may be built into the shelves of the freezer portions 104.

[0061] Oven portion 106 requirements: may primarily cook using convection heat; may have the ability to brown/broil food using an infrared heating element; may preheat the oven chamber in less than 3 minutes; may keep a meal cartridge warm after cooking for up to 20 minutes if the user is unable to take the meal cartridge out immediately after completion of cooking. For example, the cooked meal cartridge may be in the transfer elevator shaft at this time, and the browning element may be used as a heat lamp.

[0062] The heating area of oven portion 106 may be safe up to 1000 degrees Fahrenheit (*e.g.*, for self-cleaning). The average cooking temperature is between 300 and 550 degrees Fahrenheit. When the temperature is set, the temperature may not fluctuate from its set-point more than ± 5 degrees Fahrenheit. In some embodiments, that temperature fluctuation may be no more than ± 0.5 , ± 1 , ± 2 , ± 3 , ± 4 , ± 5 , ± 10 , degrees Fahrenheit and ranges therebetween.

[0063] Oven portion 106 may contain a method of detecting a fire within the oven chamber such as a camera and software. Oven portion 106 may further comprise a fire suppression system to remove air (*i.e.*, oxygen) from the oven portion, dispense water, dispense CO₂, dispense a fire suppressant material (*e.g.*, salt) or the like. Some embodiments may comprise all of these and the appliance may be configured to determine and use the safest and/or least destructive option based on fire severity and food characteristics.

[0064] Transfer mechanism requirements: may support meal cartridges that weigh up to 32 ounces of food plus the container; and may utilize a transfer mechanism that can receive food from any shelf in the freezer and move it to the oven.

[0065] Onboard tech requirements: smart appliance 102 may connect to both 2.4 GHz and 5 GHz Wi-Fi in support of 802.11b/g/n/ac/ad standards (and the like); may contain at least 1 GB onboard storage; may support WPA/WPA2/WPA3 encryption standards; may connect to a Wi-Fi network as a client; may connect via Bluetooth; may connect via NFC; may broadcast a Wi-Fi network to act as an access point for initial configuration/provision; may continue performing its current cooking sequence during a network outage; may maintain meal cartridge count and state during a network outage; and may have an oscillator to maintain time during a network or power outage.

[0066] Referring now to Fig. 5, a flow chart of a method 500 implemented in the system 100 of Fig. 1, is illustrated, according to aspects of the present disclosure. Among other things, the method comprises partitioning (502) interior space of an enclosed structure of an appliance into at least a first portion and a second portion; configuring (504) the first portion to: receive one or more meal cartridges, and store and preserve the meal cartridges at a selected temperature range; providing (506) transfer mechanism to transfer at least one meal cartridge in the first portion to the second portion within the enclosed structure in response to a command input for cooking the at least one meal cartridge; and configuring (508) the second portion to: accept the at least one meal cartridge, receive a cooking instruction command, wherein the cooking instruction command comprises a cooking duration and

temperature determined for the at least one meal cartridge, and cook the at least one meal cartridge based upon the cooking duration and temperature.

[0067] As used herein, the terms “appliance,” “smart appliance,” and “system” may be used interchangeably. In some embodiments the “appliance” or “smart appliance” may be a sub-feature of the “system.” One of skill in the art would immediately envisage the meaning of those terms in view of the context in which they are used.

[0068] As an example, Figs. 6-19 generally illustrate how the disclosed smart appliance 102 stores, transfers and cooks a premade meal cartridge using the freezer portion 104 and oven portion 106, according to aspects described above. As shown in Figs. 6-8, the freezer portion 104 may include one or more doors 602 for a user to load one or more premade meal cartridges 604 on a number of shelves or trays 606 for storage during a meal planning and preparation phase, such that the freezer portion 104 may be configured to refrigerate (and/or freeze) and preserve the meal cartridge 604 at a selected temperature range. As shown in Fig. 9, the smart appliance 102 may be configured to detect the presence or absence of a premade meal cartridge 604 on any shelf or tray 606 of the freezer portion 104 via *e.g.*, a unique identifier associated with each meal cartridge 604 and a camera or an RF ID tag or barcode reader device 608 implemented within the freezer portion 104. This may trigger an upload of food data to, *e.g.*, connected cloud systems, as described above in connection with Figs. 1 and 2. In some embodiments, the freezer portion 104 may be conjoined with the oven portion 106. In other embodiments, the freezer portion 104 and/or oven portion 106 may be retrofitted to an existing cold storage device and/or oven (or other suitable heating device).

[0069] Referring to Figs. 10-14, in response to receiving a cooking instruction command, smart appliance 102 may be configured to transfer one or more meal cartridges 604 from freezer portion 104 to oven portion 106. For example, a door 610 between the freezer portion 104 and oven portion 106 may be opened to allow one or more meal cartridges 604 to be pushed or pulled from its shelf or tray 606 onto an elevator tray 612 that moves along an elevator shaft 614 and forms the bottom of an oven enclosure 616 of the oven portion 106 (*i.e.*, the door serving as a pusher or puller depending on its configuration here). A transfer mechanism can push or pull a meal cartridge using a conveyor, a mechanical mover such as a hooked apparatus or a rod that can push or pull the meal cartridge. The configuration of the transfer mechanism is not particularly limited and is configured to be able to move and transfer a meal cartridge and such working configurations would be understood by the skilled artisan in view of the description contained herein. Thereafter, the elevator tray 612 moves to

seal the oven enclosure 616 with meal cartridge 604 to be cooked in the oven portion 106. In the meantime, door 610 may be closed for separating and insulating the freezer portion 104 from the oven portion 106.

[0070] The cutaway views shown in Figs. 15-17 illustrate how the oven portion 106 is configured to cook meal cartridge 604 inside the oven enclosure 616, according to aspects described above. For example, the oven portion 106 may comprise an oven configured to heat up to about 1000 degrees Fahrenheit, and a browning element configured to warm, cook, broil, and/or sear a cooked meal cartridge 604 that has not been taken out by the user immediately for consumption. As shown in Fig. 17, the oven portion 106 may contain a heating element 618 and a convection fan 620 configured to circulate air and heat food more evenly. The oven portion 106 may be configured to cook the meal cartridge 604 at a predetermined temperature for an amount of time specified by the food manufacturer or the user. For example, the received cooking instruction command may comprise data such as temperature and cooking time. Cooking instruction may also be obtained by the smart appliance 102 via receiving a user input or scanning a food item. For example, this data may be obtained during the loading phase of meal cartridges into the freezer portion 104 via a barcode scan. The oven portion 106 may also preheat and cool down very quickly. The cool down phase may be facilitated by the cold air from the freezer portion 104, which also ensures that the oven portion 106 is not too hot for the user to touch or handle.

[0071] As shown in Figs. 18 and 19, meal cartridge 604, which has been fully cooked in accordance with its corresponding cooking instruction, may be configured for retrieval and consumption by the user. In one embodiment, the elevator tray 612 may be configured to open oven enclosure 616 and move downward along the elevator shaft 614, such that meal cartridge 604 may be retrieved by the user.

[0072] The smart appliance 102 of the present disclosure may be configured to automatically transition food from a frozen state in the freezer portion 104 to a cooking state in the oven portion 106 without human intervention. As disclosed above in connection with Figs. 1 and 2, smart appliance 102 may have the following features: connection to local wireless LAN; integration with a cloud system configured to keep track of the state of the appliance at all times including food stored in the freezer and food in the pre/cooking/cooked state; knowledge of cooking times based on the scanned food item; user control via at least one smartphone application or equivalent device capable of communicating with the appliance; integration with other smart home services including, but not limited to, Alexa, Siri, and

Google Assistant; and knowledge and timing of real world events.

[0073] For clarity purposes, not all of the features of the aspects are disclosed herein. One of skill in the art would appreciate that in the development of any actual implementation of the present disclosure, numerous implementation-specific decisions can be made in order to achieve the developer's specific goals, and these specific goals will vary for different implementations and different developers, along with different user preferences. It is understood that such a development effort might be complex and time-consuming, but would nevertheless be a routine undertaking of engineering for those of ordinary skill in the art, having the benefit of this disclosure.

[0074] Furthermore, it is to be understood that the phraseology or terminology used herein is for the purpose of description and not of restriction, such that the terminology or phraseology of the present specification is to be interpreted by those skilled in the art in light of the teachings and guidance presented herein, in combination with the knowledge of the skill in the relevant art(s). Moreover, it is not intended for any term in the specification or claims to be ascribed an uncommon or special meaning unless explicitly set forth as such.

[0075] The various aspects disclosed herein encompass present and future known equivalents to the known modules referred to herein by way of illustration. Moreover, while aspects and applications have been shown and described, it would be apparent to those skilled in the art having the benefit of this disclosure that many more modifications than mentioned above are possible without departing from the inventive concepts disclosed herein.

Claims:

1. An appliance, comprising:
an enclosed structure comprising:
a first portion configured to: receive one or more meal cartridges, and store and preserve the meal cartridges at a selected temperature range;
a second portion; and
a transfer mechanism configured to transfer at least one meal cartridge for the first portion to the second portion within the enclosed structure in response to a command input for cooking the at least one meal cartridge,
wherein the second portion is configured to: accept the at least one meal cartridge, receive a cooking instruction command wherein the cooking instruction command comprises a cooking duration and temperature determined for the at least one meal cartridge, and cook the at least one meal cartridge based upon the cooking duration and temperature.
2. The appliance of claim 1, wherein the first portion comprises a plurality of removable shelves configured to store the meal cartridges.
3. The appliance of claim 1, wherein the selected temperature range for the first portion is from about -10 degrees Fahrenheit to about 40 degrees Fahrenheit.
4. The appliance of claim 1, wherein the second portion is configured to heat up to about 1000 degrees Fahrenheit.
5. The appliance of claim 2, further comprising modules configured to detect: a cooking status of the at least one meal cartridge in the second portion, a presence or absence of any meal cartridge on each shelf of the first portion, an indication of a network connectivity status, an operating status of the appliance, or an operating status of the second portion.
6. The appliance of claim 5, further comprising an interface configured to display one or more of: the cooking status of the at least one meal cartridge in the second portion, the presence or absence of any meal cartridge on each shelf of the first portion, the indication of the internet connectivity status, the operating status of the appliance, and the operating status of the second portion.

7. The appliance of claim 6, wherein the interface further comprising at least one button selected from a reset button, a cancel button, a pause/resume button, a reheat button, and a sync button of the appliance.
8. The appliance of claim 1, wherein the transfer mechanism is configured to sequentially transfer two or more meal cartridges from the first portion to the second portion within the enclosed structure in response to receiving the cooking instruction commands for cooking the two or more meal cartridges, wherein the second portion is configured to: receive a cooking sequence of the two or more meal cartridges, and accept and cook the two or more meal cartridges in accordance with the cooking sequence and the cooking duration and temperature determined for each of the two or more meal cartridges.
9. The appliance of claim 1, further comprising means for opening the at least one meal cartridge prior to transferring the at least one meal cartridge from the first portion to the second portion.
10. The appliance of claim 1, wherein each of the meal cartridges is associated with a unique identifier, the appliance further comprises a module for detecting the unique identifier associated with each meal cartridge when the first portion receives each meal cartridge.
11. The appliance of claim 10, wherein the second portion is configured to detect the unique identifier associated with each meal cartridge when the second portion receives each meal cartridge from the first portion.
12. The appliance of claim 1, further comprising insulation means configured to thermally insulate the first portion from the second portion of the appliance.
13. The appliance of claim 1, wherein the second portion further comprises a convection heater.
14. The appliance of claim 1, wherein the second portion further comprises a fan assembly.
15. The appliance of claim 1, wherein the cooking temperature and cooking duration are controlled by an oven that is controlled by at least one processor.

16. The appliance of claim 15, wherein the oven further comprises a browning element configured to warm the at least one meal cartridge upon detecting that the at least one meal cartridge has not been taken out of the second portion after being cooked.
17. The appliance of claim 1, wherein the first portion and the second portion are separated by a divider comprising at least one of a door, a slider, or a roller.
18. The appliance of claim 1, wherein the second portion comprises an elevator tray, wherein the elevator tray comprises opening means for extracting the at least one meal cartridge from the first portion, wherein the elevator tray is further configured to select the at least one meal cartridge chosen by the cooking instruction command by moving vertically within the second portion and transferring the at least one meal cartridge to an oven contained in the second portion, wherein the elevator tray is configured to form the bottom of the oven.
19. The appliance of claim 1, wherein the first portion further comprises a compressor, and an oven, wherein the appliance further comprises a vent from the compressor to the oven, wherein the compressor generates heat as it operates and that heat is vented to the oven via the vent to maintain the oven at a preselected temperature.
20. The appliance of claim 1, wherein the first portion further comprises at least one of a camera, an RF ID tag, or barcode reader device.
21. The appliance of claim 1, wherein the second portion further comprises means for detecting a fire within the second portion.
22. The appliance of claim 17, wherein the divider further comprises guides configured to engage the at least one meal cartridge when transferring the at least one meal cartridge from the first portion to the second portion.
23. The appliance of claim 1, wherein the second portion comprises means for disposing of waste from the at least one meal cartridge.

24. The appliance of claim 6, wherein the interface is configured to interact with third party applications via application programming interface (API) synch or account linking.

25. The appliance of claim 1, wherein the second portion comprises at least one of an oven, a pressure cooker, a microwave, or a steam oven.

26. The appliance of claim 1, wherein the second portion comprises a plurality of sections configured to independently cook different ingredients of a meal at different temperatures.

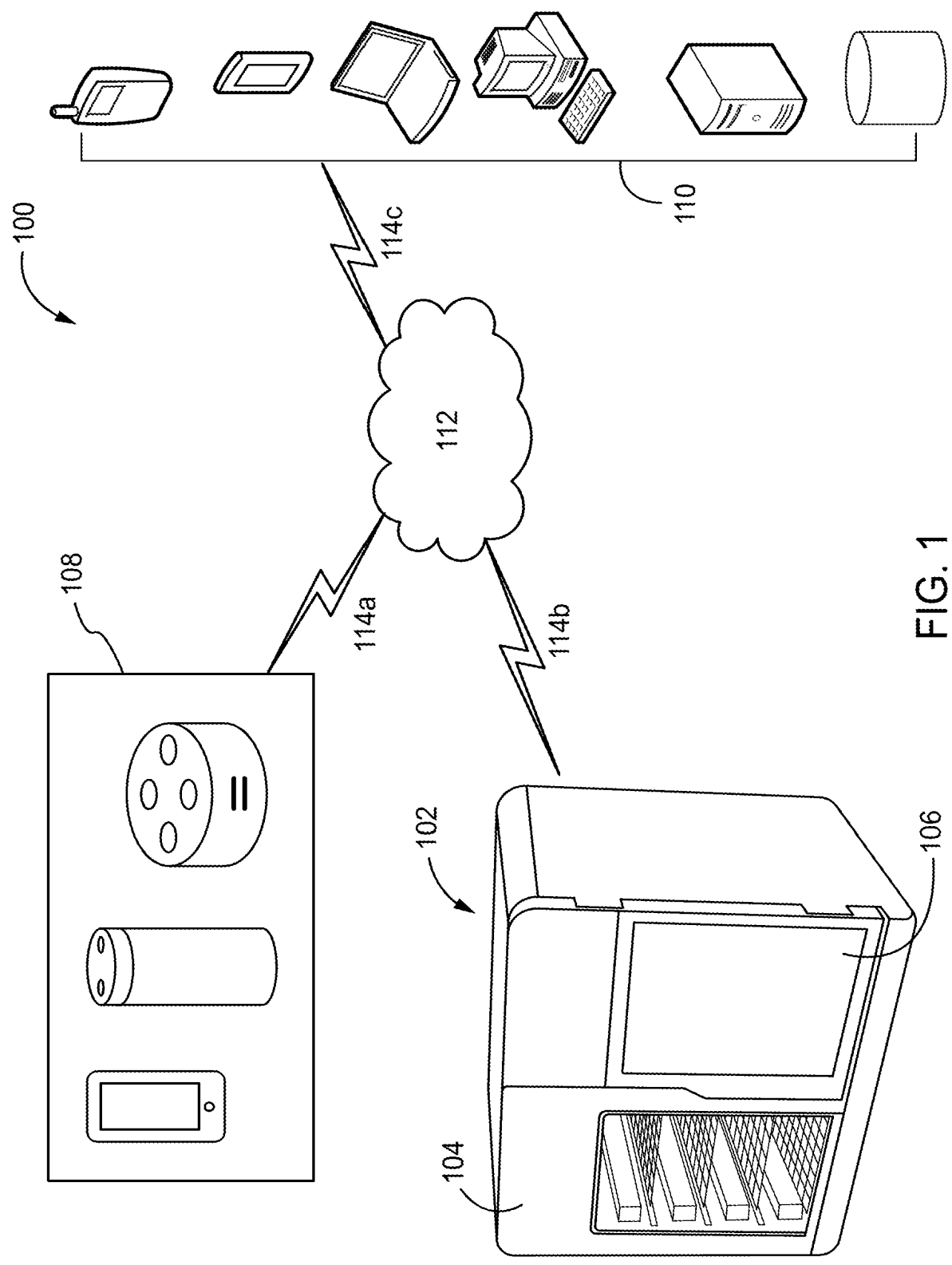


FIG. 1

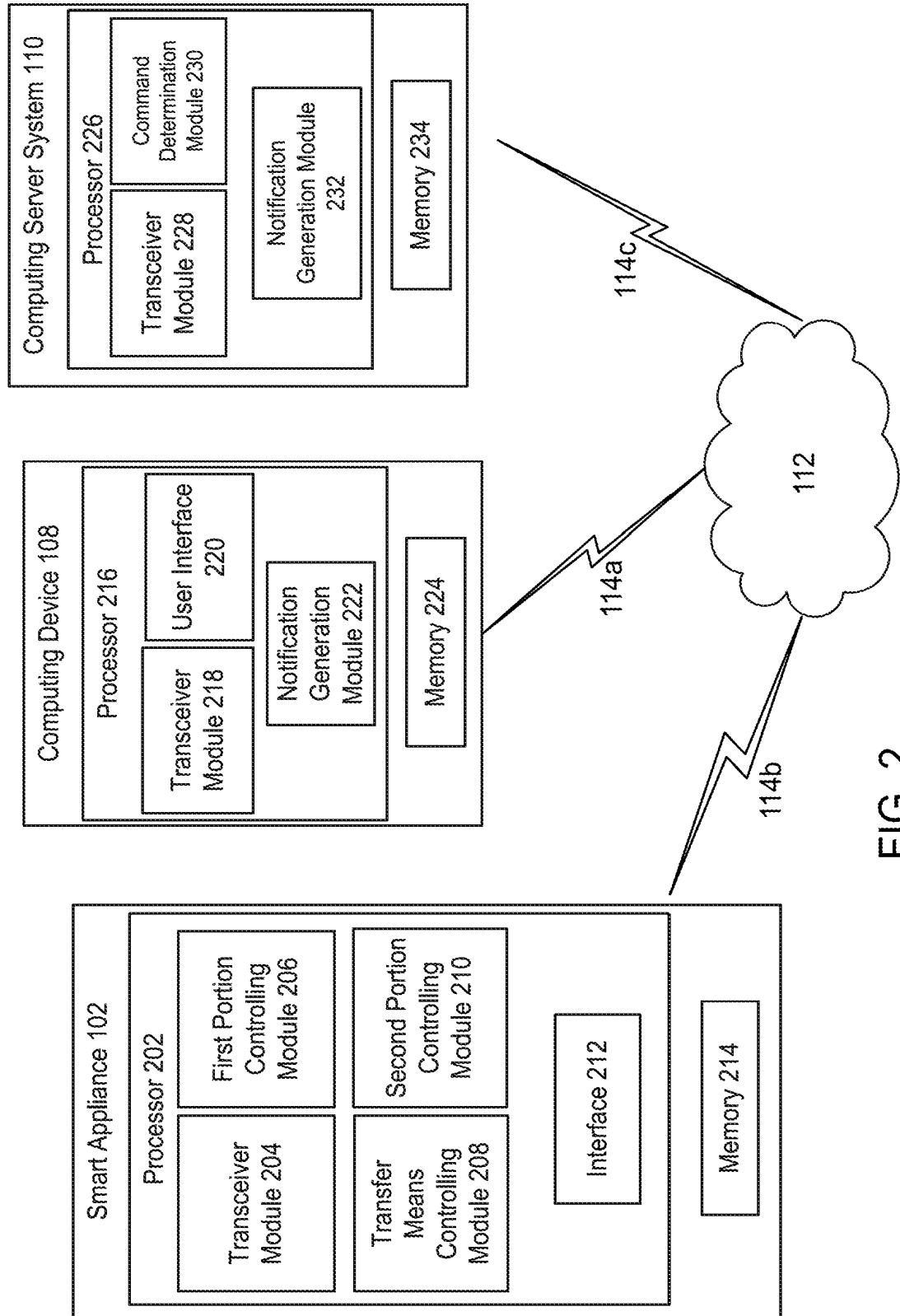


FIG. 2

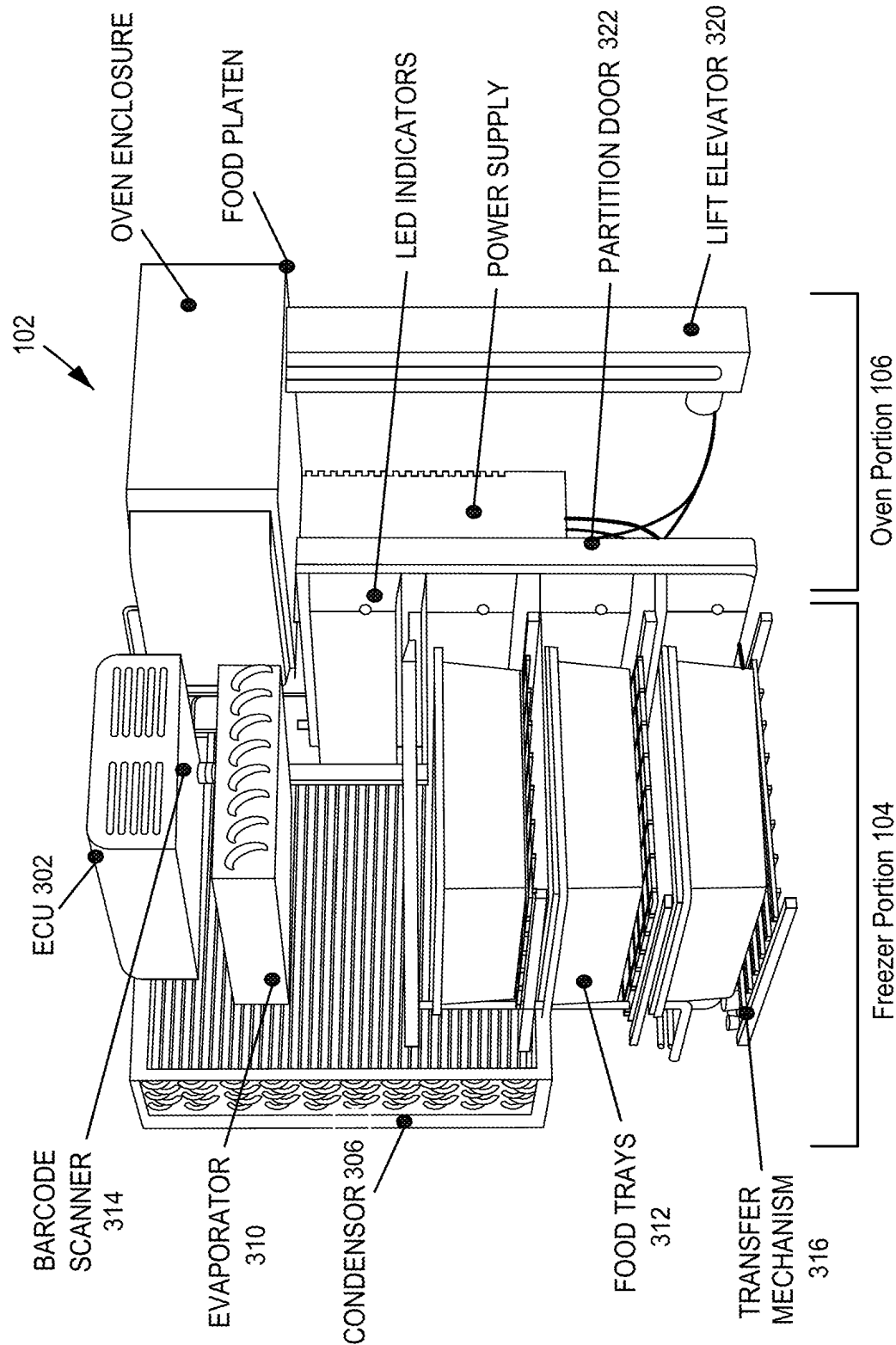


FIG. 3

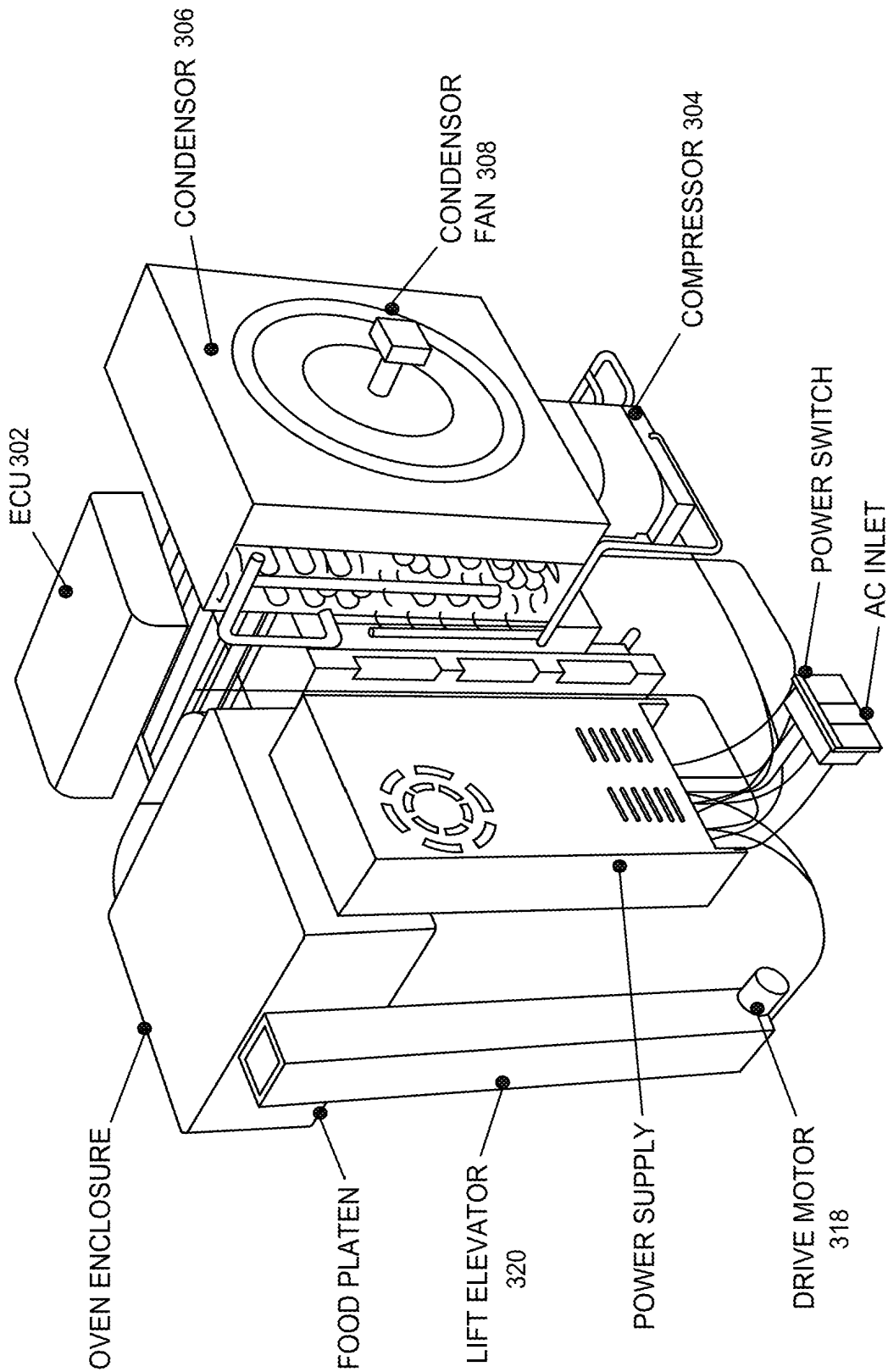


FIG. 4

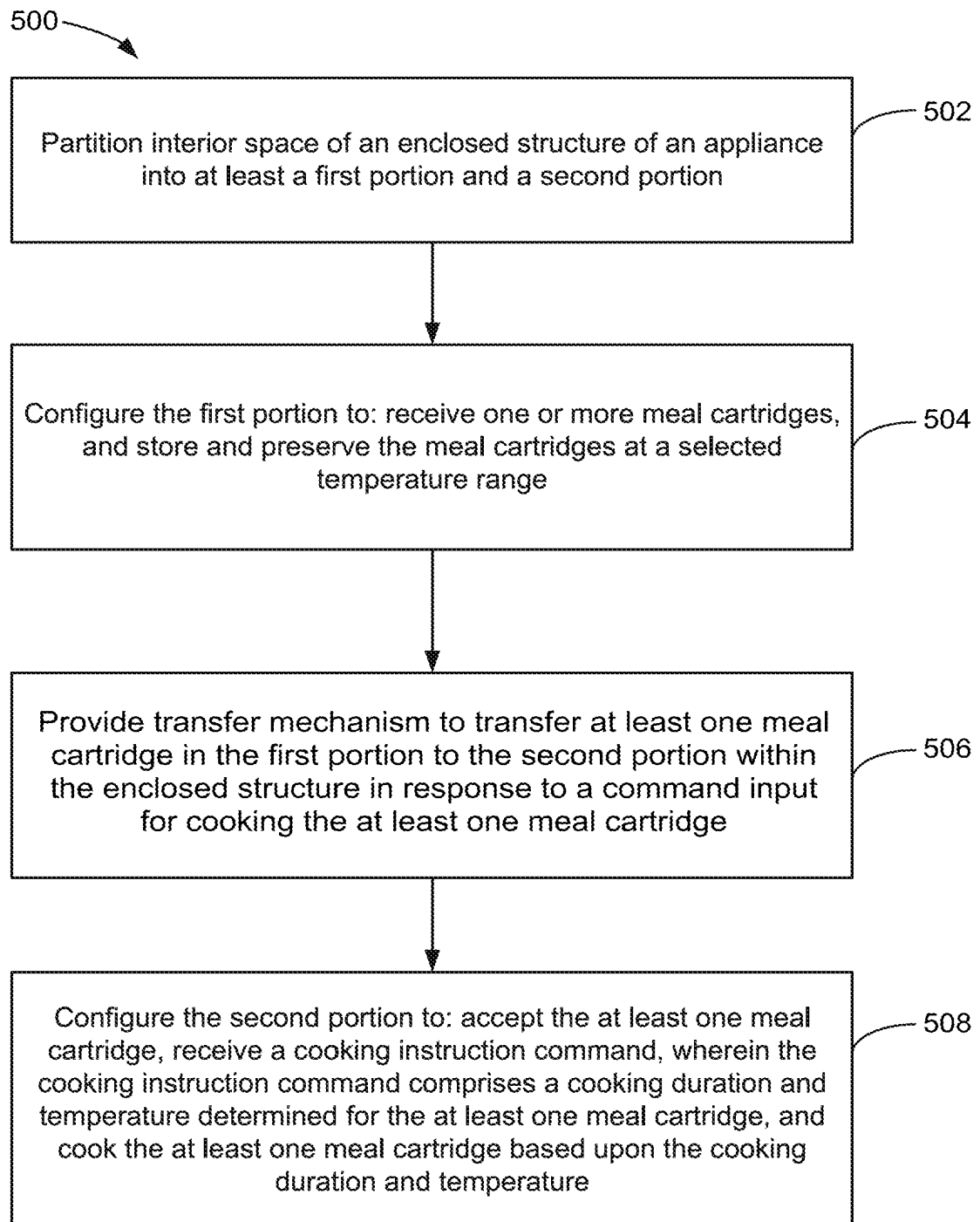


FIG. 5

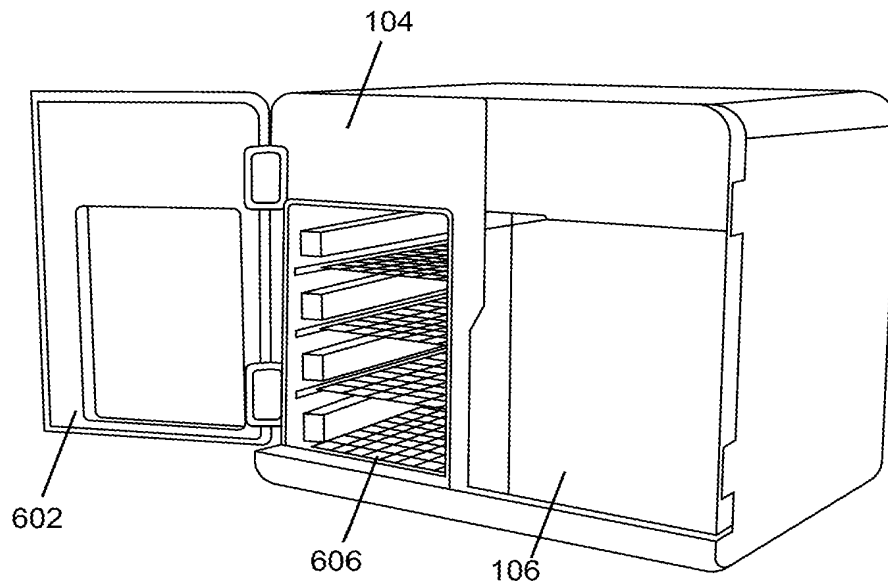


FIG. 6

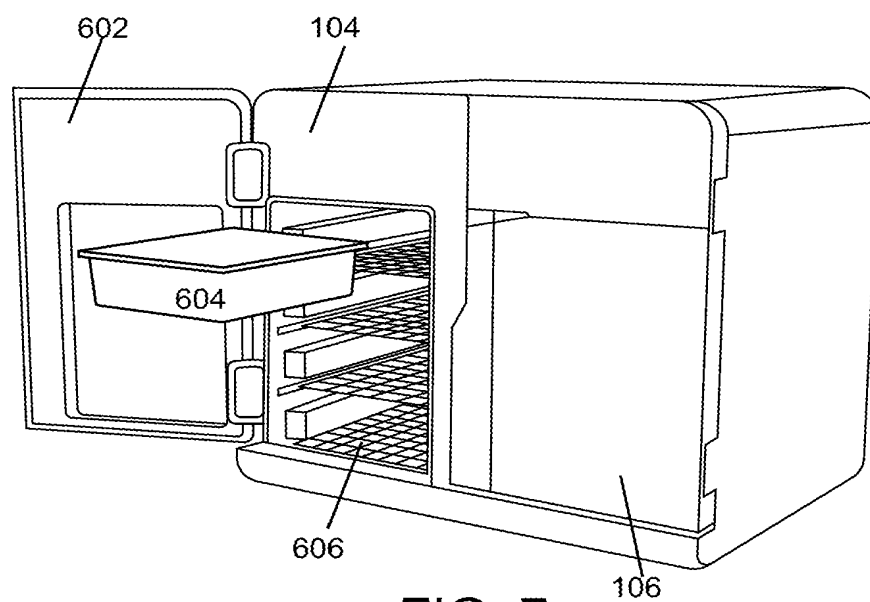


FIG. 7

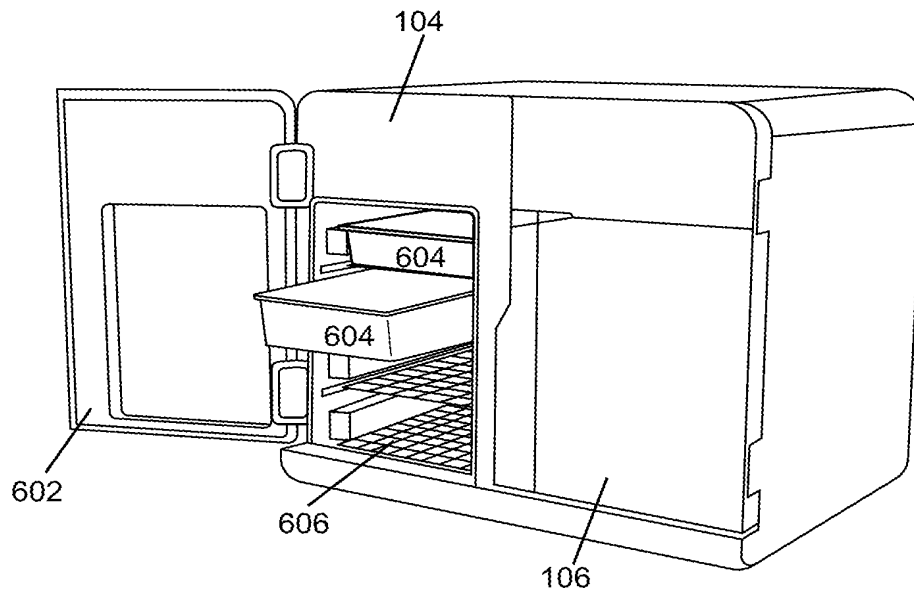


FIG. 8

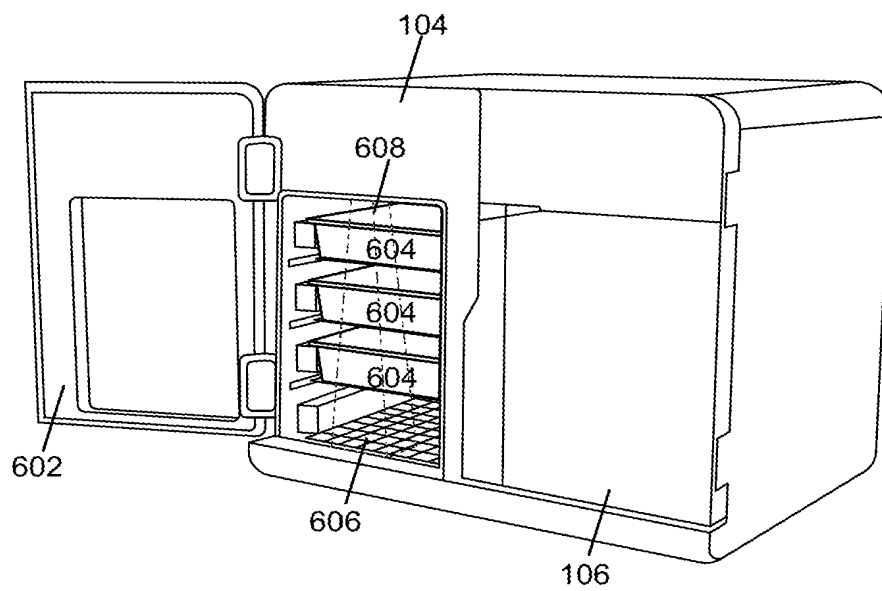


FIG. 9

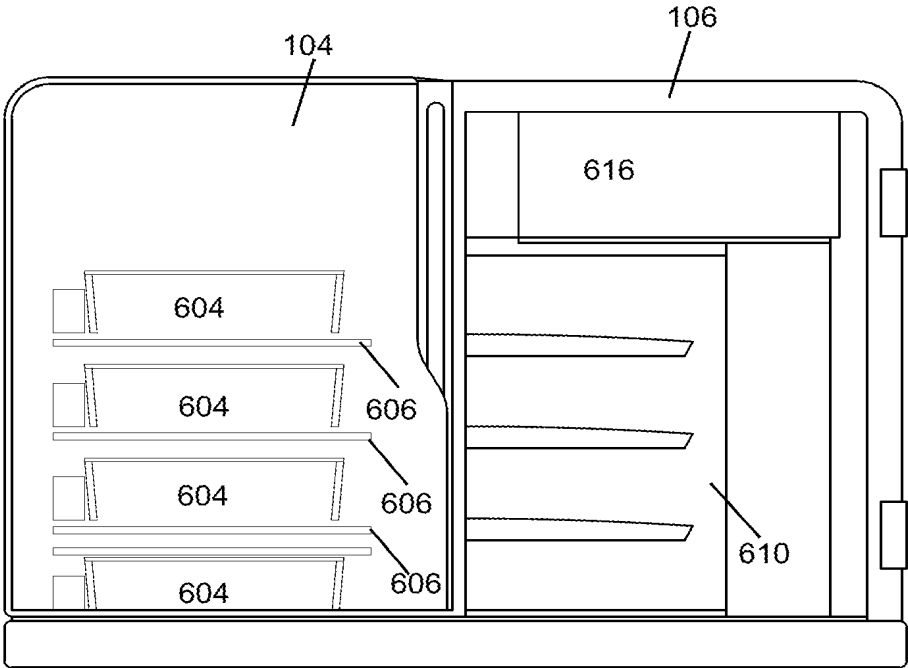


FIG. 10

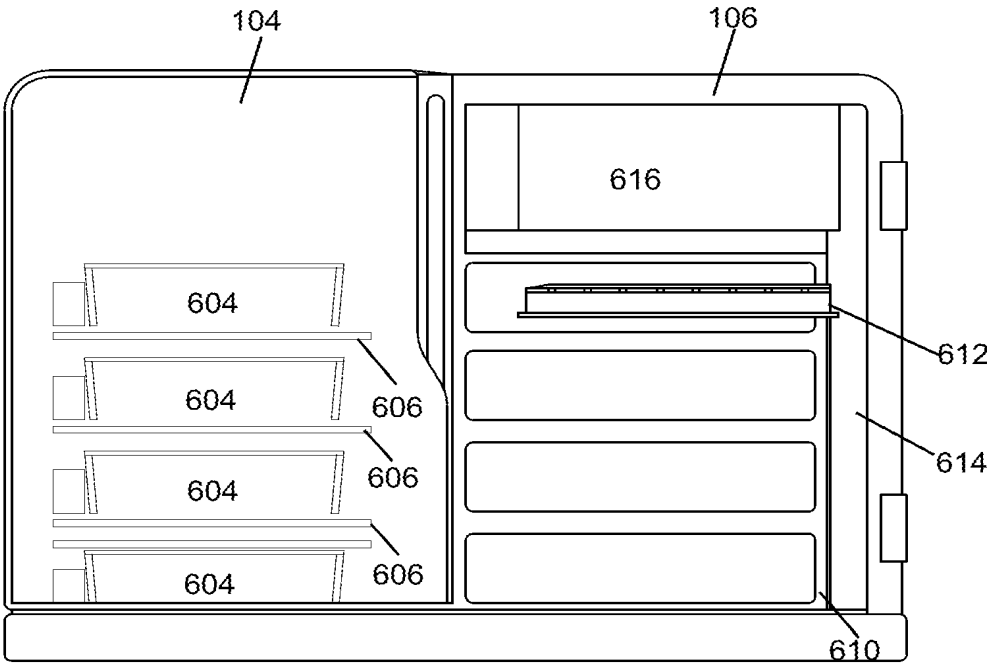


FIG. 11

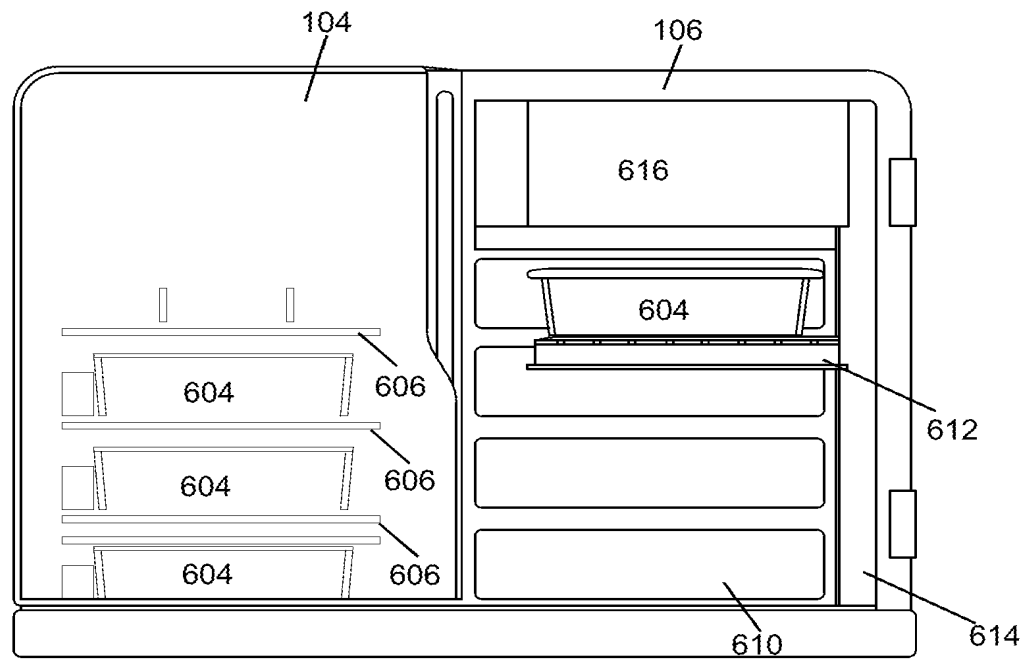


FIG. 12

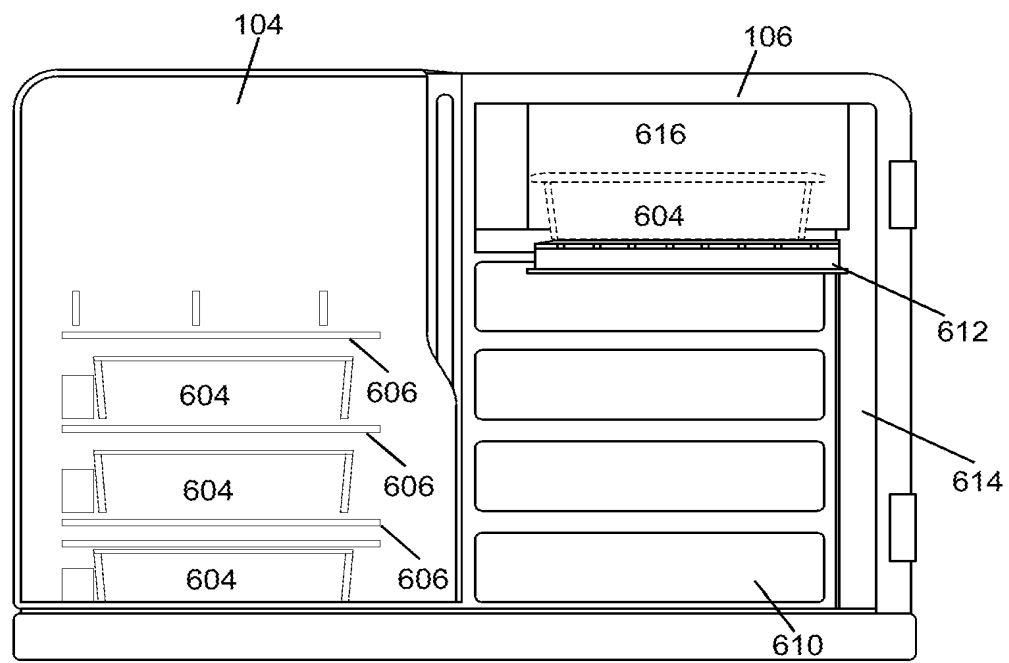


FIG. 13

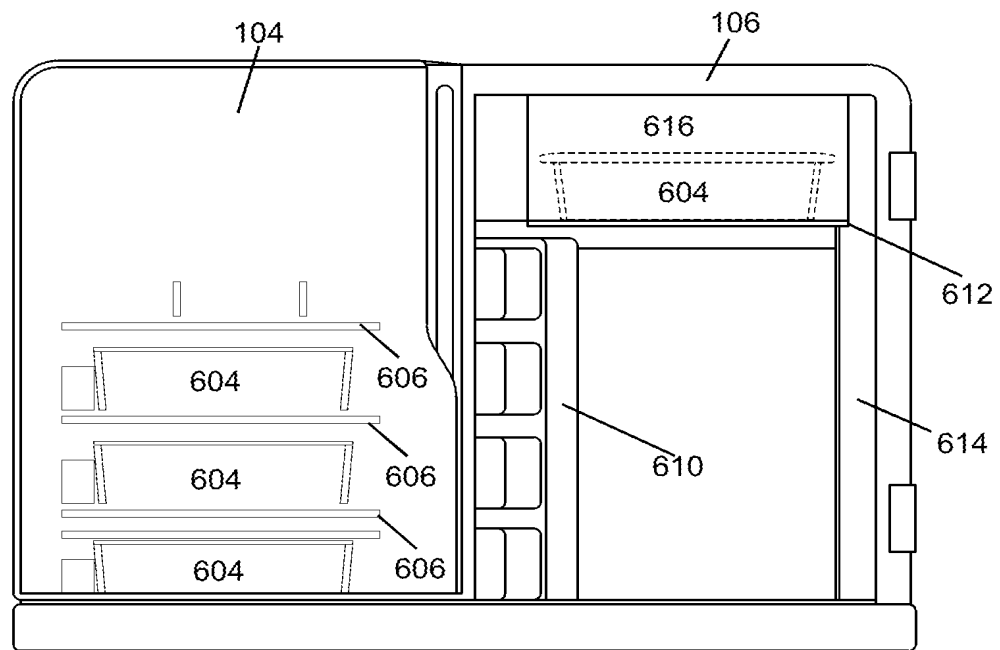


FIG. 14

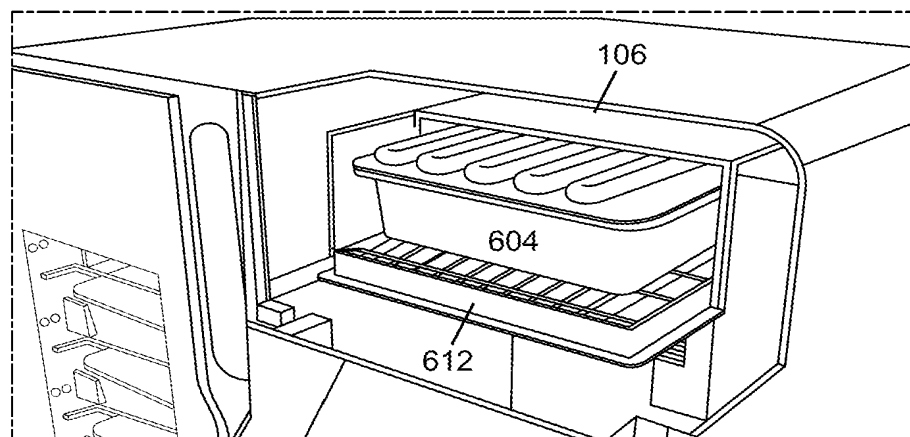


FIG. 15

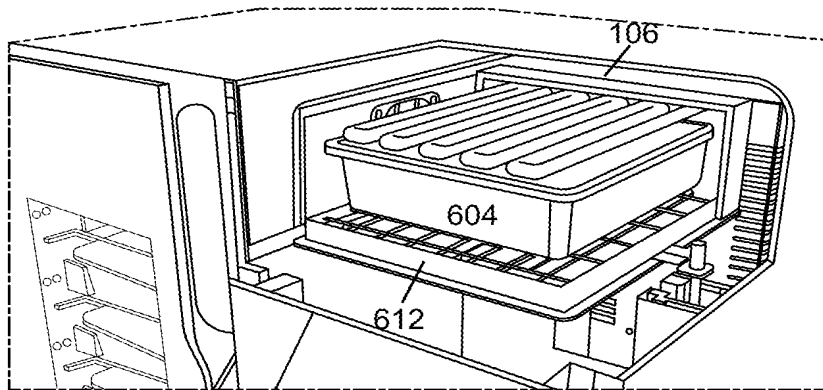


FIG. 16

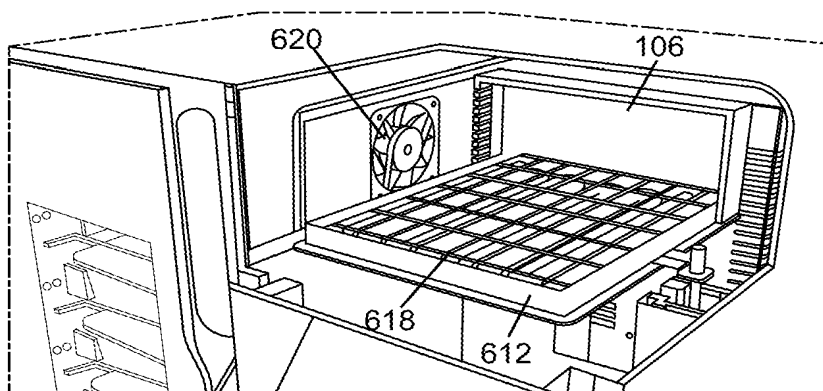


FIG. 17

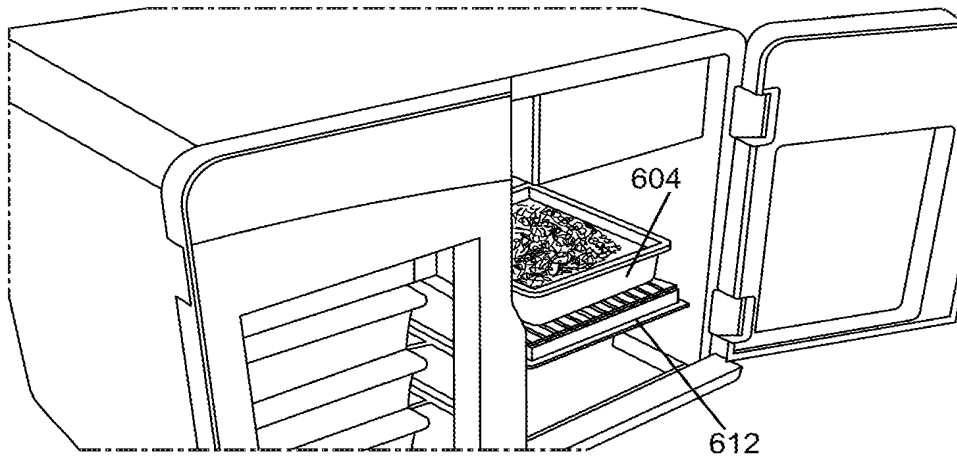


FIG. 18

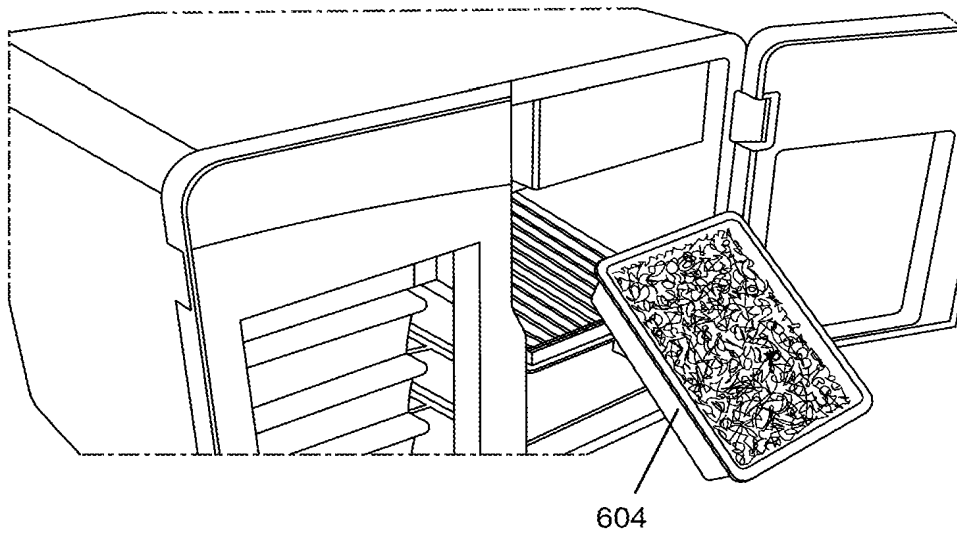


FIG. 19

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US20/18305

A. CLASSIFICATION OF SUBJECT MATTER

IPC - A47J 36/24, 36/26, 36/00; A23L 5/10, 5/00 (2020.01)

CPC - A47J 36/24, 36/26, 36/00; A23L 5/10, 5/00; A23V 2002/00

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)

See Search History document

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

See Search History document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2018/0249861 A1 (KEENWAWA, INC.) 06 September 2018; figures 1, 23F, 23L, 23M, 23N; paragraphs [0072], [0082], [0084], [0085], [0093], [0099], [0100], [0114], [0121], [0125], [0129], [0130], [0139], [0144], [0145], [0182], [0186], [0194], [0195], [0204], [0222]	1-3, 5-8, 10-20, 22, 24-26 --- 4, 9, 21, 23
Y	US 6,250,210 B1 (MORETH, R.) 26 June 2001; column 3, lines 43-53; column 4, lines 45-64	4
Y	US 2016/0379434 A1 (HUANG, Z.) 29 December 2016; paragraph [0293]	9
Y	US 4,133,995 A (BUCK, R.) 09 January 1979; abstract; column 3, lines 6-24	21
Y	US 2005/0193901 A1 (BUEHLER, D.) 08 September 2005; paragraphs [0124], [0125]	23

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"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

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**COOKING SYSTEM FOR A SPACE RESTRICTED ENVIRONMENT,
A SELF-CONTAINED COOKING UNIT FOR THE COOKING SYSTEM
AND RELATED METHOD OF OPERATING A COOKING SYSTEM
WITHIN A SPACE RESTRICTED ENVIRONMENT**

5

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to United States Patent Application No. 62/811,584 filed 28 February 2019, which application is herein expressly incorporated by reference.

10

FIELD

[0002] The present disclosure generally relates to a cooking system for a space restricted environment and a self-contained cooking unit for the cooking system. The present disclosure more particularly relates to a space efficient and modular cooking system for vehicles and the like, that can also be used for residential and other applications. The present disclosure also relates to a corresponding method of operating a cooking system within a space restricted environment.

15

BACKGROUND

[0003] The statements in this section merely provide background information related to the present disclosure and may not constitute prior art.

20

[0004] In vehicles such as recreational vehicle or caravans (collectively RVs) and watercraft that provide for a cooking area, space is restricted and as a result the corresponding functionality may be compromised. Space is similarly restricted in watercraft, boats and the like which provide for a cooking area. Explaining further, conventional cooking hobs require a fixed installation that occupies a horizontal space within a vehicle that could otherwise be dedicated to multi-purpose counter space. Such conventional cooking hobs also need specific clearance dimensions in a vertical direction. This increases the dependency on inconvenient cabinet and drawer space that is lower and deeper, particularly in space restricted environments such as presented in RVs, watercraft, and the like.

25

30

[0005] While known cooking systems for vehicles and like may have proven to be generally successful for their intended purposes, a continuous need for improvement remains in the pertinent art.

SUMMARY

[0006] The present teachings are generally related to various aspects of a space efficient and modular cooking system for a vehicle or the like.

[0007] It is an object of the present teachings to provide a cooking system for a space restricted environment that includes one or more cooking devices in the form of cooking hobs, air filter units or both cooking hobs and air filter units that may be quickly and easily deployed from a storage area and flexibly used both within and outside the space restricted environment. For example, the cooking devices may be stored below a countertop or behind various other surfaces when not in use.

[0008] It is related object of the present teachings to provide a cooking system for a space restricted environment that includes at least one modular cooking unit having a cooking device.

[0009] It is another related object of the present teachings to provide a cooking system for a space restricted environment that provides a user with flexibility to create various desired cooking setups for different cooking sessions.

[0010] The present teachings particularly provide a cooking system for a space restricted environment including at least one cooking unit having at least one cooking device. As used herein, the term "cooking device" will be understood to mean a cooking hob, an air filter unit or both a cooking hob and an air filter unit. The at least one cooking device is movable between a stowed position and a deployed position such that in the stowed position the cooking device is located either behind, or below, or above an corresponding surface of a countertop, cabinet, wall or the like and in the deployed position the cooking device extends through an opening in the corresponding surface.

[0011] The present teachings particularly provide a self-contained cooking unit for a cooking system of a space restricted environment that includes a housing, a lid assembly and a cooking device. The housing includes an open upper end. The lid assembly includes a lid for closing the open upper end of the housing. The lid is moveable between an open position and a closed position. The cooking device is removable from the housing. Additionally, the cooking unit may incorporate an air filter unit that may be removable from the housing or an air filter unit that is integrated within the housing.

[0012] The cooking system may also include an elevator. The elevator may be disposed in the housing, for example, for movement between a stowed or lower

position and a deployed or upper position. The cooking device may be carried by the elevator such that the cooking device is in a stowed position within the housing when the elevator is in the stowed position and the cooking device is in a deployed position at least partially extending from the housing when the elevator is in the deployed or
5 extended position.

[0013] The cooking system may further include a cord retraction mechanism. The cord retraction mechanism may be disposed in the housing, for example, for guiding the cooking device cords in and out of the housing during movement from lower position to an upper position and vice versa. Additional cord
10 guidance is facilitated by the retraction during the removal of the cooking hob or air filter unit from the housing for operation within space restricted environment and vice versa.

[0014] The present teachings further provide a method of operating a cooking system within a space restricted environment. The space restricted environment may include a countertop, for example. The method includes providing at
15 least one self-contained cooking unit. Each cooking unit includes a housing, a lid assembly and a cooking device. Each cooking unit may optionally include an elevator and / or a cord retraction mechanism that may be disposed within the housing. The method additionally includes mounting the self-contained cooking unit to the countertop proximate an opening in the countertop. The method further includes using the elevator
20 to move the cooking device from a stowed position disposed within the housing to a deployed position at least partially extending from the housing. From the deployed position, the cooking device may be removed from the self-contained unit for flexible cooking use on the countertop or remotely therefrom. The method also optionally includes using the cord retraction mechanism to guide the cooking device cords in and
25 out of the housing during deployment, removal from housing, and vice versa where a cord is needed.

[0015] Further areas of applicability will become apparent from the description provided herein. It should be understood that the description and specific examples are intended for purposes of illustration only and are not intended to limit the
30 scope of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The drawings described herein are for illustration purposes only and are not intended to limit the scope of the present disclosure in any way.

[0017] Figure 1 is a perspective view a cooking system for a space restricted environment in accordance with an exemplary embodiment of the present disclosure, the cooking system shown operatively associated with a countertop and including a plurality of cooking units.

5 **[0018]** Figure 2 is a perspective view of another cooking system for a space restricted environment in accordance with an exemplary embodiment of the present disclosure, the cooking system shown operatively associated with a countertop and including a plurality of cooking units.

[0019] Figure 3A is a simplified view showing upward, vertical deployment of a cooking device of the present teachings from a stowed position located below a countertop.

[0020] Figure 3B is a simplified view showing various locations for cooking units on an exemplary countertop.

[0021] Figure 3C is a simplified view showing downward, vertical deployment of a cooking device of the present teachings from a stowed position within an upper cabinet.

[0022] Figure 3D is a simplified view showing horizontal deployment of a cooking device of the present teachings from a stowed position behind a wall.

[0023] Figure 3E is a simplified view showing horizontal deployment of a cooking device of the present teachings from a stowed position within an upper cabinet.

[0024] Figure 4A is a partially cut-way perspective view of a self-contained air filter unit which can be utilized on its own within the alternative cooking unit method of Figure 4 in accordance with the present teachings.

[0025] Figure 4B is a partially cut-away perspective view illustrating an alternative cooking unit of Figure 2 in accordance with the present teachings, a housing of the cooking unit shown operatively associated with countertop.

[0026] Figure 5 is a partially cut-away perspective view of one of the cooking units of the system of Figure 2, further illustrating an integrated elevator mechanism, the elevator mechanism including a retraction mechanism used to selectively retain an associated elevator mechanism in the stored position.

[0027] Figure 6 is a perspective view of a cord retraction mechanism in accordance with the present teachings.

[0028] Figure 7 is a perspective view of another cord retraction mechanism in accordance with the present teachings.

[0029] Figure 8 is a perspective view of another cord retraction mechanism in accordance with the present teachings.

[0030] Figure 9A is a simplified schematic view of one of the cooking units of the cooking system shown in Figure 1 of the present teachings, an elevator assembly of the cooking unit operates to move the associated cooking device between a stored position and a deployed position shown in the stored position.

[0031] Figure 9B is a simplified schematic view similar to Figure 9A, illustrating the elevator assembly in the deployed position.

[0032] Figure 9C is a perspective view of a portion of the cooking system in Figure 1 of the present teachings, further illustrating a retraction mechanism used to selectively retain an associated elevator assembly in the stored position.

[0033] Figure 9D is another perspective view further illustrating the retraction mechanism of Figure 9C.

[0034] Figure 9E is a perspective view of a portion of the cooking system in Figure 1 of the present teachings, further illustrating a rack and pinion arrangement for limiting a deployment speed of an elevator housing of the elevator assembly.

[0035] Figure 9F is a perspective view of a portion of the cooking system in Figure 1 of the present teachings, further illustrating a biasing mechanism for biasing the elevator housing to the deployed position, the biasing mechanism including a plurality of constant force springs.

[0036] Figure 9G is a partially cut-away perspective view of a portion of the cooking system in Figure 1 of the present teachings, further illustrating a lid assembly and related components, a lid of the lid assembly shown in a closed position.

DETAILED DESCRIPTION

[0037] The following description is merely exemplary in nature and is not intended to limit the present disclosure, application, or uses. In this regard, the following description uses specific embodiments that are just examples of particular structure that fall within the scope of the present teachings. For example, while particular cooking units are illustrated in the drawings and described herein, it will be understood that many other cooking units will fall within the scope of the present teachings. It will also be understood that common reference characters have been used throughout the drawings to indicate like or corresponding parts and features.

[0038] With initial reference to Figure 1 of the drawings, a cooking system for a space restricted environment in accordance with an exemplary embodiment of the

present disclosure is illustrated and identified at reference character 10 (hereinafter simply the “cooking system 10”). The present teachings are particular adapted for enabling efficient usage and storage within a vehicle such a recreational vehicle (“RV”), caravan, or the like. It will be understood, however, that the present teachings may be readily adapted for other applications such as boats and the like within the present scope. In this regard, and without limitation, the present teachings may be readily extended to other mobile or non-mobile applications.

[0039] As particularly shown in the environmental view of Figure 1, the cooking system 10 may include one or more cooking units 12. In the particular embodiment illustrated, the cooking system 10 includes a plurality of cooking units 12 having a first cooking unit 12A, a second cooking unit 12B, and a third cooking unit 12C. It will be understood, however, a cooking system 10 within the scope of the present teachings may include a greater or lesser number of cooking units 12.

[0040] In the embodiment illustrated in Figure 1, each cooking unit 12 is shown to include a corresponding cooking hob 14 and optionally including a corresponding air filter unit 18A. As will be discussed below in connection with Figures 9A through 9G, the optional air filter units 18A may be movable between stowed positions below the countertop 22 and deployed positions at least partially extending through openings 28 in the countertop 22. The air filter units 18A may route air in a conventional manner down and out of the vehicle to vent the air from the vehicle. For certain applications within the scope of the present teachings, the system 10 may only include cooking hobs 14 (*i.e.*, no air filter units 18). In other words, the present teachings may be used in environments incorporating independent air filtering.

[0041] Each cooking unit 12 for both cooking system 10 and cooking system 10B will be understood to be a self-contained unit. Explaining further, the cooking units 12 may be packaged and shipped and as self-contained units that may be readily and independently mounted relative to a countertop. Alternative, the components of the cooking units 12 may be connected together (forming different shapes) and sent as one complete solution for single installation. In the embodiment illustrated, the functional components of the cooking unit 12 are housed within the housing 21 during shipping and when the cooking unit 12 is stored within the countertop 22. The housing 21 includes an open upper end and contains all functional components of the cooking unit 12. The upper end of the housing 21 is closed by the lid assembly 20.

[0042] As will become better understood below, Figure 1 illustrates the first cooking unit 12A in first functional position, the second cooking unit 12B in a second functional position and the third cooking unit 12C in a third functional position. The cooking unit 12A may be further operated in a fourth functional position in which the cooking hob 14 is removed from the space restricted environment for remote use. In the first functional position, the cooking hob 14 and the air filter unit 18A of the first cooking unit 12A are stored below a corresponding surface (e.g., the countertop 22), a lid 24 of a lid assembly 20 is articulated to a closed position, and the lid 24 is flush with an upper surface of the countertop 22 such that a corresponding portion of the countertop 22 may be alternatively used. In the second functional position, the lid 24 of the lid assembly 20 is articulated to an open position, while the cooking hob 14 and an air filter housing 26 of the second cooking unit 12B are linearly displaced (e.g., upwardly in the embodiment illustrated) to deployed positions. In this second functional position, the cooking hob 14 and air filter unit 18A partially extends from a corresponding opening 28 in the countertop 22. In the third functional position, the cooking hob 14 of the third cooking unit 12C is placed on the countertop 22 and ready for use.

[0043] Another cooking system 10B in accordance with the present teachings will be introduced with reference to Figure 21 prior to a further description of various detail that may be common to both cooking systems 10 and 10B. As compared to the cooking system 10 of Figure 1, each cooking unit 12 of the cooking system 10B is shown to only include a cooking device in the form of a cooking hob 14 or in the form of an air filter unit 18A. Explaining further, the second cooking unit 12B and the third cooking unit 12C include cooking hobs 14 and a fourth cooking unit 12D includes an air filter unit 18B. This allows a flexible selection in the number of cooking hobs 14 and air filter units 18B in one cooking system 10B. In order to facilitate this flexibility in a modular manner, cooking hob 14 and air filter unit 18B may be of similar dimensions and / or shape. This allows a common housing 21 to be utilized for either the cooking hob 14 or air filter unit 18B in a cooking unit 12.

[0044] Before further addressing certain details of the cooking systems 10 and 10B, a description of some common features and advantages will be described. Significantly, and as will be more fully appreciated hereinafter, the cooking units 12 may be located such that otherwise desirable storage area is not consumed by the system 10 or 10B. For example, the cooking units 12 may be located proximate a rear side of

the countertop 22 (e.g., proximate a wall of the RV). Such an arrangement is shown in Figure 1 and Figure 2 and schematically in Figure 3A, for example. As such, the vertical space occupied by the cooking units 12 is restricted to a less desirable storage area. In this regard, the cooking units 12 do not impede upon the more convenient cabinet and drawer space located at the forward side of the countertop 22. In Figure 3B, a simplified view of a countertop 22 incorporating a number of cooking units 12 in various locations is provided. Figure 3B is illustrative of the flexibility of the system 10 of the present teachings. It will be understood that the cooking units 12 may be located anywhere on the countertop 22.

[0045] In addition to locating the cooking units 12 relative to the countertop 22 as shown in Figures 1, 2, 3A and 3B, the cooking units may be located in other convenient areas as desired. For example, Figure 3C schematically illustrates downward vertical deployment of a cooking unit 12 from a lower side of an upper cabinet. Figure 3D schematically illustrates horizontal deployment of a cooking unit from a wall positioned between an upper cabinet and a lower cabinet. Figure 3E schematically illustrates horizontal deployment of a cooking unit from a stowed position within an upper cabinet. These and other applications will be understood to be within the scope of the present teachings.

[0046] The cooking hobs 14 of cooking systems 10 and 10B will be understood to be similar. The size and configuration of the cooking hobs 14 may be readily adapted for specific uses within the scope of the present teachings. As illustrated, the cooking hobs 14 may include at least one induction heating element 30. While generally illustrated in the drawings to include a single induction heating element 30, the cooking hob 14 may also include two or more induction heating elements 30. The induction heating element 30 may be powered by either a rechargeable battery 32 or through a power cord 34, or by both a rechargeable battery 32 and a power cord 34. The power cord 34 may be a detachable power cord. In other applications, the present teachings may be adapted to include a gas or other powered heating element.

[0047] In the first functional position, the power cord 34 is connected to the rechargeable battery 32 for charging of the battery, thereby ensuring a full charge upon cooking hob deployment. As shown in the third function position, the power cord 34 of the third cooking unit 12C may extend from the cooking hob 14, through the opening 28 in the countertop 22 and to a power source (not particularly shown). The

power cord 34 may be a self-retracting power cord. Some examples are provided below.

[0048] The power cord 34 may serve to both power the cooking hob 14 and recharge the battery 32. The power cord 34 may unplug from the cooking hob 14 such that the cooking hob 14 may be used remotely from rest of the cooking system 10, either within the space restricted environment, or outside the space restricted environment. When the cooking hob 14 is detached, the cooking hob 14 may be powered by an electrical cord, an internal battery, or an external battery. For example, a caravan user may desire to take a charged cooking hob 14 outside the caravan for cooking purposes. It will be understood that other charging means may be used with the present teachings, including but not limited to wireless and docking charging means.

[0049] As further detailed in Figures 9A through 9G, the cooking units 12 may include a frame 16 having a first frame component 36 and a second frame component 38. The first frame component is an upper frame component 36 proximate an upper end or proximal end of the cooking unit 12. The first frame component 36 may be mounted to an underside of the countertop 22 and may support the components of the lid assembly 20, as will be addressed below. The second frame component is a lower frame component 38 proximate a lower or distal end of the cooking unit 12. A pair of vertically extending guide members 40 extends between the first and second frame components 36 and 38.

[0050] The lid assembly 20 includes the lid 24, a lid assembly frame 42 and a cosmetic trim member 44. The lid 24 is coupled to the lid assembly frame 42 for articulation between an open position and a closed position about a pivot axis 46. The open position is shown in Figure 9B for example. The closed position is shown in Figures 9A and 9G, for example.

[0051] The cosmetic trim member 44 upwardly extends through the hole 28 in the countertop 22 to a position flush with an upper surface of the countertop 22. The upper surface of the countertop 22, the upper surface of the lid 24 and the uppermost surface of the cosmetic trim member 44 are generally within the same common horizontal plane. As noted above, such a relationship allows for a corresponding portion of the countertop 22 to be alternatively used when the hob 14 is stored. One or more springs 48 may upwardly bias the lid assembly frame 42 relative to the first frame component 36.

[0052] The elevator and air filter unit assembly 45 may include an elevator 47 and an air filter unit 18A. The elevator 47 is operative for moving the hob 14 between the stowed position and the deployed position. Explaining further, the elevator 47 includes an elevator frame 50 moveable between corresponding stowed and deployed positions. It will be understood that the shape, size and other characteristics of the elevator frame 50 may be readily adapted within the scope of the present teachings provided that the general function is retained. The stowed position is shown in Figure 9A for example. The deployed position of the elevator frame 50 is shown in Figure 9B, for example. In the stowed position, the hob 14 and air filter unit 18A are completely recessed below the upper surface of the countertop 22. In the deployed position, the hob 14 and air filter unit 18A partially extend above the countertop 22. Vertical movement of the elevator 47 between the stowed position and the deployed position is guided by the vertically extending guide members 40.

[0053] Movement of the elevator frame 50 from the stowed position to the deployed position may be provided by a biasing mechanism 52. In one particular form, the biasing mechanism may include a plurality of constant-force springs 52. As will be addressed in detail below, may be used within the scope of the present teachings to move the elevator frame between the stowed and deployed positions.

[0054] The speed at which the elevator frame 50 moves may be regulated by a speed control mechanism 54. The speed control mechanism 54 may include a rack and pinion arrangement 56 having a rotational damper 58 in the form of a pinion and a cooperating rack 60. The rack 60 may extend between the first and second frame components 36 and 38.

[0055] A linear damper 62 is carried by the elevator frame 50. The linear damper 62 engages a lower side of the first frame component 36 as the elevator frame 50 approaches its deployed position. Such engagement provides a smooth stop of the elevator and air filter unit 45.

[0056] The cooking unit 12 further includes a push-push activated retraction mechanism 64. It will be understood that the particular type of retraction member is beyond the scope of the present teachings. In this regard, other retraction mechanism may be readily incorporated, including but not limited to an electronic button, a touch button, a movement sensor, a light sensor and a sound sensor. In the particular embodiment illustrated, the retraction mechanism 64 includes a first component or retraction mechanism capture geometry 66 and a second component or

retraction mechanism 68. The first component 66 may be carried by the elevator frame 50. The second component 68 may be carried by the second frame component 38.

[0057] The air filter unit housing 26 of the air filter unit 18A may include a filter 70. The air filter unit housing 26 functions to purify the space restricted environment of odors. The air filter unit housing 26 defines a vent path containing the filter 70. The vent path fluidly communicates an upper end of the air filter unit housing 26 with an area below the elevator frame 50. In this manner, odors can be withdrawn from the space restricted environment and expelled from the vehicle, for example, in a known manner. The air filter unit 18A is carried by the elevator frame 50 such that the air filter unit correspondingly moves between stowed and deployed positions. It will be understood that the cooking unit 12 of the present invention may be adapted such that it does not include an air filter unit 18A.

[0058] With particular reference to Figures 1 and 9A-9G the drawings, operation of one of the cooking units 12 of cooking system 10 of the present teachings will be further described. With the cooking unit 12 in its stowed position, (as represented in Figure 1 by the first cooking unit 12A), the user initiates deployment of the elevator and air filter unit assembly 45 by pressing down on the lid 24. Downward movement of the lid 24 correspondingly downwardly displaces the elevator and air filter unit assembly 45, including the elevator frame 50. As a result, the push-push release mechanism 64 releases the elevator and air filter unit assembly 45 from the stowed position. The constant-force springs 52 of the biasing mechanism 52 now moves the constant-force springs 52 upwardly. The speed of movement is regulated by the speed control mechanism 54. The elevator and air filter unit 45 continues to the deployed position, as shown in Figure 9B, for example. In this position, the cooking hob 14 may be removed by the user for use on the countertop 22 or remotely. After such use, the hob 14 is returned to the elevator and air filter unit 45. When the elevator and air filter unit 45 is pressed down by the user, the components of the push-push release mechanism 64 engage to retain the elevator and air filter unit assembly 45 in the stowed position.

[0059] With reference to Figures 2, 4A, 4B and 5-6, the system 10B will be further described. In addition to the cooking device (e.g., either a cooking hob 14 or an air filter unit 18B), it will be understood that each of the cooking units 12A-12D generally includes a housing 21, an elevator 202, a cord retraction mechanism 300 and a lid assembly 20. As above, each cooking unit 10B will continue to be understood to

be a self-contained unit and it will also be understood that a greater or lesser number of cooking units 12 may be incorporated within the scope of the present teachings.

[0060] With particular reference to Figure 4A, the air filter unit 18B for cooking units 12 of the system 10B differs from that for cooking units 12 of the system 10 by recycling air rather than venting it out of the space restricted environment and expelling it from the vehicle. In air filter unit 18B of cooking units 12 of the system 10B, the air filter unit housing 26 functions to purify the space restricted environment of odors. Small differences may be noted between the air filter unit 18B shown in Figure 2 and the air filter unit shown in Figure 4A. For example, the handle of Figure 2 is not shown in Figure 4A. These differences, however, simply reflect two exemplary embodiments consistent with the present teachings.

[0061] The air filter unit 18B in cooking system 10B of the present teachings may include at least one fan 71 disposed in the housing 26. While generally illustrated in the drawings to include a single fan 71 and single filter 70, the air filter unit 18B may also include two or more fans 71 and / or filters 70. The fan 71 may be powered by either a rechargeable battery 32 or through a power cord 34, or by both a rechargeable battery 32 and a power cord 34. The air filter unit 18B operates by forcing air through the filter 70 by means of the fan 71. The filtered air is then expelled from an opening (not particularly shown) in the air filter unit 18B, back into the space restricted environment. In this manner, the space restricted environment can be purified from odors.

[0062] Similar to the functional positions of the cooking devices discussed above with respect to the system 10, the cooking hob 14 and the air filter unit 18B of the system 10B may both operate in first, second, third and fourth functional positions.

[0063] In the first functional position, the power cord 34 is connected to the rechargeable battery 32 for charging of the battery, thereby ensuring a full charge upon air filter unit deployment. As shown in the fourth function position, the power cord 34 of the fourth cooking unit 12D may extend from the air filter unit 18B, through the opening 28 in the countertop 22 and to a power source (not particularly shown). The power cord 34 may be a self-retracting power cord. Some examples are provided below.

[0064] The power cord 34 may serve to both power the air filter unit 18B and recharge the battery 32. The power cord 34 may unplug from the air filter unit 18B such that the air filter unit 18B may be used remotely from rest of the cooking system

10. When the air filter unit 18B is detached, the air filter unit 18B may be powered by an electrical cord, an internal battery, or an external battery. For example, a caravan user may desire to take a charged air filter unit 18B away from the cooking system 10 and to the dining area of the caravan for odor purification purposes. It will be understood that
5 other charging means may be used with the present teachings, including but not limited to wireless and docking charging means.

[0065] With reference to Figures 2 and 4-8 the drawings, one cooking unit 12 of the cooking system 10B will be further described. With the cooking unit 12 in its stowed position, (as represented in Figure 2 by the first cooking unit 12A), the user
10 initiates deployment of the elevator assembly 202 by pressing down on the lid 24. Downward movement of the lid 24 correspondingly downwardly displaces the stored cooking hob 14 or air filter unit 18B. As a result, the push-push release mechanism 64 is activated so that the retraction mechanism 68 releases the retraction mechanism capture geometry 66 (in the cooking units 12 of the system 10B, this is embedded
15 within the cooking hob 14 and the air filter unit 18B body which is not necessarily shown in the figures), hence, releasing the elevator assembly 202 from the stowed position.

[0066] The elevator assembly 202 includes a biasing mechanism in the form of extension springs 204 which normally bias the associated cooking device to the deployed position. The cooking device sits on the elevator frame 50. Upon releasing
20 the retraction mechanism 68, the extension springs advance the elevator assembly 202 to the deployed position. During the deployment of the elevator assembly 202, the cord retraction mechanism 300 start its engagement. In this regard, an elastic member 302 of the cord retraction mechanism 300 may be employed. The cooking hob 14 or air filter unit 18B may be removed by the user for use on the countertop 22 or remotely.
25 After such use, the cooking hob 14 or air filter unit 18B is returned to the elevator assembly 202. When the elevator assembly 202 is pressed down by the user, extension springs 204 are moved downwardly and the components of the push-push release mechanism 64 engage to retain the elevator assembly 202 in the stowed position. During the removal of the cooking hob 14 or the air filter unit 18B, the cord
30 retraction mechanism 300 is engaged to ensure no excess cord is present on the countertop 22 during use within the restricted environment. Furthermore, the retraction mechanism 300 engagement ensures that no excess cord is present in the cooking unit 10B housing 21 both during removal and placement of cooking hob 14 or air filter unit 18B, hence, smooth operation of the elevator assembly 202 is allowed. Once the

elevator assembly 202 is in stowed position again, the cord retraction mechanism 300 is disengaged.

[0067] With reference to Figures 6 through 8, the various cord retraction mechanism in accordance with the present teachings, including the cord retraction mechanism 300 introduced above are illustrated. The first cord retraction mechanism 300 of Figure 6 includes a tensioning element in the form of the elastic member 302. The second cord retraction mechanism 300A of Figure 7 includes a tensioning element in the form of an extension spring 402. The extension spring 402 may be connected to a guide wheel 404 for guiding the cord 34. The third cord retraction mechanism 300B of Figure 8 includes a tensioning element in the form of a flat metal spring 502. The cord 34 may be guided by a guide mechanism 504 including a pair of guide wheels 506 connected by a pair of plates 508. The flat metal spring 502 may be wound around a central spigot or hub 510. A channel 512 defined by the spigot 510 may provide a cable connection point for power. A drum 514 circumferentially surrounds the wound spring 502.

[0068] It will now be appreciated that the cooking systems 10 and 10B of the present teachings both provide an arrangement particularly adapted for storage and flexibility of use within a restricted space environment. The cooking systems 10 and 10B of the present teachings also provides a rechargeable hob 14 that can be taken outside the flexible use environment of the vehicle for remote use. As noted elsewhere, outside the space restricted environment, the cooking hob 14 may be powered by an electrical cord, an internal battery or an external battery.

[0069] It will also be understood that the scope of the present teachings does not require an elevator mechanism. In this regard, the cooking hob 14 may simply be manually removed from the housing 21. It will still also be understood that various other elevator mechanisms may be used in connection with the teachings of the present invention. In this regard, any other elevator mechanism known in the art or developed hereafter may be employed with present teachings.

[0070] While various aspects have been described, those skilled in the art will recognize modifications or variations which might be made without departing from the present disclosure. The examples illustrate the various embodiments and are not intended to limit the present disclosure. For example, while the various inventions described herein may have particular application for recreational vehicles, the present teachings may be readily adapted for other vehicles, including but not limited to those in

the marine industry. Therefore, the description and claims should be interpreted liberally with only such limitation as is necessary in view of the pertinent prior art.

CLAIMS

What is claimed is:

1. A cooking system 10 for a space restricted environment, the cooking system 10 comprising:

5 at least one cooking device movable between a stowed position and a deployed position such that in the stowed position the cooking device is located either behind or below a corresponding surface of a countertop 22, cabinet, wall or the like and in the deployed position the cooking device upwardly extends through an opening in the corresponding surface, the at least one cooking device selected from a group
10 consisting of a cooking hob, an air filter unit and a combination thereof.

2. The cooking system for a restricted environment of claim 1, wherein the cooking device is movable between the stowed position and the deployed position in a direction selected from a group consisting of a horizontal direction, a vertically upward
15 direction and a vertically downward direction.

3. The cooking system 10 for a space restricted environment of claim 1, further comprising an elevator operative to move the cooking device between the stowed position and the deployed position and a cord retraction mechanism for guiding
20 one or more cooking device cords.

4. The cooking system for a space restricted environment of claim 1, wherein the cooking device is removable from the deployed position for random placement on the countertop to provide cooking setup flexibility.
25

5. The cooking system for a space restricted environment of claim 1, wherein the device is a cooking hob including an induction cooking element.

6. The cooking system for a space restricted environment of claim 1,
30 wherein the cooking device is powered by an electrical cord, and further

Wherein the electric cord is detachable for remote use of the cooking device.

7. The cooking system for a space restricted environment of claim 1, wherein the cooking device is powered by a battery selected from a group consisting of an internal battery and an external battery.

5 8. The cooking system for a space restricted environment of claim 1, wherein each cooking unit further includes a lid assembly having a lid moveable between an open position and a closed position, the lid closing the opening in the corresponding surface and substantially flush with the upper surface of the corresponding surface when in the closed position.

10 9. The cooking system for a space restricted environment of claim 1, wherein each cooking unit of the at least one cooking unit defines a self-contained unit for ready and independent mounting relative to the corresponding surface.

15 10. The cooking system for a space restricted environment of claim 4, wherein the lid assembly further includes a cosmetic trim member upwardly extending through a hole in the corresponding surface to a position flush with the corresponding surface.

20 11. The cooking system for a space restricted environment of claim 10, wherein the corresponding surface, the upper surface of the lid and an uppermost surface of the cosmetic trim member are generally within a common horizontal plane.

25 12. The cooking system for a space restricted environment of claim 1, wherein the elevator includes an elevator frame moveable from the stowed position to the deployed position by a biasing mechanism.

30 13. The cooking system for a space restricted environment of claim 1, in combination with the corresponding surface.

14. The cooking system for a space restricted environment of claim 1, wherein each cooking unit is mounted relative to the corresponding surface proximate a hidden side of the corresponding surface.

15. A self-contained cooking unit for a cooking system of a space restricted environment, the self-contained cooking unit comprising:

a housing including an open upper end;

an elevator disposed in the housing for movement between a lower position and an upper position; and

at least one cooking device carried by the elevator, the cooking device in a stowed position within the housing when the elevator is in the lower position and the cooking device in a deployed position at least partially extending from the housing when the elevator is in the upper position.

16. The self-contained cooking unit for a cooking system for a space restricted environment of claim 15, further comprising a lid assembly including a lid for closing the open upper end of the housing, the lid moveable between an open position and a closed position.

17. The self-contained cooking unit for a cooking system for a space restricted environment of claim 16, wherein the restricted environment includes a countertop including an opening, the self-contained cooking unit mountable relative to the countertop opening such that lid closes the opening when the lid is in the closed position.

18. The self-contained cooking unit for a cooking system for a space restricted environment of claim 16, wherein the lid is flush with an upper surface of the countertop when the lid is in the closed position.

19. The self-contained cooking unit for a cooking system for a space restricted environment of claim 16, wherein the lid assembly further includes a cosmetic trim member upwardly extending through a hole in the countertop to a position flush with the upper surface of the countertop.

20. The self-contained cooking unit for a cooking system for a space restricted environment of claim 19, wherein the upper surface of the countertop, the upper surface of the lid and an uppermost surface of the cosmetic trim member are generally within a common horizontal plane.

21. The self-contained cooking unit for a cooking system for a space restricted environment of claim 15, wherein the elevator includes an elevator frame moveable from the stowed position to the deployed position by a biasing mechanism.

5 22. The self-contained cooking unit for a cooking system for a space restricted environment of claim 16, in combination with the countertop.

23. The self-contained cooking unit for a cooking system for a space restricted environment of claim 22, wherein each cooking unit is mounted relative to the
10 countertop proximate a hidden side of the countertop.

24. A method of operating cooking system within a space restricted environment, the space restricted environment including a countertop, the method comprising:

15 providing at least one self-contained cooking unit, each cooking unit including a housing having an open upper end, a lid assembly at the open upper end, an elevator and a cooking device, the elevator disposed within the housing;

mounting the self-contained cooking unit to the countertop proximate an opening in the countertop; and

20 using the elevator to move the cooking device from a stowed position disposed within the housing to a deployed position at least partially extending from the housing.

25 25. The method of operating cooking system within a space restricted environment of claim 25, wherein using the elevator to move the cooking device from the stowed position to the deployed position includes moving the cooking device in a direction selected from a group consisting of a horizontal direction, a vertically upward direction and a vertically downward direction.

30 26. The method of operating cooking system within a space restricted environment of claim 24, further comprising removing the cooking device from the deployed position to a use position spaced from the self-contained cooking unit.

27. The method of operating cooking system within a space restricted environment of claim 24, wherein the elevator includes an elevator frame moveable

from a lower position when the cooking device is in the stowed position to an upper position when the cooking hob is in the deployed position.

28. The method of operating cooking system within a space restricted
5 environment of claim 27, using the elevator to move the cooking device from the stowed position to the deployed position includes biasing the elevator frame to the deployed position.

29. The method of operating cooking system within a space restricted
10 environment of claim 27, using the elevator to move the cooking device from the stowed position to the deployed position includes biasing the elevator frame to the deployed position with a plurality of biasing elements.

30. The method of operating cooking system within a space restricted
15 environment of claim 27, further comprising regulating a speed of the elevator frame by a speed control mechanism.

31. The method of operating cooking system within a space restricted
environment of claim 30, wherein the speed control mechanism includes a rack and
20 pinion arrangement having a rotational damper in the form of a pinion and a cooperating rack.

32. The method of operating cooking system within a space restricted
environment of claim 24, wherein mounting the self-contained cooking unit to the
25 countertop proximate an opening in the countertop further includes mounting the self-contained cooking unit proximate a rear side of the countertop.

33. The method of operating cooking system within a space restricted
environment of claim 24, wherein the lid assembly includes a lid and wherein the
30 method further comprises articulating the lid to a closed position in which the lid is flush with an upper surface of the countertop.

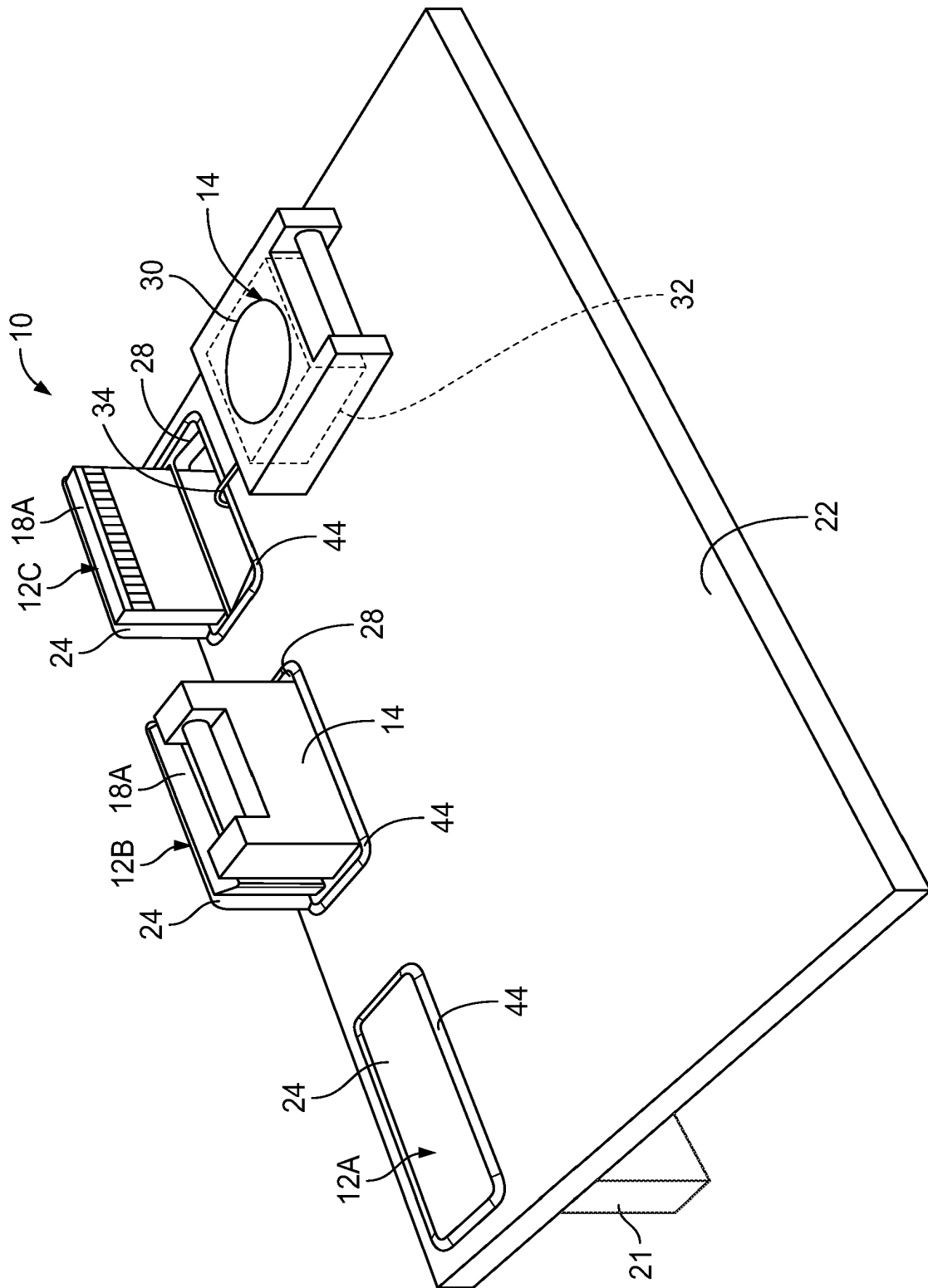


FIG. 1

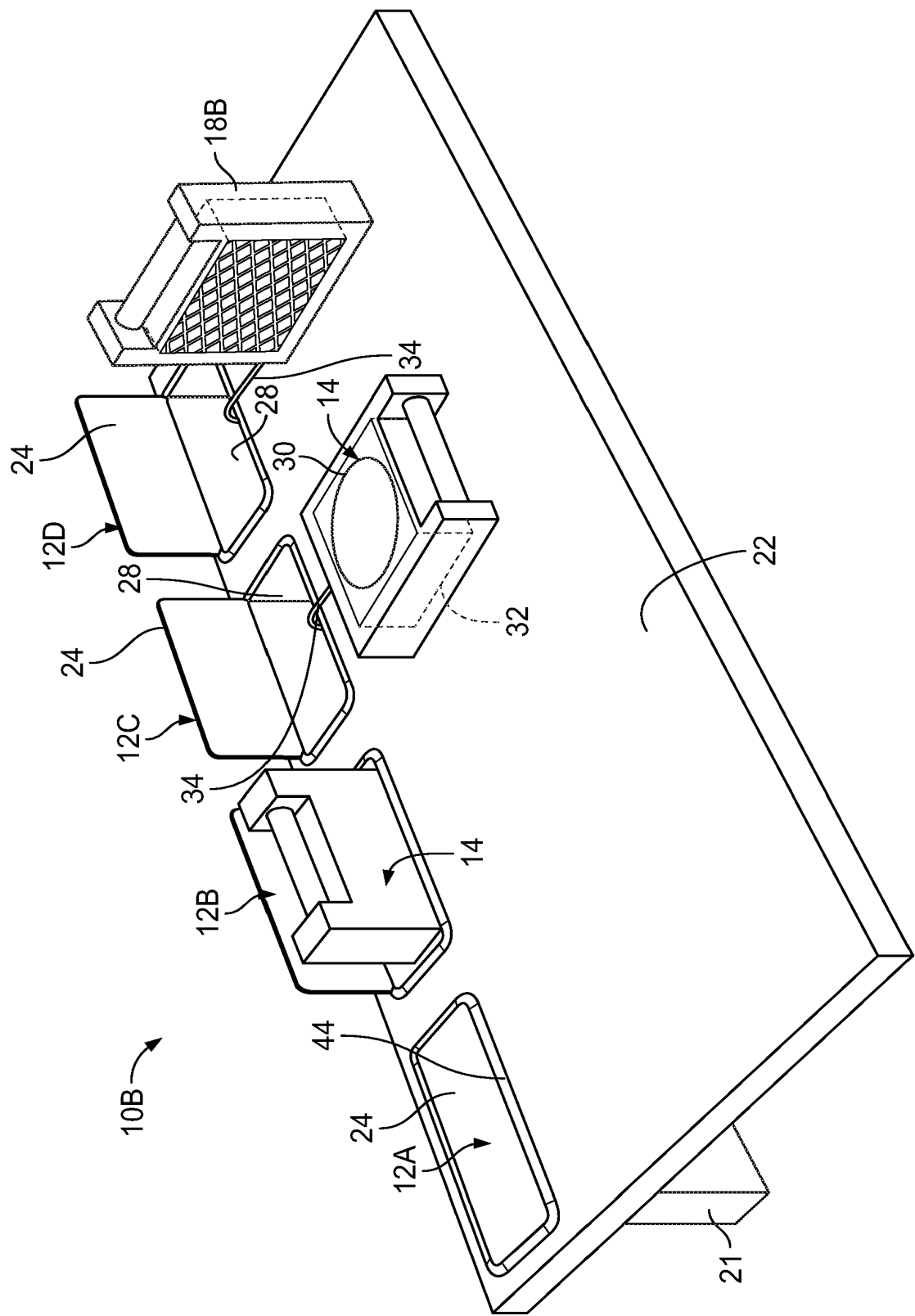


FIG. 2

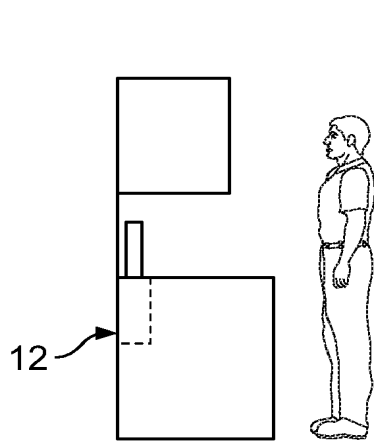


FIG. 3A

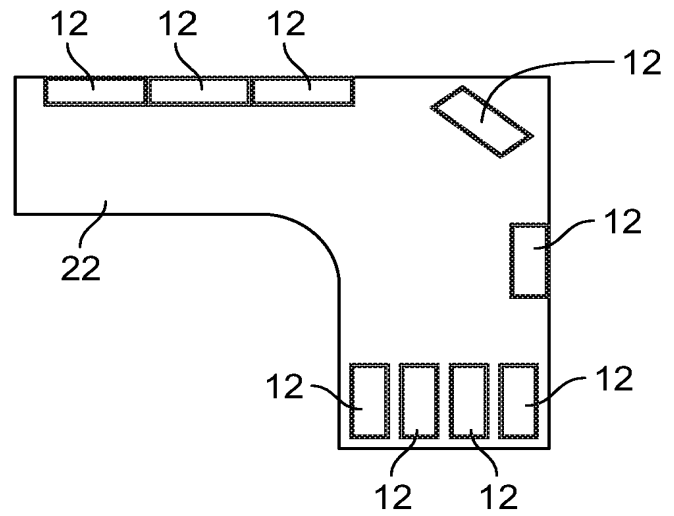


FIG. 3B

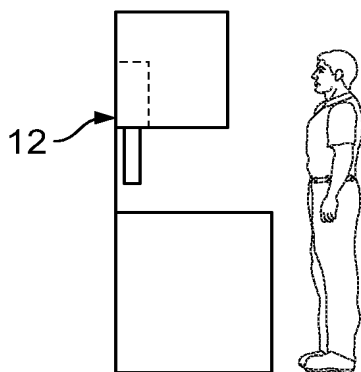


FIG. 3C

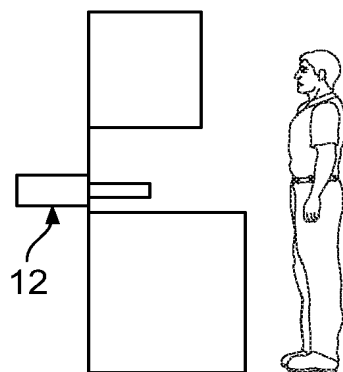


FIG. 3D

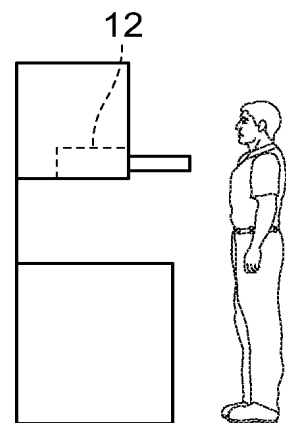
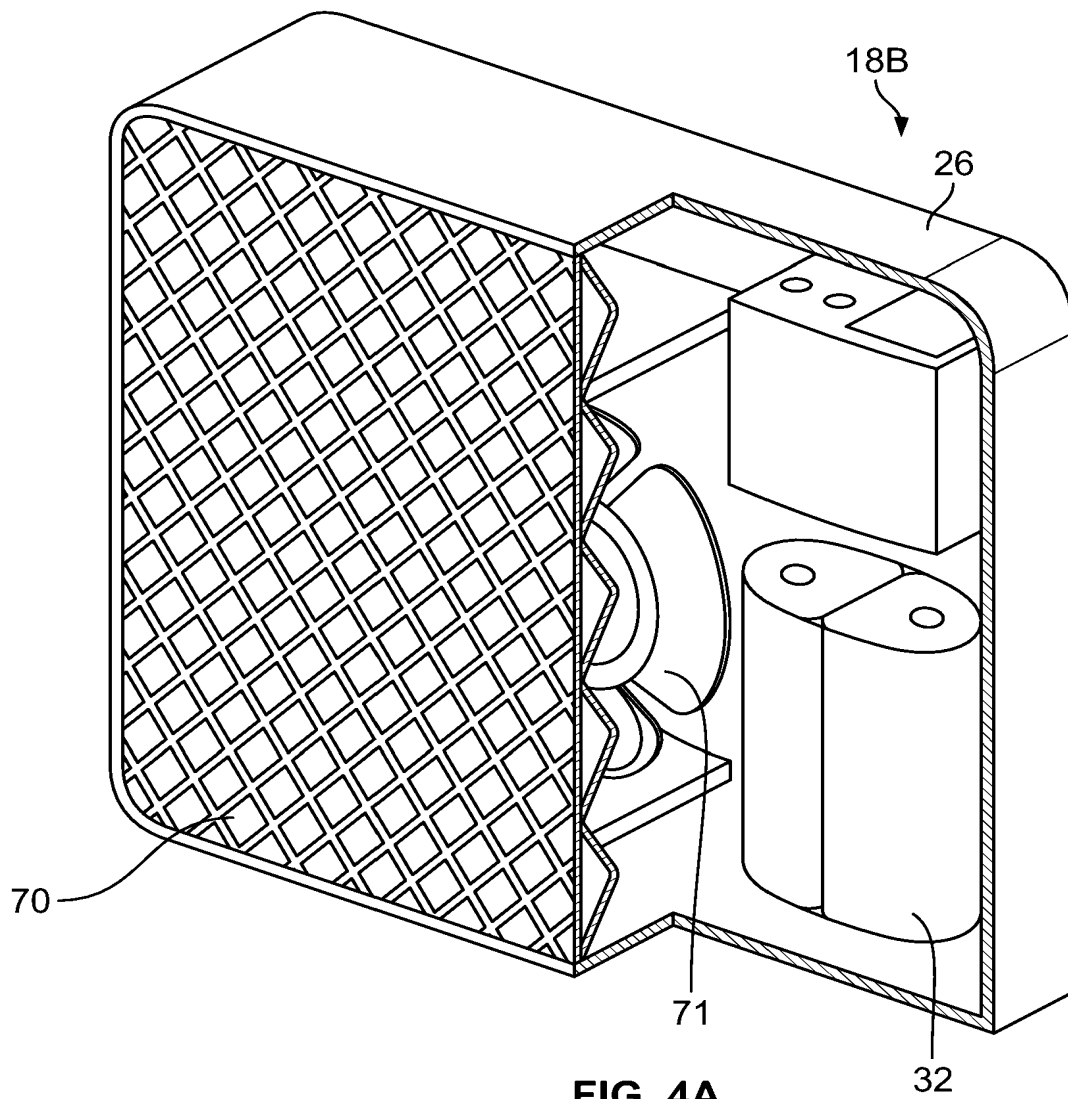


FIG. 3E



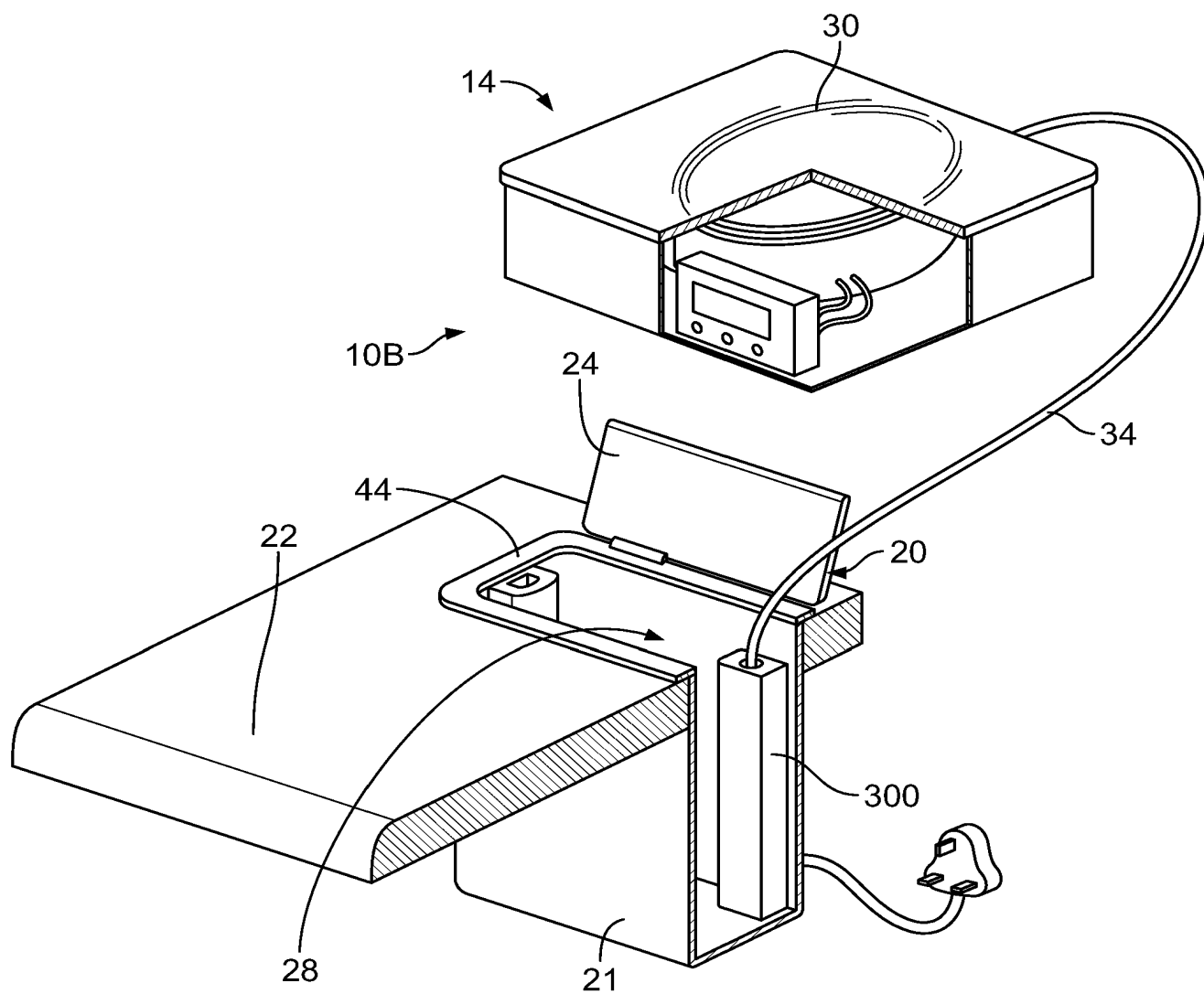


FIG. 4B

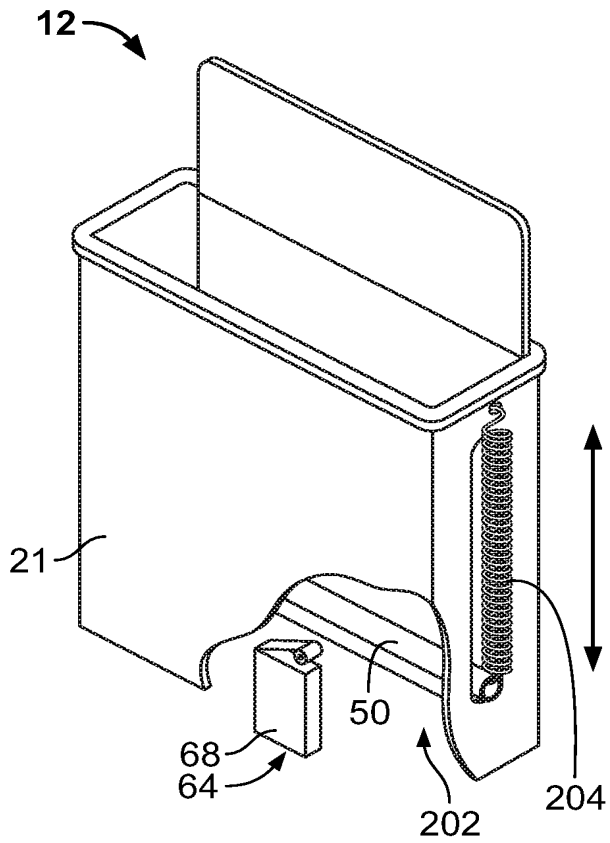


FIG. 5

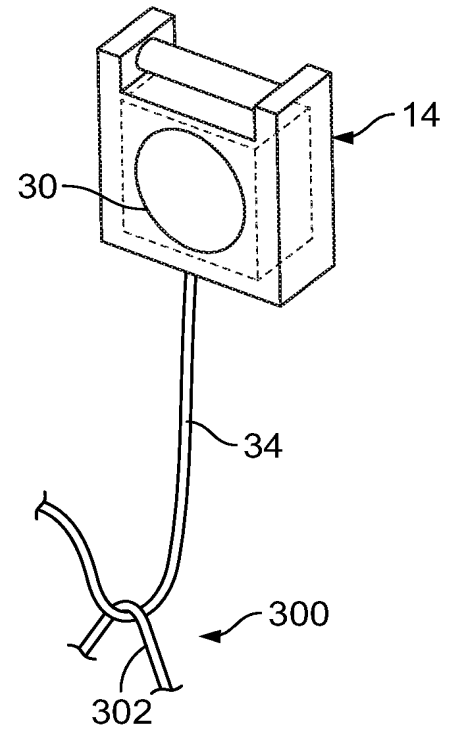


FIG. 6

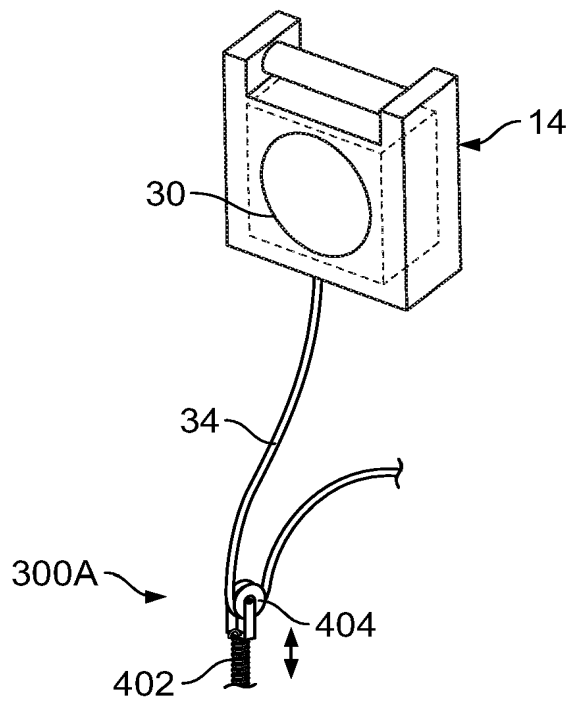


FIG. 7

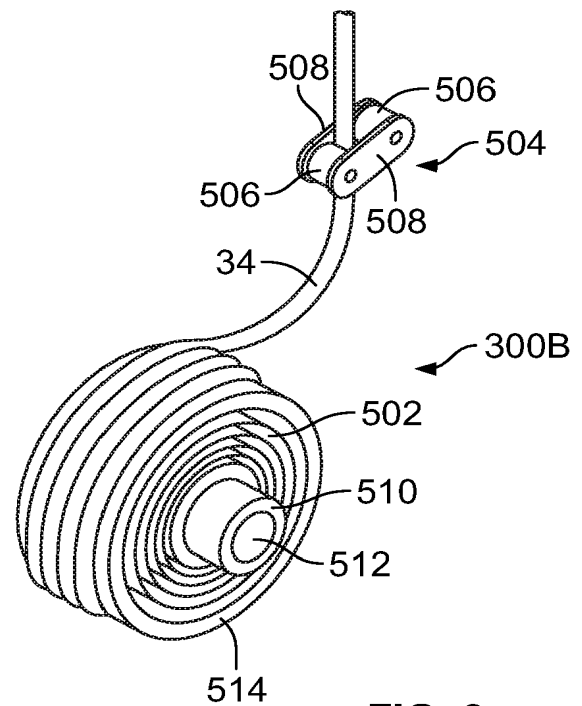


FIG. 8

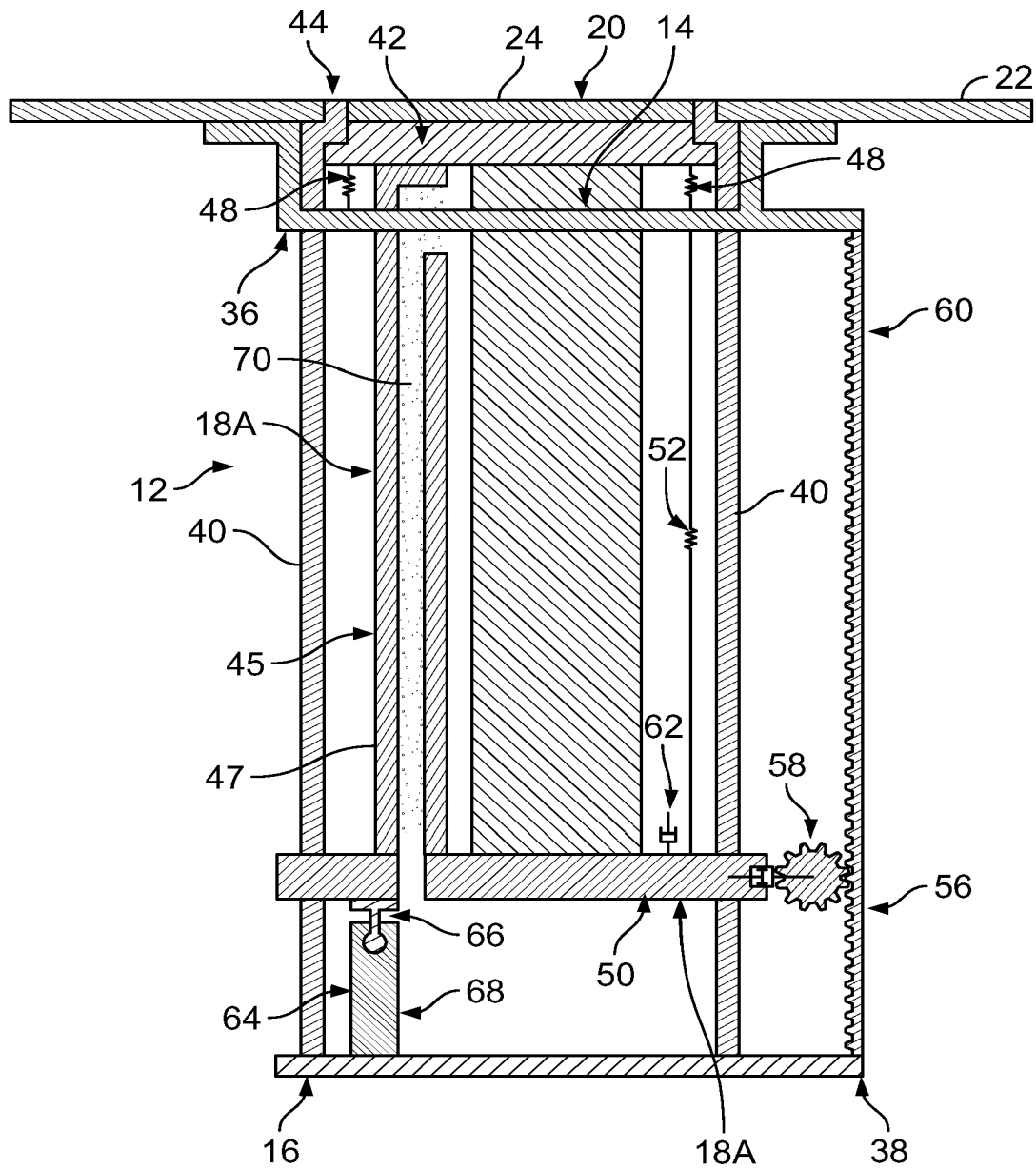


FIG. 9A

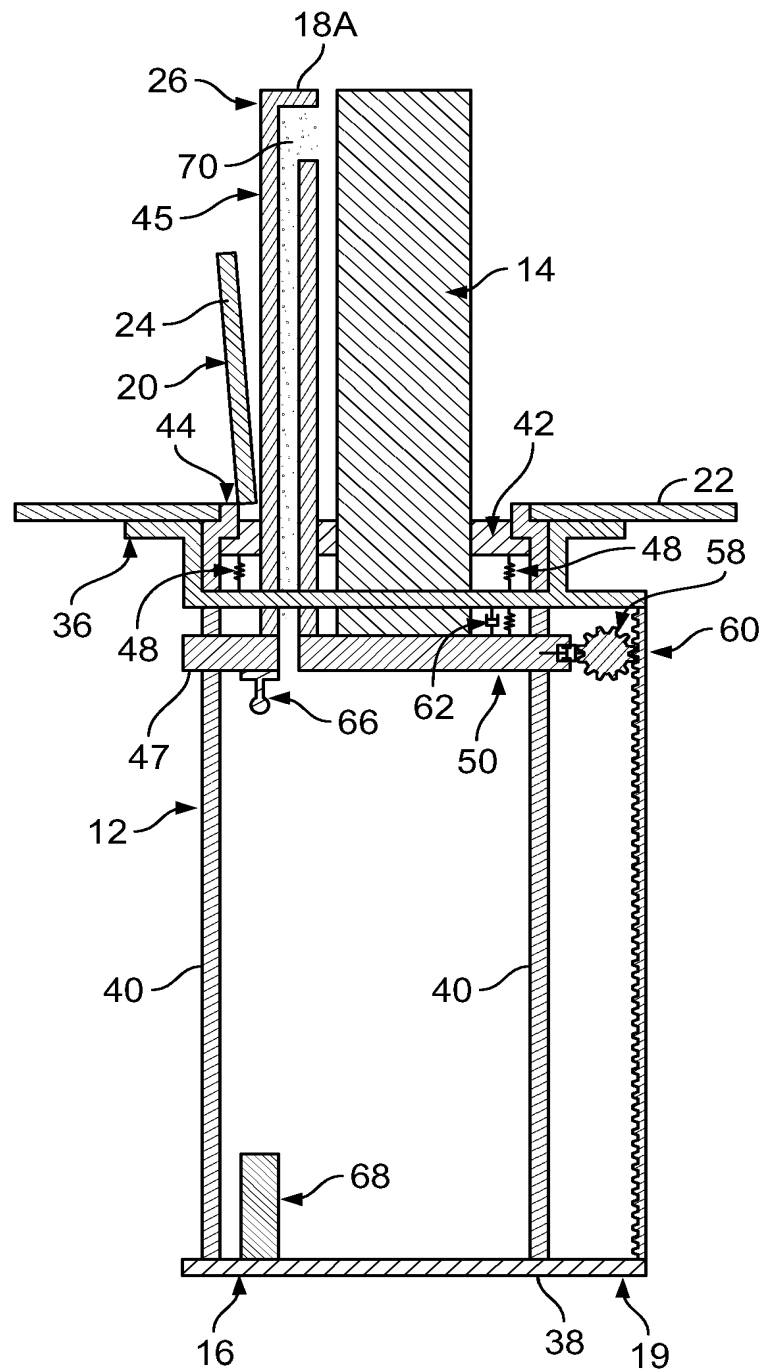


FIG. 9B

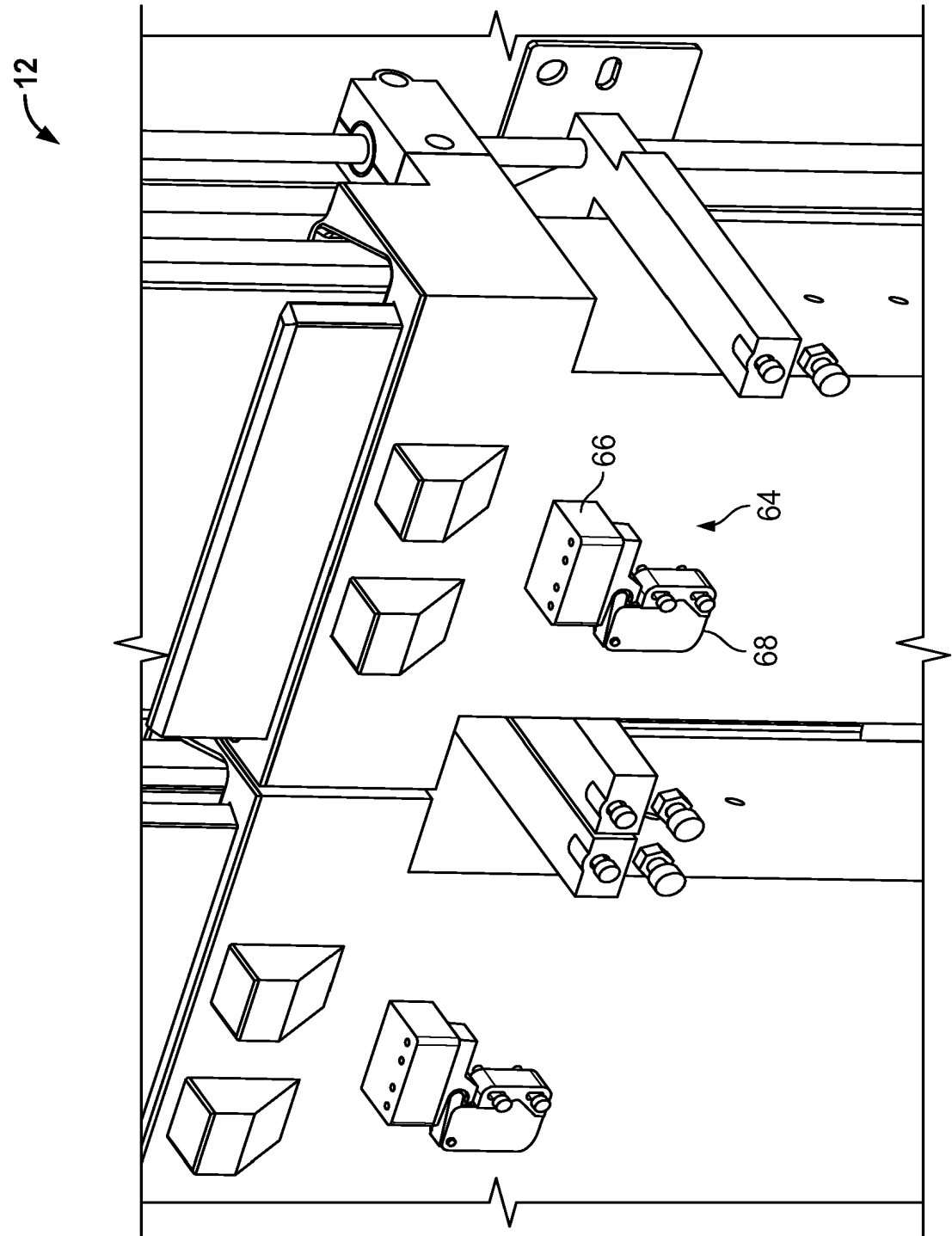


FIG. 9C

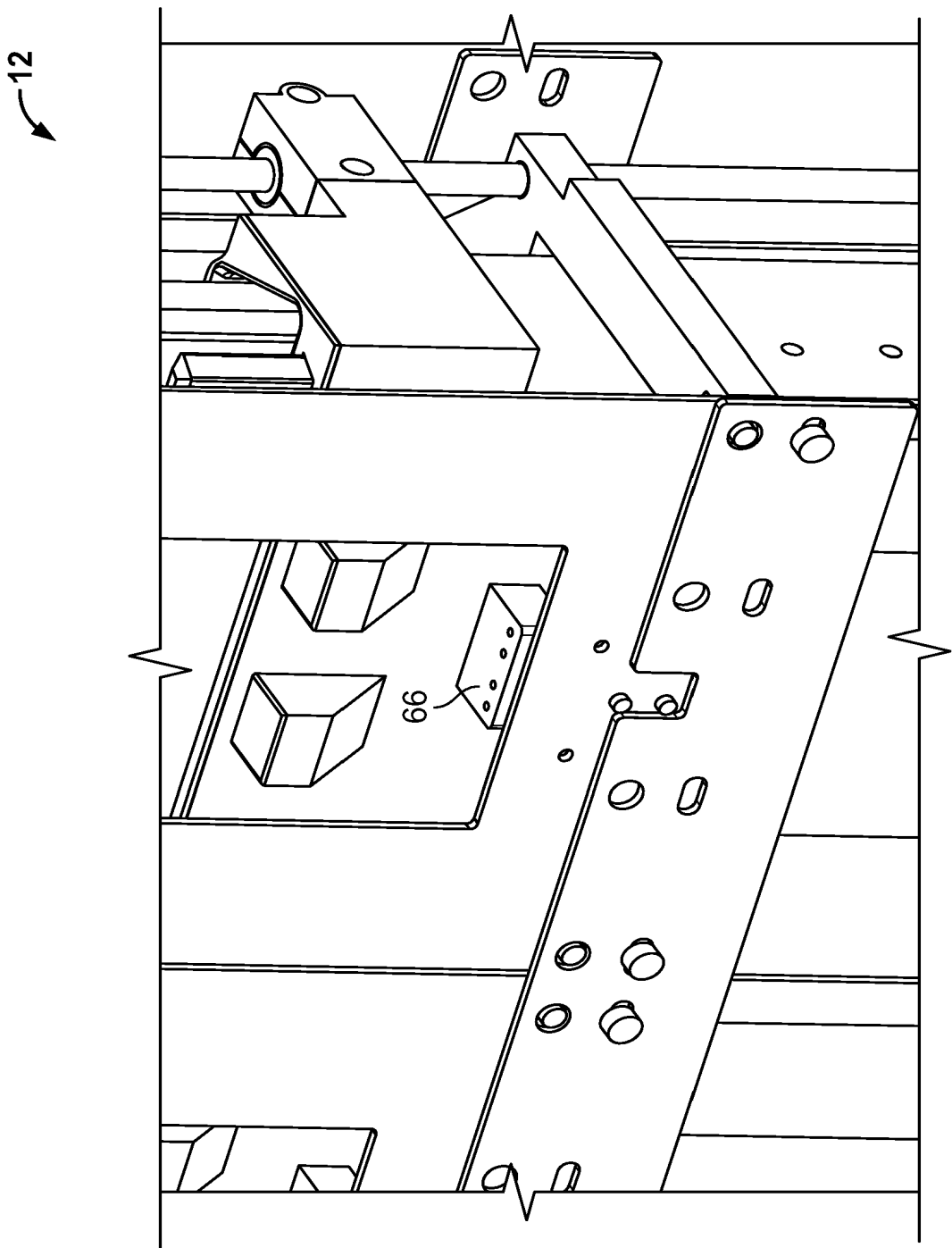


FIG. 9D

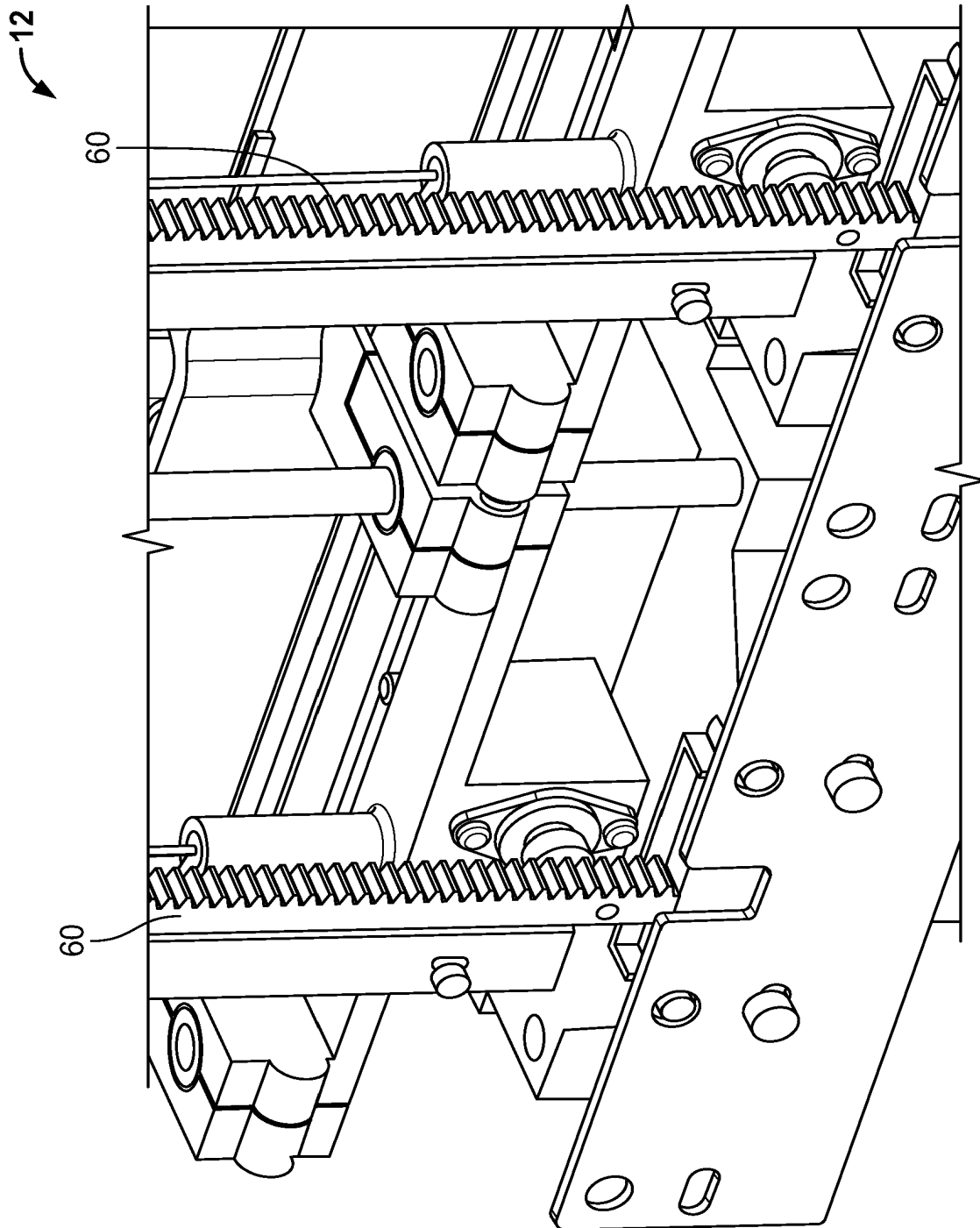


FIG. 9E

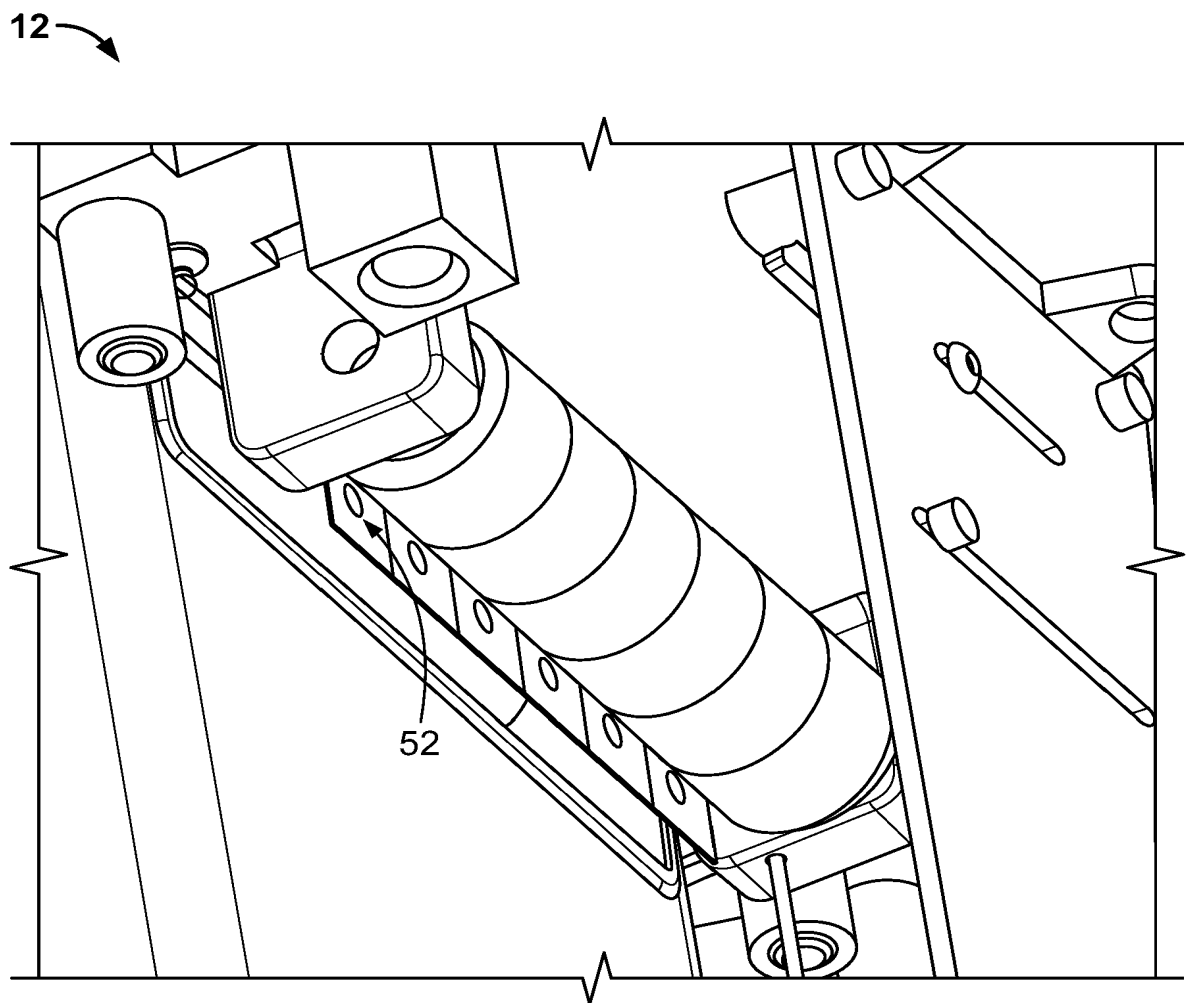


FIG. 9F

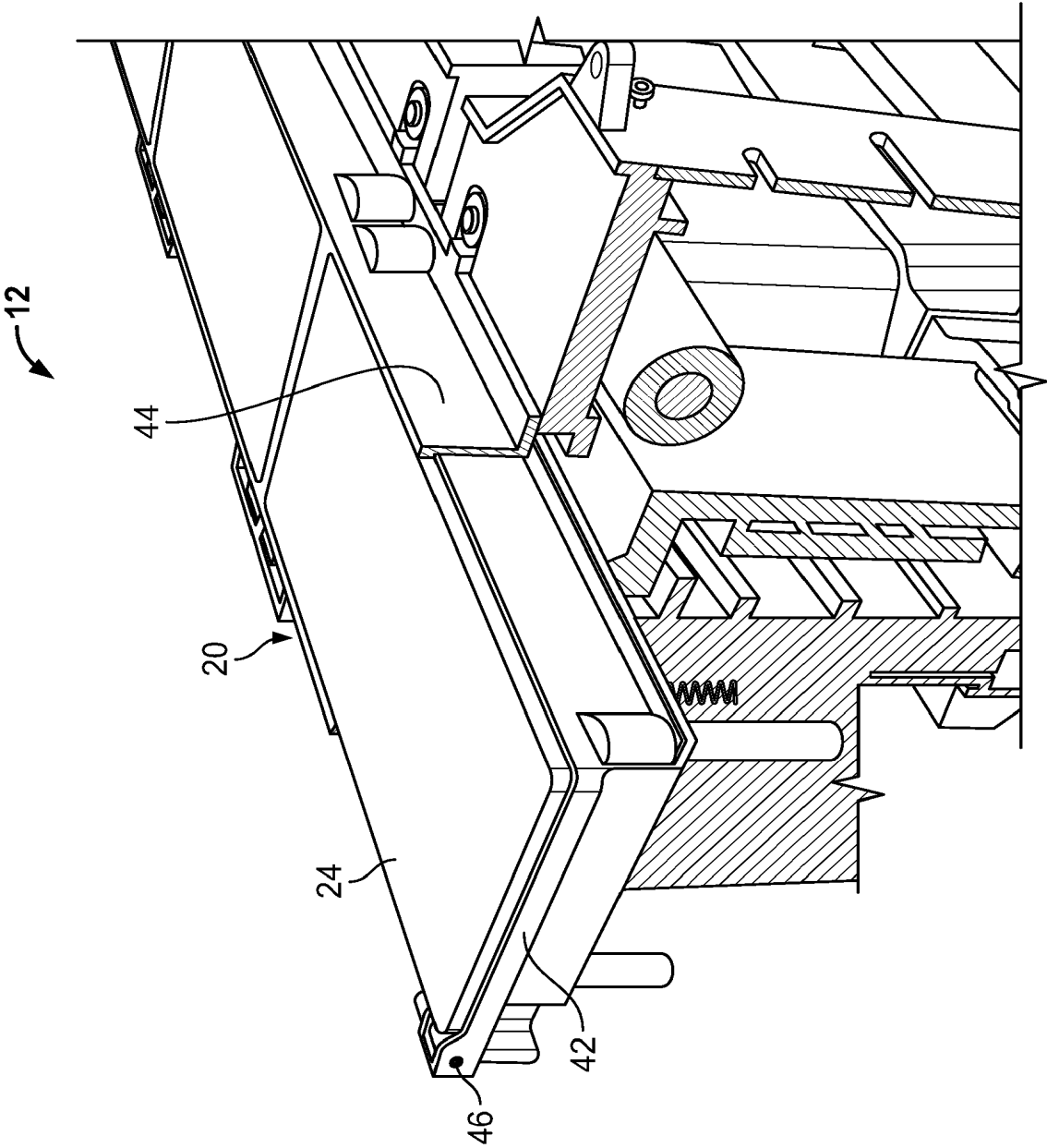


FIG. 9G

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2020/051436

A. CLASSIFICATION OF SUBJECT MATTER

INV. F24C15/10 B60P3/36 F24C15/20 F24C15/30
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 H02G B60P A47B

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 653 240 A1 (FRANKE TECHNOLOGY & TRADEMARK [CH]) 23 October 2013 (2013-10-23) figures 1-4	1,2,6
Y	----- IT VR20 100 104 A1 (HICOOK S R L) 19 November 2011 (2011-11-19) figures 1-2	3
X	----- US 2014/060394 A1 (YAMAN ONUR [TR] ET AL) 6 March 2014 (2014-03-06) claim 1	1
X	----- US 5 062 410 A (SARNOSKY JOSEPH R [US] ET AL) 5 November 1991 (1991-11-05) figures 1a,1b	1
	----- -/--	

☒ 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

"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

20 May 2020

Date of mailing of the international search report

31/07/2020

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
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Fax: (+31-70) 340-3016

Authorized officer

Adant, Vincent

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2020/051436

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>US 3 332 637 A (PRICE DAVID B) 25 July 1967 (1967-07-25) claim 1</p> <p>-----</p>	3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2020/051436

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.:

1-3, 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: 1-3, 6

Cooking system with features related to the cord

2. claim: 7

Cooking system with battery-powered devices

3. claims: 8, 10, 11, 16-20, 24, 33

Cooking system with features related to the lid

4. claims: 4, 9, 13, 14, 22, 23, 26

Cooking system with features related to the layout of the cooking devices

5. claims: 12, 15, 21, 25, 27-32

Cooking system with features related to the elevator

6. claim: 5

Cooking system wherein the device is an induction cooking hob

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2020/051436

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2653240	A1	23-10-2013	DK 2653240 T3 07-04-2015
			EP 2653240 A1 23-10-2013
			ES 2533856 T3 15-04-2015
			PL 2653240 T3 31-08-2015

IT VR20100104	A1	19-11-2011	-----
US 2014060394	A1	06-03-2014	CN 103269618 A 28-08-2013
			EP 2654503 A1 30-10-2013
			TR 201010888 A1 23-07-2012
			US 2014060394 A1 06-03-2014
			WO 2012084485 A1 28-06-2012

US 5062410	A	05-11-1991	NONE

US 3332637	A	25-07-1967	NONE

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国际局

(43) 国际公布日
2020 年 11 月 26 日 (26.11.2020)



(10) 国际公布号
WO 2020/233111 A1

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A47J 27/04 (2006.01) *A47J 37/06* (2006.01)
- (21) 国际申请号: PCT/CN2019/126303
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- (25) 申请语言: 中文
- (26) 公布语言: 中文
- (30) 优先权:
201910429941.X 2019 年 5 月 22 日 (22.05.2019) CN
- (71) 申请人: 珠海格力电器股份有限公司 (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) [CN/CN]; 中国广东省珠海市前山金鸡西路, Guangdong 519070 (CN)。
- (72) 发明人: 王大维 (WANG, Dawei); 中国广东省珠海市前山金鸡西路, Guangdong 519070 (CN)。

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- (74) 代理人: 广州华进联合专利商标代理有限公司 (ADVANCE CHINA IP LAW OFFICE); 中国广东省广州市天河区珠江东路 6 号 4501 房, Guangdong 510623 (CN)。
- (81) 指定国 (除另有指明, 要求每一种可提供的国家保护): 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,

(54) **Title:** STEAMING AND GRILLING COMBINED MACHINE

(54) 发明名称: 蒸烤组合机

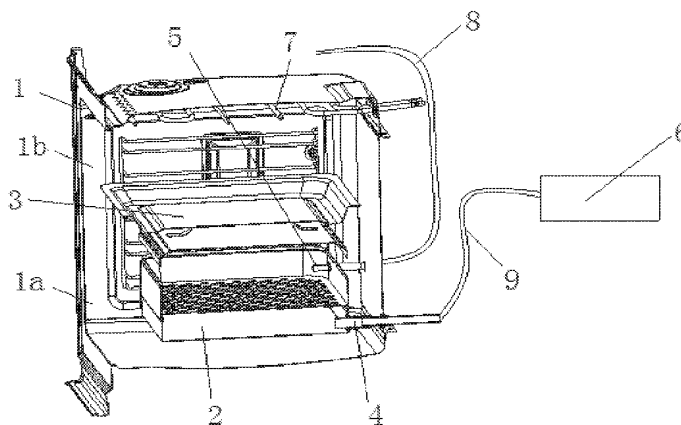


图 1

(57) **Abstract:** Disclosed is a steaming and grilling combined machine. By arranging a vessel (2), an accommodating cavity is divided into a steaming area (1a) and a grilling area (1b), the steaming area (1a) and the grilling area (1b) work independently, i.e. steaming work is carried out inside the steaming area (1a), and grilling work is carried out inside the grilling area (1b). By means of the arrangement, two different ingredients can be respectively processed in the steaming area (1a) and the grilling area (1b) at the same time, such that the defect of low working efficiency caused by a single cooking function of a kitchen appliance is effectively solved. In the steaming and grilling combined machine, steam inlet holes (21) are arranged at a position close to a bottom wall of the vessel (2); and due to the fact that steam per se moves upward, more steam can act on the ingredients inside the vessel (2) by means of the arrangement, and effective availability of the steam is guaranteed.

GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, 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) 指定国 (除另有指明, 要求每一种可提供的地区保护): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), 欧亚 (AM, AZ, BY, KG, KZ, RU, TJ, TM), 欧洲 (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)。

本国际公布:

— 包括国际检索报告 (条约第21条(3))。

(57) 摘要: 一种蒸烤组合机, 通过设置器皿 (2), 将容纳腔分割成蒸制区 (1a) 和烧烤区 (1b), 蒸制区 (1a) 和烧烤区 (1b) 独立工作, 在蒸制区 (1a) 内部进行蒸制工作, 在烧烤区 (1b) 进行烤制工作。通过这种设置方式, 可以在蒸制区 (1a) 和烤制区 (1b) 同时对两种不同的食材进行同时加工, 从而有效地解决了厨房电器烹饪功能单一、导致工作效率较低的缺陷。蒸烤组合机中, 进汽孔 (21) 靠近器皿 (2) 的底壁位置设置; 由于蒸汽自身会向上方运动, 通过这种设置方式可以使得更多的蒸汽作用在器皿 (2) 内部的食材中, 确保蒸汽的有效利用率。

蒸烤组合机

相关申请

本申请要求 2019 年 05 月 22 日申请的，申请号为 201910429941.X，名称为“一种蒸烤组合机”的中国专利申请的优先权，在此将其全文引入作为参考。

技术领域

本申请涉及厨房电器技术领域，具体涉及一种蒸烤组合机。

背景技术

随着生活水平的提高，许多人对家庭用品的要求也在不断提高，相关技术中，厨房电器通常功能单一，不同烹饪过程需要更换不同的烹饪电器，影响用户烹饪体验。

因此需要提供一种蒸烤组合机。

发明内容

为了解决厨房电器功能单一的问题，本申请提供了一种蒸烤组合机。

一种蒸烤组合机，包括：壳体，所述壳体内部设置有烧烤区和蒸制区，所述壳体上设置有供蒸汽流入的蒸汽流入孔；器皿，设置在所述蒸制区内部，所述器皿的侧壁上设置有供蒸汽进入的进汽孔，所述进汽孔与所述蒸汽流入孔相对设置；所述器皿上的所述进汽孔与所述壳体的所述蒸汽流入孔之间设置有蒸汽进气管，所述蒸汽进气管用以将蒸汽带入所述器皿内部；烤盘，设置在所述烧烤区内部，所述壳体内与所述烤盘相对应的位置设置有发热管，用以对位于所述烤盘内部的食材进行烤制；其中，所述进汽孔靠近所述器皿的底部位置设置。

在一实施例中，所述蒸汽进气管包括可拆卸安装在所述器皿上的第一进气管，以及可拆卸安装在所述壳体上的第二进气管，所述第一进气管可拆卸地连接在所述第二进气管上。

在一实施例中，所述第二进气管密封连接在所述第一进气管的内壁上。

在一实施例中，所述第一进气管靠近所述第二进气管的一端的内壁上设置有倒角。

在一实施例中，所述第一进气管和/或所述第二进气管的外壁上设置有螺纹。

在一实施例中，所述壳体上设有供蒸汽流出的蒸汽流出孔，所述器皿的侧壁上设有供

蒸汽流出的出汽孔，所述出汽孔与所述蒸汽流出孔相对应，且所述出汽孔与所述蒸汽流出孔之间设置有蒸汽出气管。

在一实施例中，所述出汽孔设置在所述进汽孔的上方位置。

在一实施例中，所述蒸汽出气管与所述蒸汽进气管结构一致。

在一实施例中，所述器皿包括：底座，其上设置有所述进汽孔和所述出汽孔；以及，盖子，扣设在所述底座上，与所述底座形成封闭空间。

在一实施例中，所述器皿内部设置有蒸盘，所述蒸盘用以放置食材，所述进汽孔设置在蒸盘的下方，出汽孔设置在蒸盘的上方。

在一实施例中，所述器皿与所述烤盘相对应的部位、和/或所述烤盘与所述器皿相对应的部位设置有隔热层，用以防止所述器皿和所述烤盘之间发生热交换。

在一实施例中，所述器皿与所述烤盘之间设置有隔热板。

在一实施例中，所述蒸烤组合机还包括蒸汽发生装置，所述蒸汽发生装置通过输入管管连接所述蒸汽流入孔。

在一实施例中，所述器皿上设置有供蒸汽流出的排气孔。

本申请技术方案提供的蒸烤组合机，通过设置器皿，将容纳腔分割成蒸制区和烧烤区，蒸制区和烧烤区独立工作，在蒸制区内部进行蒸制工作，在烧烤区进行烤制工作。通过上述的设置方式，能够在蒸制区（器皿）和烤制区同时对两种不同的食材进行同时加工，从而有效地解决了厨房电器烹饪功能单一、导致工作效率较低的缺陷。同时，通过设置蒸汽进气管，能够将蒸汽尽可能全部打入到器皿内部，从而有利于提高蒸汽的使用效率，同时确保器皿工作的稳定性。此外，通过设置器皿，能够防止蒸汽直接上升到位于容纳腔上部的烧烤区内部，从而对烧烤区中的发热管造成损伤。

本申请提供的蒸烤组合机，进汽孔靠近所述器皿的底壁位置设置。由于蒸汽自身会向上方运动，通过上述的设置方式能够使得更多的蒸汽作用在器皿内部的食材中，确保蒸汽的有效利用率。

本申请提供的蒸烤组合机，所述蒸汽进气管包括可拆卸安装在所述器皿上的第一进气管，以及可拆卸安装在所述壳体上的第二进气管，所述第一进气管可拆卸地连接在所述第二进气管上。通过第一进气管与第二进气管的配合，分别对第一进气管和第二进气管进行安装然后连接，分体设置的蒸汽进气管提高了整个蒸汽进气管的装配效率。

本申请提供的蒸烤组合机，所述第二进气管密封连接在所述第一进气管的内壁上。从而提高了第一进气管与第二进气管之间的密封性能，避免蒸汽进气管中的蒸汽溢出到外界。

本申请提供的蒸烤组合机，所述第一进气管靠近所述第二进气管的一端的内壁上设置有倒角。通过设置倒角，当需要将第二进气管插入第一进气管内部时，倒角的存在方便第二进气管的端部插入到第一进气管内部，提高装配过程的便利性。

本申请提供的蒸烤组合机，所述第一进气管和/或所述第二进气管的外壁上设置有螺纹。通过螺纹将第一进气管和所述第二进气管连接在壳体或器皿上，提高安装的连接稳定性。

本申请提供的蒸烤组合机，所述壳体上设有供蒸汽流出的蒸汽流出孔，所述器皿的侧壁上设有供蒸汽流出的出汽孔，所述出汽孔与所述蒸汽流出孔相对应，且所述出汽孔与所述蒸汽流出孔之间设置有蒸汽出气管。通过设置出汽孔，将器皿中多余的蒸汽排出至外界，保证器皿内的压力与外界平衡，同时设置出汽孔，能够避免蒸汽泄露到腔体里对烧烤造成影响。

本申请提供的蒸烤组合机，所述出汽孔设置在所述进汽孔的上方位置。通过上述的位置关系，蒸汽通过位于下方位置的进汽孔流入到器皿中，然后通过位于上述位置出汽孔流出器皿。进汽孔与出汽孔的设置位置与蒸汽的流动方向一致，能够提高蒸汽在器皿内部的利用率。

本申请提供的蒸烤组合机，所述器皿内部设置有蒸盘，所述蒸盘用以放置食材，所述进汽孔设置在蒸盘的下方，出汽孔设置在蒸盘的上方。蒸汽通过位于蒸盘下方的进汽孔流入到的器皿内部，对蒸盘上的食材进行底部蒸制，然后蒸汽进一步上升，对食材的上部进行蒸制，在完成蒸制后从出汽孔中流出，实现蒸汽对食材的最大利用率。

本申请提供的蒸烤组合机，所述器皿与所述烤盘相对应的部位、和/或所述烤盘与所述器皿相对应的部位设置有隔热层，用以防止所述器皿和所述烤盘之间发生热交换。进而避免烤盘中的热量传递至器皿内部、高温对器皿内部的蒸汽造成影响。

本申请提供的蒸烤组合机，所述器皿与所述烤盘之间设置有隔热板。通过设置隔热板，进一步阻止烤盘内部的热量传递至器皿内部，对器皿内部的蒸制造成影响。

本申请提供的蒸烤组合机，器皿上设置有供蒸汽流出的排气孔。通过设置排气孔，当器皿内部的蒸汽压力过高时，能够进一步稳定器皿的压力。同时，从器皿内部流出的蒸汽对烤盘进行补偿，烤盘中的食材经过蒸汽补偿后，可以获得更好的口感。

附图说明

图1为本申请提供的蒸烤组合机的结构示意图；

图2为本申请提供的蒸烤组合机的壳体与蒸汽发生装置的连接示意图；

图 3 为本申请提供的蒸烤组合机的蒸汽进气管（蒸汽出气管）与壳体 and 器皿之间的连接示意图；

图 4 为本申请提供的蒸烤组合机的器皿盖子与底座在打开状态下的结构示意图；

图 5 为本申请提供的蒸烤组合机的器皿中盖子、蒸盘与底座完全分离状态下的结构示意图；

图 6 为本申请提供的蒸烤组合机的器皿的结构示意图。

附图标记说明：

1-壳体；1a-蒸制区；1b-烧烤区；11-蒸汽流入孔；12-蒸汽流出孔；2-器皿；21-进汽孔；22-出汽孔；23-底座；24-盖子；25-蒸盘；26-排气孔；3-烤盘；4-蒸汽进气管；41-第一进气管；411-倒角；42-第二进气管；5-蒸汽出气管；6-蒸汽发生装置；7-发热管；8-输出管；9-输入管。

具体实施方式

为了便于理解本申请，下面将参照相关附图对本申请进行更全面的描述。附图中给出了本申请的较佳的实施例。但是，本申请可以以许多不同的形式来实现，并不限于本文所描述的实施例。相反地，提供这些实施例的目的是使对本申请的公开内容的理解更加透彻全面。

本申请提供一种蒸烤组合机，如图 1 和图 2 所示，包括：壳体 1，其内部设置有烧烤区 1b 和蒸制区 1a，所述壳体 1 上设置有供蒸汽流入的蒸汽流入孔 11；器皿 2 设置在所述蒸制区 1a 内部，所述器皿 2 的侧壁上设置有供蒸汽进入的进汽孔 21，所述进汽孔 21 与所述蒸汽流入孔 11 相对设置；所述器皿 2 上的所述进汽孔 21 与所述壳体 1 的所述蒸汽流入孔 11 之间设置有蒸汽进气管 4，所述蒸汽进气管 4 用以将蒸汽带入所述器皿 2 内部；烤盘 3，设置在所述烧烤区 1b 内部，所述壳体 1 内与所述烤盘 3 相对应的位置设置有发热管 7，用以对位于所述烤盘 3 内部的食材进行烤制；其中，如图 1 所示，所述进汽孔 21 靠近所述器皿 2 的底壁位置设置。

在一些实施例中，通过设置器皿 2，将容纳腔分割成蒸制区 1a 和烧烤区 1b，蒸制区 1a 和烧烤区 1b 独立工作，在蒸制区 1a 内部进行蒸制工作，在烧烤区 1b 进行烤制工作。通过上述的设置方式，在蒸制区 1a 和烤制区同时对两种不同的食材进行同时加工，从而有效地解决了烹饪用具烹饪功能单一、导致工作效率低的缺陷。通过设置蒸汽进气管 4，能够将蒸汽尽可能全部打入到器皿 2 内部，从而有利于提高蒸汽的使用效率，同时确保器皿 2 工作的稳定性。此外，通过设置器皿 2，能够防止蒸汽直接上升到位于容纳腔上部的烧

烤区 1b 内部，从而对烧烤区 1b 中的发热管 7 造成损伤。

在一些实施例中，器皿 2 和壳体 1 采用金属材质制成；在另一些实施例中，器皿 2 和壳体 1 采用塑料材质制成，在此对材质不进行过多限制。

在一些实施例中，为了实现将蒸汽引入到器皿 2 内部，如图 1 所示，本申请的蒸烤组合机还包括蒸汽发生装置 6，所述蒸汽发生装置 6 通过输入管 9 连接所述蒸汽流入孔 11。同时，在蒸汽流入孔 11 上设置有蒸汽进气管 4，输入管 9 中的蒸汽通过蒸汽进气管 4 流入到器皿 2 内部。

在一些实施例中，如图 3 所示，所述蒸汽进气管 4 包括可拆卸安装在所述器皿 2 上的第一进气管 41，以及可拆卸安装在所述壳体 1 上的第二进气管 42，所述第一进气管 41 可拆卸地连接在所述第二进气管 42 上。通过第一进气管 41 与第二进气管 42 的配合，能够分别对第一进气管 41 和第二进气管 42 进行安装然后连接。分体设置的蒸汽进气管 4 提高了整个蒸汽进气管 4 的装配效率。

在一些实施例中，如图 3 所示，所述第二进气管 42 密封连接在所述第一进气管 41 的内壁上。同时，如图 3 所示，在第一进气管 41 靠近所述第二进气管 42 的一端的内壁上设置有倒角 411。通过设置倒角 411，当需要将第二进气管 42 插入第一进气管 41 内部时，倒角 411 的存在方便了第二进气管 42 的端部插入到第一进气管 41 内部，提高装配过程的便利性。

在一些实施例中，第一进气管和第二进气管采用硬质金属材料制成。为了实现密封效果，在一些实施例中，在第一进气管或第二进气管内壁上设置有密封圈。

在另外一些实施例中，第一进气管 41 套接在第二进气管 42 的内壁上。此时倒角 411 将设置在第二进气管 42 的内壁位置。

在一些实施例中，为了实现第一进气管 41 和第二进气管 42 的安装，如图 3 所示，在第一进气管 41 和第二进气管 42 的外壁上设置有螺纹。通过螺纹实现将第一进气管 41 和第二进气管 42 安装在器皿 2 和壳体 1 上，通过螺纹连接的方式便于进行拆装工作。

在一些实施例中，如图 1 所示，所述壳体 1 上设有供蒸汽流出的蒸汽流出孔 12，所述器皿 2 的侧壁上设有供蒸汽流出的出汽孔 22，所述出汽孔 22 与所述蒸汽流出孔 12 相对应，且所述出汽孔 22 与所述蒸汽流出孔 12 之间设置有蒸汽出气管 5。

通过设置出汽孔 22，能够将器皿 2 中多余的蒸汽排出至外界，保证器皿 2 内的压力与外界平衡，同时设置出汽孔 22，避免蒸汽泄露到腔体里对烧烤造成影响。

在一些实施例中，如图 1 所示，所述壳体 1 上设有供蒸汽流出的蒸汽流出孔 12，所述器皿 2 的侧壁上设有供蒸汽流出的出汽孔 22，所述出汽孔 22 与所述蒸汽流出孔 12 相对应，

且所述出汽孔 22 与所述蒸汽流出孔 12 之间设置有蒸汽出气管 5。通过设置出汽孔 22，能够将器皿 2 中多余的蒸汽排出至外界，保证器皿 2 内的压力与外界平衡，同时设置出汽孔 22，能够避免蒸汽泄露到腔体里对烧烤造成影响。

在一些实施例中，如图 1、图 5 或图 6 所示，出汽孔 22 设置在所述进汽孔 21 的上方位置。通过上述的位置关系，蒸汽通过位于下方位置的进汽孔 21 流入到器皿 2 中，然后通过位于上述位置出汽孔 22 流出器皿 2。进汽孔 21 与出汽孔 22 的设置位置与蒸汽的流动方向一致，提高了蒸汽在器皿 2 内部的利用率。

在一些实施例中，所述进汽孔 21 和所述出汽孔 22 设置在器皿 2 侧壁的对角线的两端位置处。

在一些实施例中，蒸汽出气管 5 上连接有输出管 8，用以将多余的蒸汽从器皿 2 内部进行导出。同时，本实施例中所述蒸汽出气管 5 与所述蒸汽进气管 4 结构一致。在其它一些实施例中，蒸汽出气管 5 之间采用一根直管，在本实施例中不进行过多描述。

在一些实施例中，如图 4-6 所示，所述器皿 2 包括：底座 23，其上设置有所述进汽孔 21 和所述出汽孔 22；以及，盖子 24，扣设在所述底座 23 上，与所述底座 23 形成封闭空间。

所述器皿 2 内部设置有蒸盘 25，所述蒸盘 25 用以放置食材，所述进汽孔设置在蒸盘的下方，出汽孔设置在蒸盘的上方。蒸盘 25 本体上设置有开孔，以方便蒸汽通过开孔上升到蒸盘 25 上方。

在一些实施例中，所述蒸盘 25 与底座 23 一体成型。在其它的一些实施例中，如图 5 所示，蒸盘 25 与底座 23 之间分体设置。

在一些实施例中，在器皿 2 与所述烤盘 3 相对应的部位、和/或所述烤盘 3 与所述器皿 2 相对应的部位设置有隔热层，用以防止所述器皿 2 和所述烤盘 3 之间发生热交换。进而避免烤盘 3 中的热量传递至器皿 2 内部、高温对器皿 2 内部的蒸汽造成影响。

同时，在其它实施例中，为了进一步提高隔热效果，在器皿 2 与烤盘 3 之间设置有隔热板。隔热层和隔热板均采用常用的隔热材料制成，在此不进行过多描述。

在一些实施例中，如图 6 所示，所述器皿 2 上设置有供蒸汽流出的排气孔 26。排气孔 26 用于当器皿 2 内部的蒸汽压力过高时，进一步稳定器皿 2 的压力。同时，从器皿 2 内部流出的蒸汽能够对烤盘 3 进行补偿，烤盘 3 中的食材经过蒸汽补偿后，可以获得更好的口感。

显然，上述实施例仅仅是为清楚地说明所作的举例，而并非对实施方式的限定。对于所属领域的普通技术人员来说，在上述说明的基础上还可以做出其它不同形式的变化或变

动。这里无需也无法对所有的实施方式予以穷举。而由此所引伸出的显而易见的变化或变动仍处于本申请的保护范围之内。

权利要求

1.一种蒸烤组合机，其特征在于，包括：

壳体（1），其内部设置有烧烤区（1b）和蒸制区（1a），所述壳体（1）上设置有供蒸汽流入的蒸汽流入孔（11）；

器皿（2），设置在所述蒸制区（1a）内部，所述器皿（2）的侧壁上设置有供蒸汽进入的进汽孔（21），所述进汽孔（21）与所述蒸汽流入孔（11）相对设置；

所述器皿（2）上的所述进汽孔（21）与所述壳体（1）的所述蒸汽流入孔（11）之间设置有蒸汽进气管（4），所述蒸汽进气管（4）用以将蒸汽带入所述器皿（2）内部；

烤盘（3），设置在所述烧烤区（1b）内部，所述壳体（1）内与所述烤盘（3）相对应的位置设置有发热管（7），用以对位于所述烤盘（3）内部的食材进行烤制；

所述进汽孔（21）靠近所述器皿（2）的底壁位置设置。

2.根据权利要求1所述的蒸烤一体机，其特征在于，所述蒸汽进气管（4）包括可拆卸安装在所述器皿（2）上的第一进气管（41），以及可拆卸安装在所述壳体（1）上的第二进气管（42），所述第一进气管（41）可拆卸地连接在所述第二进气管（42）上。

3.根据权利要求2所述的蒸烤一体机，其特征在于，所述第二进气管（42）密封连接在所述第一进气管（41）的内壁上。

4.根据权利要求3所述的蒸烤一体机，其特征在于，所述第一进气管（41）靠近所述第二进气管（42）的一端的内壁上设置有倒角（411）。

5.根据权利要求2-4任一所述的蒸烤一体机，其特征在于，所述第一进气管（41）和/或所述第二进气管（42）的外壁上设置有螺纹。

6.根据权利要求2-4任一所述的蒸烤组合机，其特征在于，所述壳体（1）上设有供蒸汽流出的蒸汽流出孔（12），所述器皿（2）的侧壁上设有供蒸汽流出的出汽孔（22），所述出汽孔（22）与所述蒸汽流出孔（12）相对应，且所述出汽孔（22）与所述蒸汽流出孔（12）之间设置有蒸汽出气管（5）。

7.根据权利要求6所述的蒸烤组合机，其特征在于，所述出汽孔（22）设置在所述进汽孔（21）的上方位置。

8.根据权利要求6或7所述的蒸烤组合机，其特征在于，所述蒸汽出气管（5）与所述蒸汽进气管（4）结构一致。

9.根据权利要求6或7所述的蒸烤组合机，其特征在于，所述器皿（2）包括：

底座（23），其上设置有所述进汽孔（21）和所述出汽孔（22）；以及，

盖子（24），扣设在所述底座（23）上，与所述底座（23）形成封闭空间。

10.根据权利要求 9 所述的蒸烤组合机，其特征在于，所述器皿（2）内部设置有蒸盘（25），所述蒸盘（25）用以放置食材，所述进汽孔（21）设置在所述蒸盘（25）的下方，所述出汽孔（22）设置在所述蒸盘（25）的上方。

11.根据权利要求 1-4,7,10 任一所述的蒸烤组合机，其特征在于，所述器皿（2）与所述烤盘（3）相对应的部位、和/或所述烤盘（3）与所述器皿（2）相对应的部位设置有隔热层，用以防止所述器皿（2）和所述烤盘（3）之间发生热交换。

12.根据权利要求 1 或 11 所述的蒸烤组合机，其特征在于，所述器皿（2）与所述烤盘（3）之间设置有隔热板。

13.根据权利要求 1-4,7,10 任一所述的蒸烤组合机，其特征在于，还包括蒸汽发生装置（6），所述蒸汽发生装置（6）通过输入管连接所述蒸汽流入孔（11）。

14.根据权利要求 1-4,7,10 任一所述的蒸烤组合机，其特征在于，所述器皿（2）上设置有供蒸汽流出的排气孔（26）。

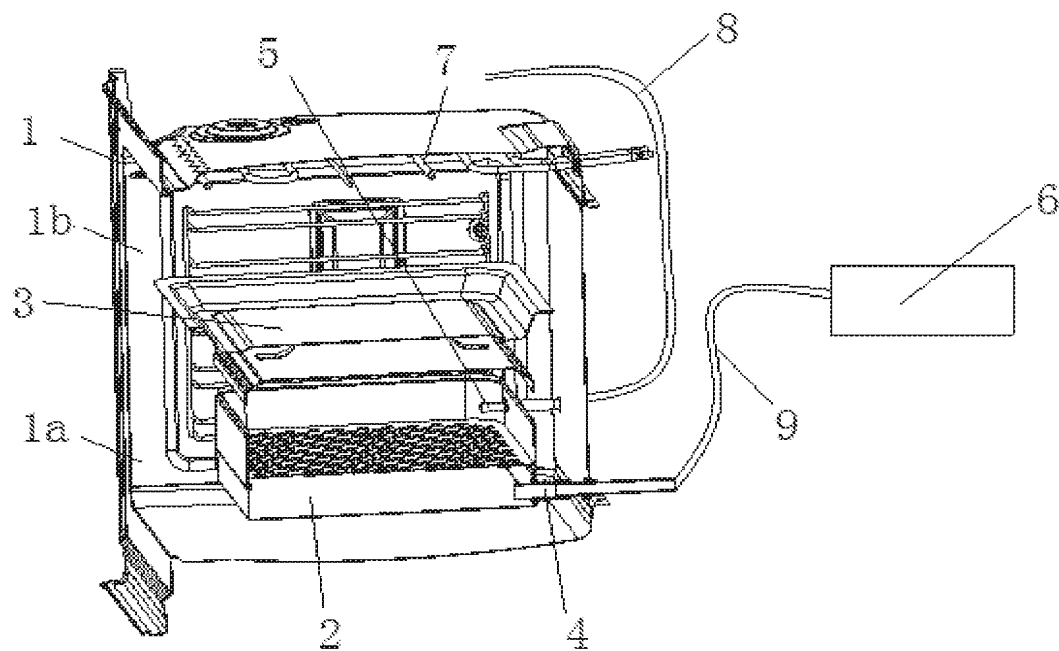


图 1

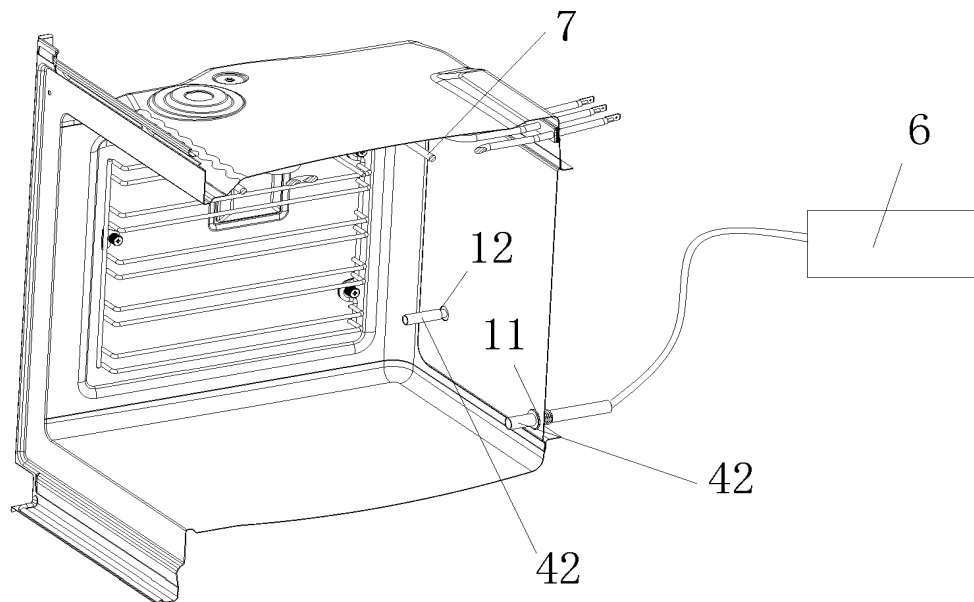


图 2

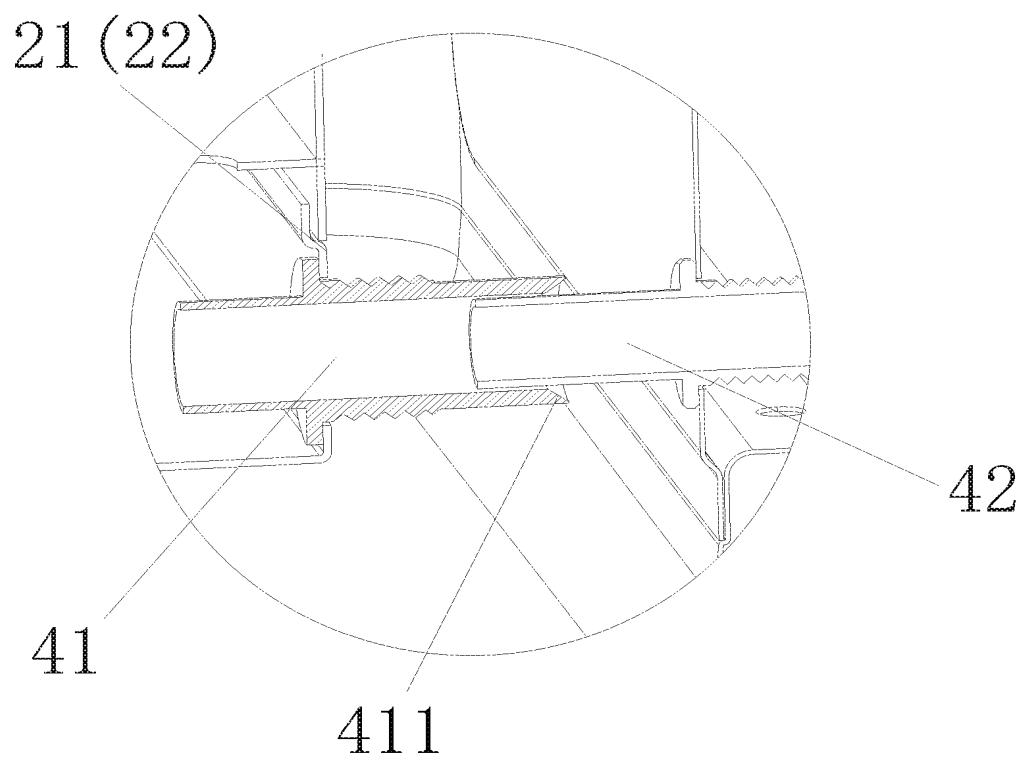


图 3

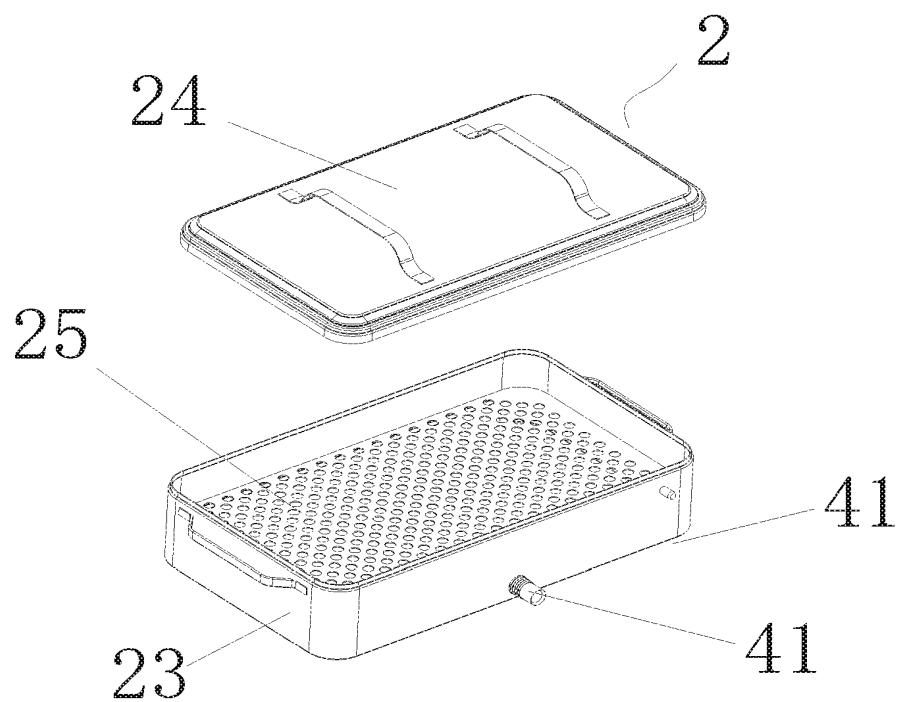


图 4

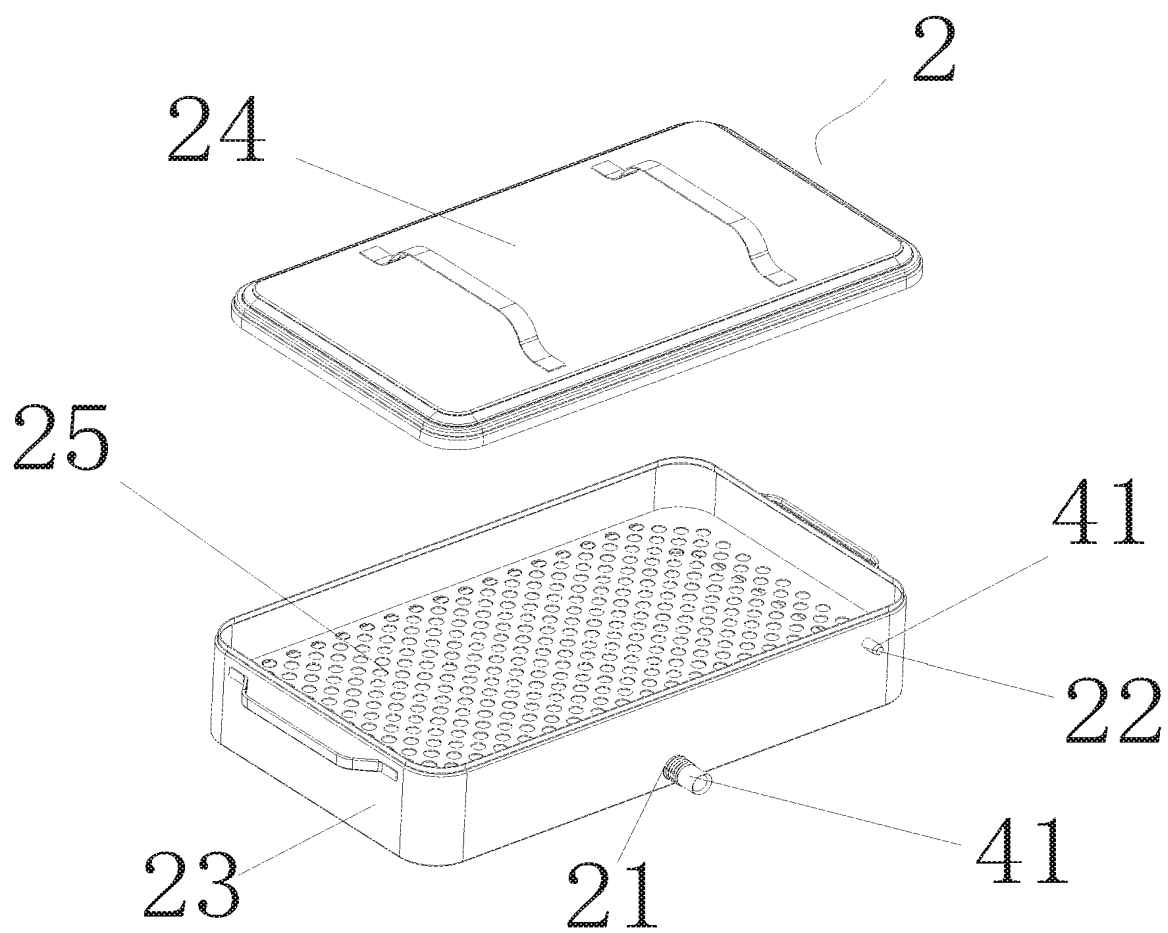


图 5

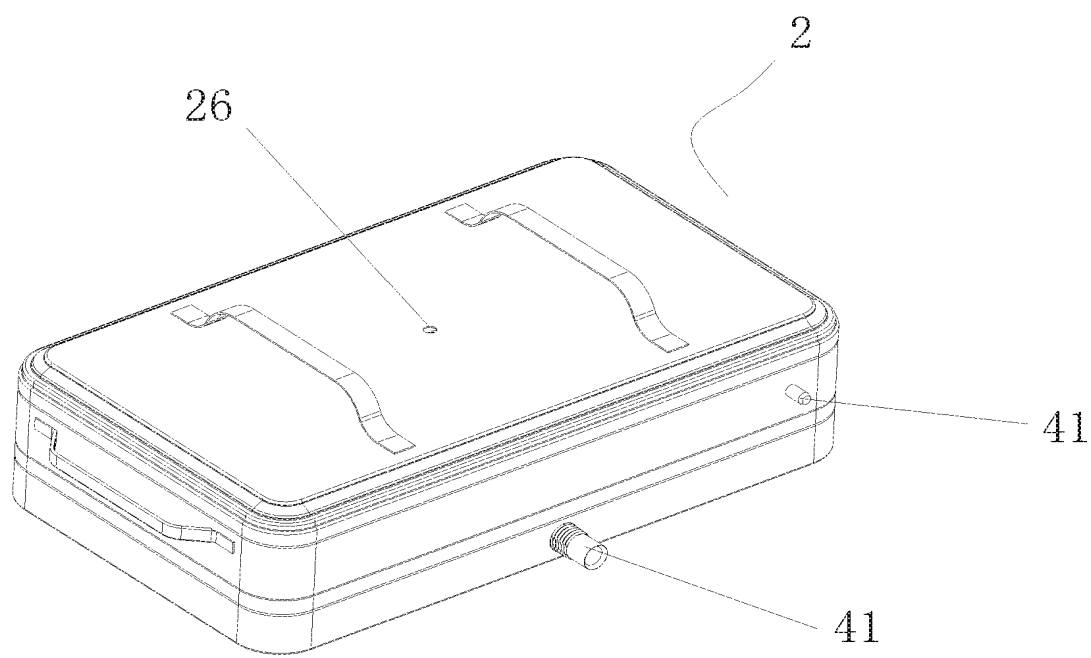


图 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/126303

A. CLASSIFICATION OF SUBJECT MATTER

A47J 27/04(2006.01)i; A47J 37/06(2006.01)i

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)

A47J

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)

CNPAT, CNKI, EPODOC, WPI: 格力, 烤, 亮, 蒸汽, 进汽, 进气, 底, 流入, 流出, STEAM, BAKE, COMBINATION, SHELL, BARBECUE, SIDEWALL, VESSEL, INLET, ENTER, HOLE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 110051216 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 July 2019 (2019-07-26) description, paragraphs [0029]-[0035], and figures 1-6	1-14
Y	CN 109463994 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 15 March 2019 (2019-03-15) claims, description, paragraphs [0046]-[0068], figures 1-7	1-14
Y	CN 109497825 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 22 March 2019 (2019-03-22) description, paragraphs [0029]-[0035], and figures 1-3	1-14
A	CN 201734495 U (JOYOUNG CO., LTD.) 09 February 2011 (2011-02-09) entire document	1-14
A	CN 109512273 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 March 2019 (2019-03-26) entire document	1-14
A	CN 109512272 A (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 26 March 2019 (2019-03-26) entire document	1-14

☒ 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

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“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

27 February 2020

Date of mailing of the international search report

18 March 2020

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
CN)
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/126303**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 206324635 U (FOSHAN CITY SHUNDE DISTRICT SHUNJIALI ELECTRICAL APPLIANCES CO., LTD.) 14 July 2017 (2017-07-14) entire document	1-14
A	CN 200970127 Y (WANG, Yaomin) 07 November 2007 (2007-11-07) entire document	1-14
A	JP H0531028 A (SANYO ELECTRIC CO. et al.) 09 February 1993 (1993-02-09) entire document	1-14

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/126303

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	110051216	A	26 July 2019	None	
CN	109463994	A	15 March 2019	None	
CN	109497825	A	22 March 2019	None	
CN	201734495	U	09 February 2011	None	
CN	109512273	A	26 March 2019	None	
CN	109512272	A	26 March 2019	None	
CN	206324635	U	14 July 2017	None	
CN	200970127	Y	07 November 2007	None	
JP	H0531028	A	09 February 1993	None	

A. 主题的分类 A47J 27/04 (2006.01) i; A47J 37/06 (2006.01) i 按照国际专利分类 (IPC) 或者同时按照国家分类和 IPC 两种分类		
B. 检索领域 检索的最低限度文献 (标明分类系统和分类号) A47J 包含在检索领域中的除最低限度文献以外的检索文献 在国际检索时查阅的电子数据库 (数据库的名称, 和使用的检索词 (如使用)) CNPAT, CNKI, EPDOC, WPI; 格力, 烤, 壳, 蒸汽, 进汽, 进气, 底, 流入, 流出, STEAM, BAKE, COMBINATION, SHELL, BARBECUE, SIDEWALL, VESSEL, INLET, ENTER, HOLE		
C. 相关文件		
类 型*	引用文件, 必要时, 指明相关段落	相关的权利要求
PX	CN 110051216 A (珠海格力电器股份有限公司) 2019年 7月 26日 (2019 - 07 - 26) 说明书第[0029]-[0035]段, 图1-6	1-14
Y	CN 109463994 A (珠海格力电器股份有限公司) 2019年 3月 15日 (2019 - 03 - 15) 权利要求书, 说明书第[0046]-[0068]段, 图1-7	1-14
Y	CN 109497825 A (珠海格力电器股份有限公司) 2019年 3月 22日 (2019 - 03 - 22) 说明书第[0029]-[0035]段, 图1-3	1-14
A	CN 201734495 U (九阳股份有限公司) 2011年 2月 9日 (2011 - 02 - 09) 全文	1-14
A	CN 109512273 A (珠海格力电器股份有限公司) 2019年 3月 26日 (2019 - 03 - 26) 全文	1-14
A	CN 109512272 A (珠海格力电器股份有限公司) 2019年 3月 26日 (2019 - 03 - 26) 全文	1-14
A	CN 206324635 U (佛山市顺德区顺佳利电器有限公司) 2017年 7月 14日 (2017 - 07 - 14) 全文	1-14
☒ 其余文件在C栏的续页中列出。 ☒ 见同族专利附件。		
* 引用文件的具体类型: “A” 认为不特别相关的表示了现有技术一般状态的文件 “E” 在国际申请日的当天或之后公布的在先申请或专利 “L” 可能对优先权要求构成怀疑的文件, 或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件 (如具体说明的) “O” 涉及口头公开、使用、展览或其他方式公开的文件 “P” 公布日先于国际申请日但迟于所要求的优先权日的文件 “T” 在申请日或优先权日之后公布, 与申请不相抵触, 但为了理解发明之理论或原理的在后文件 “X” 特别相关的文件, 单独考虑该文件, 认定要求保护的发明不是新颖的或不具有创造性 “Y” 特别相关的文件, 当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时, 要求保护的发明不具有创造性 “&” 同族专利的文件		
国际检索实际完成的日期 2020年 2月 27日		国际检索报告邮寄日期 2020年 3月 18日
ISA/CN的名称和邮寄地址 中国国家知识产权局 (ISA/CN) 中国北京市海淀区蓟门桥西土城路6号 100088 传真号 (86-10)62019451		受权官员 刘杰 电话号码 86-(10)-53962433

C. 相关文件

类 型*	引用文件，必要时，指明相关段落	相关的权利要求
A	CN 200970127 Y (王耀民) 2007年 11月 7日 (2007 - 11 - 07) 全文	1-14
A	JP H0531028 A (SANYO ELECTRIC CO. 等) 1993年 2月 9日 (1993 - 02 - 09) 全文	1-14

国际检索报告
关于同族专利的信息

国际申请号

PCT/CN2019/126303

检索报告引用的专利文件			公布日 (年/月/日)	同族专利	公布日 (年/月/日)
CN	110051216	A	2019年 7月 26日	无	
CN	109463994	A	2019年 3月 15日	无	
CN	109497825	A	2019年 3月 22日	无	
CN	201734495	U	2011年 2月 9日	无	
CN	109512273	A	2019年 3月 26日	无	
CN	109512272	A	2019年 3月 26日	无	
CN	206324635	U	2017年 7月 14日	无	
CN	200970127	Y	2007年 11月 7日	无	
JP	H0531028	A	1993年 2月 9日	无	



(51) International Patent Classification:
F24C 15/32 (2006.01) *F22B 1/28* (2006.01)

(21) International Application Number:
PCT/IB2020/056446

(22) International Filing Date:
09 July 2020 (09.07.2020)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
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(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, IT, JO, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD,

(54) Title: STEAM GENERATOR, IN PARTICULAR FOR OVENS

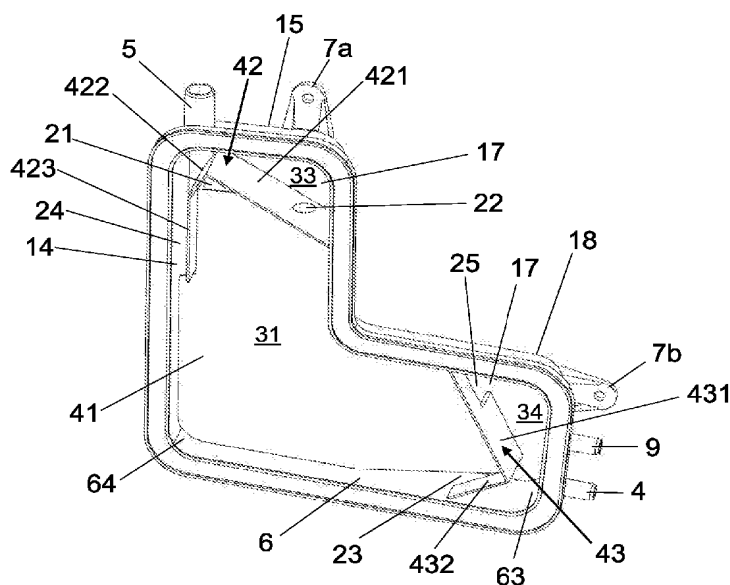


Fig. 3

(57) Abstract: A steam generator (1), in particular for an oven, comprising a tank (3) provided with an inlet pipe (4) suitable for introducing liquid into the tank (3) and an outlet pipe (5) suitable for releasing steam from the tank (3); at least one heating element (2) adapted to heat the liquid to produce the steam; wherein the tank (3) comprises: a first chamber (31); a second chamber (32); a third chamber (33), proximal to the outlet pipe (5); wherein the first chamber (31) and the second chamber (32) are adapted to contain the liquid introduced by means of said inlet pipe (4); wherein a first partition wall (41) is provided, which partially separates the first chamber (31) and the second chamber (32) from each other; wherein a second partition wall (42) is provided, which separates at least partially both the first chamber (31) and the second chamber (32) from the third chamber (33); wherein a first passage (21) is provided which allows the steam to pass from the first chamber (31) to the second chamber (32); wherein a second passage (22) is provided

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, ST, SV, SY, TH, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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).

Declarations under Rule 4.17:

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*
— *in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE*

which allows the steam to pass from the second chamber (32) to the third chamber (33); wherein a third passage (23) is provided which allows the liquid to pass between the second chamber (32) and the first chamber (31), near the bottom (6) of the tank (3).

STEAM GENERATOR, IN PARTICULAR FOR OVENS

Field of the invention

The present invention relates to a steam generator. The steam generator is particularly adapted to be used in an oven that provides steam cooking, in particular steam cooking and cleaning.

Prior art

Ovens for steaming food, which generally also provide steam cleaning, are known. A steam generator is provided for the production of steam, which comprises a heater and a tank containing the water to be heated to generate steam.

A problem of the current steam generators for ovens relates to the control of the fluid which is released from the steam generator and is introduced into the oven.

Indeed, in addition to steam, splashes of hot water, generated in particular by the turbulent motion of the boiling water, may also be released from the steam generator.

In an attempt to solve this problem, the current steam generators can be filled to a maximum of about 30% of their inner volume. The remaining inner volume must be left empty to attempt to contain the splashes of water inside the tank so that mostly steam is introduced into the oven.

Therefore, the current solutions do not make it possible to make the best use of the inner volume of the tank.

Disadvantageously, the tank must be filled too frequently with new water to be heated, also because the steam generator must remain compact in size.

Furthermore, the current technical solutions do not completely prevent the release of splashes of water from the steam generator.

Other problems of the current steam generators relate to the formation of limescale inside the tank and the stagnation of water in the tank at the end of the step of steam production.

Therefore, the need is felt to overcome the disadvantages of current steam generators, in particular for ovens.

Summary of the invention

It is an object of the present invention to make a steam generator that prevents or

limits the splashing of water from its tank during the step of steam generation.

In particular, an object of the invention is to make a steam generator, in particular of compact size, which makes it possible to avoid or limit the release of splashes of water from its tank, the inner volume of which can be filled more efficiently than the prior art.

It is another object of the present invention to prevent water stagnation in the tank at the end of the step of steam generation.

It is another object of the present invention to facilitate the removal of limescale residues which may form in the tank.

The present invention achieves at least one of such objects, and other objects which will be apparent in light of the present description, by means of a steam generator, in particular for an oven, comprising a tank provided with at least one inlet pipe suitable for introducing liquid into the tank and at least one outlet pipe suitable for releasing steam from the tank;

at least one heating element adapted to heat the liquid to produce the steam;

wherein the tank comprises: a first chamber or zone; a second chamber or zone; a third chamber or zone, proximal to the outlet pipe; wherein the first chamber or zone and the second chamber or zone are adapted to contain the liquid introduced by means of said inlet pipe; wherein a first partition wall is provided, which partially separates the first chamber or zone and the second chamber or zone from each other; wherein a second partition wall is provided, which separates at least partially, e.g. partially, both the first chamber or zone and the second chamber or zone from the third chamber or zone; wherein a first passage is provided which allows the steam to pass from the first chamber or zone to the second chamber or zone; and wherein a second passage is provided which allows the steam to pass from the second chamber or zone to the third chamber or zone.

At least one further passage, or third passage, distinct or different from the first passage and from the second passage is preferably provided, which allows the liquid to pass between the first chamber and the second chamber, in particular allows a direct passage of liquid.

In particular, the liquid introduced through the inlet pipe can fill both the first chamber and the second chamber, in particular at the same time.

Said at least one further passage is preferably near or at the bottom of the tank.

The liquid fraction of boiling water can pass directly from the third chamber to the first chamber by means of at least one passage, or fourth passage (optional), distinct from the first passage and from the second passage, and/or by passing through the second passage to be introduced into the second chamber, from which it can then return to the first chamber, preferably by means of said third passage.

In other words, preferably in all embodiments, the third passage allows the passage, between the first chamber and the second chamber, of the liquid introduced into the tank through the inlet pipe. The third passage also allows the passage of the liquid fraction of the water coming from the second chamber into the first chamber.

The invention further relates to an oven for steam cooking and preferably also for steam cleaning the oven, according to claim 18, preferably wherein the oven comprises at least one further tank connected to the tank of the steam generator, the further tank being in particular adapted to be used as an auxiliary reserve of liquid.

Advantageously, the tank can be filled to 60% or 70% of its inner volume without having releases of splashes of water from the outlet pipe during the generation of steam.

Advantageously, the steam generator is also simple to construct.

Preferably, the third chamber or zone is arranged between the outlet pipe and the first chamber or zone, and/or the third chamber or zone is arranged between the outlet pipe and the second chamber or zone.

The second partition wall allows the direct passage of steam from the first chamber to the third chamber to be limited.

Therefore, most of the steam produced by heating the liquid in the first chamber first passes from the first chamber to the second chamber, and then from the second chamber to the third chamber to then be released from the outlet pipe.

The liquid fraction of the boiling water can advantageously return to the first chamber, coming directly from the third chamber, preferably by means of the fourth passage; and/or by first passing through the second chamber and to then reach the first chamber, preferably by means of said third passage. The water which returns

to the first chamber was previously heated. Therefore, the steam production process is particularly efficient.

Note that the liquid in the first chamber heats up faster than the liquid in the second chamber because the first chamber is preferably closer to the heating element. In particular, the heating element is preferably closer with respect to the first chamber and further with respect to the second chamber and preferably also further with respect to the third chamber.

Preferably, the second partition wall is shaped and arranged to facilitate the flow of liquid from the third chamber towards the first chamber and/or towards the second chamber by gravity.

Preferably, the steam generator is L-shaped to optimize its dimensions when assembled with an oven, without having to reduce the capacity of the steam generator tank.

Preferably, the steam generator is designed so that at least one of its walls can be arranged vertically, e.g. with respect to an oven support surface, and the bottom is inclined so that liquid can be released from the inlet pipe by gravity.

Preferably, at least one venting pipe is provided to prevent the inner pressure of the tank from increasing excessively, e.g. so that the inner pressure of the tank is substantially equal to the atmospheric pressure.

Advantageously, the steam generator makes it easier to remove limescale, in particular when the bottom of the tank is inclined, when the steam generator is assembled with the oven. Indeed, the limescale can slide on the bottom towards the inlet pipe, through which maintenance operations can be carried out. The detachment of limescale is also facilitated by providing that the wall to which the heating element is attached is adapted to be a vertical wall, in particular when the steam generator is assembled with the oven.

Advantageously, a steam generator according to the invention can also be used in other electrical appliances, in particular household appliances, which involve the production of steam, e.g. washing machines, tumble dryers, dishwashers, and medical appliances, e.g. for the sterilization of articles.

Further features and advantages of the present invention will become more apparent in light of the detailed description of preferred, but not exclusive

embodiments.

The dependent claims describe particular embodiments of the invention.

Brief description of the figures

The description of the invention refers to the accompanying drawings, which are provided by way of non-limiting example, in which:

Fig. 1 shows a perspective view of a steam generator according to the invention;

Fig. 2 shows a plan view of the steam generator in Fig. 1;

Fig. 2A shows section C-C in Fig. 2;

Fig. 3 shows a perspective view of some components of the steam generator in Fig. 1;

Fig. 4 shows an enlarged detail of Fig. 3;

Fig. 5 shows a plan view of the components shown in Fig. 3;

Fig. 5A shows section A-A in Fig. 5;

Fig. 5B shows section B-B in Fig. 5;

Fig. 6 shows another perspective view of the components shown in Fig. 3;

Fig. 7 shows another perspective view of the components shown in Fig. 3;

Fig. 8 shows a perspective view of the components shown in Fig. 3, from which a component was removed for the sake of illustration;

Fig. 9 shows a plan view of the components shown in Fig. 8.

Fig. 10 shows a front view of the back of a first example of an oven provided with a steam generator according to the invention;

Fig. 11 shows a front view of the back of a second example of an oven provided with a steam generator according to the invention.

The same elements or parts have the same reference numerals.

Description of example embodiments of the invention

A steam generator 1 according to the invention is described with reference to the figures.

The steam generator 1 is particularly adapted to be used in an oven 100 (Fig. 10 and 11) for steaming food and steam cleaning the oven itself.

The steam generator 1 comprises a tank 3 adapted to contain the liquid, in particular water, which produces steam when heated.

To feed the water into the tank 3, the latter is provided with an inlet, in particular an inlet pipe 4.

For releasing the steam from the tank 3, the latter is provided with an outlet, in particular an outlet pipe 5.

5 The tank 3 has a bottom 6, or bottom wall, i.e. a surface which acts as a lower containment for the liquid introduced into the tank 3 through the inlet pipe 4.

Preferably, the inlet pipe 4 is proximal to the bottom 6 of the tank 3 and the outlet pipe 5 is distal from the bottom 6. In other words, the inlet pipe 4 and the outlet pipe 5 are preferably in a lower zone and an upper zone of the tank 3, respectively.

10 More in detail, with particular reference to Fig. 6 and 7, the outlet pipe 5 extends outwards from the tank 3 from a wall 15 of the tank 3 which is preferably opposite to the bottom 6. In particular, the wall 15 is preferably an upper wall of the tank 3.

The wall 15 also preferably comprises two connecting portions 65, 66, preferably curved. The wall 15 is connected to the wall 14 by means of the connecting portion 65 and is connected to the wall 16 by means of the connecting portion 66. The wall 14 and the wall 16 are preferably opposite to each other, preferably parallel to each other. Preferably, the outlet pipe 5 extends from the connecting portion 65 of the wall 15. In particular, an opening 51 of the outlet pipe 5 is obtained in the connecting portion 65. Preferably, the portion of wall 15 which extends between the connecting portions 65, 66 is orthogonal or substantially orthogonal to the wall 14 and/or to the wall 16.

The inlet pipe 4 extends, towards the outside of the tank 3, from a wall 19 preferably proximal to the bottom 6. In particular, the wall 19 comprises two connecting portions 62, 63, preferably curved. The wall 19 is connected to the bottom 6 by means of the connecting portion 63 and is connected to the wall 18 by means of the connecting portion 62. The wall 18 and the bottom 6 are preferably opposite to each other, preferably parallel to each other. Also, preferably, the wall 19 is opposite to the wall 14. The wall 19 is preferably a side wall, in particular a lower side wall, of the tank 3.

30 Preferably, the portion of wall 19 which extends between the connecting portions 62, 63 is orthogonal or substantially orthogonal to the wall 18 and/or to the bottom 6.

The inlet pipe 4 and the outlet pipe 5 extend about a respective axis and preferably, but not exclusively, the axis of the inlet pipe 4 and the axis of the outlet pipe 5 mutually form an angle between 90° and 270° or between 90° and 180° or between 90° and 140°, e.g. of about 95°. Preferably, said angle is greater than 90°.

- 5 Preferably, the inlet pipe 4 has a section, in particular an inner section, which is smaller than or equal to the section, in particular the inner section, of the outlet pipe 5.

To heat the water, the steam generator 1 is provided with at least one heating element 2, e.g. only one heating element 2, or heater.

- 10 The tank 3 is advantageously divided into at least three chambers or zones 31, 32, 33 communicating with each other (see in particular Fig. 5 and 5A).

A first chamber or zone 31 is preferably proximal to the heating element 2.

- A second chamber or zone 32 (indicated in 5A) is preferably distal from the heating element 2; in particular, the first chamber 31 is preferably arranged between the
15 heating element 2 and the second chamber 32.

A third chamber or zone 33 is preferably proximal to the outlet pipe 4.

In particular, a first partition wall 41 is provided, which partially separates the first chamber 31 and the second chamber 32 from each other. In Figs. 8 and 9, the first partition wall 41 is not shown to better illustrate the inside of the tank 3.

- 20 Furthermore, a second partition wall 42 is provided, which partially, or at least partially, separates both the first chamber 31 and the second chamber 32 from the third chamber 33.

Preferably, the first partition wall 41 and the second partition wall 42 are mutually transversal, e.g. mutually perpendicular or substantially perpendicular.

- 25 A first passage 21 allows the steam to pass from the first chamber 31 to the second chamber 32. Preferably, the first passage 21 is delimited by the first partition wall 41 and by the second partition wall 42.

- A second passage 22 allows the steam to pass from the second chamber 32 to the third chamber 33. Preferably, the second passage 22 is obtained in the second
30 partition wall 42. By way of non-limiting example, the second passage 22 may be formed by at least one hole, e.g. one hole, obtained in the second partition wall 42.
The first passage 21 and the second passage 22 are mutually distinct.

The first passage 21 and the second passage 22 are preferably in an upper zone of tank 3, in particular, they are arranged in the upper zone which comprises also the outlet pipe 5.

The third chamber 33 is preferably arranged above the first chamber 31 and above the second chamber 32.

In particular, the third chamber 33 is arranged between the outlet pipe 5 and the first chamber 31, and between the outlet pipe 5 and the second chamber 32.

Preferably, the third chamber 33 communicates directly with the outlet pipe 5. In particular, preferably, the third chamber 33 is delimited at the top by the wall 15 provided with the outlet pipe 5.

Preferably, but not exclusively, the bottom 6 of the tank 3 is also the bottom of the first chamber 31 and of the second chamber 32.

Advantageously, the inner division of the tank 3 makes it possible to fill the tank 3 to 60% or 70% of its inner volume without releases of splashes of water from the outlet pipe 5 during the generation of steam.

In particular, the second partition wall 42 is arranged to limit the direct flow of steam from the first chamber 31 to the third chamber 33.

In particular, most of the steam produced by the heating of the liquid in the first chamber 31 passes first from the first chamber 31 to the second chamber 32, and then from the second chamber 32 to the third chamber 33, and then exits from the outlet pipe 5. The path followed by the steam is diagrammatically shown by the arrows F1, F2, F3 in Figs. 4 and 5A.

The liquid fraction of the boiling water can advantageously return to the first chamber 31, coming directly from the third chamber 33 and/or passing first through the second chamber 32 to then reach the first chamber 31. The water which returns to the first chamber 31 was previously heated. Therefore, the steam production process is particularly efficient.

In particular, a third passage 23 allows the steam to pass between the second chamber 32 and the first chamber 31. The third passage 23 is preferably near or at the bottom 6 of the tank 3. The third passage 23 is preferably near the inlet pipe 4.

The third passage 23 is distinct from the first passage 21 and the second passage 22.

Preferably, but not exclusively, the third passage 23 is partly delimited by the bottom 6 of the tank 3.

Preferably, but not exclusively, the third passage 23 is delimited by the bottom 6 of the tank 3 and by the first partition wall 41.

- 5 The third passage may also be provided in other zones, e.g. may be completely or partially delimited by the first partition wall, e.g. may be obtained in the first partition wall.

The third passage 23 allows the passage of the liquid introduced into the tank 3 through the inlet pipe 4. According to the principle of communicating vessels, the
10 liquid level in the first chamber 31 and the second chamber 32 is substantially the same, in particular when the heating element 2 is off.

The third passage 23 also allows the passage of the liquid fraction of the water from the second chamber 32 into the first chamber 31.

By way of non-limiting example, the third passage 23 may be, for example, at a
15 distance, in particular a minimum distance, from the bottom 6 from 0 to 10 cm, or from 0 to 5 cm. In particular, the value "0" relates to the case in which the third passage 23 is partly delimited by the bottom 6 of the tank 3, e.g. when the third passage 23 is delimited by the bottom 6 of the tank 3 and the first partition wall 41

To facilitate the flow of the liquid fraction of the water towards the first chamber 31
20 and/or towards the second chamber 32, the second partition wall 42 preferably comprises a first portion 421 and a second portion 422 which are mutually inclined. Preferably, the first portion 421 and the second portion 422 form an angle α (indicated in Fig. 9), the apex 420 of which faces towards the wall 15 of the tank 3 preferably towards the portion of the wall 15 which extends between the two
25 connecting portions 65, 66 or towards the connecting portion 65. The wall 42 may also be made in different manners. For example, the wall 42 may be curved, and, in particular, may be provided with a portion which is convex towards the wall 15.

Preferably, the aforesaid angle α has a width greater than 180° , preferably between 200° and 300° or between 240° and 280° , e.g. about 270° .

- 30 Note that the angle α is the angle proximal to said wall 15 formed by the two portions 421, 422.

The first portion 421 and the second portion 422 are preferably above the first partition wall 41.

Preferably, the first portion 421 and the second portion 422 are mutually consecutive.

5 The liquid fraction of water can reach the second chamber 32 passing through the second passage 22 and can reach the first chamber 31 through the third passage 23. In particular, through the third passage 23, the liquid can pass, in particular directly, from the second chamber 32 to the first chamber 31.

Preferably, there is a fourth passage 24 which allows the liquid to pass from the third
10 chamber 33 directly to the first chamber 31 and/or from the third chamber 33 to the second chamber 32. Preferably, the fourth passage 24 is partly delimited by the wall 14 of the tank 3 and/or partly by the second partition wall 42.

For example, the second partition wall 42 may optionally also comprise a third portion 423 facing the wall 14 of the tank 3. The third portion 423 and the wall 14
15 are mutually distanced so that the fourth passage 24 is delimited, at least partially, by the third portion 423 and by the wall 14. Preferably, the distance between the third portion 423 and the wall 14 is comprised between 1 and 17.5 mm, e.g. between 2 and 10 mm.

The third portion 423 extends transversely to the second portion 422 and is
20 preferably consecutive to the second portion 422.

Through the fourth passage 24, the liquid fraction of the water can reach, for example, the first chamber 31 and the second chamber 32 through a respective passage, preferably partly delimited by the first partition wall 41.

With particular reference to Fig. 1 and 2, the heating element 2 is constrained to a
25 wall 12 which delimits, in particular closes, the first chamber 31.

Preferably, the heating element 2 is arranged outside the tank 3, preferably completely outside the tank 3. In particular, the heating element 2 is fixed to a face of the wall 12 which is outside the tank 3. Alternatively, the heating element 2 can be arranged, fully or partially inside the tank 3.

30 The wall 12 is preferably an outer wall of the tank 3.

The wall 12 is preferably substantially a cover of the tank 3.

The wall 12 is hermetically fixed with the rest of the tank 3.

Preferably, fixing means (not shown) are further provided, such as screws and nuts and/or elastic means, such as clips or pegs and/or a sealant or glue for fixing the wall 12, which can optionally be unmounted. Alternatively, the wall 12 can be co-molded with the rest of the tank 3.

- 5 Preferably, the heating element 2 is of the electrical type. For example, the heating element 2 is a sheathed resistor, i.e. a resistor capable of producing heat when electric current flows through it, provided with a metal outer casing.

Preferably, the heating element 2 extends only at the lower zone of the steam generator 1, in particular of the tank 3, and optionally also at the middle zone of the tank 3. In other words, the heating element 2 does not extend to the upper zone of the steam generator 1, in particular of the tank 3. More in detail, the heating element 2 does not extend at the third chamber 33.

The second partition wall 42 is arranged, in particular, between the two walls 14, 16 of the tank 3 opposite to each other.

- 15 Preferably, the outlet pipe 5 is proximal to the wall 14 and distal from the wall 16; and the second passage 22 is proximal to the wall 16 and distal from the wall 14. In this manner, the distance between the second passage 22 and the outlet pipe 5 is advantageously increased, to prevent the release of splashes of water from outlet pipe 5 more effectively.

- 20 Preferably, the apex 420, i.e. the edge formed between the two portions 421, 422 of the second partition wall 42, is proximal to the outlet pipe 5 and preferably the second passage 22 is distal from the outlet pipe 5.

In particular, the apex 420 is preferably proximal to the wall 14 and distal from the wall 16. Preferably, the portion 422 has a smaller surface extension than the surface extension of the first portion 421.

- 25 Preferably, as mentioned, the second passage 22 is obtained in the second partition wall 42. In particular, the second passage 22 is preferably obtained in the portion 421 of the second partition wall 42. Preferably, the second passage 22 is delimited by the second partition wall 42 and by a wall 17 of the tank 3 opposite to the wall 12 to which the heating element 2 is constrained. Preferably the second passage 22 is further delimited by the first partition wall 41.

30 Preferably, the wall 17 is parallel or substantially parallel to the wall 12.

Preferably, the wall 17 defines the second chamber 32.

The first partition wall 41 and the second partition wall 42 are arranged between the wall 12 and the wall 17.

In particular, the first partition wall 41 faces both the wall 12 and the wall 17 and is spaced from the walls 12, 17. More in particular, the first partition wall 41, preferably, partly delimits the first chamber 31 and partly delimits the second chamber 32.

Preferably, the first partition wall 41 is parallel or substantially parallel to the wall 12. The first partition wall 41 is preferably supported by one or more supporting elements (not shown), e.g. arranged in the first chamber 31 and/or the second chamber 32.

Preferably, the second partition wall 42 extends from the wall 17 towards the wall 12. Preferably, there is a gap between the wall 12 and the partition wall 42. Preferably, the second partition wall 42 is in contact with the wall 17, although it is not excluded that a gap can be provided between the wall 17 and the second partition wall 42.

Preferably, the second partition wall 42 is transversal, e.g. perpendicular or substantially perpendicular, to the two walls 12, 17.

Preferably, the bottom 6 of the tank 3 is inclined with respect to the wall 14. For example, the wall 14 and the bottom 6 form an angle β (indicated in Fig. 9), inside the tank 3, preferably between 90° and 179° or between 90° and 140° , e.g. about 95° . Preferably, said angle is greater than 90° .

Advantageously, in this manner, when the wall 14 is arranged vertically, the bottom 6 is inclined so that water can be released from the pipe 4 by gravity or with the help of a pump or solenoid valve, avoiding unwanted water stagnation.

Preferably, but not exclusively, the steam generator 1 is substantially L-shaped. The L-shaped shape is particularly advantageous to optimize the size of the steam generator 1 with respect to the oven 100, without having to reduce the capacity of the tank 3.

With particular reference to Fig. 10 and 11, the generator 1 may indeed be mounted at the rear part of the oven 100, where other components, such as a fan, fan motor, or other components of the oven 100, can be placed in addition to the steam generator. The zone where the fan is mounted, with its motor, is diagrammatically

shown and is indicated by reference numeral 101. However, the steam generator 1 can be positioned in other zones at the rear of the oven, or at the side or top wall of the oven. The fan can still be positioned in a central or off-center zone of the rear part of the oven.

- 5 The L-shaped design makes it possible to take advantage of both the space at the side of the fan and the space below the fan.

Observing Figs. 10 and 11, it can be noted that the L-shaped conformation is also advantageous because the aforesaid space optimization advantages are obtained by mounting the steam generator 1 both in a rear right and in a rear left zone of the
10 oven 100.

Furthermore, the steam generator 1, in particular the tank 3, can be produced with the same mold both when the steam generator 1 is intended to be mounted in the rear right zone and in the rear left zone of the oven 100.

- 15 The inlet pipe 4 can be connected to one or more tanks (not shown) adapted to supply the steam generator 1. The outlet pipe 5 can be connected to an additional pipe (not shown) which can conduct the steam into the cooking compartment of the oven 100.

- When the steam generator 1 is L-shaped, both the wall 16 and the wall 19, which is preferably the wall provided with the inlet pipe 4, are opposite to the wall 14. The
20 distance between the wall 14 and the wall 16 is smaller, in particular always smaller, than the distance between the wall 14 and the wall 19.

Similarly, both the wall 15 and the wall 18 are opposite the bottom 6. The distance between the bottom 6 and the wall 18 is smaller, in particular always smaller, than the distance between the bottom 6 and the wall 15.

- 25 More in particular, the wall 14 preferably extends from the wall 15 to the bottom 6, to which it is connected by means of the connecting portion 64, preferably curved. The wall 16 is shorter than the wall 14. The wall 18 is connected to the wall 16, preferably by means of a connecting portion 61, preferably curved. Preferably, the wall 18 is parallel or substantially parallel to the bottom wall 6.

- 30 Preferably, the tank 3 is provided with a venting pipe 9 which prevents, in particular, the inner pressure of tank 3 from increasing excessively. The venting pipe 9 can optionally be connected to an additional pipe (not shown) which, in turn, can be

connected directly to the oven cavity, or to one or more auxiliary tanks or boxes, or the venting pipe can be left free in the atmosphere.

Preferably, the venting pipe 9 is in a lower zone of the tank 3, preferably near the inlet pipe 4. For example, the wall 19 is provided both with the inlet pipe 4 and the
5 venting pipe 9.

Preferably, but not exclusively, the tank 3 further comprises a fourth chamber 34 which is proximal to the inlet pipe 4. Preferably, the inlet pipe 4 communicates directly with the chamber 34.

A third partition wall 43 is provided, which separates at least partially both the first
10 chamber 31 and the second chamber 32 from the fourth chamber 34.

The third partition wall 43 is transversal, preferably perpendicular or substantially perpendicular to the first partition wall 41.

A passage 25 (Fig. 3) is provided which allows the steam to pass from the fourth chamber 34 to the second chamber 32. Preferably, the passage 25 is obtained in
15 the third partition wall 43. Preferably, the passage 25 is delimited by the third partition wall 43 and the wall 17.

A passage 26 may be provided (Fig. (7) either additionally or alternatively to the passage 25, which allows the liquid to pass, in particular directly, from the fourth chamber 34 to the first chamber 31.

Preferably, the third partition wall 43 further comprises two mutually inclined portions
20 431, 432. Preferably, the portion 431 and the portion 432 form an angle γ (indicated in Fig. 9) the apex 430 of which faces the wall 19 of the tank 3 provided with the inlet pipe 4, e.g. towards the portion of the wall 19 which extends between connecting portions 62, 63 or towards the connecting portion 63. The wall 43 may
25 also be made in different manners. For example, the wall 43 may be curved, and, in particular, may be provided with a portion which is convex towards the wall 19.

Preferably, said angle γ has a width greater than 180° , preferably between 200° and 300° or between 240° and 280° , e.g. about 270° .

It is worth noting that the angle γ is the angle proximal to said wall 19 formed by the
30 two portions 431, 432.

Preferably, the apex 430 is proximal to the inlet pipe 4 and preferably the passage 25 is distal from the inlet pipe 4. Preferably, the passage 25 is proximal to the wall

18. In particular, the passage 25 is preferably delimited by the first partition wall 41, the third partition wall 43, the wall 17 and the wall 18.

It has been experimentally observed that the presence of the third partition wall 43 contributes to improve the water flow in tank 3 and to improve the homogeneity of steam coming out of steam generator 1.

Preferably, the steam generator 1, in particular the tank 3, is provided with at least two connecting portions 7a, 7b which constrain the steam generator 1 to the body of the oven 100. For example, each connecting portion 7a, 7b comprises a hole in which a respective screw can be inserted (not shown).

Some preferred, but not exclusive, dimensional details which can be considered individually or in any combination are provided below.

Preferably, the inner volume or maximum capacity of the tank 3, in particular its maximum capacity, is from 50 ml to 750 ml; and/or

the inner volume of the third chamber 33 is lower than the inner volume of the first chamber 31 and/or than the inner volume of the second chamber 32, e.g. from 2 to 20 times lower; and/or

the section area of the second passage 22 is larger than the section area of the first passage 21; and/or

the section area of the second passage 22 is comprised between 150 and 1400 or between 230 and 930 mm²; and/or

the section area of the first passage 21 is between 60 and 590 or between 95 and 390 mm²; and/or

the section area of the third passage 23 is between 75 and 700 or between 115 and 460 mm²; and/or

the distance between the wall 12 and the wall 17 is between 5 and 150 or between 10 and 90 mm.

With regard to materials, the tank 3 is preferably made of plastic, e.g. thermoplastic polymer such as PPS, PC, PA, PP or POM, or metal, e.g. steel.

The first partition wall 41, is preferably made of metal, e.g. steel, but can also be made of plastic.

Preferably, the second partition wall 42 and, when provided, the third partition wall 43 are preferably made of plastic, e.g. thermoplastic polymer, e.g. such as PPS, PC, PA, PP or POM, but can also be made of metal, e.g. steel.

5 Note that the aforesaid walls 12, 14, 15, 16, 17, 18, 19 and 6, i.e. the bottom 6, and the aforesaid connecting portions 61, 62, 63, 64, 65, 66 are preferably outer walls of the steam generator 1, in particular, they comprise an outer face outside the tank 3 and an inner face inside the tank 3, opposite to the outer face.

Note that, one or more additional chambers or zones may be provided, divided by means of one or more additional partition walls or portions of partition walls, in
10 addition to the three chambers or zones 31, 32, 33, or the four chambers or zones 31, 32, 33, 34.

For example, the third chamber or zone 33 can be divided into two chambers or zones by means of a partition wall, or into three chambers or zones by means of two partition walls and so on.

15 Note that the passages 21, 22, 23, and when provided, the passages 24, 25, 26 are, in particular, inside the tank 3; in particular completely inside the tank 3.

CLAIMS

1. A steam generator (1), in particular for an oven, comprising
a tank (3) provided with at least one inlet pipe (4) suitable for introducing liquid into
the tank (3) and at least one outlet pipe (5) suitable for releasing steam from the
5 tank (3);

at least one heating element (2) adapted to heat the liquid to produce the steam;
wherein the tank (3) comprises:

a first chamber (31);

a second chamber (32);

10 a third chamber (33), proximal to the outlet pipe (5);

wherein the first chamber (31) and the second chamber (32) are adapted to contain
the liquid introduced by means of said inlet pipe (4);

wherein a first partition wall (41) is provided, which partially separates the first
chamber (31) and the second chamber (32) from each other;

15 wherein a second partition wall (42) is provided, which separates at least partially
both the first chamber (31) and the second chamber (32) from the third chamber
(33);

wherein a first passage (21) is provided which allows the steam to pass from the
first chamber (31) to the second chamber (32);

20 wherein a second passage (22) is provided which allows the steam to pass from the
second chamber (32) to the third chamber (33);

wherein a third passage (23) is provided which allows the liquid to pass between the
second chamber (32) and the first chamber (31), in particular near the bottom (6) of
the tank (3).

25 **2.** A steam generator (1) according to claim 1, wherein the first chamber (31) is
proximal to the at least one heating element (2), and wherein the second chamber
(32) is distal from the at least one heating element (2).

3. A steam generator (1) according to claim 1 or 2, wherein the third chamber (33)
is arranged between the outlet pipe (5) and the first chamber (31), and preferably
30 between the outlet pipe (5) and the second chamber (32).

4. A steam generator (1) according to any one of the preceding claims, wherein the third passage (23) is proximal to the inlet pipe (4) and/or wherein said third passage (23) is partly delimited by the bottom (6) of the tank (3).

5. A steam generator (1) according to any one of the preceding claims, wherein said
5 third passage (23) is delimited by the bottom (6) of the tank (3) and by the first partition wall (41).

6. A steam generator (1) according to any one of the preceding claims, wherein the first passage (21) and the second passage (22) are in an upper zone of the tank (3) comprising the outlet pipe (5).

10 7. A steam generator (1) according to any one of the preceding claims, wherein the second passage (22) is obtained in the second partition wall (42) and/or wherein the first passage (21) is at least partially delimited by the first partition wall (41), preferably wherein the first passage (21) is delimited by the first partition wall (41) and the second partition wall (42).

15 8. A steam generator (1) according to any one of the preceding claims, wherein the second partition wall (42) comprises a first portion (421) and a second portion (422) which are mutually inclined; preferably wherein the first portion (421) and the second portion (422) form an angle, the apex (420) of which faces a wall (15) of the tank (3) provided with the outlet pipe (5).

20 9. A steam generator (1) according to any one of the preceding claims, wherein a fourth passage (24) is provided which allows the liquid to pass from the third chamber (33) to the first chamber (31) and/or to the second chamber (32); preferably wherein the fourth passage (24) is partly delimited by a wall (14) of the tank (3) and/or partly by the second partition wall (42)

25 10. A steam generator (1) according to any one of the preceding claims, wherein the at least one heating element (2) is constrained, preferably outside the tank (3), to a wall (12) which delimits the first chamber (31).

11. A steam generator (1) according to any one of the preceding claims, wherein the first partition wall (41) and the second partition wall (42) are mutually transversal.

30 12. A steam generator (1) according to any one of the preceding claims, wherein the bottom (6) of the tank (3) is also the bottom of the first chamber (31) and of the second chamber (32).

13. A steam generator (1) according to any one of the preceding claims, wherein the bottom (6) of the tank (3) forms an angle (β) with a wall (14) of the tank (3); said angle (β) being greater than 90°, preferably comprised between 90° and 179° or between 90° and 140°.

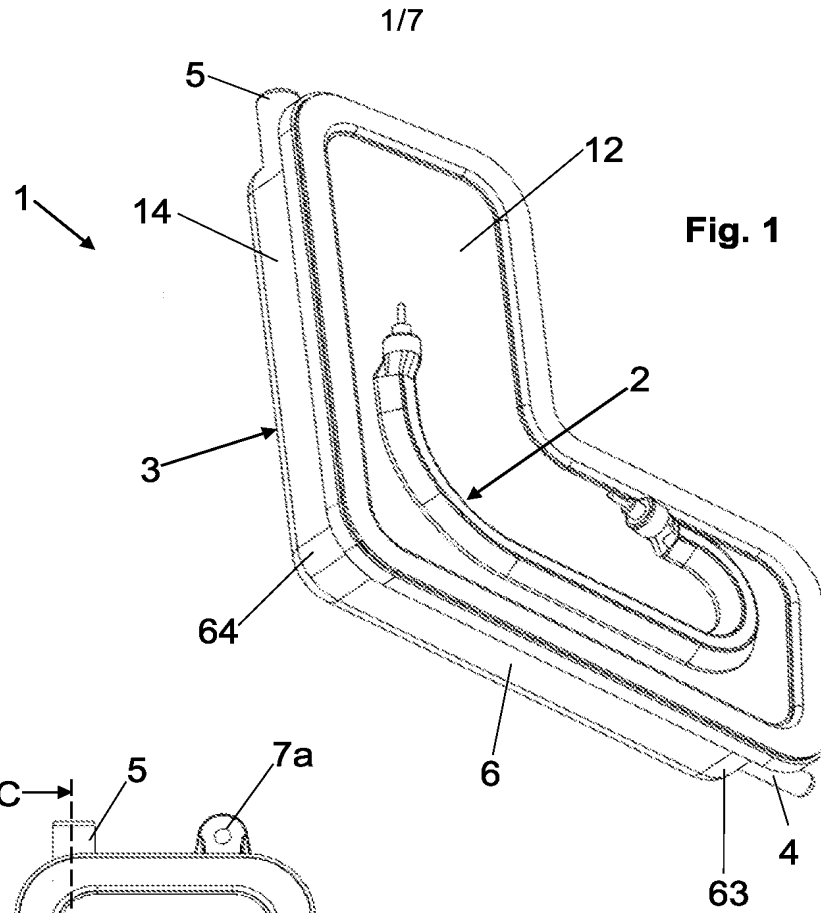
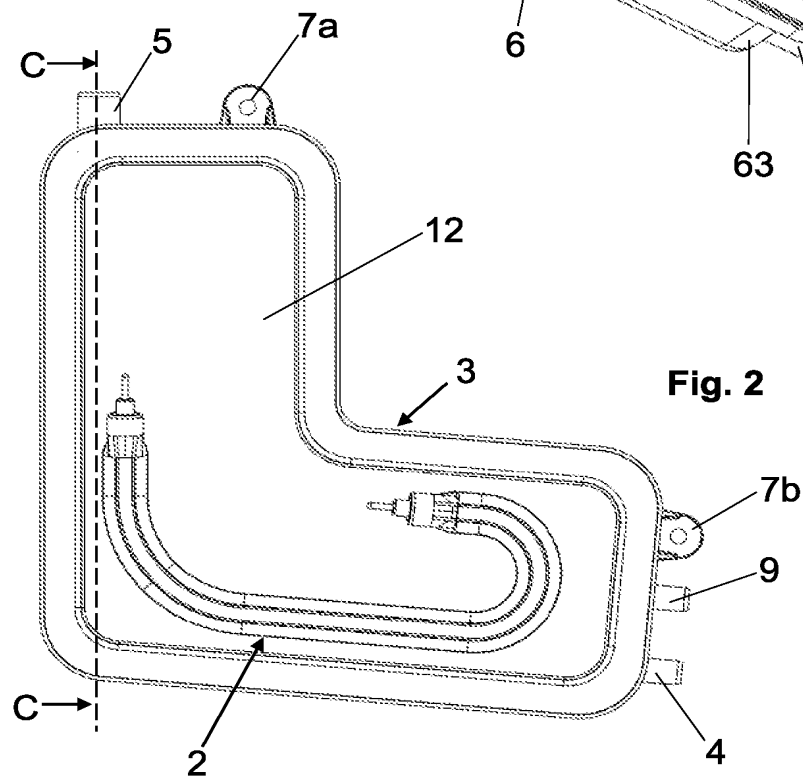
5 **14.** A steam generator (1) according to any one of the preceding claims, wherein the tank (3) comprises a fourth chamber (34) which is proximal to the inlet pipe (4); wherein a third partition wall (43) is provided, which separates at least partially both the first chamber (31) and the second chamber (32) from the fourth chamber (34); preferably wherein a passage (25) is provided, which allows the liquid to pass from
10 the fourth chamber (34) to the second chamber (32) and/or a passage (26) which allows a passage of liquid from the fourth chamber (34) to the first chamber (31).

15. A steam generator (1) according to any one of the preceding claims, wherein the tank (3) is L-shaped.

16. A steam generator (1) according to any one of the preceding claims, wherein a
15 venting pipe (9) is provided preferably proximal to the inlet pipe (4).

17. A steam generator (1) according to any one of the preceding claims, comprising at least one additional tank adapted to be connected to the tank (3).

18. An oven for steam cooking and preferably also for steam cleaning the oven, comprising a steam generator (1) according to any one of the preceding claims;
20 preferably wherein the oven comprises at least one further tank connected to the tank (3) of the steam generator (1), the further tank being in particular adapted to be used as an auxiliary reserve of liquid.



2/7

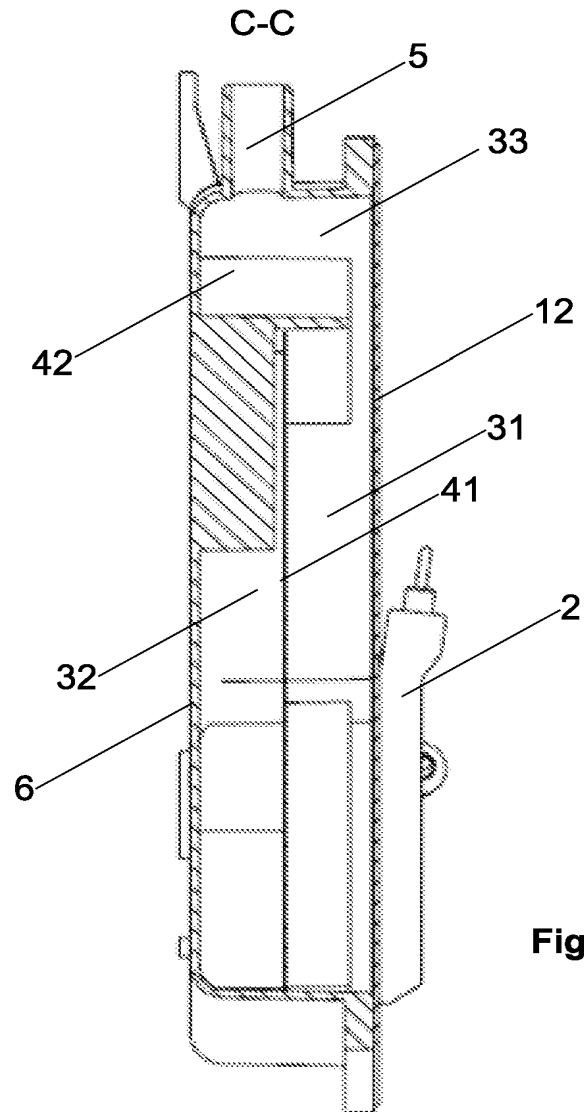
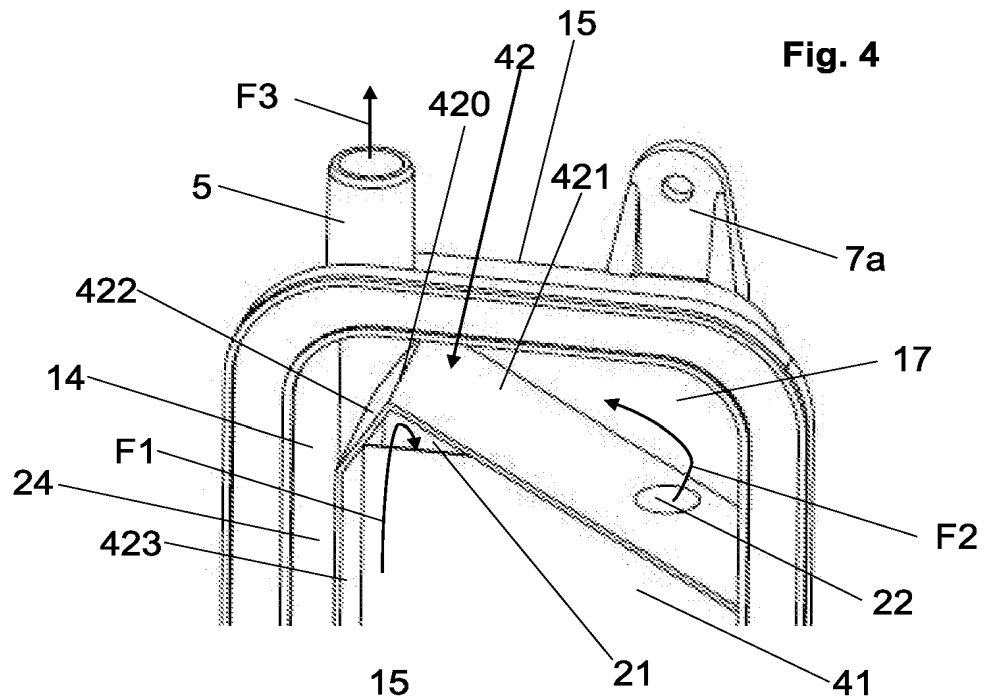
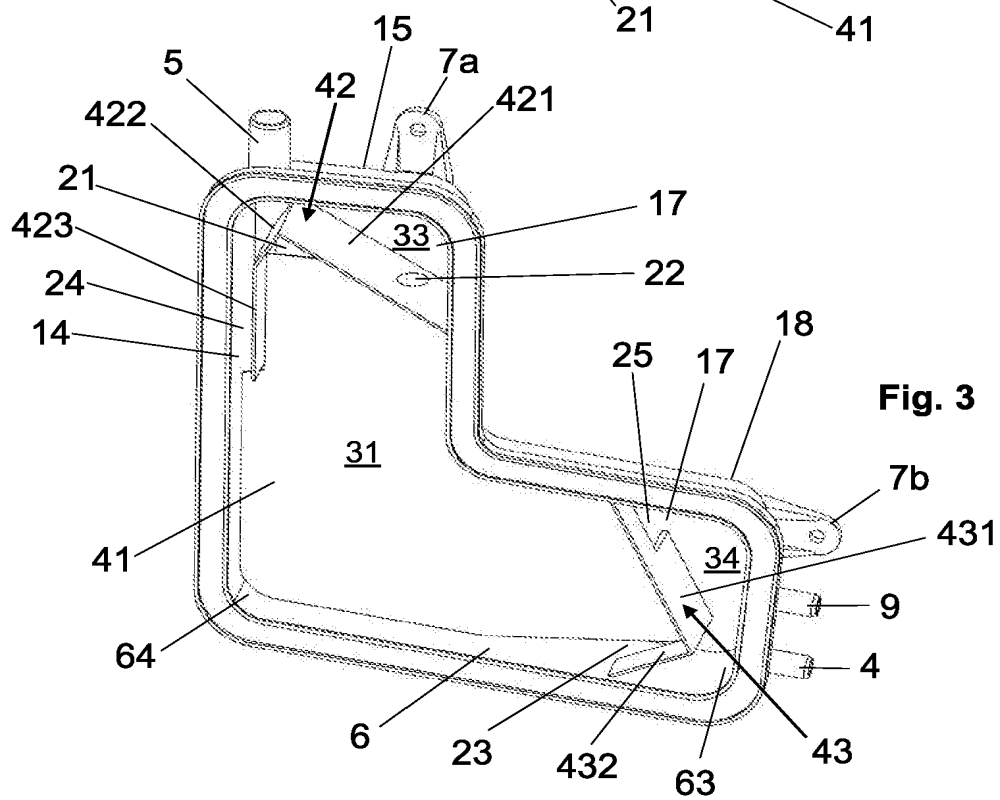
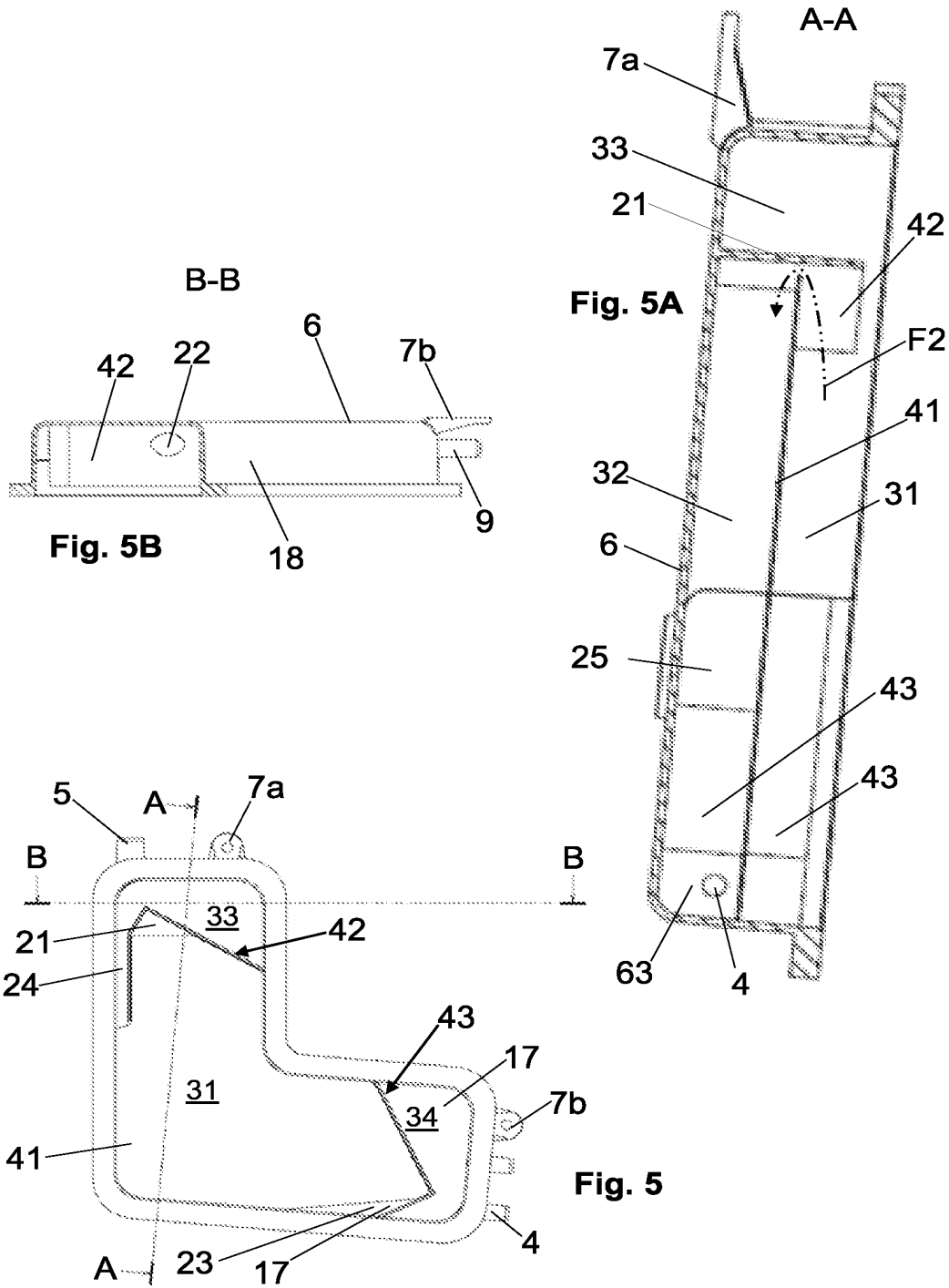


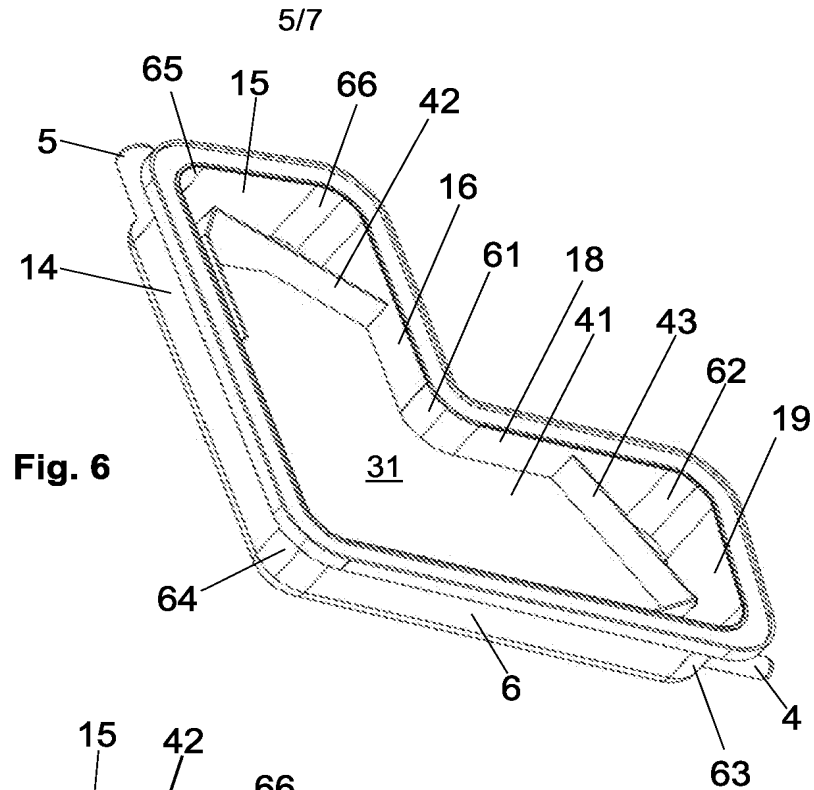
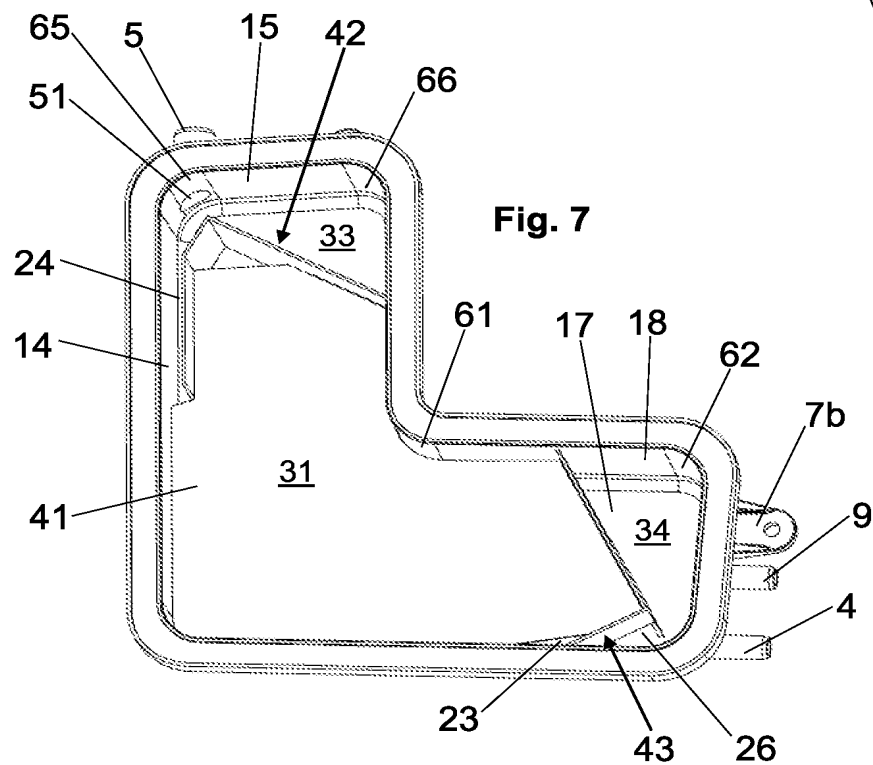
Fig. 2A

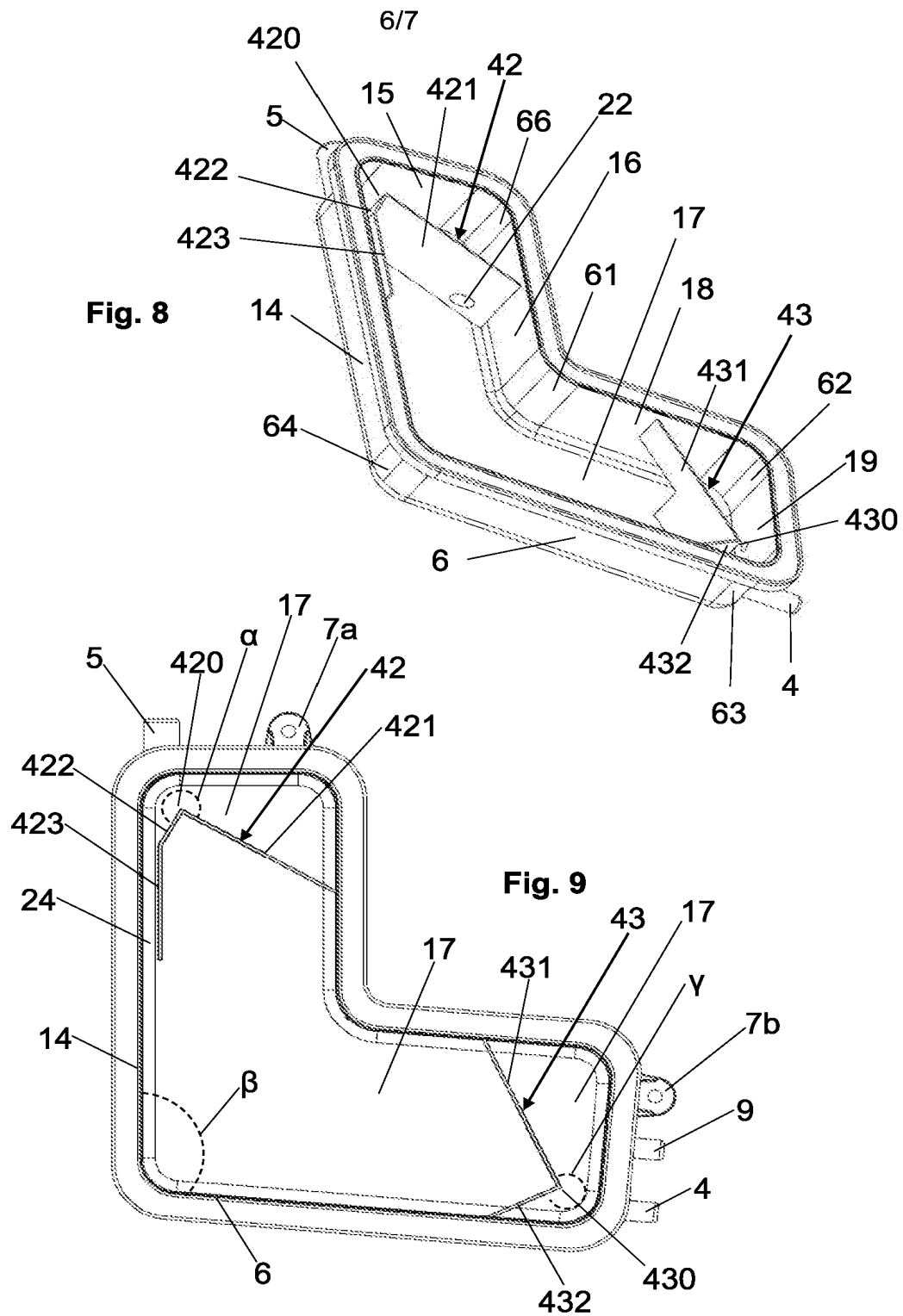
3/7



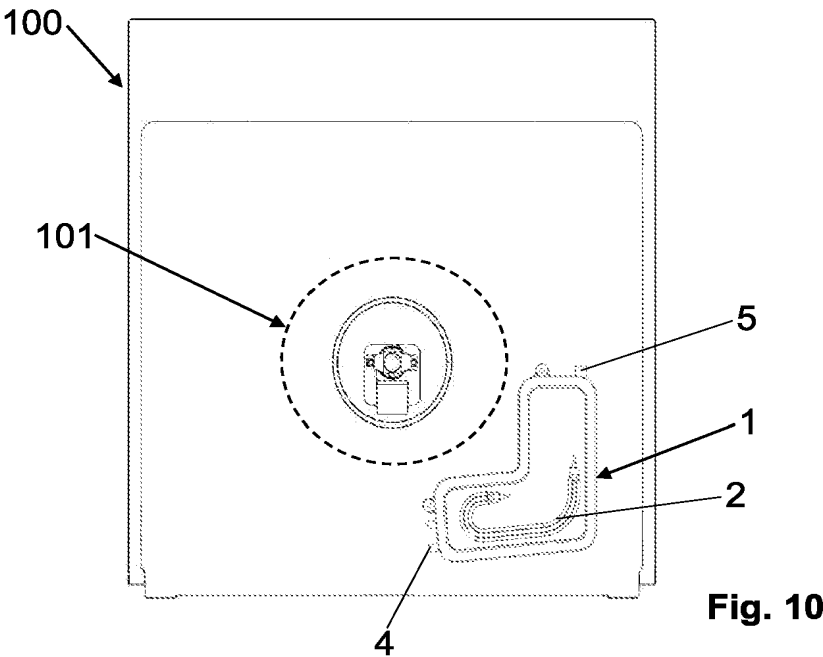
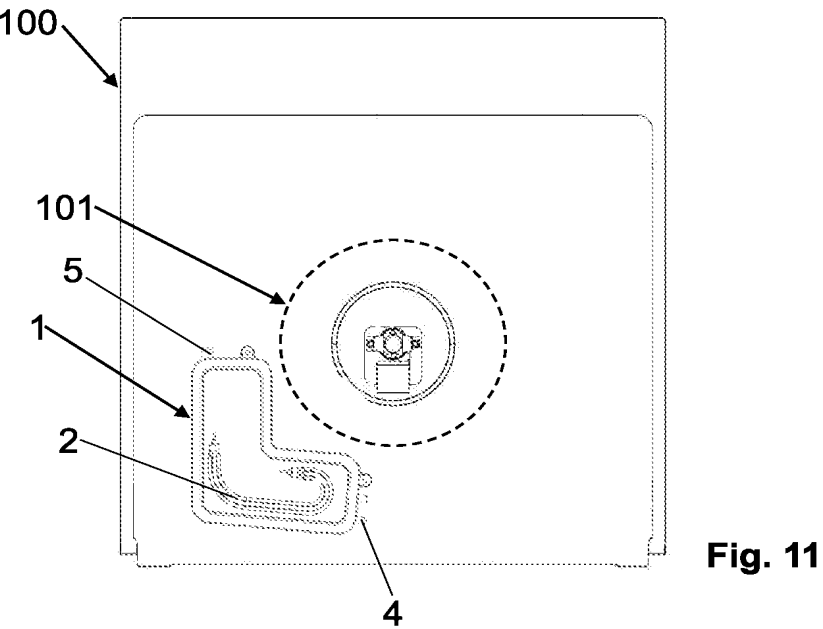
4/7







7/7



INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2020/056446

A. CLASSIFICATION OF SUBJECT MATTER
INV. F24C15/32 F22B1/28
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 F22G F22B

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.
A	EP 2 565 542 A1 (SHARP KK [JP]) 6 March 2013 (2013-03-06) paragraphs [0001], [0004], [0006], [0007]; figures 2,3,4,5,6,7 -----	1-18
A	FR 2 958 727 A1 (FAGORBRANDT SAS [FR]) 14 October 2011 (2011-10-14) paragraphs [0001], [0002]; figures 2, 3 -----	1-18
A	EP 3 457 027 A2 (EGO ELEKTRO GERAETEBAU GMBH [DE]) 20 March 2019 (2019-03-20) paragraphs [0001], [0002]; figures 2, 3 -----	1-18
A	WO 2018/143641 A1 (LG ELECTRONICS INC [KR]) 9 August 2018 (2018-08-09) abstract; figure 2 -----	1-18



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

"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

28 September 2020

Date of mailing of the international search report

28/10/2020

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Jalal, Rashwan

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2020/056446

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 2565542	A1	06-03-2013	BR 112012027798 A2	09-08-2016
			CN 102834671 A	19-12-2012
			EP 2565542 A1	06-03-2013
			MY 156932 A	15-04-2016
			RU 2012150843 A	20-06-2014
			RU 2014111449 A	27-09-2015
			SG 184919 A1	29-11-2012
			SG 10201503140Y A	29-06-2015
			US 2013042768 A1	21-02-2013
			US 2018135866 A1	17-05-2018
			WO 2011136252 A1	03-11-2011

FR 2958727	A1	14-10-2011	NONE	

EP 3457027	A2	20-03-2019	DE 102017216599 A1	21-03-2019
			EP 3457027 A2	20-03-2019
			US 2019086075 A1	21-03-2019

WO 2018143641	A1	09-08-2018	KR 20180089751 A	09-08-2018
			US 2020011537 A1	09-01-2020
			WO 2018143641 A1	09-08-2018

TRANSMITTAL FOR POWER OF ATTORNEY TO ONE OR MORE REGISTERED PRACTITIONERS

NOTE: This form is to be submitted with the Power of Attorney by Applicant form (PTO/AIA/82B) to identify the application to which the Power of Attorney is directed, in accordance with 37 CFR 1.5, unless the application number and filing date are identified in the Power of Attorney by Applicant form. If neither form PTO/AIA/82A nor form PTO/AIA/82B identifies the application to which the Power of Attorney is directed, the Power of Attorney will not be recognized in the application.

Application Number	
Filing Date	January 27, 2021
First Named Inventor	Christopher T. Martin
Title	COOKING DEVICE AND COMPONENTS THEREOF
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

SIGNATURE of Applicant or Patent Practitioner

Signature	/Alicia Hayter, Reg. No. 67,093/	Date (Optional)	1/27/2021
Name	ALICIA HAYTER	Registration Number	67093
Title (if Applicant is a juristic entity)	Patent Practitioner for Applicant		
Applicant Name (if Applicant is a juristic entity)			

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.



*Total of 1 (one) forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

OR

130401



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

OR

Firm or Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

SHARKNINJA OPERATING LLC

Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

11-18-15

Name

ROBERT L. LATZ

Title

EVP - GENERAL COUNSEL

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.



Total of

1 forms are submitted

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. This information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

POWER OF ATTORNEY BY APPLICANT

No more than ten (10) patent practitioners total may be appointed as set forth below by name and registration number. This page need not be submitted if appointing the Patent Practitioner(s) associated with a Customer Number (see form PTO/AIA/82B):

Name	Registration Number

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Christopher T. MARTIN	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	EUP1549US2	

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5832812	A	1998-11-10	WOLFE, RONALD DALE ET AL.	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20180303285	A1	2018-10-25	CHENG	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²ⁱ	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	202665302	CN	U	2013-01-16	HUANG ZHENXIONG		☐
	2	206080273	CN	U	2017-04-12	GUANGDONG RONGSHENG ELECTRIC HOLDING CO LTD		☐
	3	209032019	CN	U	2019-06-28	YUE MEIYI		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		
	Filing Date		
	First Named Inventor	Christopher T. MARTIN	
	Art Unit		
	Examiner Name		
	Attorney Docket Number	EUP1549US2	

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵
	1	International Search Report of the International Searching Authority; International Application No. PCT/US2020/042120; International Filing Date: July 15, 2020; Date of Mailing: October 30, 2020; 5 pages (EUP1549PCT)	☐
	2	Written Opinion of the International Searching Authority; International Application No. PCT/US2020/042120; International Filing Date: July 15, 2020; Date of Mailing: October 30, 2020; 11 pages (EUP1549PCT)	☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.			

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	
First Named Inventor	Christopher T. MARTIN
Art Unit	
Examiner Name	
Attorney Docket Number	EUP1549US2

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Alicia Hayter, Reg. No. 67,093/	Date (YYYY-MM-DD)	2021-01-27
Name/Print	ALICIA HAYTER	Registration Number	67093

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

HAYTER, Alicia

20 Church Street 22nd Floor Hartford, Connecticut 06103
USA**PCT****NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION****(PCT Rule 44.1)**Date of mailing
(day/month/year) 30 October 2020 (30.10.2020)Applicant's or agent's file reference
EUP1549PCT**FOR FURTHER ACTION** See paragraphs 1 and 4 belowInternational application No.
PCT/US2020/042120International filing date
(day/month/year) **15 July 2020 (15.07.2020)**

Applicant

SHARKNINJA OPERATING LLC

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.**How?** Directly to the International Bureau of WIPO preferably through ePCT or on paper to, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70**For more detailed instructions,** see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 - 9-011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. Reminders

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. These comments will be made available to the public after international publication. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices. In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months. For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Within **22 months** from the priority date, the applicant may request that a supplementary international search be carried out by a different International Searching Authority, that offers this service (Rule 45*bis*.1). The procedure for requesting supplementary international search is described in the *PCT Applicant's Guide*, International Phase, paragraphs 8.006-8.032.

Name and mailing address of the ISA/KR
International Application Division
Korean Intellectual Property Office
189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea
Facsimile No. 82-42-481-8578

Authorized officer

COMMISSIONER

Telephone No. 82-42-481-5571



* Attention

Copies of the documents cited in the international search report can be searched in the following Korean Intellectual Property Office English website for six months(expire date : **2021.04.30**) from the date of mailing of the international search report.

<http://www.kipo.go.kr/en/> => PCT ISA Portal => PCT Status

ID : PCT international application number

PW : **CXP99UQ8(**

Inquiries related to PCT International Search Report or Written Opinion prepared by KIPO as an International Searching Authority can be answered not only by KIPO but also through IPKC (Intellectual Property Korea Center), located in Vienna, VA, which functions as a PCT Help Desk for PCT applicants.

Homepage: <http://www.ipkcenter.com>

Email: ipkc@ipkcenter.com

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference EUP1549PCT	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2020/042120	International filing date (<i>day/month/year</i>) 15 July 2020 (15.07.2020)	(Earliest) Priority Date (<i>day/month/year</i>) 15 July 2019 (15.07.2019)
Applicant SHARKNINJA OPERATING LLC		

This International search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of :

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (See Box No. III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant.
☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the drawings,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 13
☒ as suggested by the applicant.
☐ as selected by this Authority, because the applicant failed to suggest a figure.
☐ as selected by this Authority, because this figure better characterizes the invention.
- b. ☐ none of the figures is to be published with the abstract.

A. CLASSIFICATION OF SUBJECT MATTER**A47J 37/01(2006.01)i**

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)

A47J 37/01; A21B 1/00; A21B 1/26; A23L 3/00; A47J 36/06; A47J 37/06; A47J 37/12

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: cooking, housing, container, heating element, motor, fan

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 202665302 U (HUANG, ZHENXIONG) 16 January 2013 paragraphs [0007], [0013]–[0014], [0020] and figure 1	1–9, 11–16, 71
Y		10, 17–53
A		54–70
Y	CN 209032019 U (LE, MEIYI) 28 June 2019 paragraphs [0027]–[0028] and figure 1	10
Y	US 2018–0303285 A1 (FOSHAN SHUNDE KUFU ELECTRIC APPLIANCES CO., LTD.) 25 October 2018 paragraph [0042] and figure 1	17–43
Y	US 5832812 A (WOLFE et al.) 10 November 1998 column 6, line 10 – column 7, line 8 and figures 1–2	44–53
X	CN 206080273 U (GUANGDONG RONGSHENG ELECTRIC HOLDING CO., LTD.) 12 April 2017 paragraph [0031] and figures 1–5	54–70
Y		51–53



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

"D" document cited by the applicant in the international application

"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

28 October 2020 (28.10.2020)

Date of mailing of the international search report

30 October 2020 (30.10.2020)

Name and mailing address of the ISA/KR

International Application Division

Korean Intellectual Property Office

189 Cheongsu-ro, Seo-gu, Daejeon, 35208, Republic of Korea



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BAHNG SEUNG HOON

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2020/042120

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 202665302 U	16/01/2013	None	
CN 209032019 U	28/06/2019	None	
US 2018-0303285 A1	25/10/2018	CN 106901617 A	30/06/2017
US 5832812 A	10/11/1998	US RE36941 E	07/11/2000
CN 206080273 U	12/04/2017	None	

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To: HAYTER, Alicia 20 Church Street 22nd Floor Hartford, Connecticut 06103 USA

Date of mailing (day/month/year)	30 October 2020 (30.10.2020)
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Applicant's or agent's file reference EUP1549PCT	FOR FURTHER ACTION See paragraph 2 below
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International application No. PCT/US2020/042120	International filing date (day/month/year) 15 July 2020 (15.07.2020)	Priority date(day/month/year) 15 July 2019 (15.07.2019)
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International Patent Classification (IPC) or both national classification and IPC A47J 37/01(2006.01)i
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Applicant SHARKNINJA OPERATING LLC
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1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
☐ Box No. II Priority
☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐ Box No. IV Lack of unity of invention
☒ Box No. V Reasoned statement under Rule 43bis. I(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
☐ Box No. VI Certain documents cited
☐ Box No. VII Certain defects in the international application
☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/KR International Application Division Korean Intellectual Property Office 189 Cheongsu-ro, Seo-gu, Daejeon, 35208, Republic of Korea Facsimile No. +82-42-481-8578	Date of completion of this opinion 28 October 2020 (28.10.2020)	Authorized officer BAHNG SEUNG HOON Telephone No. +82-42-481-5560
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2020/042120

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of :
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(b))
3. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing:
- a. ☐ forming part of the international application as filed:
 - ☐ in the form of an Annex C/ST.25 text file.
 - ☐ on paper or in the form of an image file.
 - b. ☐ furnished together with the international application under PCT Rule 13*ter*.1(a) for the purposes of international search only in the form of an Annex C/ST.25 text file.
 - c. ☐ furnished subsequent to the international filing date for the purposes of international search only:
 - ☐ in the form of an Annex C/ST.25 text file (Rule 13*ter*.1(a)).
 - ☐ on paper or in the form of an image file (Rule 13*ter*.1(b) and Administrative Instructions, Section 713).
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that forming part of the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US2020/042120

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-53,56,58-62	YES
	Claims	54-55,57,63-71	NO
Inventive step (IS)	Claims	NONE	YES
	Claims	1-71	NO
Industrial applicability (IA)	Claims	1-71	YES
	Claims	NONE	NO

2. Citations and explanations :

Reference is made to the following documents:

D1: CN 202665302 U (HUANG, ZHENXIONG) 16 January 2013

D2: CN 209032019 U (LE, MEIYI) 28 June 2019

D3: US 2018-0303285 A1 (FOSHAN SHUNDE KUFU ELECTRIC APPLIANCES CO., LTD.)
25 October 2018

D4: US 5832812 A (WOLFE et al.) 10 November 1998

D5: CN 206080273 U (GUANGDONG RONGSHENG ELECTRIC HOLDING CO., LTD.)
12 April 2017

I. Novelty and Inventive Step (PCT Article 33(2) and (3))

1. Claims 1-16

1.1. Claim 1

D1, which is considered to be the closest prior art to the subject matter of claim 1, discloses a cooking system comprising: a housing (1) having an internal compartment (2); a cooking container (8) receivable within the internal compartment (2), wherein a cooking volume is defined within an interior of the cooking container (8); and a heating element (5) associated with the internal compartment (2) (see paragraph [0007] and figure 1).

Claim 1 differs from D1 in that "a bottom surface of a cooking container is angled upwardly". However, the different feature would be easily derived from D1 (see paragraph [0014] and figure 1: a bottom surface of the internal compartment (2) is an inclined surface).

Accordingly, claim 1 would have been obvious over D1. Therefore, claim 1 does not involve

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of : Box No. V

an inventive step.

1.2. Claims 2-9, 11-16

The additional features of claims 2-3 would be easily derived from D1 (see paragraph [0014] and figure 1: the bottom surface of the internal compartment (2) is the inclined surface).

The additional feature of claim 4 would be easily derived from D1 (see paragraph [0014] and figure 1: the cooking container (8) includes a front wall and a back wall, wherein the bottom surface of the internal compartment (2) is the inclined surface: an export member (76) for pushing the tray (2)).

The additional features of claims 5-7 would be easily derived from D1 (see paragraph [0013] and figure 1: the cooking container (8) includes a net surface, wherein the net surface has a horizontal orientation).

The additional features of claims 8-9, 11-12 would be easily derived from D1 (see paragraph [0007] and figure 1: a duct (3) between the internal compartment (2) and the cooking container (8)).

The additional features of claims 13-16 would be easily derived from D1 (see paragraph [0020] and figure 1: a fan (6) and a motor disposed in the housing (1)).

Accordingly, claims 2-9, 11-16 would have been obvious over D1. Therefore, claims 2-9, 11-16 do not involve an inventive step.

1.3. Claim 10

The additional feature of claim 10 would be easily derived from D2 (see paragraphs [0027]-[0028] and figure 1: a food container (4) includes a protrusion (5) positioned within an inner container (3), wherein a channel is arranged between the food container (4) and the inner container (3)).

Accordingly, claim 10 would have been obvious over D1 in view of D2. Therefore, claim 10 does not involve an inventive step.

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2. Claims 17-30

2.1. Claim 17

D1, which is considered to be the closest prior art to the subject matter of claim 17, discloses a cooking system comprising: a housing (1) having an internal compartment (2); a cooking container (8) receivable within the internal compartment (2), wherein a cooking volume is defined within an interior of the cooking container (8); a heating element (5) associated with the internal compartment (2); and a fan (6) and a motor disposed in the housing (1) (see paragraphs [0007], [0020] and figure 1).

Claim 17 differs from D1 in that it further comprises "an air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally". However, the different feature would be easily derived from D3 (see paragraph [0042] and figure 1: a cross flow fan (5) is rotatable about an axis of rotation, wherein the axis of rotation is oriented relatively horizontally).

Accordingly, claim 17 would have been obvious over D1 in view of D3. Therefore, claim 17 does not involve an inventive step.

2.2. Claims 18-30

The additional features of claims 18-19 would be easily derived from D3 (see paragraph [0042] and figure 1: the axis of rotation is oriented perpendicular to a flow provided at an outlet of the cross flow fan (5)).

The additional features of claims 20, 24-26 would be easily derived from D3 (see paragraph [0042] and figure 1: the cross flow fan (5) includes an inlet and the outlet).

The additional feature of claim 21 would be easily derived from D3 (see paragraph [0042] and figure 1: a hot air cycle channel is formed between an air exhaust (11) and an air intake (2)).

The additional features of claims 22-23 would be easily derived from D1 (see paragraph

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In case the space in any of the preceding boxes is not sufficient.

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[0020] and figure 1: the fan (6) and the motor disposed in the housing (1)).

The additional features of claims 27-28 would be easily derived from D1 (see figure 1: the fan (6) and the motor disposed above the cooking container (8)).

The additional feature of claim 29 would be easily derived from D1 (see figure 1: the cooking container (8) receivable within the internal compartment (2)).

The additional feature of claim 30 would be easily derived from D1 (see figure 1: the fan (6) and the motor disposed above the heating element (5)).

Accordingly, claims 18-30 would have been obvious over D1 in view of D3. Therefore, claims 18-30 do not involve an inventive step.

3. Claims 31-43

3.1. Claim 31

D1, which is considered to be the closest prior art to the subject matter of claim 31, discloses a cooking system comprising: a housing (1) having an internal compartment (2); a cooking container (8) receivable within the internal compartment (2), wherein a cooking volume is defined within an interior of the cooking container (8); a heating element (5) associated with the internal compartment (2); and a fan (6) and a motor disposed in the housing (1) (see paragraphs [0007], [0020] and figure 1).

Claim 31 differs from D1 in that it further comprises "a rotatable air movement mechanism having: a first inlet arranged in a first plane of said air movement mechanism; a second inlet arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane; and an outlet arranged in fluid communication with both said first inlet and said second inlet". However, the different feature would be easily derived from D3 (see paragraph [0042] and figure 1: the cross flow fan (5) includes an inlet and the outlet).

Accordingly, claim 31 would have been obvious over D1 in view of D3. Therefore, claim 31 does not involve an inventive step.

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3.2. Claims 32-43

The additional features of claims 32-36 would be easily derived from D3 (see paragraph [0042] and figure 1: the axis of rotation is oriented perpendicular to the flow provided at the outlet of the cross flow fan (5)).

The additional feature of claim 37 would be easily derived from D3 (see paragraph [0042] and figure 1: a hot air cycle channel is formed between an air exhaust (11) and an air intake (2)).

The additional features of claims 38-39 would be easily derived from D1 (see paragraph [0020] and figure 1: the fan (6) and the motor disposed in the housing (1)).

The additional feature of claim 40 would be easily derived from D3 (see paragraph [0042] and figure 1: the cross flow fan (5) includes an inlet and the outlet).

The additional feature of claim 41 would be easily derived from D1 (see figure 1: the fan (6) and the motor disposed above the cooking container (8)).

The additional feature of claim 42 would be easily derived from D1 (see figure 1: the cooking container (8) receivable within the internal compartment (2)).

The additional feature of claim 43 would be easily derived from D1 (see figure 1: the fan (6) and the motor disposed above the heating element (5)).

Accordingly, claims 32-43 would have been obvious over D1 in view of D3. Therefore, claims 32-43 do not involve an inventive step.

4. Claims 44-53

4.1. Claim 44

D1, which is considered to be the closest prior art to the subject matter of claim 44,

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In case the space in any of the preceding boxes is not sufficient.

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discloses a cooking system comprising: a housing (1) having an internal compartment (2); a cooking container (8) receivable within the internal compartment (2), wherein a cooking volume is defined within an interior of the cooking container (8); a heating element (5) associated with the internal compartment (2); and a fan (6) and a motor disposed in the housing (1) (see paragraphs [0007], [0020] and figure 1).

Claim 44 differs from D1 in that it further comprises "a plurality of air movement mechanisms disposed within a housing; and a motor operably coupled to said plurality of air movement mechanisms". However, the different feature would be easily derived from D4 (see column 6, line 10 - column 7, line 8 and figures 1-2: an air heating and circulation system comprises two centrifugal fans (82, 84) and a fan drive motor (150), wherein the two centrifugal fans (82, 84) are coupled the fan drive motor (150)).

Accordingly, claim 44 would have been obvious over D1 in view of D4. Therefore, claim 44 does not involve an inventive step.

4.2. Claims 45-50

The additional feature of claim 45 would be easily derived from D4 (see figures 1-2: the fan drive motor (150) located in a fan housing (83)).

The additional feature of claim 46 would be easily derived from D4 (see column 6, line 10 - column 7, line 8 and figure 1: the two centrifugal fans (82, 84)).

The additional feature of claim 47 would be easily derived from D4 (see column 6, lines 10-15 and figure 1: the two centrifugal fans (82, 84) connected to a drive shaft (86)).

The additional feature of claim 48 would be easily derived from D4 (see figure 1: the two centrifugal fans (82, 84) are arranged coaxially).

The additional features of claims 49-50 would be easily derived from D4 (see figures 1-2: the fan drive motor (150) operates the two centrifugal fans (82, 84)).

Accordingly, claims 45-50 would have been obvious over D1 in view of D4. Therefore, claims 45-50 do not involve an inventive step.

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In case the space in any of the preceding boxes is not sufficient.

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4.3. Claims 51-53

The additional features of claims 51-53 would be easily derived from D5 (see paragraph [0031] and figures 1-5: an air fryer comprises two internal compartments separated from each other, and a fan blade (5) fluidly connected to the two internal compartments, and a motor (4) connected to the fan blade (5)).

Accordingly, claims 51-53 would have been obvious over D1 in view of D4, and further in view of D5. Therefore, claims 51-53 do not involve an inventive step.

5. Claims 54-70

5.1. Claim 54

D5 is considered to be the closest prior art and discloses an air fryer comprising: a housing (1) having two internal compartments; two fry baskets (2) receivable within the two internal compartments, wherein a cooking volume is defined within an interior of the two fry baskets (2); and a heater (3) disposed in the housing (1) (see paragraph [0031] and figures 1-5).

As all the features of claim 54 are disclosed in D5, this claim is not novel.

5.2. Claims 55, 57, 63-70

The additional feature of claim 55 is disclosed in D5 (see paragraph [0031] and figures 1-5: two fry baskets (2) receivable within the two internal compartments, wherein a cooking volume is defined within an interior of the two fry baskets (2)).

The additional feature of claim 57 is disclosed in D5 (see figures 1-2: a fan blade (5) disposed within the housing (1)).

The additional feature of claim 63 is disclosed in D5 (see figures 1-2: the fan blade (5) has an axially oriented inlet and a radially oriented outlet).

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In case the space in any of the preceding boxes is not sufficient.

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The additional feature of claim 64 is disclosed in D5 (see figures 1-2: the fan blade (5) is rotatable about a vertically oriented axis).

The additional feature of claim 65 is disclosed in D5 (see figures 1-2: a motor (4) connected to the fan blade (5)).

The additional feature of claim 66 is disclosed in D5 (see figures 1-2: the motor (4) is located externally from the two internal compartments).

The additional feature of claim 67 is disclosed in D5 (see figures 1-2: the motor (4) is positioned between the two internal compartments).

The additional feature of claim 68 is disclosed in D5 (see figures 1-2: two fry baskets (2) are individually insertable into the two internal compartments respectively).

The additional feature of claim 69 is disclosed in D5 (see figures 1-2: the two internal compartments are fluidly separate).

The additional feature of claim 70 is disclosed in D5 (see figures 1-2: the cooking volumes are fluidly separate).

Therefore, claims 55, 57, 63-70 are not novel.

5.3. Claims 56, 58-62

The additional feature of claim 56 would be easily derived from D5 (see paragraph [0031] and figures 1-5: the heater (3) disposed in the housing (1)).

The additional feature of claim 58 would be easily derived from D5 (see paragraph [0031] and figures 1-5: the heater (3) and the fan blade (5) disposed in the housing (1)).

The additional features of claims 59-62 would be easily derived from D5 (see figures 1-2: the fan blade (5) fluidly connected to the two internal compartments).

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

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Accordingly, claims 56, 58-62 would have been obvious over D5. Therefore, claims 56, 58-62 do not involve an inventive step.

6. Claim 71

D1 is considered to be the closest prior art and discloses a cooking system comprising: a housing (1) having an internal compartment (2); a cooking container (8) receivable within the internal compartment (2), wherein a cooking volume is defined within an interior of the cooking container (8); a heating element (5) associated with the internal compartment (2); and a fan (6) and a motor disposed in the housing (1), the fan (6) being positioned vertically above the cooking volume and horizontally offset from the heating element (5) (see paragraphs [0007], [0020] and figure 1).

As all the features of claim 71 are disclosed in D1, this claim is not novel.

II. Industrial Applicability (PCT Article 33(4))

Claims 1-71 are industrially applicable.



Espacenet

Bibliographic data: CN206080273 (U) — 2017-04-12

Novel air complain and quarrel loudly

Inventor(s): ZHANG LIFU ± (张礼富)**Applicant(s):** GUANGDONG RONGSHENG ELECTRIC HOLDING CO LTD ±
(广东容声电器股份有限公司)**Classification:** - **international:** A47J37/12
- **cooperative:** A47J37/0641 (EP)**Application number:** CN201620767726U 20160719**Priority number (s):** CN201620767726U 20160719**Abstract of CN206080273 (U)**

The utility model discloses a novel air complain and quarrel loudly, including the pot body and a plurality of fried basket, a plurality of fried baskets are detachable with the pot body and set up, the internal heating chamber that is equipped with of pot, the heat -generating body is installed to the heating intracavity, heating chamber outlying pot is internal to be equipped with the fried chamber that at least two is suitable for fried basket to hold, the last lower extreme in every fried chamber feeds through with the last lower extreme that heats the chamber respectively, it constitutes hot air duct jointly to make fried chamber and heat the chamber, the thermal cycle fan blade is installed through the motor in heating chamber below, the air cycle who makes hot air duct through the thermal cycle fan blade flows, when fried basket is installed at fried intracavity, the food chamber and the hot air duct intercommunication of fried basket, this structure makes the hot -air of heating fully flow around food, it is even more and pleasing to the eye to make food be heated, make food form crisp top layer all around.



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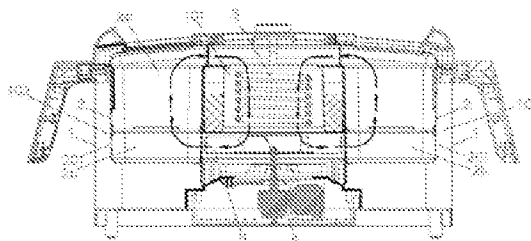
权利要求书1页 说明书4页 附图6页

(54)实用新型名称

一种新型的空气炸锅

(57)摘要

本实用新型公开一种新型的空气炸锅,包括锅体和多个炸篮,多个炸篮与锅体呈可分离式设置,所述锅体内设有加热腔,加热腔内安装有发热体,加热腔外围的锅体内设有至少两个适于炸篮容纳的炸腔,每个炸腔的上下端分别与加热腔的上下端连通,使炸腔与加热腔共同构成热风道,加热腔下方通过电机安装有热循环风叶,通过热循环风叶使热风道的空气循环流动,当炸篮安装在炸腔内时,炸篮的食物腔与热风道连通,该结构使加热的热空气充分在食物的周围流动,令食物受热更加均匀和美观,使食物四周形成酥脆的表层。



1. 一种新型的空气炸锅,包括锅体(1)和多个炸篮(2),多个炸篮(2)与锅体(1)呈可分离式设置,其特征是,所述锅体(1)内设有加热腔(101),加热腔(101)内安装有发热体(3),加热腔(101)外围的锅体(1)内设有至少两个适于炸篮(2)容纳的炸腔(102),每个炸腔(102)的上下端分别与加热腔(101)的上下端连通,使炸腔(102)与加热腔(101)共同构成热风道,加热腔(101)下方通过电机(4)安装有热循环风叶(5),通过热循环风叶(5)使热风道的空气循环流动,当炸篮(2)安装在炸腔(102)内时,炸篮(2)的食物腔(2a)与热风道连通。

2. 根据权利要求1所述一种新型的空气炸锅,其特征在于:包括两个炸篮(2),加热腔(101)两侧的锅体(1)内设两个适于炸篮(2)容纳的炸腔(102)。

3. 根据权利要求1或2所述一种新型的空气炸锅,其特征在于:所述每个炸腔(102)上容纳有一个炸篮(2)或者两个炸篮(2)。

4. 根据权利要求1或2所述一种新型的空气炸锅,其特征在于:所述每个炸腔(102)与加热腔(101)之间可拆式安装有分隔板(7)。

5. 根据权利要求4所述一种新型的空气炸锅,其特征在于:所述分隔板(7)上设有开孔(701)。

6. 根据权利要求4所述一种新型的空气炸锅,其特征在于:所述炸腔(102)两侧设有与分隔板(7)配合的滑槽(102-1)。

7. 根据权利要求1或2所述一种新型的空气炸锅,其特征在于:所述炸篮(2)是具有食物腔(2a)的筒体,筒体底部设有与热风道连通的进风腔(2b),进风腔(2b)上方构成食物腔(2a),食物腔(2a)底部为敞开状并可拆式安装有隔网(8)。

8. 根据权利要求7所述一种新型的空气炸锅,其特征在于:所述进风腔(2b)底部设有储油槽(201-2)。

9. 根据权利要求7所述一种新型的空气炸锅,其特征在于:所述筒体侧壁安装有手柄(9),炸篮(2)通过手柄(9)钩挂在锅体(1)上,使筒体悬置在炸腔(102)内。

10. 根据权利要求1或2所述一种新型的空气炸锅,其特征在于:电机(4)下方的锅体(1)底部开设有冷风进风口(103),锅体(1)侧壁开设有与冷风进风口(103)连通的散热出风口(104),冷风进风口(103)与散热出风口(104)之间构成冷却风道,冷却风道内的热循环风叶(5)下方安装有与电机(4)驱接的冷却风叶(10)。

一种新型的空气炸锅

技术领域

[0001] 本实用新型涉及空气炸锅领域,尤其是一种新型的空气炸锅。

背景技术

[0002] 随着科技的发展和大众生活质量的提高,人们对食品健康越发重视,空气炸锅的出现,一定程度上解决了传统烹饪设备用油对食品烹饪所带来的食品安全问题,空气炸锅是使用高速空气循环技术使烹饪效果达到油炸食物的效果和口感,即在锅体内产生高温的热风而使食物表面形成酥脆的表层,锁住食材内部的水分,达到普通油炸食品的口感。

[0003] 但是现有的空气炸锅,如中国专利ZL201520027100.3,一般采用单个内锅和炸篮设计,通过自上而下的热风通道对炸篮内的食物进行加热处理,所述热风通道的顶部与空气炸锅外连通,热风通道的底部与锅体内腔连通,空气炸锅的锅盖的中部安装发热丝,需要热风时,电热丝发热将风机带入的冷风加热,加热后引入到锅体内;由于单个炸篮设计,造成使用不够灵活,不能同时处理不同的种类的食物,以及不能处理选择对不同食物进行不同时间的烹炸,使得使用不够灵活,无法适应不同成员的同时烹炸不同食物的需求。

实用新型内容

[0004] 本实用新型的目的在于解决上述现有技术的不足,而提供一种结构简单合理的一种新型的空气炸锅,能够同时实现多个炸篮同时烹炸,满足同时烹炸不同食物、烹炸不同时段的要求,有效提高使用灵活性。

[0005] 本实用新型解决其技术问题所采用的技术方案是:

[0006] 一种新型的空气炸锅,包括锅体和多个炸篮,多个炸篮与锅体呈可分离式设置,所述锅体内设有加热腔,加热腔内安装有发热体,加热腔外围的锅体内设有至少两个适于炸篮容纳的炸腔,每个炸腔的上下端分别与加热腔的上下端连通,使炸腔与加热腔共同构成热风道,加热腔下方通过电机安装有热循环风叶,通过热循环风叶使热风道的空气循环流动,当炸篮安装在炸腔内时,炸篮的食物腔与热风道连通。通过将炸腔设置在加热体的外围,使得锅体内可以设置多个炸腔,从而满足多个炸篮同时烹炸不同的食物的要求,使用时,发热体加热,通过热循环风叶带动热风在炸腔与加热腔共同构成热风道内循环流动,热空气在流动过程中不断与炸篮内的食物进行空气加热,用户可以根据需要选择单个炸篮烹炸、或者两个炸篮烹炸或者多个炸篮烹炸,各炸腔可相对独立操作使用,受其它腔体影响很小;满足1~4个家庭成员/朋友之间同时操作使用,烘炸自己喜欢的食物和不同炸制时间的食物,而不影响其它成员继续炸制食物,实现分享自己动手乐趣。

[0007] 包括两个炸篮,加热腔两侧的锅体内设两个适于炸篮容纳的炸腔,使空气炸锅同时烹调两种不同味道和配方的食物,增加烹调食物的分量,避免炸腔过小导致烹调时间过长,同时,两种不同味道食物能分别加工,不受干扰,提高工作效率且不会混淆两个食物的味道。

[0008] 所述每个炸腔上容纳有一个炸篮或者两个炸篮,更多的独立炸篮能提供更多不同

种类和不同味道的食物同时加工,满足日常的生活需求。

[0009] 每个炸腔上安装有锅盖,锅盖上开设有透明视窗,通过透明视窗可观察到各个食物腔,可供用户随时观察自己炸制的食物的炸制状态。

[0010] 所述每个炸腔与加热腔之间可拆式安装有分隔板,分隔板使各炸腔可相对独立操作使用,受其它炸腔影响很小,同提供1-4个家庭成员同时操作使用,烘炸自己喜欢的食物和不同炸制时间的食物,而不影响其它成员继续炸制食物,实现分享自己动手乐趣,而且将闲置的炸篮使用分隔板分隔,能提高热量的使用效率,避免热量在闲置的炸篮处散失。

[0011] 所述分隔板上设有开孔,当一个炸腔内容纳两个炸篮的时候,分隔板上开设有开孔能使空气炸锅独立使用其中一个的炸篮,能提高热量的使用效率,避免热量在另外一个闲置的炸篮处散失。

[0012] 所述炸腔两侧设有与分隔板配合的滑槽,结构接单,方便拆卸安装,能在加热过程中安装和拆卸分隔板,不影响其他炸腔的工作。

[0013] 所述炸篮是具有食物腔的筒体,筒体底部设有与热风道连通的进风腔,进风腔上方构成食物腔,食物腔底部为敞开状并可拆式安装有隔网。

[0014] 具体地:所述筒体的水平横截面为矩形或方形或圆形,筒体底部设有支座,进风腔开设在支座内,支座的一侧构成腔的进风入口。

[0015] 使传统的内锅与炸篮为一体式结构,方便炸篮的使用,使食物悬置在隔网上,使加热的空气有足够的上下流动空间在食物周围循环流动,使食物整体形成酥脆的表层。

[0016] 所述进风腔底部设有储油槽,能收集加热过程中食物流出的油分和油炸,方便空气炸锅的清洁维护。

[0017] 所述筒体侧壁安装有手柄,炸篮通过手柄钩挂在锅体上,使筒体悬置在炸腔内,安装手柄便于在拿取炸锅炸篮方便同时,还能很好地防止容易误触碰到金属卡扣结构所引起刮伤、烫伤等危险的发生。

[0018] 电机下方的锅体底部开设有冷风进风口,锅体侧壁开设有与冷风进风口连通的散热出风口,冷风进风口与散热出风口之间构成冷却风道,冷却风道内的热循环风叶下方安装有与电机驱接的冷却风叶,该结构能降低锅体表面的温度,由于加热的空气在锅体内循环流动,使锅体在短时间内加热到高温状态,冷却风道使阻隔和降低发热体发出的热量,避免用户在使用过程中误触碰到锅体导致烫伤等事故。

[0019] 为进一步散热,锅体侧壁设有与热循环风叶对应的蒸汽出口,使积聚的蒸汽及时排走,减少炸腔内的水分,避免影响食物表面吸收过多水分导致不能形成酥脆的表层。

[0020] 本实用新型的有益效果是:

[0021] (1)本实用新型的一种新型的空气炸锅,通过将炸腔设置在加热体的外围,使得锅体内可以设置多个炸腔,从而满足多个炸篮同时烹炸不同的食物的要求,使用时,发热体加热,通过热循环风叶带动热风在炸腔与加热腔共同构成热风道内循环流动,热空气在流动过程中不断与炸篮内的食物进行空气加热,用户可以根据需要选择单个炸篮烹炸、或者两个炸篮烹炸或者多个炸篮烹炸,各炸腔可相对独立操作使用,受其它腔体影响很小;满足1~4个家庭成员/朋友之间同时操作使用,烘炸自己喜欢的食物和不同炸制时间的食物,而不影响其它成员继续炸制食物,实现分享自己动手乐趣。

附图说明

- [0022] 图1是本实用新型第一实施例的剖面结构示意图。
[0023] 图2是本实用新型第一实施例另一角度的剖面结构示意图。
[0024] 图3是本实用新型第一实施例中分隔板与炸腔的分解结构示意图。
[0025] 图4是图3中A处的放大图。
[0026] 图5是本实用新型第一实施例的分解结构示意图。
[0027] 图6是本实用新型第二实施例中三个炸篮的分解结构示意图。
[0028] 图7是本实用新型第二实施例中四个炸篮的分解结构示意图。
[0029] 图8是本实用新型第二实施例中分隔板的结构示意图。

具体实施方式

[0030] 下面结合附图和实施例对本实用新型进一步说明：

[0031] 第一实施例：如图1至图5所示：一种新型的空气炸锅，包括锅体1和两个炸篮2，两个炸篮2与锅体1呈可分离式设置，所述锅体1内设有加热腔101，加热腔101内安装有发热体3，加热腔101外围的锅体1内设有两个适于两炸篮2容纳的炸腔102，每个炸腔102的上下端分别与加热腔101的上下端连通，使炸腔102与加热腔101共同构成热风道（图1中箭头的循环线路走过的位置代表热风道），加热腔101下方通过电机4安装有热循环风叶5，通过热循环风叶5使热风道的空气循环流动，当炸篮2安装在炸腔102内时，炸篮2的食物腔2a与热风道连通。该结构的空气炸锅，通过将炸腔102设置在加热体3的外围，使得锅体1内可以设置多个炸腔102，从而满足多个炸篮2同时烹炸不同的食物的要求，使用时，发热体3加热，通过热循环风叶5带动热风在炸腔102与加热腔101共同构成热风道内循环流动，热空气在流动过程中不断与炸篮2内的食物进行空气加热，用户可以根据需要选择单个炸篮烹炸、或者两个炸篮烹炸或者多个炸篮烹炸，各炸腔102可相对独立操作使用，受其它腔体影响很小；满足1~4个家庭成员/朋友之间同时操作使用，烘炸自己喜欢的食物和不同炸制时间的食物，而不影响其它成员继续炸制食物，实现分享自己动手乐趣。

[0032] 所述每个炸腔102上容纳有一个炸篮2。

[0033] 每个炸腔102上安装有锅盖6，锅盖6上开设有透明视窗601，通过透明视窗601可观察到各个食物腔2a，可供用户随时观察自己炸制的食物的炸制状态。

[0034] 所述每个炸腔102与加热腔101之间可拆式安装有分隔板7，分隔板7使各炸腔102可相对独立操作使用；当需要同时使用两个炸腔102时，则无需使用分隔板7，如果只需要使用一个炸腔102，则通过将分隔板7，使其中一个炸腔102与加热腔101隔离，使加热腔的热空气无法进入该炸腔102；其使用灵活、多变，满足不同需求的使用。

[0035] 所述炸腔102两侧设有与分隔板7配合的滑槽102-1，结构简单，方便拆卸安装。

[0036] 所述炸篮2是具有食物腔2a的筒体，筒体底部设有与热风道连通的进风腔2b，进风腔2b上方构成食物腔2a，食物腔2a底部为敞开状并可拆式安装有隔网8。

[0037] 具体地：所述筒体的水平横截面为矩形或方形或圆形，筒体底部设有支座201，进风腔2b开设在支座201内，支座201的一侧构成腔的进风入口201-1。

[0038] 通过将炸篮2设置成内锅与篮体一体式结构，方便炸篮的使用，使食物悬置在隔网

8上,使加热的空气有足够的上下流动空间在食物周围循环流动,加热腔101的热空气通过热循环风叶5快速由进风腔2b进入到食物腔2a,使食物整体形成酥脆的表层。

[0039] 所述进风腔2b底部设有储油槽201-2,能收集加热过程中食物流出的油分和油炸,方便空气炸锅的清洁维护。

[0040] 所述筒体侧壁安装有手柄9,炸篮2通过手柄9钩挂在锅体1上,使筒体悬置在炸腔102内,安装手柄9便于在拿取炸锅炸篮2方便同时,还能很好地防止容易误触碰到金属卡扣结构所引起刮伤、烫伤等危险的发生。

[0041] 电机4下方的锅体1底部开设有冷风进风口103,锅体1侧壁开设有与冷风进风口103连通的散热出风口104,冷风进风口103与散热出风口104之间构成冷却风道,冷却风道内的热循环风叶5下方安装有与电机4驱接的冷却风叶10,该结构能降低锅体1表面的温度,由于加热的空气在锅体1内循环流动,使锅体1在短时间内加热到高温状态,冷却风道使阻隔和降低发热体发出的热量,避免用户在使用过程中误触碰到锅体1导致烫伤等事故;冷风进风口103靠近电机4,还可以起到对电机散热的作用。

[0042] 为进一步散热,锅体1侧壁设有与热循环风叶5对应的蒸汽出口105,使积聚的蒸汽及时排走,减少炸腔内的水分,避免影响食物表面吸收过多水分导致不能形成酥脆的表层;且蒸汽出口105与冷却风道互相隔离,互不干涉。

[0043] 第二实施例:如图6至图8所示:与第一实施例相似,不同之处在于,所述每个炸腔102上容纳有两个炸篮2;更多的独立炸篮2能提供更多不同种类和不同口味的食物同时加工,满足不同人的食物处理需求。

[0044] 其中图6中是三个炸篮的使用状态。

[0045] 其中图7中是四个炸篮的使用状态。

[0046] 进一步地,所述分隔板7上设有开孔701,当一个炸腔102内容纳两个炸篮2的时候,在同一个炸腔102中,如需要只使用其中一个炸篮2时,通过装配带有开孔701的分隔板7,开孔701的位置是对应需要使用的炸篮2设置,另一炸篮2对应的分隔板7则为实体遮挡,热空气穿过开孔701进入到对应的炸篮2中进行烹炸,使得本实用新型的空气炸锅实用更加灵活;能够独立使用其中一个的炸篮,能提高热量的使用效率,避免热量在另外一个闲置的炸篮处散失;保证热效率。

[0047] 具体是:分隔板7上设有两开孔701,两开孔701分别对应该炸篮2的顶部开口以及对应炸篮2的支座201中进风腔2b的进风入口201-1。

[0048] 以上所述的具体实施例,仅为本实用新型较佳的实施例而已,举凡依本实用新型申请专利范围所做的等同设计,均应为本实用新型的技术所涵盖。

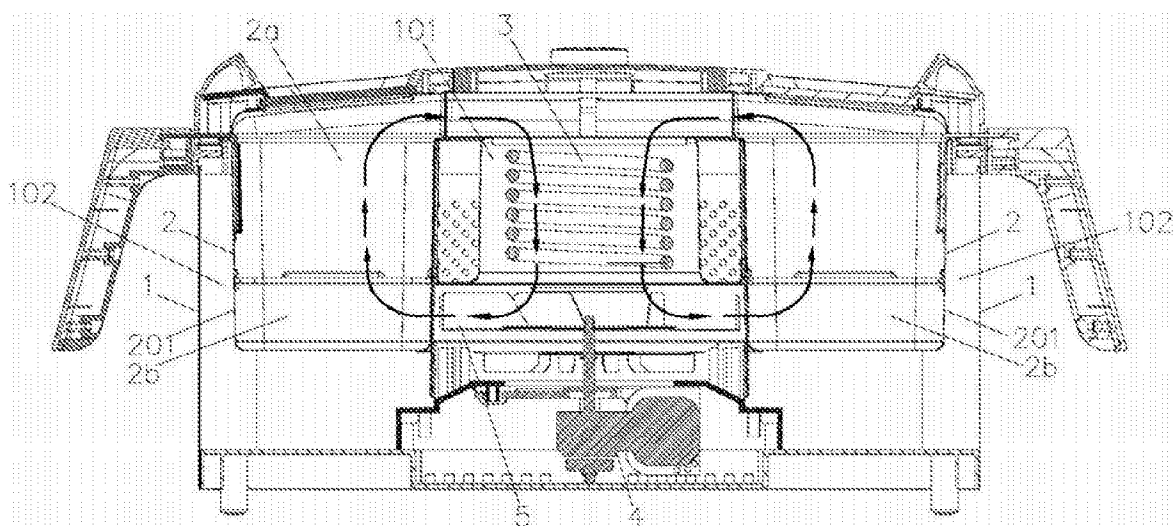


图1

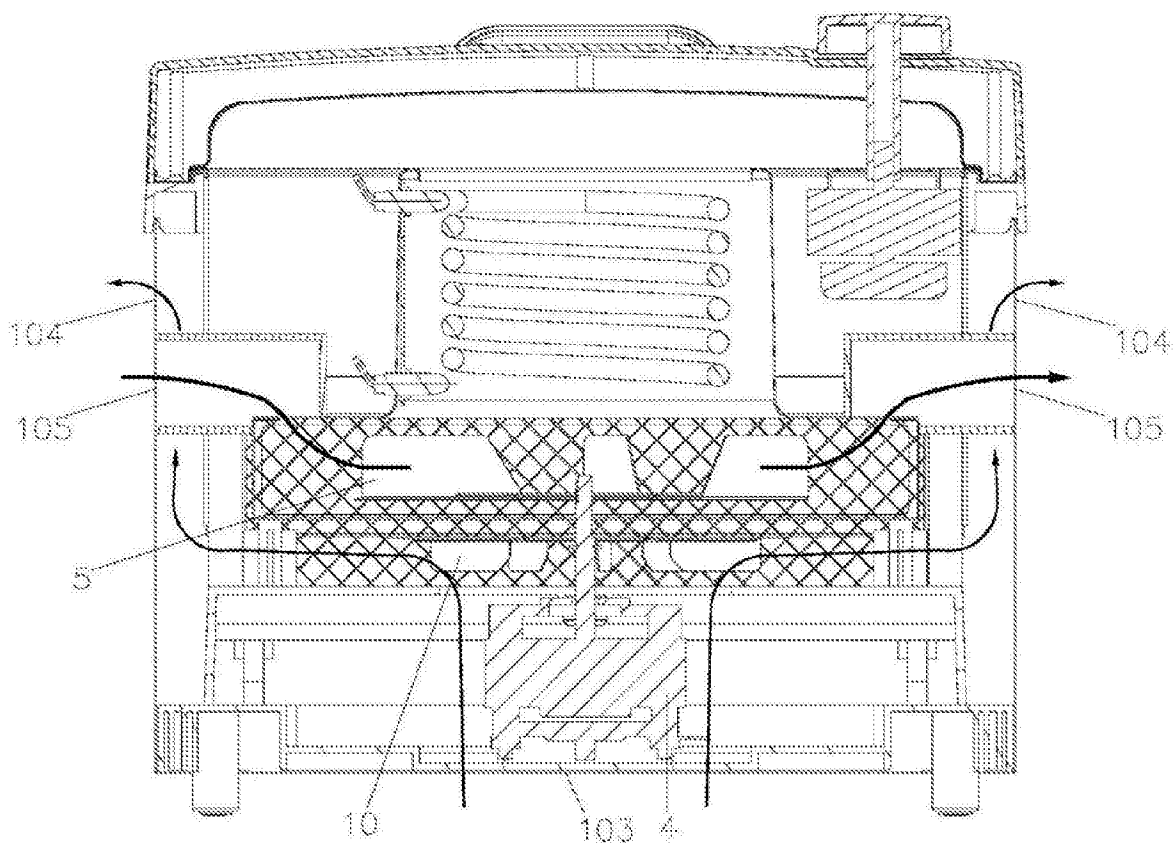


图2

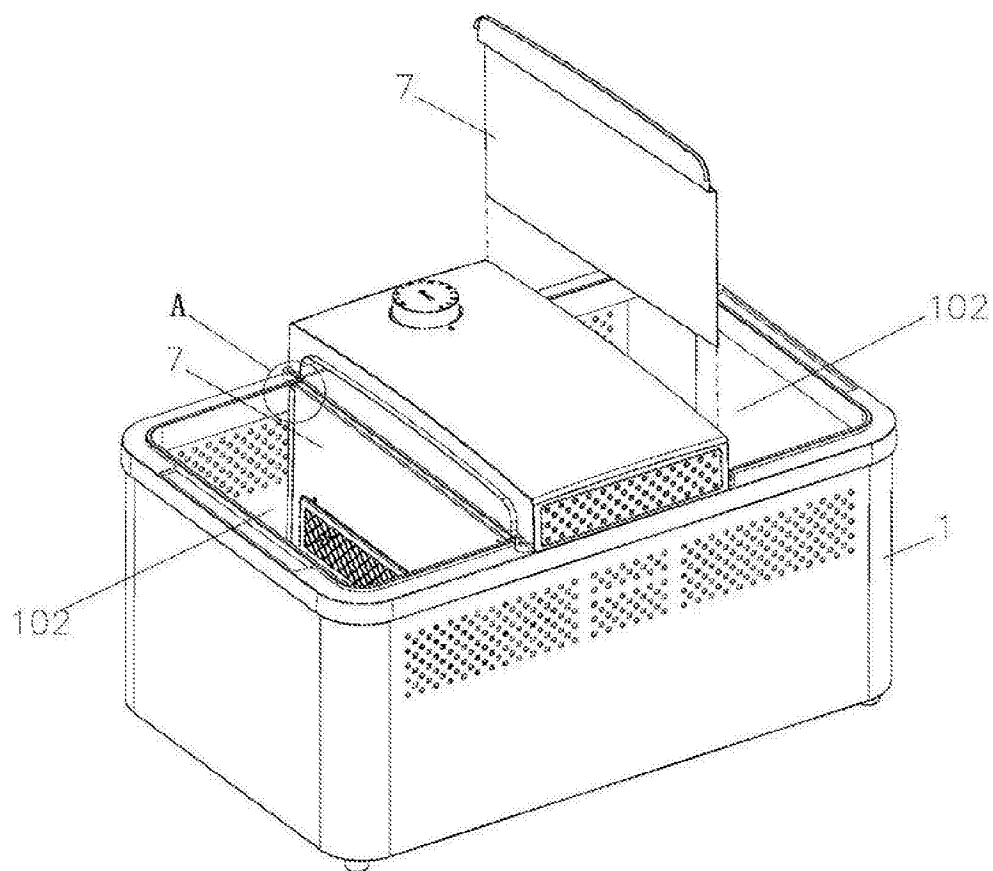


图3

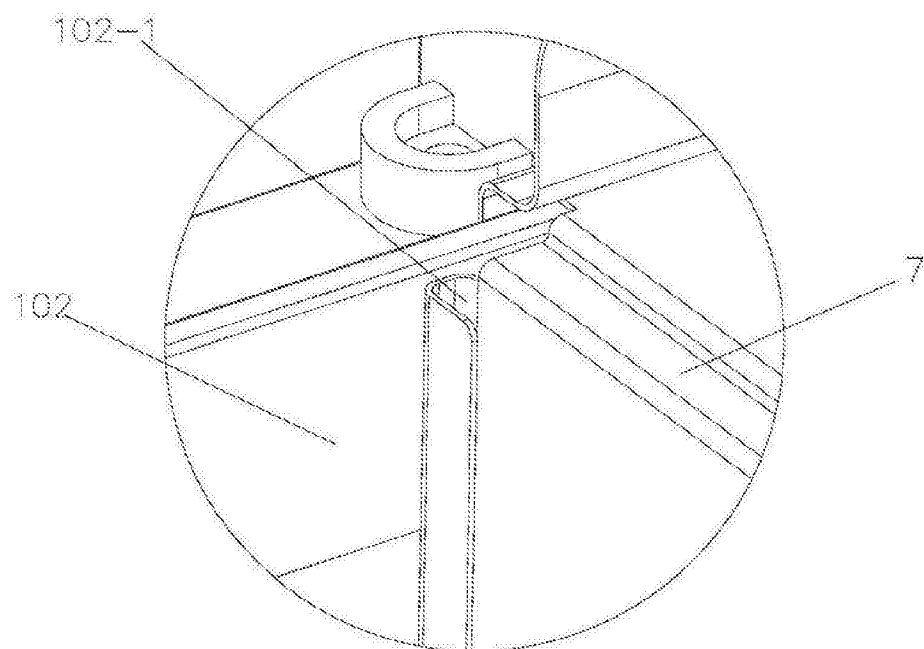


图4

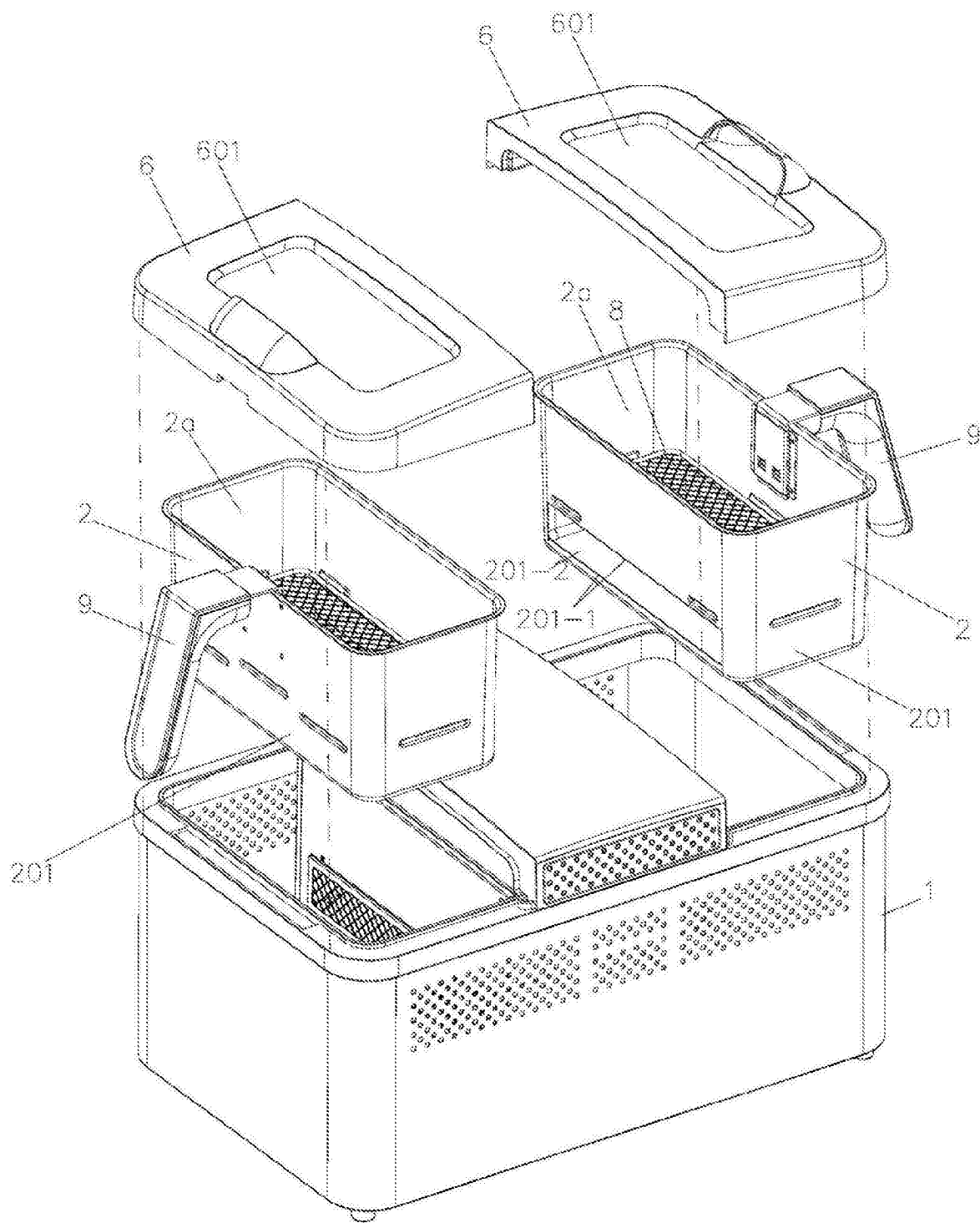


图5

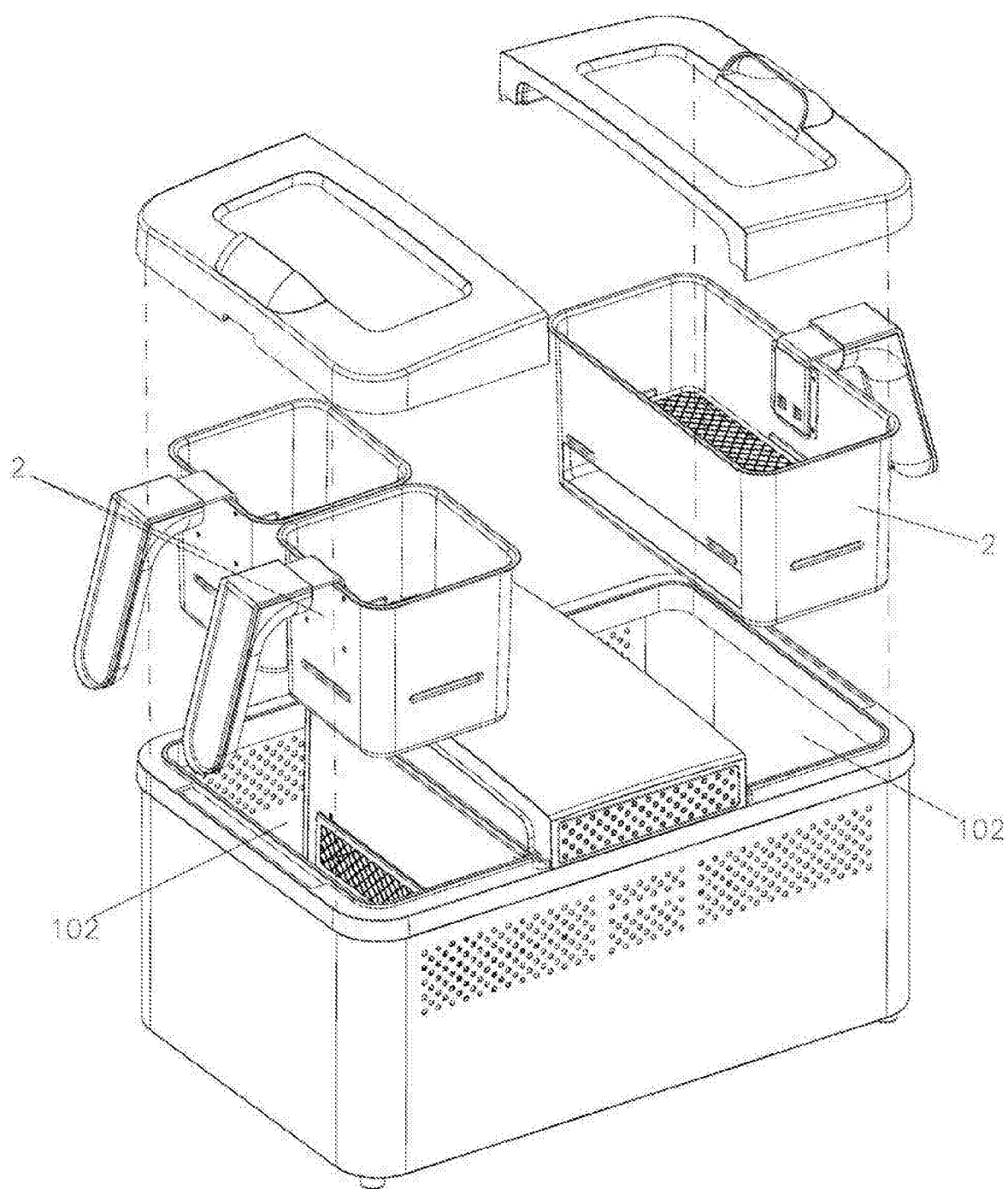


图6

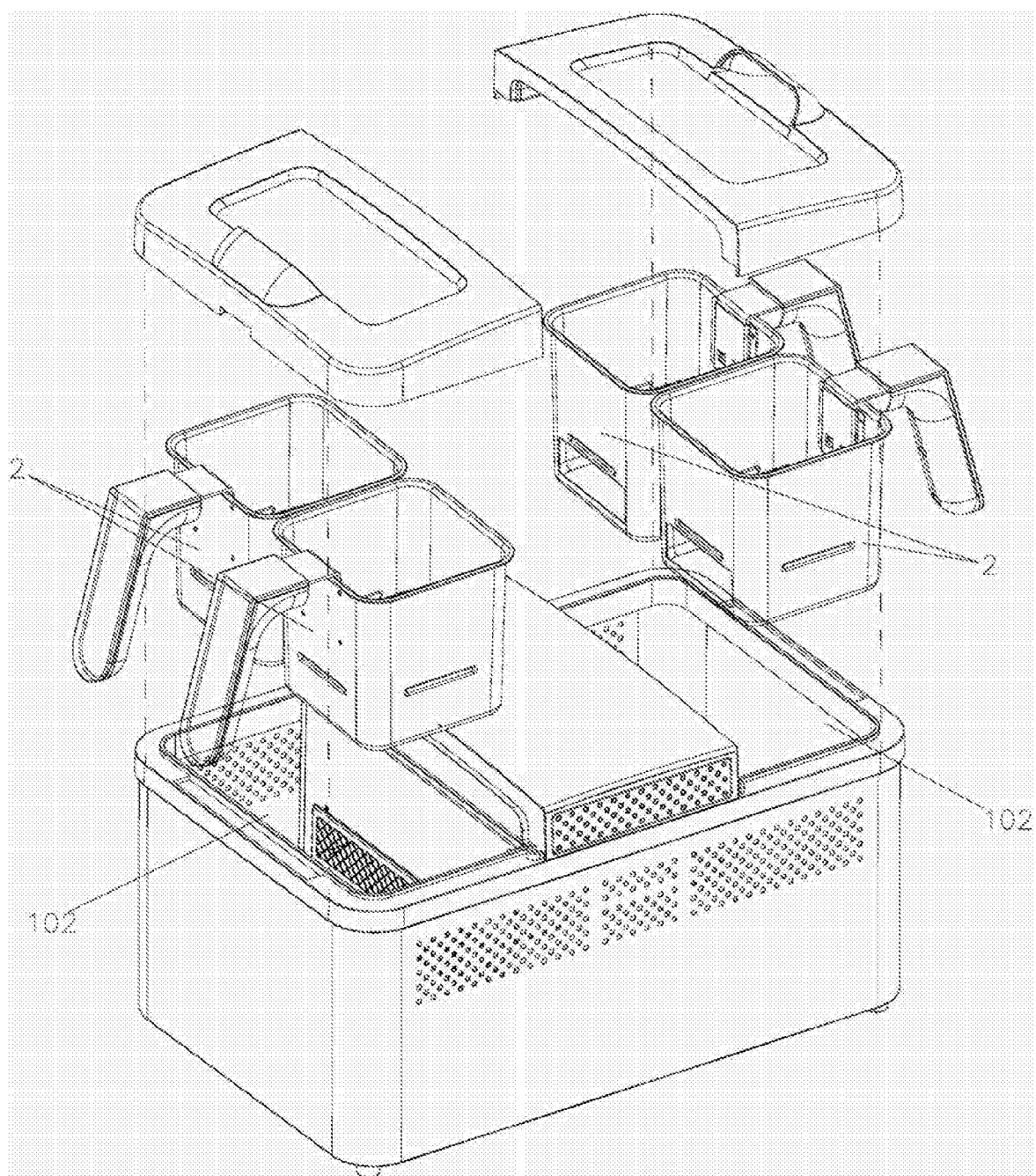


图7

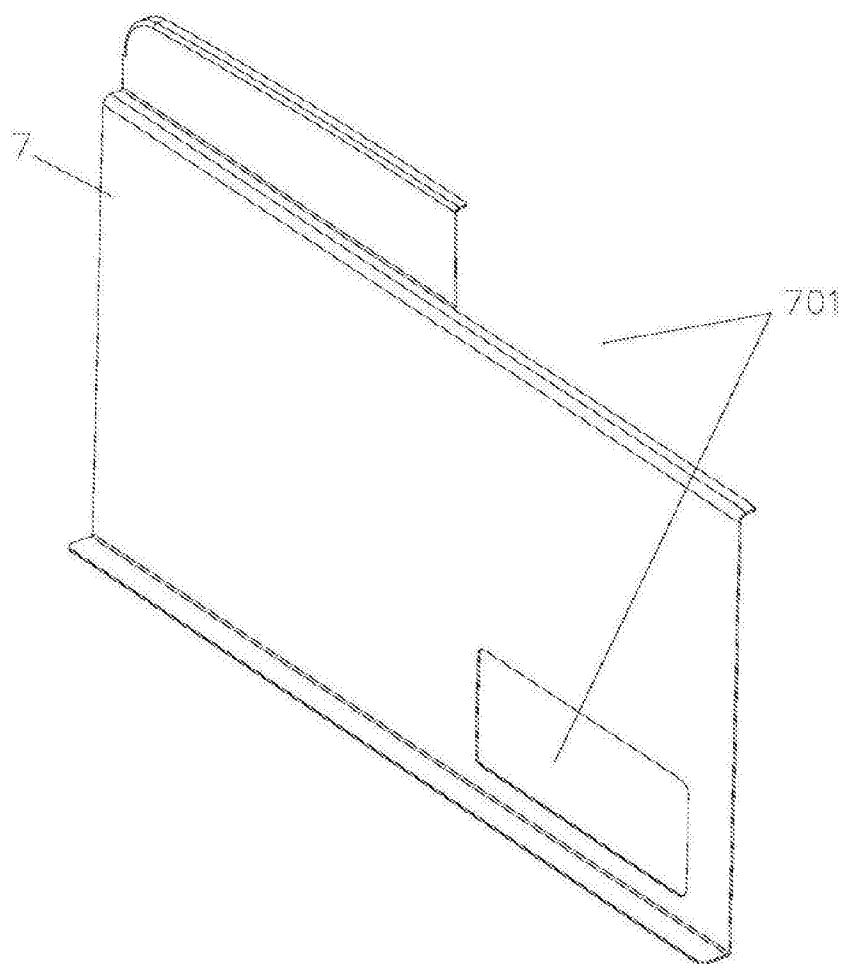


图8



Espacenet

Bibliographic data: CN209032019 (U) — 2019-06-28

Air fryer

Inventor(s): YUE MEIYI ± (乐美益)

Applicant(s): YUE MEIYI ± (乐美益)

Classification: - **international:** **A47J37/12**
- **cooperative:**

Application number: CN20182193229U 20180710

Priority number(s): CN20182193229U 20180710

Abstract of CN209032019 (U)

The utility model provides an air fryer which comprises a shell, a hot air assembly arranged in the shell and an inner container located below the hot air assembly, the shell and the inner container form a heat flow circulation cavity used for cooking food, and a frying basket with a breathable bottom is arranged in the inner container. The inner container is provided with at least two supporting pieces used for supporting the frying basket, and a gap is formed between each supporting piece and the bottom of the inner container. The utility model discloses an air fryer adopting the technical scheme. According to the air fryer, the utilization efficiency of heat energy can be improved; according to the air fryer, the heating efficiency of food at the bottom of the frying basket is improved, heat flow achieves heat cyclic utilization in the supporting piece and the gap, the heat utilization rate of the air fryer is increased, and therefore energy saving is achieved, it is guaranteed that the upper side temperature and the lower side temperature of the frying basket are consistent, the food cooking effect is improved, and the food taste is good.



(12)实用新型专利

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A47J 37/12(2006.01)

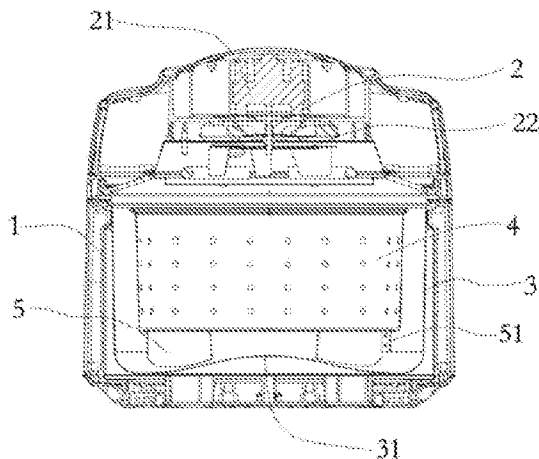
权利要求书1页 说明书4页 附图2页

(54)实用新型名称

一种空气炸锅

(57)摘要

本实用新型提供了一种空气炸锅,包括壳体,设置在壳体内部的热风组件和位于所述热风组件下方的内胆,所述壳体和所述内胆构成用于烹饪食物的热流循环腔室,所述内胆内设置有具有透气底部的炸篮;所述内胆设置有至少两个用于支撑所述炸篮的支撑件,且各所述支撑件和所述内胆底部之间设有间隙。采用本实用新型技术方案,该空气炸锅能够提高热能的利用效率,使得炸篮底部的食物加热效率提高,且使得热流在支撑件和上述间隙内实现热量循环利用,提高了该空气炸锅热量的利用率,由此实现节能,保证炸篮上下侧温度一致,改善食物烹饪效果且保证食物口感良好。



CN 209032019 U

1. 一种空气炸锅,其特征在于:包括壳体,设置在壳体内部的热风组件和位于所述热风组件下方的内胆,所述壳体和所述内胆构成用于烹饪食物的热流循环腔室,所述内胆内设置有具有透气底部的炸篮;所述内胆设置有至少两个用于支撑所述炸篮的支撑件,且各所述支撑件和所述内胆底部之间设有间隙。

2. 根据权利要求1所述的空气炸锅,其特征在于:各所述支撑件与所述内胆底部之间所形成的间隙值为3—6mm。

3. 根据权利要求1或2所述的空气炸锅,其特征在于:所述支撑件为支撑板,各所述支撑板的底部与所述内胆底部形成所述间隙,各所述支撑板的板面相对设置,且各所述支撑板设置在同一高度上。

4. 根据权利要求3所述的空气炸锅,其特征在于:所述支撑板的端部设置有安装板,各所述支撑板通过所述安装板而与所述内胆的侧壁相连接。

5. 根据权利要求1或2所述的空气炸锅,其特征在于:所述内胆的底部设置有弧形凸起。

6. 根据权利要求5所述的空气炸锅,其特征在于:所述弧形凸起设置于所述内胆的中心,且各所述支撑件以所述弧形凸起中心所在的直线呈中心对称分布。

7. 根据权利要求5所述的空气炸锅,其特征在于:所述支撑件的底部设置有与所述弧形凸起相适应的弧形边。

8. 根据权利要求1所述的空气炸锅,其特征在于:所述炸篮沿其篮底中心设置有多呈放射状分布的透气槽,所述炸篮的侧壁设置有多通气孔。

9. 根据权利要求1所述的空气炸锅,其特征在于:所述热风组件包括用于加热空气的加热装置和将加热后的热流输送至所述内胆的风扇。

10. 根据权利要求1所述的空气炸锅,其特征在于:所述内胆底侧设有若干透气孔,所述壳体的底部设置有与所述透气孔相连通的散热孔,所述热流循环腔室的顶侧设有油烟排出通道,所述壳体的顶侧设有与所述油烟排出通道相连通的油烟口。

一种空气炸锅

技术领域

[0001] 本实用新型涉及厨房家电技术领域,具体涉及一种空气炸锅。

背景技术

[0002] 随着人们生活水平的提高,厨房电器的使用越来越广泛,空气炸锅就是其中一种。空气炸锅的工作原理为,空气在炸锅的顶部进入并通过加热装置实现空气的快速加热,加热后的热风通过风扇进入至炸锅内并形成用于烹饪食物的急速循环的热流,而食物位于热流循环腔室内进行烹饪,从而使烹饪效果达到油炸食物的效果和口感,也就是加热的时候将高温的热流吹在炸篮内食物表面形成酥脆的表层,快速锁住食物内部的水分,从而达到普通油炸食品又香又脆的口感。

[0003] 空气炸锅内包括有内胆和炸篮,现有技术中,一般在内胆的底部设置支撑板,此后将炸篮置于支撑板上,热流循环加热炸篮内的食物,从而完成食物的烹饪。炸篮在盛放食物后,食物在炸篮底部堆积,热流循环时由于炸篮底部与内胆之间紧靠,从而使得热流在炸篮底部的循环效果不佳,导致炸篮底部的食物需要进行长时间加热,同时,上述结构使得炸篮的上下两侧温度不一致,进而影响空气炸锅的食物烹饪效果,且影响食物口感;同时,热流在炸篮底部循环效果不佳,导致热流未被充分利用就排出,进而使得该空气炸锅的热能利用效率低。

发明内容

[0004] 本实用新型的目的在于,提供一种空气炸锅,该空气炸锅能够提高热能的利用效率,使得炸篮底部的热流循环效果良好,保证炸篮上下侧温度一致,改善食物烹饪效果且保证食物口感良好。

[0005] 基于此,本实用新型提供了一种空气炸锅,包括壳体,设置在壳体内的热风组件和位于所述热风组件下方的内胆,所述壳体和所述内胆构成用于烹饪食物的热流循环腔室,所述内胆内设置有具有透气底部的炸篮;所述内胆设置有至少两个用于支撑所述炸篮的支撑件,且各所述支撑件和所述内胆底部之间设有间隙。

[0006] 作为优选方案,各所述支撑件与所述内胆底部之间所形成的间隙值为3—6mm。

[0007] 作为优选方案,所述支撑件为支撑板,各所述支撑板的底部与所述内胆底部形成所述间隙,各所述支撑板的板面相对设置,且各所述支撑板设置在同一高度上。

[0008] 作为优选方案,所述支撑板的端部设置有安装板,各所述支撑板通过所述安装板而与所述内胆的侧壁相连接。

[0009] 作为优选方案,所述内胆的底部设置有弧形凸起。

[0010] 作为优选方案,所述弧形凸起设置于所述内胆的中心,且各所述支撑件以所述弧形凸起中心所在的直线呈中心对称分布。

[0011] 作为优选方案,所述支撑件的底部设置有与所述弧形凸起相适应的弧形边。

[0012] 作为优选方案,所述炸篮沿其篮底中心设置有多呈放射状分布的透气槽,所述

炸篮的侧壁设置有多多个通气孔。

[0013] 作为优选方案,所述热风组件包括用于加热空气的加热装置和将加热后的热流输送至所述内胆的风扇。

[0014] 作为优选方案,所述内胆底侧设有若干透气孔,所述壳体的底部设置有与所述透气孔相连通的散热孔,所述热流循环腔室的顶侧设有油烟排出通道,所述壳体的顶侧设有与所述油烟排出通道相连通的油烟口。

[0015] 实施本实用新型实施例,具有如下有益效果:

[0016] 1、由壳体上侧进入的外部空气通过加热并形成热流,热流输送至内胆中对炸篮上的食物进行加热,直至完成食物的烹饪;当热流不断进入内胆时,一部分热流碰到支撑件后从炸篮底部进入炸篮,另一部分热流进入至支撑件和内胆底部的间隙内并对炸篮底部的食物进行加热,而上述间隙使得热流在内胆底部流动提供空间,从而能够更好地对炸篮底部的食物进行加热,且使得炸篮的上下两侧的温度保持一致,进而使得炸篮内的食物烹饪效果良好,提高食物的口感;进一步地,上述结构使得炸篮底部的食物加热效率提高,且使得热流在支撑件和上述间隙内实现热量循环利用,提高了该空气炸锅热量的利用率,由此实现节能。

[0017] 2、各支撑件与内胆底部之间所形成的间隙值为3—6mm,需要指出的是,当上述间隙值过大时,热量在内胆内的行进距离变长,且加大了内胆的容量,由此需要输送更多的热流,由此造成热量浪费,而当上述间隙值过小时,则使得热流在内胆底部循环加热效果不佳,导致炸篮上下侧温度不同,影响食物烹饪效果,采用上述间隙值为优选实施方案。

[0018] 3、内胆的底部设置有弧形凸起,热流在进入内胆后冲击弧形凸起,从而使得热流能够更好地返回至炸篮中,从而提高热流进入内胆底部后能够及时回弹,加速热流的流动,提高热流的循环效率,进而使得炸篮内的食物加热效果良好。

[0019] 4、炸篮沿其篮底中心设置有多多个呈放射状分布的透气槽,炸篮的侧壁设置有多多个通气孔,透气槽能够将炸篮内食物的油脂析出流至内胆,且为热流提供循环通道,通气孔则使得炸篮结构的通气性能良好。

附图说明

[0020] 图1为本实用新型实施例中空气炸篮的剖面视图。

[0021] 图2为本实用新型实施例中炸篮与支撑件的结构示意图。

[0022] 图中:1—壳体,2—热风组件,3—内胆,4—炸篮,5—支撑板;21—加热装置,22—风扇,31—弧形凸起,41—透气槽,42—通气孔,43—把手,51—安装板,52—弧形边。

具体实施方式

[0023] 下面将结合本实用新型实施例中的附图,对本实用新型实施例中的技术方案进行清楚、完整地描述,显然,所描述的实施例仅仅是本实用新型一部分实施例,而不是全部的实施例。基于本实用新型中的实施例,本领域普通技术人员在没有作出创造性劳动前提下所获得的所有其他实施例,都属于本实用新型保护的范围。

[0024] 如图1至图2所示,本实施例提供一种空气炸锅,包括壳体1,设置在壳体1内的热风组件2和位于所述热风组件2下方的内胆3,所述壳体1和所述内胆3构成用于烹饪食物的热

流循环腔室,需要指出的是,热风组件2即将外部空气加热并将形成的热流输送至内胆3内,在本实施例中,热风组件2内包括有风扇22,由此实现热流进入至内胆3后形成循环的热流,所述内胆3内设置有具有透气底部的炸篮4,而热流在内胆3内对炸篮4内的食物进行循环加热,进而完成食物的烹饪;所述内胆3设置有至少两个用于支撑所述炸篮4的支撑件,且各所述支撑件和所述内胆3底部之间设有间隙,在本实施例中支撑件的数量为三个,由此使得炸篮4的支撑更加稳定。

[0025] 基于以上技术方案,由壳体1上侧进入的外部空气通过加热并形成热流,热流输送至内胆3中对炸篮4上的食物进行加热,直至完成食物的烹饪;当热流不断进入内胆3时,一部分热流碰到支撑件后从炸篮4底部进入炸篮4,另一部分热流进入至支撑件和内胆3底部的间隙内并对炸篮4底部的食物进行加热,而上述间隙使得热流在内胆3底部流动提供空间,从而能够更好地对炸篮4底部的食物进行加热,且使得炸篮4的上下两侧的温度保持一致,进而使得炸篮4内的食物烹饪效果良好,提高食物的口感;进一步地,上述结构使得炸篮4底部的食物加热效率提高,且使得热流在支撑件和上述间隙内实现热量循环利用,提高了该空气炸锅热量的利用率,由此实现节能。

[0026] 在本实施例中,各所述支撑件与所述内胆3底部之间所形成的间隙值为3—6mm,需要指出的是,当上述间隙值过大时,热量在内胆3内的行进距离变长,且加大了内胆3的容量,由此需要输送更多的热流,由此造成热量浪费,而当上述间隙值过小时,则使得热流在内胆3底部循环加热效果不佳,导致炸篮4上下侧温度不同,影响食物烹饪效果,采用上述间隙值为优选实施方案。

[0027] 其中,所述支撑件为支撑板5,采用支撑板5的结构对于炸篮4的支撑效果好且减少材料使用,各所述支撑板5的底部与所述内胆3底部形成所述间隙,各所述支撑板5的板面相对设置,而支撑板5的板面相对设置形成空气的流动腔,从而提升热流循环效果,热流在冲击至板面后一部分气流能够反弹后进入至炸篮4,而另一部分气流沿着板面方向流至间隙,且各所述支撑板5设置在同一高度上,高度一致的支撑板5使得炸篮4平稳地设置在内胆3中。

[0028] 具体地,所述支撑板5的端部设置有安装板51,各所述支撑板5通过所述安装板51而与所述内胆3的侧壁相连接,安装板51的结构使得支撑板5便捷地安装在内胆3侧壁,而在本实施例中,安装板51通过螺钉安装在内胆3侧壁,由此使得支撑板5的拆装维护更加方便。

[0029] 进一步地,所述内胆3的底部设置有弧形凸起31,热流在进入内胆3后冲击弧形凸起31,从而使得热流能够更好地返回至炸篮4中,从而提高热流进入内胆3底部后能够及时回弹,加速热流的流动,提高热流的循环效率,进而使得炸篮4内的食物加热效果良好。优选地,所述弧形凸起31设置于所述内胆3的中心,且各所述支撑件以所述弧形凸起31中心所在的直线呈中心对称分布,由此使得热流冲击弧形凸起31后沿着支撑件导向进入至炸篮4。具体地,所述支撑件的底部设置有与所述弧形凸起31相适应的弧形边52,由此使得支撑件和弧形凸起31的结构设置合理,保证支撑件与弧形凸起31相隔离。

[0030] 此外,所述炸篮4沿其篮底中心设置有多呈放射状分布的透气槽41,所述炸篮4的侧壁设置有多通气孔42,透气槽41能够将炸篮4内食物的油脂析出流至内胆3,且为热流提供循环通道,通气孔42则使得炸篮4结构的通气性能良好。在本实施例中,该炸篮4还设置有把手43,由此便于炸篮4的取放。

[0031] 具体地,所述热风组件2包括用于加热空气的加热装置21和将加热后的热流输送至所述内胆3的风扇22,需要指出的是,加热装置21与风扇22为现有结构,故不加以展开论述,空气在加热装置21加热后通过风扇22输送热流,同时风扇22能够实现热流在内胆3内循环。

[0032] 在本实施例中,所述内胆3底侧设有若干透气孔,所述壳体1的底部设置有与所述透气孔相连通的散热孔,所述热流循环腔室的顶侧设有油烟排出通道,所述壳体1的顶侧设有与所述油烟排出通道相连通的油烟口。基于上述结构,内胆3内小部分热流通过壳体1底部的散热孔散出,内胆3内的油烟通过油烟排出通道后排放至油烟口,该空气炸锅的热流排出可以通过壳体1上下侧实现,进而保证该空气炸锅稳定运行。

[0033] 采用本实用新型实施例的空气炸锅,由壳体1上侧进入的外部空气通过加热并形成热流,热流输送至内胆3中对炸篮4上的食物进行加热,直至完成食物的烹饪;当热流不断进入内胆3时,一部分热流碰到支撑件后从炸篮4底部进入炸篮4,另一部分热流进入至支撑件和内胆3底部的间隙内并对炸篮4底部的食物进行加热,而上述间隙使得热流在内胆3底部流动提供空间,从而能够更好地对炸篮4底部的食物进行加热,且使得炸篮4的上下两侧的温度保持一致,进而使得炸篮4内的食物烹饪效果良好,提高食物的口感;进一步地,上述结构使得炸篮4底部的食物加热效率提高,且使得热流在支撑件和上述间隙内实现热量循环利用,提高了该空气炸锅热量的利用率,由此实现节能。

[0034] 在本实用新型的描述中,需要理解的是,术语“上”、“下”、“左”、“右”、“顶”、“底”等指示的方位或位置关系为基于附图所示的方位或位置关系,仅是为了便于描述本实用新型和简化描述,而不是指示或暗示所指的装置或元件必须具有特定的方位、以特定的方位构造和操作,因此不能理解为对本实用新型的限制。

[0035] 以上所述仅是本实用新型的优选实施方式,应当指出,对于本技术领域的普通技术人员来说,在不脱离本实用新型技术原理的前提下,还可以做出若干改进和替换,这些改进和替换也应视为本实用新型的保护范围。

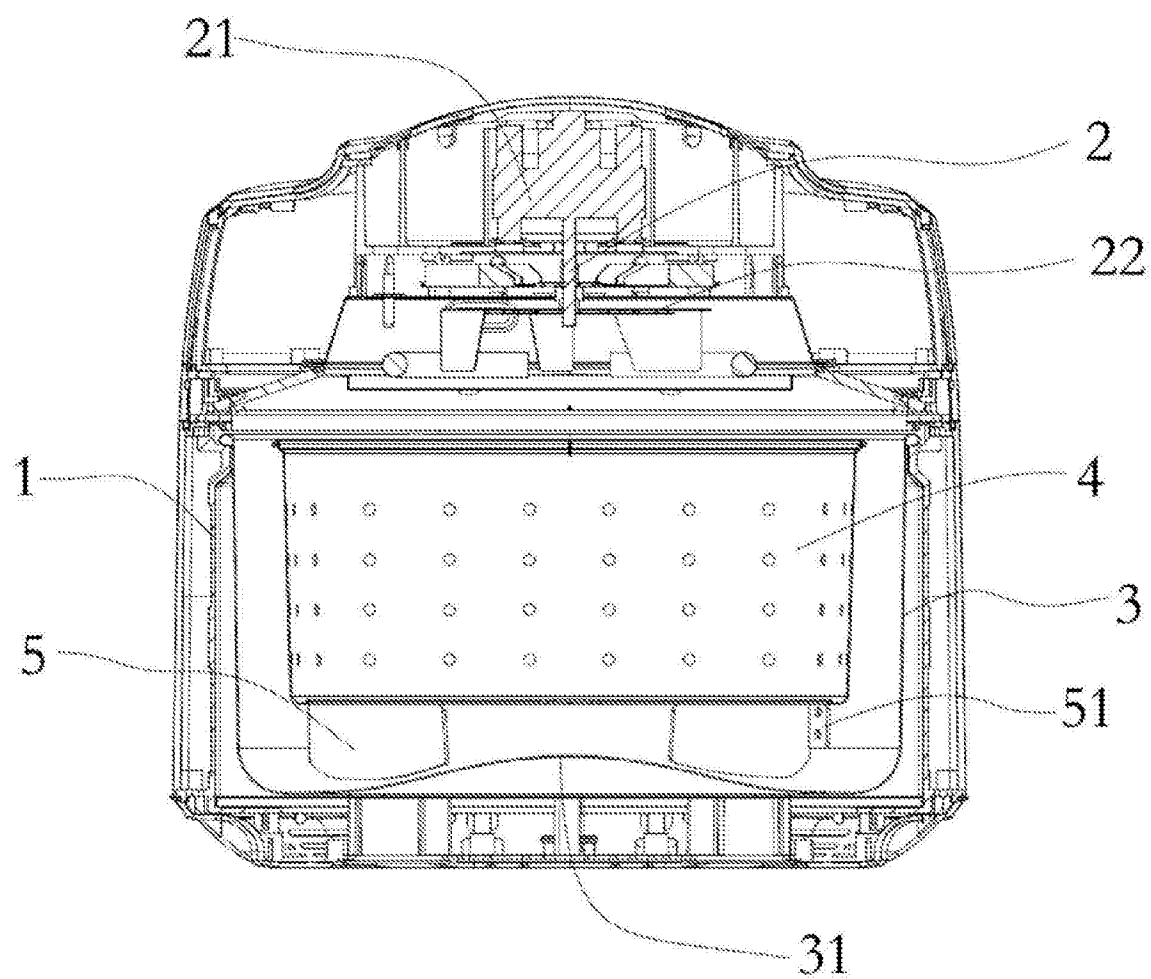


图1

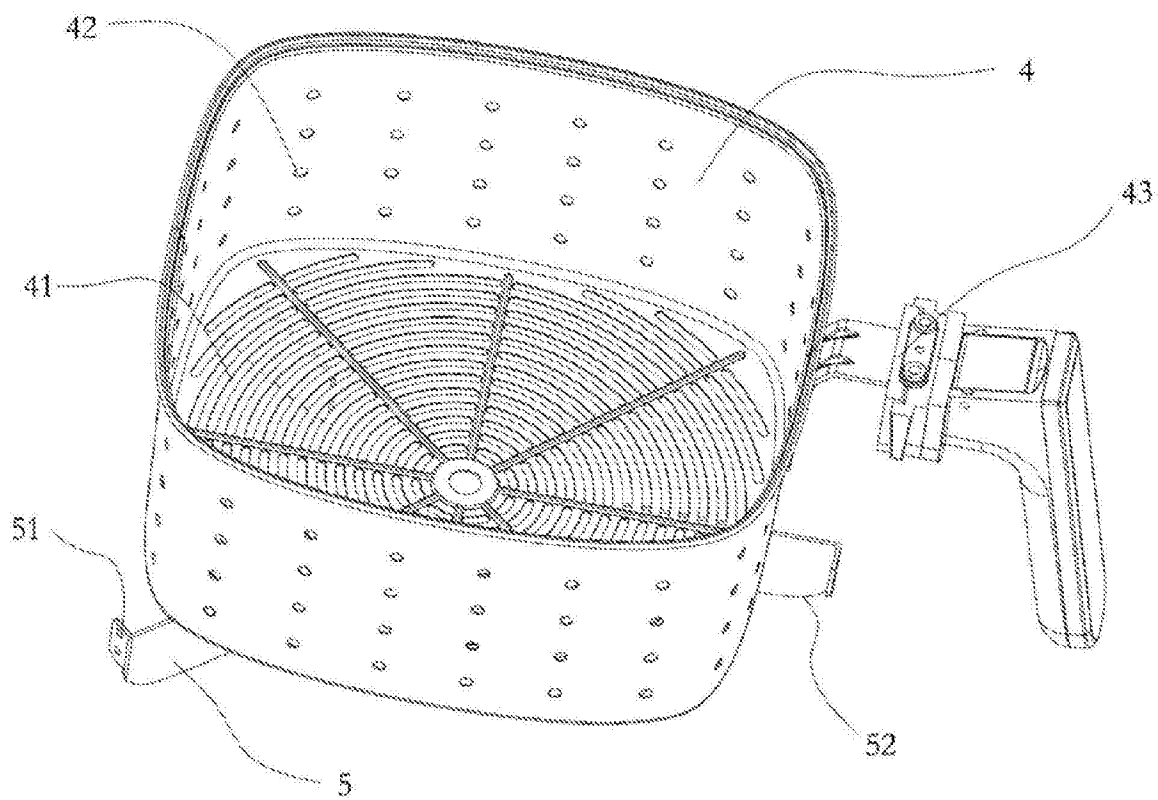


图2



Espacenet

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Hot air electric oven

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Abstract of CN202665302 (U)

The utility model belongs to the technical field of an electric oven, and discloses a hot air electric oven. The hot air electric oven comprises a shell (1); a heat insulation wall (2) forming a chamber is arranged in the shell (1); an air guide cover (7) is arranged in the chamber; an air outlet (4) is arranged on the air guide cover (7); a heating element (5) is arranged below the air outlet (4); a centrifugal fan (6) is arranged above the air outlet (4); a food basket (8) is arranged below the air guide cover (7) in a push-pull manner; vent holes are formed on the bottom surface of the food basket (8), and the side surface of the food basket (8) is of a closed structure; a gap is reserved between the food basket (8) and the bottom of the chamber; a hot air channel (3) is formed between the bottom surface and side surface of the food basket (8) and the heat insulation wall (2); and the bottom of the chamber is of a plane structure or a concave-surface structure. According to the utility model, hot air enters the inner chamber in a more disperse manner so that the food is heated more uniformly; and moreover, the structure is simpler and easy to process, and the cost is low.



(12) 实用新型专利

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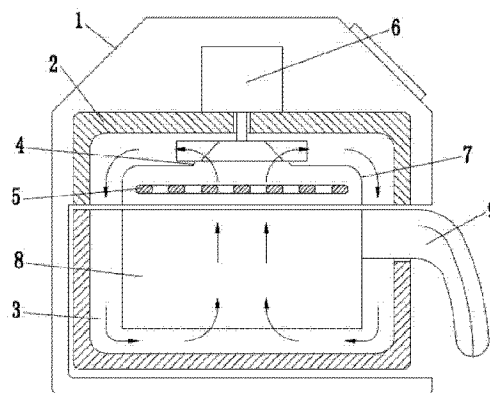
权利要求书 1 页 说明书 3 页 附图 1 页

(54) 实用新型名称

一种热风电烤炉

(57) 摘要

本实用新型属于电烤炉技术领域,公开了一种热风电烤炉,包括壳体(1),壳体(1)内设有围成腔室的隔热壁(2),腔室内设有导风罩(7),导风罩(7)上设有出风口(4),出风口(4)下方设有发热元件(5),出风口(4)上方设有离心风机(6);导风罩(7)的下方推拉式设置有食物篮(8),食物篮(8)的底面设有透气孔,侧面为封闭结构;食物篮(8)和腔室的底部之间留有空隙,食物篮(8)的底面、侧面和隔热壁(2)之间形成热风通道(3);所述的腔室的底部为平面结构,或者为凹面结构。本实用新型使热空气更加分散的进入内腔室中,使食物的受热更加均匀,而且结构更加简单,容易加工,成本低廉。



1. 一种热风电烤炉,包括壳体(1),壳体(1)内设有围成腔室的隔热壁(2),腔室内设有导风罩(7),导风罩(7)上设有出风口(4),出风口(4)下方设有发热元件(5),出风口(4)上方设有离心风机(6);导风罩(7)的下方推拉式设置有食物篮(8),食物篮(8)的底面设有透气孔,侧面为封闭结构;食物篮(8)和腔室的底部之间留有空隙,食物篮(8)的底面、侧面和隔热壁(2)之间形成热风通道(3),其特征是:所述的腔室的底部为平面结构,或者为凹面结构。
2. 根据权利要求1所述的热风电烤炉,其特征是:所述的食物篮(8)侧面设有隔热手柄(9)。
3. 根据权利要求1所述的热风电烤炉,其特征是:所述的离心风机(6)的电机部设在隔热壁(2)的外侧,离心风机(6)的叶片部设在导风罩(7)和隔热壁(2)之间。
4. 根据权利要求1所述的热风电烤炉,其特征是:所述的腔室的内表面的拐角处为圆弧过渡。
5. 根据权利要求1所述的热风电烤炉,其特征是:所述的壳体(1)上设有操作面板。
6. 根据权利要求1所述的热风电烤炉,其特征是:所述的食物篮(8)的底面为网状结构或栅格状结构。
7. 根据权利要求1所述的热风电烤炉,其特征是:所述的腔室的底部凹面结构,其凹面为曲面或者斜面,或者为波浪面。

一种热风电烤炉

技术领域

[0001] 本实用新型属于电烤炉技术领域,尤其是涉及一种热风电烤炉。

背景技术

[0002] 烧烤食品由于其独特的口感深受人们的喜爱。现有的室内制作烧烤食品的技术主要是利用微波炉或者光波炉等进行简单的烘烤。但是由于其烘烤原理与烟火烘烤有很大区别,所以其口感较差。而且由于清理油渍不方便,也不适合对过油食品进行烘烤,所以过油食品基本还是以传统油炸方式为主,但此种方式即使是换成电炸锅还是很浪费食用油的。

[0003] 为此设计者开发了一种烤箱,其基本原理是通过风扇将发热元件产生的热量吹到食物上进行加热。例如美国专利 4374319 于 1983 年 2 月 15 日公开了一种烤箱,其方案是在食物腔室内设置底部隔板,食物腔室上部或侧面设置开口,开口处设置风扇,风扇后面设置加热元件,腔室外侧四周为循环通道,底部隔板和 / 或腔室的侧壁上设置气孔。该方案的原理是:使加热元件周围的热空气进入循环通道,然后穿过气孔进入食物腔室内,经过食物后变成冷空气,再利用风扇从开口处吸出,再经过加热元件加热,如此往复循环,达到加热食物的目的。但是此方案中的加热元件位于食物腔室的外面,且气孔的流量过小,极大的降低了其加热效率。

[0004] 还有专利 CN 101500462 B 于 2012 年 1 月 25 日公开了一种制备食品的设备 and 用于该设备的空气导向件。该方案的工作原理与美国专利 4374319 的原理基本相同,只是将加热元件设置在食物腔室内。而其主要特征是在循环通道内,食物腔室的下方,设置了一个空气导向件,意在引导空气向上流动。但是此结构会导致空气流动过于集中,使食物接受到的热量不均匀,导致食物熟透程度不一;而且其结构过于复杂,增加了产品的材料成本和制造成本;同时也不方便产品的清洗。

[0005] 此外,专利 CN101360440 于 2009 年 2 月 4 日公开了一种带有搅拌装置的烹饪器具及相关方法。其中烹饪器具的方案是在食物腔室上方设置主加热装置,并将其加热的热气流通过食物腔室侧面的进气口引到食物腔室内,而其主要特征是在食物腔室内设置搅拌机构,从而达到边搅拌边加热的目的,使食物受热均匀。但是此结构过于复杂,制造成本高,且很不方便清洗。

实用新型内容

[0006] 为了解决上述现有技术中存在的不足,本实用新型设计了一种加热更加均匀,结构简单的热风电烤炉。

[0007] 本实用新型的技术方案是:一种热风电烤炉,包括壳体(1),壳体(1)内设有围成腔室的隔热壁(2),腔室内设有导风罩(7),导风罩(7)上设有出风口(4),出风口(4)下方设有发热元件(5),出风口(4)上方设有离心风机(6);导风罩(7)的下方推拉式设置有食物篮(8),食物篮(8)的底面设有透气孔,侧面为封闭结构;食物篮(8)和腔室的底部之间留有空隙,食物篮(8)的底面、侧面和隔热壁(2)之间形成热风通道(3);所述的腔室的底部为平面

结构,或者为凹面结构。

[0008] 本方案中发热元件(5)发热,并使其周围的空气变热,然后通过离心风机(6)将热空气经过热风通道(3)带到腔室的底部,再穿过食物篮(8)的底面进入食物篮(8)中,从而加热食物篮(8)中的食物。由于热空气经过热风通道(3),而不是从发热元件(5)周围直接吹到食物上,减少食物局部接收热量多而烤焦的问题,而且腔室的底部为平面设置,使热空气更加分散的进入食物篮(8)中,使食物的受热更加均匀。同时,平面结构更加简单,容易加工,成本低廉。

[0009] 上述的食物篮(8)侧面设有隔热手柄(9),以方便用户使用。

[0010] 上述的离心风机(6)的电机部设在隔热壁(2)的外侧,从而避免热空气对电机产生影响,延长使用寿命;离心风机(6)的叶片部设在导风罩(7)和隔热壁(2)之间,有利于增强空气的流动性,提高加热效率。

[0011] 上述的腔室的内表面的拐角处为圆弧过渡,使空气更加容易流通。

[0012] 上述的壳体(1)上设有操作面板。

[0013] 上述的食物篮(8)的底面为网状结构或栅格状结构,以使空气更容易的穿过底面。

[0014] 上述的腔室的底部凹面结构,其凹面为曲面或者斜面,或者为波浪面。

[0015] 本实用新型与现有技术相比主要具有如下有益效果:既可以烘烤无油食品作为烤炉使用,又可以烘烤过油食品作为无油炸锅使用,食物的受热更加均匀;结构更加简单,容易加工,成本低廉;避免热空气影响电机,延长使用寿命。

附图说明

[0016] 图1为本实用新型实施例的剖面结构示意图。

具体实施方式

[0017] 下面结合附图对本实用新型做进一步说明。

[0018] 如图1所示,一种热风电烤炉,包括壳体1,壳体1内设有围成腔室的隔热壁2,腔室内设有导风罩7,导风罩7上设有出风口4,出风口4下方设有发热元件5,出风口4上方设有离心风机6;导风罩7的下方推拉式设置有食物篮8,食物篮8的底面为网状结构,侧面为封闭结构;食物篮8和腔室的底部之间留有空隙,食物篮8的底面、侧面和隔热壁2之间形成热风通道3;腔室的底部为平面结构。

[0019] 食物篮8侧面设有隔热手柄9,防止用户烫伤,方便用户使用。

[0020] 离心风机6的电机部设在隔热壁2的外侧,从而避免热空气对电机产生影响,延长使用寿命;离心风机6的叶片部设在导风罩7和隔热壁2之间,有利于增强空气的流动性,提高加热效率。

[0021] 腔室的内表面的拐角处为圆弧过渡,使空气更加容易流通。

[0022] 壳体1上设有操作面板。

[0023] 本实施例中发热元件5发热,并使其周围的空气变热,然后通过离心风机6将热空气经过热风通道3带到腔室的底部,再穿过食物篮8的底面进入食物篮8中,从而加热食物篮8中的食物。由于腔室的底部为平面设置,使热空气更加分散的进入食物篮8中,使食物的受热更加均匀。同时,平面结构更加简单,容易加工,成本低廉。

[0024] 通过用户操控操作面板可以调节加热温度和时间等,加热完成后,用户抓住隔热手柄 9 可以拉出食物篮 8,方便倒出食物;同时也方便食物篮 8 的清洗。

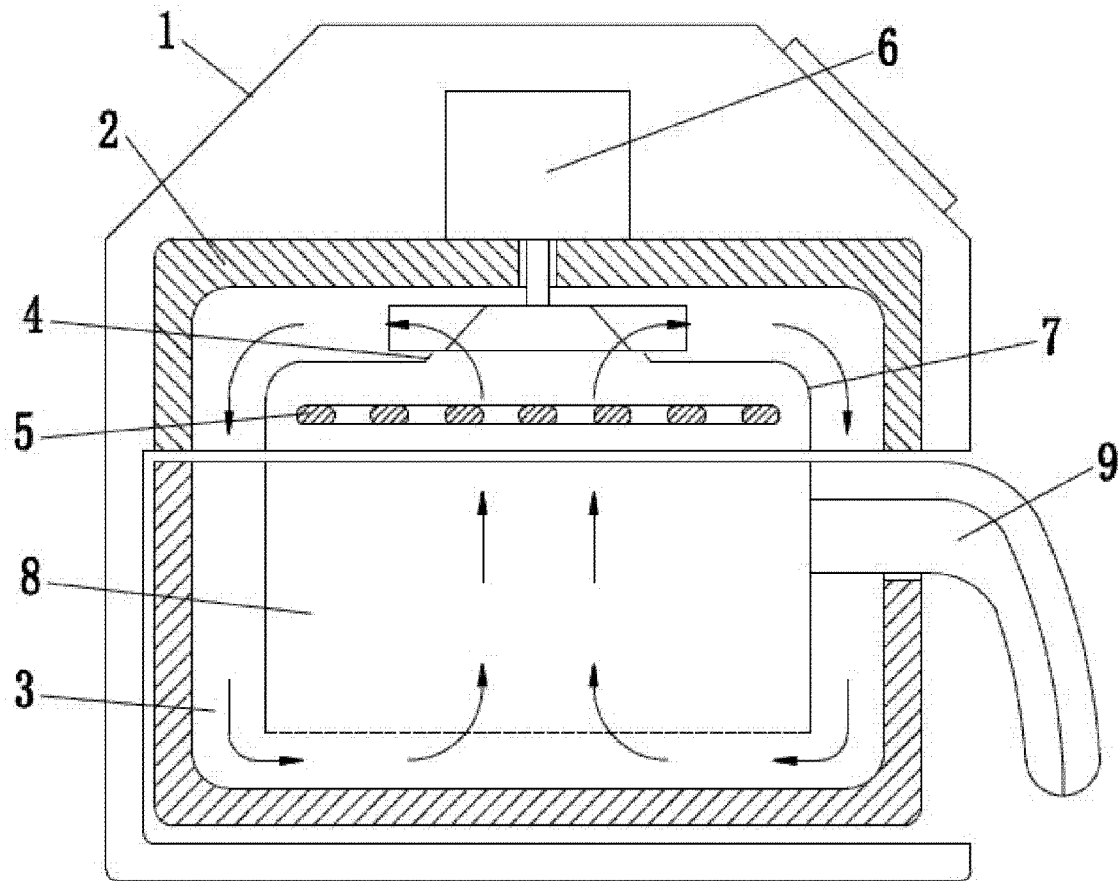


图 1

Electronic Patent Application Fee Transmittal

Application Number:				
Filing Date:				
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF			
First Named Inventor/Applicant Name:	Christopher T. Martin			
Filer:	Alicia Anne Hayter/Michelle Lombardo			
Attorney Docket Number:	EUP1549US2			
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Filing Fees for Utility under 35 USC 111(a)				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
UTILITY APPLICATION FILING	1011	1	320	320
UTILITY SEARCH FEE	1111	1	700	700
UTILITY EXAMINATION FEE	1311	1	800	800
Pages:				
Claims:				
CLAIMS IN EXCESS OF 20	1202	8	100	800
INDEPENDENT CLAIMS IN EXCESS OF 3	1201	2	480	960
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
LATE FILING FEE FOR OATH OR DECLARATION	1051	1	160	160
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				3740

Electronic Acknowledgement Receipt

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Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
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37 CFR 1.16 (National application filing, search, and examination fees)

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	8OY5544.PDF	3908456	no	44
			7ed6eef89c5407200876c0d93ce17ff53ff4529b		
Warnings:					
Information:					
2	Preliminary Amendment	8OY5589.pdf	78301	no	8
			4074570868b45e46ad7f3619b8d940054bbdff9		
Warnings:					
Information:					
3	Application Data Sheet	8L17542.PDF	1256635	no	10
			c1120a34033bfd94fa6fce33e5d5e9c3a7f06e75		
Warnings:					
Information:					
4	Power of Attorney	8L23992.PDF	406180	no	4
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Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	8OY3977.PDF	74038	no	4
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Warnings:					
Information:					
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6	Other Reference-Patent/App/Search documents	8N65764.PDF	1046656	no	5
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7	Other Reference-Patent/App/Search documents	8N65771.PDF	2450572	no	11
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Warnings:					
Information:					
8	Foreign Reference	8N65936.PDF	1612697	no	13
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9	Foreign Reference	8N65981.PDF	1114735	no	9
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11	Fee Worksheet (SB06)	fee-info.pdf	39995	no	2
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Warnings:					
Information:					
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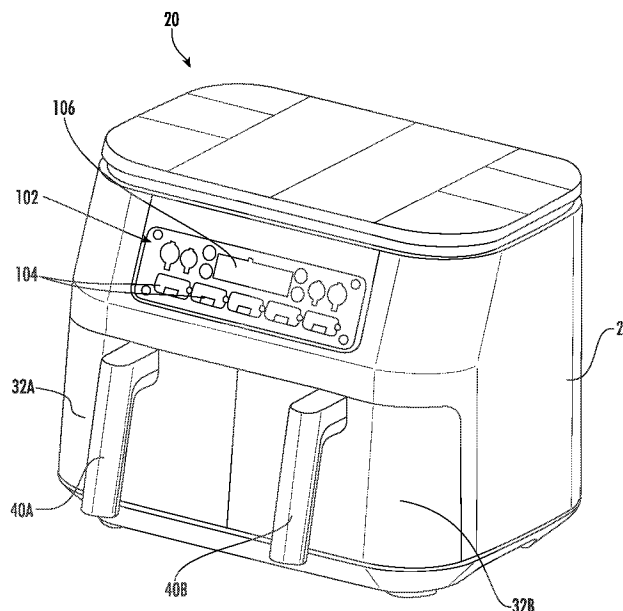


FIG. 13

(57) Abstract: A cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A bottom surface of said cooking container is angled upwardly. A heating element is associated with said at least one internal compartment.



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).

Declarations under Rule 4.17:

- *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))*

Published:

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COOKING DEVICE AND COMPONENTS THEREOF

BACKGROUND

[0001] Embodiments of the present disclosure relate generally to a cooking system, and more specifically, to a countertop cooking system operable in a plurality of distinct cooking modes.

SUMMARY

[0002] According to an embodiment, cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A bottom surface of said cooking container is angled upwardly. A heating element is associated with said at least one internal compartment.

[0003] In addition to one or more of the features described above, or as an alternative, in further embodiments said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.

[0004] In addition to one or more of the features described above, or as an alternative, in further embodiments said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.

[0005] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.

[0006] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

[0007] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert at least partially defines said cooking volume within said interior of said cooking container.

[0008] In addition to one or more of the features described above, or as an alternative, in further embodiments said food support surface has a generally horizontal orientation when said insert is arranged within said interior of said cooking container.

[0009] In addition to one or more of the features described above, or as an alternative, in further embodiments said food support surface is offset from said bottom surface of said cooking container by a clearance.

[0010] In addition to one or more of the features described above, or as an alternative, in further embodiments said clearance defined between said food support surface and said bottom surface of said cooking container varies over at least one dimension of the cooking container.

[0011] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert further comprises at least one protrusion and said bottom surface of said cooking container further comprises at least one channel, said at least one protrusion being positioned within said at least one channel when said insert is properly installed in said interior of said cooking container.

[0012] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.

[0013] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert further comprises a blocking wall arranged at an angle to said food support surface and said air duct is defined between said blocking wall and a back wall of said cooking container.

[0014] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an air movement mechanism disposed in said housing.

[0015] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0016] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing having a first inlet, a second inlet and an outlet, the first inlet and the second inlet being arranged in fluid communication with said outlet and a fan wheel rotatably mounted within said fan housing.

[0017] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0018] According to an embodiment, a cooking system includes a housing having at least one internal compartment, a cooking container receivable within said at least one internal compartment, a cooking volume being defined within an interior of said cooking container, and a heating element associated with said at least one internal compartment. An air movement mechanism is disposed in said housing. The air movement mechanism is rotatable about an axis of rotation oriented relatively horizontally.

[0019] In addition to one or more of the features described above, or as an alternative, in further embodiments said axis of rotation is oriented substantially perpendicular to a flow provided at an outlet of said air movement mechanism towards a relative bottom of said housing.

[0020] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

[0021] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

[0022] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

[0023] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about said axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0024] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0025] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0026] In addition to one or more of the features described above, or as an alternative, in further embodiments a configuration of said first plurality of impeller blades is substantially identical to a configuration of said second plurality of impeller blades.

[0027] In addition to one or more of the features described above, or as an alternative, in further embodiments a configuration of said first plurality of impeller blades is different than a configuration of said second plurality of impeller blades.

[0028] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is disposed vertically above said cooking volume.

[0029] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is disposed vertically above said cooking container.

[0030] In addition to one or more of the features described above, or as an alternative, in further embodiments an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

[0031] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is horizontally offset from said heating element.

[0032] According to an embodiment, a cooking system includes a housing having at least one internal compartment, and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element associated with said cooking volume. A rotatable air movement mechanism has a first inlet arranged in a first plane of said air movement mechanism and a second inlet arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane. An outlet of the air movement mechanism is arranged in fluid communication with both said first inlet and said second inlet.

[0033] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

[0034] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container is movable relative to said housing along an

axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

[0035] In addition to one or more of the features described above, or as an alternative, in further embodiments said first plane and said second plane are substantially parallel.

[0036] In addition to one or more of the features described above, or as an alternative, in further embodiments said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

[0037] In addition to one or more of the features described above, or as an alternative, in further embodiments said second side is opposite said first side.

[0038] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

[0039] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0040] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0041] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0042] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

[0043] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

[0044] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is horizontally offset from said heating element.

[0045] According to yet another embodiment, a cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element is associated with said cooking volume. A plurality of air movement mechanism is disposed within said housing and a motor is operably coupled to said plurality of air movement mechanisms.

[0046] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is located externally to said at least one internal compartment.

[0047] In addition to one or more of the features described above, or as an alternative, in further embodiments said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

[0048] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

[0049] In addition to one or more of the features described above, or as an alternative, in further embodiments said first air movement mechanism and a second air movement mechanism are arranged coaxially.

[0050] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed and said second speed being substantially identical.

[0051] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed being different than said second speed.

[0052] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

[0053] In addition to one or more of the features described above, or as an alternative, in further embodiments said first air movement mechanism is positioned within said first

internal compartment and said second air movement mechanism is positioned within said second internal compartment.

[0054] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is positioned between said first internal compartment and said second internal compartment.

[0055] According to yet another embodiment, a cooking system includes a housing having at first internal compartment and a second internal compartment. At least one cooking container is receivable within one of said first internal compartment and said second internal compartment. At least one cooking volume is defined within an interior of said at least one cooking container. At least one heating element disposed in said housing.

[0056] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one cooking container is a first cooking container receivable within said first internal compartment and a second cooking container receivable within said second internal compartment, wherein a first cooking volume is defined within an interior of said first cooking container and a second cooking volume is defined within an interior of said second cooking container.

[0057] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one heating element includes a first heating element positioned within said first internal compartment and a second heating element positioned within said second internal compartment.

[0058] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising at least one air movement mechanism disposed within said housing.

[0059] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism is stacked vertically relative to said at least one heating element within said housing.

[0060] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

[0061] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism further comprises: a fan housing and a fan wheel rotatably mounted within said fan housing.

[0062] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0063] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism includes a first air movement mechanism associated with said first internal compartment and a second air movement mechanism associated with said second internal compartment.

[0064] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism has an axially oriented inlet and a radially oriented outlet.

[0065] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism is rotatable about a vertically oriented axis.

[0066] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operably coupled to said at least one air movement mechanism.

[0067] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is located externally from said first internal compartment and said second internal compartment.

[0068] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is positioned between said first internal compartment and said second internal compartment.

[0069] In addition to one or more of the features described above, or as an alternative, in further embodiments said first cooking container and said second cooking container are individually insertable into said first cooking compartment and said second cooking compartment respectively.

[0070] In addition to one or more of the features described above, or as an alternative, in further embodiments said first internal compartment and said second internal compartment are fluidly separate.

[0071] In addition to one or more of the features described above, or as an alternative, in further embodiments said first cooking volume and said second cooking volume are fluidly separate.

[0072] According to another embodiment, a cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at

least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element is associated with said at least one internal compartment and an air movement mechanism is disposed in said housing. The air movement mechanism is positioned vertically above said cooking volume and horizontally offset from said heating element.

BRIEF DESCRIPTION OF THE FIGURES

[0073] The accompanying drawings incorporated in and forming a part of the specification embodies several aspects of the present disclosure and, together with the description, serves to explain the principles of the disclosure. In the drawings:

[0074] FIG. 1 is a schematic diagram of a cooking system having a cooking container installed therein according to an embodiment;

[0075] FIG. 2 is a schematic diagram of the cooking system of FIG. 1 absent the cooking container according to an embodiment;

[0076] FIG. 3 is a schematic diagram of another cooking system absent the cooking container according to an embodiment;

[0077] FIG. 4 is a cross-sectional view of a portion of a cooking system according to an embodiment;

[0078] FIG. 5 is a perspective view of a portion of a cooking system according to an embodiment;

[0079] FIG. 6 is a perspective view of a fan wheel of an air movement mechanism of the cooking system according to an embodiment;

[0080] FIG. 7 is a schematic diagram of a control system of the cooking system according to an embodiment;

[0081] FIG. 8 is a front perspective view of a portion of the cooking system according to another embodiment;

[0082] FIG. 9 is a front view of the portion of the cooking system of FIG. 8 according to an embodiment;

[0083] FIG. 10 is a rear perspective view of the portion of the cooking system of FIG. 8 according to an embodiment;

[0084] FIG. 11 is a perspective view of a motor of the cooking system of FIG. 8 according to an embodiment;

[0085] FIG. 12 is a schematic diagram of the motor and the air movement mechanisms of the cooking system according to an embodiment;

[0086] FIG. 13 is a perspective view of the cooking system according to another embodiment;

[0087] FIG. 14 is a plan view of the cooking system of FIG. 13, with the cooking containers removed according to an embodiment; and

[0088] FIG. 15 is a perspective cross-sectional view of the cooking system of FIG. 13 according to an embodiment.

DETAILED DESCRIPTION

[0089] With reference now to the FIGS., an example of a cooking system 20 is illustrated at numeral 20. As best shown in FIGS. 1 and 2, the cooking system 20 includes a housing 22 having an exterior heat resistant or non-conductive surface 24 and an interior surface 26 that defines an at least partially hollow compartment 28 arranged within an interior of the housing 22. The housing 22 may be formed as a single unitary body, or alternatively, may be formed by connecting a plurality of pieces together. In addition, the housing 22 may be made of any suitable material, including but not limited to glass, aluminum, plastic, or stainless steel for example. A liner 30 may be disposed within at least a portion of the housing 22. The liner 30 may be formed from any suitable conductive material, such as aluminum for example. In an embodiment, the liner 30 forms at least a portion of the interior surface 26 and thereby defines at least a portion of the internal compartment 28 of the housing 22. However, it should be understood that other components of the cooking system 20, or surfaces thereof, may also define the internal compartment 28.

[0090] A cooking container 32 is receivable within a portion of the internal compartment 28 of the housing 22, such as a bottom portion of the internal compartment 28 for example. Although the cooking container 32 is described herein as being separable from the housing 22, embodiments where the cooking container 32 is movably connected with or integrally formed with the housing 22 are also contemplated herein. The cooking container 32 may be a pot formed from a ceramic, metal, or die cast aluminum material. However, any suitable material capable of withstanding the high temperatures required for cooking food products are also within the scope of the disclosure. In an embodiment, the cooking container 32 is configured to translate along an axis relative to the housing 22 such that the cooking container 32 is slidably received within an opening 34 formed in a wall 36 of the housing 22. Accordingly, in such embodiments, a size and shape of the cooking container 32 may be complementary to the size and shape of the opening 34. In the illustrated, non-limiting

embodiment, the cooking container 32 is generally square in shape. However, in other embodiments, the cooking container 32 may have another configuration.

[0091] The cooking container 32 has a generally hollow interior 38 for supporting one or more consumable products, such as food products for example, therein. Examples of food products suitable for use with the cooking system 20, include but are not limited to, meats, fish, poultry, bread, rice, grains, pasta, vegetables, fruits, and dairy products, among others.

[0092] At least one handle 40 may be associated with the cooking container 32 to allow a user to easily grasp and manipulate the cooking container 32 relative to the housing 22. In the illustrated, non-limiting embodiment, the cooking container 32 includes a single handle 40 extending from a first, front surface 42 of the cooking container 32. Although the cooking container 32 illustrated and described herein has a single handle 40, in other embodiments, the cooking container 32 may have two or more handles, or alternatively, a handle or groove formed into a surface of the cooking container 32. Any suitable configuration of the cooking container 32 and/or handle(s) 40 is within the scope of the disclosure.

[0093] One or more inserts or food support structures 50 may be positionable within the interior 38 of the cooking container 32. In such embodiments, the insert 50 provides a surface on which food is supported. An example of an insert 50 suitable for use with the cooking container 32 is best shown in FIGS. 4 and 5. As shown, the insert 50 includes a solid blocking wall 52 and a food support surface 54 having a plurality of perforations or openings 56 formed therein. In the illustrated, non-limiting embodiment, the blocking wall 52 and the food support surface 54 are arranged generally perpendicular to one another. Although the insert 50 is shown as being an L-shaped plate, in other embodiments, the insert 50 may include additional side walls such that the insert 50 is a basket for example. When the insert 50 is installed within the interior 38 of the cooking container 32, the blocking wall 52 and the food support surface 54 of the insert 50 cooperate with one or more walls of the cooking container 32 to define an area there between referred to herein as a “cooking volume.” Further, in embodiments where an insert is not disposed within the cooking container 32, the interior 38 of the cooking container 32 may define the cooking volume.

[0094] In the illustrated, non-limiting embodiment, the bottom surface 58 of the cooking container 32 is sloped relative to a bottom surface of the housing 22 or to a surface on which the cooking system 20 may be positioned and supported. As shown, the slope extends generally upwardly towards a front wall 60 of the cooking container 32. As a result, a height of the interior 38 of the cooking container 32 adjacent a back wall 62 is greater than a

height of the interior 38 of the cooking container 32 adjacent the front wall 60 thereof. When the insert 50 is installed within the interior 38 of the cooking container 32, the food support surface 54 has a generally horizontal orientation. As shown, the insert 50 may include one or more protrusions 64, such as tabs for example, configured to contact the bottom surface 58 of the cooking container 32 to achieve this desired orientation. The food support surface 54 is therefore at least partially offset from the bottom surface 58 of the cooking container 32. Because of the angled configuration of the bottom surface 58 of the cooking container 32, the clearance 66 between the bottom surface 58 and the food support surface 54, varies, and more specifically, gradually decreases from a back to a front of the cooking container 32.

[0095] The insert 50 and the bottom surface 58 of the cooking container 32 may cooperate to properly position the insert within the interior 38 such that the blocking wall 52 of the insert 50 is offset from the back wall 62 of the cooking container 32. This clearance between the blocking wall 52 and the back wall 62 defines an air duct 74 within the cooking container 32, separate from the cooking volume, and through which air is circulated during operation of the cooking system 20. In an embodiment, a contour of the cooking container 32 facilitates positioning of the insert 50 relative to the cooking container 32. As previously described, one or more protrusions 64 extend from a bottom surface of the insert 50, and as best shown in FIGS. 4 and 5, the bottom surface 58 of the cooking container 32 may be contoured to define one or more channels 68 therein. When the insert 50 is positioned within the cooking container 32, the one or more protrusions 64 are received within the one or more channels 68. The engagement between the at least one protrusion 64 and the sidewalls of the channel(s) 68 properly positions the insert 50 within the cooking container 32 to create a suitably sized air duct 74.

[0096] The cooking system 20 additionally includes at least one heating element 70 operable to impart heat to the cooking volume during one or more modes of operation of the cooking system 20. In the illustrated, non-limiting embodiment best shown in FIGS. 1, 2 and 4-5, the at least one heating element 70 is positioned within the internal compartment 28, generally at or above an upper extent or surface 72 of the cooking container 32, such as proximate a center of the cooking container 32 for example. In an embodiment, the heating element 70 is disposed adjacent a center of the cooking volume and/or the cooking container 32. In such embodiments, the at least one heating element 70 is mounted completely outside of the cooking container 32, and vertically offset from the upper extent or surface 72 thereof. In another embodiment, best shown in FIG. 3, the at least one heating element 70 may be located adjacent the rear of the internal compartment 28, such as in vertical alignment with

the air duct 74 formed between the blocking wall 52 of the insert 50 and the back wall 62 of the cooking container 32. However, it should be understood that a heating element 70 located at any suitable location is within the scope of the disclosure.

[0097] The at least one heating element 70 may be capable of performing any suitable type of heat generation. For example, a heating element 70 configured to heat one or more food items located within the cooking volume of the cooking container 32 via conduction, convection, radiation, and induction are all within the scope of the disclosure. In the illustrated, non-limiting embodiment, the heating element 70 is a convective heating element, and the cooking system 20 additionally includes an air movement mechanism 76, such as a fan for example, operable to circulate air through the cooking volume. The air is heated as it flows along a path of circulation, such as by flowing over a portion of the at least one heating element 70. As shown, the air movement mechanism 76 is located within the internal compartment 28 at a position entirely above the upper extent 72 of the cooking container 32. In addition, at least a portion of the air movement mechanism 76, and in some embodiment, the entirety of the air movement mechanism 76, is disposed vertically above the cooking volume, and therefore the insert 50. As shown, the air movement mechanism 76 is horizontally offset from the at least one heating element 70. However, embodiments where the air movement mechanism 76 vertically or horizontally overlaps or is aligned with the at least one heating element 70 are also contemplated herein.

[0098] The air movement mechanism 76, or at least a portion thereof may be removable from the internal compartment. In the illustrated, non-limiting embodiment, the air movement mechanism 76 is driven by a motor 78 located at least partially externally to the internal compartment 28. Further, the cooking system 20 may include a vent 80 for exhausting hot air generated by operation of at least one of the air movement mechanism 76 or the motor 78 to the exterior of the cooking system 20. Although the vent 80 is illustrated as being formed at the rear of the internal compartment 28, embodiments where the vent 80 is formed at another location are also contemplated herein.

[0099] An example of the air movement mechanism 76 is illustrated in more detail in FIGS. 5 and 6. In the illustrated, non-limiting embodiment, the air movement mechanism 76 includes a fan wheel 82 positioned within a fan housing 84. As shown, the fan wheel 82 is configured to rotate about an axis X oriented generally horizontally, and in some embodiments, the axis of the fan wheel is oriented perpendicular to the translational axis along which the cooking container 32 is configured to move relative to the housing 22. The fan housing 84 has an outer wall 86 having a scroll-shaped length, a first sidewall 88

including a first inlet aperture 90 and a second sidewall (not shown) including a second inlet aperture. Although the outlet opening 92 of the fan housing 84 is illustrated as being generally rectangular in shape, embodiments where the outlet opening 92 is another shape are also contemplated herein.

[0100] With specific reference now to FIG. 6, the fan wheel 82 is typically formed with first wheel portion 94 and a second wheel portion 96. Both the first wheel portion 94 and the second wheel portion 96 function as an air inlet and are configured to provide air to a single plenum. The air inlet defined by the first wheel portion 94 is arranged in a first plane at a first side of the air movement mechanism 76 and the air inlet defined by the second wheel portion 96 is arranged in a second plane at a second side of the air movement mechanism 76, the first and second planes being generally parallel. Accordingly, the air inlets defined by the first and second wheel portions 94, 96 remain generally fixed relative to both the fan housing 84 and an axis of rotation of the fan wheel 82. The first wheel portion 94 includes a first plurality of impeller blades 98 and the second wheel portion 96 similarly includes a second plurality of impeller blades 100. One or both of the first plurality and the second plurality of impeller blades 98, 100 may have a backward curved configuration, a forward curved configuration, or another configuration.

[0101] With reference now to FIG. 7, a control panel or user interface 102 may be positioned at an exterior surface of the housing 22. The control panel 102 includes one or more inputs 104 associated with energizing the heating element 70 of the cooking system 20 and for selecting various modes of operation of the cooking system 20. One or more of the inputs 104 may include a light or other indicator to show that the respective input has been selected. The control panel 102 may additionally include a display 106 separate from and associated with the at least one input 104. However, embodiments where the display 106 is integrated into the at least one input 104 are also contemplated herein.

[0102] Operation of the one or more inputs 104 will be described in more detail below. FIG. 7 illustrates an example of a control system 108 of the cooking system 20 including a controller or processor 110 for controlling operation of the heating element 70 and air movement device 76 (including the motor 78 associated therewith), and in some embodiments for executing stored sequences of heating operation. The processor 110 is operably coupled to the control panel 102 and to the heating element 70 and the air movement mechanism 76.

[0103] In addition, the cooking system 20 may include one or more sensors S for monitoring one or more parameters associated with the temperature of the heating element

70, the cooking volume, the airflow being delivered to the cooking volume and/or and the insert 50 positioned within the cooking container 32 during a cooking operation.

Accordingly, operation of the cooking system 20, and in particular of the one or more heating elements 70, may be regulated in response to the parameters sensed by the one or more sensors S. In an embodiment, the one or more sensors S includes a temperature sensor arranged in communication with the processor 110. In an embodiment, the temperature sensor(s) S, such as a negative temperature coefficient (NTC) sensor for example, is positioned adjacent the rear of the internal compartment 28, upstream from the air duct 74 defined between the back wall 62 of the cooking container 32 and the blocking wall 52 of the insert 50. In embodiments of the cooking system 20 including one or more temperature sensors S, adjustment of an operating parameter, such as operation of the heating element 70 for example, may be performed using the control algorithm in response to the temperature of the heated airflow, measured by the temperature sensor S disposed in the heated airflow. For example, power provided to the heating element 70 may be increased if the sensed airflow temperature is below a set point, and the power provided to the heating element 70 may be reduced or ceased completely if the sensed airflow temperature is above a set point, thereby allowing the cooking volume to cool.

[0104] In an embodiment, the air movement mechanism 76 of the cooking system 20 is a variable speed fan operable at a plurality of rotational speeds. In an embodiment, the operational speed of the air movement mechanism 76 may vary based on the cooking mode selected. For example, the speed of the air movement mechanism 76 during operation in a first cooking mode may be different than the speed of the air movement mechanism 76 during operation in a second cooking mode. The operational speed of the air movement mechanism 76 may be controlled by the processor 110 in response to one or more inputs 104, including selection of a cooking mode. However, the processor 110 may also be configured to adjust the operational speed of the air movement mechanism 76, or alternatively, the power supplied to the at least one heating elements 70 to control the temperature and/or pressure within the interior 38 of the cooking container 32.

[0105] In an embodiment, at least one input 104 on the control panel 102 is an on/off button which allows the user to activate or deactivate the control panel 102. When the control panel 102 is deactivated, the one or more heating elements 70 are not energized. In an exemplary embodiment, the at least one input 104 is operable to select one or more manual modes of operation of the heating element 70. Alternatively, or in addition, at least one input 104 is operable to select a stored sequence of operation of the heating element 70. In some

cases, the stored sequences may be particularly well suited for a given method of food preparation and/or for particular ingredients or types of ingredients. The plurality of stored sequences associated with the at least one input 104 may be stored within a memory accessible by the processor 110. Alternatively, the plurality of stored sequences may be stored remotely from the cooking system 20, and may be accessed by the processor 110, such as via wireless communication for example.

[0106] In addition, a user may be able to enter a time associated with operation of the cooking system 20 in a desired manual mode. The time may be entered via the same input 104 or a separate input 104 as used to select a mode of operation. Further in embodiments where the cooking system 20 is in a mode configured to perform a stored sequence in response to selection of one of the inputs 104, the display 106 may indicate a time remaining. Temperature or other parameters may also be entered via inputs 104 and/or shown on the display 106.

[0107] The at least one input 104 may include a distinct start button intended to initiate operation in a desired mode, a distinct stop button to cease all operation, or a stop/start button intended to initiate and cease functions. Alternatively, the cooking system 20 may be operable to automatically start operation after a predetermined time has elapsed once an input 104 has been selected and any necessary information has been provided to the control panel 102. Alternatively, one or more of the other inputs 104 may be operable to start and stop operation of the cooking system 20, regardless of whether the cooking system 20 is following a stored sequence or is in a manual mode.

[0108] As previously noted, the one or more inputs 104 may be operable to initiate operation of the cooking system 20 in a plurality of cooking modes. In an embodiment, the cooking system 20 is operable in a cooking mode where the heating element 70 is employed to perform a non-contact heating operation, such as a convective or radiative heating operation. Suitable cooking operations that may be performed in this first cooking mode include, but are not limited to air frying, broiling, baking/roasting, and dehydrating.

[0109] During operation in the first cooking mode, the air movement mechanism 76 is operable to circulate a heated air flow through the cooking volume. As previously described, the air movement mechanism 76 is operable to draw air upwards, through the adjacent heating element 70 and into the two inlets arranged at opposing sides of the fan wheel 82. The heated air is expelled outwardly from the outlet opening 92 of the fan housing 84 in a single direction. In the illustrated, non-limiting embodiment, the air output from the air movement mechanism 76 is provided within a plane directed downwardly into the

cooking container 32. In the illustrated, non-limiting embodiment, the outlet opening 92 arranged directly adjacent the upper extent 72 of the cooking container 32, such that the air is expelled from the outlet opening 92 directly into the air duct 74 formed within the cooking container 32. Once the heated air reaches the bottom surface 58 of the cooking container 32, the hot air will be deflected off the bottom surface 58 towards the cooking volume. Because the bottom surface 58 of the cooking container 32 is sloped, the interaction between the heated air and the sloped bottom surface 58 directs the heated air both forwards and upwardly, causing the air to evenly distribute from the back to the front of the cooking container 32 before passing through the openings 56 formed in the food support surface 54 of the insert 50. The hot air is drawn by the air movement mechanism 76 through the openings 56 and over the exterior of the food items positioned on the food support surface 54. From within the cooking volume, the air is then drawn back into one of the inlets of the air movement mechanism 76 for further circulation within the interior 28.

[0110] With reference now to FIGS. 8-15, in an embodiment of the cooking system 20, the housing 22 includes a plurality of internal compartments arranged within the interior of the housing 22. For example, as best shown in FIGS. 8, 14, and 15, the housing 22 is illustrated as having a first internal compartment 28a and a second internal compartment 28b, separated from one another at least in part by a divider or wall 130. The divider 130 extends vertically from a base of the housing or liner 30 and forms a sidewall of a bottom portion of two adjacent internal compartments 28a, 28b. In an embodiment, the divider 130 extends to a lower edge of an upper portion of each internal compartment 28a, 28b, the upper portion of each internal compartment containing the respective heating element 70a, 70b, and air movement mechanism 76a, 76b associated therewith. As shown, the plurality of internal compartments 28a, 28b (both the upper and lower portions) are fluidly separate from one another. Although two internal compartments 28a, 28b are illustrated and described herein, it should be understood that embodiments including any number of internal compartments, such as more than two compartments are also within the scope of the disclosure. The plurality of internal compartments 28a, 28b may be substantially similar in size and shape, or alternatively, may be different.

[0111] Each of the internal compartments 28a, 28b formed in the housing 22 may be substantially identical to the internal compartment 28 previously described with respect to FIGS. 1-6. More specifically, a respective cooking container 32a, 32b is insertable into each internal compartment 28a, 28b, and an insert 50a, 50b may be removably installed within the interior 38a, 38b of each cooking container 32a, 32b. In addition, each internal compartment

28a, 28b includes at least one heating element 70a, 70b and an air movement mechanism 76a, 76b configured to circulate air through the internal compartment 28a, 28b, respectively. The components associated with operation of each internal compartment, such as the heating element and air movement mechanism are also independently operable and fluidly separate from the components of the adjacent internal compartment.

[0112] In the non-limiting embodiment of FIGS. 14 and 15, each air movement mechanism 76a, 76b is illustrated as a fan wheel or impeller 82 that is configured to rotate about a generally vertically oriented axis. The air movement mechanisms 76a, 76b need not include a separate housing as previously described with respect to the embodiment of FIGS. 1-6. As shown, the air movement mechanisms 76a, 76b may be stacked vertically relative to the heating element 70a, 70b such that a flow of air is configured to flow from the heating element 70a, 70b directly to the air movement mechanism 76a, 76b sequentially. The axial flow of air provided to the inlet of the air movement mechanism 76a, 76b is expelled from the impeller 82a, 82b radially, adjacent the sides of the internal compartment 28. Although this configuration of the air movement mechanism 76a, 76b is illustrated with respect to an embodiment of the cooking system 20 including a plurality of fluidly distinct internal compartments 28a, 28b, it should be understood that such an air movement mechanism 76 may also be used in embodiments of the cooking system 20 including only a single internal compartment 28.

[0113] As noted above, the cooking system 20 includes a motor 78 located external to the internal compartment 28 and operable to rotate an air movement mechanism 76 about an axis of rotation X. In embodiments of the cooking system 20 including two distinct internal compartments, a single motor 78 may be used to drive both a first air movement mechanism 76a associated with the first internal compartment 28a and a second air movement mechanism 76b associated with the second internal compartment 28b. In such embodiments, the motor 78 may be disposed within the housing 22 between the first and second compartments 28a, 28b, such that the first air movement mechanism 76a is mounted to a first output shaft 120 extending from a first side of the motor 78 and the second air movement mechanism 76b is mounted to a second output shaft 122 extending from a second side of the motor 78. As a result, the first air movement mechanism 76a and the second air movement mechanism 76b may be positioned coaxially (see FIG. 10). However, embodiments, where the axis of rotation X1 of the first air movement mechanism 76a is offset from the axis of rotation X2 of the second air movement mechanism 76b are also contemplated herein.

[0114] Because a single motor 78 is used to drive the both the first and second air movement mechanisms 76a, 76b, in an embodiment, both the first and second air movement mechanisms 76a, 76b are driven about their axes, even when only one of the first and second internal compartment 28a, 28b is being used to perform a cooking operation. Accordingly, an air movement mechanism 76 may rotate about its axis even when the adjacent heating mechanism 70 associated therewith is non-operational. In other embodiments, the first and second air movement mechanisms 76a, 76b may be independently operable via a shared motor 78. Further, in an embodiment, the motor 78 is operable to rotate the first and second air movement mechanisms 76a, 76b, at the same speed. However, embodiments where the first and second air movement mechanisms 76a, 76b, are rotated at different speeds, such as via a coupling for example, are also within the scope of the disclosure.

[0115] However, it should be understood that embodiments of the cooking system 20 that include a separate motor associated with each internal compartment are also within the scope of the disclosure. For example, as shown in FIG. 15, the system 20 includes two separate motors 78a, 78b configured to operate the air movement mechanisms 76a, 76b associated with the first and second internal compartments 28a, 28b independently. In such embodiments, each motor 78a, 78b may be located external to the internal compartment 28, for example in a vertically stacked configuration relative to the heating elements 70a, 70b, and the air movement mechanisms 76a, 76b. In such embodiments, the motors 78a, 78b may be located near an upper end or top surface of the housing 22.

[0116] In embodiments of the cooking system 20 including a plurality of internal compartments, a single control system 108, as previously described with respect to FIG. 7, may be suitable to selectively perform one or more cooking operations associated with both the first internal compartment 28a and the second internal compartment 28b. Accordingly, the same inputs 104 may be used to provide control for the plurality of internal compartments 28a, 28b, or alternatively, distinct inputs 104 may be associated with each of the plurality of internal compartments 28a, 28b, respectively.

[0117] All references, including publications, patent applications, and patents cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0118] The use of the terms “a” and “an” and “the” and similar referents in the context of describing the disclosure (especially in the context of the following claims) is to be construed to cover both the singular and the plural, unless otherwise indicated herein or

clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to,”) unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate the disclosure and does not pose a limitation on the scope of the disclosure unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the disclosure.

[0119] Exemplary embodiments of this disclosure are described herein, including the best mode known to the inventors for carrying out the disclosure. Variations of those embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the disclosure to be practiced otherwise than as specifically described herein. Accordingly, this disclosure includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

CLAIMS

What is claimed is:

1. A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly; and
a heating element associated with said at least one internal compartment.
2. The cooking system of claim 1, wherein said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.
3. The cooking system of claim 1, wherein said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.
4. The cooking system of claim 1, wherein said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.
5. The cooking system of claim 1, further comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.
6. The cooking system of claim 5, wherein said insert at least partially defines said cooking volume within said interior of said cooking container.
7. The cooking system of claim 5, wherein said food support surface has a generally horizontal orientation when said insert is arranged within said interior of said cooking container.
8. The cooking system of claim 5, wherein said food support surface is offset from said bottom surface of said cooking container by a clearance.
9. The cooking system of claim 8, wherein said clearance defined between said food support surface and said bottom surface of said cooking container varies over at least one dimension of the cooking container.
10. The cooking system of claim 5, wherein said insert further comprises at least one protrusion and said bottom surface of said cooking container further comprises at least one channel, said at least one protrusion being positioned within said at least one channel when said insert is properly installed in said interior of said cooking container.

11. The cooking system of claim 5, wherein an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.

12. The cooking system of claim 11, wherein said insert further comprises a blocking wall arranged at an angle to said food support surface and said air duct is defined between said blocking wall and a back wall of said cooking container.

13. The cooking system of claim 1, further comprising an air movement mechanism disposed in said housing.

14. The cooking system of claim 13, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

15. The cooking system of claim 13, wherein said air movement mechanism further comprises:

a fan housing having a first inlet, a second inlet and an outlet, the first inlet and the second inlet being arranged in fluid communication with said outlet; and

a fan wheel rotatably mounted within said fan housing.

16. The cooking system of claim 15, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

17. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said at least one internal compartment; and

an air movement mechanism disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally.

18. The cooking system of claim 17, wherein said axis of rotation is oriented substantially perpendicular to a flow provided at an outlet of said air movement mechanism towards a relative bottom of said housing.

19. The cooking system of claim 17, wherein said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

20. The cooking system of claim 17, wherein said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

21. The cooking system of claim 20, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

22. The cooking system of claim 17, further comprising a motor operable to rotate said air movement mechanism about said axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

23. The cooking system of claim 17, wherein said air movement mechanism further comprises:

a fan housing; and

a fan wheel rotatably mounted within said fan housing.

24. The cooking system of claim 23, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

25. The cooking system of claim 24, wherein a configuration of said first plurality of impeller blades is substantially identical to a configuration of said second plurality of impeller blades.

26. The cooking system of claim 24, wherein a configuration of said first plurality of impeller blades is different than a configuration of said second plurality of impeller blades.

27. The cooking system of claim 17, wherein said air movement mechanism is disposed vertically above said cooking volume.

28. The cooking system of claim 17, wherein said air movement mechanism is disposed vertically above said cooking container.

29. The cooking system of claim 17, further comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

30. The cooking system of claim 17, wherein said air movement mechanism is horizontally offset from said heating element.

31. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said cooking volume;
a rotatable air movement mechanism having:
a first inlet arranged in a first plane of said air movement mechanism;
a second inlet arranged in a second plane of said air movement mechanism,
said second plane being distinct from said first plane; and
an outlet arranged in fluid communication with both said first inlet and said second inlet.

32. The cooking system of claim 31, wherein said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

33. The cooking system of claim 32, wherein said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

34. The cooking system of claim 31, wherein said first plane and said second plane are substantially parallel.

35. The cooking system of claim 31, wherein said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

36. The cooking system of claim 35, wherein said second side is opposite said first side.

37. The cooking system of claim 31, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

38. The cooking system of claim 31, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

39. The cooking system of claim 31, wherein said air movement mechanism further comprises:

a fan housing; and

a fan wheel rotatably mounted within said fan housing.

40. The cooking system of claim 39, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

41. The cooking system of claim 31, wherein said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

42. The cooking system of claim 31, further comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

43. The cooking system of claim 31, wherein said air movement mechanism is horizontally offset from said heating element.

44. A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;
a heating element associated with said cooking volume;
a plurality of air movement mechanisms disposed within said housing; and
a motor operably coupled to said plurality of air movement mechanisms.

45. The cooking system of claim 44, wherein said motor is located externally to said at least one internal compartment.

46. The cooking system of claim 44, wherein said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

47. The cooking system of claim 46, wherein said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

48. The cooking system of claim 46, wherein said first air movement mechanism and a second air movement mechanism are arranged coaxially.

49. The cooking system of claim 46, wherein said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed and said second speed being substantially identical.

50. The cooking system of claim 46, wherein said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed being different than said second speed.

51. The cooking system of claim 46, wherein said at least one internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

52. The cooking system of claim 51, wherein said first air movement mechanism is positioned within said first internal compartment and said second air movement mechanism is positioned within said second internal compartment.

53. The cooking system of claim 51, wherein said motor is positioned between said first internal compartment and said second internal compartment.

54. A cooking system comprising:
a housing having at first internal compartment and a second internal compartment;
at least one cooking container receivable within one of said first internal compartment and said second internal compartment, wherein at least one cooking volume is defined within an interior of said at least one cooking container; and
at least one heating element disposed in said housing.

55. The cooking system of claim 54, wherein said at least one cooking container is a first cooking container receivable within said first internal compartment and a second cooking container receivable within said second internal compartment, wherein a first cooking volume is defined within an interior of said first cooking container and a second cooking volume is defined within an interior of said second cooking container.

56. The cooking system of claim 54, wherein said at least one heating element includes a first heating element positioned within said first internal compartment and a second heating element positioned within said second internal compartment.

57. The cooking system of claim 54, further comprising at least one air movement mechanism disposed within said housing.

58. The cooking system of claim 57, wherein said at least one air movement mechanism is stacked vertically relative to said at least one heating element within said housing.

59. The cooking system of claim 57, wherein said at least one air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

60. The cooking system of claim 57, wherein said at least one air movement mechanism further comprises:
a fan housing; and
a fan wheel rotatably mounted within said fan housing.

61. The cooking system of claim 60, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

62. The cooking system of claim 57, wherein said at least one air movement mechanism includes a first air movement mechanism associated with said first internal compartment and a second air movement mechanism associated with said second internal compartment.

63. The cooking system of claim 57, wherein said at least one air movement mechanism has an axially oriented inlet and a radially oriented outlet.

64. The cooking system of claim 57, wherein said at least one air movement mechanism is rotatable about a vertically oriented axis.

65. The cooking system of claim 57, further comprising a motor operably coupled to said at least one air movement mechanism.

66. The cooking system of claim 65, wherein said motor is located externally from said first internal compartment and said second internal compartment.

67. The cooking system of claim 65, wherein said motor is positioned between said first internal compartment and said second internal compartment.

68. The cooking system of claim 55, wherein said first cooking container and said second cooking container are individually insertable into said first cooking compartment and said second cooking compartment respectively.

69. The cooking system of claim 55, wherein said first internal compartment and said second internal compartment are fluidly separate.

70. The cooking system of claim 55, wherein said first cooking volume and said second cooking volume are fluidly separate.

71. A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;
a heating element associated with said at least one internal compartment; and
an air movement mechanism disposed in said housing, said air movement mechanism being positioned vertically above said cooking volume and horizontally offset from said heating element.

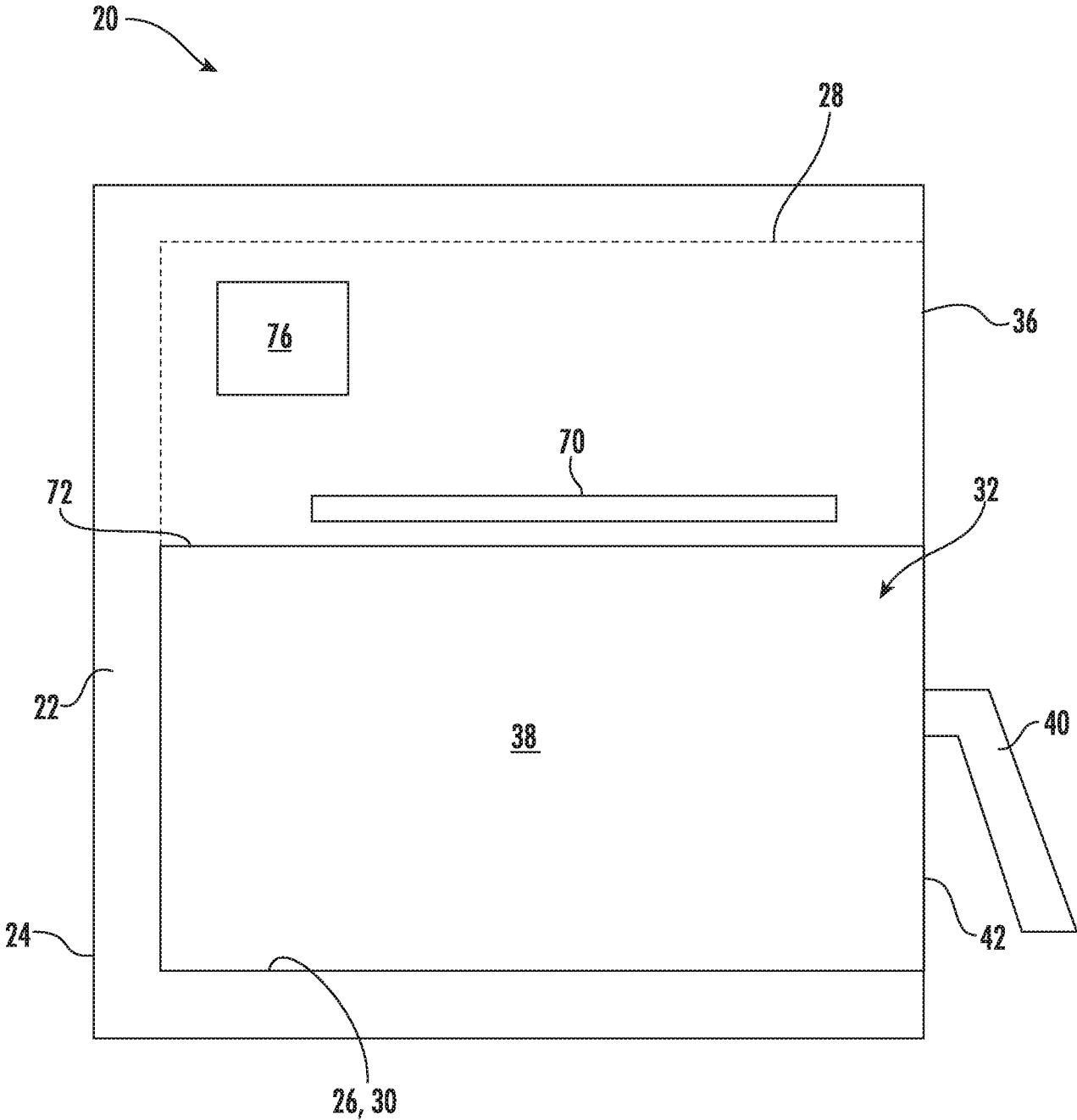


FIG. 1

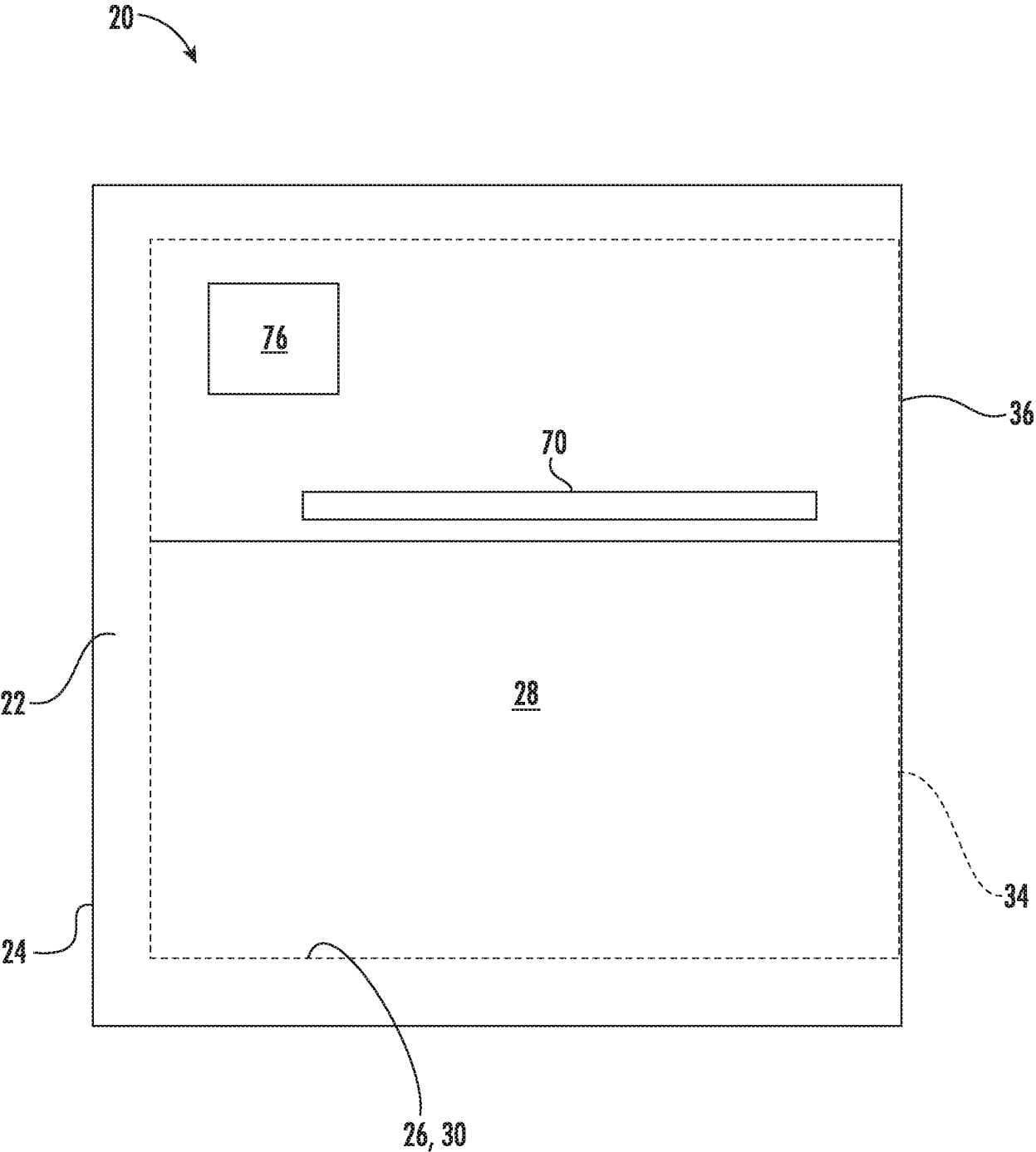


FIG. 2

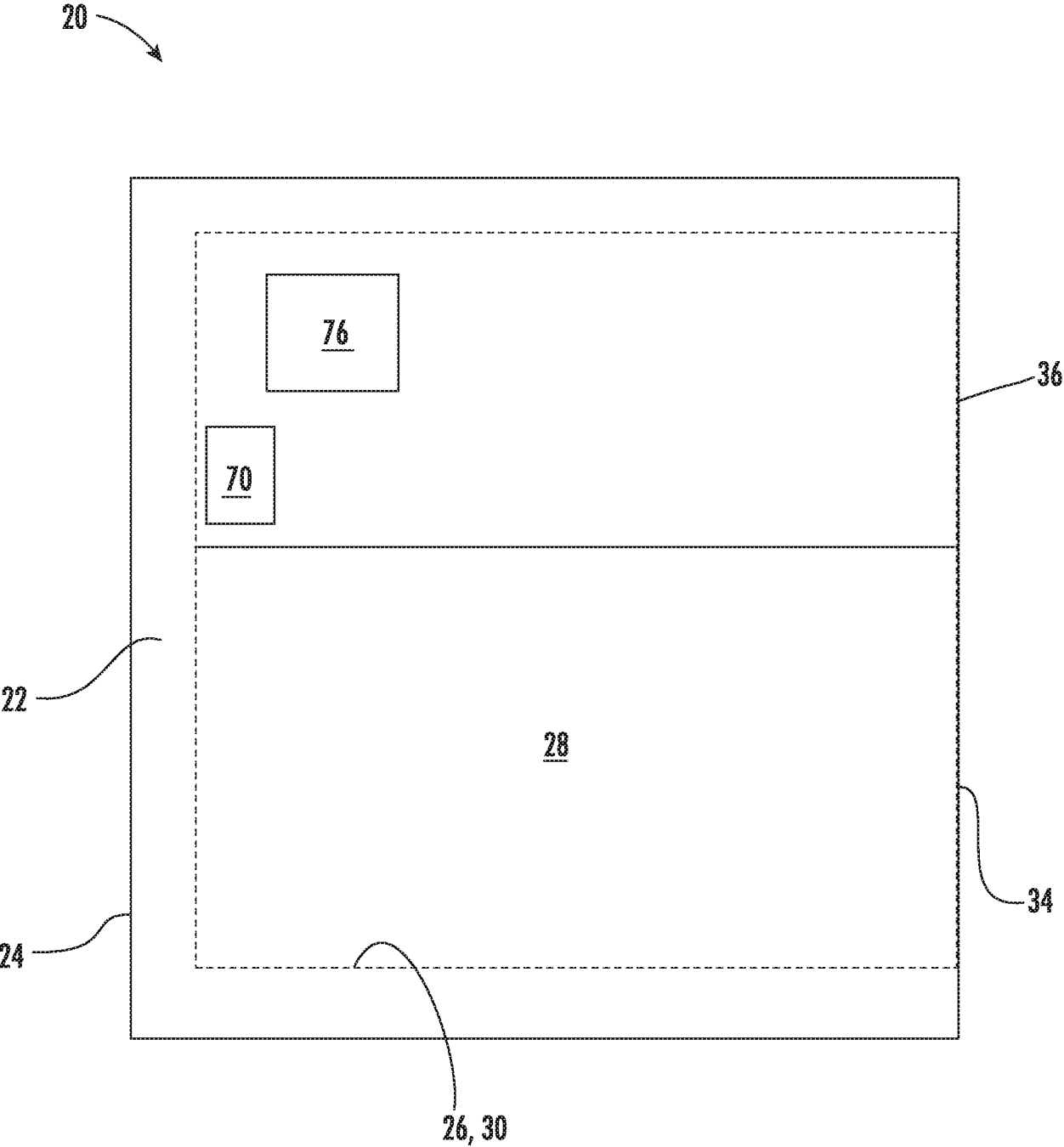
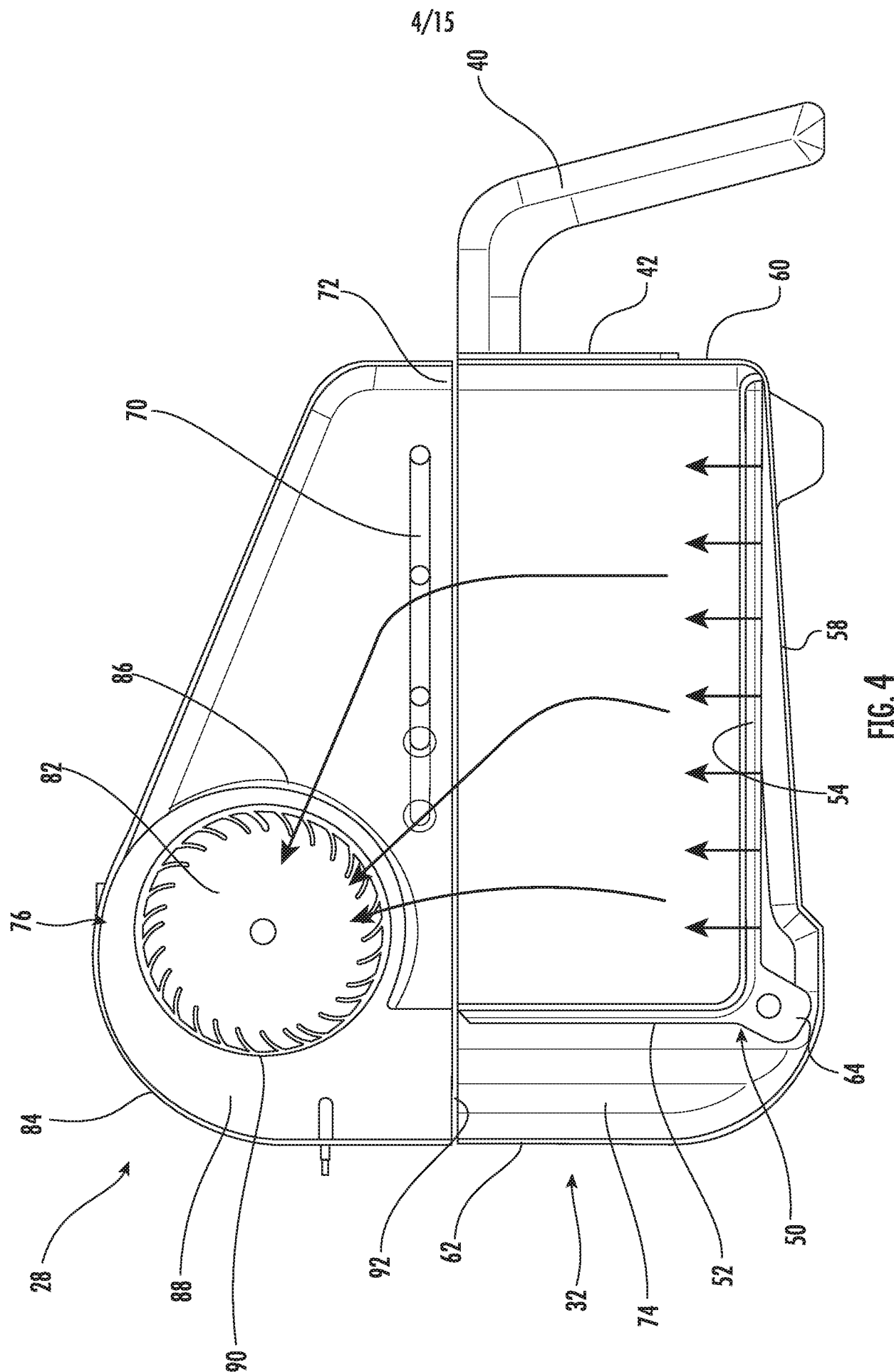


FIG. 3



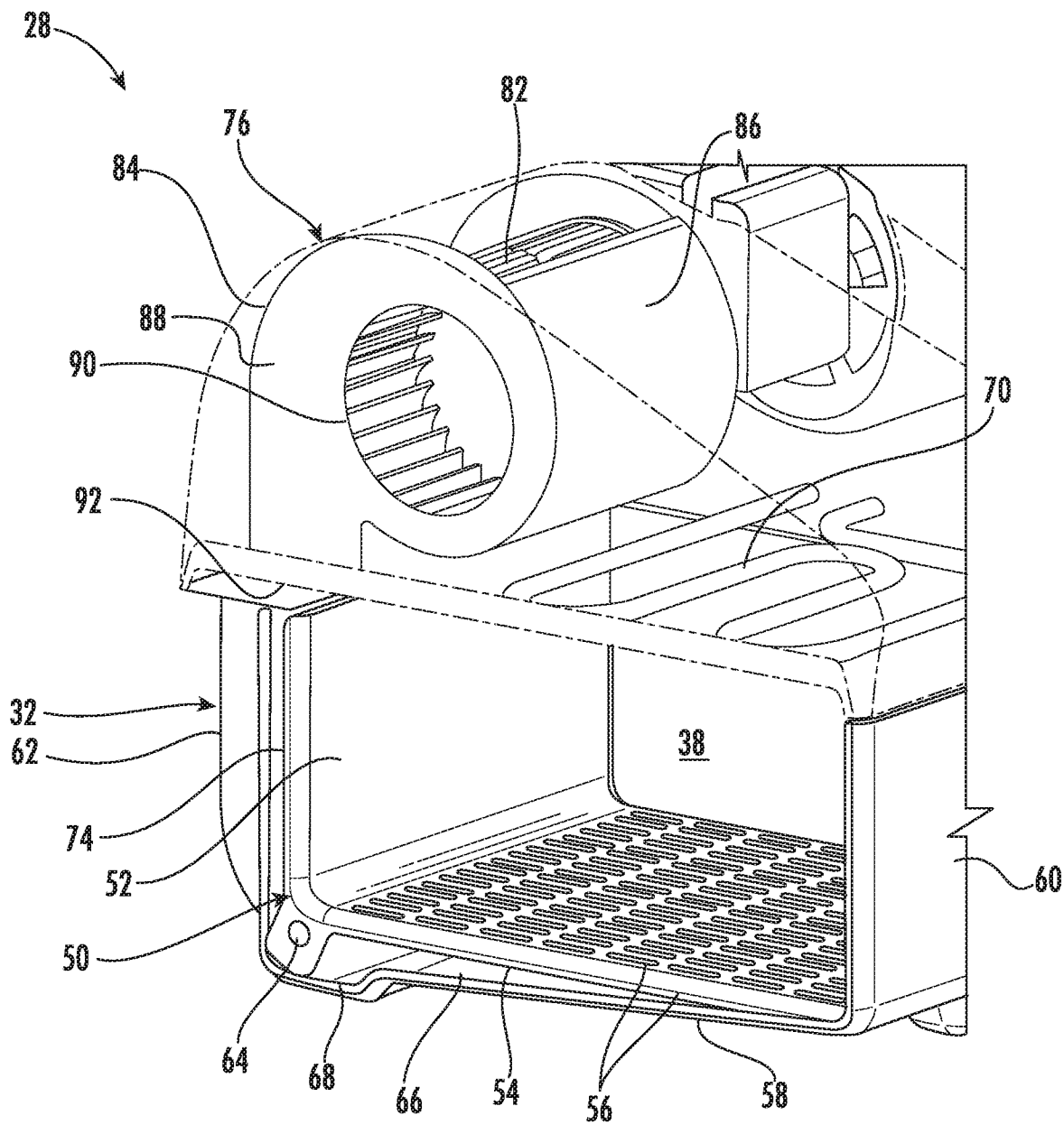


FIG. 5

6/15

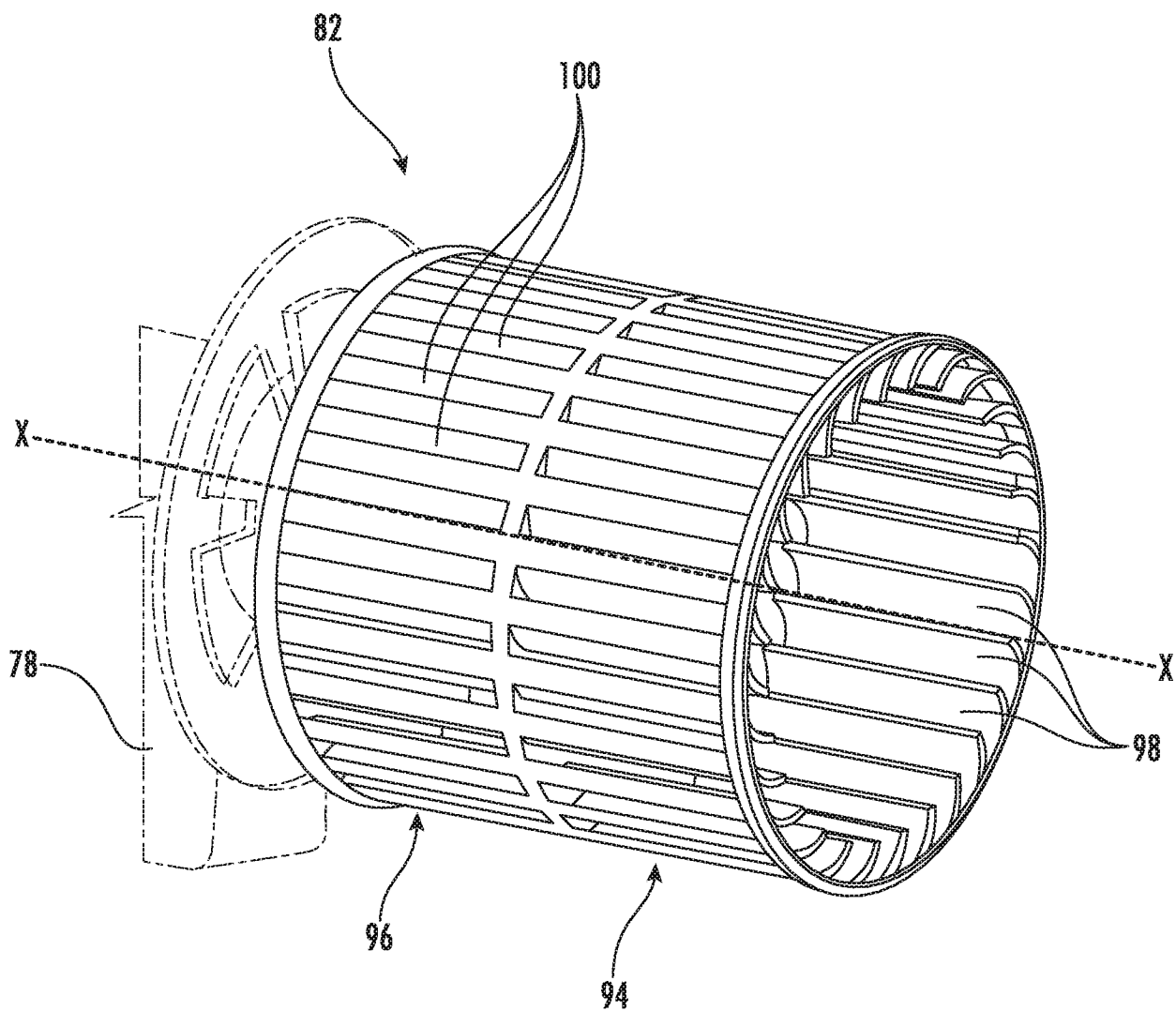


FIG. 6

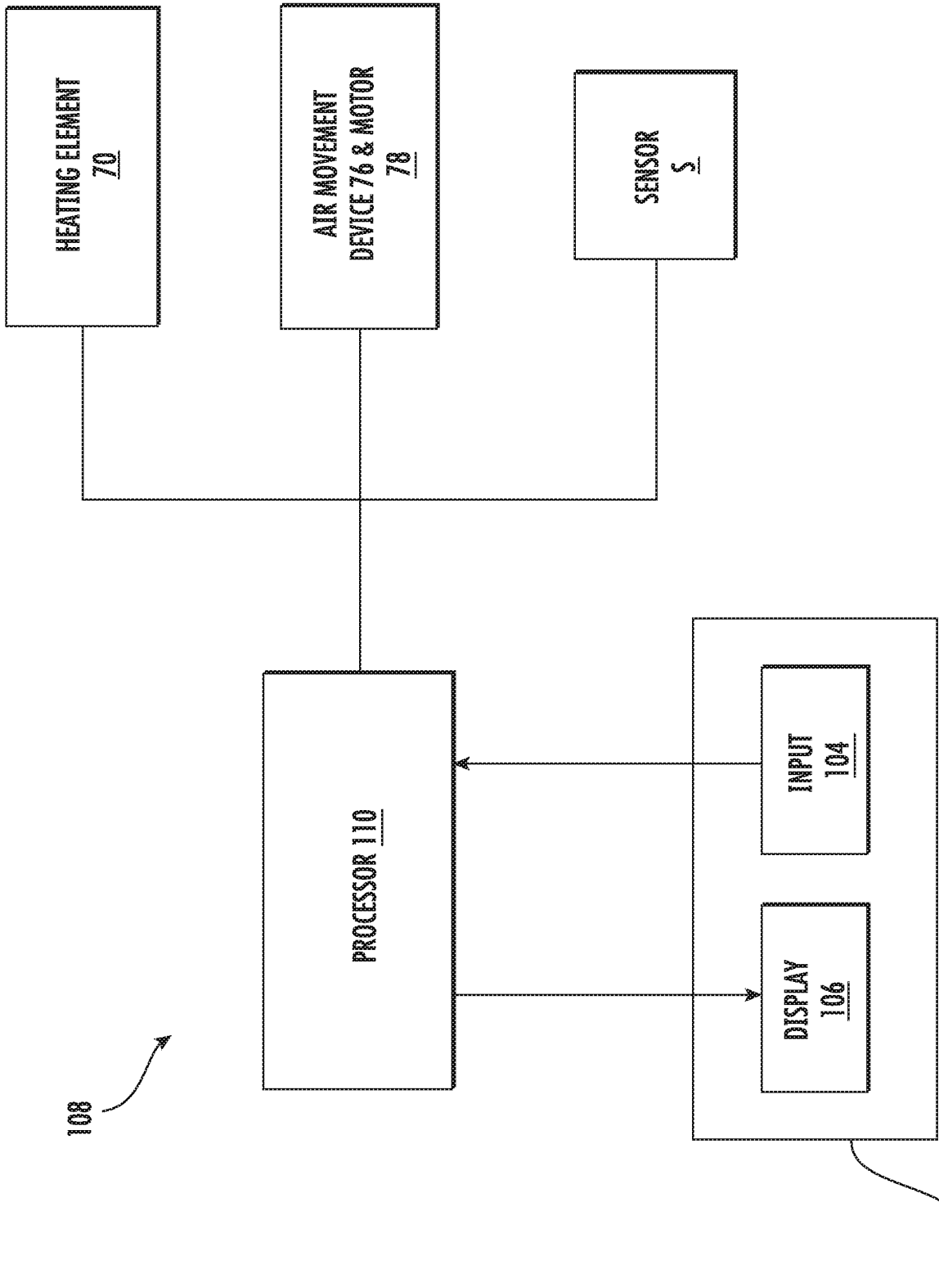


FIG. 7

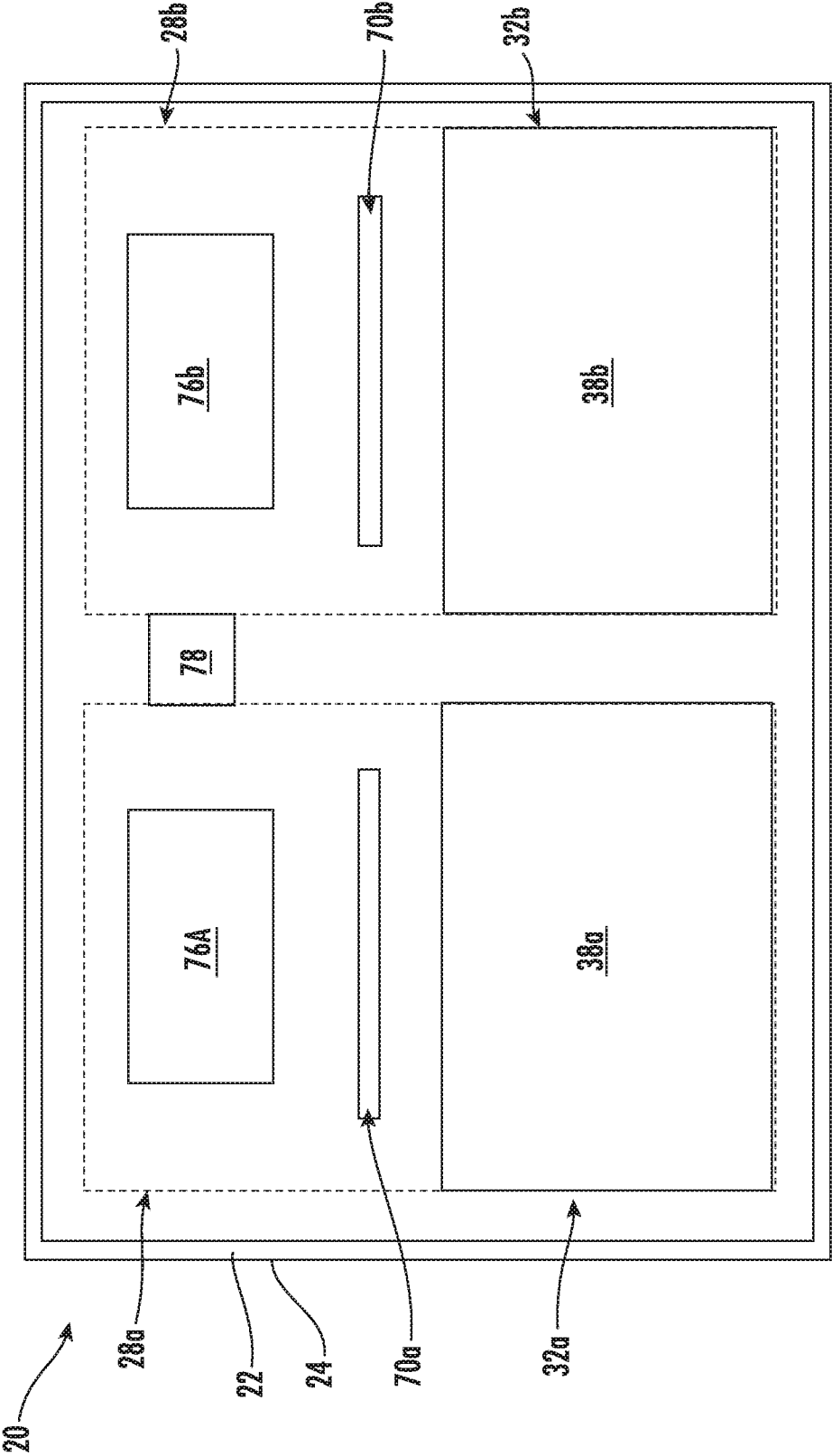


FIG. 8

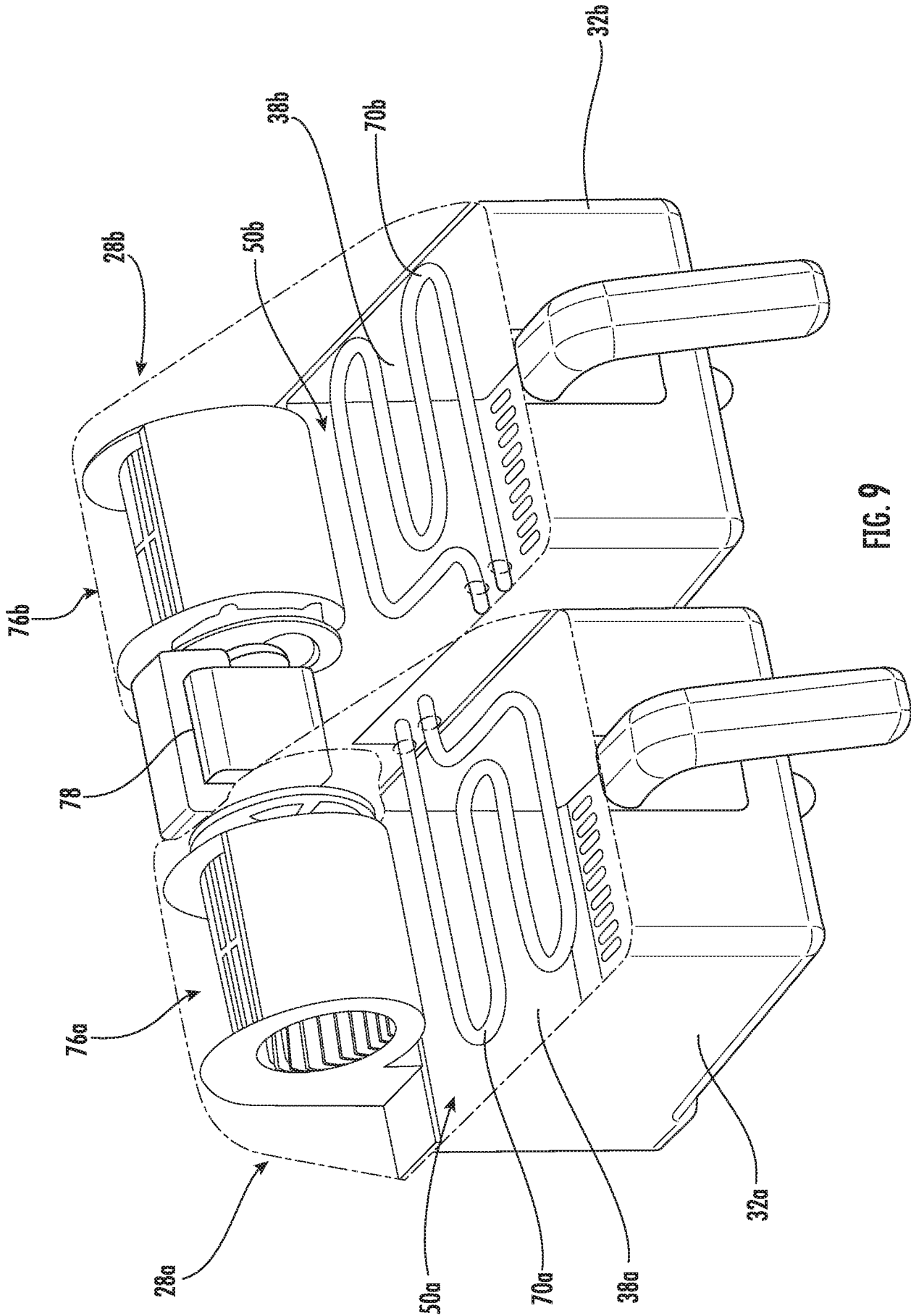
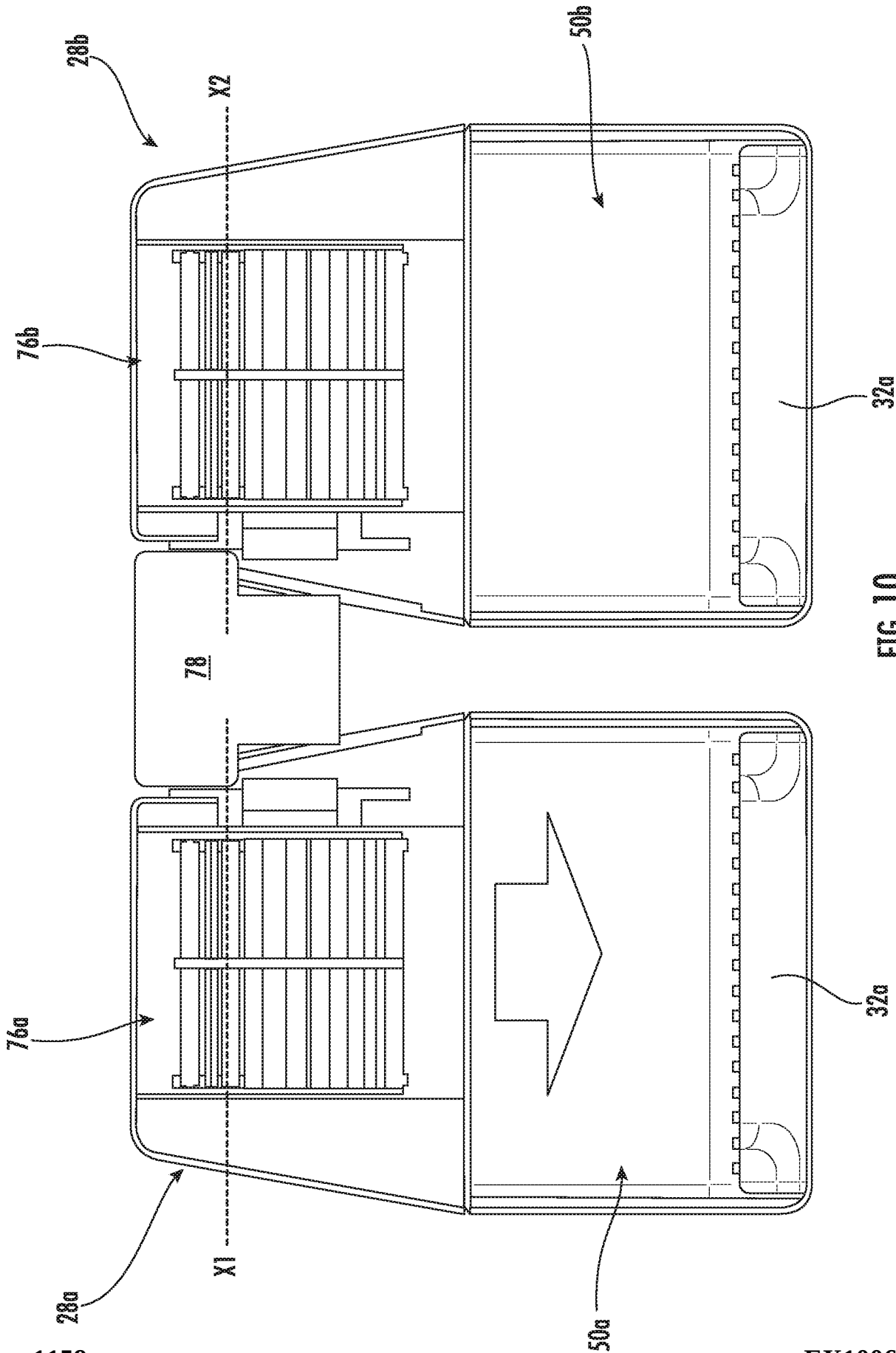


FIG. 9



11/15

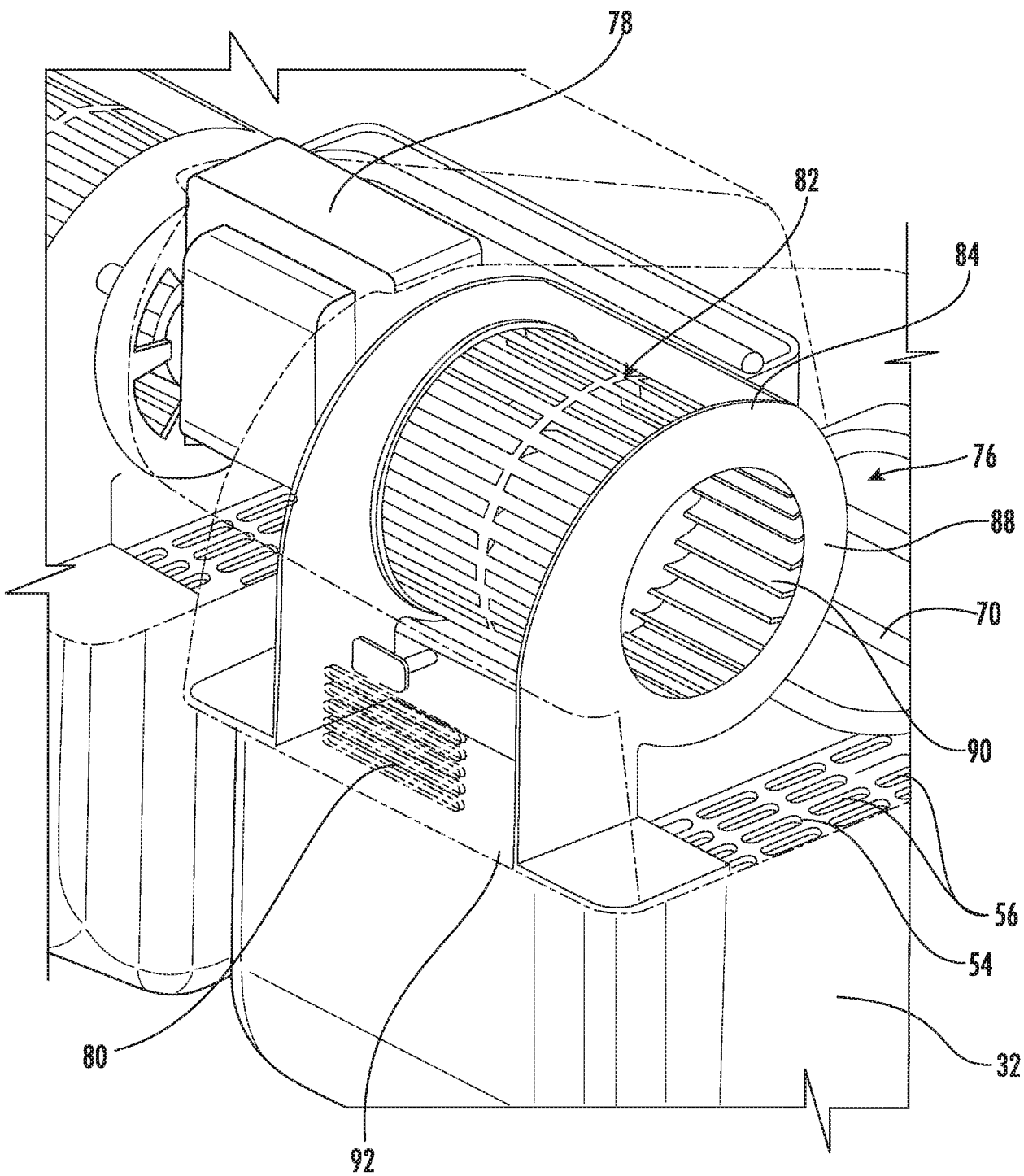


FIG. 11

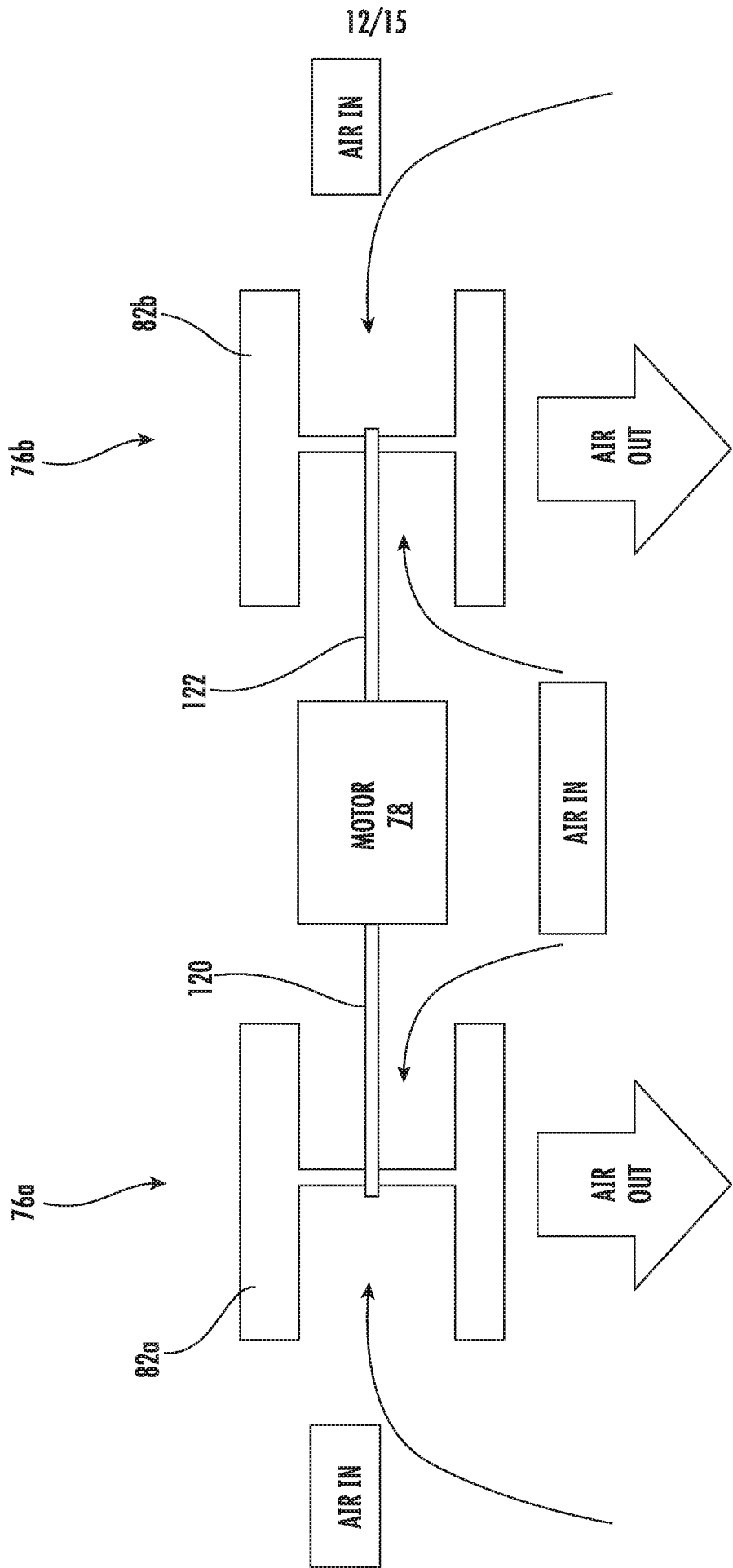


FIG. 12

13/15

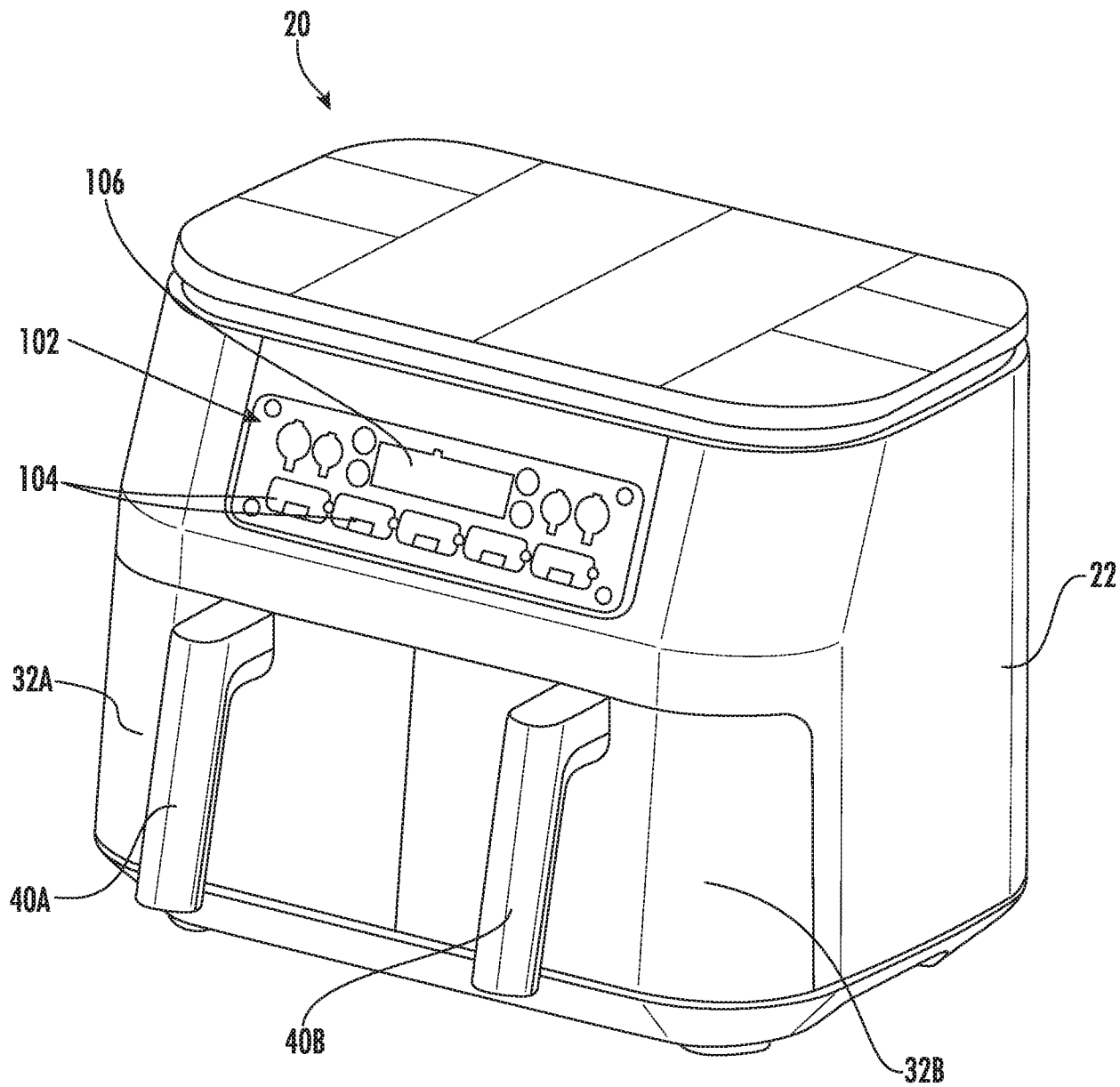


FIG. 13

14/15

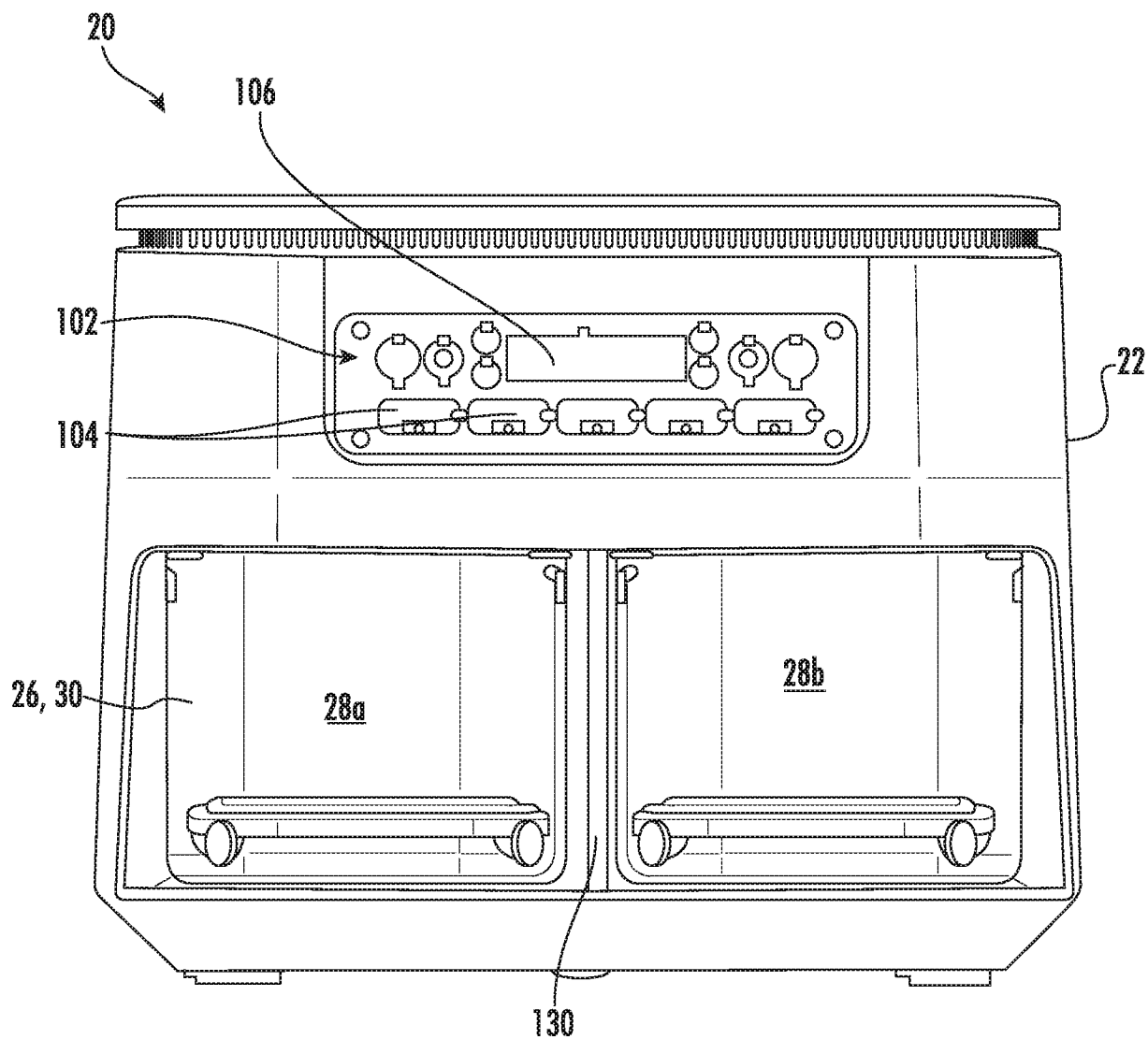
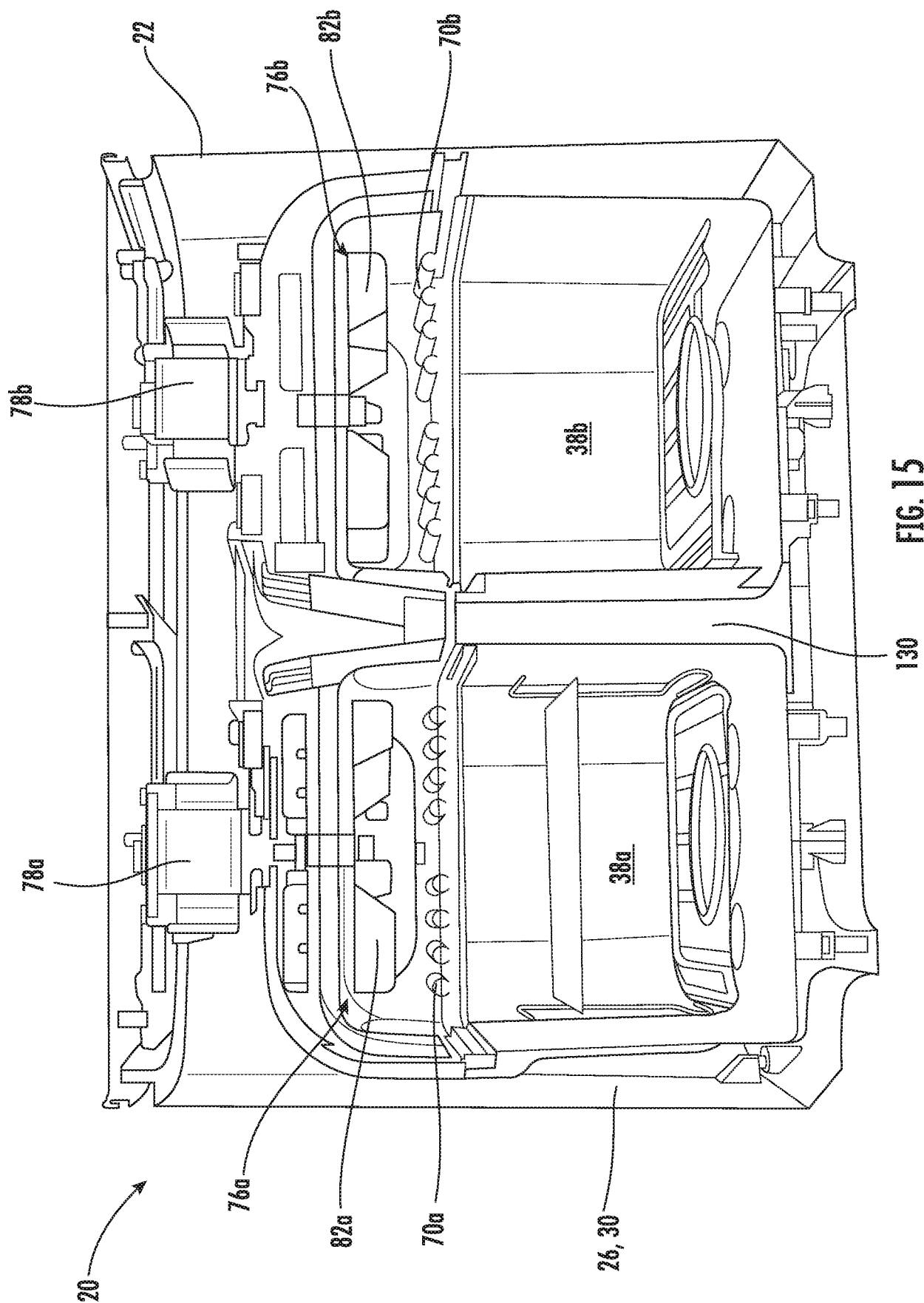


FIG. 14



Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
--------------------------	---

Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Christopher	T.	Martin			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	North Attleboro	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	51 Stoddard Drive					
Address 2						
City	North Attleboro	State/Province	MA			
Postal Code	02760	Country	US			
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Thomas		Guerin			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Boston	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	109 D St. #5					
Address 2						
City	Boston	State/Province	MA			
Postal Code	02127	Country	US			
Inventor	3				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Roger	Neil	Jackson			
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

City	Cornwall	Country of Residence ⁱ	GB
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Mailing Address of Inventor:

Address 1	The Lodge, Hillside		
Address 2	Treburley, Launceton		
City	Cornwall	State/Province	
Postal Code	PL159PU	Country ⁱ	GB
Inventor	4	Remove	
Legal Name			

Prefix	Given Name	Middle Name	Family Name	Suffix
	Joshua	D.	Anthony	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service				
City	North Billerica	State/Province	MA	Country of Residence ⁱ
				US

Mailing Address of Inventor:

Address 1	3 Fieldstone Lane		
Address 2			
City	North Billerica	State/Province	MA
Postal Code	01862	Country ⁱ	US
Inventor	5	Remove	
Legal Name			

Prefix	Given Name	Middle Name	Family Name	Suffix
	Kerry		Schwarz	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service				
City	Needham	State/Province	MA	Country of Residence ⁱ
				US

Mailing Address of Inventor:

Address 1	39 A Street		
Address 2	Suite 100		
City	Needham	State/Province	MA
Postal Code	02494	Country ⁱ	US
Inventor	6	Remove	
Legal Name			

Prefix	Given Name	Middle Name	Family Name	Suffix
	Michaela		Dubeau	
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service				

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

City	Uxbridge	State/Province	MA	Country of Residence	US
------	----------	----------------	----	----------------------	----

Mailing Address of Inventor:

Address 1	39 Aldrich Street				
Address 2					
City	Uxbridge	State/Province	MA		
Postal Code	01569	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	130401		
Email Address		<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

Application Information:

Title of the Invention	COOKING DEVICE AND COMPONENTS THEREOF		
Attorney Docket Number	EUP1549US2	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	15	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication eighteen months after filing.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	130401		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
	a 371 of international	PCT/US2020/042120	2020-07-15
Prior Application Status	Expired	Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
PCT/US2020/042120	Claims benefit of provisional	62/874193	2019-07-15
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			Add

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

			<input type="button" value="Remove"/>
Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ^j (if applicable)
Additional Foreign Priority Data may be generated within this form by selecting the Add button.			<input type="button" value="Add"/>

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013. NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant	1	Remove
<p>If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.</p> <p style="text-align: right;">Clear</p>		
Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
☐ Person to whom the inventor is obligated to assign.		☐ Person who shows sufficient proprietary interest
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
Name of the Deceased or Legally Incapacitated Inventor: <div style="border: 1px solid black; height: 20px; width: 100%;"></div>		
If the Applicant is an Organization check here. ☒		
Organization Name	SHARKNINJA OPERATING LLC	
Mailing Address Information For Applicant:		
Address 1	89 A Street	
Address 2	Suite 100	
City	Needham	State/Province MA
Country	US	Postal Code 02494
Phone Number		Fax Number
Email Address		
Additional Applicant Data may be generated within this form by selecting the Add button. <div style="float: right;">Add</div>		

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Assignee	1			
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				<input type="button" value="Remove"/>
If the Assignee or Non-Applicant Assignee is an Organization check here.				☐
Prefix	Given Name	Middle Name	Family Name	Suffix
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1		<input type="text"/>		
Address 2		<input type="text"/>		
City	<input type="text"/>	State/Province	<input type="text"/>	
Country ⁱ	<input type="text"/>	Postal Code	<input type="text"/>	
Phone Number	<input type="text"/>	Fax Number	<input type="text"/>	
Email Address	<input type="text"/>			
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Alicia Hayter, Reg. No. 67,093/		Date (YYYY-MM-DD)	2021-01-27
First Name	Alicia	Last Name	Hayter	Registration Number
				67093
Additional Signature may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US2
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Christopher T. Martin	Group Art Unit: TBA
Application Serial No.: TBA	Examiner: TBA
Filing Date: January 27, 2021	Confirmation No.: TBA

TITLE: COOKING DEVICE AND COMPONENTS THEREOF

PRELIMINARY AMENDMENT

VIA ELECTRONIC FILING SERVICE

Commissioner of Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Commissioner:

This preliminary amendment is submitted with the application for entry into the U.S. National Phase. This application claims priority to PCT/US2020/042120, filed July 15, 2020, and U.S. 62/874,193, filed July 15, 2019.

Applicants expressly request U.S. National Stage processing upon completion of the requirements under 35 U.S.C. §371(f).

In connection with the filing of this National Phase application, please make the following preliminary amendments prior to payment of the fees and examination.

IN THE SPECIFICATION

Please add the following new paragraph after the title before the background.

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a National Stage application of PCT/US2020/042120, filed July 15, 2020, which claims priority to U.S. Provisional Application 62/874,193, filed July 15, 2019, both of which are incorporated by reference in their entirety herein.

AMENDMENTS TO THE CLAIMS

1. (Original) cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment,
wherein a cooking volume is defined within an interior of said cooking container,
wherein a bottom surface of said cooking container is angled upwardly; and
a heating element associated with said at least one internal compartment.
2. (Original) The cooking system of claim 1, wherein said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.
3. (Original) The cooking system of claim 1, wherein said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.
4. (Original) The cooking system of claim 1, wherein said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.
5. (Original) The cooking system of claim 1, further comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.
- 6.-10. Cancelled
11. (Original) The cooking system of claim 5, wherein an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.
12. Cancelled
13. (Original) The cooking system of claim 1, further comprising an air movement mechanism disposed in said housing.
14. (Original) The cooking system of claim 13, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

15. Cancelled
16. Cancelled
17. (Original) A cooking system comprising:
 - a housing having at least one internal compartment;
 - a cooking container receivable within said at least one internal compartment,wherein a cooking volume is defined within an interior of said cooking container;
 - a heating element associated with said at least one internal compartment; and
 - an air movement mechanism disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally.
18. Cancelled
19. Cancelled
20. (Original) The cooking system of claim 17, wherein said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.
21. Cancelled
22. (Original) The cooking system of claim 17, further comprising a motor operable to rotate said air movement mechanism about said axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.
23. (Original) The cooking system of claim 17, wherein said air movement mechanism further comprises:
 - a fan housing; and
 - a fan wheel rotatably mounted within said fan housing.
24. (Original) The cooking system of claim 23, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.
25. Cancelled
26. Cancelled
27. (Original) The cooking system of claim 17, wherein said air movement

mechanism is disposed vertically above said cooking volume.

28. Cancelled

29. Cancelled

30. (Original) The cooking system of claim 17, wherein said air movement mechanism is horizontally offset from said heating element.

31. (Original) A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said cooking volume;

a rotatable air movement mechanism having:

a first inlet arranged in a first plane of said air movement mechanism;

a second inlet arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane; and

an outlet arranged in fluid communication with both said first inlet and said second inlet.

32. (Original) The cooking system of claim 31, wherein said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

33. Cancelled

34. (Original) The cooking system of claim 31, wherein said first plane and said second plane are substantially parallel.

35. (Original) The cooking system of claim 31, wherein said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

36. Cancelled

37. (Original) The cooking system of claim 31, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of

said air movement mechanism is aligned with said air duct.

38. (Original) The cooking system of claim 31, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

39. Cancelled

40. Cancelled

41. (Original) The cooking system of claim 31, wherein said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

42. Cancelled

43. Cancelled

44. (Original) A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment,
wherein a cooking volume is defined within an interior of said cooking container;
a heating element associated with said cooking volume;
a plurality of air movement mechanisms disposed within said housing; and
a motor operably coupled to said plurality of air movement mechanisms.

45. (Original) The cooking system of claim 44, wherein said motor is located externally to said at least one internal compartment.

46. (Original) The cooking system of claim 44, wherein said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

47. (Original) The cooking system of claim 46, wherein said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

48.-50. Cancelled

51. (Original) The cooking system of claim 46, wherein said at least one

internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

52 -70. Cancelled

71. (Original) A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment,

wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said at least one internal compartment; and

an air movement mechanism disposed in said housing, said air movement mechanism being positioned vertically above said cooking volume and horizontally offset from said heating element.

REMARKS

Claims 1-71 are pending in the present Application. Claims 6-10, 12, 15, 16, 18, 19, 21, 25, 26, 28, 29, 33, 36, 39, 40, 42, 43, 48-50, 52-70 have been cancelled, leaving Claims 1-5, 11, 13-14, 17, 20, 22-24, 27, 30-32, 34-35, 37-38, 41, 44-47, 51, and 71 for consideration upon entry of the present Amendment. No new matter has been introduced by these amendments.

Consideration and allowance of the claims is respectfully requested in view of the above amendments and the following remarks.

If there are any charges with respect to this amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicant. The Office is invited to contact Applicant's attorney at the below phone number regarding this preliminary amendment or otherwise concerning this application.

Respectfully submitted,
CANTOR COLBURN LLP

Date: January 27, 2021

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1/15

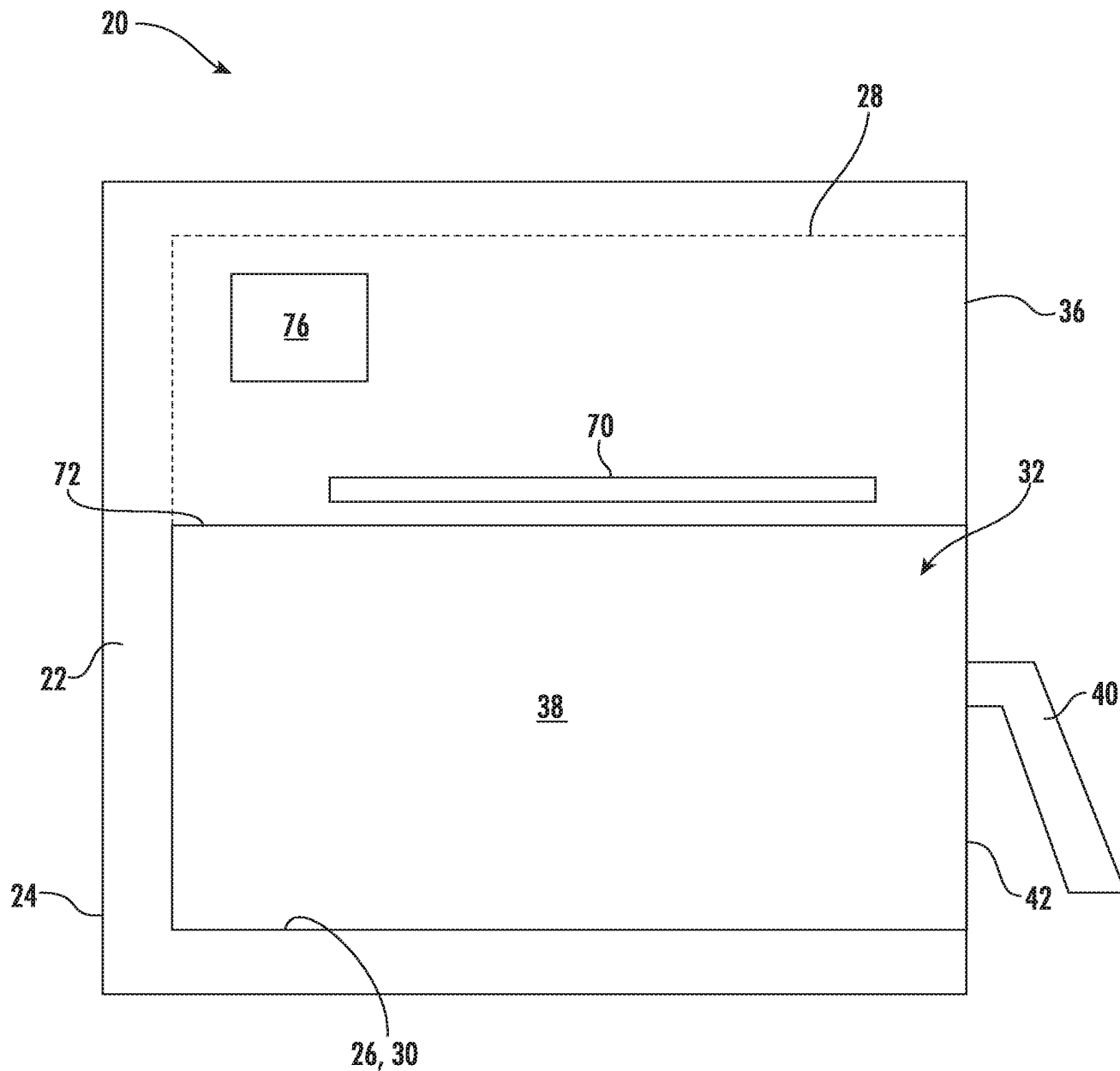


FIG. 1

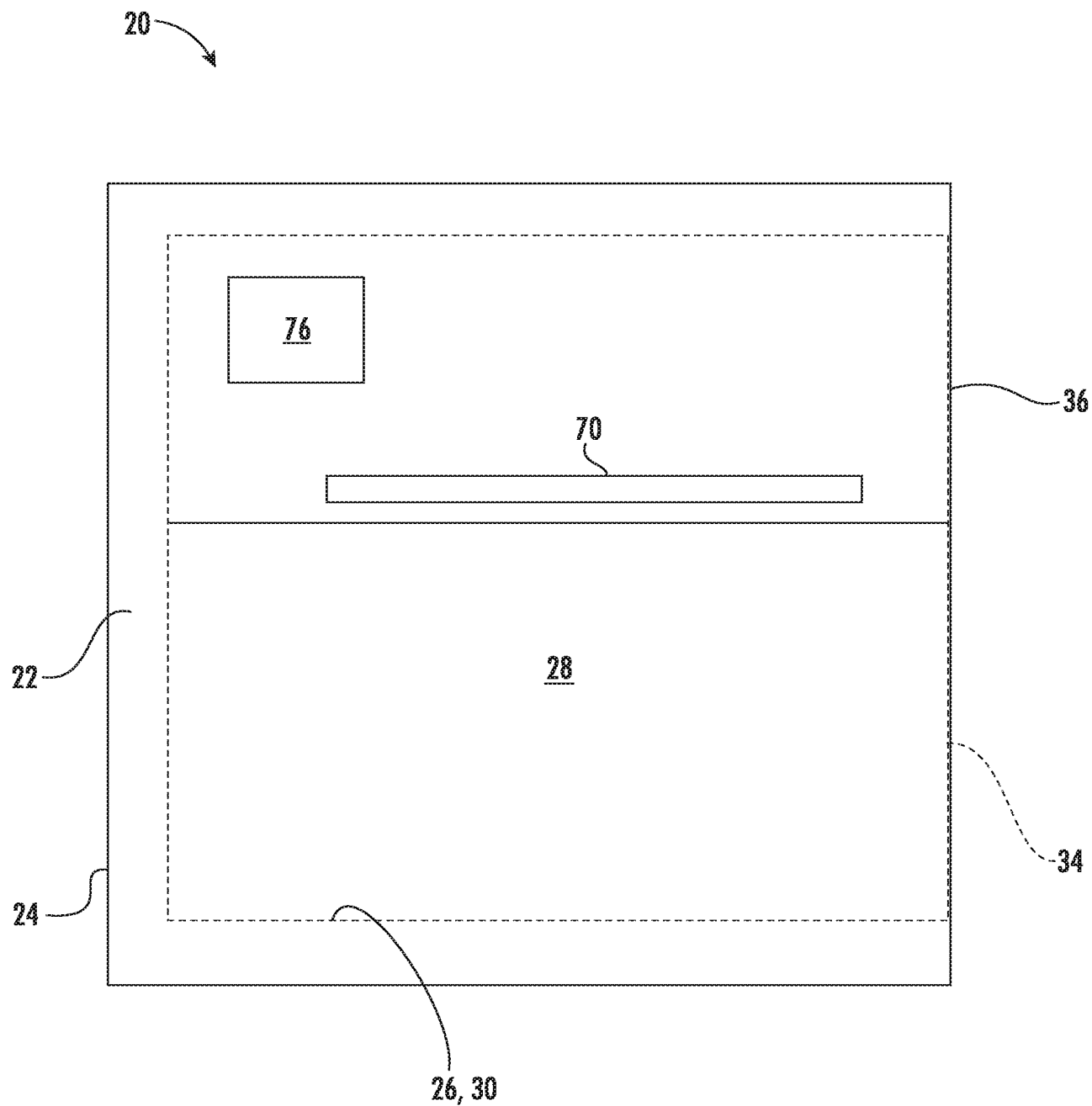


FIG. 2

3/15

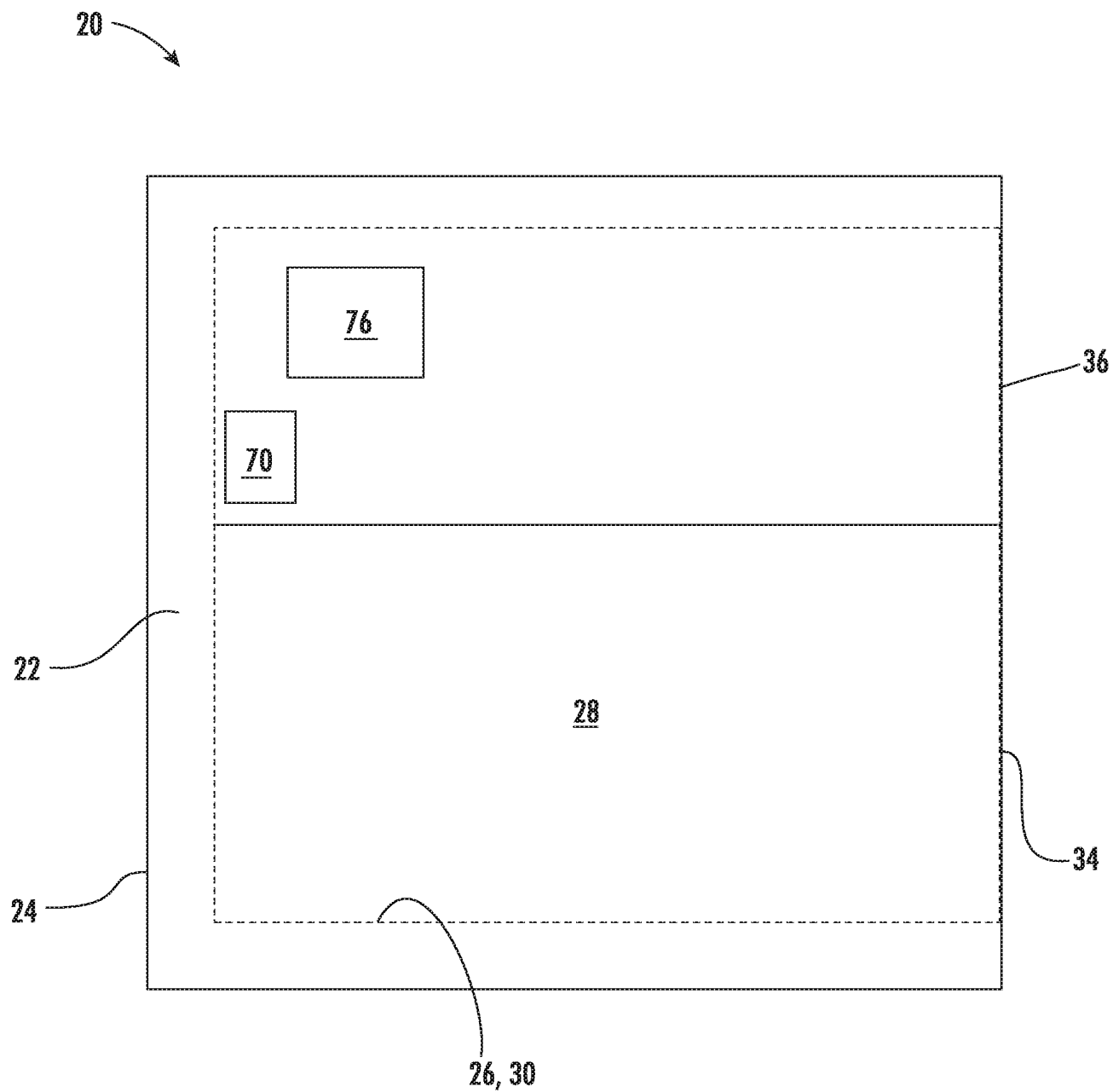
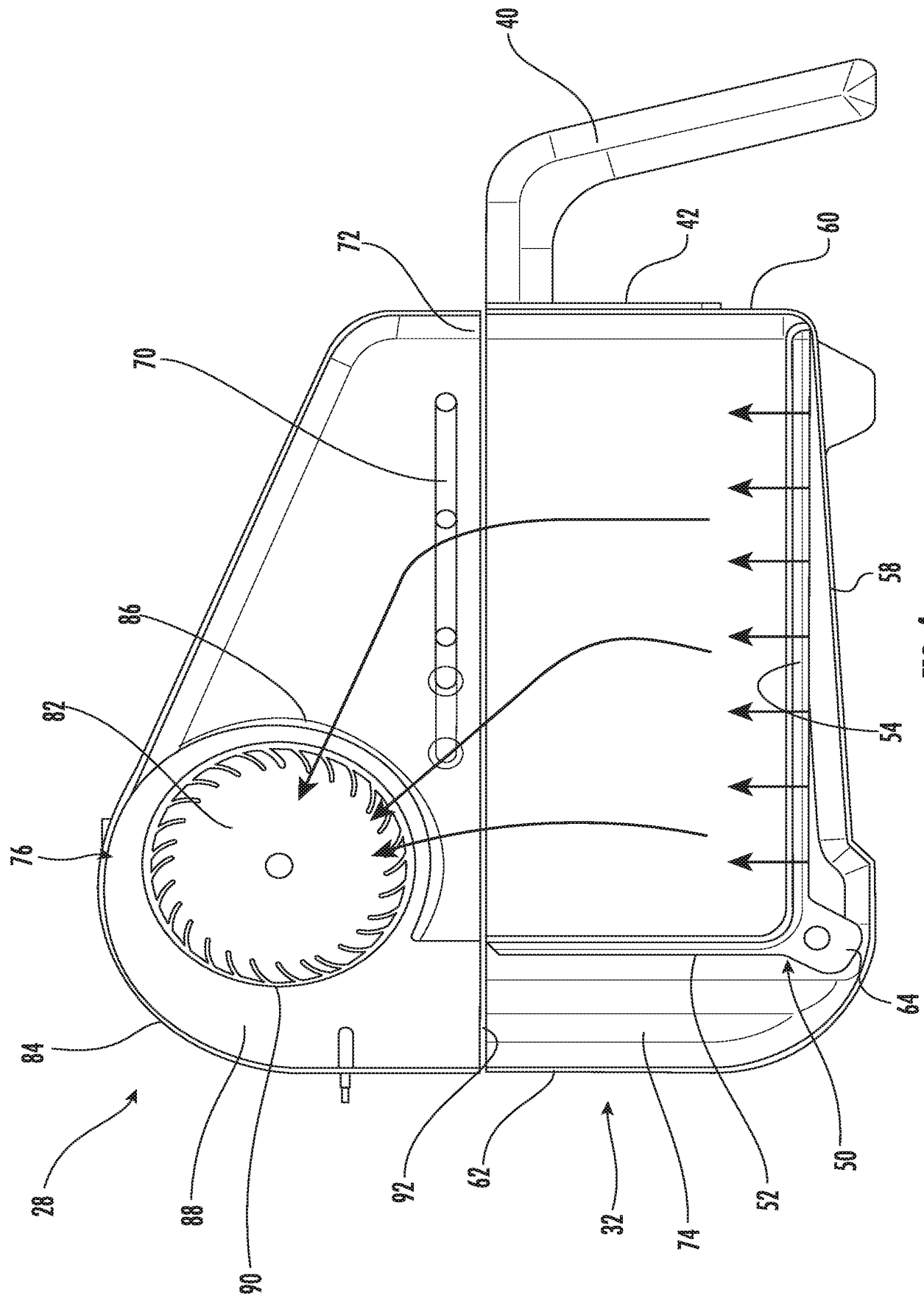


FIG. 3



5/15

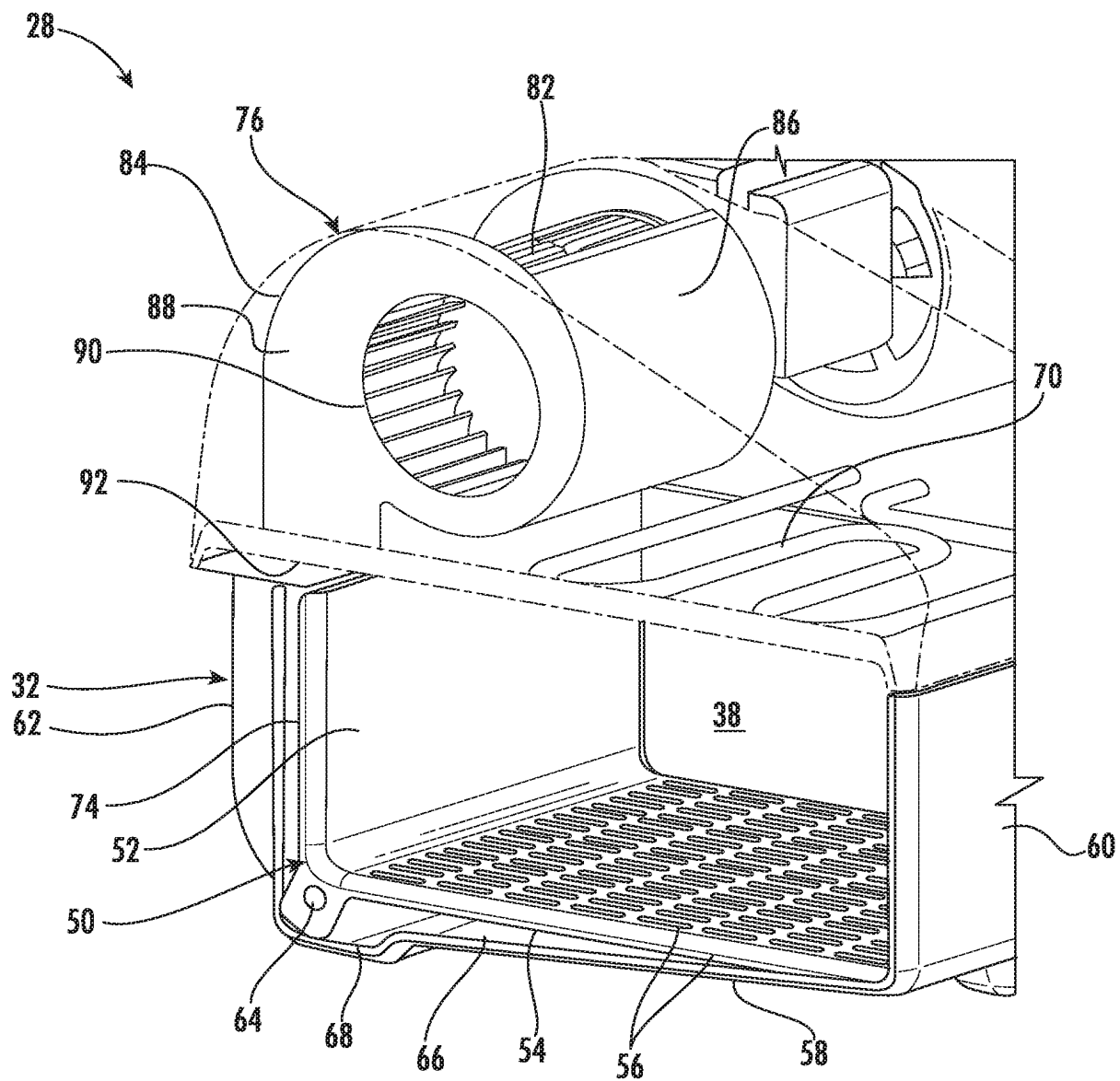


FIG. 5

6/15

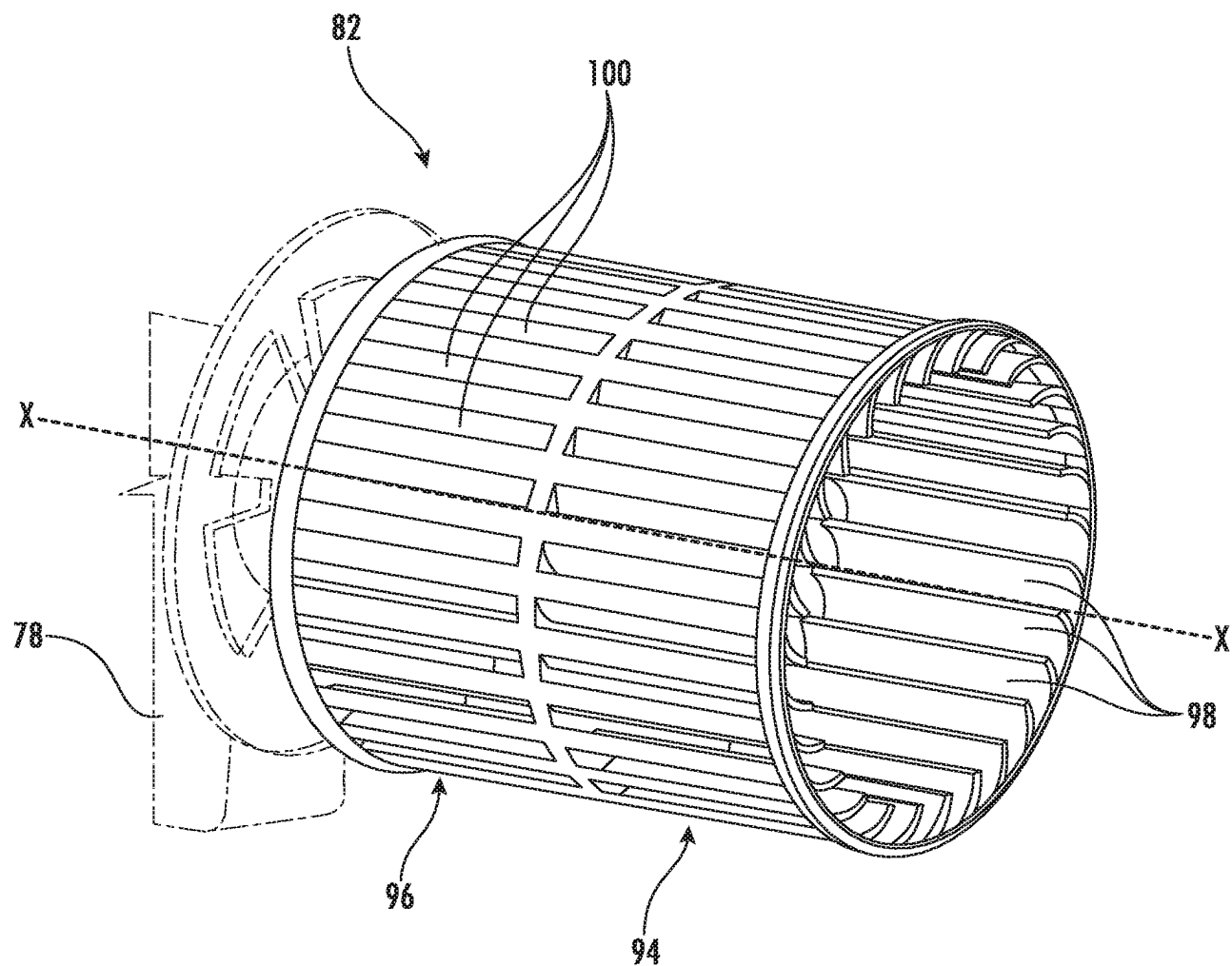


FIG. 6

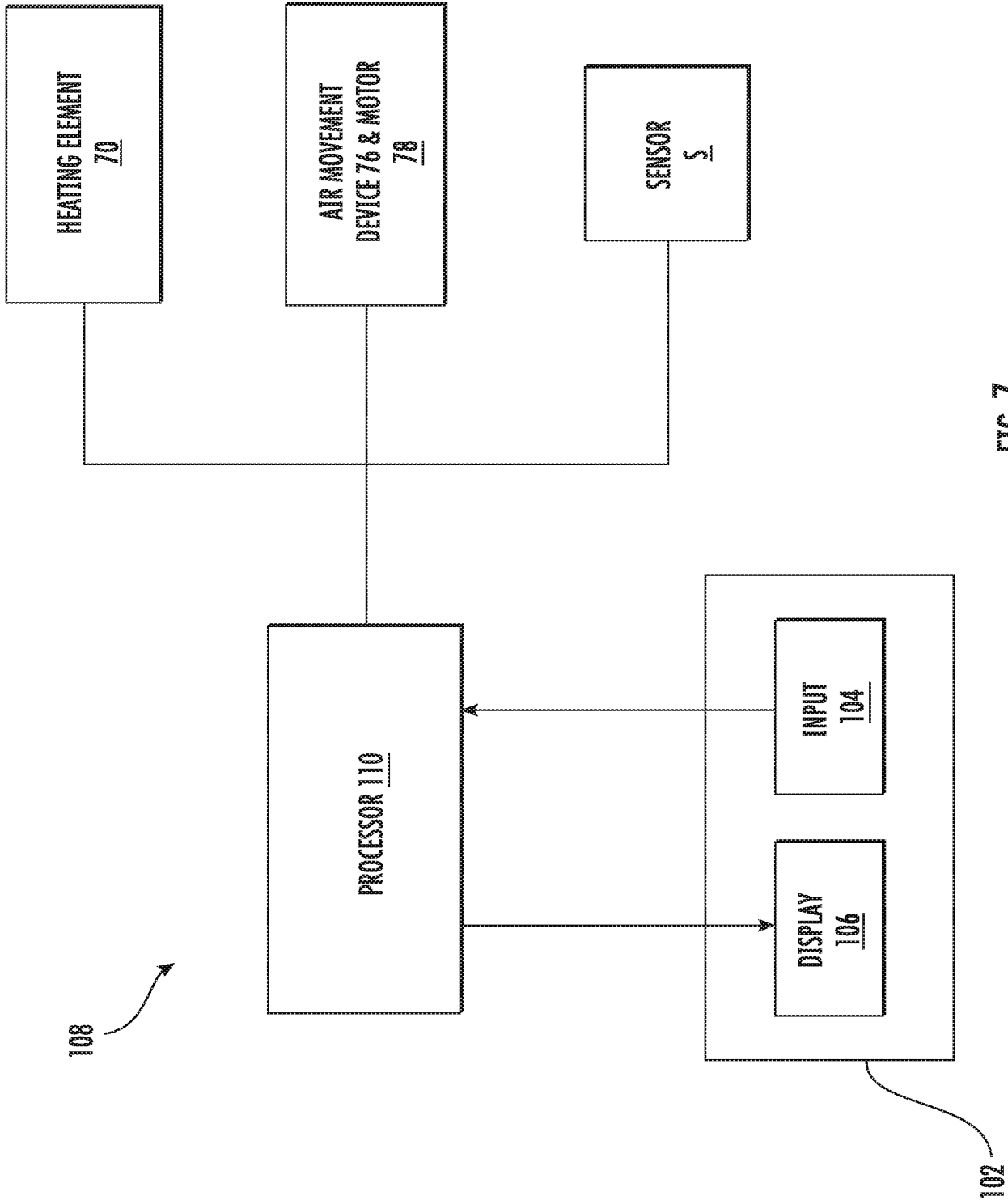


FIG. 7

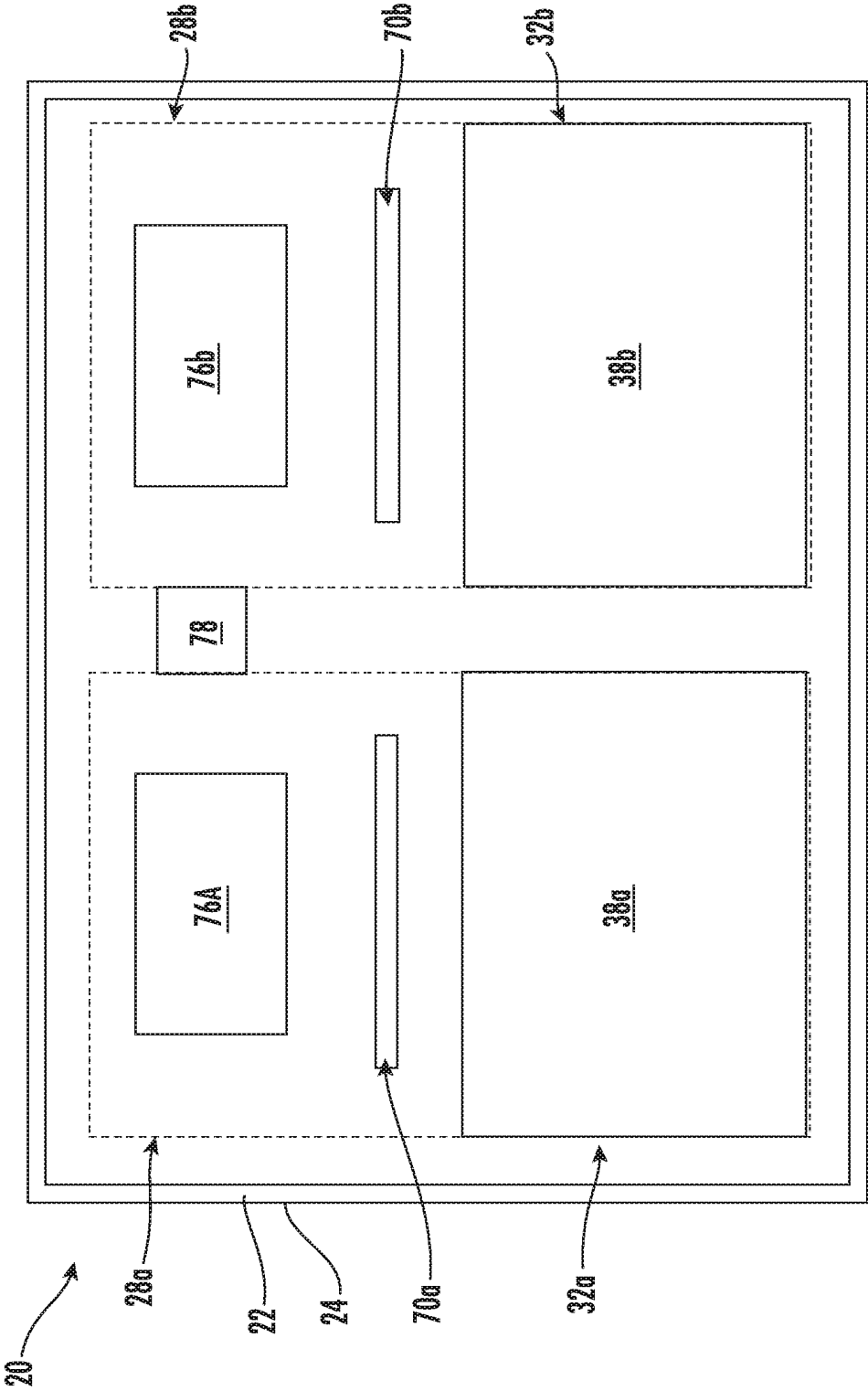


FIG. 8

9/15

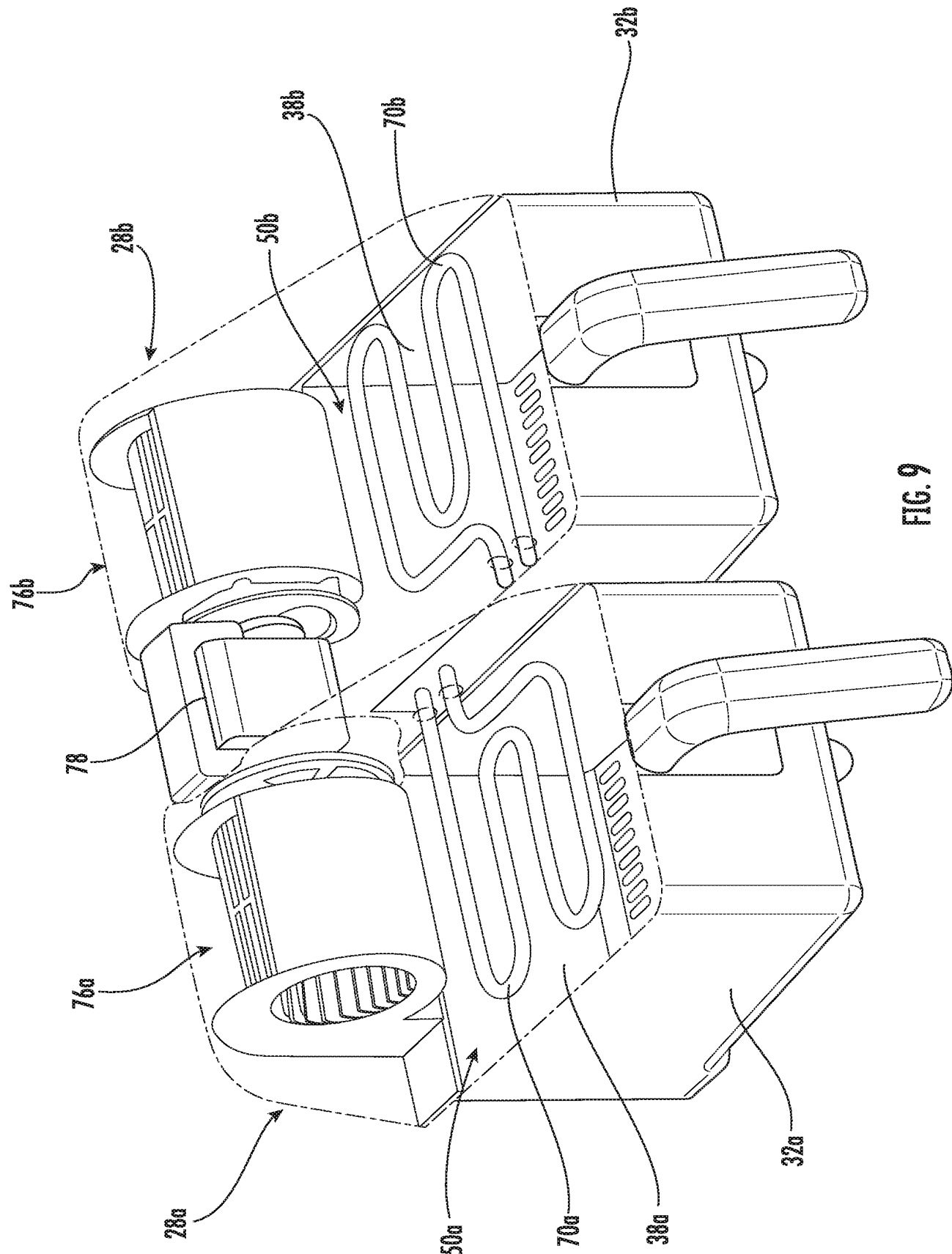
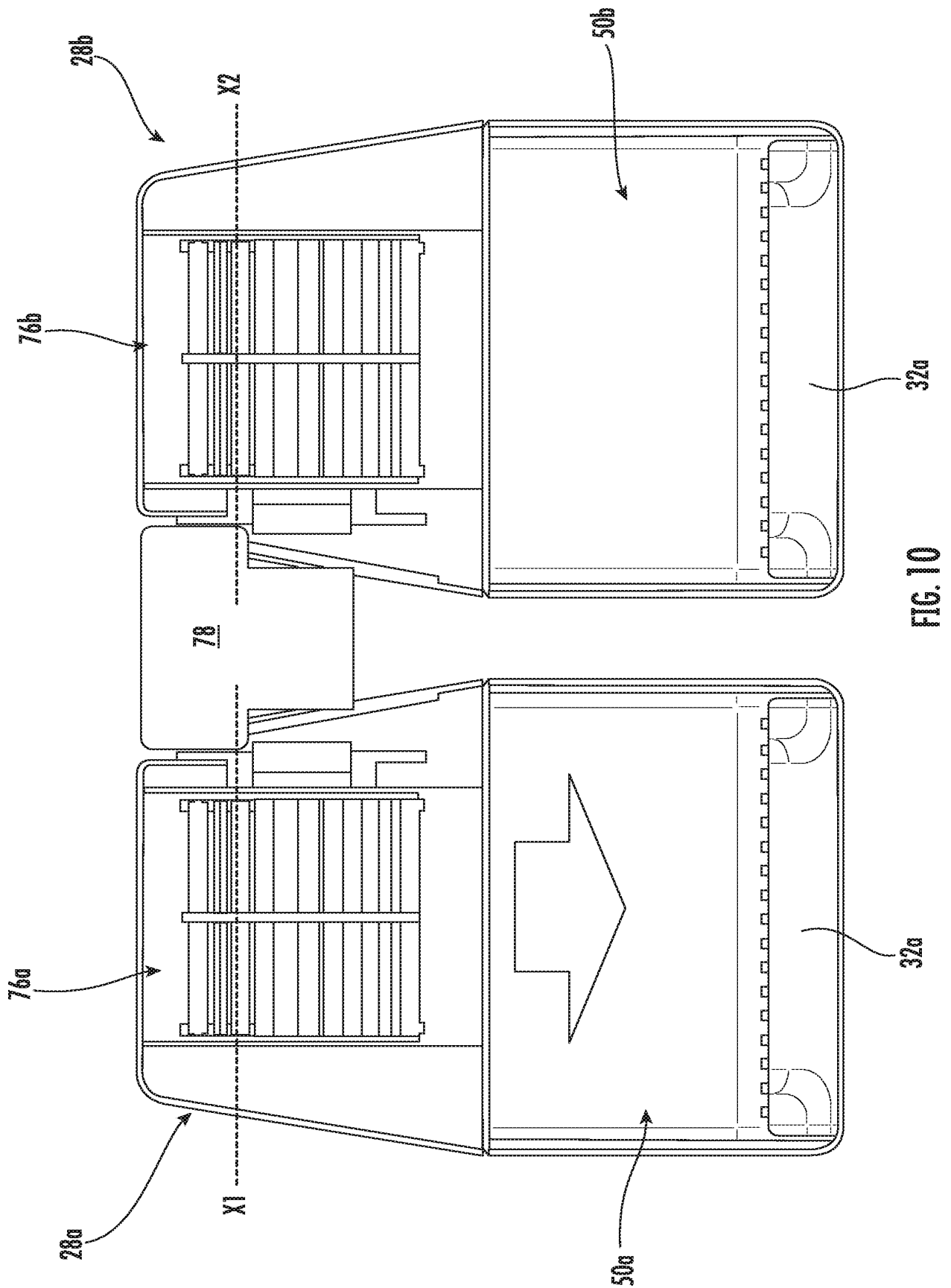


FIG. 9

10/15



11/15

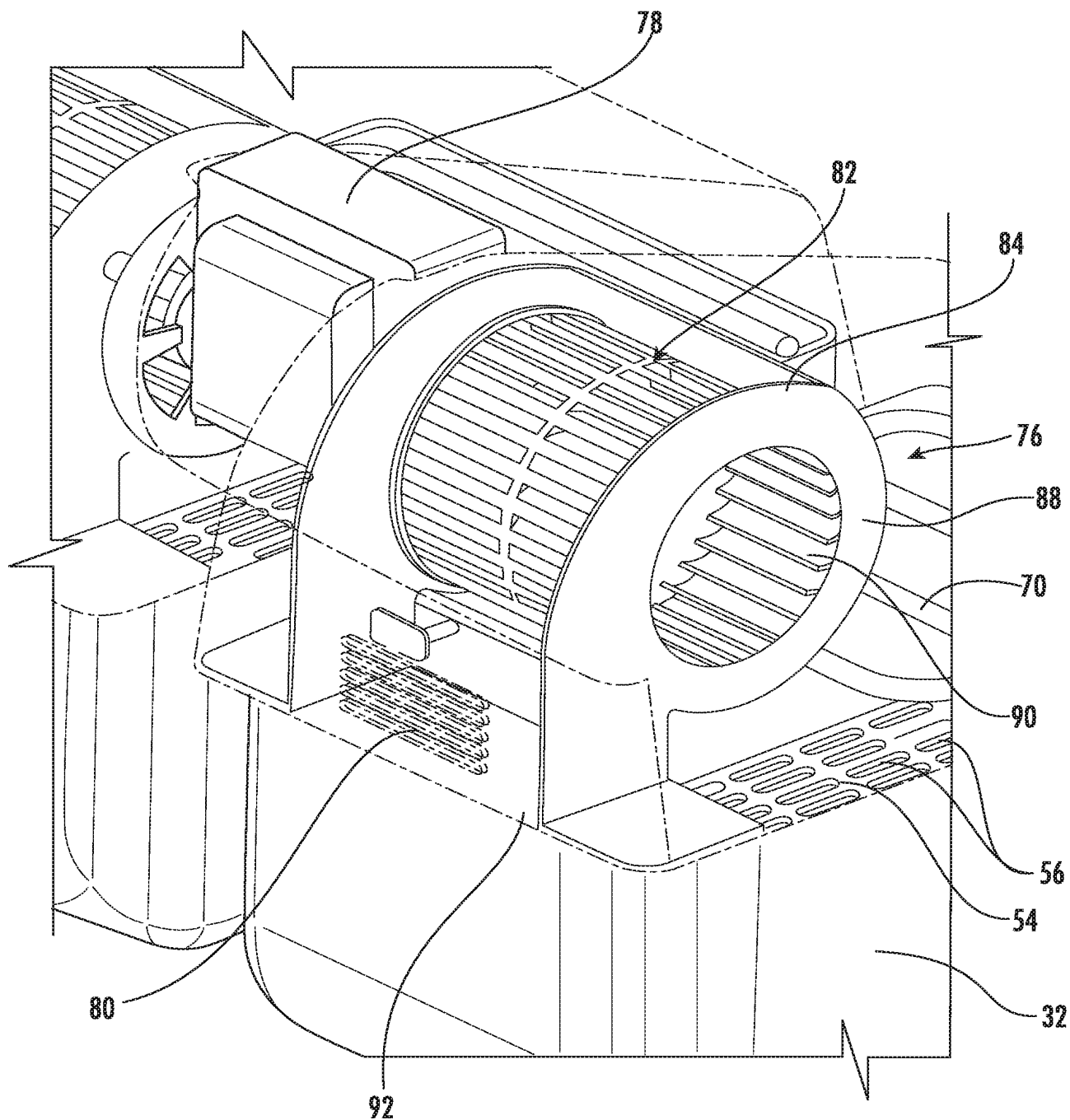


FIG. 11

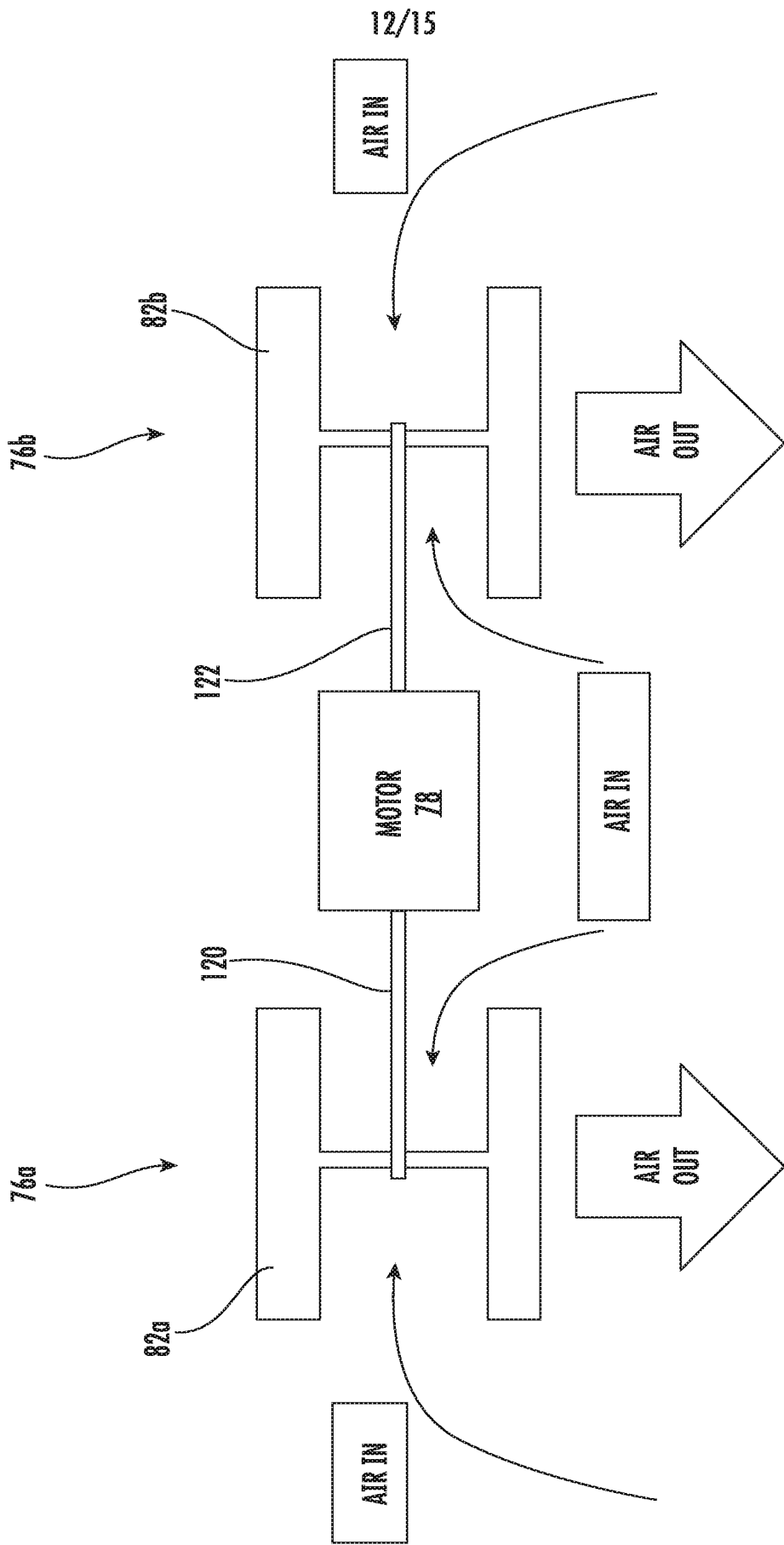


FIG. 12

13/15

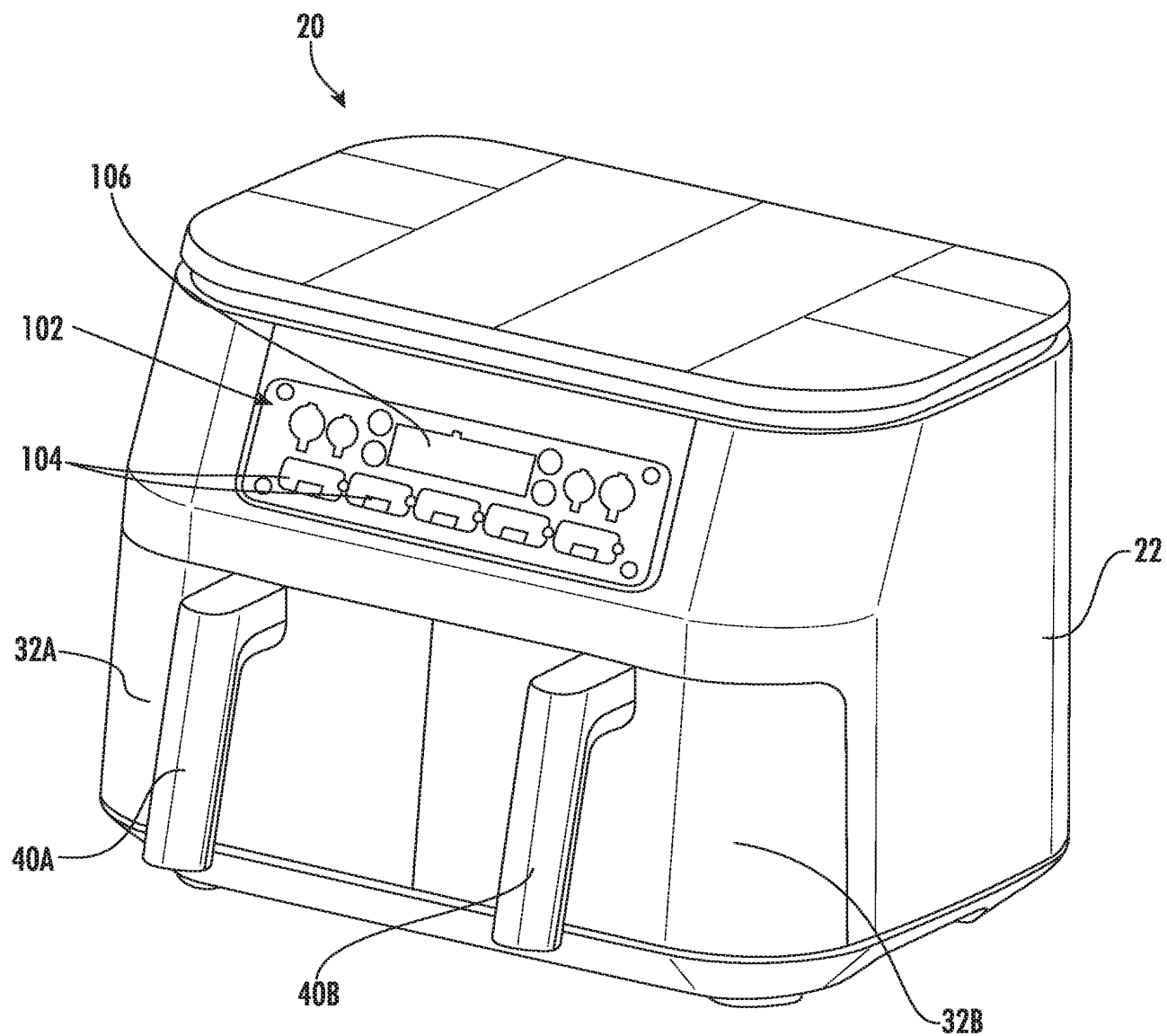


FIG. 13

14/15

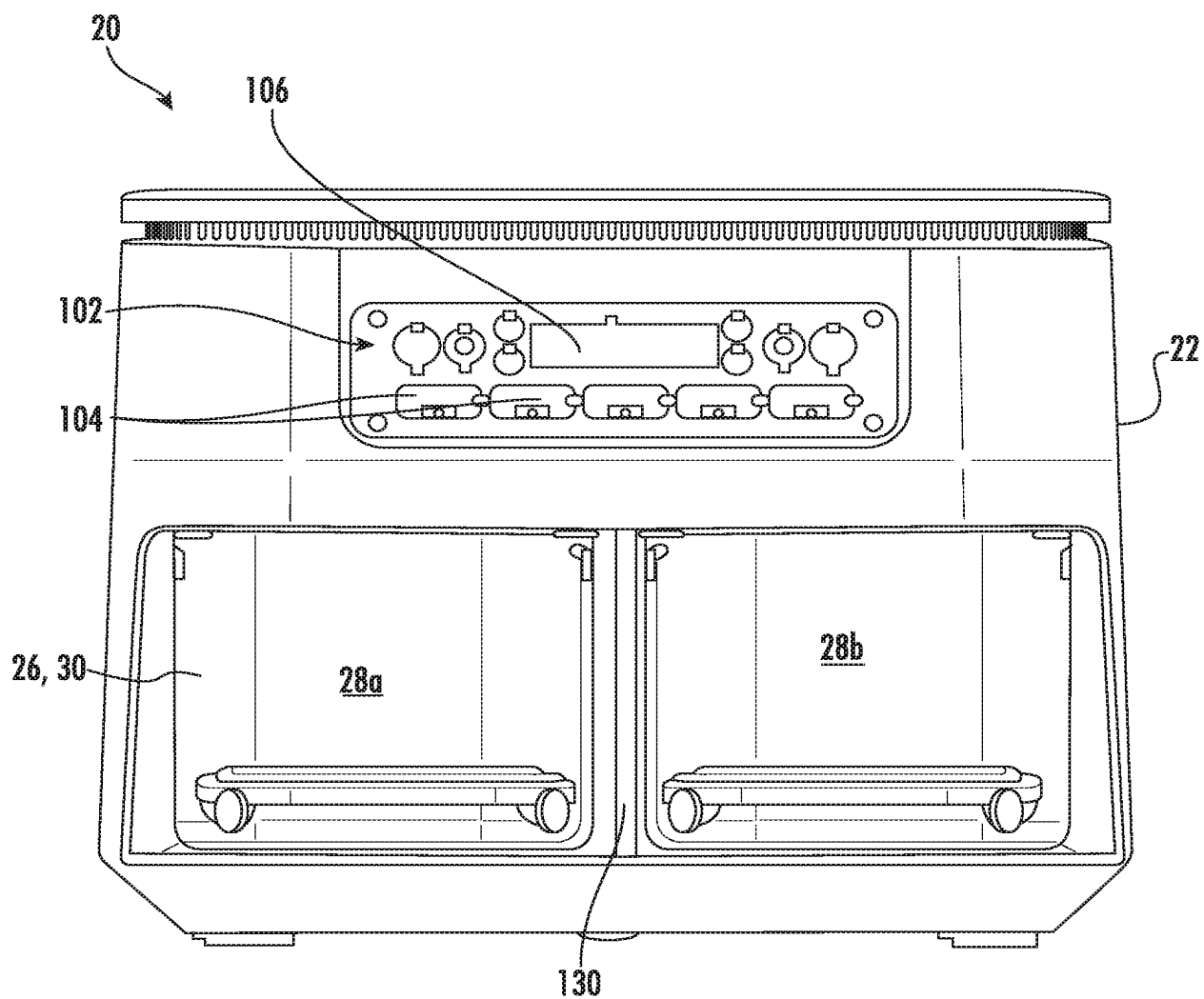
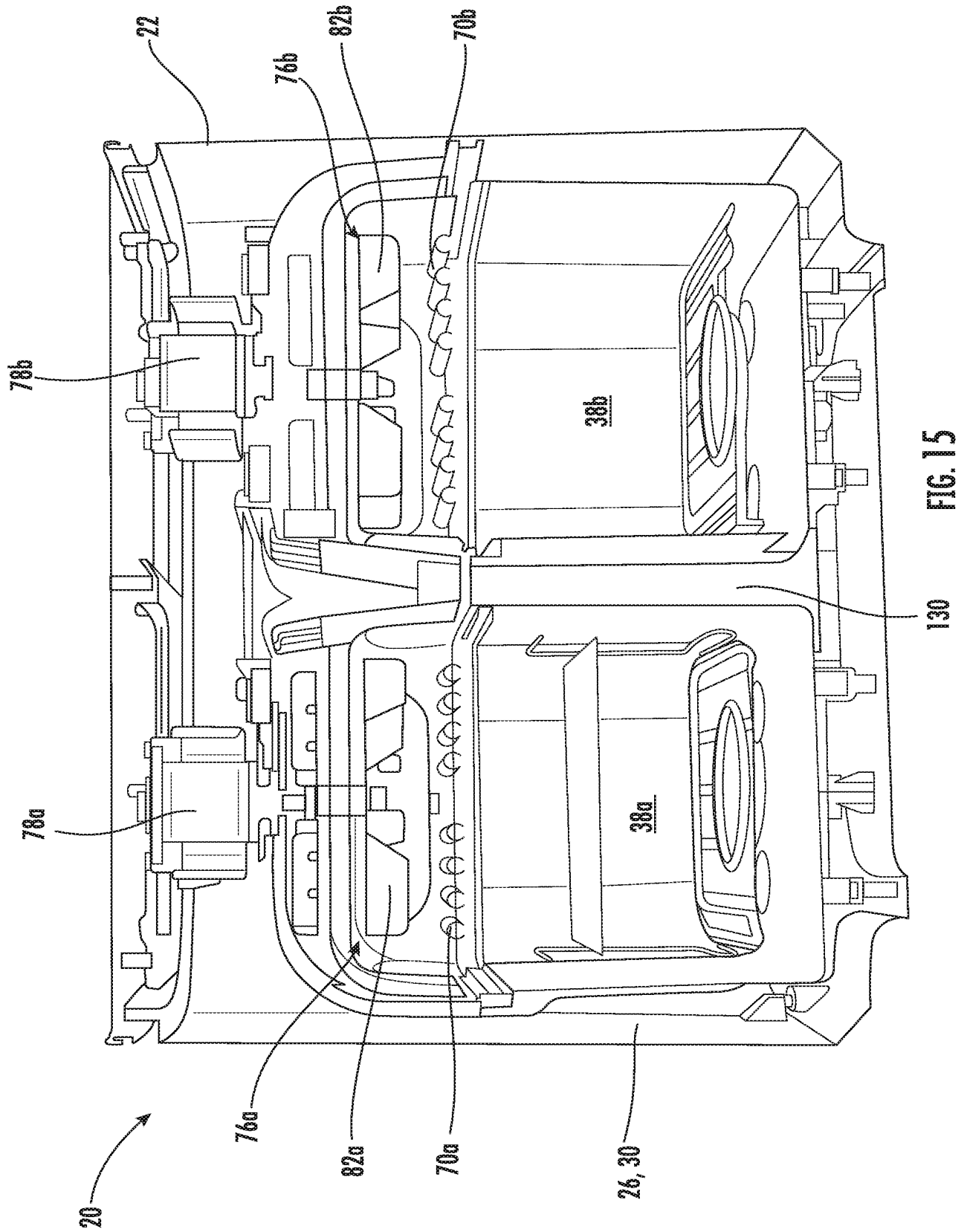


FIG. 14

15/15



CLAIMS

What is claimed is:

1. A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly; and
a heating element associated with said at least one internal compartment.
2. The cooking system of claim 1, wherein said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.
3. The cooking system of claim 1, wherein said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.
4. The cooking system of claim 1, wherein said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.
5. The cooking system of claim 1, further comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.
6. The cooking system of claim 5, wherein said insert at least partially defines said cooking volume within said interior of said cooking container.
7. The cooking system of claim 5, wherein said food support surface has a generally horizontal orientation when said insert is arranged within said interior of said cooking container.
8. The cooking system of claim 5, wherein said food support surface is offset from said bottom surface of said cooking container by a clearance.
9. The cooking system of claim 8, wherein said clearance defined between said food support surface and said bottom surface of said cooking container varies over at least one dimension of the cooking container.
10. The cooking system of claim 5, wherein said insert further comprises at least one protrusion and said bottom surface of said cooking container further comprises at least one channel, said at least one protrusion being positioned within said at least one channel when said insert is properly installed in said interior of said cooking container.

11. The cooking system of claim 5, wherein an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.

12. The cooking system of claim 11, wherein said insert further comprises a blocking wall arranged at an angle to said food support surface and said air duct is defined between said blocking wall and a back wall of said cooking container.

13. The cooking system of claim 1, further comprising an air movement mechanism disposed in said housing.

14. The cooking system of claim 13, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

15. The cooking system of claim 13, wherein said air movement mechanism further comprises:

a fan housing having a first inlet, a second inlet and an outlet, the first inlet and the second inlet being arranged in fluid communication with said outlet; and

a fan wheel rotatably mounted within said fan housing.

16. The cooking system of claim 15, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

17. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said at least one internal compartment; and

an air movement mechanism disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally.

18. The cooking system of claim 17, wherein said axis of rotation is oriented substantially perpendicular to a flow provided at an outlet of said air movement mechanism towards a relative bottom of said housing.

19. The cooking system of claim 17, wherein said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

20. The cooking system of claim 17, wherein said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

21. The cooking system of claim 20, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

22. The cooking system of claim 17, further comprising a motor operable to rotate said air movement mechanism about said axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

23. The cooking system of claim 17, wherein said air movement mechanism further comprises:

a fan housing; and

a fan wheel rotatably mounted within said fan housing.

24. The cooking system of claim 23, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

25. The cooking system of claim 24, wherein a configuration of said first plurality of impeller blades is substantially identical to a configuration of said second plurality of impeller blades.

26. The cooking system of claim 24, wherein a configuration of said first plurality of impeller blades is different than a configuration of said second plurality of impeller blades.

27. The cooking system of claim 17, wherein said air movement mechanism is disposed vertically above said cooking volume.

28. The cooking system of claim 17, wherein said air movement mechanism is disposed vertically above said cooking container.

29. The cooking system of claim 17, further comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

30. The cooking system of claim 17, wherein said air movement mechanism is horizontally offset from said heating element.

31. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said cooking volume;
a rotatable air movement mechanism having:
 a first inlet arranged in a first plane of said air movement mechanism;
 a second inlet arranged in a second plane of said air movement mechanism,
said second plane being distinct from said first plane; and
 an outlet arranged in fluid communication with both said first inlet and said second inlet.

32. The cooking system of claim 31, wherein said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

33. The cooking system of claim 32, wherein said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

34. The cooking system of claim 31, wherein said first plane and said second plane are substantially parallel.

35. The cooking system of claim 31, wherein said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

36. The cooking system of claim 35, wherein said second side is opposite said first side.

37. The cooking system of claim 31, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

38. The cooking system of claim 31, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

39. The cooking system of claim 31, wherein said air movement mechanism further comprises:

 a fan housing; and

 a fan wheel rotatably mounted within said fan housing.

40. The cooking system of claim 39, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

41. The cooking system of claim 31, wherein said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

42. The cooking system of claim 31, further comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

43. The cooking system of claim 31, wherein said air movement mechanism is horizontally offset from said heating element.

44. A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;
a heating element associated with said cooking volume;
a plurality of air movement mechanisms disposed within said housing; and
a motor operably coupled to said plurality of air movement mechanisms.

45. The cooking system of claim 44, wherein said motor is located externally to said at least one internal compartment.

46. The cooking system of claim 44, wherein said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

47. The cooking system of claim 46, wherein said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

48. The cooking system of claim 46, wherein said first air movement mechanism and a second air movement mechanism are arranged coaxially.

49. The cooking system of claim 46, wherein said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed and said second speed being substantially identical.

50. The cooking system of claim 46, wherein said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed being different than said second speed.

51. The cooking system of claim 46, wherein said at least one internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

52. The cooking system of claim 51, wherein said first air movement mechanism is positioned within said first internal compartment and said second air movement mechanism is positioned within said second internal compartment.

53. The cooking system of claim 51, wherein said motor is positioned between said first internal compartment and said second internal compartment.

54. A cooking system comprising:
a housing having at first internal compartment and a second internal compartment;
at least one cooking container receivable within one of said first internal compartment and said second internal compartment, wherein at least one cooking volume is defined within an interior of said at least one cooking container; and
at least one heating element disposed in said housing.

55. The cooking system of claim 54, wherein said at least one cooking container is a first cooking container receivable within said first internal compartment and a second cooking container receivable within said second internal compartment, wherein a first cooking volume is defined within an interior of said first cooking container and a second cooking volume is defined within an interior of said second cooking container.

56. The cooking system of claim 54, wherein said at least one heating element includes a first heating element positioned within said first internal compartment and a second heating element positioned within said second internal compartment.

57. The cooking system of claim 54, further comprising at least one air movement mechanism disposed within said housing.

58. The cooking system of claim 57, wherein said at least one air movement mechanism is stacked vertically relative to said at least one heating element within said housing.

59. The cooking system of claim 57, wherein said at least one air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

60. The cooking system of claim 57, wherein said at least one air movement mechanism further comprises:
a fan housing; and
a fan wheel rotatably mounted within said fan housing.

61. The cooking system of claim 60, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

62. The cooking system of claim 57, wherein said at least one air movement mechanism includes a first air movement mechanism associated with said first internal compartment and a second air movement mechanism associated with said second internal compartment.

63. The cooking system of claim 57, wherein said at least one air movement mechanism has an axially oriented inlet and a radially oriented outlet.

64. The cooking system of claim 57, wherein said at least one air movement mechanism is rotatable about a vertically oriented axis.

65. The cooking system of claim 57, further comprising a motor operably coupled to said at least one air movement mechanism.

66. The cooking system of claim 65, wherein said motor is located externally from said first internal compartment and said second internal compartment.

67. The cooking system of claim 65, wherein said motor is positioned between said first internal compartment and said second internal compartment.

68. The cooking system of claim 55, wherein said first cooking container and said second cooking container are individually insertable into said first cooking compartment and said second cooking compartment respectively.

69. The cooking system of claim 55, wherein said first internal compartment and said second internal compartment are fluidly separate.

70. The cooking system of claim 55, wherein said first cooking volume and said second cooking volume are fluidly separate.

71. A cooking system comprising:
a housing having at least one internal compartment;
a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;
a heating element associated with said at least one internal compartment; and
an air movement mechanism disposed in said housing, said air movement mechanism being positioned vertically above said cooking volume and horizontally offset from said heating element.

COOKING DEVICE AND COMPONENTS THEREOF

BACKGROUND

[0001] Embodiments of the present disclosure relate generally to a cooking system, and more specifically, to a countertop cooking system operable in a plurality of distinct cooking modes.

SUMMARY

[0002] According to an embodiment, cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A bottom surface of said cooking container is angled upwardly. A heating element is associated with said at least one internal compartment.

[0003] In addition to one or more of the features described above, or as an alternative, in further embodiments said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.

[0004] In addition to one or more of the features described above, or as an alternative, in further embodiments said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.

[0005] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.

[0006] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

[0007] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert at least partially defines said cooking volume within said interior of said cooking container.

[0008] In addition to one or more of the features described above, or as an alternative, in further embodiments said food support surface has a generally horizontal orientation when said insert is arranged within said interior of said cooking container.

[0009] In addition to one or more of the features described above, or as an alternative, in further embodiments said food support surface is offset from said bottom surface of said cooking container by a clearance.

[0010] In addition to one or more of the features described above, or as an alternative, in further embodiments said clearance defined between said food support surface and said bottom surface of said cooking container varies over at least one dimension of the cooking container.

[0011] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert further comprises at least one protrusion and said bottom surface of said cooking container further comprises at least one channel, said at least one protrusion being positioned within said at least one channel when said insert is properly installed in said interior of said cooking container.

[0012] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.

[0013] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert further comprises a blocking wall arranged at an angle to said food support surface and said air duct is defined between said blocking wall and a back wall of said cooking container.

[0014] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an air movement mechanism disposed in said housing.

[0015] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0016] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing having a first inlet, a second inlet and an outlet, the first inlet and the second inlet being arranged in fluid communication with said outlet and a fan wheel rotatably mounted within said fan housing.

[0017] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0018] According to an embodiment, a cooking system includes a housing having at least one internal compartment, a cooking container receivable within said at least one internal compartment, a cooking volume being defined within an interior of said cooking container, and a heating element associated with said at least one internal compartment. An air movement mechanism is disposed in said housing. The air movement mechanism is rotatable about an axis of rotation oriented relatively horizontally.

[0019] In addition to one or more of the features described above, or as an alternative, in further embodiments said axis of rotation is oriented substantially perpendicular to a flow provided at an outlet of said air movement mechanism towards a relative bottom of said housing.

[0020] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

[0021] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

[0022] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

[0023] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about said axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0024] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0025] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0026] In addition to one or more of the features described above, or as an alternative, in further embodiments a configuration of said first plurality of impeller blades is substantially identical to a configuration of said second plurality of impeller blades.

[0027] In addition to one or more of the features described above, or as an alternative, in further embodiments a configuration of said first plurality of impeller blades is different than a configuration of said second plurality of impeller blades.

[0028] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is disposed vertically above said cooking volume.

[0029] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is disposed vertically above said cooking container.

[0030] In addition to one or more of the features described above, or as an alternative, in further embodiments an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

[0031] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is horizontally offset from said heating element.

[0032] According to an embodiment, a cooking system includes a housing having at least one internal compartment, and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element associated with said cooking volume. A rotatable air movement mechanism has a first inlet arranged in a first plane of said air movement mechanism and a second inlet arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane. An outlet of the air movement mechanism is arranged in fluid communication with both said first inlet and said second inlet.

[0033] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

[0034] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container is movable relative to said housing along an

axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

[0035] In addition to one or more of the features described above, or as an alternative, in further embodiments said first plane and said second plane are substantially parallel.

[0036] In addition to one or more of the features described above, or as an alternative, in further embodiments said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

[0037] In addition to one or more of the features described above, or as an alternative, in further embodiments said second side is opposite said first side.

[0038] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

[0039] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0040] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0041] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0042] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

[0043] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

[0044] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is horizontally offset from said heating element.

[0045] According to yet another embodiment, a cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element is associated with said cooking volume. A plurality of air movement mechanism is disposed within said housing and a motor is operably coupled to said plurality of air movement mechanisms.

[0046] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is located externally to said at least one internal compartment.

[0047] In addition to one or more of the features described above, or as an alternative, in further embodiments said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

[0048] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

[0049] In addition to one or more of the features described above, or as an alternative, in further embodiments said first air movement mechanism and a second air movement mechanism are arranged coaxially.

[0050] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed and said second speed being substantially identical.

[0051] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed being different than said second speed.

[0052] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

[0053] In addition to one or more of the features described above, or as an alternative, in further embodiments said first air movement mechanism is positioned within said first

internal compartment and said second air movement mechanism is positioned within said second internal compartment.

[0054] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is positioned between said first internal compartment and said second internal compartment.

[0055] According to yet another embodiment, a cooking system includes a housing having at first internal compartment and a second internal compartment. At least one cooking container is receivable within one of said first internal compartment and said second internal compartment. At least one cooking volume is defined within an interior of said at least one cooking container. At least one heating element disposed in said housing.

[0056] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one cooking container is a first cooking container receivable within said first internal compartment and a second cooking container receivable within said second internal compartment, wherein a first cooking volume is defined within an interior of said first cooking container and a second cooking volume is defined within an interior of said second cooking container.

[0057] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one heating element includes a first heating element positioned within said first internal compartment and a second heating element positioned within said second internal compartment.

[0058] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising at least one air movement mechanism disposed within said housing.

[0059] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism is stacked vertically relative to said at least one heating element within said housing.

[0060] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

[0061] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism further comprises: a fan housing and a fan wheel rotatably mounted within said fan housing.

[0062] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0063] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism includes a first air movement mechanism associated with said first internal compartment and a second air movement mechanism associated with said second internal compartment.

[0064] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism has an axially oriented inlet and a radially oriented outlet.

[0065] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism is rotatable about a vertically oriented axis.

[0066] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operably coupled to said at least one air movement mechanism.

[0067] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is located externally from said first internal compartment and said second internal compartment.

[0068] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is positioned between said first internal compartment and said second internal compartment.

[0069] In addition to one or more of the features described above, or as an alternative, in further embodiments said first cooking container and said second cooking container are individually insertable into said first cooking compartment and said second cooking compartment respectively.

[0070] In addition to one or more of the features described above, or as an alternative, in further embodiments said first internal compartment and said second internal compartment are fluidly separate.

[0071] In addition to one or more of the features described above, or as an alternative, in further embodiments said first cooking volume and said second cooking volume are fluidly separate.

[0072] According to another embodiment, a cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at

least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element is associated with said at least one internal compartment and an air movement mechanism is disposed in said housing. The air movement mechanism is positioned vertically above said cooking volume and horizontally offset from said heating element.

BRIEF DESCRIPTION OF THE FIGURES

[0073] The accompanying drawings incorporated in and forming a part of the specification embodies several aspects of the present disclosure and, together with the description, serves to explain the principles of the disclosure. In the drawings:

[0074] FIG. 1 is a schematic diagram of a cooking system having a cooking container installed therein according to an embodiment;

[0075] FIG. 2 is a schematic diagram of the cooking system of FIG. 1 absent the cooking container according to an embodiment;

[0076] FIG. 3 is a schematic diagram of another cooking system absent the cooking container according to an embodiment;

[0077] FIG. 4 is a cross-sectional view of a portion of a cooking system according to an embodiment;

[0078] FIG. 5 is a perspective view of a portion of a cooking system according to an embodiment;

[0079] FIG. 6 is a perspective view of a fan wheel of an air movement mechanism of the cooking system according to an embodiment;

[0080] FIG. 7 is a schematic diagram of a control system of the cooking system according to an embodiment;

[0081] FIG. 8 is a front perspective view of a portion of the cooking system according to another embodiment;

[0082] FIG. 9 is a front view of the portion of the cooking system of FIG. 8 according to an embodiment;

[0083] FIG. 10 is a rear perspective view of the portion of the cooking system of FIG. 8 according to an embodiment;

[0084] FIG. 11 is a perspective view of a motor of the cooking system of FIG. 8 according to an embodiment;

[0085] FIG. 12 is a schematic diagram of the motor and the air movement mechanisms of the cooking system according to an embodiment;

[0086] FIG. 13 is a perspective view of the cooking system according to another embodiment;

[0087] FIG. 14 is a plan view of the cooking system of FIG. 13, with the cooking containers removed according to an embodiment; and

[0088] FIG. 15 is a perspective cross-sectional view of the cooking system of FIG. 13 according to an embodiment.

DETAILED DESCRIPTION

[0089] With reference now to the FIGS., an example of a cooking system 20 is illustrated at numeral 20. As best shown in FIGS. 1 and 2, the cooking system 20 includes a housing 22 having an exterior heat resistant or non-conductive surface 24 and an interior surface 26 that defines an at least partially hollow compartment 28 arranged within an interior of the housing 22. The housing 22 may be formed as a single unitary body, or alternatively, may be formed by connecting a plurality of pieces together. In addition, the housing 22 may be made of any suitable material, including but not limited to glass, aluminum, plastic, or stainless steel for example. A liner 30 may be disposed within at least a portion of the housing 22. The liner 30 may be formed from any suitable conductive material, such as aluminum for example. In an embodiment, the liner 30 forms at least a portion of the interior surface 26 and thereby defines at least a portion of the internal compartment 28 of the housing 22. However, it should be understood that other components of the cooking system 20, or surfaces thereof, may also define the internal compartment 28.

[0090] A cooking container 32 is receivable within a portion of the internal compartment 28 of the housing 22, such as a bottom portion of the internal compartment 28 for example. Although the cooking container 32 is described herein as being separable from the housing 22, embodiments where the cooking container 32 is movably connected with or integrally formed with the housing 22 are also contemplated herein. The cooking container 32 may be a pot formed from a ceramic, metal, or die cast aluminum material. However, any suitable material capable of withstanding the high temperatures required for cooking food products are also within the scope of the disclosure. In an embodiment, the cooking container 32 is configured to translate along an axis relative to the housing 22 such that the cooking container 32 is slidably received within an opening 34 formed in a wall 36 of the housing 22. Accordingly, in such embodiments, a size and shape of the cooking container 32 may be complementary to the size and shape of the opening 34. In the illustrated, non-limiting

embodiment, the cooking container 32 is generally square in shape. However, in other embodiments, the cooking container 32 may have another configuration.

[0091] The cooking container 32 has a generally hollow interior 38 for supporting one or more consumable products, such as food products for example, therein. Examples of food products suitable for use with the cooking system 20, include but are not limited to, meats, fish, poultry, bread, rice, grains, pasta, vegetables, fruits, and dairy products, among others.

[0092] At least one handle 40 may be associated with the cooking container 32 to allow a user to easily grasp and manipulate the cooking container 32 relative to the housing 22. In the illustrated, non-limiting embodiment, the cooking container 32 includes a single handle 40 extending from a first, front surface 42 of the cooking container 32. Although the cooking container 32 illustrated and described herein has a single handle 40, in other embodiments, the cooking container 32 may have two or more handles, or alternatively, a handle or groove formed into a surface of the cooking container 32. Any suitable configuration of the cooking container 32 and/or handle(s) 40 is within the scope of the disclosure.

[0093] One or more inserts or food support structures 50 may be positionable within the interior 38 of the cooking container 32. In such embodiments, the insert 50 provides a surface on which food is supported. An example of an insert 50 suitable for use with the cooking container 32 is best shown in FIGS. 4 and 5. As shown, the insert 50 includes a solid blocking wall 52 and a food support surface 54 having a plurality of perforations or openings 56 formed therein. In the illustrated, non-limiting embodiment, the blocking wall 52 and the food support surface 54 are arranged generally perpendicular to one another. Although the insert 50 is shown as being an L-shaped plate, in other embodiments, the insert 50 may include additional side walls such that the insert 50 is a basket for example. When the insert 50 is installed within the interior 38 of the cooking container 32, the blocking wall 52 and the food support surface 54 of the insert 50 cooperate with one or more walls of the cooking container 32 to define an area there between referred to herein as a “cooking volume.” Further, in embodiments where an insert is not disposed within the cooking container 32, the interior 38 of the cooking container 32 may define the cooking volume.

[0094] In the illustrated, non-limiting embodiment, the bottom surface 58 of the cooking container 32 is sloped relative to a bottom surface of the housing 22 or to a surface on which the cooking system 20 may be positioned and supported. As shown, the slope extends generally upwardly towards a front wall 60 of the cooking container 32. As a result, a height of the interior 38 of the cooking container 32 adjacent a back wall 62 is greater than a

height of the interior 38 of the cooking container 32 adjacent the front wall 60 thereof. When the insert 50 is installed within the interior 38 of the cooking container 32, the food support surface 54 has a generally horizontal orientation. As shown, the insert 50 may include one or more protrusions 64, such as tabs for example, configured to contact the bottom surface 58 of the cooking container 32 to achieve this desired orientation. The food support surface 54 is therefore at least partially offset from the bottom surface 58 of the cooking container 32. Because of the angled configuration of the bottom surface 58 of the cooking container 32, the clearance 66 between the bottom surface 58 and the food support surface 54, varies, and more specifically, gradually decreases from a back to a front of the cooking container 32.

[0095] The insert 50 and the bottom surface 58 of the cooking container 32 may cooperate to properly position the insert within the interior 38 such that the blocking wall 52 of the insert 50 is offset from the back wall 62 of the cooking container 32. This clearance between the blocking wall 52 and the back wall 62 defines an air duct 74 within the cooking container 32, separate from the cooking volume, and through which air is circulated during operation of the cooking system 20. In an embodiment, a contour of the cooking container 32 facilitates positioning of the insert 50 relative to the cooking container 32. As previously described, one or more protrusions 64 extend from a bottom surface of the insert 50, and as best shown in FIGS. 4 and 5, the bottom surface 58 of the cooking container 32 may be contoured to define one or more channels 68 therein. When the insert 50 is positioned within the cooking container 32, the one or more protrusions 64 are received within the one or more channels 68. The engagement between the at least one protrusion 64 and the sidewalls of the channel(s) 68 properly positions the insert 50 within the cooking container 32 to create a suitably sized air duct 74.

[0096] The cooking system 20 additionally includes at least one heating element 70 operable to impart heat to the cooking volume during one or more modes of operation of the cooking system 20. In the illustrated, non-limiting embodiment best shown in FIGS. 1, 2 and 4-5, the at least one heating element 70 is positioned within the internal compartment 28, generally at or above an upper extent or surface 72 of the cooking container 32, such as proximate a center of the cooking container 32 for example. In an embodiment, the heating element 70 is disposed adjacent a center of the cooking volume and/or the cooking container 32. In such embodiments, the at least one heating element 70 is mounted completely outside of the cooking container 32, and vertically offset from the upper extent or surface 72 thereof. In another embodiment, best shown in FIG. 3, the at least one heating element 70 may be located adjacent the rear of the internal compartment 28, such as in vertical alignment with

the air duct 74 formed between the blocking wall 52 of the insert 50 and the back wall 62 of the cooking container 32. However, it should be understood that a heating element 70 located at any suitable location is within the scope of the disclosure.

[0097] The at least one heating element 70 may be capable of performing any suitable type of heat generation. For example, a heating element 70 configured to heat one or more food items located within the cooking volume of the cooking container 32 via conduction, convection, radiation, and induction are all within the scope of the disclosure. In the illustrated, non-limiting embodiment, the heating element 70 is a convective heating element, and the cooking system 20 additionally includes an air movement mechanism 76, such as a fan for example, operable to circulate air through the cooking volume. The air is heated as it flows along a path of circulation, such as by flowing over a portion of the at least one heating element 70. As shown, the air movement mechanism 76 is located within the internal compartment 28 at a position entirely above the upper extent 72 of the cooking container 32. In addition, at least a portion of the air movement mechanism 76, and in some embodiment, the entirety of the air movement mechanism 76, is disposed vertically above the cooking volume, and therefore the insert 50. As shown, the air movement mechanism 76 is horizontally offset from the at least one heating element 70. However, embodiments where the air movement mechanism 76 vertically or horizontally overlaps or is aligned with the at least one heating element 70 are also contemplated herein.

[0098] The air movement mechanism 76, or at least a portion thereof may be removable from the internal compartment. In the illustrated, non-limiting embodiment, the air movement mechanism 76 is driven by a motor 78 located at least partially externally to the internal compartment 28. Further, the cooking system 20 may include a vent 80 for exhausting hot air generated by operation of at least one of the air movement mechanism 76 or the motor 78 to the exterior of the cooking system 20. Although the vent 80 is illustrated as being formed at the rear of the internal compartment 28, embodiments where the vent 80 is formed at another location are also contemplated herein.

[0099] An example of the air movement mechanism 76 is illustrated in more detail in FIGS. 5 and 6. In the illustrated, non-limiting embodiment, the air movement mechanism 76 includes a fan wheel 82 positioned within a fan housing 84. As shown, the fan wheel 82 is configured to rotate about an axis X oriented generally horizontally, and in some embodiments, the axis of the fan wheel is oriented perpendicular to the translational axis along which the cooking container 32 is configured to move relative to the housing 22. The fan housing 84 has an outer wall 86 having a scroll-shaped length, a first sidewall 88

including a first inlet aperture 90 and a second sidewall (not shown) including a second inlet aperture. Although the outlet opening 92 of the fan housing 84 is illustrated as being generally rectangular in shape, embodiments where the outlet opening 92 is another shape are also contemplated herein.

[0100] With specific reference now to FIG. 6, the fan wheel 82 is typically formed with first wheel portion 94 and a second wheel portion 96. Both the first wheel portion 94 and the second wheel portion 96 function as an air inlet and are configured to provide air to a single plenum. The air inlet defined by the first wheel portion 94 is arranged in a first plane at a first side of the air movement mechanism 76 and the air inlet defined by the second wheel portion 96 is arranged in a second plane at a second side of the air movement mechanism 76, the first and second planes being generally parallel. Accordingly, the air inlets defined by the first and second wheel portions 94, 96 remain generally fixed relative to both the fan housing 84 and an axis of rotation of the fan wheel 82. The first wheel portion 94 includes a first plurality of impeller blades 98 and the second wheel portion 96 similarly includes a second plurality of impeller blades 100. One or both of the first plurality and the second plurality of impeller blades 98, 100 may have a backward curved configuration, a forward curved configuration, or another configuration.

[0101] With reference now to FIG. 7, a control panel or user interface 102 may be positioned at an exterior surface of the housing 22. The control panel 102 includes one or more inputs 104 associated with energizing the heating element 70 of the cooking system 20 and for selecting various modes of operation of the cooking system 20. One or more of the inputs 104 may include a light or other indicator to show that the respective input has been selected. The control panel 102 may additionally include a display 106 separate from and associated with the at least one input 104. However, embodiments where the display 106 is integrated into the at least one input 104 are also contemplated herein.

[0102] Operation of the one or more inputs 104 will be described in more detail below. FIG. 7 illustrates an example of a control system 108 of the cooking system 20 including a controller or processor 110 for controlling operation of the heating element 70 and air movement device 76 (including the motor 78 associated therewith), and in some embodiments for executing stored sequences of heating operation. The processor 110 is operably coupled to the control panel 102 and to the heating element 70 and the air movement mechanism 76.

[0103] In addition, the cooking system 20 may include one or more sensors S for monitoring one or more parameters associated with the temperature of the heating element

70, the cooking volume, the airflow being delivered to the cooking volume and/or and the insert 50 positioned within the cooking container 32 during a cooking operation. Accordingly, operation of the cooking system 20, and in particular of the one or more heating elements 70, may be regulated in response to the parameters sensed by the one or more sensors S. In an embodiment, the one or more sensors S includes a temperature sensor arranged in communication with the processor 110. In an embodiment, the temperature sensor(s) S, such as a negative temperature coefficient (NTC) sensor for example, is positioned adjacent the rear of the internal compartment 28, upstream from the air duct 74 defined between the back wall 62 of the cooking container 32 and the blocking wall 52 of the insert 50. In embodiments of the cooking system 20 including one or more temperature sensors S, adjustment of an operating parameter, such as operation of the heating element 70 for example, may be performed using the control algorithm in response to the temperature of the heated airflow, measured by the temperature sensor S disposed in the heated airflow. For example, power provided to the heating element 70 may be increased if the sensed airflow temperature is below a set point, and the power provided to the heating element 70 may be reduced or ceased completely if the sensed airflow temperature is above a set point, thereby allowing the cooking volume to cool.

[0104] In an embodiment, the air movement mechanism 76 of the cooking system 20 is a variable speed fan operable at a plurality of rotational speeds. In an embodiment, the operational speed of the air movement mechanism 76 may vary based on the cooking mode selected. For example, the speed of the air movement mechanism 76 during operation in a first cooking mode may be different than the speed of the air movement mechanism 76 during operation in a second cooking mode. The operational speed of the air movement mechanism 76 may be controlled by the processor 110 in response to one or more inputs 104, including selection of a cooking mode. However, the processor 110 may also be configured to adjust the operational speed of the air movement mechanism 76, or alternatively, the power supplied to the at least one heating elements 70 to control the temperature and/or pressure within the interior 38 of the cooking container 32.

[0105] In an embodiment, at least one input 104 on the control panel 102 is an on/off button which allows the user to activate or deactivate the control panel 102. When the control panel 102 is deactivated, the one or more heating elements 70 are not energized. In an exemplary embodiment, the at least one input 104 is operable to select one or more manual modes of operation of the heating element 70. Alternatively, or in addition, at least one input 104 is operable to select a stored sequence of operation of the heating element 70. In some

cases, the stored sequences may be particularly well suited for a given method of food preparation and/or for particular ingredients or types of ingredients. The plurality of stored sequences associated with the at least one input 104 may be stored within a memory accessible by the processor 110. Alternatively, the plurality of stored sequences may be stored remotely from the cooking system 20, and may be accessed by the processor 110, such as via wireless communication for example.

[0106] In addition, a user may be able to enter a time associated with operation of the cooking system 20 in a desired manual mode. The time may be entered via the same input 104 or a separate input 104 as used to select a mode of operation. Further in embodiments where the cooking system 20 is in a mode configured to perform a stored sequence in response to selection of one of the inputs 104, the display 106 may indicate a time remaining. Temperature or other parameters may also be entered via inputs 104 and/or shown on the display 106.

[0107] The at least one input 104 may include a distinct start button intended to initiate operation in a desired mode, a distinct stop button to cease all operation, or a stop/start button intended to initiate and cease functions. Alternatively, the cooking system 20 may be operable to automatically start operation after a predetermined time has elapsed once an input 104 has been selected and any necessary information has been provided to the control panel 102. Alternatively, one or more of the other inputs 104 may be operable to start and stop operation of the cooking system 20, regardless of whether the cooking system 20 is following a stored sequence or is in a manual mode.

[0108] As previously noted, the one or more inputs 104 may be operable to initiate operation of the cooking system 20 in a plurality of cooking modes. In an embodiment, the cooking system 20 is operable in a cooking mode where the heating element 70 is employed to perform a non-contact heating operation, such as a convective or radiative heating operation. Suitable cooking operations that may be performed in this first cooking mode include, but are not limited to air frying, broiling, baking/roasting, and dehydrating.

[0109] During operation in the first cooking mode, the air movement mechanism 76 is operable to circulate a heated air flow through the cooking volume. As previously described, the air movement mechanism 76 is operable to draw air upwards, through the adjacent heating element 70 and into the two inlets arranged at opposing sides of the fan wheel 82. The heated air is expelled outwardly from the outlet opening 92 of the fan housing 84 in a single direction. In the illustrated, non-limiting embodiment, the air output from the air movement mechanism 76 is provided within a plane directed downwardly into the

cooking container 32. In the illustrated, non-limiting embodiment, the outlet opening 92 arranged directly adjacent the upper extent 72 of the cooking container 32, such that the air is expelled from the outlet opening 92 directly into the air duct 74 formed within the cooking container 32. Once the heated air reaches the bottom surface 58 of the cooking container 32, the hot air will be deflected off the bottom surface 58 towards the cooking volume. Because the bottom surface 58 of the cooking container 32 is sloped, the interaction between the heated air and the sloped bottom surface 58 directs the heated air both forwards and upwardly, causing the air to evenly distribute from the back to the front of the cooking container 32 before passing through the openings 56 formed in the food support surface 54 of the insert 50. The hot air is drawn by the air movement mechanism 76 through the openings 56 and over the exterior of the food items positioned on the food support surface 54. From within the cooking volume, the air is then drawn back into one of the inlets of the air movement mechanism 76 for further circulation within the interior 28.

[0110] With reference now to FIGS. 8-15, in an embodiment of the cooking system 20, the housing 22 includes a plurality of internal compartments arranged within the interior of the housing 22. For example, as best shown in FIGS. 8, 14, and 15, the housing 22 is illustrated as having a first internal compartment 28a and a second internal compartment 28b, separated from one another at least in part by a divider or wall 130. The divider 130 extends vertically from a base of the housing or liner 30 and forms a sidewall of a bottom portion of two adjacent internal compartments 28a, 28b. In an embodiment, the divider 130 extends to a lower edge of an upper portion of each internal compartment 28a, 28b, the upper portion of each internal compartment containing the respective heating element 70a, 70b, and air movement mechanism 76a, 76b associated therewith. As shown, the plurality of internal compartments 28a, 28b (both the upper and lower portions) are fluidly separate from one another. Although two internal compartments 28a, 28b are illustrated and described herein, it should be understood that embodiments including any number of internal compartments, such as more than two compartments are also within the scope of the disclosure. The plurality of internal compartments 28a, 28b may be substantially similar in size and shape, or alternatively, may be different.

[0111] Each of the internal compartments 28a, 28b formed in the housing 22 may be substantially identical to the internal compartment 28 previously described with respect to FIGS. 1-6. More specifically, a respective cooking container 32a, 32b is insertable into each internal compartment 28a, 28b, and an insert 50a, 50b may be removably installed within the interior 38a, 38b of each cooking container 32a, 32b. In addition, each internal compartment

28a, 28b includes at least one heating element 70a, 70b and an air movement mechanism 76a, 76b configured to circulate air through the internal compartment 28a, 28b, respectively. The components associated with operation of each internal compartment, such as the heating element and air movement mechanism are also independently operable and fluidly separate from the components of the adjacent internal compartment.

[0112] In the non-limiting embodiment of FIGS. 14 and 15, each air movement mechanism 76a, 76b is illustrated as a fan wheel or impeller 82 that is configured to rotate about a generally vertically oriented axis. The air movement mechanisms 76a, 76b need not include a separate housing as previously described with respect to the embodiment of FIGS. 1-6. As shown, the air movement mechanisms 76a, 76b may be stacked vertically relative to the heating element 70a, 70b such that a flow of air is configured to flow from the heating element 70a, 70b directly to the air movement mechanism 76a, 76b sequentially. The axial flow of air provided to the inlet of the air movement mechanism 76a, 76b is expelled from the impeller 82a, 82b radially, adjacent the sides of the internal compartment 28. Although this configuration of the air movement mechanism 76a, 76b is illustrated with respect to an embodiment of the cooking system 20 including a plurality of fluidly distinct internal compartments 28a, 28b, it should be understood that such an air movement mechanism 76 may also be used in embodiments of the cooking system 20 including only a single internal compartment 28.

[0113] As noted above, the cooking system 20 includes a motor 78 located external to the internal compartment 28 and operable to rotate an air movement mechanism 76 about an axis of rotation X. In embodiments of the cooking system 20 including two distinct internal compartments, a single motor 78 may be used to drive both a first air movement mechanism 76a associated with the first internal compartment 28a and a second air movement mechanism 76b associated with the second internal compartment 28b. In such embodiments, the motor 78 may be disposed within the housing 22 between the first and second compartments 28a, 28b, such that the first air movement mechanism 76a is mounted to a first output shaft 120 extending from a first side of the motor 78 and the second air movement mechanism 76b is mounted to a second output shaft 122 extending from a second side of the motor 78. As a result, the first air movement mechanism 76a and the second air movement mechanism 76b may be positioned coaxially (see FIG. 10). However, embodiments, where the axis of rotation X1 of the first air movement mechanism 76a is offset from the axis of rotation X2 of the second air movement mechanism 76b are also contemplated herein.

[0114] Because a single motor 78 is used to drive the both the first and second air movement mechanisms 76a, 76b, in an embodiment, both the first and second air movement mechanisms 76a, 76b are driven about their axes, even when only one of the first and second internal compartment 28a, 28b is being used to perform a cooking operation. Accordingly, an air movement mechanism 76 may rotate about its axis even when the adjacent heating mechanism 70 associated therewith is non-operational. In other embodiments, the first and second air movement mechanisms 76a, 76b may be independently operable via a shared motor 78. Further, in an embodiment, the motor 78 is operable to rotate the first and second air movement mechanisms 76a, 76b, at the same speed. However, embodiments where the first and second air movement mechanisms 76a, 76b, are rotated at different speeds, such as via a coupling for example, are also within the scope of the disclosure.

[0115] However, it should be understood that embodiments of the cooking system 20 that include a separate motor associated with each internal compartment are also within the scope of the disclosure. For example, as shown in FIG. 15, the system 20 includes two separate motors 78a, 78b configured to operate the air movement mechanisms 76a, 76b associated with the first and second internal compartments 28a, 28b independently. In such embodiments, each motor 78a, 78b may be located external to the internal compartment 28, for example in a vertically stacked configuration relative to the heating elements 70a, 70b, and the air movement mechanisms 76a, 76b. In such embodiments, the motors 78a, 78b may be located near an upper end or top surface of the housing 22.

[0116] In embodiments of the cooking system 20 including a plurality of internal compartments, a single control system 108, as previously described with respect to FIG. 7, may be suitable to selectively perform one or more cooking operations associated with both the first internal compartment 28a and the second internal compartment 28b. Accordingly, the same inputs 104 may be used to provide control for the plurality of internal compartments 28a, 28b, or alternatively, distinct inputs 104 may be associated with each of the plurality of internal compartments 28a, 28b, respectively.

[0117] All references, including publications, patent applications, and patents cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0118] The use of the terms “a” and “an” and “the” and similar referents in the context of describing the disclosure (especially in the context of the following claims) is to be construed to cover both the singular and the plural, unless otherwise indicated herein or

clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to,”) unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate the disclosure and does not pose a limitation on the scope of the disclosure unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the disclosure.

[0119] Exemplary embodiments of this disclosure are described herein, including the best mode known to the inventors for carrying out the disclosure. Variations of those embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the disclosure to be practiced otherwise than as specifically described herein. Accordingly, this disclosure includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

VIII-2-1	Declaration: Entitlement to apply for and be granted a patent Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate: Name (LAST, First)	In relation to this international application SHARKNINJA OPERATING LLC is entitled to apply for and be granted a patent by virtue of the following:
VIII-2-1 (iv)		an assignment from MARTIN, Christopher T. to SHARKNINJA OPERATING LLC, dated 16 July 2019 (16.07.2019)
VIII-2-1 (iv)		an assignment from GUERIN, Thomas to SHARKNINJA OPERATING LLC, dated 15 July 2019 (15.07.2019)
VIII-2-1 (iv)		an assignment from JACKSON, Roger Neil to SHARKNINJA OPERATING LLC, dated 15 July 2019 (15.07.2019)
VIII-2-1 (iv)		an assignment from ANTHONY, Joshua D. to SHARKNINJA OPERATING LLC, dated 16 July 2019 (16.07.2019)

PCTNOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92*bis*.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

HAYTER, Alicia
20 Church Street 22nd Floor
Hartford, Connecticut 06103
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (<i>day/month/year</i>) 05 August 2020 (05.08.2020)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference EUP1549PCT	
International application No. PCT/US2020/042120	International filing date (<i>day/month/year</i>) 15 July 2020 (15.07.2020)

1. The following indications appeared on record concerning:											
☐ the applicant	☐ the inventor										
☐ the agent	☐ the common representative										
Name and Address	<table border="1"> <tr> <td>State of Nationality</td> <td>State of Residence</td> </tr> <tr> <td colspan="2">Telephone No.</td> </tr> <tr> <td colspan="2">Facsimile No.</td> </tr> <tr> <td colspan="2">E-mail address</td> </tr> </table>	State of Nationality	State of Residence	Telephone No.		Facsimile No.		E-mail address			
State of Nationality	State of Residence										
Telephone No.											
Facsimile No.											
E-mail address											
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:											
☒ the person	☐ the name										
☐ the address	☐ the nationality										
☐ the residence											
Name and Address	<table border="1"> <tr> <td>State of Nationality</td> <td>State of Residence</td> </tr> <tr> <td colspan="2">Telephone No.</td> </tr> <tr> <td colspan="2">Facsimile No.</td> </tr> <tr> <td colspan="2">E-mail address</td> </tr> <tr> <td colspan="2">☐ Notifications by e-mail authorized</td> </tr> </table>	State of Nationality	State of Residence	Telephone No.		Facsimile No.		E-mail address		☐ Notifications by e-mail authorized	
State of Nationality	State of Residence										
Telephone No.											
Facsimile No.											
E-mail address											
☐ Notifications by e-mail authorized											
3. Further observations, if necessary: The person identified in Box 2 has been added as inventor only.											
4. A copy of this notification has been sent to: <table border="0"> <tr> <td>☒ the receiving Office</td> <td>☐ the International Preliminary Examining Authority</td> </tr> <tr> <td>☒ the International Searching Authority</td> <td>☐ the designated Offices concerned</td> </tr> <tr> <td>☐ the Authority(ies) specified for supplementary search</td> <td>☐ the elected Offices concerned</td> </tr> <tr> <td></td> <td>☐ other:</td> </tr> </table>		☒ the receiving Office	☐ the International Preliminary Examining Authority	☒ the International Searching Authority	☐ the designated Offices concerned	☐ the Authority(ies) specified for supplementary search	☐ the elected Offices concerned		☐ other:		
☒ the receiving Office	☐ the International Preliminary Examining Authority										
☒ the International Searching Authority	☐ the designated Offices concerned										
☐ the Authority(ies) specified for supplementary search	☐ the elected Offices concerned										
	☐ other:										

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Dezempte Anne e-mail pct.team6@wipo.int Telephone No. +41 22 338 74 06
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VIII-3-1	Declaration: Entitlement to claim priority Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	In relation to this international application SHARKNINJA OPERATING LLC is entitled to claim priority of earlier application No. US 62/874,193 by virtue of the following:
VIII-3-1 (iv)		an assignment from MARTIN, Christopher T. to SHARKNINJA OPERATING LLC, dated 16 July 2019 (16.07.2019)
VIII-3-1 (iv)		an assignment from GUERIN, Thomas to SHARKNINJA OPERATING LLC, dated 15 July 2019 (15.07.2019)
VIII-3-1 (iv)		an assignment from JACKSON, Roger Neil to SHARKNINJA OPERATING LLC, dated 15 July 2019 (15.07.2019)
VIII-3-1 (iv)		an assignment from ANTHONY, Joshua D. to SHARKNINJA OPERATING LLC, dated 16 July 2019 (16.07.2019)



(51) International Patent Classification:

A47J 37/01 (2006.01)

(21) International Application Number:

PCT/US2020/042120

(22) International Filing Date:

15 July 2020 (15.07.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

62/874,193

15 July 2019 (15.07.2019)

US

(71) Applicant: **SHARKNINJA OPERATING LLC**
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(72) Inventors: **MARTIN, Christopher T.**; 51 Stoddard Dr.,
North Attleboro, Massachusetts 02760 (US). **GUERIN,**
Thomas; 109 D St. #5, Boston, Massachusetts 02127 (US).
JACKSON, Roger Neil; The Lodge, Hillside, Trebur-

setts 01862 (US). **SCHWARZ, Kerry**; 89 A Street, Need-
ham, MA 02494 (US). **DUBEAU, Michaela**; 89 Aldrich
Street, Uxbridge, MA 01569 (US).

(74) Agent: **HAYTER, Alicia**; 20 Church Street 22nd Floor,
Hartford, Connecticut 06103 (US).

(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, IT, JO, JP, KE, KG, KH, KN,
KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD,
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(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,

(54) Title: COOKING DEVICE AND COMPONENTS THEREOF

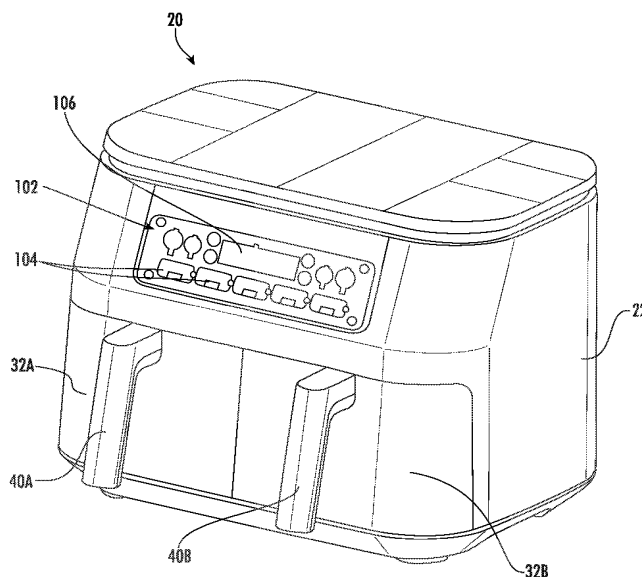


FIG. 13

(57) Abstract: A cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A bottom surface of said cooking container is angled upwardly. A heating element is associated with said at least one internal compartment.

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).

Declarations under Rule 4.17:

- *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))*

Published:

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

PCT REQUEST

(Original in Electronic Form)

0	For receiving Office use only	
0-1	International Application No.	PCT/US20/42120
0-2	International Filing Date	15 July 2020 (15.07.2020)
0-3	Name of receiving Office and "PCT International Application"	PCT INTERNATIONAL APPLICATION RO/US
0-4	Form PCT/RO/101 PCT Request	
0-4-1	Prepared Using	ePCT-Filing for data package download Version 4.7.101 MT/FOP 20200705/1.1
0-5	Petition	
	The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty	
0-6	Receiving Office (specified by the applicant)	United States Patent and Trademark Office (USPTO) (RO/US)
0-7	Applicant's or agent's file reference	EUP1549PCT
I	Title of Invention	[The title is as provided on page 1 of the description]
II	Applicant	
II-1	This person is	Applicant only
II-2	Applicant for	All designated States
II-4	Name	SHARKNINJA OPERATING LLC
II-5	Address	89 A Street, Suite 100 Needham, Massachusetts 02494 United States of America
II-6	State of nationality	US
II-7	State of residence	US
III-1	Applicant and/or inventor	
III-1-1	This person is	Inventor only
III-1-3	Inventor for	All designated States
III-1-4	Name (LAST, First)	MARTIN, Christopher T.
III-1-5	Address	51 Stoddard Dr. North Attleboro, Massachusetts 02760 United States of America
III-2	Applicant and/or inventor	
III-2-1	This person is	Inventor only
III-2-3	Inventor for	All designated States
III-2-4	Name (LAST, First)	GUERIN, Thomas
III-2-5	Address	109 D St. #5 Boston, Massachusetts 02127 United States of America

PCT REQUEST

(Original in Electronic Form)

III-3	Applicant and/or inventor	
III-3-1	This person is	Inventor only
III-3-3	Inventor for	All designated States
III-3-4	Name (LAST, First)	JACKSON, Roger Neil
III-3-5	Address	The Lodge, Hillside, Treburley Launceton Cornwall PL159PU United Kingdom
III-4	Applicant and/or inventor	
III-4-1	This person is	Inventor only
III-4-3	Inventor for	All designated States
III-4-4	Name (LAST, First)	ANTHONY, Joshua D.
III-4-5	Address	3 Fieldstone Lane North Billerica, Massachusetts 01862 United States of America
IV-1	Agent or common representative; or address for correspondence	
	The person identified below is hereby/ has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:	Agent
IV-1-1	Name (LAST, First)	HAYTER, Alicia
IV-1-2	Address	20 Church Street 22nd Floor Hartford, Connecticut 06103 United States of America
IV-1-3	Telephone No.	860-286-2929
IV-1-5	e-mail	global-ip@cantorcolburn.com
IV-1-5(a)	E-mail authorization The receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority are authorized to use this e-mail address, if the Office or Authority so wishes, to send notifications issued in respect of this international application:	exclusively in electronic form (no paper notifications will be sent)
IV-1-6	Agent's registration No.	67093
V	DESIGNATIONS	
V-1	The filing of this request constitutes under Rule 4.9(a), the designation of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.	
VI-1	Priority claim of earlier national application	
VI-1-1	Filing date	15 July 2019 (15.07.2019)
VI-1-2	Number	62/874,193
VI-1-3	Country or Member of WTO	US

PCT REQUEST

(Original in Electronic Form)

VI-2	Priority document request The International Bureau is requested to obtain from a digital library a certified copy of the earlier application(s) identified above as item(s), using, where applicable, the access code(s) indicated:	VI-1 Access code: 1001	
VI-3	Incorporation by reference : where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a), or an element or part of the description, claims or drawings referred to in Rule 20.5bis(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.		
VII-1	International Searching Authority Chosen	Korean Intellectual Property Office (ISA/KR)	
VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	1	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	1	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	

PCT REQUEST

(Original in Electronic Form)

IX	Check list	Number of sheets	Electronic file(s) attached
IX-1	Request (including declaration sheets)	6	✓
IX-2	Description	20	✓
IX-3	Claims	7	✓
IX-4	Abstract	1	✓
IX-5	Drawings	15	✓
IX-6a	Sequence listing part of the description (also to be used for the purposes of international search)	-	-
IX-7	TOTAL	49	
Accompanying Items		Paper document(s) attached	Electronic file(s) attached
IX-8	Fee calculation sheet	-	✓
IX-20	Figure of the drawings which should accompany the abstract	13	
IX-21	Language of filing of the international application	English	
X-1	Signature of applicant, agent or common representative	/Alicia Hayter, Reg. No. 67093/	
X-1-1	Name (LAST, First)	HAYTER, Alicia	
X-1-3	Capacity (if such capacity is not obvious from reading the request)	Agent	

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	15 July 2020 (15.07.2020)
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/KR
10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	
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PCT**NOTIFICATION OF THE RECORDING
OF A CHANGE**(PCT Rule 92*bis*.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

HAYTER, Alicia
20 Church Street 22nd Floor
Hartford, Connecticut 06103
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (<i>day/month/year</i>) 05 August 2020 (05.08.2020)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference EUP1549PCT	
International application No. PCT/US2020/042120	International filing date (<i>day/month/year</i>) 15 July 2020 (15.07.2020)

1. The following indications appeared on record concerning:			
☐ the applicant	☐ the inventor	☐ the agent	☐ the common representative
Name and Address		State of Nationality	State of Residence
		Telephone No.	
		Facsimile No.	
		E-mail address	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:			
☒ the person	☐ the name	☐ the address	☐ the nationality ☐ the residence
Name and Address SCHWARZ, Kerry 89 A Street Needham, MA 02494 United States of America		State of Nationality	State of Residence
		Telephone No.	
		Facsimile No.	
		E-mail address ☐ Notifications by e-mail authorized	
3. Further observations, if necessary: The person identified in Box 2 has been added as inventor only.			
4. A copy of this notification has been sent to:			
☒ the receiving Office	☐ the International Preliminary Examining Authority		
☒ the International Searching Authority	☐ the designated Offices concerned		
☐ the Authority(ies) specified for supplementary search	☐ the elected Offices concerned		
	☐ other:		

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Dezempte Anne e-mail pct.team6@wipo.int Telephone No. +41 22 338 74 06
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VIII-2-1	<p>Declaration: Entitlement to apply for and be granted a patent</p> <p>Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate:</p> <p>Name (LAST, First)</p>	<p>In relation to the international application No. PCT/US2020/042120</p> <p>SHARKNINJA OPERATING LLC is entitled to apply for and be granted a patent by virtue of the following:</p>
VIII-2-1 (ii)		<p>SHARKNINJA OPERATING LLC is entitled as employer of the inventor, SCHWARZ, Kerry</p>

VIII-2-2	Declaration: Entitlement to apply for and be granted a patent Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate: Name (LAST, First)	In relation to the international application No. PCT/US2020/042120 SHARKNINJA OPERATING LLC is entitled to apply for and be granted a patent by virtue of the following:
VIII-2-2 (ii)		SHARKNINJA OPERATING LLC is entitled as employer of the inventor, DUBEAU, Michaela

CERTIFICATE OF AVAILABILITY OF A CERTIFIED PATENT DOCUMENT IN A DIGITAL LIBRARY

The International Bureau certifies that a copy of the patent application indicated below has been available to the WIPO Digital Access Service since the date of availability indicated, and that the patent application has been available to the indicated Office(s) as of the date specified following the relevant Office code:

Document details: Country/Office: US

Filing date: 15 Jul 2019 (15.07.2019)

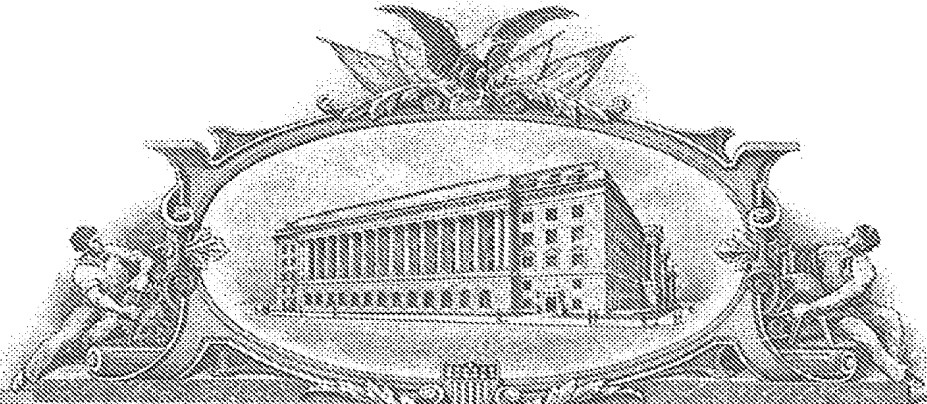
Application number: 62874193

Date of availability of document: 18 Jul 2019 (18.07.2019)

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Date of issue of this certificate: 03 Aug 2020 (03.08.2020)



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 03, 2020

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 62/874,193

FILING DATE: *July 15, 2019*

THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS *US62/874,193*



Certified by

Under Secretary of Commerce
for Intellectual Property
and Director of the United States
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

Secrecy Order 37 CFR 5.2:

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor	1				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Christopher	T.	Martin			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	North Attleboro	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	51 Stoddard Drive					
Address 2						
City	North Attleboro	State/Province	MA			
Postal Code	02760	Country	US			
Inventor	2				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Thomas		Guerin			
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service						
City	Boston	State/Province	MA	Country of Residence	US	
Mailing Address of Inventor:						
Address 1	109 D Street, #5					
Address 2						
City	Boston	State/Province	MA			
Postal Code	02127	Country	US			
Inventor	3				Remove	
Legal Name						
Prefix	Given Name	Middle Name	Family Name	Suffix		
	Roger	Neil	Jackson			
Residence Information (Select One) ☐ US Residency ☒ Non US Residency ☐ Active US Military Service						

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

City	Cornwall	Country of Residence ⁱ	GB
------	----------	-----------------------------------	----

Mailing Address of Inventor:

Address 1	The Lodge, Hillside		
Address 2	Treburley, Launceston		
City	Cornwall	State/Province	
Postal Code	PL159PU	Country ⁱ	GB
Inventor	4	Remove	

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Joshua	D.	Anthony	

Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service

City	North Billerica	State/Province	MA	Country of Residence ⁱ	US
------	-----------------	----------------	----	-----------------------------------	----

Mailing Address of Inventor:

Address 1	3 Fieldstone Lane		
Address 2			
City	North Billerica	State/Province	MA
Postal Code	01862	Country ⁱ	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button.

Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ An Address is being provided for the correspondence Information of this application.

Customer Number	130401		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	COOKING DEVICE AND COMPONENTS THEREOF		
Attorney Docket Number	EUP1549US	Small Entity Status Claimed	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	12	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not be** the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	130401		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			
Add			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant	1	Remove
------------------	---	------------------------

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

[Clear](#)

Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
----------	--	----------------

☒ Person to whom the inventor is obligated to assign.
 ☐ Person who shows sufficient proprietary interest

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	SHARKNINJA OPERATING LLC		
-------------------	--------------------------	--	--

Mailing Address Information For Applicant:

Address 1	89 A Street		
Address 2	Suite 100		
City	Needham	State/Province	MA
Country	US	Postal Code	02494
Phone Number		Fax Number	
Email Address			

Additional Applicant Data may be generated within this form by selecting the Add button. [Add](#)

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

Assignee 1				
Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.				
				<input type="button" value="Remove"/>
If the Assignee or Non-Applicant Assignee is an Organization check here. ☐				
Prefix	Given Name	Middle Name	Family Name	Suffix
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Mailing Address Information For Assignee including Non-Applicant Assignee:				
Address 1		<input type="text"/>		
Address 2		<input type="text"/>		
City	<input type="text"/>	State/Province	<input type="text"/>	
Country i	<input type="text"/>	Postal Code	<input type="text"/>	
Phone Number	<input type="text"/>	Fax Number	<input type="text"/>	
Email Address	<input type="text"/>			
Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Signature:

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the INITIAL filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Alicia Hayter, Reg. No. 67093/		Date (YYYY-MM-DD)	2019-07-15
First Name	Alicia	Last Name	Hayter	Registration Number
				67093
Additional Signature may be generated within this form by selecting the Add button.				<input type="button" value="Add"/>

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	EUP1549US
		Application Number	
Title of Invention	COOKING DEVICE AND COMPONENTS THEREOF		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

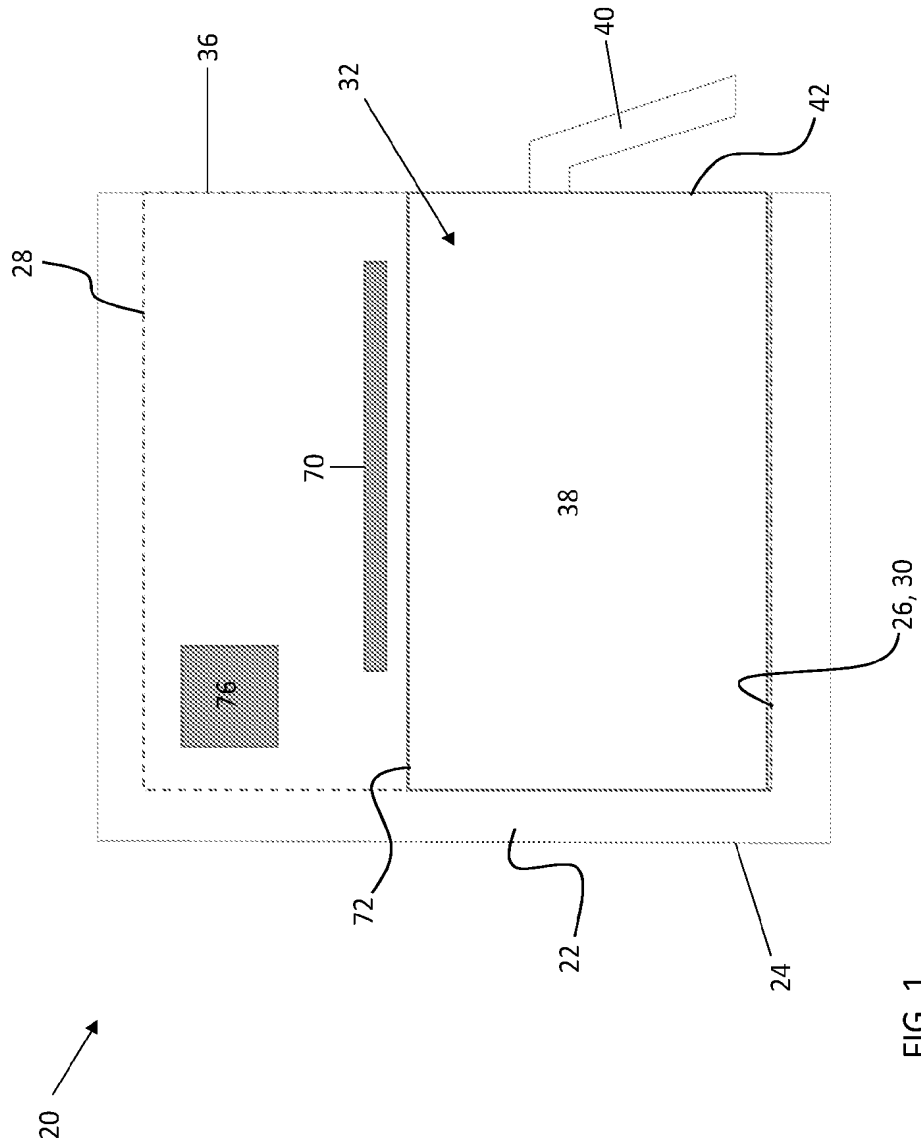


FIG. 1

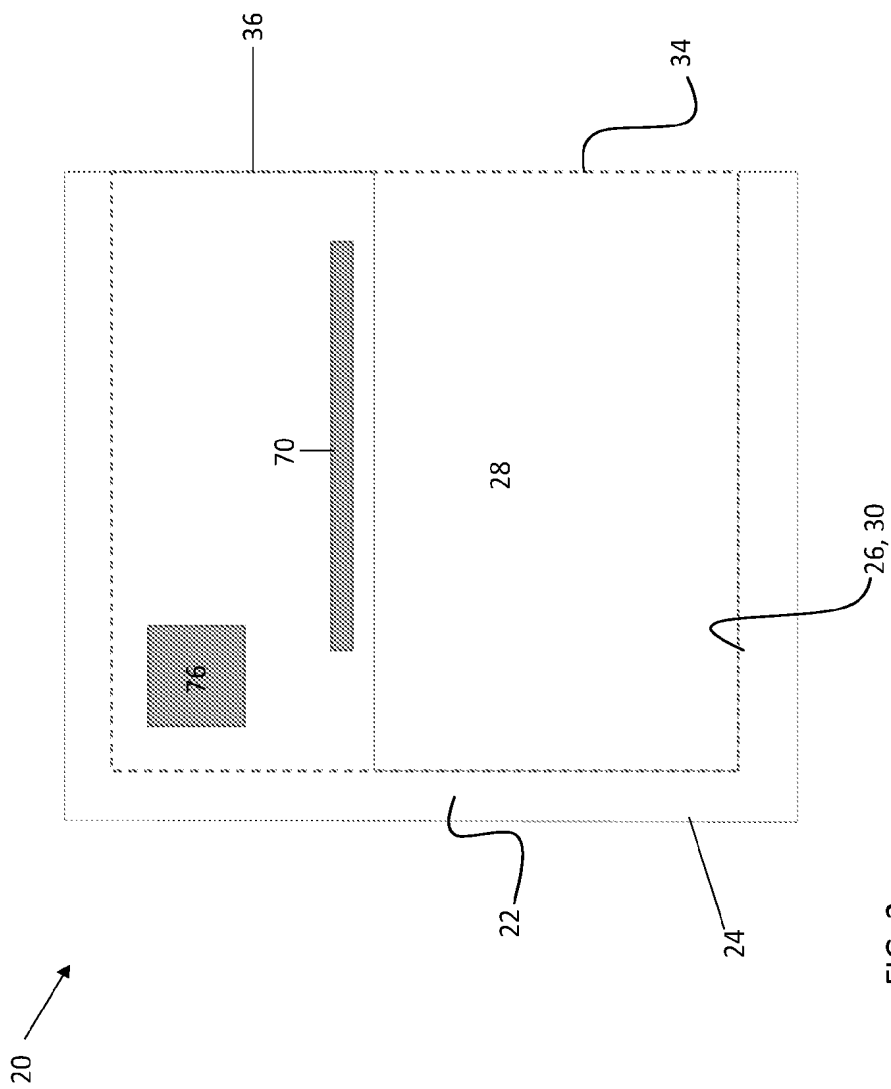


FIG. 2

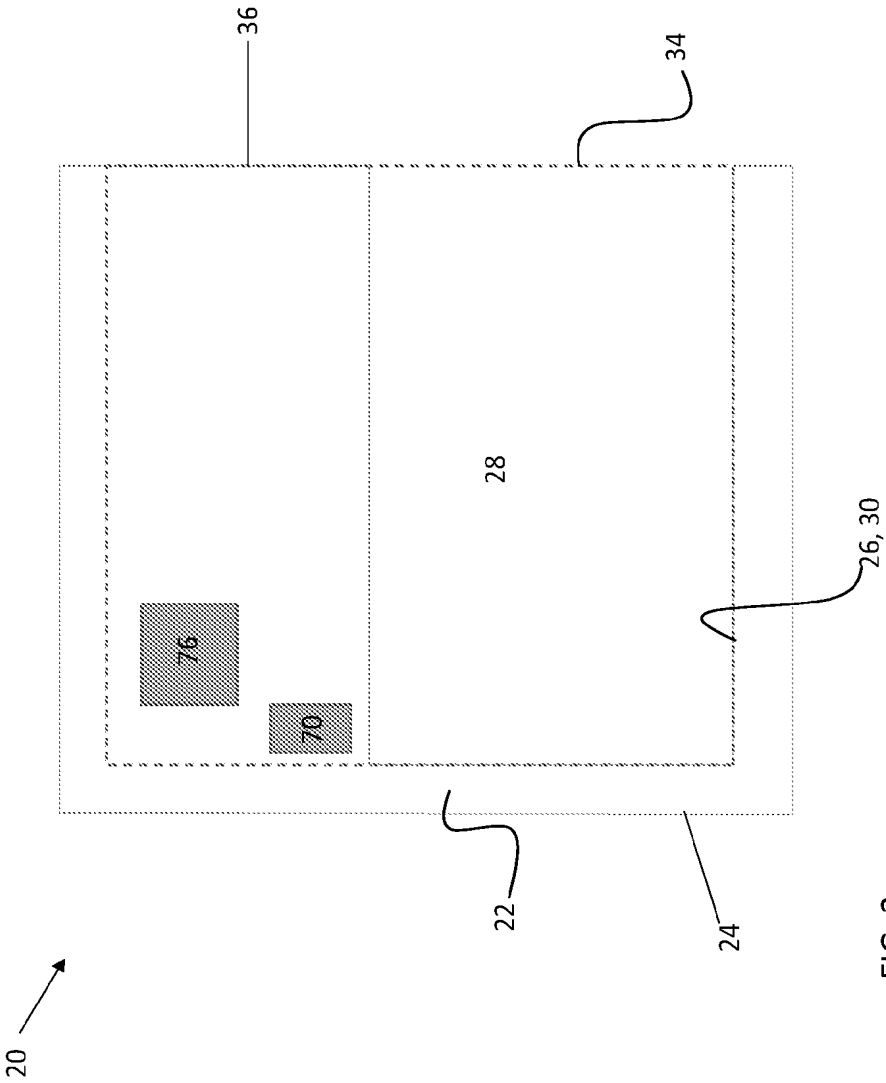


FIG. 3

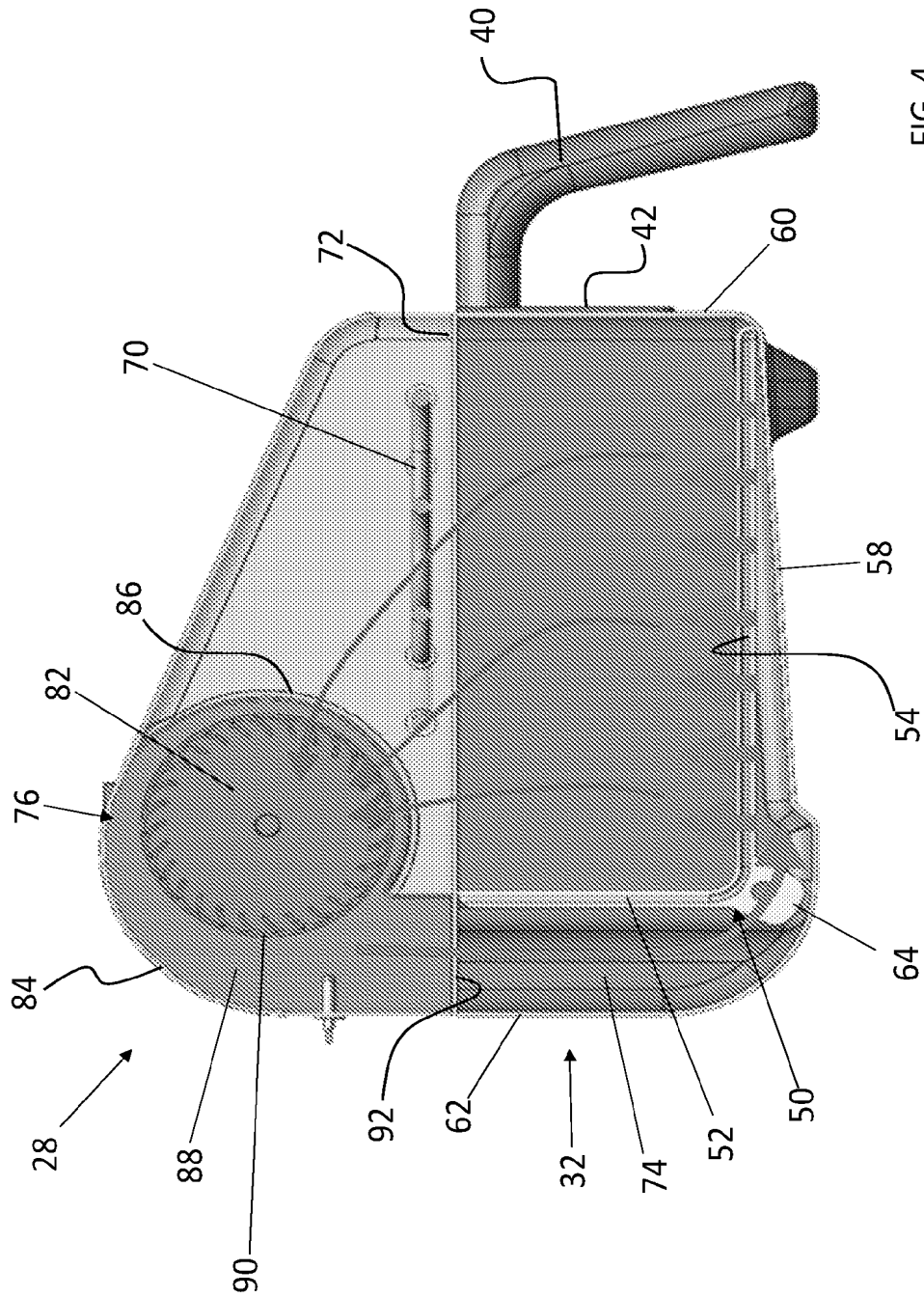


FIG. 4

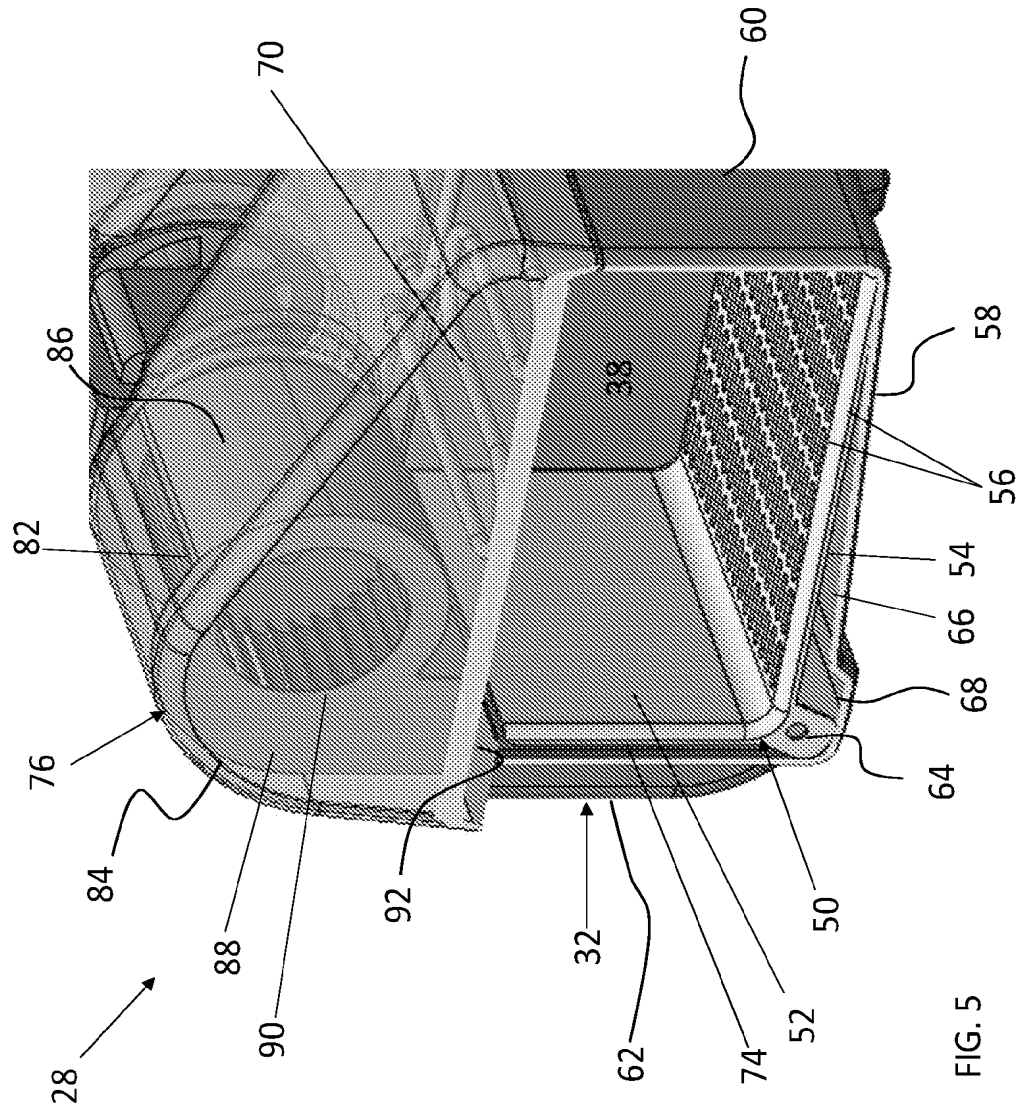


FIG. 5

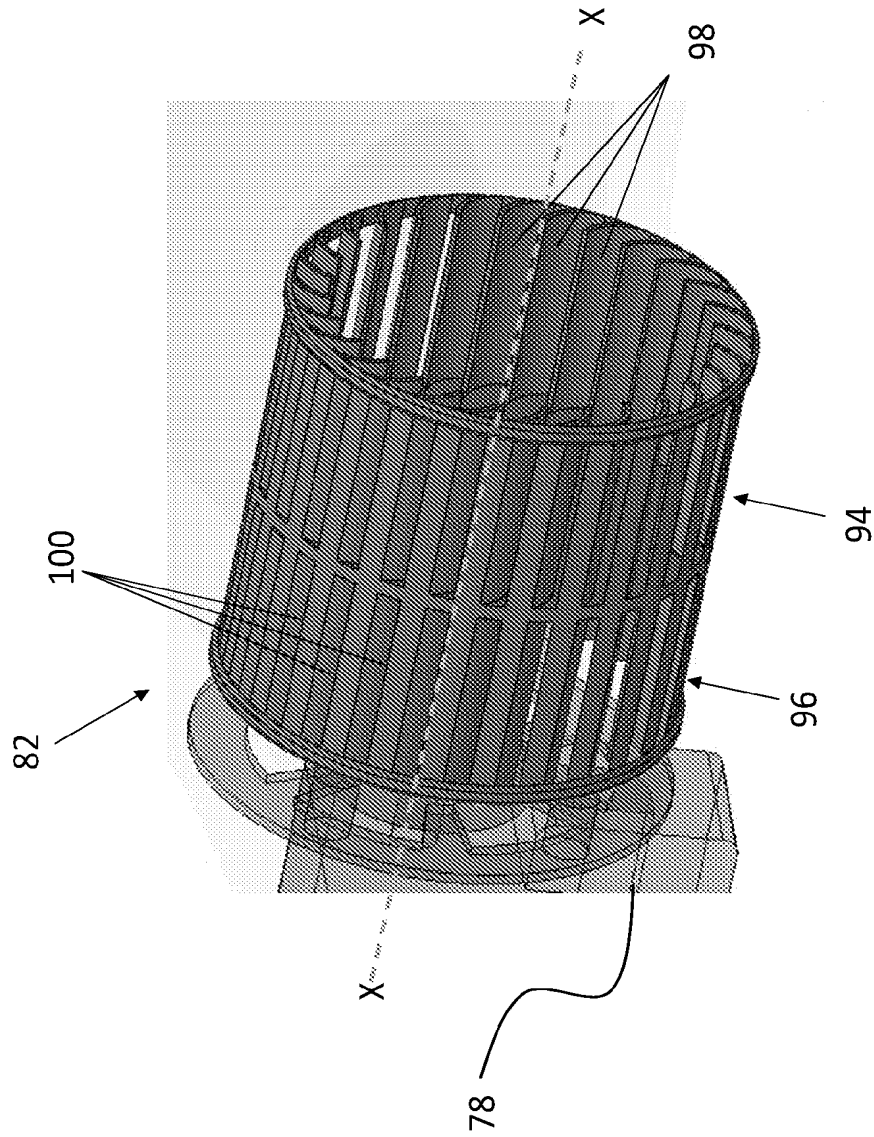


FIG. 6

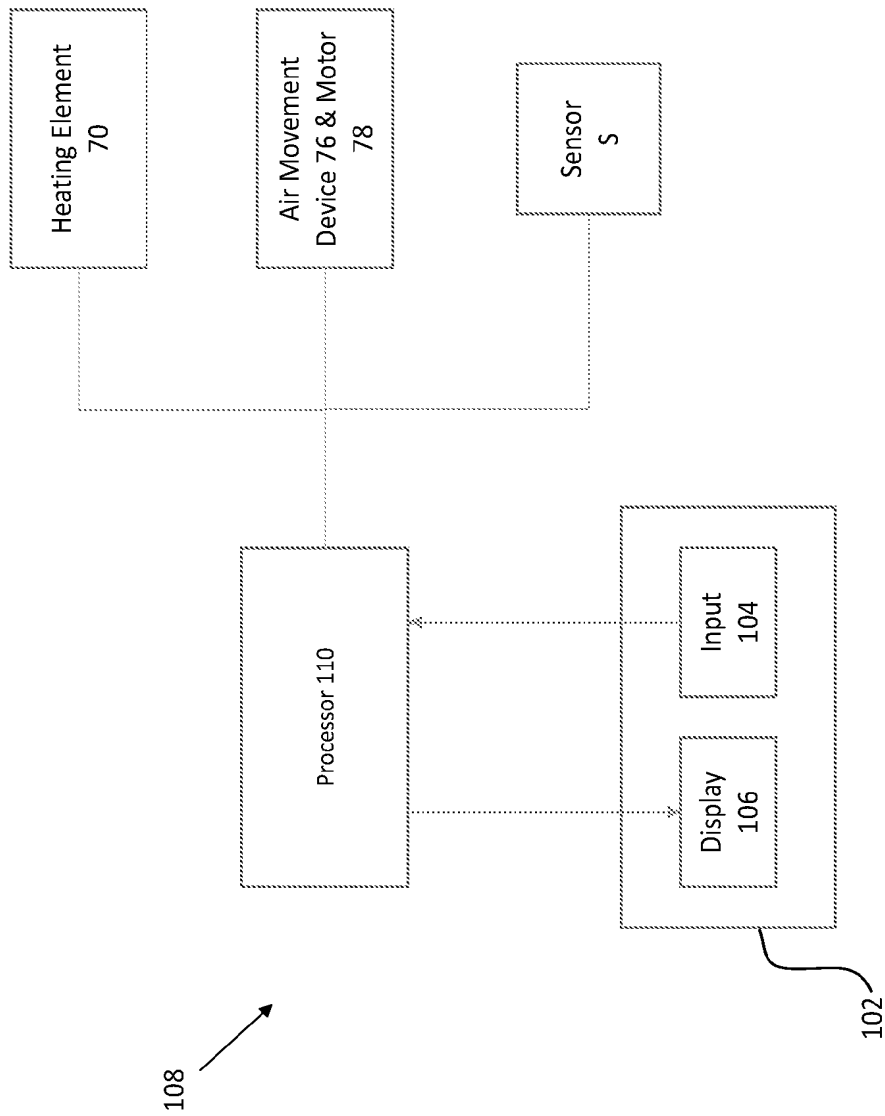


FIG. 7

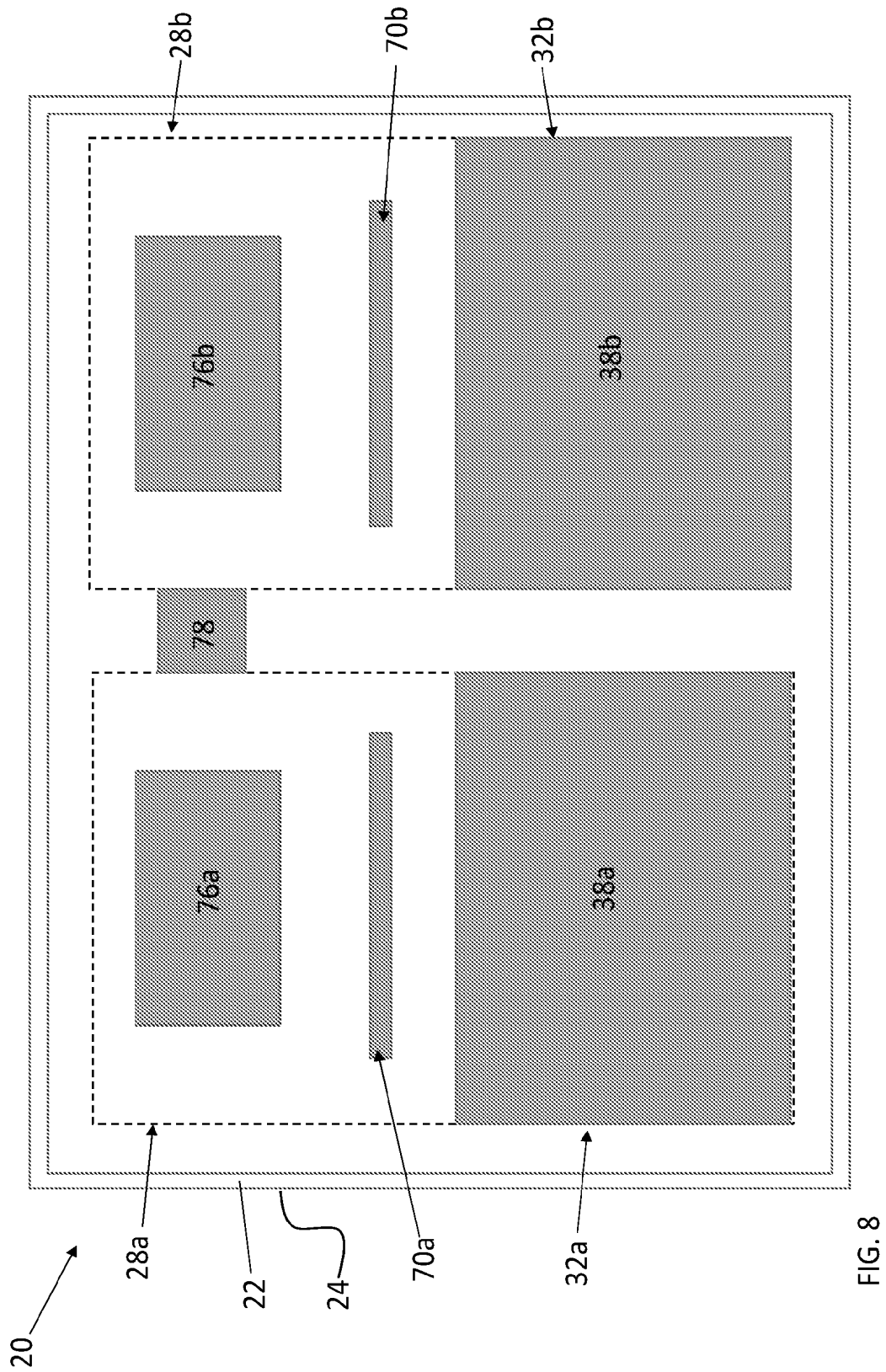


FIG. 8

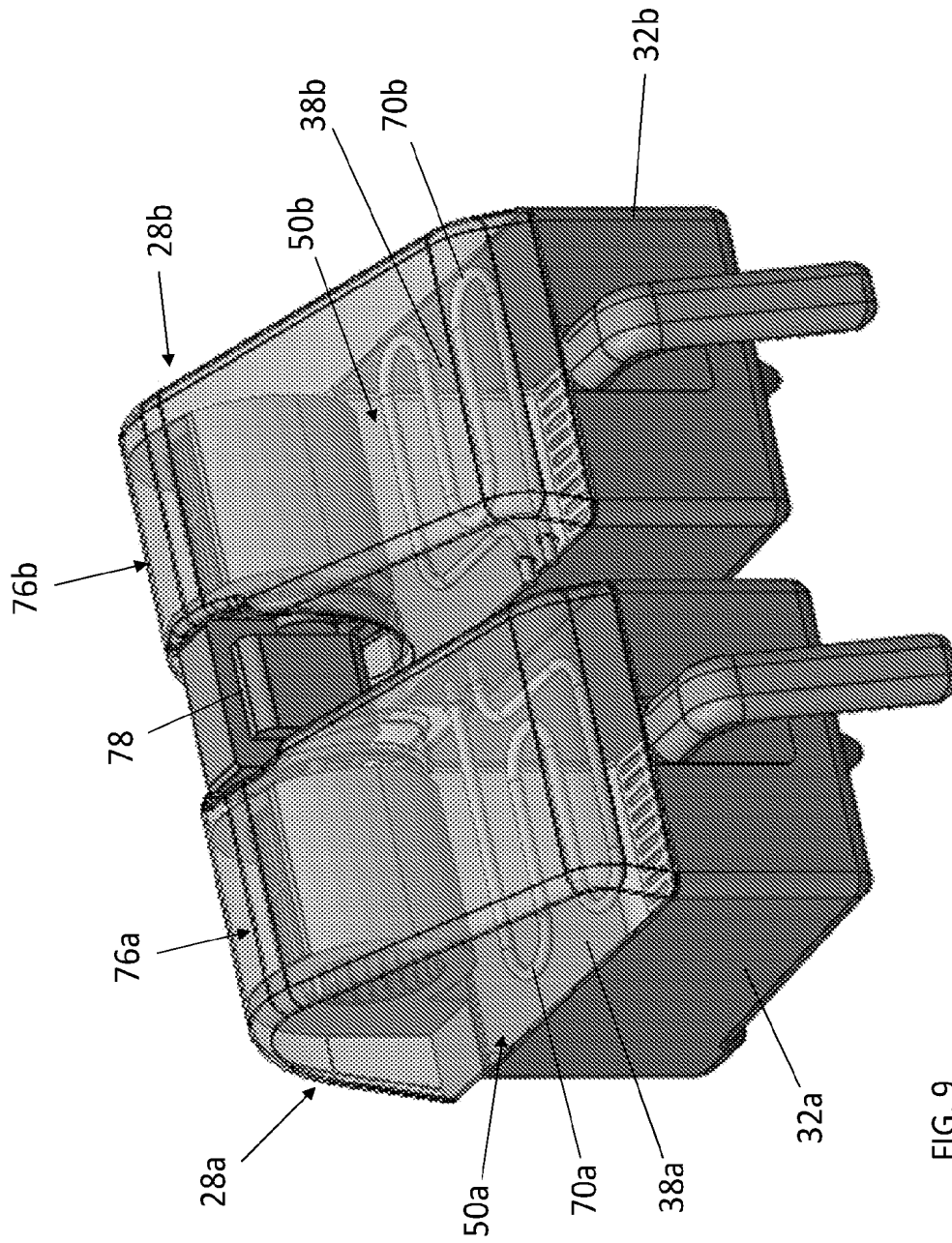


FIG. 9

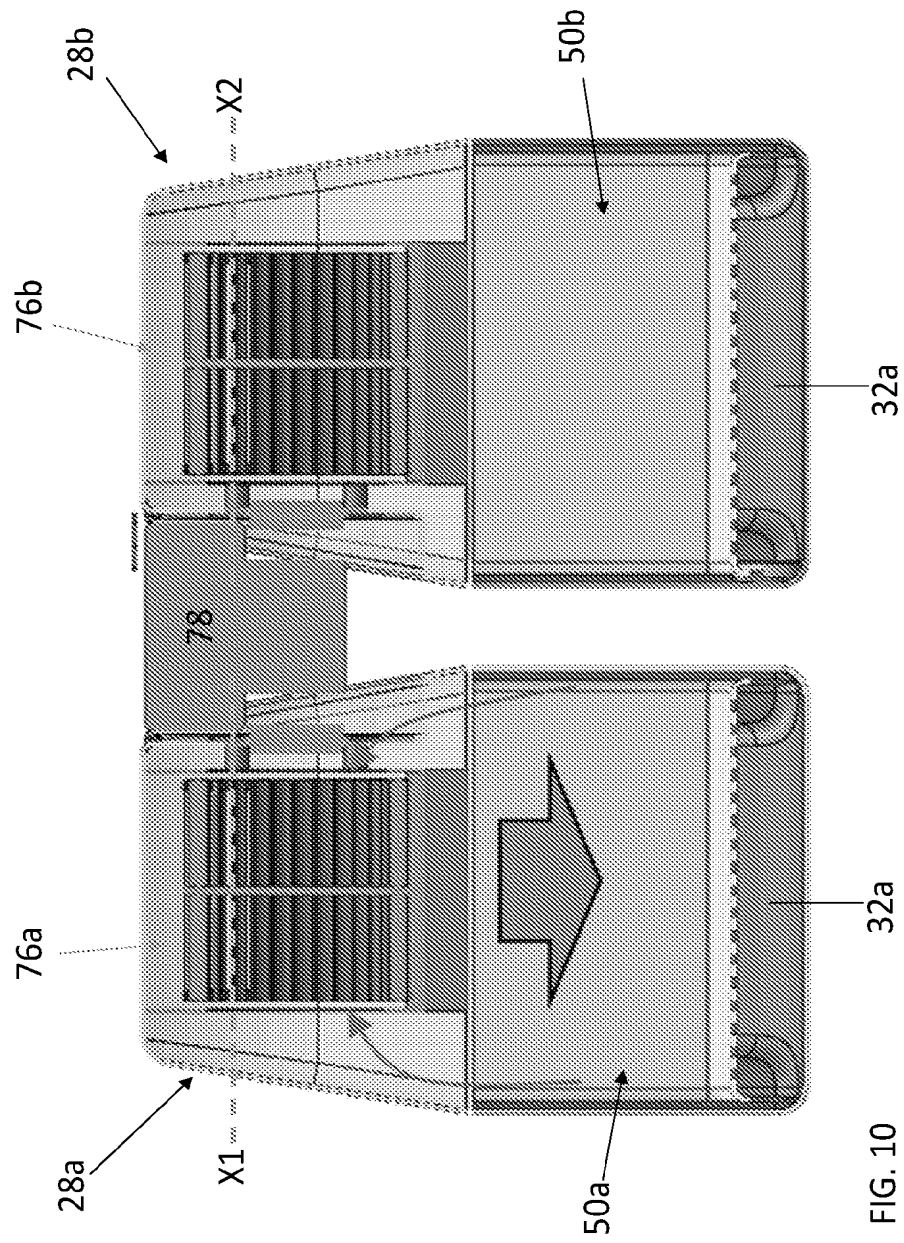


FIG. 10

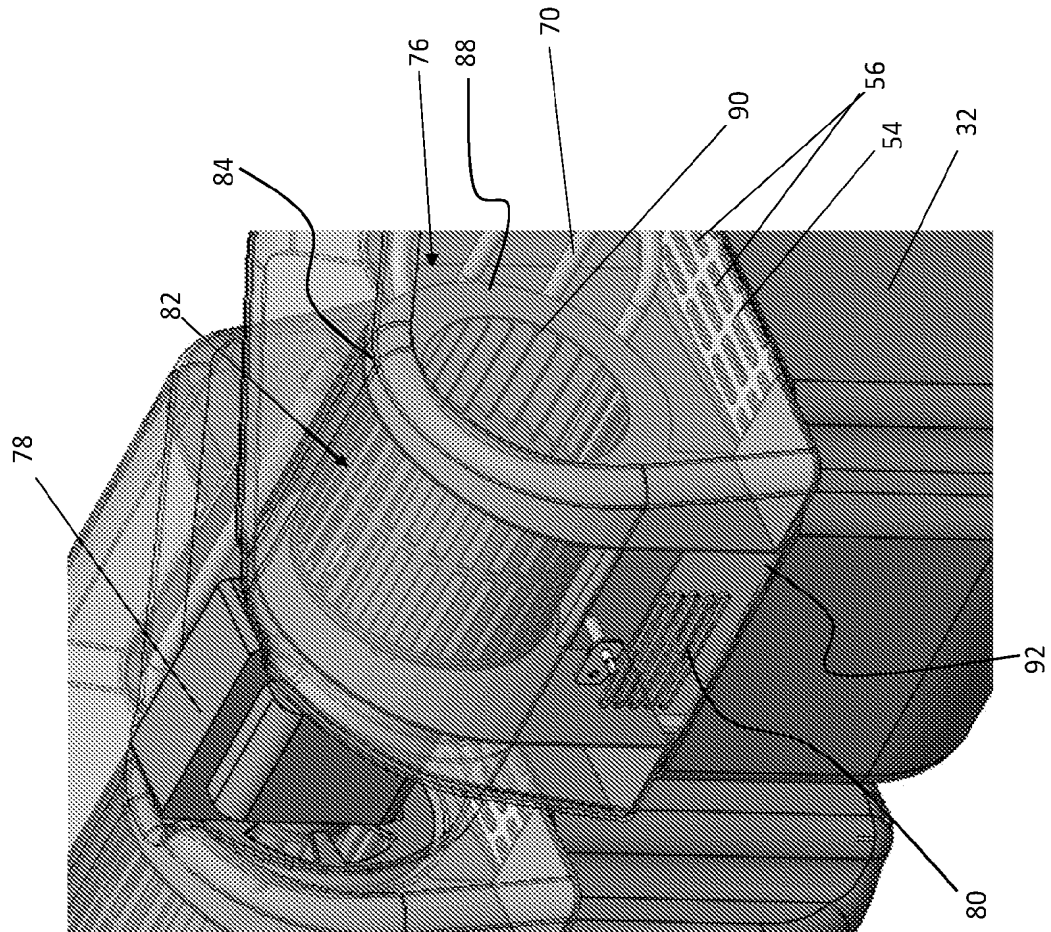


FIG. 11

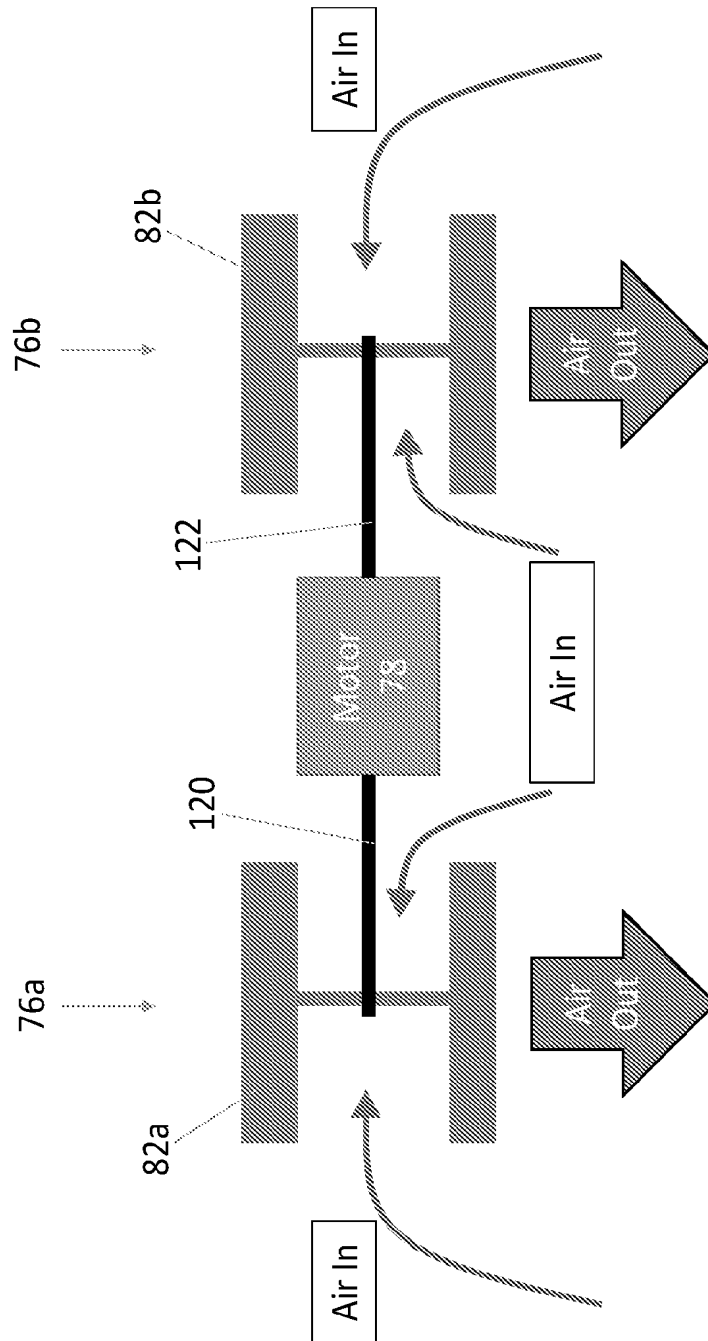


FIG. 12

Electronic Acknowledgement Receipt

EFS ID:	36585278
Application Number:	62874193
International Application Number:	
Confirmation Number:	1001
Title of Invention:	COOKING DEVICE AND COMPONENTS THEREOF
First Named Inventor/Applicant Name:	Christopher T. Martin
Customer Number:	130401
Filer:	Alicia Anne Hayter/Jennelle Masotti
Filer Authorized By:	Alicia Anne Hayter
Attorney Docket Number:	EUP1549US
Receipt Date:	15-JUL-2019
Filing Date:	
Time Stamp:	15:49:16
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$ 280
RAM confirmation Number	071619INTEFSW15494600
Deposit Account	061130
Authorized User	Jennelle Masotti

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37 CFR 1.16 (National application filing, search, and examination fees)

37 CFR 1.19 (Document supply fees)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	8CE2501.PDF	1256266	no	9
			dd138207d580ca9a2f8ccf6be481f4d65aeba43f		
Warnings:					
Information:					
2	Specification	8CF4989.PDF	115583	no	31
			a75bb4a6ef277c5b949ccbd871badfb6c8659bd0		
Warnings:					
Information:					
3	Drawings-only black and white line drawings	8CF3949.PDF	909755	no	12
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Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29772	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			2311376		

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

COOKING DEVICE AND COMPONENTS THEREOF

BACKGROUND

[0001] Embodiments of the present disclosure relate generally to a cooking system, and more specifically, to a countertop cooking system operable in a plurality of distinct cooking modes.

SUMMARY

[0002] According to an embodiment, cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A bottom surface of said cooking container is angled upwardly. A heating element is associated with said at least one internal compartment.

[0003] In addition to one or more of the features described above, or as an alternative, in further embodiments said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.

[0004] In addition to one or more of the features described above, or as an alternative, in further embodiments said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.

[0005] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.

[0006] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.

[0007] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert at least partially defines said cooking volume within said interior of said cooking container.

[0008] In addition to one or more of the features described above, or as an alternative, in further embodiments said food support surface has a generally horizontal orientation when said insert is arranged within said interior of said cooking container.

[0009] In addition to one or more of the features described above, or as an alternative, in further embodiments said food support surface is offset from said bottom surface of said cooking container by a clearance.

[0010] In addition to one or more of the features described above, or as an alternative, in further embodiments said clearance defined between said food support surface and said bottom surface of said cooking container varies over at least one dimension of the cooking container.

[0011] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert further comprises at least one protrusion and said bottom surface of said cooking container further comprises at least one channel, said at least one protrusion being positioned within said at least one channel when said insert is properly installed in said interior of said cooking container.

[0012] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.

[0013] In addition to one or more of the features described above, or as an alternative, in further embodiments said insert further comprises a blocking wall arranged at an angle to said food support surface and said air duct is defined between said blocking wall and a back wall of said cooking container.

[0014] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an air movement mechanism disposed in said housing.

[0015] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0016] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing having a first inlet, a second inlet and an outlet, the first inlet and the second inlet being arranged in fluid communication with said outlet and a fan wheel rotatably mounted within said fan housing.

[0017] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0018] According to an embodiment, a cooking system includes a housing having at least one internal compartment, a cooking container receivable within said at least one internal compartment, a cooking volume being defined within an interior of said cooking container, and a heating element associated with said at least one internal compartment. An air movement mechanism is disposed in said housing. The air movement mechanism is rotatable about an axis of rotation oriented relatively horizontally.

[0019] In addition to one or more of the features described above, or as an alternative, in further embodiments said axis of rotation is oriented substantially perpendicular to a flow provided at an outlet of said air movement mechanism towards a relative bottom of said housing.

[0020] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

[0021] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

[0022] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

[0023] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about said axis or rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0024] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0025] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0026] In addition to one or more of the features described above, or as an alternative, in further embodiments a configuration of said first plurality of impeller blades is substantially identical to a configuration of said second plurality of impeller blades.

[0027] In addition to one or more of the features described above, or as an alternative, in further embodiments a configuration of said first plurality of impeller blades is different than a configuration of said second plurality of impeller blades.

[0028] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is disposed vertically above said cooking volume.

[0029] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is disposed vertically above said cooking container.

[0030] In addition to one or more of the features described above, or as an alternative, in further embodiments an insert positionable within said interior of said cooking container,

wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

[0031] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is horizontally offset from said heating element.

[0032] According to an embodiment, a cooking system includes a housing having at least one internal compartment, and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element associated with said cooking volume. A rotatable air movement mechanism has a first inlet arranged in a first plane of said air movement mechanism and a second inlet arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane. An outlet of the air movement mechanism is arranged in fluid communication with both said first inlet and said second inlet.

[0033] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

[0034] In addition to one or more of the features described above, or as an alternative, in further embodiments said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

[0035] In addition to one or more of the features described above, or as an alternative, in further embodiments said first plane and said second plane are substantially parallel.

[0036] In addition to one or more of the features described above, or as an alternative, in further embodiments said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

[0037] In addition to one or more of the features described above, or as an alternative, in further embodiments said second side is opposite said first side.

[0038] In addition to one or more of the features described above, or as an alternative, in further embodiments an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

[0039] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operable to rotate said air movement mechanism about an axis or rotation, wherein said motor is located at least partially external to said at least one internal compartment.

[0040] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0041] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0042] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

[0043] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

[0044] In addition to one or more of the features described above, or as an alternative, in further embodiments said air movement mechanism is horizontally offset from said heating element.

[0045] According to yet another embodiment, a cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element is associated with said cooking volume. A plurality of air

movement mechanism is disposed within said housing and a motor is operably coupled to said plurality of air movement mechanisms.

[0046] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is located externally to said at least one internal compartment.

[0047] In addition to one or more of the features described above, or as an alternative, in further embodiments said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

[0048] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

[0049] In addition to one or more of the features described above, or as an alternative, in further embodiments said first air movement mechanism and a second air movement mechanism are arranged coaxially.

[0050] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed and said second speed being substantially identical.

[0051] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed being different than said second speed.

[0052] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

[0053] In addition to one or more of the features described above, or as an alternative, in further embodiments said first air movement mechanism is positioned within said first internal compartment and said second air movement mechanism is positioned within said second internal compartment.

[0054] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is positioned between said first internal compartment and said second internal compartment.

[0055] According to yet another embodiment, a cooking system includes a housing having a fluidly separate first internal compartment and second internal compartment. At least one cooking container is receivable within one of said first internal compartment and said second internal compartment, wherein at least one cooking volume is defined within an interior of said at least one cooking container. At least one heating element is disposed in said housing.

[0056] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one cooking includes a first cooking container receivable within said first internal compartment and a second cooking container receivable within said second internal compartment, wherein a first cooking volume is defined within an interior of said first cooking container and a second cooking volume is defined within an interior of said second cooking container.

[0057] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one heating element includes a first heating element positioned within said first internal compartment and a second heating element positioned within said second internal compartment.

[0058] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising at least one air movement mechanism disposed within said housing.

[0059] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism includes a first inlet, a second

inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

[0060] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism further comprises a fan housing and a fan wheel rotatably mounted within said fan housing.

[0061] In addition to one or more of the features described above, or as an alternative, in further embodiments said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

[0062] In addition to one or more of the features described above, or as an alternative, in further embodiments said at least one air movement mechanism includes a first air movement mechanism associated with said first internal compartment and a second air movement mechanism associated with said second internal compartment.

[0063] In addition to one or more of the features described above, or as an alternative, in further embodiments comprising a motor operably coupled to said at least one air movement mechanism.

[0064] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is located externally from said first internal compartment and said second internal compartment.

[0065] In addition to one or more of the features described above, or as an alternative, in further embodiments said motor is positioned between said first internal compartment and said second internal compartment.

[0066] According to another embodiment, a cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A heating element is associated with said at least one internal compartment and an air movement mechanism is disposed in said housing. The air movement mechanism is positioned vertically above said cooking volume and horizontally offset from said heating element.

BRIEF DESCRIPTION OF THE FIGURES

[0067] The accompanying drawings incorporated in and forming a part of the specification embodies several aspects of the present disclosure and, together with the description, serves to explain the principles of the disclosure. In the drawings:

[0068] FIG. 1 is a schematic diagram of a cooking system having a cooking container installed therein according to an embodiment;

[0069] FIG. 2 is a schematic diagram of the cooking system of FIG. 1 absent the cooking container according to an embodiment;

[0070] FIG. 3 is a schematic diagram of another cooking system absent the cooking container according to an embodiment;

[0071] FIG. 4 is a cross-sectional view of a portion of a cooking system according to an embodiment;

[0072] FIG. 5 is a perspective view of a portion of a cooking system according to an embodiment;

[0073] FIG. 6 is a perspective view of a fan wheel of an air movement mechanism of the cooking system according to an embodiment;

[0074] FIG. 7 is a schematic diagram of a control system of the cooking system according to an embodiment;

[0075] FIG. 8 is a front perspective view of a portion of the cooking system according to another embodiment;

[0076] FIG. 9 is a front view of the portion of the cooking system of FIG. 8 according to an embodiment;

[0077] FIG. 10 is a rear perspective view of the portion of the cooking system of FIG. 8 according to an embodiment;

[0078] FIG. 11 is a perspective view of a motor of the cooking system of FIG. 8 according to an embodiment; and

[0079] FIG. 12 is a schematic diagram of the motor and the air movement mechanisms of the cooking system according to an embodiment.

DETAILED DESCRIPTION

[0080] With reference now to the FIGS., an example of a cooking system is illustrated at numeral 20. As best shown in FIGS. 1 and 2, the cooking system 20 includes a housing 22 having an exterior heat resistant or non-conductive surface 24 and an interior surface 26 that defines an at least partially hollow compartment 28 arranged within an interior of the housing 22. The housing 22 may be formed as a single unitary body, or alternatively, may be formed by connecting a plurality of pieces together. In addition, the housing 22 may be made of any suitable material, including but not limited to glass, aluminum, plastic, or stainless steel for example. A liner 30 may be disposed within at least a portion of the housing 22. The liner 30 may be formed from any suitable conductive material, such as aluminum for example. In an embodiment, the liner 30 forms at least a portion of the interior surface 26 and thereby defines at least a portion of the internal compartment 28 of the housing 22. However, it should be understood that other components of the cooking system 20, or surfaces thereof, may also define the internal compartment 28.

[0081] A cooking container 32 is receivable within a portion of the internal compartment 28 of the housing 22, such as a bottom portion of the internal compartment 28 for example. Although the cooking container 32 is described herein as being separable from the housing 22, embodiments where the cooking container 32 is movably connected with or integrally formed with the housing 22 are also contemplated herein. The cooking container 32 may be a pot formed from a ceramic, metal, or die cast aluminum material. However, any suitable material capable of withstanding the high temperatures required for cooking food products are also within the scope of the disclosure. In an embodiment, the cooking container 32 is configured to translate along an axis relative to the housing 22 such that the cooking container 32 is slidably received within an opening 34 formed in a wall 36 of the housing 22. Accordingly, in such embodiments, a size and shape of the cooking container 32 may be complementary to the size and shape of the opening

34. In the illustrated, non-limiting embodiment, the cooking container 32 is generally square in shape. However, in other embodiments, the cooking container 32 may have another configuration.

[0082] The cooking container 32 has a generally hollow interior 38 for supporting one or more consumable products, such as food products for example, therein. Examples of food products suitable for use with the cooking system 20, include but are not limited to, meats, fish, poultry, bread, rice, grains, pasta, vegetables, fruits, and dairy products, among others.

[0083] At least one handle 40 may be associated with the cooking container 32 to allow a user to easily grasp and manipulate the cooking container 32 relative to the housing 22. In the illustrated, non-limiting embodiment, the cooking container 32 includes a single handle 40 extending from a first, front surface 42 of the cooking container 32. Although the cooking container 32 illustrated and described herein has a single handle 40, in other embodiments, the cooking container 32 may have two or more handles, or alternatively, a handle or groove formed into a surface of the cooking container 32. Any suitable configuration of the cooking container 32 and/or handle(s) 40 is within the scope of the disclosure.

[0084] One or more inserts or food support structures 50 may be positionable within the interior 38 of the cooking container 32. In such embodiments, the insert 50 provides a surface on which food is supported. An example of an insert 50 suitable for use with the cooking container 32 is best shown in FIGS. 4 and 5. As shown, the insert 50 includes a solid blocking wall 52 and a food support surface 54 having a plurality of perforations or openings 56 formed therein. In the illustrated, non-limiting embodiment, the blocking wall 52 and the food support surface 54 are arranged generally perpendicular to one another. Although the insert 50 is shown as being an L-shaped plate, in other embodiments, the insert 50 may include additional side walls such that the insert 50 is a basket for example. When the insert 50 is installed within the interior 38 of the cooking container 32, the blocking wall 52 and the food support surface 54 of the insert 50 cooperate with one or more walls of the cooking container 32 to define an area there between referred to herein as a “cooking volume.” Further, in embodiments where an insert is not disposed within the cooking container 32, the interior 38 of the cooking container 32 may define the cooking volume.

[0085] In the illustrated, non-limiting embodiment, the bottom surface 58 of the cooking container 32 is sloped relative to a bottom surface of the housing 22 or to a surface on which the cooking system 20 may be positioned and supported. As shown, the slope extends generally upwardly towards a front wall 60 of the cooking container 32. As a result, a height of the interior 38 of the cooking container 32 adjacent a back wall 62 is greater than a height of the interior 38 of the cooking container 32 adjacent the front wall 60 thereof. When the insert 50 is installed within the interior 38 of the cooking container 32, the food support surface 54 has a generally horizontal orientation. As shown, the insert 50 may include one or more protrusions 64, such as tabs for example, configured to contact the bottom surface 58 of the cooking container 32 to achieve this desired orientation. The food support surface 54 is therefore at least partially offset from the bottom surface 58 of the cooking container 32. Because of the angled configuration of the bottom surface 58 of the cooking container 32, the clearance 66 between the bottom surface 58 and the food support surface 54, varies, and more specifically, gradually decreases from a back to a front of the cooking container 32.

[0086] The insert 50 and the bottom surface 58 of the cooking container 32 may cooperate to properly position the insert within the interior 38 such that the blocking wall 52 of the insert 50 is offset from the back wall 62 of the cooking container 32. This clearance between the blocking wall 52 and the back wall 62 defines an air duct 74 within the cooking container 32, separate from the cooking volume, and through which air is circulated during operation of the cooking system 20. In an embodiment, a contour of the cooking container 32 facilitates positioning of the insert 50 relative to the cooking container 32. As previously described, one or more protrusions 64 extend from a bottom surface of the insert 50, and as best shown in FIGS. 4 and 5, the bottom surface 58 of the cooking container 32 may be contoured to define one or more channels 68 therein. When the insert 50 is positioned within the cooking container 32, the one or more protrusions 64 are received within the one or more channels 68. The engagement between the at least one protrusion 64 and the sidewalls of the channel(s) 68 properly positions the insert 50 within the cooking container 32 to create a suitably sized air duct 74.

[0087] The cooking system 20 additionally includes at least one heating element 70 operable to impart heat to the cooking volume during one or more modes of operation of the cooking system 20. In the illustrated, non-limiting embodiment best shown in FIGS. 1, 2 and 4-5,

the at least one heating element 70 is positioned within the internal compartment 28, generally at or above an upper extent or surface 72 of the cooking container 32, such as proximate a center of the cooking container 32 for example. In an embodiment, the heating element 70 is disposed adjacent a center of the cooking volume and/or the cooking container 32. In such embodiments, the at least one heating element 70 is mounted completely outside of the cooking container 32, and vertically offset from the upper extent or surface 72 thereof. In another embodiment, best shown in FIG. 3, the at least one heating element 70 may be located adjacent the rear of the internal compartment 28, such as in vertical alignment with the air duct 74 formed between the blocking wall 52 of the insert 50 and the back wall 62 of the cooking container 32. However, it should be understood that a heating element 70 located at any suitable location is within the scope of the disclosure.

[0088] The at least one heating element 70 may be capable of performing any suitable type of heat generation. For example, a heating element 70 configured to heat one or more food items located within the cooking volume of the cooking container 32 via conduction, convection, radiation, and induction are all within the scope of the disclosure. In the illustrated, non-limiting embodiment, the heating element 70 is a convective heating element, and the cooking system 20 additionally includes an air movement mechanism 76, such as a fan for example, operable to circulate air through the cooking volume. The air is heated as it flows along a path of circulation, such as by flowing over a portion of the at least one heating element 70. As shown, the air movement mechanism 76 is located within the internal compartment 28 at a position entirely above the upper extent 72 of the cooking container 32. In addition, at least a portion of the air movement mechanism 76, and in some embodiment, the entirety of the air movement mechanism 76, is disposed vertically above the cooking volume, and therefore the insert 50. As shown, the air movement mechanism 76 is horizontally offset from the at least one heating element 70. However, embodiments where the air movement mechanism 76 vertically or horizontally overlaps or is aligned with the at least one heating element 70 are also contemplated herein.

[0089] The air movement mechanism 76, or at least a portion thereof may be removable from the internal compartment. In the illustrated, non-limiting embodiment, the air movement mechanism 76 is driven by a motor 78 located at least partially externally to the internal

compartment 28. Further, the cooking system 20 may include a vent 80 for exhausting hot air generated by operation of at least one of the air movement mechanism 76 or the motor 78 to the exterior of the cooking system 20. Although the vent 80 is illustrated as being formed at the rear of the internal compartment 28, embodiments where the vent 80 is formed at another location are also contemplated herein.

[0090] An example of the air movement mechanism 76 is illustrated in more detail in FIGS. 5 and 6. In the illustrated, non-limiting embodiment, the air movement mechanism 76 includes a fan wheel 82 positioned within a fan housing 84. As shown, the fan wheel 82 is configured to rotate about an axis X oriented generally horizontally, and in some embodiments, the axis of the fan wheel is oriented perpendicular to the translational axis along which the cooking container 32 is configured to move relative to the housing 22. The fan housing 84 has an outer wall 86 having a scroll-shaped length, a first sidewall 88 including a first inlet aperture 90 and a second sidewall (not shown) including a second inlet aperture. Although the outlet opening 92 of the fan housing 84 is illustrated as being generally rectangular in shape, embodiments where the outlet opening 92 is another shape are also contemplated herein.

[0091] With specific reference now to FIG. 6, the fan wheel 82 is typically formed with first wheel portion 94 and a second wheel portion 96. Both the first wheel portion 94 and the second wheel portion 96 function as an air inlet and are configured to provide air to a single plenum. The air inlet defined by the first wheel portion 94 is arranged in a first plane at a first side of the air movement mechanism 76 and the air inlet defined by the second wheel portion 96 is arranged in a second plane at a second side of the air movement mechanism 76, the first and second planes being generally parallel. Accordingly, the air inlets defined by the first and second wheel portions 94, 96 remain generally fixed relative to both the fan housing 84 and an axis of rotation of the fan wheel 82. The first wheel portion 94 includes a first plurality of impeller blades 98 and the second wheel portion 96 similarly includes a second plurality of impeller blades 100. One or both of the first plurality and the second plurality of impeller blades 98, 100 may have a backward curved configuration, a forward curved configuration, or another configuration.

[0092] With reference now to FIG. 7, a control panel or user interface 102 may be positioned at an exterior surface of the housing 22. The control panel 102 includes one or more inputs 104 associated with energizing the heating element 70 of the cooking system 20 and for selecting various modes of operation of the cooking system 20. One or more of the inputs 104 may include a light or other indicator to show that the respective input has been selected. The control panel 102 may additionally include a display 106 separate from and associated with the at least one input 104. However, embodiments where the display 106 is integrated into the at least one input 104 are also contemplated herein.

[0093] Operation of the one or more inputs 104 will be described in more detail below. FIG. 7 illustrates an example of a control system 108 of the cooking system 20 including a controller or processor 110 for controlling operation of the heating element 70 and air movement device 76 (including the motor 78 associated therewith), and in some embodiments for executing stored sequences of heating operation. The processor 110 is operably coupled to the control panel 102 and to the heating element 70 and the air movement mechanism 76.

[0094] In addition, the cooking system 20 may include one or more sensors S for monitoring one or more parameters associated with the temperature of the heating element 70, the cooking volume, the airflow being delivered to the cooking volume and/or the insert 50 positioned within the cooking container 32 during a cooking operation. Accordingly, operation of the cooking system 20, and in particular of the one or more heating elements 70, may be regulated in response to the parameters sensed by the one or more sensors S. In an embodiment, the one or more sensors S includes a temperature sensor arranged in communication with the processor 110. In an embodiment, the temperature sensor(s) S, such as a negative temperature coefficient (NTC) sensor for example, is positioned adjacent the rear of the internal compartment 28, upstream from the air duct 74 defined between the back wall 62 of the cooking container 32 and the blocking wall 52 of the insert 50. In embodiments of the cooking system 20 including one or more temperature sensors S, adjustment of an operating parameter, such as operation of the heating element 70 for example, may be performed using the control algorithm in response to the temperature of the heated airflow, measured by the temperature sensor S disposed in the heated airflow. For example, power provided to the heating element 70 may be increased if the sensed airflow temperature is below a set point, and the power provided to the heating element

70 may be reduced or ceased completely if the sensed airflow temperature is above a set point, thereby allowing the cooking volume to cool.

[0095] In an embodiment, the air movement mechanism 76 of the cooking system 20 is a variable speed fan operable at a plurality of rotational speeds. In an embodiment, the operational speed of the air movement mechanism 76 may vary based on the cooking mode selected. For example, the speed of the air movement mechanism 76 during operation in a first cooking mode may be different than the speed of the air movement mechanism 76 during operation in a second cooking mode. The operational speed of the air movement mechanism 76 may be controlled by the processor 110 in response to one or more inputs 104, including selection of a cooking mode. However, the processor 110 may also be configured to adjust the operational speed of the air movement mechanism 76, or alternatively, the power supplied to the at least one heating elements 70 to control the temperature and/or pressure within the interior 38 of the cooking container 32.

[0096] In an embodiment, at least one input 104 on the control panel 102 is an on/off button which allows the user to activate or deactivate the control panel 102. When the control panel 102 is deactivated, the one or more heating elements 70 are not energized. In an exemplary embodiment, the at least one input 104 is operable to select one or more manual modes of operation of the heating element 70. Alternatively, or in addition, at least one input 104 is operable to select a stored sequence of operation of the heating element 70. In some cases, the stored sequences may be particularly well suited for a given method of food preparation and/or for particular ingredients or types of ingredients. The plurality of stored sequences associated with the at least one input 104 may be stored within a memory accessible by the processor 110. Alternatively, the plurality of stored sequences may be stored remotely from the cooking system 20, and may be accessed by the processor 110, such as via wireless communication for example.

[0097] In addition, a user may be able to enter a time associated with operation of the cooking system 20 in a desired manual mode. The time may be entered via the same input 104 or a separate input 104 as used to select a mode of operation. Further in embodiments where the cooking system 20 is in a mode configured to perform a stored sequence in response to selection

of one of the inputs 104, the display 106 may indicate a time remaining. Temperature or other parameters may also be entered via inputs 104 and/or shown on the display 106.

[0098] The at least one input 104 may include a distinct start button intended to initiate operation in a desired mode, a distinct stop button to cease all operation, or a stop/start button intended to initiate and cease functions. Alternatively, the cooking system 20 may be operable to automatically start operation after a predetermined time has elapsed once an input 104 has been selected and any necessary information has been provided to the control panel 102. Alternatively, one or more of the other inputs 104 may be operable to start and stop operation of the cooking system 20, regardless of whether the cooking system 20 is following a stored sequence or is in a manual mode.

[0099] As previously noted, the one or more inputs 104 may be operable to initiate operation of the cooking system 20 in a plurality of cooking modes. In an embodiment, the cooking system 20 is operable in a cooking mode where the heating element 70 is employed to perform a non-contact heating operation, such as a convective or radiative heating operation. Suitable cooking operations that may be performed in this first cooking mode include, but are not limited to air frying, broiling, baking/roasting, and dehydrating.

[0100] During operation in the first cooking mode, the air movement mechanism 76 is operable to circulate a heated air flow through the cooking volume. As previously described, the air movement mechanism 76 is operable to draw air upwards, through the adjacent heating element 70 and into the two inlets arranged at opposing sides of the fan wheel 82. The heated air is expelled outwardly from the outlet opening 92 of the fan housing 84 in a single direction. In the illustrated, non-limiting embodiment, the air output from the air movement mechanism 76 is provided within a plane directed downwardly into the cooking container 32. In the illustrated, non-limiting embodiment, the outlet opening 92 arranged directly adjacent the upper extent 72 of the cooking container 32, such that the air is expelled from the outlet opening 92 directly into the air duct 74 formed within the cooking container 32. Once the heated air reaches the bottom surface 58 of the cooking container 32, the hot air will be deflected off the bottom surface 58 towards the cooking volume. Because the bottom surface 58 of the cooking container 32 is sloped, the interaction between the heated air and the sloped bottom surface 58 directs the heated

air both forwards and upwardly, causing the air to evenly distribute from the back to the front of the cooking container 32 before passing through the openings 56 formed in the food support surface 54 of the insert 50. The hot air is drawn by the air movement mechanism 76 through the openings 56 and over the exterior of the food items positioned on the food support surface 54. From within the cooking volume, the air is then drawn back into one of the inlets of the air movement mechanism 76 for further circulation within the interior 28.

[0101] With reference now to FIGS. 8-12, in an embodiment of the cooking system 20, the housing 22 includes a plurality of internal compartments arranged within the interior of the housing 22. For example, the housing 22 is illustrated as having a first internal compartment 28a and a second internal compartment 28b. As shown, the plurality of internal compartments 28a, 28b are fluidly separate from one another. Although two internal compartments 28a, 28b are illustrated and described herein, it should be understood that embodiments including any number of internal compartments, such as more than two compartments are also within the scope of the disclosure. The plurality of internal compartments 28a, 28b may be substantially similar in size and shape, or alternatively, may be different.

[0102] Each of the internal compartments 28a, 28b formed in the housing 22 is substantially identical to the internal compartment 28 previously described with respect to FIGS. 1-6. More specifically, a respective cooking container 32a, 32b is insertable into each internal compartment 28a, 28b, and an insert 50a, 50b may be removably installed within the interior 38a, 38b of each cooking container 32a, 32b. In addition, each internal compartment 28a, 28b includes at least one heating element 70a, 70b and an air movement mechanism 76a, 76b configured to circulate air through the internal compartment 28a, 28b, respectively.

[0103] As noted above, the cooking system 20 includes a motor 78 located external to the internal compartment 28 and operable to rotate an air movement mechanism 76 about an axis of rotation X. In embodiments of the cooking system 20 including two distinct internal compartments, a single motor 78 may be used to drive both a first air movement mechanism 76a associated with the first internal compartment 28a and a second air movement mechanism 76b associated with the second internal compartment 28b. In such embodiments, the motor 78 may be disposed within the housing 22 between the first and second compartments 28a, 28b, such that

the first air movement mechanism 76a is mounted to a first output shaft 120 extending from a first side of the motor 78 and the second air movement mechanism 76b is mounted to a second output shaft 122 extending from a second side of the motor 78. As a result, the first air movement mechanism 76a and the second air movement mechanism 76b may be positioned coaxially (see FIG. 10). However, embodiments, where the axis of rotation X1 of the first air movement mechanism 76a is offset from the axis of rotation X2 of the second air movement mechanism 76b are also contemplated herein.

[0104] Because a single motor 78 is used to drive the both the first and second air movement mechanisms 76a, 76b, in an embodiment, both the first and second air movement mechanisms 76a, 76b are driven about their axes, even when only one of the first and second internal compartment 28a, 28b is being used to perform a cooking operation. Accordingly, an air movement mechanism 76 may rotate about its axis even when the adjacent heating mechanism 70 associated therewith is non-operational. In other embodiments, the first and second air movement mechanisms 76a, 76b may be independently operable via a shared motor 78. Further, in an embodiment, the motor 78 is operable to rotate the first and second air movement mechanisms 76a, 76b, at the same speed. However, embodiments where the first and second air movement mechanisms 76a, 76b, are rotated at different speeds, such as via a coupling for example, are also within the scope of the disclosure.

[0105] In embodiments of the cooking system 20 including a plurality of internal compartments, a single control system 108, as previously described with respect to FIG. 7, may be suitable to selectively perform one or more cooking operations associated with both the first internal compartment 28a and the second internal compartment 28b. Accordingly, the same inputs 104 may be used to provide control for the plurality of internal compartments 28a, 28b, or alternatively, distinct inputs 104 may be associated with each of the plurality of internal compartments 28a, 28b, respectively.

[0106] All references, including publications, patent applications, and patents cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0107] The use of the terms “a” and “an” and “the” and similar referents in the context of describing the disclosure (especially in the context of the following claims) is to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to,”) unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate the disclosure and does not pose a limitation on the scope of the disclosure unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the disclosure.

[0108] Exemplary embodiments of this disclosure are described herein, including the best mode known to the inventors for carrying out the disclosure. Variations of those embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the disclosure to be practiced otherwise than as specifically described herein. Accordingly, this disclosure includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

CLAIMS

What is claimed is:

1. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container, wherein a bottom surface of said cooking container is angled upwardly; and

a heating element associated with said at least one internal compartment.
2. The cooking system of claim 1, wherein said bottom surface of said cooking container is oriented at an angle to a surface for supporting the cooking system.
3. The cooking system of claim 1, wherein said bottom surface of said cooking container is not orthogonal to a back wall of said cooking container.
4. The cooking system of claim 1, wherein said cooking container includes a front wall and a back wall, and a height of said cooking container adjacent said back wall of said cooking container is greater than a height of said cooking container adjacent said front wall of said cooking container.
5. The cooking system of claim 1, further comprising an insert positionable within said interior of said cooking container, said insert including a food support surface having at least one opening formed therein.
6. The cooking system of claim 5, wherein said insert at least partially defines said cooking volume within said interior of said cooking container.
7. The cooking system of claim 5, wherein said food support surface has a generally horizontal orientation when said insert is arranged within said interior of said cooking container.
8. The cooking system of claim 5, wherein said food support surface is offset from said bottom surface of said cooking container by a clearance.

9. The cooking system of claim 8, wherein said clearance defined between said food support surface and said bottom surface of said cooking container varies over at least one dimension of the cooking container.

10. The cooking system of claim 5, wherein said insert further comprises at least one protrusion and said bottom surface of said cooking container further comprises at least one channel, said at least one protrusion being positioned within said at least one channel when said insert is properly installed in said interior of said cooking container.

11. The cooking system of claim 5, wherein an air duct separate from said cooking volume is defined between said insert and a portion of said cooking container.

12. The cooking system of claim 11, wherein said insert further comprises a blocking wall arranged at an angle to said food support surface and said air duct is defined between said blocking wall and a back wall of said cooking container.

13. The cooking system of claim 1, further comprising an air movement mechanism disposed in said housing.

14. The cooking system of claim 13, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

15. The cooking system of claim 13, wherein said air movement mechanism further comprises:

a fan housing having a first inlet, a second inlet and an outlet, the first inlet and the second inlet being arranged in fluid communication with said outlet; and

a fan wheel rotatably mounted within said fan housing.

16. The cooking system of claim 15, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

17. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said at least one internal compartment; and

an air movement mechanism disposed in said housing, said air movement mechanism being rotatable about an axis of rotation, wherein said axis of rotation is oriented relatively horizontally.

18. The cooking system of claim 17, wherein said axis of rotation is oriented substantially perpendicular to a flow provided at an outlet of said air movement mechanism towards a relative bottom of said housing.

19. The cooking system of claim 17, wherein said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

20. The cooking system of claim 17, wherein said air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

21. The cooking system of claim 20, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

22. The cooking system of claim 17, further comprising a motor operable to rotate said air movement mechanism about said axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

23. The cooking system of claim 17, wherein said air movement mechanism further comprises:

a fan housing; and

a fan wheel rotatably mounted within said fan housing.

24. The cooking system of claim 23, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

25. The cooking system of claim 24, wherein a configuration of said first plurality of impeller blades is substantially identical to a configuration of said second plurality of impeller blades.

26. The cooking system of claim 24, wherein a configuration of said first plurality of impeller blades is different than a configuration of said second plurality of impeller blades.

27. The cooking system of claim 17, wherein said air movement mechanism is disposed vertically above said cooking volume.

28. The cooking system of claim 17, wherein said air movement mechanism is disposed vertically above said cooking container.

29. The cooking system of claim 17, further comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

30. The cooking system of claim 17, wherein said air movement mechanism is horizontally offset from said heating element.

31. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said cooking volume;

a rotatable air movement mechanism having:

a first inlet arranged in a first plane of said air movement mechanism;

a second inlet arranged in a second plane of said air movement mechanism, said second plane being distinct from said first plane; and

an outlet arranged in fluid communication with both said first inlet and said second inlet.

32. The cooking system of claim 31, wherein said air movement mechanism is rotatable about an axis of rotation and during operation of said air movement mechanism, said first inlet and said second inlet being fixed relative to said axis of rotation.

33. The cooking system of claim 32, wherein said cooking container is movable relative to said housing along an axis of translation, and said axis of rotation is oriented perpendicularly to said axis of translation.

34. The cooking system of claim 31, wherein said first plane and said second plane are substantially parallel.

35. The cooking system of claim 31, wherein said first plane is defined at a first side of said air movement mechanism and said second plane is defined at a second side of said air movement mechanism.

36. The cooking system of claim 35, wherein said second side is opposite said first side.

37. The cooking system of claim 31, wherein an air duct separate from said cooking volume is defined within said cooking container, and said outlet of said air movement mechanism is aligned with said air duct.

38. The cooking system of claim 31, further comprising a motor operable to rotate said air movement mechanism about an axis of rotation, wherein said motor is located at least partially external to said at least one internal compartment.

39. The cooking system of claim 31, wherein said air movement mechanism further comprises:

a fan housing; and

a fan wheel rotatably mounted within said fan housing.

40. The cooking system of claim 39, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

41. The cooking system of claim 31, wherein said air movement mechanism is positioned vertically above at least one of said cooking volume and said cooking container.

42. The cooking system of claim 31, further comprising an insert positionable within said interior of said cooking container, wherein a portion of said air movement mechanism is disposed in vertical alignment with said insert.

43. The cooking system of claim 31, wherein said air movement mechanism is horizontally offset from said heating element.

44. A cooking system comprising:

a housing having at least one internal compartment;

a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;

a heating element associated with said cooking volume;

a plurality of air movement mechanisms disposed within said housing; and

a motor operably coupled to said plurality of air movement mechanisms.

45. The cooking system of claim 44, wherein said motor is located externally to said at least one internal compartment.

46. The cooking system of claim 44, wherein said plurality of air movement mechanisms includes a first air movement mechanism and a second air movement mechanism.

47. The cooking system of claim 46, wherein said motor includes a first output shaft and a second output shaft, said first air movement mechanism being operably coupled to said first output shaft and said second air movement mechanism being operably coupled to said second output shaft.

48. The cooking system of claim 46, wherein said first air movement mechanism and a second air movement mechanism are arranged coaxially.

49. The cooking system of claim 46, wherein said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed and said second speed being substantially identical.

50. The cooking system of claim 46, wherein said motor operates said first air movement mechanism at a first speed and said motor operates said second air movement mechanism at a second speed, said first speed being different than said second speed.

51. The cooking system of claim 46, wherein said at least one internal compartment includes a first internal compartment and a second internal compartment, said first internal compartment being fluidly separate from said second internal compartment.

52. The cooking system of claim 51, wherein said first air movement mechanism is positioned within said first internal compartment and said second air movement mechanism is positioned within said second internal compartment.

53. The cooking system of claim 51, wherein said motor is positioned between said first internal compartment and said second internal compartment.

54. A cooking system comprising:

a housing having a first internal compartment and a second internal compartment, said first internal compartment and said second internal compartment being fluidly separate;

at least one cooking container receivable within one of said first internal compartment and said second internal compartment, wherein at least one cooking volume is defined within an interior of said at least one cooking container; and

at least one heating element disposed in said housing.

55. The cooking system of claim 54, wherein said at least one cooking includes a first cooking container receivable within said first internal compartment and a second cooking container receivable within said second internal compartment, wherein a first cooking volume is defined within an interior of said first cooking container and a second cooking volume is defined within an interior of said second cooking container.

56. The cooking system of claim 54, wherein said at least one heating element includes a first heating element positioned within said first internal compartment and a second heating element positioned within said second internal compartment.

57. The cooking system of claim 54, further comprising at least one air movement mechanism disposed within said housing.

58. The cooking system of claim 57, wherein said at least one air movement mechanism includes a first inlet, a second inlet, and an outlet, said first inlet and said second inlet being arranged in fluid communication with said outlet.

59. The cooking system of claim 57, wherein said at least one air movement mechanism further comprises:

a fan housing; and

a fan wheel rotatably mounted within said fan housing.

60. The cooking system of claim 59, wherein said fan wheel includes a first wheel portion having a first plurality of impeller blades and a second wheel portion having a second plurality of impeller blades.

61. The cooking system of claim 57, wherein said at least one air movement mechanism includes a first air movement mechanism associated with said first internal compartment and a second air movement mechanism associated with said second internal compartment.

62. The cooking system of claim 61, further comprising a motor operably coupled to said at least one air movement mechanism.

63. The cooking system of claim 62, wherein said motor is located externally from said first internal compartment and said second internal compartment.

64. The cooking system of claim 62, wherein said motor is positioned between said first internal compartment and said second internal compartment.

65. A cooking system comprising:

- a housing having at least one internal compartment;
- a cooking container receivable within said at least one internal compartment, wherein a cooking volume is defined within an interior of said cooking container;
- a heating element associated with said at least one internal compartment; and
- an air movement mechanism disposed in said housing, said air movement mechanism being positioned vertically above said cooking volume and horizontally offset from said heating element.

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ABSTRACT

A cooking system includes a housing having at least one internal compartment and a cooking container receivable within said at least one internal compartment. A cooking volume is defined within an interior of said cooking container. A bottom surface of said cooking container is angled upwardly. A heating element is associated with said at least one internal compartment.

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VIII-3-1	Declaration: Entitlement to claim priority Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)) Name	In relation to the international application No. PCT/US2020/042120 SHARKNINJA OPERATING LLC is entitled to claim priority of earlier application No. US 62/874,193 by virtue of the following:
VIII-3-1 (ii)		SHARKNINJA OPERATING LLC is entitled as employer of the inventor, SCHWARZ, Kerry
VIII-3-1 (ii)		SHARKNINJA OPERATING LLC is entitled as employer of the inventor, DUBEAU, Michaela