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(54) **Title:** TEMPERATURE CONTROLLED OVEN WITH EXUDATE COLLECTION

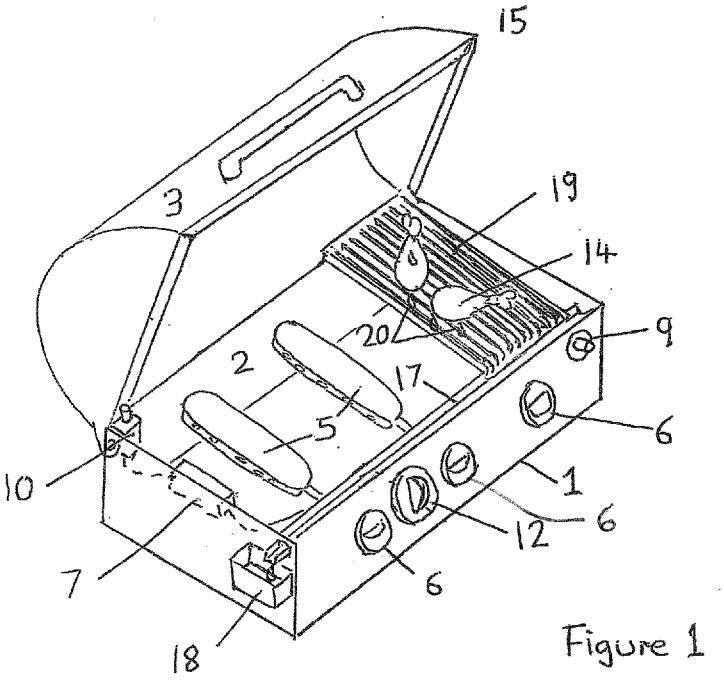

Figure 1

(57) **Abstract:** A temperature controlled oven (1) comprises a burner box (2), a controllable heat source (5) within the burner box (2), a heating rack (19) supported by the burner box (2) at a position over the heat source (5) and a hood (3) moveable between a first, closed position at which it covers the burner box (2) and a second, open position at which the heating rack (19) is exposed, the heating rack (19) comprising a plurality of spaced apart collection bars to support a product for cooking and which are inclined to the horizontal at an angle of between 2 and 15°, said collection bars each defining a collection channel (17) along which exudate from the product may flow under gravity to a drainage channel (17), said drainage channel (17) being inclined to the horizontal at an angle of between 2 and 10° to direct collected exudate to an exudate collection vessel (18), the temperature controlled oven (1) further comprising a temperature controlled thermostat (7) operable to control operation of the heat source.

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Temperature Controlled Oven with Exudate Collection.

Field of Invention

This invention relates to a temperature-controlled oven such as may be employed for cooking food and in particular but not exclusively, to an oven such as may be used as a barbecue and which addresses the fluctuations in temperature when cooking of fatty foods over naked flames.

It is to be understood that the present invention is not confined to collection of oil and other exudates within temperature-controlled barbecues and may be applied to, for example, cooking ovens or grills and industrial ovens. Where the context permits, the present invention may be used where heating an object results in the melting or exuding of at least a part of the object, normally a food item.

Background

One of the main problems with cooking fatty foods such as sausages, meats kebabs, beef burgers and the like foods over charcoal or gas heated synthetic charcoal or coals, is that the melted fat / oils runs down and through common type open grill surfaces and drips onto the heated coals or radiants where it ignites. This causes flames to rise and overcook or burn the food item being cooked, and a resulting flare-up may cause personal danger to the user.

There have been a number of attempts, some very complex, to prevent the fat from igniting. For example in US 5,105,725, there is shown a grill having a grid element. The grid element comprises a base element and upstanding ribs.

One problem associated with the prior art is that those solutions have resulted in a reduction of direct heat radiation from the heat source. That is undesirable because it reduces the cooking efficiency.

We are taught from UK patent GB2428962B that there maybe provided a heating rack comprising a plurality of elongate collector units, each elongate collector unit comprising an elongate support section which defines a contact surface for

supporting an object to be heated and an elongate collector section shaped to define a channel for receiving exudate from a supported object and, in use, to direct said exudate to a collection zone at an end of the channel, wherein said support section and collector section are spaced apart over at least a part of the length of the elongate collector unit.

One of the requirements of barbecuing is that the heat source is below the food item. As heat rises, this is the most efficient way of providing heat to the food item. As shown in UK patent GB2428962B oils and fats (exudate) that ooze from the food item, run down the elongated grill support sections, into the collector sections and then travel along the collector section channels under gravity into a collection vessel, where the exudate cools down. It must be noted that while the exudate is travelling along the collector sections, it is being heated by the heat source below. If the heat source is able to raise the temperature of the collector sections above the flash point of the exudate, the exudate will catch fire. Therefore, it is important that the materials and material thickness of the support section and collector sections is dense and thick enough to act as a heat sink, which will keep the collector sections below the flash point of the exudate.

It is well known that fats and oils that drip down inside the barbecue onto the heat source can flare up and will add additional uncontrolled heat, exudates and sooty smoke to the main body and internal workings, the food items and cooking rack. When the barbecue hood is closed the temperature inside the barbecue increases dramatically which produces even more oil drips caused by this additional heat and this in turn produces excessive flames and smoke in a run away condition, making it difficult to control the cooking temperature of the barbecue which can have a corresponding adverse effect on the quality of food cooked upon it.

Temperature controlled barbecues, which have an adjustable thermostatic control device fitted which can reduce the gas or electric input inside the main body are an attempt to try to improve this situation and are designed to operate like a domestic thermostatic temperature controlled household gas or electric ovens when the barbecue hood is closed. However because of the addition of unwanted oils and fats that drip from the food onto the gas tubes, electric elements or heat radiants below

and igniting, realistic temperature control is limited as reducing the gas or electric heating does not controllably remove the heat source.

Barbecues are a popular worldwide cooking appliance and, as previously stated, barbecues consist of a heat source directly below the cooking rack and food placed upon it. This is the most efficient way of cooking because thermal heat rises to efficiently heat the food above.

This open rack cooking process is particularly efficient, compared to a solid flat skillet, at heating non flat curved foods like chicken thighs, sausages, chicken wings etc, because heating of the food is not limited to contact to the hot surface and unlike a solid skillet or pan that tend to absorb and block out the hot gases from the radiants, open rack barbecue cooking allows these hot thermal gases and direct radiant heat to envelop and efficiently heat the food on the open cooking rack.

Present standard temperature-controlled barbecues use a common standard open cooking rack with standard wire or cast-iron single cooking bars with no means to collect and convey oils along these cooking racks away from the burner box.

Whether the heat source is lump wood, charcoal, gas or electricity, efficient open rack cooking leads to the run-away out of control excessive flames caused by oil and fats dripping from the food into the burner box towards the heat source, which produces an uncontrolled cooking condition.

Even with the addition of thermostatic control to gas or electric BBQ units this condition is not alleviated because the efficient open cooking rack allows for oil and fats to drip down from the food and ignite inside the burner box, causing raised temperatures that influence the thermostat temperature, which then automatically turns down the gas or electricity supply to the heat radiants. Unfortunately, this can have limited effect on the temperature inside the barbecue because the fat fire will continue to burn uncontrollably until all of the oil and fats have stopped dripping out of the food, So making the thermostatic control system ineffective.

Hot oil and soot depositing onto the internal workings including burner radiants, control valves thermocouples, mercury tubes etc, causes these items to catch fire, block up, seize up, operate inefficiently, reduce their operating life and eventually fail prematurely.

Summary

The present invention seeks to provide a temperature controlled oven with improved temperature control and with reduced risk of flare up of heated exudate.

In accordance with one aspect of the present invention there is provided a temperature controlled oven comprising a burner box, a controllable heat source within the burner box, a heating rack supported by the burner box at a position over the heat source and a hood moveable between a first, closed position at which it covers the burner box and a second, open position at which the heating rack is exposed, the heating rack comprising a plurality of spaced apart collection bars to support a product for cooking and which are inclined to the horizontal, said collection bars each defining a collection channel along which exudate from the product may flow under gravity to a drainage channel, said drainage channel being inclined to the horizontal to direct collected exudate to an exudate collection vessel, the temperature controlled oven further comprising a thermostat operable to control operation of the heat source.

The present invention teaches that said temperature controlled oven shall further comprise one or more of the following features.:-

The spaced apart collection bars are inclined to the horizontal at an angle of between 2 and 15 degrees.

The drainage channel is inclined to the horizontal at an angle of between 2 and 10 degrees.

The collection vessel may be positioned externally of the burner box or within the burner box. If positioned within the burner box it is preferably located at a position as remote as realistically possible from the heat source.

The hood may be separable from the burner box or it may be secured thereto, for example pivotally secured to the burner box.

The temperature controlled oven may comprise a display to display the temperature measured by the automatic temperature controlled thermostat. If the hood is pivotally or otherwise secured to the burner box the automatic temperature control thermostat preferably is attached to the burner box.

The burner box may comprise a sensor, such as a switch to sense whether the hood is in a first or a second position and to reduce or inhibit heat generation by the heat source when the hood is in the second position.

The oven may comprise a thermostatic control unit, such as a rotary dial unit or a digital display operable to set a target cooking temperature for the oven and facilitate control of the energy output of the heat source in response to the oven temperature as measured by a temperature sensor within the oven.

If the heat source comprises a plurality of heater units the control unit may be operable to control only some of the heater units and/or to allow selection of the number of heater units which are controlled by the control unit.

A control unit is supported by the burner box or hood and is manually operable or is remotely operable, for example wirelessly such as by means of an app on a smart phone or computer.

Instead of a sensor such as a switch being operated automatically by movement of the hood, it may be manually operable. It may be incorporated into a control dial such as a dial which is operable to vary the heat output from at least a part of the heat source.

The heat source may comprise a plurality of heater units such as electric or gas type heaters. At least one of a plurality may be controlled independently of one or more other of the heater units to provide a variable heat output.

The heat source may comprise one or more heater units which are controlled automatically by a heater control means responsive to the thermostat, and additionally one or more heater units that are manually controllable.

The feature of automatic control of one or more heater units in response to operation of the thermostat preferably is disabled when the hood is in an open position. The disabling of that feature may be activated by the sensor that detects movement of the hood and which is arranged to be in operable communication with the heater control means.

Preferably the heat output of the automatically controlled heater unit(s) is automatically reduced to a low level of heat output when the hood is open.

Further features and considerations relevant to provision of an improved temperature controlled oven are set forth in the following paragraphs.

Temperature controlled barbecues where the gas burners that have incorrectly been throttled down due the heat produced by the oil fires inside the barbecue, but are not directly next to these oil fires have a tendency to blow out in light wind conditions due to the low gas flow imposed by the thermostatic control reducing the gas flames and will not ignite again, other than by the ignition procedure for each gas BBQ type.

It is noted that thermostatic temperature control will operate more accurately if the dripping oils which act as an additional fuel source can be collected in the cooking surface, guided away by means of a dedicated secondary channel or channels and deposited safely outside of the barbecue burner box into a suitable container on the external side of the combustion area. The angle at which the bars are set at to encourage the oils to travel under gravity along the support and collector sections to the direction of the secondary channel is also important. The length of the bars is decided by the size of the BBQ burner box, but in general between 300mm to 500mm covers most designs. Over this distance a drainage angle of 2 to 15 degrees is required to make a directed flow of oils to the secondary channel.

The secondary channel or channels can be of varying size in terms of channel width and depth dependant on the space available to fit the secondary channel in the coolest part of the burner box normally at the front edge where the gas control valves are positioned

The secondary channel also requires an angle to encourage oil flow along its length to the collection container positioned outside the burner box

As this secondary channel can be in one section running the length of the burner box to the outside a drainage angle of 2 to 10 degrees is provided with the following benefits achieved.

In the case of temperature-controlled barbecues, the thermostatic control system and internal mechanism stays clean and free from soot and oil fires allowing it to

function correctly receiving only temperature input from the gas or electric burner radiant or radiants.

A thermostatically controlled barbecue with effective oil collection resulting in greatly reduced fat fires provides controlled cooking temperatures.

Controlled and correctly adjustable cooking temperatures provide correctly cooked barbecue food.

A thermostatically controlled barbecue with effective oil collection resulting in greatly reduced fat fires provides ease of use cooking for the operator.

A thermostatically controlled barbecue with effective oil collection resulting in greatly reduced fat fires has an automatic throttle down and up temperature control system that will only receive temperature inputs from the heat produced by the gas or electric burner radiants and therefore will function correctly as designed.

A thermostatically controlled barbecue with an on / off switch operated automatically by the opening and closing of the hood will help reduce environmental emissions.

As previously stated barbecues consist of a heat source directly below the open cooking rack and food items placed upon it. This is the most efficient way of cooking because thermal heat rises from the heat source and through the open grill rack to efficiently envelop the food above. Whether the heat source is lump wood, charcoal, gas or electricity efficient open rack cooking leads to the run-away out of control excessive flames caused by oil and fats dripping from the food into the burner box through the common type open grill rack to produce an uncontrolled cooking condition.

Description of Drawings

Figure 1 is a perspective view of a temperature controlled oven in accordance with the present invention with the hood in an open position;

Figure 2 is an end view of the oven of Figure 1 from one end, with parts of the heating rack and heat source removed for clarity and with the hood in a closed position;

Figure 3 is an end view of the other end of the oven of Figure 1 with part of the burner box, temperature control thermostat and switch removed for clarity;

Figure 4 is a perspective view corresponding substantially to that of Figure 1 to show the angle of inclination of the collector channels of the heating rack, and

Figure 5 is a front view of the oven of Figure 1 and showing the angle of inclination of the drainage channel.

Description of Embodiments of the Invention

The drawings illustrate, by way of example only, embodiments of the invention.

Referring to Figure 1, an oven 1 in accordance with the present invention comprises a burner box 2 to which is pivotally secured a hood 3.

The burner box houses three gas burner radiants 5 which lie beneath a plurality cooking racks 19 (only one of which is shown in the interests of clarity). Each heating rack comprises a plurality of parallel and spaced apart bars which each are of a U shape in cross-section thereby to provide a drainage channel. The bars are inclined at an angle of between 2 and 15 degrees to the horizontal when in use of the oven with the base of the burner box on a horizontal surface. The burner box further comprises a drainage channel 17 which extends at an angle between 2 and 10 degrees as shown by the angle 22 in Figure 5. The drainage channel serves to collect exudate flowing down the channels of the heating racks 19 and directs the exudate 20 to an externally located collection vessel 18.

The burner box comprises manually operable valves 6 for independently controlling operation of each of the three gas burner radiants 5.

Control of the gas supply to one of the radiants 5 is by means of the automatic temperature control thermostat 7, with the target cooking temperature set by means of a temperature control dial 12. A switch 10 is operable to respond to opening of the hood 3 to reduce the heat output of the gas burners whilst the hood is in the open position.

Other features of the embodiment of the invention will be apparent from the following text.

Non automatic temperature control barbecue cooking with the hood open with oil and fat exudes collection.

Barbecue cooking with the hood open is ideal for cooking certain foods like steak and fish where all around heat is not required.

As shown in figure 1 the barbecue 1 is cooking with the pivoting hood 3 in the open position 15 and the gas burner radiants 5 lit with the manual ignition 9. The control switch 10 de activates the automatic temperature control thermostat 7 to the off position and therefore no automatic temperature control is activated. The temperature can be controlled by turning the input to the individual gas burner radiants 5 up and down manually by rotating the individual manual control valve throttles 6.

The fatty food item 14 is placed on the grooved cooking racks 19 and it can be seen that the oil and fats 20 emitted from the fatty food item 14 are not dripping down onto the hot burner radiants 5 instead the oils and exudate 20 is collected by the grooves in the improved cooking racks 19 and drain down into the channel or channels 17 to be guided out by the dedicated channel 17, under gravity into the oil collection vessel 18. This has the positive effect of stopping run away fat fires within the burner box 2.

The combination of automatic temperature control barbecue cooking with the hood closed and with oil and fat collection has not been achieved before.

For certain foods like whole chickens and thick meat joints barbecue cooking with the hood closed is ideal to provide all round heat to the food items.

It is understood that when cooking with the hood closed, heat will build up inside the hood and main burner box. With the control throttles turned down manually to their lowest setting, temperatures of up to 350 degrees Celsius can still be present rather than the ideal 180 degrees Celsius. This excessive high temperature is not ideal because it tends to toast and burn the outside of the larger volume food joint before the centre has been cooked properly and the excessive heat and oils dripping onto the hot radiants result in a run-away fat fire within the burner box and hood.

A way to try to improve this condition when barbecue cooking with the lid closed is to use automatic temperature control with a temperature sensing device inside the burner box and the ability to regulate the main heat input such as gas or electric.

As shown in figure 2: the barbecue 1 with the pivoting hood 3 in the closed position 16 the manual control throttles 6 are set open to supply gas to burner radiants 5 which are lit by the manual ignition 9.

The control switch 10 is activated by the closed pivoting hood 3 which turns the automatic temperature control thermostat 7 to the active on position and the automatic temperature control function is activated. With the gas burner radiants 5 lit, heat builds up inside the closed pivoting hood 3 and burner box 2. This heat is automatically controlled and adjusted up or down by manually setting the temperature control dial 12 to the desired cooking temperature, this acts upon automatic temperature control thermostat 7 to the preferred setting which in turn acts upon the throttle up and down device 8 to maintain and regulate the amount of gas supplied to the burner radiants 5 through the control throttles 6 to provide the desired and regulated correct cooking temperature selected on control dial 12. It is noted that for multiple burner barbecues the automatic control dial 12, thermostat 7 and throttle up and down device 8 can be integrated and act upon all or just some of the burner radiants 5, and that by turning down to very low heat or turning off, these non-temperature controlled manually operated burner radiants, thermostatic temperature control can still be achieved within the barbecue pivoting hood 3 and burner box 2.

As shown in figure 3, the fatty food item 14 is placed on the dedicated collection type cooking racks 19 and it can be seen that the oil and fats 20 emitted from the fatty food item 14 are not dripping down onto the hot burner radiants 5 and instead the oils and fats exudate 20 are collected by the grooves in the improved cooking rack 19 and drain down to the dedicated channel or channels 17 to be guided out under gravity into the oil collection vessel 18 positioned outside the burner box. This has the positive effect of stopping run away fat fires within the burner box 2.

It is noted that the control switch 10 is operated automatically when the pivoting hood 3 is opened or closed, alternatively the control switch 10 can be repositioned and operated manually by the user when thermostatic temperature control is required, preferably when the pivoting hood 3 is closed, therefore acting as a temperature regulated oven. It is noted that this manually operated control switch could alternatively be integrated into the control dial 12.

It is noted that when automatic temperature control is in operation the manual control dial 12 overrides control provided by each temperature control integrated manual control throttles 6.

Note: Although gas and electric heating is mentioned here, it is understood that thermostatic temperature control can be achieved to a degree in charcoal barbecues by reducing or increasing air supply to the ignited charcoal and will benefit from removal of combustible oils from dripping into the burner box.

The elements making up an improved temperature-controlled barbecue include:

a) Oil and fats collection using efficient open grill racks
b) Automatic thermostatic control components
c) Collection channel or channels to receive the oils and fats from the grill racks and take it safely away from the hot burner box preventing ignition of afore mentioned oils and fats (exudates).
d) Optional hood open or closed activated switch

Note, the temperature control thermostat 7 is shown positioned near to the cooking surface. However it can instead be placed underneath the collection channel 17 or placed at the rear or sides of the barbecue just above the cooking surface to add further protection from dripping oils and small food items falling on top of it creating a burning heat source, giving a false temperature input to the sensor device.

As shown in figure 4 and figure 5 the fat collection channel or channels 17 exit outside of the burner box 2 to convey the oil and fats exudate 20 into a separate collection vessel 18 this is not exclusive and if desired the oils and fats exudate 20 can be run down inside the cool portion of the internal walls of the burner box 2 where it flows under gravity into oils collection cup outside the bottom point of the burner box 2, which by default is normally cooler but can also be a heat source, so not always ideal.

Note; it may be the case that although it is not completely necessary to include control switch 10 to have temperature control within the barbecue 1, as is the case with domestic gas or electric ovens.

However with the ever growing necessity to reduce global greenhouse emissions, it is noted that additional features can be incorporated into the system.

Control switch 10 may be automatically operated by the pivoting hood 3 and with the addition of another electric switch not shown, which is only engaged when the barbecue is switched to temperature control condition. This additional switch can be integrated into temperature control dial 12 or alternatively be a separate solenoid switch energised only by rotating the temperature control dial 12 to the temperature control position. This additional switch is designed to act upon a gas restricting solenoid valve to reduce down the gas input or in the case of an electric barbecues, to turn down electrical power when the pivoting hood 3 is opened and control switch 10 is activated. This will override and prevent the normal operating condition where after the release of the hot gases from the open pivoting hood 3 and burner box 2. The control thermostat 7 senses the drop in temperature and acts upon the throttle up and down device 8 allowing additional gas or electricity in the case of electric barbecues, through the control throttles 6. This condition consumes excessive gas or electricity as the barbecue tries to get back up to the required temperature as set on the control dial 12 with the subsequent impact of unnecessary CO2 emissions into the atmosphere. This additional switch and restricting solenoid valve automatically activates when the pivoting hood 3 is opened is a solution to above condition.

Claims

1. A temperature controlled oven comprises a burner box, a controllable heat source within the burner box, a heating rack supported by the burner box at a position over the heat source and a hood moveable between a first, closed position at which it covers the burner box and a second, open position at which the heating rack is exposed, the heating rack comprising a plurality of spaced apart collection bars to support a product for cooking and which are inclined to the horizontal at an angle of between 2 and 15^0, said collection bars each defining a collection channel along which exudate from the product may flow under gravity to a drainage channel, said drainage channel being inclined to the horizontal at an angle of between 2 and 10^0 to direct collected exudate to an exudate collection vessel, the temperature controlled oven further comprising a temperature controlled thermostat operable to control operation of the heat source.

2. An oven according to claim 1 wherein the collection vessel is located externally of the burner box.

3. An oven according to claim 1 wherein the collection vessel is located within the burner box at a position remote from the heat source.

4. An oven according to any one of the preceding claims wherein the hood is separable from the burner box.

5. An oven according to any one of claims 1 to 3 wherein the hood is pivotally secured to the burner box.

6. An oven according to any one of the preceding claims and comprising a display to display the temperature measured by the automatic temperature control thermostat.

7. An oven according to claim 6 wherein the display is positioned on the burner box.

8. An oven according to any one of the preceding claims wherein the burner box comprises a sensor to sense whether the hood is in said first or said second position and to reduce or inhibit heat generation by the heat source when the hood is in the second position.

9. An oven according to claim 8 wherein the sensor comprises a switch responsive to movement of the hood between said first and second positions.

10. An oven according to any one of claims 1 to 7 wherein the heat source is manually controllable to reduce or inhibit heat generation by the heat source when the heat source is in the second position.

11. An oven according to any one of the preceding claims wherein the heat source comprises a plurality of heater units and wherein at least one heater unit is controllable independently of control of one or more other heater units.

12. An oven according to any one of the preceding claims wherein the heat source comprises a plurality of heater units at least one of which is thermostatically controlled and at least one of which is manually controlled, and wherein the heat output from the manually heater unit(s) is reduced or inhibited when the hood is in said first, closed position.

13. An oven according to any one of the preceding claims wherein the oven comprises a temperature sensor within the oven and a thermostatic control unit operable to set a target cooking temperature for the oven and facilitate control of the energy output of the heat source in response to the oven temperature as measured by the temperature sensor.

14. An oven according to claim 13 wherein the heat source comprises a plurality of heater units and the controllable heat source is controlled by a thermostatic control unit operable to control only some of the heater units or to allow selection of the number of heater units which are controlled by the control unit.

15. An oven according to claim 13 or claim 14 wherein the control unit is supported by the burner box or hood and is manually operable.

16. An oven according to claim 13 or claim 14 wherein the control unit is supported by the burner box or hood and is remotely operable.

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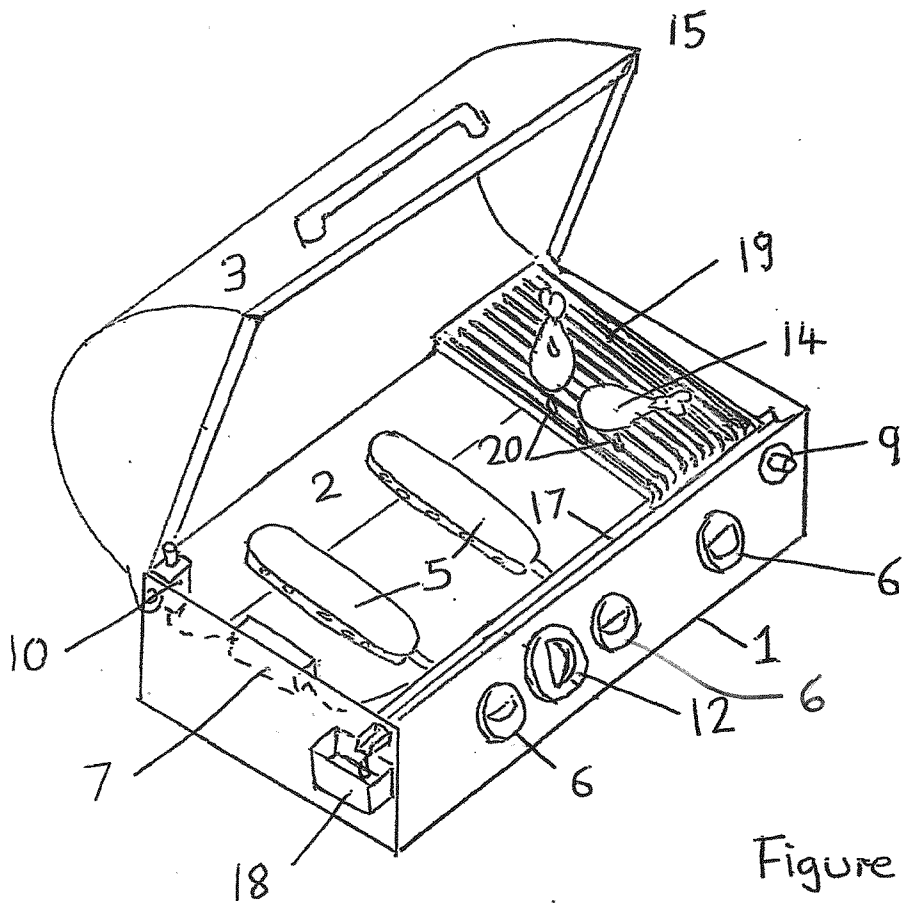

Figure 1

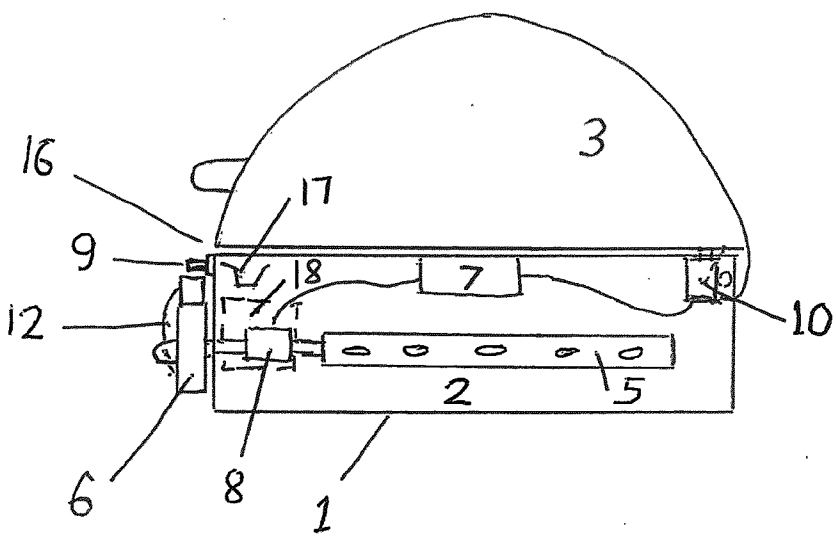

Figure 2

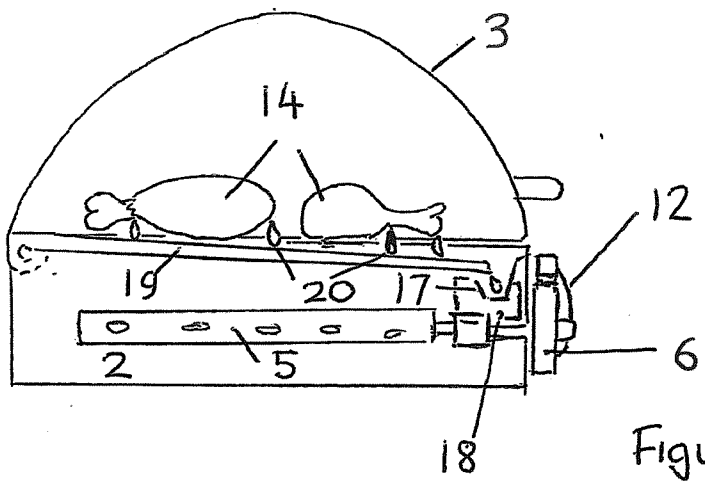

Figure 3

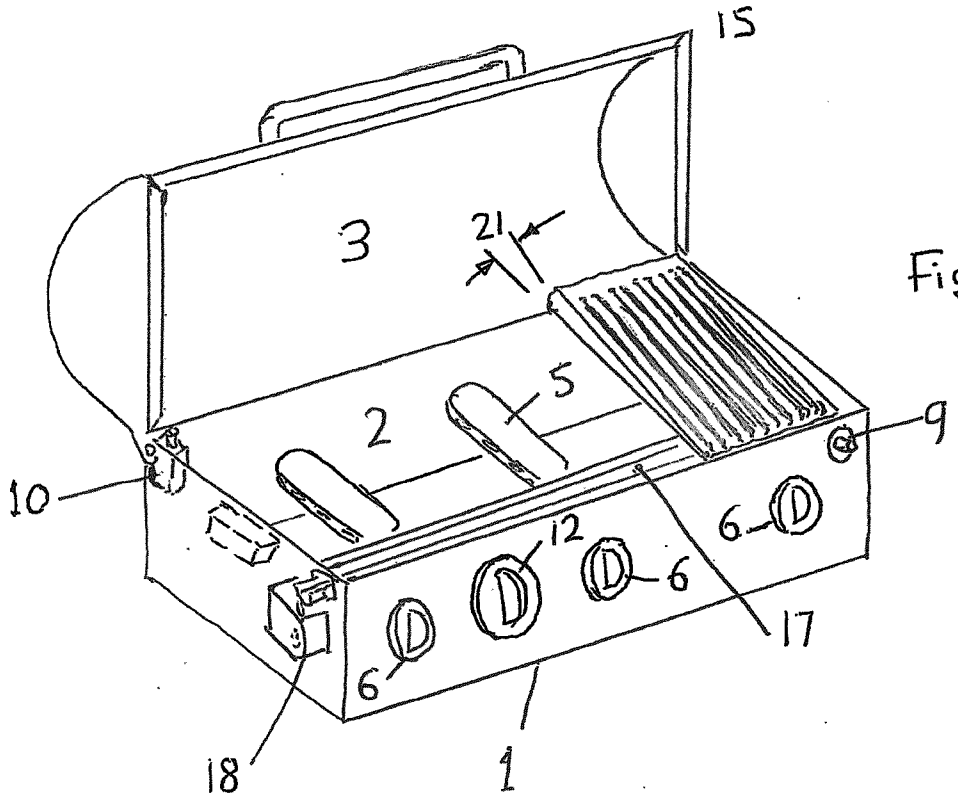

Figure 4

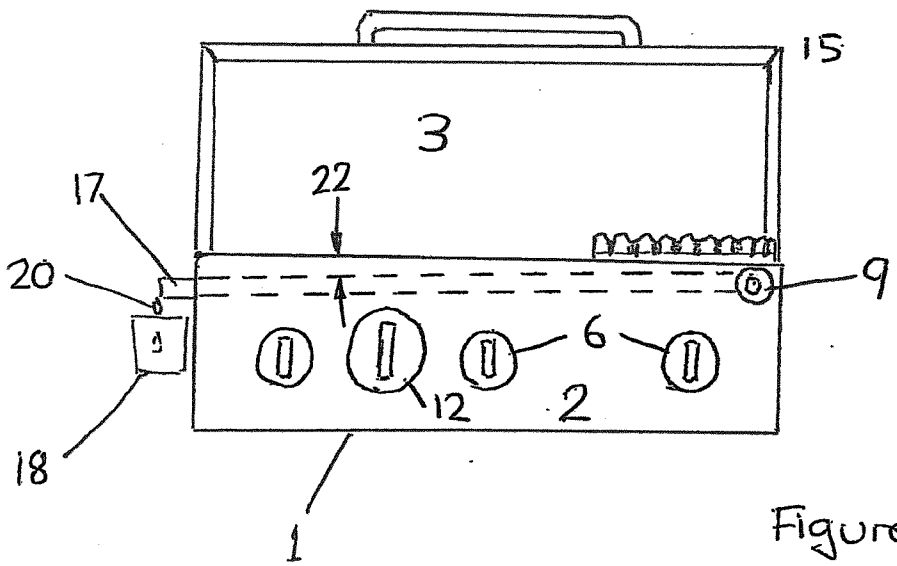

Figure 5

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2024/025175

A. CLASSIFICATION OF SUBJECT MATTER
INV. A47J37/06 A47J37/07
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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	CN 101 815 456 B (SHRIRO AUSTRALIA PTY LTD) 14 November 2012 (2012-11-14) paragraph [0049] - paragraph [0066]; claims; figures	1-7, 10-16 8,9
Y A	US 4 787 364 A (ZEPEDA ERNESTO F [MX]) 29 November 1988 (1988-11-29) column 3, line 12 - column 6, line 2; claims; figures	1-7, 10-16 8,9
Y A	US 6 371 011 B1 (KUECHLER IRVIN R [US]) 16 April 2002 (2002-04-16) column 3, line 30 - column 7, line 43; claims; figures	1-7, 10-16 8,9
A	US 2021/315416 A1 (FULLMER TYLER J [US] ET AL) 14 October 2021 (2021-10-14) paragraph [0045] - paragraph [0074]; claims; figures	4,6,7,13

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

☒ See patent family annex.

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29 August 2024	12/09/2024

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2024/025175

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CN 101815456 B	14-11-2012	AU 2008301207 A1	26-03-2009
		CN 101815456 A	25-08-2010
		EP 2190331 A1	02-06-2010
		NZ 583890 A	30-09-2011
		US 2009071465 A1	19-03-2009
		WO 2009036488 A1	26-03-2009
US 4787364 A	29-11-1988	NONE	
US 6371011 B1	16-04-2002	NONE	
US 2021315416 A1	14-10-2021	NONE	