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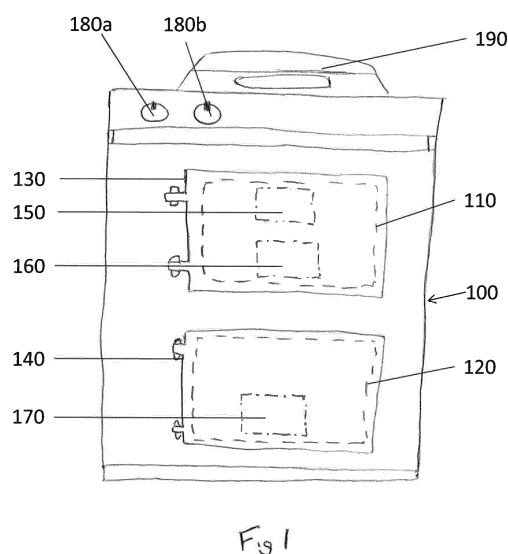
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(54) **IMPROVEMENTS RELATING TO ELECTRIC OVENS**

(57) A cast iron range cooker comprises at least one oven cavity which is accessed through a door; a first heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connected to a power supply in series with at least one first thermostat, a second heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connectable to a power supply in series with at least one second thermostat that switches at a higher temperature than the first thermostat, and a user operable input device which has at least two user selectable temperature settings for the oven cavity, at least one of which corresponds to the cavity being heated to a predefined temperature corresponding to the switching temperature of the second thermostat. The user operable input device causes both the heating means to be connected to the power source so that on initial heating both the heating means apply heat to the cavity until the switching temperature of the thermostat of the first heating means is reached and the first heating means is switched off, thereafter heating continuing using the second heating means until the switching temperature of the second thermostat is reached.



Description

[0001] This invention relates to improvements in electric ovens, and in particular to range style cookers that incorporate one or more ovens and optionally a hob primarily and which are intended for domestic cooking use.

[0002] It is known to provide domestic cookers which comprise a lightweight pressed steel body within which is housed one or more oven cavities. The walls of the cavities are made of thin sheet steel, and surrounded by insulating material. Heating of the cavities is available on demand using either gas or electric heat sources. When at rest, the cavities are unheated, so heat energy is only used at the time that products are being cooked. Whilst this is efficient it can take time for the cavities to heat up to the required temperature. Typically the temperature of the cavity can be set at any point over a wide range, typically 130 to 230 degrees Centigrade or thereabouts.

[0003] Another type of domestic cooker is known as heat-storage type cookers. Perhaps the most well known and loved are the applicant's own Aga and Rayburn Ranges of heat storage cookers. These cookers differ from the pressed steel type because the oven walls are formed of a thick material with high specific heat capacity so that the walls have a relatively high thermal mass. The cavity does not contain a heating element, and the walls also are not provided with a direct heating element. Instead the one or more ovens are in thermal contact with a system of ducts communicating with a combustion chamber which serves as heat source.

[0004] The combustion chamber is fed with a solid fuel, or, and more commonly nowadays, with fuels such as kerosene, natural gas or propane. By making the shell from cast iron, heat from the heat source is stored residually allowing the device to provide constant high temperatures with heat source constantly topping it up if heat is lost (for instance by opening a door to the oven).

[0005] It is also known to provide a heat storage stove with the heat exchange chamber containing one or more resistance heating elements. Two types of electric heat store stoves have been proposed. In the first the heat store is "charged" with heat to a high level using a high power heating element rated at 30 amps at 240 volts. This charging can be performed overnight when electricity is cheaper and then released from the store during the day as required to keep the stove at its operating temperature.

[0006] In all traditional, pre-1980's, heat storage range cookers, heat from the store passes underneath the top of the cooker on the way toward heating the oven cavities or on a return path to the heat store. The top of the cooker comprises a hob (sometimes called a stovetop or cooktop in some countries, the three terms being interchangeable) that is provided with, typically, two circular cast iron plates. The heat raises the temperature of the underside of the cast iron plates, making the top of the plates heat up due to conduction. The plates can then be used as heating zones to heat pans. Insulated lids are provided

which cover the plates when not used for cooking, retaining most of the heat in the plates but allowing some warmth to escape. One of the plates is closer to the heat source than the other and will heat up to a higher temperature suitable for boiling water in a pan, the other heating up to a lower temperature suitable for simmering water in a pan. They are sometimes called the hotplate and simmer plate for this reason.

[0007] Because it takes a long time to heat up, the cookers are usually left on for extended periods so they are ready to use at meal times. This style of cooking is very different to cooking with a sheet steel cooker, and many people feel that food cooked in a range cooker is preferable. A beneficial side effect of the heat stored in the cast iron of the ovens and heating plates is that a gentle background heat is emitted constantly which gives the room in which it is located a cosy warm feel.

[0008] In another arrangement, the top of the stove may be insulated from the stored heat and a conventional electric hob may be provided, perhaps using ceramic heating elements. These have the advantage that they heat up quickly when required, but do not give the same impression as the conventional range cooker and do not provide the same useful levels of residual heat. Whilst convenient to use, some cooks find conventional electric hobs to lack character compared with the traditional cast iron range cooker hobs, and find they lack the same level of versatility and cosiness.

[0009] The benefits of heat storage cookers are that they are always ready to cook because the oven cavities and hotplates are constantly at the right temperature.

[0010] An object of the present invention is to introduce some of the benefits of a heat storage cooker into a non-heat storage cooker, in particular the ability to have the ovens at the cooking temperature in a speedy manner.

[0011] According to a first aspect the invention provides a range cooker comprising:

at least one oven cavity which is accessed through a door;

a first heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connected to a power supply in series with at least one first thermostat,

a second heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connectable to a power supply in series with at least one second thermostat that switches at a higher temperature than the first thermostat,

a user operable input device which has at least one user selectable temperature setting for the oven cavity which corresponds to the cavity being heated to

a predefined temperature corresponding to the switching temperature of the second thermostat,

in which the user operable input device when in the at least one temperature setting causes both the heating means to be connected to the power source so that on initial heating both the heating means apply heat to the cavity until the switching temperature of the thermostat of the first heating means is reached and the first heating means is switched off, thereafter heating continuing using the second heating means until the switching temperature of the second thermostat is reached.

[0012] By providing two heating means which initially work in parallel when the user input device is set to a position calling for heating of the oven to a preset temperature, a rapid heating is achieved. At a preset first temperature, below the target temperature, one of the heating means is switched off by isolating it from the power source as the thermostat switches state, and heating then continues using the other heating means only. This has been found to help prevent any overshoot conditions, or to limit the amount of overshoot, which would otherwise occur if a single high power element was controlled using thermostatic control.

[0013] The first heating means may be associated with two thermostats, each with a different switching temperature (the "set point" of the thermostat), the user operable input means permitting a user to select between two different temperature settings, whereby for a given temperature setting the user input means selects a corresponding one of the two thermostats to connect the heating elements to the power source.

[0014] Similarly, the second heating means may be associated with two thermostats, each with a different switching temperature and each associated with one of two temperature settings selectable by the user operable input device which causes the associated thermostat to selectively connect the heating elements to the power source.

[0015] By choosing between two thermostats for each heating means, the user operable input device varies the temperature at which the heating elements are isolated from the power source. This allows the oven cavity to be rapidly heated in two stages to the user's choice of two pre-set temperatures.

[0016] Whichever temperature setting is chosen, the associated thermostat of the first heating means may have a switching temperature of between 20 and 40 degrees Centigrade below the chosen preset temperature. This reduction should be chosen so that there is relatively little overshoot, or no overshoot in the preset temperature caused by the heat from the first heating means after power has been shut off. With electrical heating elements, heat typically does not stop being emitted the instant that power is cut off, especially so with high power resistive heating elements.

[0017] The user operable input device may enable the user to select a third temperature setting in which the oven cavity is unheated, and in this setting may cause the first heating means and the second heating means to be isolated from the power supply.

[0018] The user operable input device may comprise one or more mechanical switches that vary the electrical connection of the heating means to the power sources, and vary which of the thermostats associated with the heating elements of each heating means is used to control the power supplied to the heating elements.

[0019] Instead of mechanical switches that are directly operated by the user, the input device may produce one or more control signals that are fed to a control unit, the control unit in turn causing one or more switches to open or close as required to provide the desired configuration of the electrical circuit connecting the heating elements and thermostats to the power supply.

[0020] The first temperature setting may correspond to a temperature suitable for baking food stuff. It may correspond to a temperature of between 230 and 260 degrees Centigrade.

[0021] The second temperature setting may correspond to a temperature suitable for roasting foodstuffs. It may for example correspond to a temperature in a range of 170 and 200 degrees Centigrade.

[0022] To achieve the two ranges, the first heating means may be associated with two selectable thermostats with switching temperatures of approximately 150 degrees Centigrade and 190 degrees Centigrade. The former may be in operation when in the roasting setting, the later for the backing setting.

[0023] Preferably the first heating means comprises higher power rated elements than the second heating means, or at least a set of elements that together have a higher power rating than the second set of heating elements. This allows the first heating means, which switches off earlier during heating, to provide a rapid heating effect.

[0024] For example, the first heating means may comprise one, or preferably two, elements of between 500 and 1000 Watts. The second heating means may comprise one, or preferably two, elements of between 200 and 400 Watts.

[0025] The heating elements may comprise resistive heating elements. They may comprise at least one resistive heating element that is embedded or fixed to a cast iron support. The use of a cast iron support helps provide radiant heat into the cavity in a manner similar to a traditional cast iron heat storage cooker.

[0026] The heating elements may be located inside the oven cavity.

[0027] The or each thermostat may comprise a hydraulic thermostat, by which we mean that the thermostat opens and closes in response to the change in temperature of a volume of liquid or gas contained within the thermostat.

[0028] Below the switching temperature (set point), the

thermostat may be closed providing a path for current relatively unhindered through the thermostat. Above the switching temperature, the switch may open, breaking the path and completely or partially preventing current flow.

[0029] Of course, other temperature dependent switches could be employed and the skilled reader should apply a broad construction to the term thermostat as used in this specification to cover any form of control device that opens and closes as a function of temperature around a set point to selectively cause current to flow through a heating element (and hence selectively control the heat output of the element).

[0030] The thermostat, or at least a part of the thermostat that senses the temperature, may be located within the oven cavity.

[0031] The range cooker may additionally include a second oven cavity, which may also be provided with a heating means that is controlled by the user operable input device.

[0032] The heating means of the second oven cavity may be controlled by a thermostat, and may be configured when set to a mode where heating is being demanded to be held at a constant temperature.

[0033] The second oven cavity, when heated, may be held at a temperature suitable for simmering water, for instance between 95 and 110 degrees Centigrade.

[0034] The range cooker may include a hob having at least one heating zone. This may be covered by a lid, in the manner of a traditional range cooker where an insulated lid would be used to prevent heat loss from the heating zone when not in use to cook foods.

[0035] The heating zone may be heated by one or more electrical heating elements. The elements may be loaded on or embedded within, a cast iron plate which may form part of a wall of the oven cavity.

[0036] The heating zone may be selectively set to one of two different heating temperatures. This may be controlled by the user operable input device, or a second user operable input device.

[0037] Having separate user operable input devices for the cavities and the hob may be simpler for the user to operate.

[0038] The input devices may comprise one or more rotary knobs located towards the front and top of the range cooker.

[0039] According to a second aspect the invention provides a method of operating a range cooker of the kind comprising at least one oven cavity which is accessed through a door;

[0040] The method comprising the steps of:

Providing a first heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connected to a power supply in series with at least one first thermostat,

Providing a second heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connectable to a power supply in series with at least one second thermostat that switches at a higher temperature than the first thermostat,

Providing a user operable input device which has at least one user selectable temperature setting for the oven cavity which corresponds to the cavity being heated to a predefined temperature corresponding to the switching temperature of the second thermostat,

in which in use with user operable input device in the at least one temperature setting causes both the heating means to be connected to the power source so that on initial heating both the heating means apply heat to the cavity until the switching temperature of the thermostat of the first heating means is reached and the first heating means is switched off, thereafter heating continuing using the second heating means until the switching temperature of the second thermostat is reached.

[0041] There will now be described by way of example only one embodiment of the present invention with reference to the accompanying drawings of which:

Figure 1 is a front view of an embodiment of a range cooker within the scope of the present invention; and

Figure 2 is a circuit diagram showing how the heating of the oven cavities and hob are controlled by the user of the cooker operating the control knobs of the cooker.

Figure 3 is a diagram showing the positions of the switches that are controlled by a user operable input means for different oven settings; and

Figure 4 is a diagram similar to Figure 3 for the switches associated with the hotplate.

[0042] As shown in Figure 1, a range cooker for domestic use comprises a body 100, or chassis, which in this example is a relatively slim 60cm wide. Other widths are possible, with a width of 90cm, 110cm, 140cm or more being commonly chosen to fit with the standard sizes of units of a typical fitted kitchen.

[0043] The body 100 houses two oven cavities 110, 120 (shown in broken line in Figure 1), each of which is accessed through a respective door 130, 140 secured to the body along one edge by a pair of hinges. Each cavity 110, 120 is surrounded by insulating material (not shown) so that heat input to the cavity cannot escape, and the door is also insulated. The oven cavities are arranged

one above the other in this embodiment and for convenience will be referred to as the top oven (cavity) 110 and the bottom oven (cavity) 120.

[0044] Within the top oven cavity 110 there is provided a first heating means 150 and a second heating means 160, each comprising multiple resistive heating elements. Each one of the elements has a defined heat rating, the higher the rating the more heat is output from the element when it is connected to a power supply. Each element has an input and an output from which leads extend that allow them to be connected together to form an electrical circuit.

[0045] Specifically, in this embodiment the top oven includes the following heating elements that together define the first and second heating means:

First heating means 150- this comprises two pairs of 600 Watt elements, one provided in the top of the cavity and the other at the bottom of the cavity. They both operate together so that whenever one is heating the other is also heating.

Second heating means 160- this comprises two 300 Watt elements, one provided in the top of the cavity and the other at the bottom of the cavity. Again, they both work together so that if one is heating the other is also heating, and vice versa for not heating.

[0046] Associated with the elements of the first heating means 150 are two thermostats. One has a switching temperature or set point (where it changes from closed to open) of 148 degrees Centigrade, the other 192 degrees Centigrade.

[0047] Similarly, associated with the two elements of the second heating means 160 are two further thermostats. One has a switching temperature or set point of 246 degrees Centigrade, the other 180 degrees Centigrade.

[0048] The bottom oven also contains heating elements, in this example one 600 watt and one 300 watt element. A single thermostat is associated with the bottom oven with a set point of 110 degrees Centigrade.

[0049] Connecting the various heating elements and the thermostats 150, 160, 170 to the power supply are a set of user operable switches. The position of these switches is controlled by a user operable input device in the form of a rotary knob 180 located on the front of the housing. Depending on the position of the rotary knob 180, different combinations of the heating elements and thermostats 150, 160, 170 can be connected to the power supply by selectively opening and closing the switches. In each configuration, apart from the OFF position, there is always one thermostat connected in series between a heating element and the power supply (either to the positive or earth side of the power supply). Thus, when that thermostat is closed current flows in the heating element and when open the current is cut off from the heating element.

[0050] The configuration of the heating elements, thermostats and switches in this embodiment is shown in the circuit diagram of Figure 2.

[0051] In addition to the two ovens, across the top of the housing is a hotplate (not shown) that is located under an insulated lid 190. Surrounding the hotplate is a full size pan support (not shown), which extends the working surface so that the user has a more control of the cooking process by moving the pan further or closer to the heat source. The hotplate includes three heating elements: a 2100 W heating element, and two 200W heating elements. These are connected to a power supply through two thermostats, each with a different set point. In this example one has a set point of 180 degrees Centigrade and the other 350 degrees Centigrade. A third thermostat, with a higher 360 degree Centigrade set point, is also provided and functions as an over temperature safety switch.

[0052] A second user operable input device is provided for controlling the hotplate which includes a set of mechanical switches. The device is in the form of a rotary control knob 180b, and allows the user to select three positions (including off) high power boil plate elements (3) or lower power, simmer plate elements (2). Thermostatic control allows the hotplate to be permanently left on, in either boiling plate mode or simmer plate mode, with either the lid up or down.

[0053] The hotplate elements, thermostats and user operable control device are also shown in the circuit diagram of Figure 2 of the drawings.

[0054] The hotplate and oven cavities 110, 120 operate in the manner set out below. This should be read in conjunction with Figures 3 and 4 which show the position of the switches of the circuit corresponding to different settings of the user operable input devices.

Hotplate Operation

[0055] The user can select one of three settings or modes using the second user operable input device- OFF, Low (simmer) and High (boil). Figure 4 shows the position of the associated switches for each setting.

[0056] With the hotplate lid down and the hotplate set to a maintenance rate (boil or simmer) the hotplate thermostat that has the 180 degree Centigrade rating (if simmer selected) or the thermostat that has the 350 degree Centigrade set point (if boiling selected) limits the full power. When the lid is opened the thermostat phial cools and full power is again applied to the elements.

[0057] When the plate selector is in an On position, the hotplate is ready for use immediately heat is required, kept up to temperature by the hotplate thermostat control of the current supplied to the heating elements. The temperature that is maintained will vary depending on the setting of the user operable input device/hotplate selector switch.

Hotplate Selector switch set to 'Low' Simmer (2300W, 180 degrees Centigrade, maintenance rate 200W)

Lid down

[0058] As displayed in Figures 2 and 4, starting from cold the switches are set as follows:

P4 -6 closes, the live is supplied directly to the relatively low power 200W plate element only.

P5 -7 is open.

P6 -1 closes on the plate selector live supplied to B11 - 12 on the plate thermostat to power the relatively high power 2100W plate element.

P3 -5 is closed, switching Neutral.

[0059] After a while as the hotplate reaches the simmer temperature, the thermostat B11 - 12 opens, which turns the 2100W plate element off.

[0060] The low temperature 200W heating element remains under power, keeping the temperature steady at the required 180 degrees Centigrade. This is achieved through careful selection of the rate of heat loss through the lid when closed, which together with other sources of heat loss should balance the heat output from the 200W heating element.

Lid up

[0061] When the user lifts the lid up, and leaves in in the up/open/raised position, the low power 200W heat element cannot maintain temperature of the plate on its own.

[0062] To ensure the temperature of the hotplate does not drop, the plate thermostat B11-12 closes in response to the temperature dropping and this causes power to be applied to the high power 2100W plate on element until 180 degrees Centigrade is reached again. This temperature is maintained by cycling of the thermostat.

[0063] The 360 degrees Centigrade thermostat provides overheat protection and is positioned in the Neutral.

Hotplate Selector switch set to 'High' Boil (2500W, 350 degrees Centigrade, maintenance rate 400W)

Lid down

[0064] As displayed in Figures 2 and 4:

P4 -6 closes, Live supplied direct to 200W plate element.

P5 -7 closes power direct to second 200W plate element.

P6 -2 closes on plate selector to B21 - 22 on plate thermostat to power the 2100W plate element.

P3 -5 closes, switching Neutral.

5

[0065] At 350°C thermostat contacts B21 - 22 open-turning the 2100W plate element off. 2 x 200W plate elements maintain temperature.

10 **Lid up**

[0066] 400W cannot maintain temperature so the plate thermostat B21-22 closes to the 2100W plate on element until 350 degrees Centigrade is reached.

15 **[0067]** A 360 degrees Centigrade thermostat provides overheat protection and is positioned in the Neutral.

Oven Operation

20 **[0068]** The two oven cavities have three cooking mode or temperature settings as follows, each selected by the user opening the input device/oven selector switch. The three modes of operation (four as the oven being off is one mode) are:

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The top cavity can be OFF, at high temperature, or at low temperature.

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The bottom cavity can be off or set at a simmer temperature.

[0069] The high temperature, low temperature and simmer temperature are all different set temperatures. The user chooses between them using the user operable input device. This opens and closes the associated switches in patterns that are shown in Figure 3 of the drawings. In total there are six settings:

35

1 Both cavities Off

40

2 Top Cavity = High temp

3 Top Cavity = High temp and Lower cavity = Simmer temp

45

4 Lower Cavity = Simmer

5 Top Cavity = Low temp and Lower Cavity = Simmer temp

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6 Top Cavity = Low temp

[0070] The lower cavity has a single function and is a dedicated low temperature simmer oven. The single base mounted heating element is controlled in the traditional way using a basic thermostat.

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[0071] The upper cavity has two selectable functions of High temp or Low temp cooking.

[0072] Whichever upper cavity function is selected, the basic principle of operation is the same.

[0073] When switched on, the high power elements (2 x 1.5kW made up of the 600 W and 300 W elements all being switched on) mounted at the top and at the base of the oven, heat both the cavity and raise the cast iron temperature rapidly to a preset temperature. When the pre-set thermostat opens, it leaves the 2 x 300W elements in circuit until the oven the cavity attains its normal set operating temperature, a second thermostat maintains the oven cavity temperature. Should the oven lose heat through leaving the door open, or a large amount of food being placed inside, the large temperature drop will result in maximum power until set temperature are achieved.

User Control Selector set to Hi Temperature (Roast Oven) (Top Cavity)

[0074] As displayed in Figures 2 and 3:

P1 -2 closes on selector switch, the live is supplied to B31-32 on the oven thermostat to power the 2 x 600W top elements and the 2 x 600W base elements.

P1 -1 closes on selector switch, the live is supplied to the B21-22 oven thermostat to power the 300W top element and the 300W base element.

[0075] At 192°C the thermostat contacts B31-32 open turning the 2 x 600W top elements and the 2 x 600W base elements off.

[0076] 246°C is achieved and maintained by the 2 x 300W elements on thermostat contacts B21-22. (No feed back due to 148°C and 180°C being open)

User Control Selector set to Lo Temperature (Bake Oven) (Top Cavity)

[0077] As displayed in Figures 2 and 3:

P1-3 closes on selector switch, the live is supplied to B11-12 on the oven thermostat to power the 2 x 600W top element and the 2 x 600W mid element. 1-2 on the auxiliary oven thermostat powers the 300W top element and the 300W base element.

[0078] At 148°C the thermostat B11-12 opens and turns the 2 x 600W top elements and the 2 x 600W base elements off.

[0079] 180°C achieved and maintained by 2 x 300W elements on auxiliary thermostat contacts 1-2.

User Control Selector set to Simmer Oven (Lower Cavity)

[0080] As displayed in Figures 2 and 3:

P2 - 4 closes on selector switch, the live is supplied to 1 - 2 on the simmer oven thermostat and powers the 1 x 600W element and the 1 x 300W lower base element.

[0081] At 110°C is achieved and maintained by thermostat 1-2 cycling to maintain temperature.

10 Claims

1. A cast iron range cooker comprising:

at least one oven cavity which is accessed through a door;

a first heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connected to a power supply in series with at least one first thermostat,

a second heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connectable to a power supply in series with at least one second thermostat that switches at a higher temperature than the first thermostat,

a user operable input device which has at least two user selectable temperature settings for the oven cavity, at least one of which corresponds to the cavity being heated to a predefined temperature corresponding to the switching temperature of the second thermostat, in which the user operable input device when in the at least one temperature setting causes both the heating means to be connected to the power source so that on initial heating both the heating means apply heat to the cavity until the switching temperature of the thermostat of the first heating means is reached and the first heating means is switched off, thereafter heating continuing using the second heating means until the switching temperature of the second thermostat is reached.

2. The range cooker of claim 1, wherein the first heating means is associated with two thermostats, each with a different switching temperature (the "set point" of the thermostat), the user operable input means permitting a user to select between two different temperature settings, whereby for a given temperature setting the user input means selects a corresponding one of the two thermostats to connect the heating elements to the power source.

3. The range cooker of claim 1 or claim 2, wherein the second heating means is associated with two ther-

mostats, each with a different switching temperature and each associated with one of two temperature settings selectable by the user operable input device which causes the associated thermostat to selectively connect the heating elements to the power source. 5

4. The range cooker of claim 1, 2 or 3, wherein the user operable input device varies the temperature at which the heating elements are isolated from the power source by choosing between two thermostats for each heating means. 10
5. The range cooker of any one of claims 1 to 4, wherein whichever temperature setting is chosen, the associated thermostat of the first heating means has a switching temperature of between 20 and 40 degrees Centigrade below the chosen pre-set temperature. 15
6. The range cooker of any preceding claim wherein the user operable input device enables the user to select a third temperature setting in which the oven cavity is unheated, and in this setting causes the first heating means and the second heating means to be isolated from the power supply. 20
7. The range cooker of any preceding claim when dependent on claim 2, wherein the first temperature setting corresponds to a temperature suitable for baking food stuff. 25
8. The range cooker of any preceding claim when dependent on claim 2 wherein the second temperature setting corresponds to a temperature suitable for roasting foodstuffs. 30
9. The range cooker of any preceding claim, wherein the first heating means comprises higher power rated elements than the second heating means, or comprises a set of elements that together have a higher power rating than the second set of heating elements. 35
10. The range cooker of any preceding claim wherein the heating elements comprise resistive heating elements. 40
11. The range cooker of any preceding claim that additionally includes a second oven cavity, which may also be provided with a heating means that is controlled by the user operable input device. 45
12. A method of operating a range cooker of the kind comprising at least one oven cavity which is accessed through a door, comprising the steps of: 50

Providing a first heating means comprising at

least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connected to a power supply in series with at least one first thermostat,

Providing a second heating means comprising at least one electrical heating element which selectively heats the inside of the cavity, the at least one heating element being selectively connectable to a power supply in series with at least one second thermostat that switches at a higher temperature than the first thermostat,

Providing a user operable input device which has at least one user selectable temperature setting for the oven cavity which corresponds to the cavity being heated to a predefined temperature corresponding to the switching temperature of the second thermostat,

in which in use with user operable input device in the at least one temperature setting causes both the heating means to be connected to the power source so that on initial heating both the heating means apply heat to the cavity until the switching temperature of the thermostat of the first heating means is reached and the first heating means is switched off, thereafter heating continuing using the second heating means until the switching temperature of the second thermostat is reached.

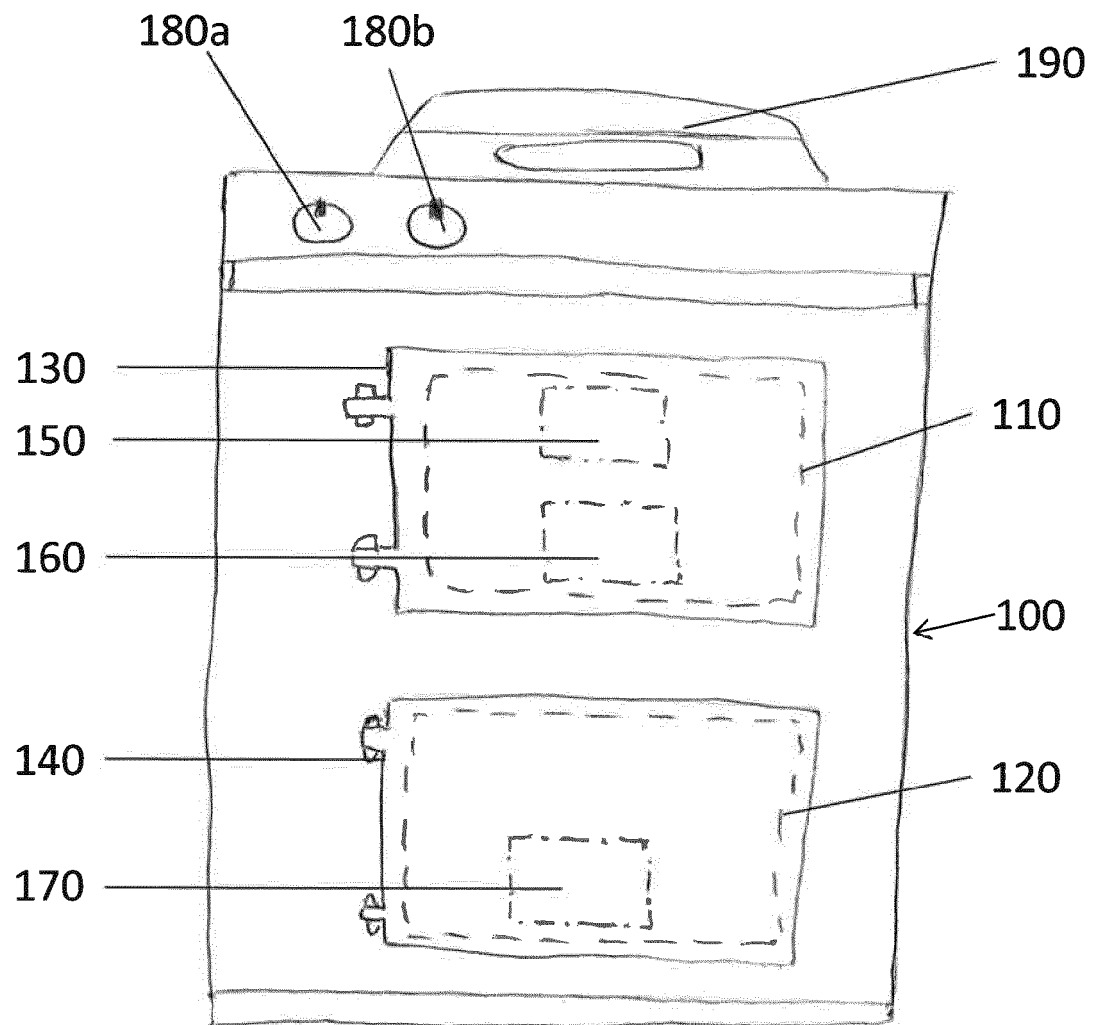
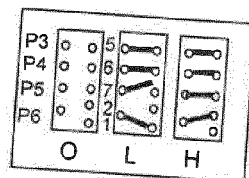
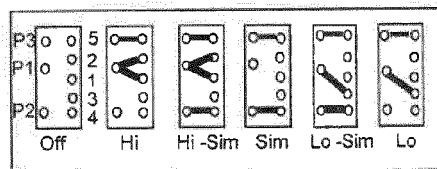
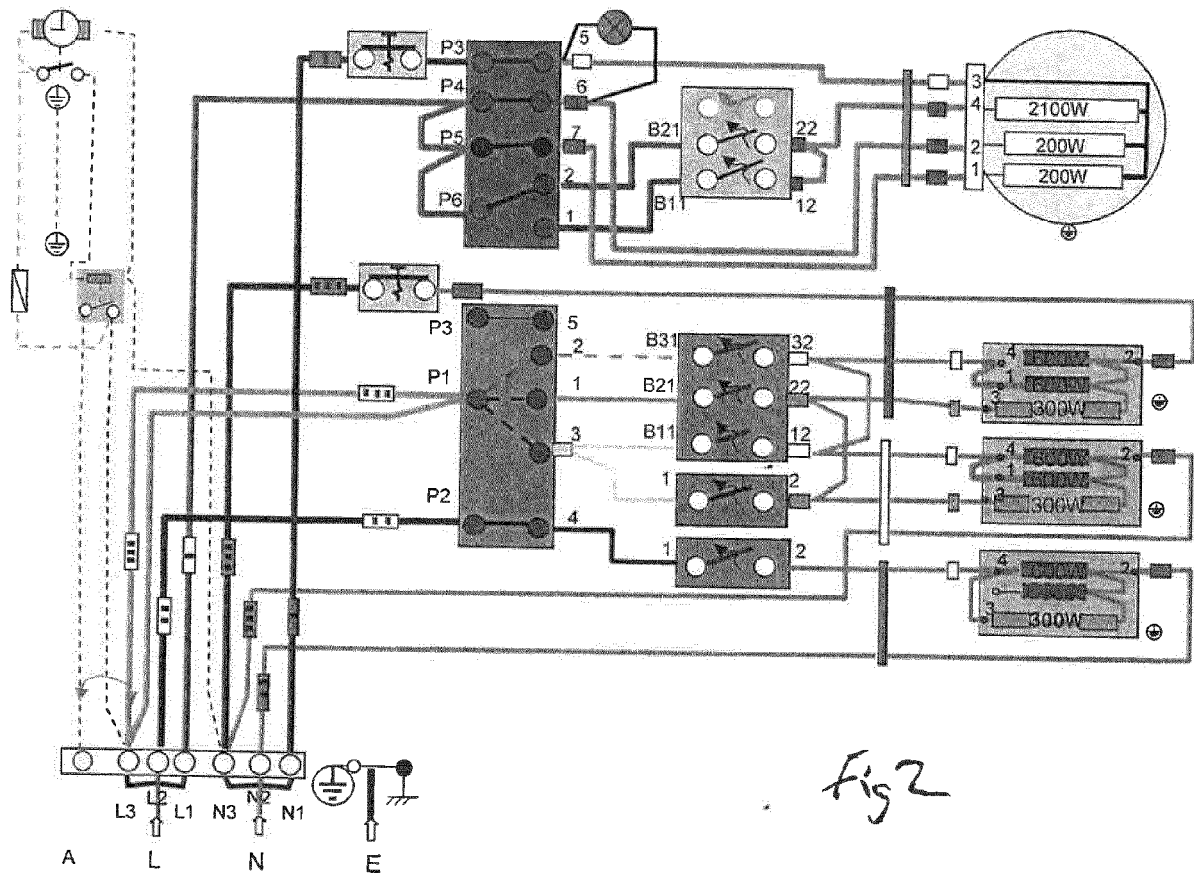


Fig 1





EUROPEAN SEARCH REPORT

 Application Number
EP 15 17 4911

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 3 358 122 A (TORREY SUMNER H) 12 December 1967 (1967-12-12) * figures 1,2 * * column 2, line 30 - column 3, line 65 * * claim 1 *	1-12	INV. H05B1/02 F24C7/08
A	WO 2011/148170 A2 (AGA CONSUMER PRODUCTS LTD [GB]; COLLINS PATRICK [GB]) 1 December 2011 (2011-12-01) * abstract * * page 2, lines 4-27 * * page 9, lines 6-31 * * figure 1 *	1-12	
A	US 5 432 321 A (GERL JOSEF [DE]) 11 July 1995 (1995-07-11) * abstract * * figures 1,2 * * column 2, line 50 - column 4, line 17 * * claim 1 *	1-12	
A	DE 298 01 994 U1 (SEPPELFRICKE HAUS UND KUECHENT [DE]) 1 October 1998 (1998-10-01) * page 5, line 21 - page 9, line 23 * * claim 1 * * figures 1,2 *	1-12	
A	GB 448 121 A (GEN ELECTRIC CO LTD; OLLIVER WILLIAM HUMPHREYS) 2 June 1936 (1936-06-02) * page 1, lines 14-39 * * page 3, lines 44-123 * * figures 1,2 *	1-12	TECHNICAL FIELDS SEARCHED (IPC) H05B F24C
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 November 2015	Examiner de la Tassa Laforgue
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 17 4911

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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17-11-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3358122 A	12-12-1967	NONE	
WO 2011148170 A2	01-12-2011	CN 103261795 A EP 2577172 A2 US 2013168378 A1 WO 2011148170 A2	21-08-2013 10-04-2013 04-07-2013 01-12-2011
US 5432321 A	11-07-1995	DE 4237570 A1 EP 0596263 A1 ES 2109410 T3 TR 28321 A US 5432321 A	11-05-1994 11-05-1994 16-01-1998 25-04-1996 11-07-1995
DE 29801994 U1	01-10-1998	NONE	
GB 448121 A	02-06-1936	NONE	