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(56) Documents Cited

GB 2203320 A GB 2185876 A GB 2160694 A
GB 1248723 A EP 0050240 A2 US 5039535 A

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(54) Abstract Title

Controlling electric ovens

(57) The invention provides a method of controlling the operation of an electric oven having a plurality of operating modes, in which the user's choice of a cooking temperature automatically determines the cooking mode via a control member. Advantageously, the user controls other cooking parameters by dialog with said control member.

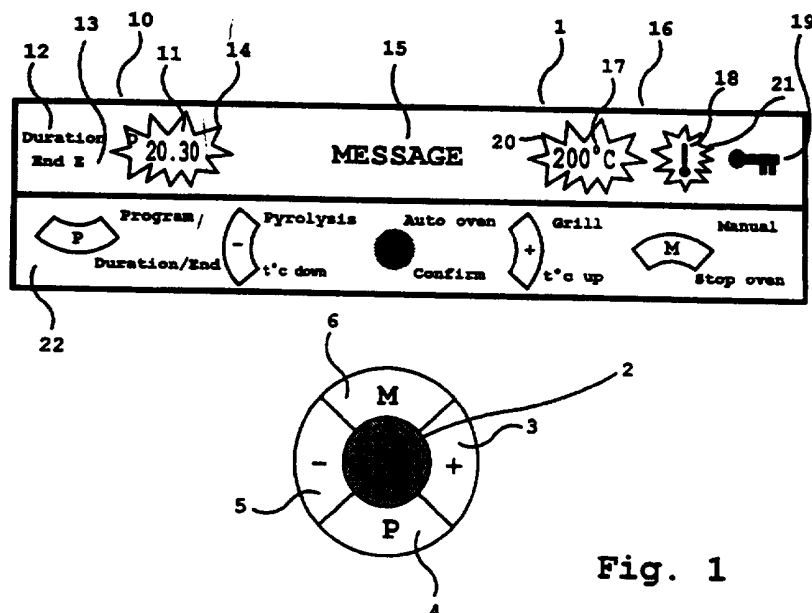


Fig. 1

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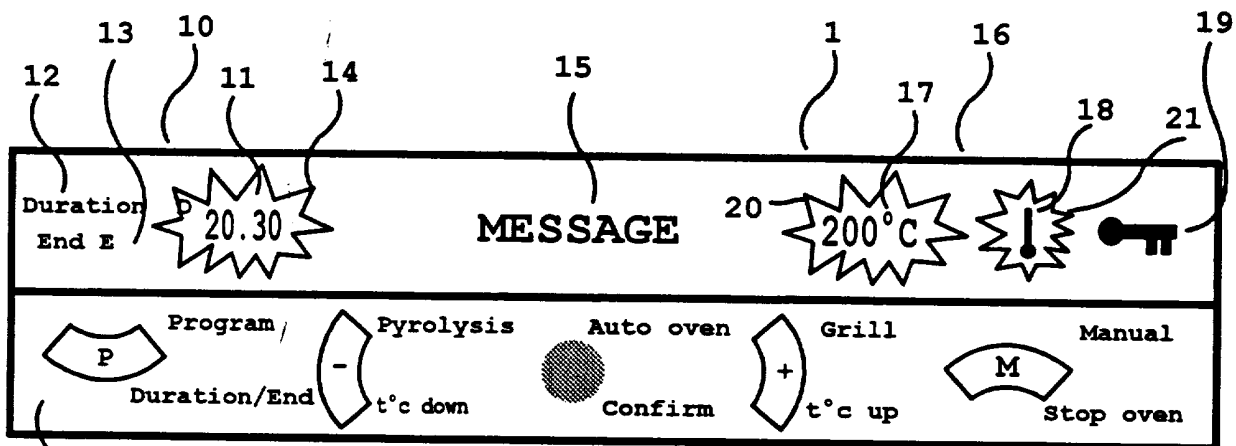


Fig. 1

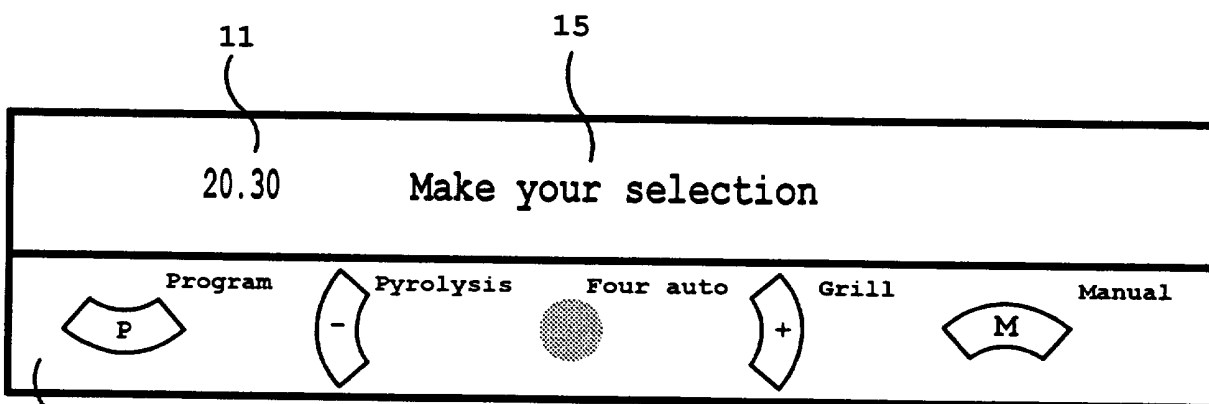


Fig. 2

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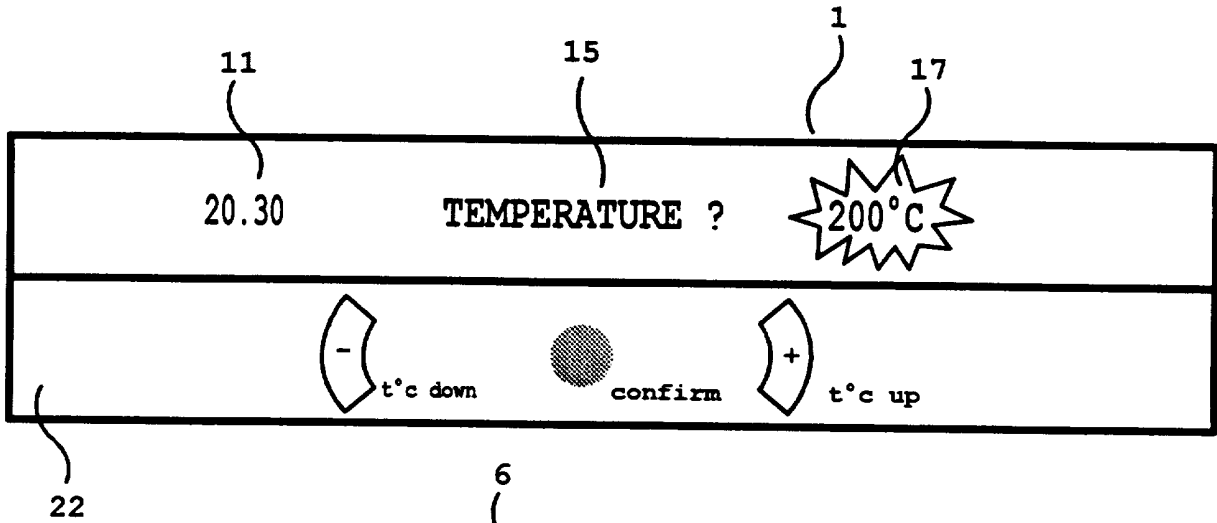


Fig. 3

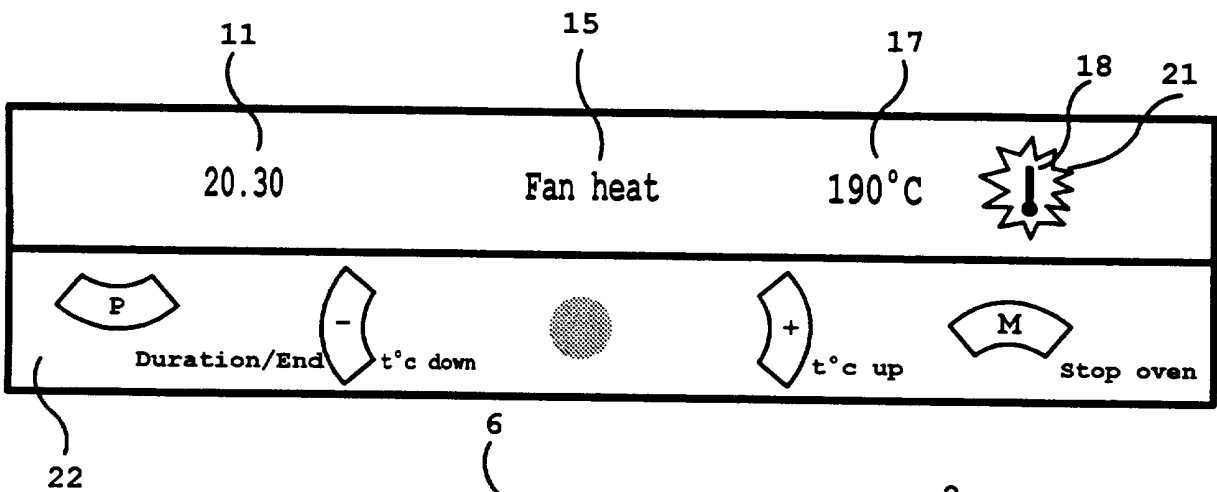


Fig. 4

A METHOD OF CONTROLLING THE OPERATION OF AN ELECTRIC OVEN
HAVING A PLURALITY OF COOKING MODES, AND APPARATUS FOR
IMPLEMENTING THE METHOD

5 The invention relates to a method of controlling the
operation of an electric oven having a plurality of
cooking modes, and to apparatuses enabling such a method
to be implemented.

10 Electric ovens for consumers can operate in various
cooking modes: natural convection, fan heat, grill, and
may also include a mode of operation suitable for
defrosting food and/or an option for pyrolytic cleaning.
A rotary spit or "rotisserie" function may also be
associated therewith.

15 Operating mode is selected by the user by
positioning a knob in an appropriate position, and by
positioning other knobs for setting temperature and
cooking duration. These various knobs are distributed
longitudinally along a strip usually situated above the
oven door.

20 The selected mode of cooking: natural convection,
fan heat, bottom heat, or top heat, optionally associated
with a fan, then known as "bottom fan heat" and as "fan
grill", is normally determined by the type of food to be
cooked, and by what needs to be done in addition to
25 cooking: drying (e.g. for tart pastry) or sealing (for
meat), etc. A non-professional user generally does not
know how to choose the most appropriate mode of cooking,
and recipes consulted by the user give only the cooking
temperature. This means the user must consult an
30 operating manual, likely to become lost, and then set the
operation of the oven by using a plurality of knobs.

The invention mitigates those drawbacks by providing
a method of controlling the operation of such an electric
oven in which temperature selection determines cooking
35 mode via a control member associated with the oven.
Advantageously, the user controls the other cooking
parameters by dialog with the control member.

It has been observed that appropriate cooking is obtained by using a mode of cooking determined by temperature in accordance with the following table:

5	Temperature T	Mode of cooking
	Oven	
	$40^{\circ}\text{C} \leq T < 140^{\circ}\text{C}$	Fan heat
	$140^{\circ}\text{C} \leq T < 180^{\circ}\text{C}$	Bottom fan heat
	$180^{\circ}\text{C} \leq T < 230^{\circ}\text{C}$	Fan heat
10	$230^{\circ}\text{C} \leq T < 275^{\circ}\text{C}$	Natural convection
	Grill/spit	
	$180^{\circ}\text{C} \leq T < 230^{\circ}\text{C}$	Grill/spit
	$230^{\circ}\text{C} \leq T < 275^{\circ}\text{C}$	Fan grill/fan spit

15 The oven is fitted with a control member which, when the user selects a temperature, automatically controls operation of the combination of oven elements that enables the appropriate mode of cooking to be obtained, which elements are constituted by bottom and top
20 resistance elements, the fan, and the spit-turning mechanism.

The combinations are as follows:

- natural convection: bottom and top elements
- fan heat: bottom and top elements and fan
- 25 • bottom fan heat: bottom element and fan
- grill: top elements
- fan grill: top elements and fan
- spit: top elements and spit-turning mechanism
- 30 • fan spit: top elements, spit-turning mechanism, and fan

The control member is advantageously also designed to control other cooking parameters in accordance with information given by the user, the other cooking parameters normally being duration, starting immediately or later, sequencing two operations such as defrosting followed by cooking, etc.

The control member is functionally connected to the operating elements of the above-described oven and also to a dialog interface constituted by a display screen and control buttons. The control member guides the user while setting the oven by displaying messages or questions and by proposing various solutions associated with symbols representing the buttons to be used to obtain those solutions, thereby making the oven easier to use.

Figure 1 shows the dialog interface between the control member and the user; and

Figures 2 to 4 show example dialogs.

The dialog interface comprises a screen 1 and an appropriate number of control buttons (restricted to five in the example of Figure 1, i.e. buttons 2, 3, 4, 5, and 6). Naturally, the shape and layout of the buttons can be altered. The layout selected herein is that of four buttons each occupying a sector of a circle and surrounding a central round button. The outer four buttons carry symbols, e.g. - and + for operations that seek to decrease or increase a length of time or a temperature, M for operations that can be performed manually at any time (switching off the oven), and P for selecting a cooking program in memory.

Screen 1 comprises a plurality of zones and an example layout is given in Figure 1. It should be observed that the zones shown in Figure 1 are not all displayed simultaneously on the screen while the oven is in use, with only those zones that are necessary for adjustment or information purposes appearing.

A "time" zone 10 includes a clock 11, the mentions "Duration D" 12 and "End E" 13, and optional flashing as represented by zigzag line 14.

5 A "message" zone 15 serves to display a question or information relating to oven setting or operation.

A "temperature" zone 16 serves to show the temperature 17, a thermometer symbol 18, and a "key" zone 19 indicating that the oven is locked (during pyrolytic cleaning), and also zig zag lines 20 and 21 representing flashing.

10 A "buttons" zone 22 displays a selection of parameters or a selection of actions to be performed on a parameter simultaneously with an associated symbol representing the button to be used for selecting the parameter or for acting thereon.

The various zones are displayed by being illuminated, optionally in a plurality of colors. It is possible to use red for setting and green for information.

20 There follow several examples, that are not limiting in any way, of the way in which the dialog interface can operate.

1) At rest, the clock 11 displays the current time, the message zone 15 is neutral, displaying the trademark under which the oven was sold or displaying a prompt message. In the zone 22, the symbol representing the central button 2 is illuminated.

2) The user has pressed the central button 2. The display shown in Figure 2 then appears: the clock 11 tells the time, the message zone 15 displays the message "Make your selection" while the five symbols representing buttons in the zone 22 are illuminated offering five options: "Program", "Pyrolysis", "Auto oven" (for automatic oven), "Grill", and "Manual" (for manual oven), enabling the user to start setting the oven.

3) If the user opts for automatic operation of the oven, then it is necessary to press on the central button

2. This leads to the display shown in Figure 3: the clock 11 tells the time and the message zone 15 displays the question "Temperature?", the temperature zone 17 displays the temperature in memory, causing it to flash, and the symbols for the buttons 3 and 5 light up. The user then sets the desired temperature using the up button 3 (+) or the down button 5 (-), and then confirms the selection with the central button 2.

4) Assuming that the chosen temperature is 190°C, the situation shown in Figure 4 then appears: the clock 11 tells the time, the message zone 15 specifies "Fan heat" since the temperature 190°C lies in the range corresponding to that particular mode of cooking; the temperature zone 17 is no longer flashing, while the thermometer symbol 18 flashes as the temperature rises.

The symbols for the buttons 3 and 5 remain lighted since the user can still change the temperature, as does the symbol for the button 6 since it is possible to stop the oven.

The symbol for the button 4 lights up proposing the Duration/End option to invite the user to program a duration or a time at which cooking is to end.

If the user presses button 4, the message zone invites the user to select a duration or an end time, and so on until the selection has been programmed using the zones 11, 12, and 13, and the buttons corresponding to the symbols which light up in the zone 22.

Similar operations are performed for other possible selections, with the dialog interface guiding the user through the selection of setting buttons.

Once setting has been completed, the screen displays information concerning the time, the temperature, and the state of progress in cooking ("Cooking now", "Will cook later", "Cooking over").

The programs in memory can be input by the manufacturer or by the user to match the user's habits.

The method of the invention thus relieves the user of making a decision about cooking mode, by automatically selecting the mode which is most appropriate for the selected temperature, and use of the dialog interface
5 makes it possible to combine various knobs in a single control having buttons that are easier to operate.

To implement this method, an electric oven is provided fitted with a control member that is functionally connected to the elements of the oven and
10 also to a dialog interface constituted by a display screen and control buttons, the screen displaying messages or questions together with possible answers in association with symbols of the control buttons that correspond to said answers.

CLAIMS

1. A method of controlling the operation of an electric oven having a plurality of operating modes, in which the user's choice of a cooking temperature automatically determines the cooking mode via a control member.

2. A method of controlling the operation of an electric oven having a plurality of cooking modes, according to claim 1, in which the user controls other cooking parameters by dialog with said control member.

3. A method of controlling the operation of an electric oven having a plurality of cooking modes, according to claim 2, in which a control interface constituted by a display screen and a set of buttons displays a message or a question while simultaneously displaying a selection of parameters or a selection of actions on a parameter and an associated symbol representing the button to be used to select said parameter or to act thereon.

4. An electric oven having a plurality of cooking modes for implementing the method according to any one of claims 1 to 3, the oven including a control member functionally connected to the elements of the oven that enable the various cooking modes, and a dialog interface constituted by a screen (1) and control buttons (2-6), the screen (1) displaying messages or questions together with a selection (22) of parameters or a selection of actions on a parameter, and an associated symbol representing the button

to be used for selecting the parameter or for acting thereon.

5. An oven comprising:

5 a plurality of cooking elements; and
 a control unit; wherein
 said elements are selectively operable in a plurality
of different combinations of one or more elements, and
 in use, selection from said plurality of combinations
10 is effected in dependence upon temperature information
input to said control unit.

6. An oven substantially as hereinbefore described with reference to the accompanying drawings.

15

7. A method of controlling the operation of an oven substantially as hereinbefore described with reference to the accompanying drawings.

Application No: GB 9803170.1
Claims searched: All

Examiner: Paul Gavin
Date of search: 14 July 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): F4W, G3N(NG1A3,NG1A5,NG1A9)

Int Cl (Ed.6): A21B(1/40), A47J(39/00), F24C(7/08)

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2 203 320 A (CREDA) - whole document	1 & 6 at least.
X	GB 2 185 876 A (MATSUSHITA) - whole document	1 & 6 at least
X	GB 2 160 694 A (K K TOSHIBA) - whole document	All
X	GB 1 248 723 (SCHOLTES) - whole document	1 & 6 at least
X	EP 0 050 240 A2 (BOSCH) - whole document	All
X	US 5 039 535 (LANG) - whole document	All

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.

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A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.

E Patent document published on or after, but with priority date earlier than, the filing date of this application.