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54 **Improvements relating to cookers.**

57 The present specification discloses a cooker (1) with a hinged oven door (7). A control panel (13) incorporating control knobs (15) is located above the oven door (7) and these control knobs (15) can become heated to undesirable temperatures and form a depository for grease etc, due to the heated air flow passing thereover when the oven door (7) is open whilst the oven (5) or a grill (11) located therein, is in operation.

The present invention provides a vent (19) between the control panel (13) and the oven door (7), the vent (19) communicating with a source of air (21) which is cooler than the air issuing from the open door (5). This cooler air flow thus tends to cool and deflects the hot air flow from the oven (5) away from the control panel (13), thereby at least reducing the above problem.

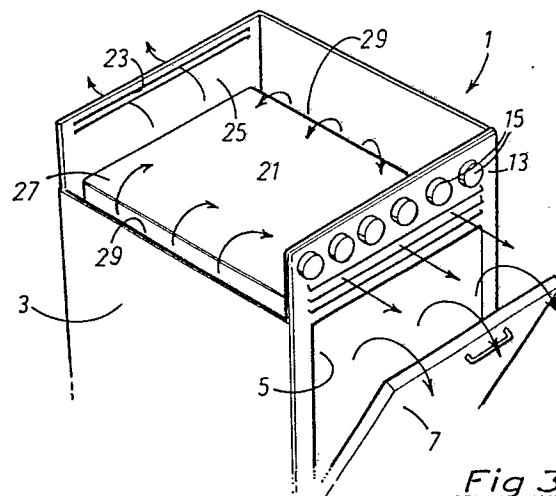


Fig. 3.

Description

IMPROVEMENTS RELATING TO COOKERS.

The present invention relates to a cooker designed primarily for domestic use.

In particular the present invention relates to a cooker of the type which comprises an oven with an oven door which can be hinged open about its horizontal lower edge region, to a fully open position to allow access to the oven, or to a partially open position wherein a grill heating element located in the roof region of the oven can be used. Immediately above the oven on the front face of the cooker is a control panel which incorporates control knobs for controlling the oven and grill. However, a problem arises with such cookers when the oven door is hinged partially open and the grill is being used, the heat issuing from the oven being directed upwards by the oven door, in addition to its natural tendency to rise, and thus passing directly over the control panel so that the control knobs are heated. The control knobs may be heated to a temperature at which they cannot be touched and, in practice, the temperature of the control knobs in such a cooker does increase to a greater extent than is recommended by at least British Gas regulations.

Hereinafter reference has been made to a grill heating element and this may take the form of a gas burner or an electrical heating element. However, for the sake of simplicity reference will only be made hereinafter to an electrical grill heating element.

The problem discussed hereabove also occurs in other types of cookers, e.g. side-hinged door cookers, when the door is left open and the oven is operational.

The aim of the present invention is to provide a cooker wherein the control panel and control knobs are heated to a limited and acceptable extent when the oven door is left open and the grill and/or oven is operational.

According to the present invention there is provided a cooker comprising an oven with a hinged oven door, a control panel incorporating control knobs being located above the oven door, with a vent being located between the control panel and said oven door, said vent communicating with a source of air which is cooler than the air which issues from the oven when the grill heating element is operational.

In use with the oven door partially open, the hot air issuing from the oven passes over the vent drawing cooler air through the vent, the cooler air mixing with the hot air and thus cooling the air which passes over the control panel. Also the flow of cooler air through the vent tends to form a laminar flow effect whereby the vented air, besides being cooler than the oven air, also reduces the natural tendency for the oven air to hug the surface of the control panel. The vent in a preferred embodiment of the present invention communicates with an enclosed space behind the control panel and above the oven though beneath a hob provided on the top of the preferred embodiment. The said cooler air may be merely drawn into this enclosed space via a

further vent to the rear of the cooker. However, to enhance the cooling effect, the said cooler air is preferably in the form of a convection current of air which is drawn through vents and other openings in the lower region of the cooker, the air passing along passages within the cooker around the oven, and thus being heated and effectively pumped as a convection current, into the said enclosed space above the oven, whence the heated though cooler air, is pumped out of the cooker via said vent. This positive flow of cooler air enhances the cooling effect whereby the control panel and control knobs are maintained within a desired temperature range.

It is possible by careful balancing of the airways to reverse the airflow through the front fascia vent. This condition is achieved when the oven door is closed. Under this condition the rising convected air passes out of the said further vent and has the effect of reducing the pressure behind the control panel and thus drawing in the hot air rising up from the face of the oven door.

The reason for this reversal of the air flow is because with the oven door closed, the velocity of the air passing over the vent is dramatically reduced and air is not drawn out from the enclosed space behind the control panel. The convected air now leaves the cooker by the highest escape route which is the said further vent. As it does so it creates reduced pressure behind the fascia vents and so pulls in the rising hot air from the front of the door. Thus the hot air flow across the control panel is again reduced.

The present invention may be applied to free-standing cookers or cookers which are built into kitchen furniture, the same advantage arising in both installations.

The present invention will now be further described, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a perspective view of a preferred embodiment of the present invention;

Fig. 2 is a schematic vertical cross-sectional view of the embodiment of Fig. 1; and

Fig. 3 is a cutaway view of the upper part of the embodiment of Figs. 1 and 2.

A preferred embodiment of the cooker 1 constructed according to the present invention is illustrated in the accompanying drawings. The cooker 1 has a rectangular box-like casing 3 in which an oven 5 is located. The oven 5 has a door 7 which is hinged as at 9, about its lower edge region for movement about a generally horizontal axis. The door 5 can be hinged to a fully open position as shown in dashed lines in Fig. 1 to allow for access to the oven 5, or to a partially open position as shown in full lines in Fig. 1, wherein a grill heating element 11 (see Fig. 2) can be used.

Above the oven door 7 is a control panel 13 on which various control knobs 15 are located, the control knobs controlling the oven 5, the grill heating element 11 and a hob 17 provided on the top of the

cooker 1.

Located between the control panel 13 and the oven door 7 is a louvred vent 19 which extends as a strip across the width of the cooker 1. This vent 19 communicates with an enclosed space 21 behind the control panel 13 and between the top of the oven 5 and the hob 17. A further vent 23 provided in the upper region of the rear face 25 of said enclosed space 21 allows air to pass into and out of the enclosed space and will be referred to later. The oven 5 is defined by a thermally insulated cabinet 27 and air passages 29 are formed between the side walls of the cabinet 27 and the inner walls of the casing 3. These air passages 29 connect said enclosed space 21 with air vents 31 provided in the front face of the casing 3 beneath the oven door 7 and a storage compartment door 33.

When the grill is being used, the oven door 7 being then partially open, the oven cabinet 27 is heated and thus an amount of heat energy is transmitted to the air in the air passage 29. Thus air therefore rises into the said enclosed space 21 drawing further air into said air passages 29 via the air vents 31 and around the edge of the storage compartment door 33. This convection current of heated air then passes from said enclosed space 21 through the vent 19 beneath the control panel 13, the velocity of the convection current being measured by the flow of hot air from the grill across the vent 19. Whilst the air flow is heated it is at a considerably lower temperature than the air issuing generally upwards through the partially open oven door 7, and this convection current thus both tends to cool the hot air from the grill, and also deflects this air away from the control panel 13. Any increase in temperature of the control panel 13 and control knobs is thus maintained within acceptable limits.

With the oven door 7 closed and the oven 5 operating, hot air rising across the front face of the cooker is, by careful balancing of the airways in the cooker, drawn into the enclosed space 21 via the vent 19. Thus, the hot air flow across the control panel 13 is reduced. This reversal of the air flow through vent 19 as compared to the case when the oven door is open, is due to the fact that the velocity of the air passing upwards over the vent 19 is dramatically reduced when the oven door is closed. Thus air is not drawn out of the enclosed space 21 and the convected air rising through passages 29 leaves the cooker by the highest escape route, which is the further vent 23. As it does so it creates a reduced pressure in the enclosed space 21 and so the hot air is drawn through the vent 19.

Whilst the cooker described hereinabove has a drop-down oven door, the present invention is equally applicable to any other type of cooker where the control panel is located above the oven door, e.g. a cooker with a side-hinged oven door. Further, whilst a free-standing cooker is illustrated, the present invention can also be used with the same advantage in a built-in cooker, i.e. a cooker built into a kitchen unit.

The present invention thus provides a simple means for maintaining the temperature of a control panel of a particular type of cooker, within accept-

able limits, especially when the grill is being operated.

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Claims

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1. A cooker comprising an oven (5) with a hinged oven door (7), a control panel (13) incorporating control knobs (13) being located above the oven door (7), characterised in that a vent (19) is located between the control panel (13) and said oven door (7), said vent (19) communicating with a source of air (21) which is cooler than the air which issues from the oven (5) when the oven door (7) is open and the oven (5) or a grill heating element (11) located therein, is operational.

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2. A cooker as claimed in claim 1, wherein the vent (19) communicates with an enclosed space (21) behind the control panel (13) and above the oven (5).

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3. A cooker as claimed in claim 2, wherein the enclosed space (21) is beneath a hob (17) of the cooker (1).

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4. A cooker as claimed in claim 2 or 3, wherein a further vent (23) is provided at the rear of the cooker (1) at a higher level than said vent (19), said further vent (23) also allowing the enclosed space (21) and ambient atmosphere to communicate with each other.

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5. A cooker as claimed in any one of claims 2 to 4, wherein passages (29) are provided around the oven (5), said passages (29) connecting said enclosed space (21) with vents (31) and other openings in the lower region of the cooker (1).

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6. A cooker as claimed in any one of claims 1 to 5, wherein the oven door (7) is hinged about its lower edge region (9) to pivot about a substantially horizontal axis between a fully closed position, a fully open position and an intermediate position in which the grill heating element (11) within the oven is operational.

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7. A cooker as claimed in any one of claims 1 to 5, wherein the oven door (7) is hinged about a side edge region, to pivot about a substantially vertical axis.

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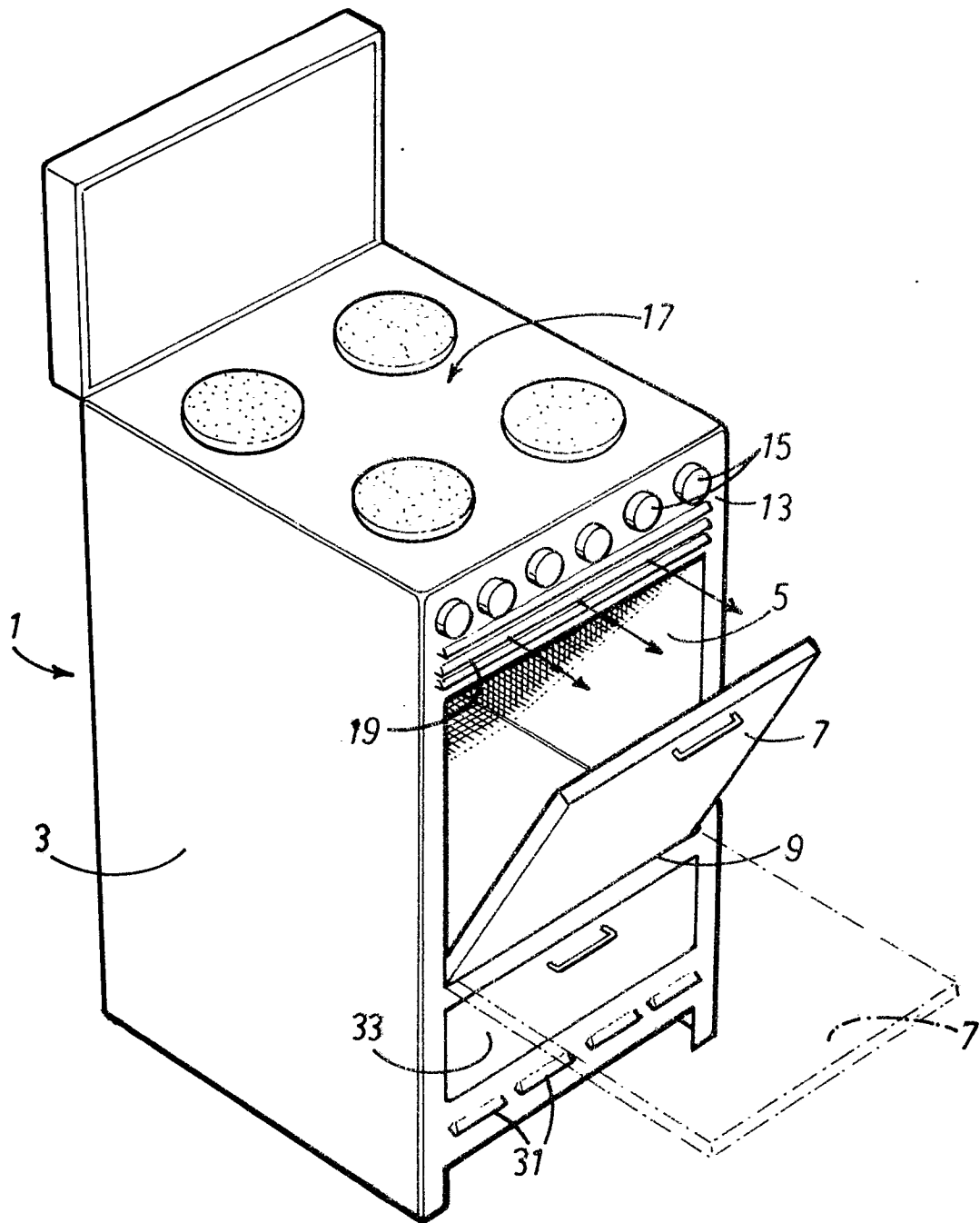


Fig 1.

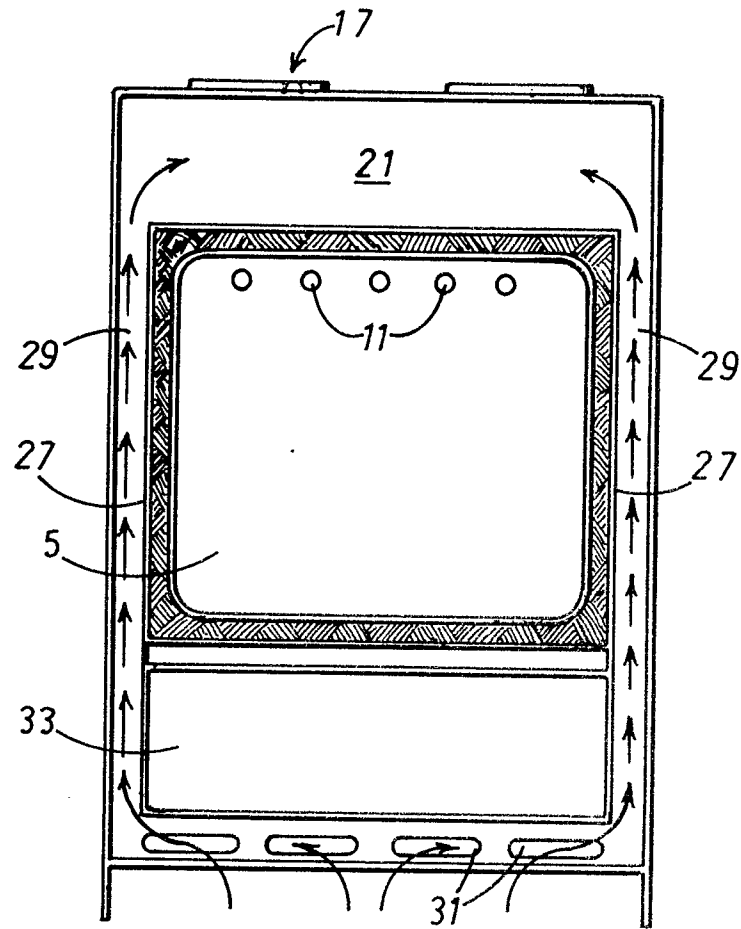


Fig 2.

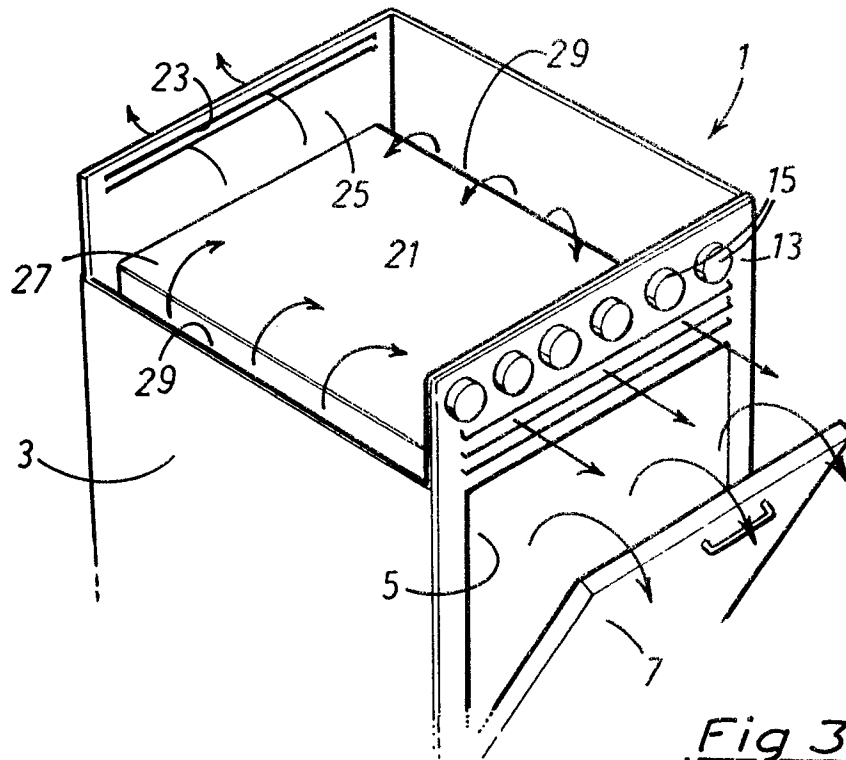


Fig 3.



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
X	US-A-3 485 229 (GILLIOM) * Column 4, lines 1-30; figures * ---	1,2,5,6	F 24 C 15/00
X	GB-A-2 026 685 (BUDERUS) * Whole document * ---	1,2,5,6	
A	DE-A-2 106 772 (SIEMENS) * Page 7, claim 1; figure 1 * ---	1-3	
A	US-A-4 163 894 (SCHERER) * Page 1; abstract; figure 2 * -----	1,4	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
			F 24 C A 47 J
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13-02-1989	Examiner VANHEUSDEN J.
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			