

- [54] SELF-CLEANING WALL OVEN WITH AIR FLOW SYSTEM
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- [73] Assignee: Westinghouse Electric Corporation, Pittsburgh, Pa.
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- [51] Int. Cl. F24c 15/32
- [58] Field of Search 126/21 R, 21 A, 273 R, 126/273 A; 219/400

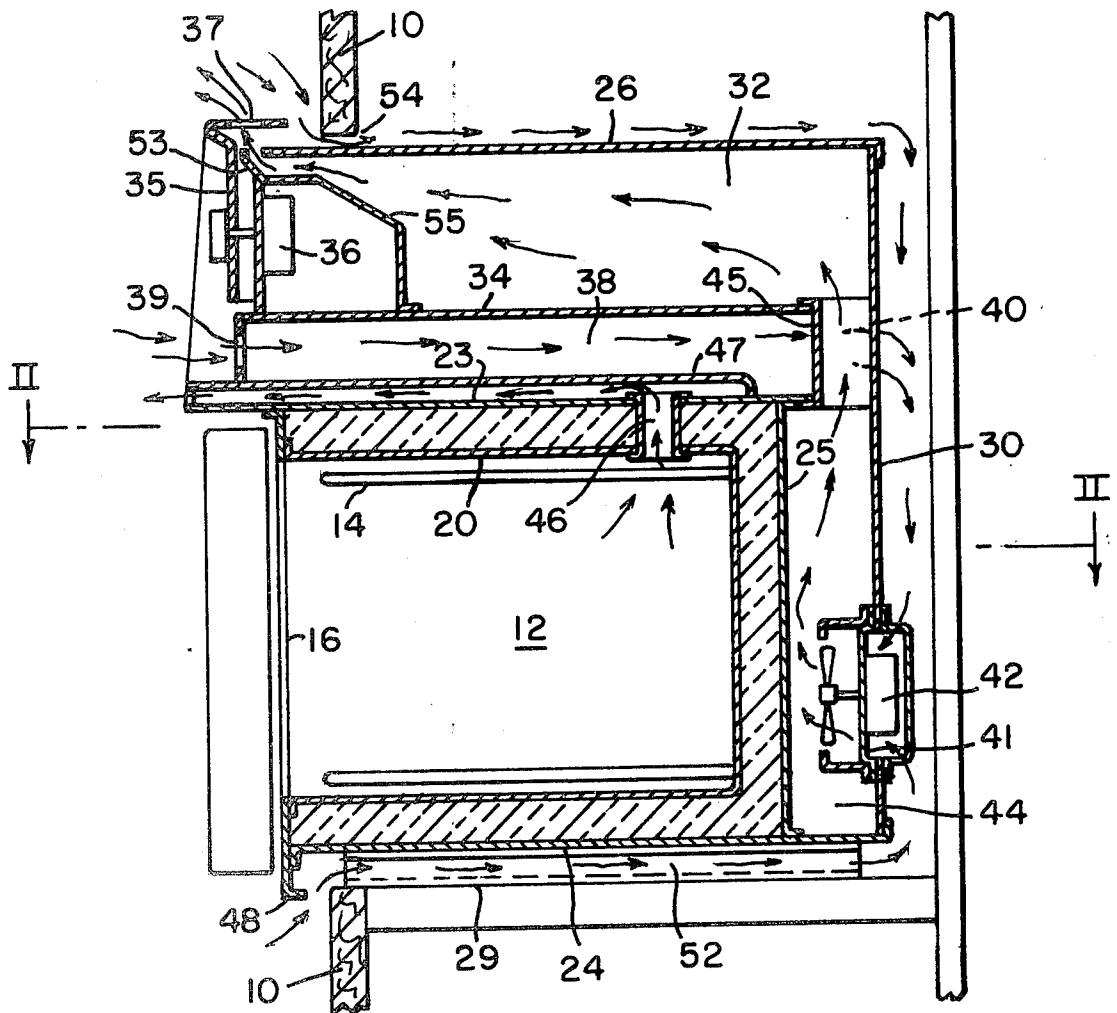
3,659,578 5/1972 Davis et al. 126/21 R

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 Attorney, Agent, or Firm—E. C. Arenz

[57] **ABSTRACT**
 A wall oven assembly of the pyrolytic self-cleaning type is provided with a forced air flow system in which air is drawn in through a perimetric gap between the front frame of the assembly and the wall cabinet along at least the opposite sides and the top of the assembly, as well as being drawn in through an intermediate passage between an upper control chamber and a lower oven cavity structure, and the air so drawn in is then forced by a fan at the rear of the oven assembly back into the room through opposite side passages and through the control chamber having an outlet along its front top edge.

- [56] **References Cited**
 UNITED STATES PATENTS
- 3,205,884 9/1965 Locher 126/273 A
- 3,633,561 1/1972 Barnett et al. 126/21 R

4 Claims, 3 Drawing Figures



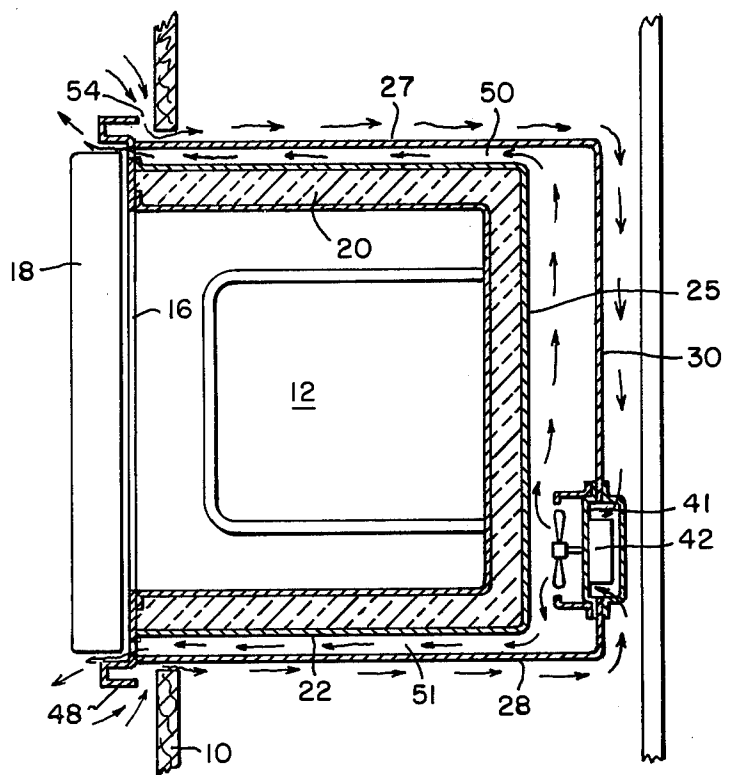


FIG. 2.

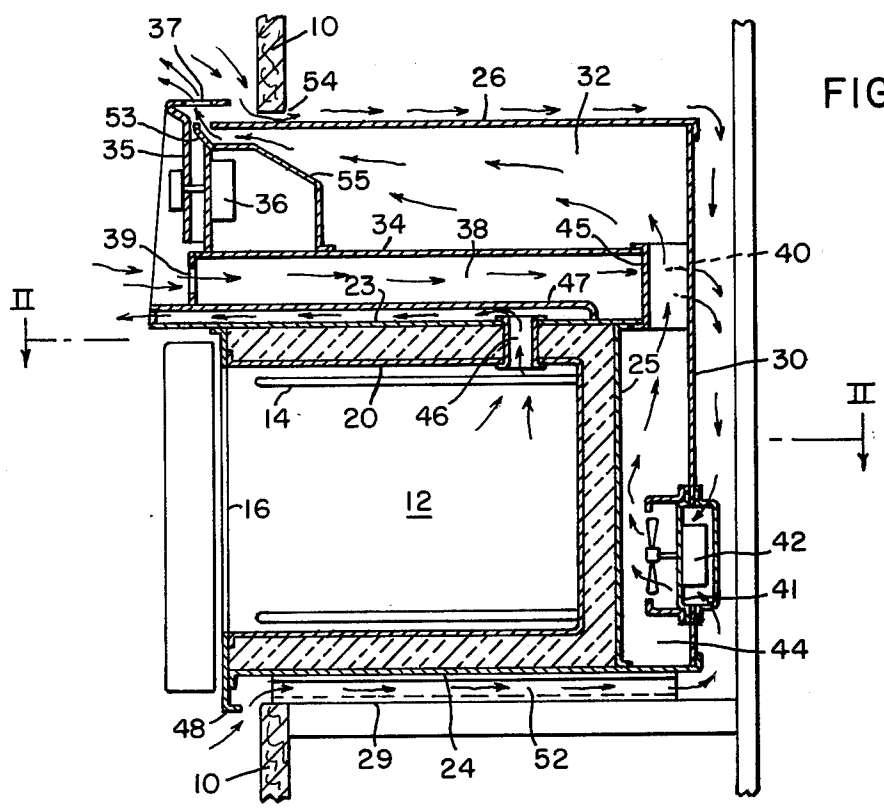
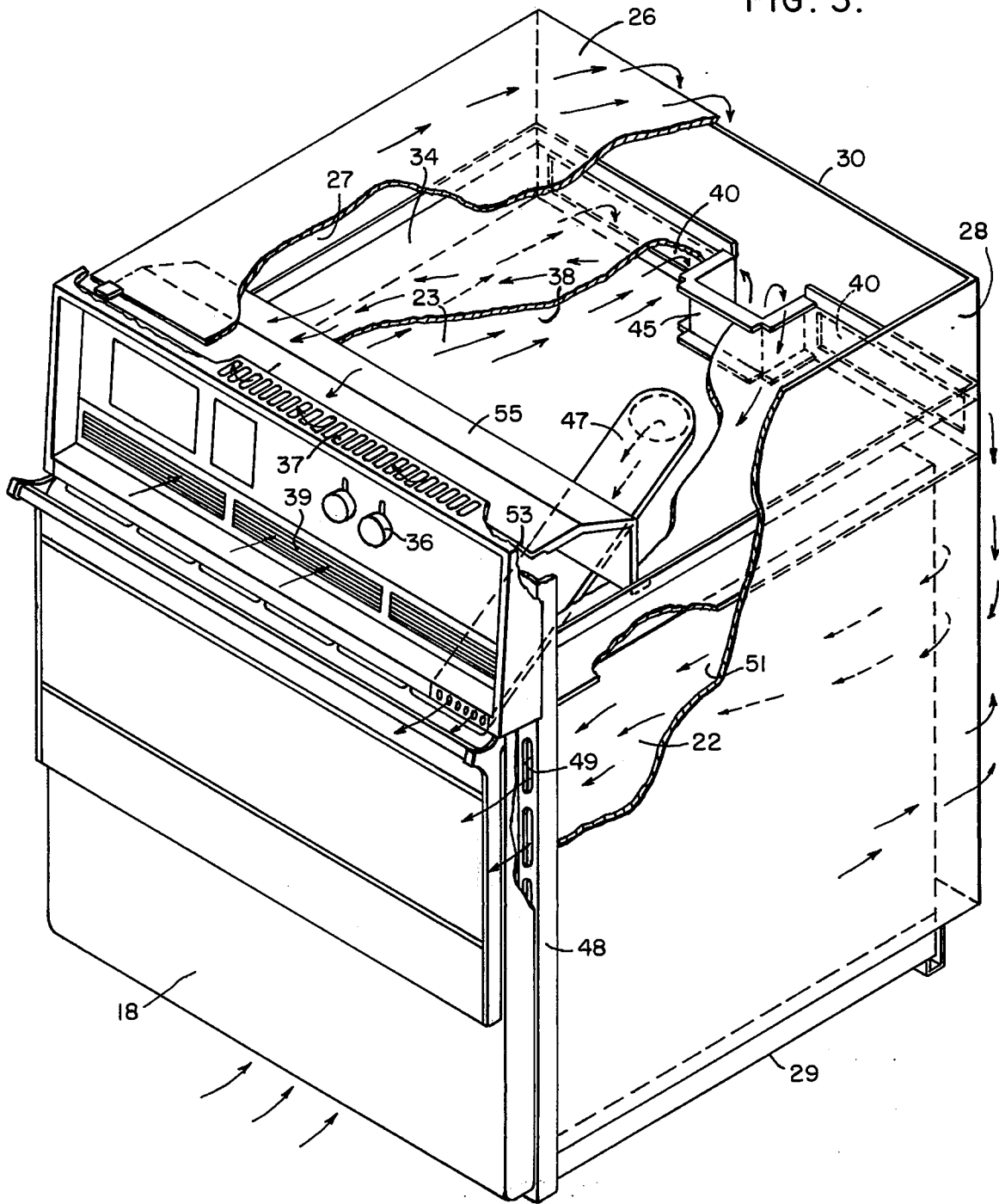


FIG. 1.

FIG. 3.



SELF-CLEANING WALL OVEN WITH AIR FLOW SYSTEM

CROSS REFERENCE TO RELATED APPLICATION

Barnett and Baker U.S. patent applications Ser. No. 482,197 filed June 24, 1974 (WE case 44,963) is a related application in the sense of commonality of some parts of the oven assembly.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention pertains to the art of domestic self-cleaning wall oven constructions.

2. Description of the Prior Art

The prior art patents of which applicant is aware relating to air flow cooling systems for built-in wall ovens of the pyrolytic self-cleaning type are: U.S. Pat. Nos. 3,686,476; 3,659,578; 3,633,561; 3,587,557; 3,548,152; 3,485,229; 3,384,067; 3,310,046.

While some parts of the arrangements disclosed in these patents bear some similarity to parts of applicant's arrangement according to this invention, none are considered to provide all the advantages attained by applicant's arrangement.

In such ovens, there are requirements limiting exterior surface temperatures of those parts of the oven assembly bounded by the wall cabinet, and also limits set for the maximum temperature to which control knob temperatures may rise during the pyrolytic self-cleaning cycle of the oven. As a result, exhausting hot air in the vicinity closely below the control knobs can create problems of control knob temperatures. Additionally, exhausting hot air in this location may result in the hot air being blown directly at the face of one standing in front of the oven.

It is the aim of the invention to provide an air flow system for an oven assembly of the type noted in which the overall air flow system functions to avoid the problem of heating parts such as the knobs, control panel, door and frame.

SUMMARY OF THE INVENTION

In accordance with applicant's invention, the air flow system includes generally perimetric air inlets as well as an inlet at the front of the intermediate passage defined between the control chamber and the oven cavity defining structure, and in which the air is forced back into the room closely adjacent the sides of the oven cavity defining structure and through the control chamber from which it is deflected upwardly and forwardly along the top edge of the control chamber. The concept of the invention also calls for a counter flow arrangement of air along at least the sides, and in the area above the oven cavity.

DRAWING DESCRIPTION

FIG. 1 is a partly schematic view in the nature of a vertical section through an oven assembly according to the invention;

FIG. 2 is a partly schematic view in the nature of a horizontal section corresponding to one taken along the line II—II of FIG. 1; and

FIG. 3 is a fragmentary, partly-broken, isometric view of the upper portion of the oven assembly.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing, the oven assembly according to the invention is typically installed in a room such as a kitchen having a wall cabinet 10 provided with a rectangular opening therein sized to accommodate the particular wall oven to be installed. The invention is described in connection with a single wall oven of the self-cleaning type, but it will be understood that the principles of the invention are equally applicable to a double wall oven, in which normally only the upper of the two ovens is of the pyrolytic, self-cleaning type.

The oven cavity 12 is generally defined by a box-shaped oven liner 14 having an open front 16 adapted to be closed by the insulated front door 18, with all five sides except the front of the oven liner being surrounded by the conventional thermal insulation 20. In the preferred construction, the outer faces of the thermal insulation of the oven cavity defining structure are covered by the outer side panels 21 and 22, inner top panel 23, bottom panel 24, and inner rear panel 25.

The oven assembly also includes an outer housing formed of walls including a top cover 26, outer side walls 27 and 28, a bottom channel-shaped wall 29 and a rear cover or wall 30.

A control and wiring chamber 32 (FIGS. 1 and 3) is formed in the upper part of the housing between the top cover 26 and an upper inner panel 34, both of which extend laterally between the opposite side walls 27 and 28 of the housing. The front of the control chamber 32 is provided with a wall 35 for mounting various of the oven controls indicated at 36. The top edge of wall 35 is spaced forwardly of slanted deflector 53 and the front edge of top cover 26 to provide openings as at 37 to permit the exit of air forced through the control chamber.

An intermediate passage 38 (FIGS. 1 and 3) is defined between the top face 23 of the oven cavity defining structure, and the upper inner panel 34 defining the bottom of the control chamber. This intermediate passage 38 has a front opening 39 in communication with the air in the room, and has a rear opening 40 in the back cover 30.

At the lower rear of the assembly, an opening 41 is provided (FIGS. 1 and 2) in rear cover 30 to receive a fan motor assembly 42 mounted to the rear cover 30 by a conventional spider arrangement. The suction side of the fan is in communication with the space 43 immediately to the rear of the rear cover 30, and the pressure side of the fan discharges into the space 44 behind the rear face 25 of the oven cavity defining structure. A duct 45 at the level of the intermediate passage 38 places the interior of the control chamber 32 in communication with the space 44.

The gases produced within the oven cavity during a heat cleaning cycle are vented back into the room through a vertical conduit 46 (FIG. 1) which extends through the insulation in the upper wall of the oven cavity defining structure and is connected to a relatively shallow vent duct 47 in the lower part of the intermediate passage and carries the gases to the front side of the oven assembly as disclosed in U.S. Pat. No. 3,633,561.

A front frame 48 (FIG. 3) serves as the basic structural part at the front of the oven assembly and has a number of the side wall parts and the control chamber

front fastened thereto to provide the overall structural integrity of the assembly. A series of vertically disposed slots 49 in the front frame at the sides of the oven are aligned with the side air passageways 50 and 51 defined between the side outer faces of the oven cavity defining structure and the outer side panels.

In the installed relation of the oven assembly to the wall cabinet, suitable gaps 54 (FIGS. 1 and 2) are provided between the frame 48 and cabinet wall 10 so that a perimetric air inlet is defined between the boundaries of the opening of the cabinet, at least the top and opposite sides of the oven assembly, and at the bottom by the spaced apart bottom panel 24 and bottom pan 29. Except for the bottom, the perimetric air inlet permits the air induced by the fan means 42 to flow in the gaps and past the exterior faces of the housing, and to the space 43 at the rear of the oven assembly. Additionally, air is drawn in through the front of the unit through the intermediate passage 38 and exits to the rear space 43. Finally, air is drawn past the bottom of the oven cavity defining structure through the passage 52 to the suction side of the fan. The direction of the air flow through the various passages and past the surfaces of the oven assembly are indicated by the direction arrows in each of the views.

The air so drawn by the fan is forced into the space 44 at the rear of the oven cavity and then flows through the side air passages 50 and 51 to the slots 49 in the front frame; and also upwardly through the connecting duct 45 to the interior of the control chamber 32, from whence it exits along the front top edge thereof through the gap 37. To ensure that this air exiting through gap 37 is directed away from anyone standing in front of the oven, the inclined deflector 53 (FIGS. 1 and 3) at the front of the partition 55 is provided.

It is to be particularly noted that a counter flow relationship of the air exists at both the sides of the oven assembly, and also at the upper part of the oven assembly between the external air flow above the control chamber and the internal air flow in the control chamber, and between the internal flow in the control chamber and the air through the intermediate passage. Air at room temperature is introduced through the perimetric air inlet and at the bottom of the oven assembly, and serves to prevent the exterior surfaces of the housing from exceeding the permitted temperature. The air which is drawn through the intermediate passage 38 and which serves in part to effect some cooling of the gases passing forwardly through the duct 47, and is thereby heated somewhat, is mixed with the air from the perimetric inlets at the rear of the oven assembly. By virtue of the air entering the front of the intermediate passage 38, the problem of the control knobs being heated to an excessive temperature is eliminated.

The air exiting from the slots 49 and the front frame 48 may be discharged to the side through the gap between the faces of the door and the front frame in that area, or if desired may be directed into the interior of the door through aligned slots in the innerface of the door and then passed upwardly in the door for purposes of cooling the door.

I claim:

1. An oven assembly of the pyrolytic self-cleaning type for wall installation in a cabinet having an opening sufficiently large that a perimetric air inlet is defined between the boundaries of said opening and at least the

top and opposite sides of the oven assembly, comprising:

- an outer housing means including top, bottom, rear and opposite side walls;
 - a thermally-insulated oven liner having an open front disposed in said housing and presenting top, bottom, rear and opposite side outer faces, the rear and opposite side outer faces being spaced inwardly from the respectively facing walls of said outer housing to define air flow passages therebetween;
 - a control chamber in the top part of said outer housing and having a top front air outlet, the bottom of said control chamber defining an intermediate passage with the top outer face of said oven liner, said intermediate passage having an air inlet opening at its front and an air outlet opening to the space behind said housing rear wall at its rear;
 - duct means connecting said air flow passage at the rear of said liner to the interior of said control chamber; and
 - fan means in the air flow passage at the rear of said oven liner and having a suction side in communication with the space to the rear of said rear housing wall for drawing air through said perimetric air inlet and past the exterior of said top and opposite side walls of said housing, and through said intermediate passage, and forcing air from the discharge side of said fan means through said air flow passage at the rear of said oven liner, through said control chamber, and through said air flow passages at the opposite sides of said liner from rear to front.
2. An oven assembly according to claim 1 including: air passage means at the bottom of said oven assembly in communication with the space to the rear of said rear housing wall.
 3. An oven assembly according to claim 1 including: means associated with said top front air outlet of said control chamber for deflecting air exiting therefrom in a partly upwardly direction.
 4. A wall oven assembly of the pyrolytic self-cleaning type adapted to be installed in a cabinet in a room, comprising:
 - an outer housing;
 - a control chamber in the upper part of said housing;
 - a thermally-insulated oven cavity defining structure in said housing;
 - an intermediate air flow passage defined between said control chamber and said oven cavity defining structure, said intermediate passage having an inlet opening at the front and an outlet opening at the rear;
 - air inlet means defined at the top and sides of said housing with said cabinet;
 - fan means located at the rear of said oven assembly and having a suction side and a pressure side, said pressure side being in communication with a space at the rear of said oven cavity defining structure;
 - side air flow passages defined at both sides of said oven assembly between the outer sides of said oven cavity defining structure and respectively facing inner faces of said outer housing, and in communication with the pressure side of said fan means;
 - means placing said space at the rear of said oven cavity defining structure in communication with the interior of said control chamber;

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said fan means being operable to draw air through said air inlet means and past the outer faces of said outer housing to the suction side of said fan means, and also draw air through said intermediate passage from front to rear, and for forcing air back

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into said room through said side air passages and through said control chamber having an outlet at its upper front edge portion.

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