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BUILT-IN OVEN

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FIG. 1

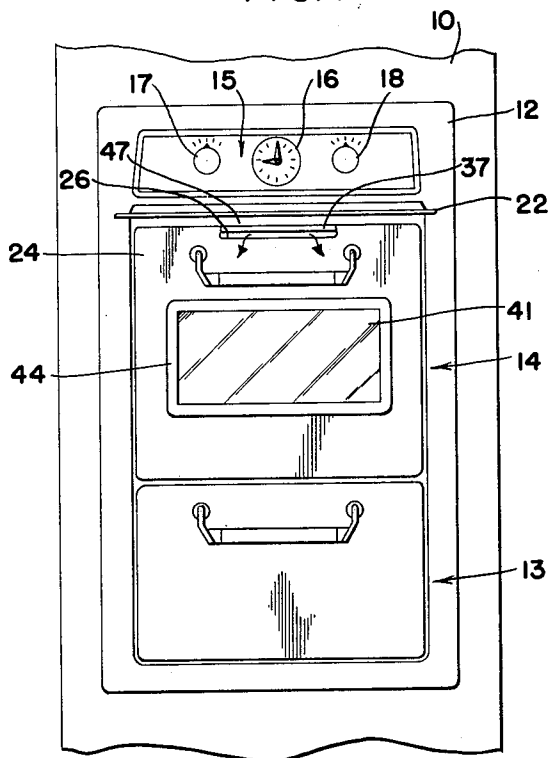


FIG. 2

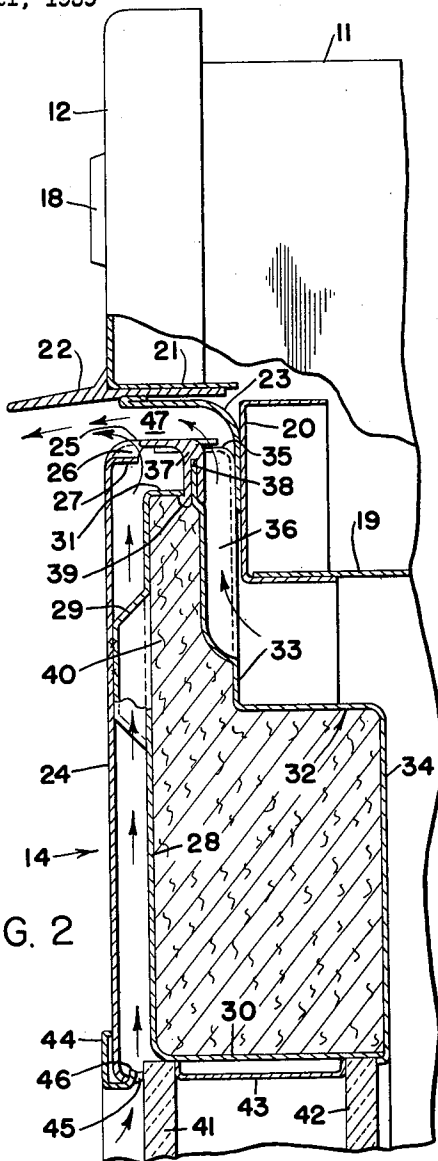
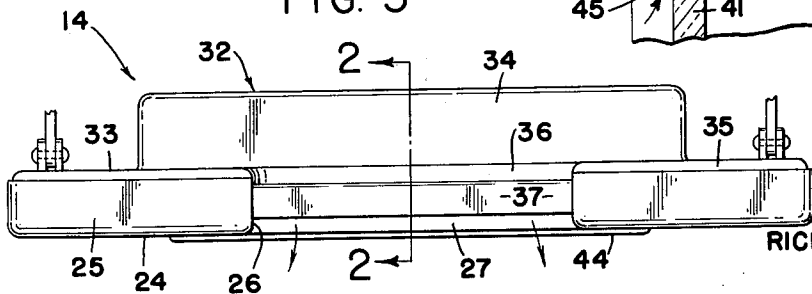


FIG. 3



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BUILT-IN OVEN

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The present improvements relate to built-in cooking ovens and, more particularly, to the ventilation of such ovens.

A conventional cooking oven on this order is of course designed for installation in a wall recess or the like and, since the unit is thus enclosed, it is customary to provide some form of vent for exhaust of the oven with its door closed. Moreover, since the provision of a remote exhaust system would add significantly to the cost of installation and cannot be accommodated in all cases, the standard construction for such an oven provides a self-contained exhaust arrangement for discharge through an upper portion of the exposed front of the oven as installed. It is desirable and common to locate the oven controls likewise at the upper front of the unit, and such discharge in the same area has resulted in objectionable heating of the controls in prior constructions.

It is a primary object of my invention to provide an oven of this type characterized by novel and improved vent means for exhaust of the oven, by convection currents and with the door in its normal closed condition, through the front of the assembly.

Another object is to provide simple and economical venting means for such an oven, with a related and more specific object being to provide the desired venting through the door assembly of the oven, whereby the major part of the complete unit can be constructed as before with obvious cost advantage.

My improved vent arrangement will further be seen, from the detailed description to follow, to provide protection for top oven controls and also cooling of the upper section of the oven door.

It is an additional object of the present invention to provide an oven vent arrangement in which the flow of heated air from the oven is diluted with relatively cool air prior to discharge of the same.

Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then comprises the features herein-after fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing:

FIG. 1 is a front elevational view of a built-in oven having a vent arrangement in accordance with the present invention;

FIG. 2 is a fragmentary side elevation in which the upper front of the oven and door are shown in cross section, the plane of the section through the door being indicated approximately by the line 2—2 in FIG. 3; and

FIG. 3 is a top plan view of the door removed from the oven.

Referring now to the drawing in detail, reference numeral 10 designates a broke section of a cabinet or other wall having an opening in which a cooking oven, comprising a box-like outer enclosure or casing 11 and a front peripheral frame 12, is mounted. Such frame overlies the outer surface of the wall 10 about the opening thereof which receives the body of the oven.

The unit illustrated in FIG. 1 is a gas built-in oven

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having a bottom broiler compartment and drawer 13 therein, with the front of this drawer and the door 14 of the oven both positioned in the peripheral frame. This general arrangement is of course entirely conventional and, as will appear, the unillustrated details of the construction are not necessary for full and proper understanding of the present invention. Also in accordance with known units of this type, as for example supplied by The Tappan Company, the oven door 14 is pivoted at its bottom edge and incompletely sealed along such edge when closed for entry of air, while an oven control panel 15 is mounted in the top portion of the frame 12. The panel here shown includes a clock 16 and conventional oven controls having knobs 17 and 18.

With particular regard now to FIG. 2, reference numeral 19 designates the top of the oven compartment, and there is an ordinary inner frame 20 about the open front of the oven against which the oven door is closed. The outer frame 12 is provided with a flange 21 directed inwardly around the opening in which the oven door and the front of the broiler drawer are accommodated, and an outwardly projecting canopy 22 is secured to and extends along the top horizontal portion of such flange. A curved strip 23 bridges such portion of the front frame flange 21 and the inner frame 20 at the top rear corner of the thus formed recess for a purpose to be described.

The oven door is constructed of an outer panel 24 having a rectangular window-defining opening in the body thereof and an inwardly directed outer flange 25 about its periphery. Such flange is partially cut away over a top central portion of the same, as indicated at opening 26, with a short forward section 27 remaining and being depressed.

A secondary reinforcing member 28 having a number of spaced protuberances 29 projecting outwardly is arranged against the inner surface of the door panel 24 and secured thereto in appropriate manner, for example, by spot welding at the regions of contact of the protuberances, which serve to space the body of the reinforcing member from the panel. The body of this secondary member is essentially in the form of a sheet having an opening bounded by a fairly wide flange 30 extending inwardly, such opening being in line with but slightly larger than the window-defining opening of the outer panel 24. Such member 28 also has an outer flange 31, again extending inwardly and, spaced inwardly of the flange 25 of the outer panel. The door shell is completed by an inner liner 32 having an outer section 33 opposing the inner frame 20 about the front of the oven and an inner section 34 offset inwardly, a further window opening being formed in the latter corresponding to the aforementioned other such openings in the door assembly. This liner has an outwardly directed flange 35 about its outer periphery, except for a top central portion as will be described, and this flange fits just within the inwardly directed flange 25 of the outer door panel.

In the construction shown, the flange 30 about the opening in the reinforcing member 28 extends to and engages the rear or innermost wall of the liner section 34, while the peripheral flange 31 of the reinforcing member is similarly engaged with the liner about substantially the entire outer section 33 of the same.

Over the earlier noted top central section of the door liner, corresponding in position and length to the cut-out 26 in the outer panel flange, the liner flange 35 is also cut away and a portion of the liner wall section 33 therebelow is deformed outwardly to provide a recess 36 at the top inner face of the door. This recess extends, as shown, downwardly from the top of the door when closed to a point appreciably below the top of the oven.

The gap in the top edge of the door is closed by a strip 37 of the cross-sectional shape shown in FIG. 2 and thus

having a horizontal top portion and inner vertical portion in which a slot 38 is formed, the juncture of the two such portions being rounded. A front bead 39 at the bottom of the vertical portion of this strip engages under the reinforcing member flange 31, with the top edge of the inset wall at the liner recess 36 fitted in the slot 38 of the strip. As thus assembled, the top of the strip 37 is flush with the flange 25 of the outer panel, and the front edge of such strip is spaced above and slightly to the rear of the depressed panel section 27 thereby to define a slot therewith.

The closed void between the reinforcing member 28 and the liner 32 is filled with suitable insulating material 40, and front and inner glass panes 41 and 42 are mounted in the door respectively against the slightly turned-in edges of the front panel and inner liner at the window openings of the same. A finish and spacer strip 43 extends about the periphery of the thus-formed double window between the two panes.

A trim ring 44 is disposed about the front pane 41, overlying the outer panel 24, and across the top of such pane, the inturned edge of the panel is cut away to provide a series of ambient air inlet ports as indicated at 45, or a single long port across the top, between the panel and the outer face of the pane. The inner edge of the trim ring 44 is bent back, as shown at 46, at such ports so as not to obscure the same.

As mentioned earlier, air is permitted to enter the oven with the door closed in the usual manner along the bottom of the door, and it will now be seen that heated air can escape from the top of the closed oven by convection through the vent formed by the recess 36 at the top inner face of the door.

The door is sized so that its top is spaced appreciably below the top of the door opening in the front frame 12 thereby to provide an exhaust passage 47 communicating with such door vent. The heated air thus flows out such passage, as indicated by the arrows, with the curved strip 23 smoothly deflecting the flow and of course closing the top joint between the front frame and the inner frame. Such discharge occurs immediately below the outwardly projecting canopy 22, and the latter therefore serves to shield the superimposed controls.

It will also be seen that air can circulate through the upper portion of the door between the outer panel 24 and the reinforcing member 28 by virtue of the ports 45 at the top of the window and the slot or opening 26 at the top front of the door defined by the depressed section 27 and the strip 37. This slot is adjacent the path of discharge of the heated air from the oven, and a Venturi or aspirating action results which tends to draw air in this manner through such upper and outer top portion of the door. The door is thereby cooled and the heated discharge of oven gases is diluted by such cooling air flowing upwardly through the door.

If desired, ports can also be provided at the bottom edge of the door to communicate with the space between the outer panel and the reinforcing or secondary member, so that the remainder of the door face can be similarly cooled.

This new vent arrangement accordingly is provided

primarily by modification of the usual oven door. There is no need to employ costly vent additions to the oven liner nor, for that matter, to re-work the regular front frame assembly, with these considerations being very definitely important from the standpoint of redesign and change in already established production techniques. It will also be noted that the heated discharge is very close to the actual top of the oven or, in other words, as far removed from the top controls as is feasible, whereby the protection of the latter against overheating is enhanced.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in the following claim or the equivalent of such be employed.

I, therefore, particularly point out and distinctly claim as my invention:

In combination with an oven having walls defining an oven compartment open at the front, framing means at the front of such compartment including a generally vertical wall section which extends upwardly from the top front edge of the compartment and a generally horizontal wall section projecting outwardly from the generally vertical wall section at an elevation above that of the compartment top, an oven door of hollow construction mounted adjacent the front of the compartment for closure thereof, said door having an upper inner face portion which is opposed to the generally vertical wall section of the framing means when the door is brought to its closed position, a local recess of appreciable width and depth being provided in a section of such upper inner face portion of the door between the sides thereof and extending downwardly from the top of the door when the same is closed below the top of the oven compartment, such inner face portion of the door apart from the recess engaging the generally vertical wall section of the framing means, whereby the recess forms a vent communicating with the interior of the closed oven for exhaust of heated gases therefrom, the top of the closed door being spaced below the generally horizontal wall section of the frame means to provide an exhaust passage communicating with the vent for outward flow of gases from the latter, the top of the door being substantially flat and free of obstructions so that such outward flow of oven gases is generally unimpeded and smooth, an aspirator opening in the top of the door to the interior thereof, and the door being further provided with an ambient air inlet at a lower portion thereof, the outward flow of gases from the oven in closed door operation of the same across the top opening producing by aspirating action a positive flow of ambient air through the door for cooling thereof.

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