

May 1, 1945.

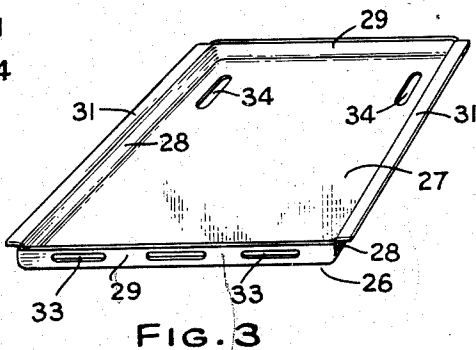
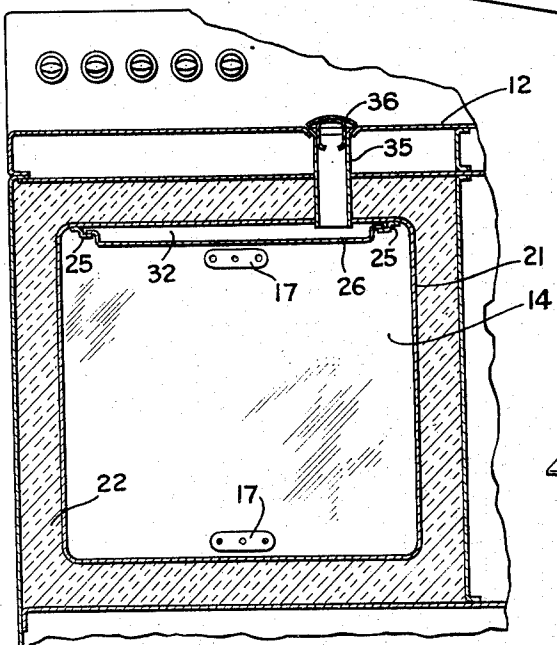
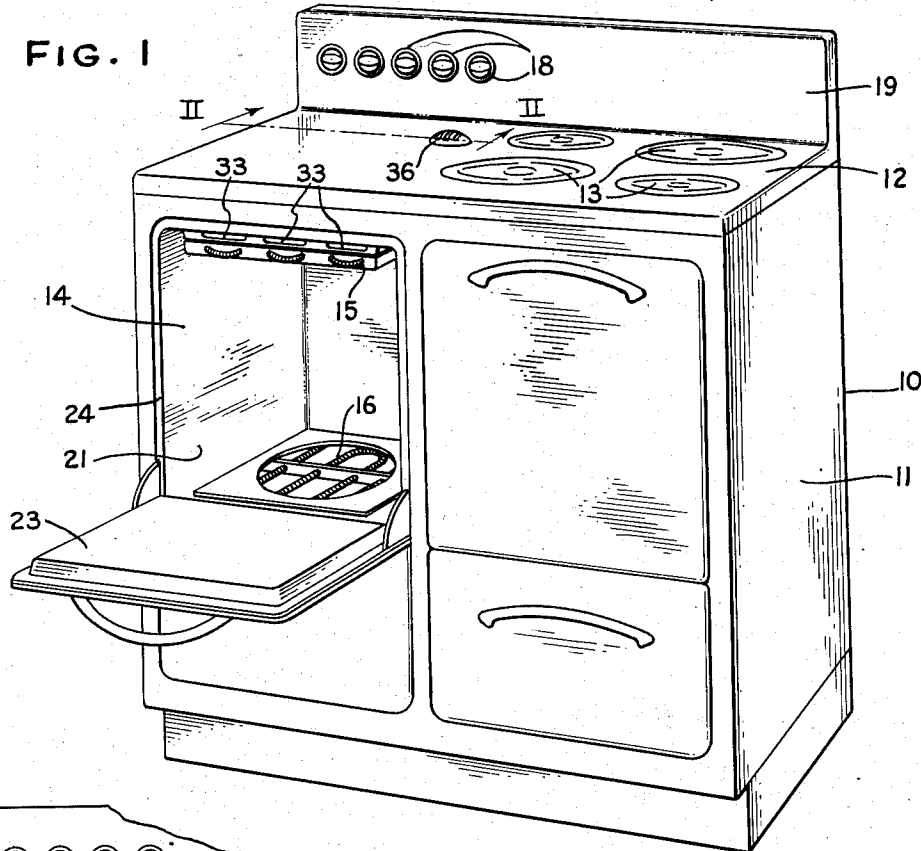
E. E. SUTHERLAND

2,375,047

HEATING APPARATUS

Filed Dec. 22, 1942.

2 Sheets-Sheet 1



WITNESSES:

*Roy N. Enwall.*  
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FIG. 2

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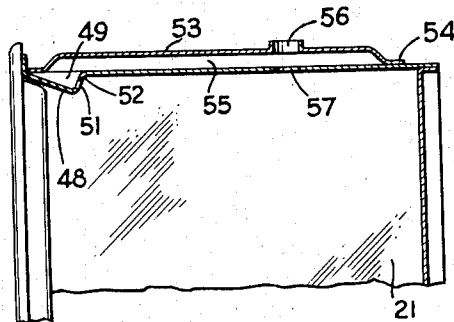
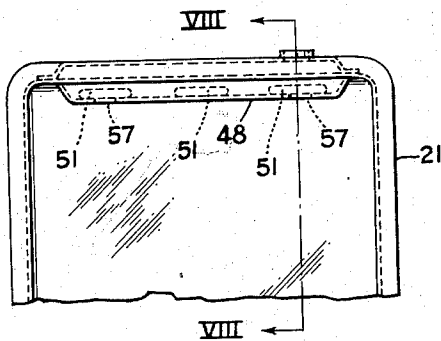
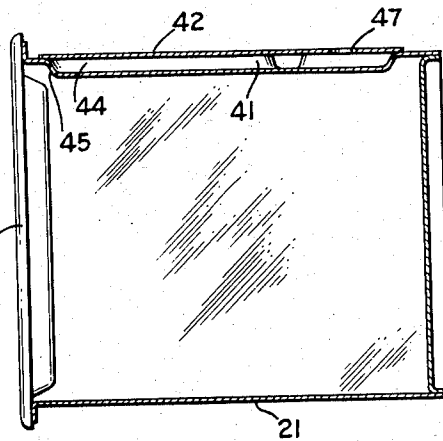
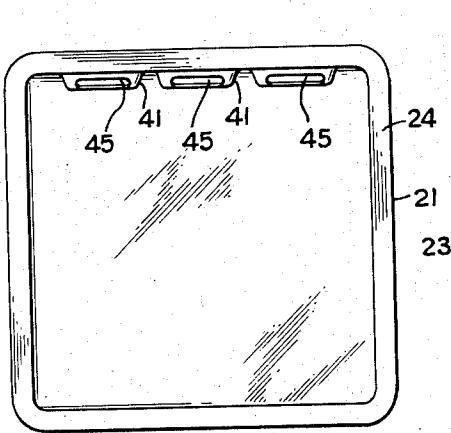
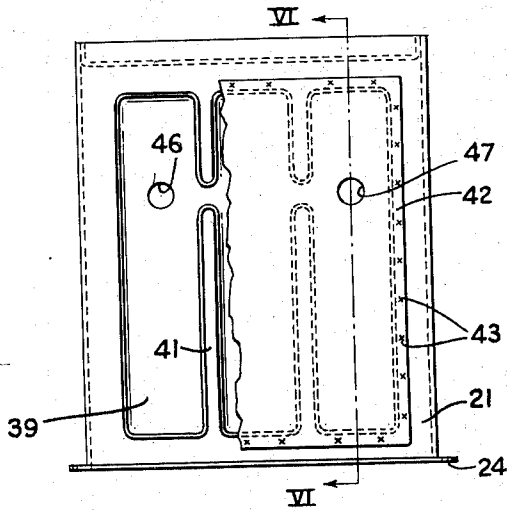
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# UNITED STATES PATENT OFFICE

2,375,047

## HEATING APPARATUS

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Application December 22, 1942, Serial No. 469,811

### 1 Claim. (Cl. 126—21)

This invention relates to heating apparatus and particularly to electric cooking ranges and it has for an object to provide an improved venting means for the ovens of such ranges.

Ranges which are heated by fuel such as wood, oil, or gas are usually connected to a flue which carries the combustion gases to the outdoors. It is, therefore, a simple matter to vent the oven into the flue to remove the cooking odors and vapors. However, provision is seldom made for connecting an electric range, to a flue leading to the outdoors and consequently the oven is vented directly into the kitchen. The venting means for electrically heated ovens usually comprises a pipe extending directly from the interior of the oven and opening on the range platform or back-splasher with the result that the vapors tend to condense on the range platform or back-splasher around the vent outlet and cause the discoloration of the range. The cooking odors present in the kitchen by reason of this manner of venting the ovens are objectionable.

Such oven vents have also been arranged so that the vent pipe opens into the oven at a point near the rear end thereof and due apparently either to insufficient capacity of the vent pipe or its location in the oven, the hot gases and vapors tend to leak out at the top of the oven door and cause discoloration of the range at this point.

It is an object of the invention to provide an improved venting means for an oven which substantially prevents discoloration by oven vapors of the range surfaces at the point where the oven vent opens to the atmosphere.

It is also an object of the invention to provide an improved oven venting means which substantially prevents oven vapors from discharging around the oven door.

These and other objects are effected by the invention as will be apparent from the following description and claim taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a perspective view of an electric cooking range in which the present invention is incorporated, with the oven door open to show the arrangement of the heating elements within the oven and the location of applicant's improved oven vent relative thereto;

Fig. 2 is a vertical sectional view taken substantially along the line II—II of Fig. 1;

Fig. 3 is a perspective view of a tray or partition forming a part of the present oven vent;

Fig. 4 is a top plan view of an oven liner illustrating a modification of the invention, a por-

tion of a top plate fixed to the top of the oven liner being removed to more clearly illustrate the invention;

Fig. 5 is a front elevational view of the oven liner shown in Fig. 4;

Fig. 6 is a vertical sectional view taken substantially on the line VI—VI of Fig. 4 and showing the position of the oven door relative to the oven liner;

Fig. 7 is a view corresponding to Fig. 5, illustrating a further modification of the present invention; and,

Fig. 8 is a vertical sectional view taken substantially on the line VIII—VIII of Fig. 7.

Referring to the drawings and particularly to the modification illustrated in Figs. 1 to 3, inclusive, there is shown a range generally indicated 10. This range may be of any desired construction and is here shown as comprising a body 11 having a platform 12 in which are supported a plurality of electric surface cooking units 13. The structural details of the range 10, except for the oven venting arrangement to be hereinafter described, are not important to the present invention and it is to be understood that the invention is not limited in its application to the particular range shown in the drawings.

The range 10 is provided with an oven 14 in which are supported electric heating elements 15 and 16 disposed at the top and bottom of the oven respectively. These elements are preferably removable from the range in a manner well known in the art by having suitable terminal pins (not shown) at the rear ends thereof which are received in terminal blocks 17 shown in Fig. 2. The oven heating elements and the range surface units 13 are controlled by suitable switches which may be actuated by knobs 18 mounted in the backsplasher 19 of the platform.

The oven 14 comprises an oven liner 21 which is generally rectangular and supported within the range body 11 and surrounded on all sides except at its open front end by means of suitable insulating material 22 such as rock wool. The open front of the oven is normally closed by means of a hinged, insulated door 23, the edges of which engage a vertical flange 24 surrounding the open end of the oven liner as particularly shown in Fig. 6.

The oven liner 21 may be of conventional construction and is modified by having a pair of guide strips 25 secured to the upper wall thereof, as shown in Fig. 2, and extending substantially from front to rear for the purpose of sup-

porting a removable partition 26 like that shown in Fig. 3.

The partition 26 comprises a bottom wall 27 having upstanding side and end walls 28 and 29, respectively, to form a shallow dish-like member. The upstanding side walls 28 are provided with outwardly-extending flanges 31 which are receivable on and slidable along the guides 25 so that when the partition 26 is disposed within the oven as shown in Figs. 1 and 2, it provides with the top wall of the oven liner a chamber 32 which extends over a substantial portion of the top of the oven. The front upstanding wall 29 of the partition is provided with one or more inlet openings 33 which permit the hot gases and vapors within the oven to enter the chamber 32. Other openings 34 in the bottom wall 27 of the partition 26 adjacent the rear end thereof provide further inlet openings to the chamber.

The chamber may be connected to the atmosphere by any suitable venting arrangement and in the particular embodiment herein illustrated a vertical pipe 35 is provided which opens on the platform 12 of the range. This pipe may be provided with a suitable removable cap member 36 which overlies but does not close the pipe and prevents objects from falling therein.

In operation, as the oven heats up, the air therein expands and is vented to the atmosphere by first entering the chamber 32 and then rising through the pipe 35 extending through the platform. As the temperature of the food being cooked within the oven rises, part of its liquid content is vaporized, and this vapor passes into the chamber 32 through the openings 33 and 34. Due to the close proximity of the upper heating element 15 and due to the fact that the chamber is disposed at a hot part of the oven, the vapors entering the chamber are dried and the cooking odors are burned out. Thus, the chamber has the effect of superheating the vapors, permitting them to be discharged into the room without condensing on the outer surface of the range around the vent opening. The chamber has the added function of serving as a heat insulator and tends to cut down heat losses through the top of the oven.

Since the partition 26 is readily removable from the oven by merely pulling the same forward along the guides 25, it may be periodically cleaned of any deposits which may collect therein.

A further advantage arising from this construction is that a standard oven liner may be used, it merely being necessary to secure the guides 25 thereto as by spot welding or riveting the same.

In Figs. 4 to 6, inclusive, there is illustrated a modified form of the invention in which the vent chamber is formed as a permanent part of the oven liner. As shown particularly in Figs. 4 and 6, the top wall of the oven liner 21 is depressed to form a shallow recess 39 extending over substantially the entire top of the oven. If desired, this recess may be interrupted by raised rib portions 41 for the purpose of reinforcing the oven liner. The top of the recess is closed by means of a plate 42 which may be spot welded to the outer surface of the oven liner, as indicated at 43. The resulting chamber 44 is substantially the same as that provided in the construction shown in Figs. 1 to 3.

Inlet openings 45 are provided along the front wall of the depressed top wall of the oven liner closely adjacent the oven door 23 and one or more openings 46 may be provided in the depressed

portion adjacent the rear of the chamber 44. The cover plate 42 is provided with an outlet opening 47 for receiving the vertical outlet pipe 35 shown in Fig. 2.

The operation of this modified oven vent is substantially the same as the vent previously described. The mentioned ribs 41, while primarily intended to reinforce the oven liner, have the added function of breaking the chamber up into small communicating compartments so that gases and vapors passing into the chamber follow a circuitous path to reach the outlet opening provided in the top plate. It is to be understood that these ribs may be arranged in any desired manner to provide any path of flow for the gases which may be deemed advantageous, and that this same principle may be applied to the other forms of the invention.

By having the inlet openings 33 and 45 closely adjacent the oven door, gases and vapors tending to leak out around the top of the oven door enter the vent chamber 32 or 44 through these openings and thereby substantially reduce such leakage. To further reduce leakage at the oven door, the front inlet openings may be arranged in the manner shown in Figs. 7 and 8, wherein a depressed portion 48 of the top of the oven liner tends to break up any flow of gas or vapor directed toward the oven door. This depressed portion may be applied to either of the forms of the invention described above and is specifically shown as applied to a third form of the invention illustrated in Figs. 7 and 8.

As shown in Figs. 7 and 8, the depressed portion 48 of the top wall of the oven liner 21 provides a shallow pocket 49 extending substantially across the top of the oven liner which communicates with the interior of the oven by means of a plurality of inlet openings 51 formed in the substantially vertical rear wall 52 of this depressed portion. A suitably shaped plate 53 which is provided with downwardly-offset flanges 54 is secured, as by spot welding, to the outer surface of the upper wall of the oven liner. This flanged plate together with the top wall of the oven liner provides a chamber 55 equivalent in function to the chambers 32 and 44, which may be connected to the atmosphere by means of a vent pipe like that shown in Fig. 2 communicating with opening 56. If desired, additional inlet openings 57 may be provided and the ribbing 41, shown in Figs. 4 to 6, may be applied to the plate 53 or to top wall of the oven liner.

While the invention has been shown in several forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof, and it is desired, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claim.

What is claimed is:

The combination with a cooking range, including an oven having a front access opening and a door for closing said opening, of means for preventing discoloration of exterior parts of said range by condensation thereon of water vapor and organic components of gases produced by cooking of food in said oven, including a partition secured to and narrowly spaced from the top of said oven, whereby a relatively shallow chamber substantially coextensive with the top of said oven is produced, there being a port in said partition near the front of said oven through which said vapor and said gases pass from that portion

of the oven into said chamber, to prevent leakage of said vapor and said gases around the edges of said door, a vent leading from the rear portion of said chamber to the atmosphere, whereby said vapor and said gases are caused to travel from the front to the rear portion of said chamber, and a heating element positioned immediately below said chamber, said heating element

being so constructed and arranged as to supply to said partition and said chamber heat of sufficient intensity to superheat said vapor and to consume said organic components during the movement of said vapor and said gases from the front portion of said chamber to said vent.

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