May 6, 1952 J. A. NELSON ET AL 2,595,480

VENTILATED RANGE

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Fig. 1

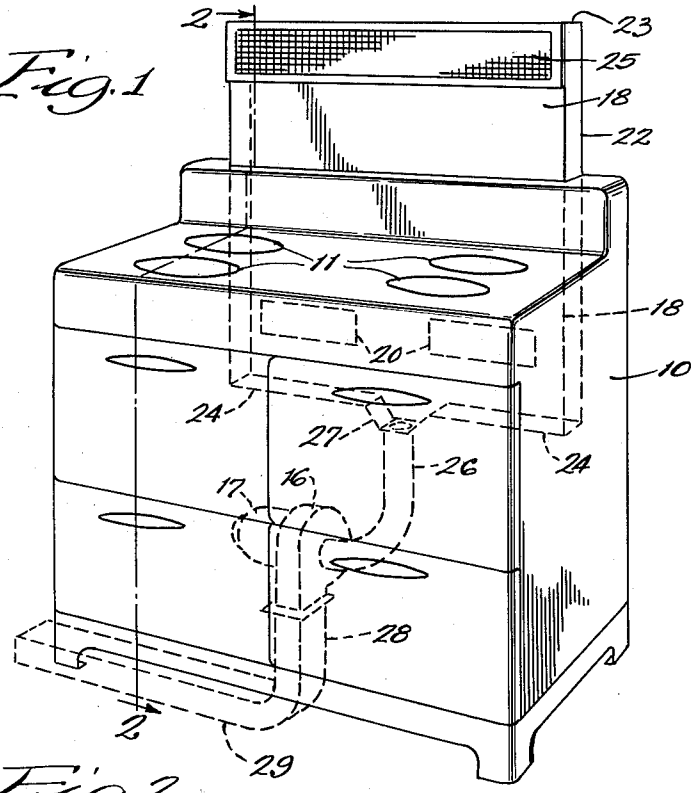
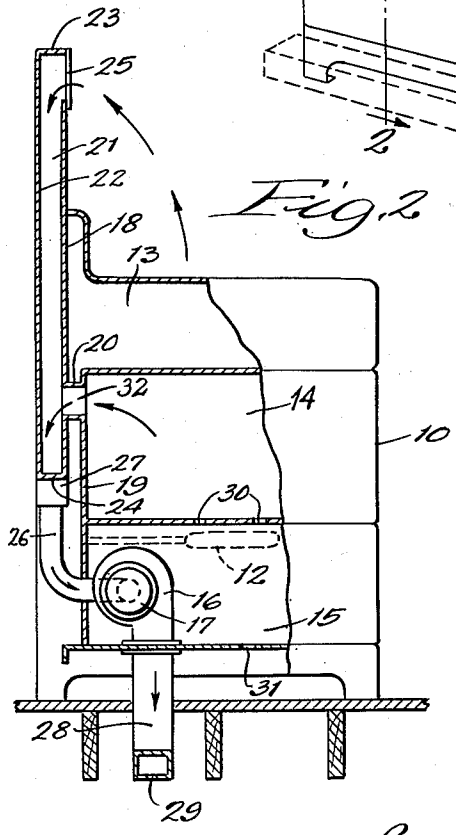


Fig. 2



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VENTILATED RANGE

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1 Claim. (Cl. 126—299)

1

This invention relates to a ventilated range. The invention is particularly useful in connection with a gas or other fuel-burning range, and also in connection with ranges employing electric and other heating elements.

In present day cooking appliances utilizing gas, liquid or solid fuels, electric heating elements, etc., the exhaust products of water vapor, food vapors, and odors, products of fuel combustion, etc., are discharged directly into the kitchen. Sometimes special structures are set up for drawing off vapors, air, and fumes from the room, but such structures are expensive, and the excessive dilution of the withdrawn material with air is undesired. In ordinary practice, the gases, vapors, and odors released from the cooking appliance contribute to condensation on window surfaces, walls, and furniture, grease deposition requiring excessive cleaning and decorating, and the pollution of atmosphere in the entire house by food odors. Even when means for withdrawing vapors, etc., are located close to the range, the withdrawn vapors have an opportunity to cool and condense, and further there is extensive dilution of the withdrawn vapors by air.

An object of the present invention is to provide means whereby vapors from an internal heating element of the range and from exterior heating elements can be withdrawn with very little air dilution, while at the same time providing means for rapid exhausting of the vapors before condensation can take place. Yet another object is to provide a range in which a collector box for such vapors, etc., is supported directly in the frame and in contact with heat radiated from the frame, while maintaining means for exhausting such vapors also directly within the frame, with the result that any condensation that occurs, occurs beyond and outside of the range itself and either after exit into the atmosphere outside the building or adjacent such exit. Yet another object is to provide in such a range, blower means carried directly within the range and adjacent the vapor collector box whereby the vapors can be discharged from the range before condensation can take place and before they can clog up or injure the blower mechanism. Yet another object is to provide a range equipped with an internal vapor collector box and with an internal exhausting mechanism whereby the stove is self-ventilating, drawing in vapors and air from all of the heating elements and discharging such vapors prior to condensation to surfaces outside of the range. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a specific embodiment, by the accompanying drawing, in which—

Figure 1 is a perspective view of a range embodying one phase of our invention; and Fig. 2, a side view in elevation, a portion of the range being shown in section and the section being taken as indicated at line 2—2 of Fig. 1.

2

In the illustration given, 10 designates a range equipped with a plurality of top heating elements 11 and with an internal heating element 12. In the specific illustration given, the elements are gas burner elements, but it will be understood that substitute heating means may be employed. In the specific range structure shown, there is a burner compartment 13 below the top burners 11, a pair of oven compartments 14, and a pair of lower compartments 15 below the oven compartments. The burner 12 is illustrated as a broiler burner located in one of the lower compartments 15 below one of the ovens. The other lower compartment 15 is employed for housing a blower 16 driven by motor 17.

The range is provided with a rear wall 18 which extends above the top of the range and then extends downwardly, forming the back wall for the burner compartment 13. A similar wall 19 forms the rear wall for the compartment 15. A pair of conduits 20 provide passages or ports 32 connecting the ovens 14 with the chamber 21 provided at the rear of wall 18. The chamber 21 is formed by wall 18 and a collector box wall 22 spaced from wall 18, and closes at the top with wall 23 and at the bottom with wall 24.

The collector box provided by the walls described extends well above the top of the range 10 so as to provide an extended back splasher therefor. At its extreme upper end, the box is provided with a plurality of openings 25 providing an intake or inlet for vapors rising from the top burners of the range.

A conduit 26 of reduced cross section communicates with the bottom of the collector box 21. In the illustration given, the bottom wall 24 of the collector box is centrally tapered downwardly, as indicated at 27, to receive and merge with the conduit 26.

The conduit 26 extends downwardly and laterally, entering the lower compartment 15 in which the blower 16 is mounted. Here the conduit enters the intake portion of the blower 16, and the vapors are discharged by the blower downwardly through conduit 28 into exhaust pipe 29. The exhaust pipe 29 is preferably turned laterally so as to discharge the vapors outside the basement wall.

Operation

In the operation of the structure, vapors produced within the broiler compartment pass upwardly through openings 30 into the oven compartment and thence outwardly through the conduits 20 into box 21. Air from the lower side of

the range is fed to the broiler compartment through an opening 31. It will be understood that the openings may be of any type or number, and in the event of electric heaters, may be dispensed with entirely.

Vapors rising from food being cooked on the top burners 11 move upwardly and inwardly through the intake 25 into the chamber 21. Suction induced by the blower 16 within the lower compartment 15 causes the flow of all of such vapors, together with some air, downwardly and thence through the tapered opening 27 in the conduit 26. Here, by reason of the reduced cross section of conduit 26, the vaporous material passes at increased velocity and is discharged through the exhaust pipe 29.

In all of the above operations, substantial condensation of vapors within the collector box, blower, and discharge pipe is prevented by the heating of chamber 21 and an increased velocity of discharge of the materials. Chamber 21 is maintained at a temperature tending to prevent condensation by reason of the radiation of heat from the burner chambers upon chamber 21 and by reason of the direct heated gases flowing from compartments 14. To the above, the heat produced in the operation of the motor and blower is directly added and assists in the preventing of condensation. The location of the blower immediately adjacent the collector box 21 not only enables the heat therefrom to be added to the heat of the range in maintaining the temperature within chamber 21, but also provides for the quick elimination of vapors from the box and before there is an opportunity for condensation. By this means, the blower itself is kept substantially free of grease and other condensed vapors, and the use of filters and other means for removing such condensate is substantially eliminated.

The products of the enclosed burners, including vapors and fumes from the enclosures, are exhausted directly and never allowed to escape into the room. The products, fumes, and vapors from the top burners of necessity escape around cooking pots, but are caught by the intake 25 close to their point of origin and are not allowed to diffuse into the kitchen.

By reason of the direct pickup of enclosed burner products and the semi-direct pickup of top burner products, little dilution takes place. Therefore, greases and other vapors cannot condense on wall and furniture surfaces, relative humidity in the room is reduced, and odors are prevented from traveling to living rooms.

By preventing the mixing of the vapors with air at the very beginning, the present structure makes very little change in the air supplied or remaining within the room and exhausts only the products of the enclosed burners and vapors, plus enough atmosphere to provide velocity sufficient to carry them to the closely-located inlet. The exhaust here through the inlet 25 will be no more than considered adequate for proper air changes per hour in a home.

With the structure described, a complete self-ventilating unit is provided with the blower adjusted and selected for the specific type of range employed and effective in serving its needs. For installation within a home, it is only necessary to form a small opening in the floor through which the exhaust pipe 28 may be extended.

While in the specific illustration given, we have shown much of the structure in great detail for the purpose of illustrating one embodiment, it will be understood that such details may be varied widely by those skilled in the the art without departing from the spirit of our invention.

We claim:

A range having a box-like frame providing an upper cooking surface equipped with burners and having a burner compartment therebeneath receiving heat from said burners, said range also having at least one substantially closed oven compartment beneath said burner compartment and a partially closed lower compartment beneath said oven compartment, means for heating said oven compartment positioned near the partition wall between said oven and lower compartments so as to also heat said lower compartment, a collector box extending substantially the width of said frame and extending for a substantial distance both above and below the cooking surface of said range, said box having an open interior chamber of substantially the same size as said box and an intake extending across its upper portion for withdrawing vapors rising from the top surface of said range into said chamber, a port at the rear of said oven compartment in communication with said collector box chamber, said collector box having its bottom extending below the port of said compartment and having its bottom wall tapering inwardly near the center thereof, an outlet conduit communicating with the tapered portions of said bottom wall of the box and passing into said lower compartment, a motor-driven blower in said lower compartment having its inlet communicating with said conduit, and a second conduit leading from the outlet of said blower and extending outside of the range, the portion of said collector box below the cooking surface of said range abutting a substantial expanse of the rear wall of said range, whereby said collector box chamber receives heat from the heated compartments within said range which tends to prevent the condensation of vapors in said chamber.

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