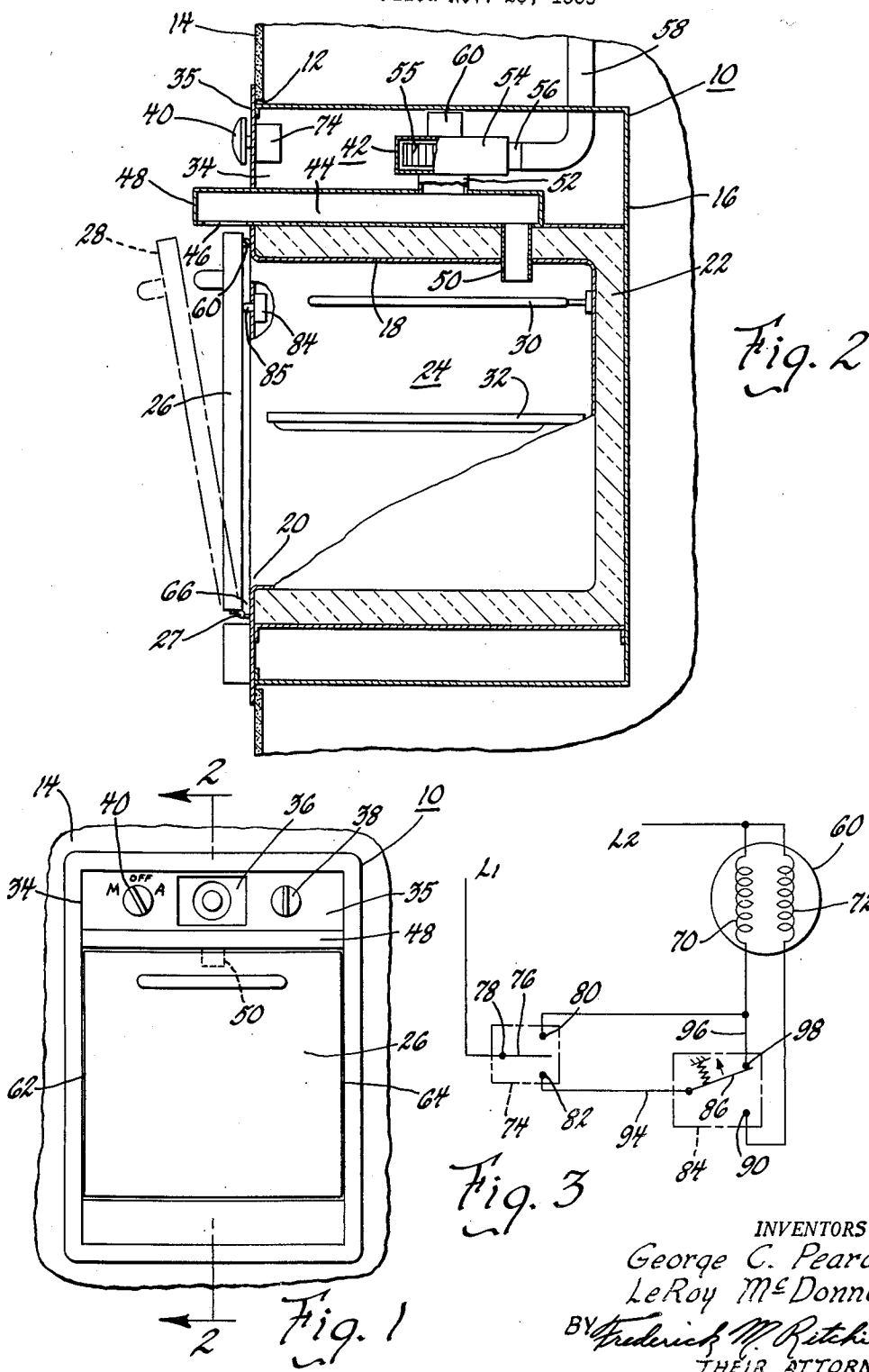


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G. C. PEARCE ET AL
DOMESTIC OVEN VENTILATION SYSTEM

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INVENTORS

George C. Pearce

LeRoy McDonnold

BY *Frederick M. Ritchie*
THEIR ATTORNEY

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DOMESTIC OVEN VENTILATION SYSTEM

George C. Pearce, Dayton, and Le Roy McDonnold, West Carrollton, Ohio, assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware
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This invention relates to a domestic appliance and more particularly to an improved control circuit for a wall oven.

Venting of built-in appliances has remained a problem, since the venting must be accomplished through an exposed surface of the appliance. Thus difficulties arise such as passing the vented hot gases over the control panel of the oven and in the direction of the operator. Further, it is known that the venting problem becomes more acute during broiling operations when additional smoke is generated and must be eliminated. During baking operations, however, the production of noxious fumes and gases is less and the need for ventilation is reduced accordingly. It is to the provision of a venting system to meet the above situations that this invention is directed.

Accordingly, it is an object of this invention to provide an integral ventilating system for a wall oven which is responsive to the operation for which the oven is being used.

A further object of this invention is to provide an exhaust system for a built-in oven, the capacity of which is responsive to the position of the oven door.

A more particular object of this invention is embodied in an exhaust system for a cooking appliance wherein a two-speed blower is utilized.

Another object of this invention is provided in a ventilating arrangement for an oven which has a high capacity during oven broiling operations and a low capacity during oven baking operations.

It is also an object of this invention to provide a ventilating arrangement for an oven which is adapted for high capacity operation when the oven door is open and low capacity operation when the oven door is closed.

A further object of this invention is the provision of a combination oven vent and kitchen exhaust arrangement.

A more specific object of this invention is the provision of an exhaust fan system for an oven which uses a two speed blower and a control having a high speed position during oven broiling, a low speed position during oven baking and a manual position for kitchen exhaust.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the present invention are clearly shown.

In the drawings:

FIGURE 1 is a fragmentary front elevational view of a wall mounted built-in oven;

FIGURE 2 is a schematic side sectional view of an exhaust system for a built-in wall oven taken along line 2—2 in FIGURE 1; and

FIGURE 3 is a schematic wiring diagram for controlling the above mentioned exhaust system in accordance with the concepts of this invention.

In accordance with this invention and with reference to FIGURES 1 and 2, a wall oven 10 is designed for installation within an opening 12 in a wall 14. The oven 10 is comprised of a casing 16 which receives and houses a box-like oven liner 18 having a front opening 20. Interposed between the casing 16 and the liner 18 is conventional insulation 22 to provide for better heat distribution within an oven chamber 24 defined by the liner 18. The front opening 20 of the oven chamber 24 is adapted to be closed by a door 26 which is pivotally

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mounted at 27 for movement between a vertical position wherein said opening 20 is substantially closed and a horizontal position wherein said oven chamber 24 is opened for access. An intermediate position 28 shown by phantom line is facilitated in any conventional manner to condition the oven for a broiling operation wherein a top broil heating element 30 is energized to broil foods placed on any conventional rack 32 disposed immediately below the heating element 30.

The oven 10 and more particularly the casing 16 houses a control section 34 at the top thereof having a front face or escutcheon 35. These controls may embrace an automatically timed baking control 36 and a thermostat and broil control 38. In addition to the conventional controls, a blower control switch knob 40 is provided and adapted, as will be more fully described hereinafter, to control an oven exhaust system shown generally at 42.

The exhaust system is installed within the control portion 34 of the casing 16 and above the oven chamber 24. The exhaust system is comprised of a duct or plenum 44 which has an elongated inlet opening 46 which faces downwardly over top of the oven door 26 across the width of the oven. The duct 44 may extend beyond the front of the control panel 35 to form an overhang or ledge 48 which separates the oven chamber 24 from the control panel. This projection helps the exhaust system to intercept hot gases before they overheat the controls. At the other end of the duct 44 a round conduit 50 extends through the oven liner 18 into the oven chamber 24. Also provided in the duct 44 is a blower inlet neck or collar 52 to which a blower 54 is secured. The exhaust outlet 56 of the blower is connected by a conventional conduit 58 to the atmosphere. A simple repulsion induction motor 60 is designed for two-speed operation and is drivingly connected to the impeller 55 of the blower 54. The blower is designed for two-speed operation and may have an exhaust capacity of 100 to 125 c.f.m. when operated on high speed and from 50 to 60 c.f.m. when operated on low speed.

The door 26 may be sealed along its top at 60 and in similar fashion along its sides 62 and 64, but is spaced at 66 from the bottom front flange of the oven liner 18 to form a lower vent opening. Thus, with the door 26 in a closed position a slight oven ventilation is accomplished through the spaced opening 66 at the bottom of the oven door and from the oven chamber 24 through the exhaust conduit 50 into the exhaust system. It should be noted merely that for proper baking, ventilation should be such that temperature distribution within the oven chamber 24 remains uniform. For this reason conventional means, such as hinge 27, may be provided for positioning the oven door 26 relative to the opening 20 of the lining 18 in order to effect the desired venting through the oven during baking. Since the relatively large opening 46 in the duct 44 is outside of the oven chamber, it should be recognized that any exhausting which the blower 54 accomplishes is substantially ineffective on the relatively small tubular conduit 50 extending into the oven chamber. In any event, the amount of exhaust through the conduit 50 when the door 26 is closed will depend on the gap 66 which, as aforesaid, is adjustable. It should be noted also that French doors may be used in place of a solid horizontally pivotally mounted door 26 without substantially changing the teachings of this invention.

During broiling operation, the door 26 may be moved to the phantom line broil position (FIGURE 2), thereby placing the opening 46 of the exhaust system in hot gas and smoke receiving relationship to the oven chamber 24. As aforesaid, the opening 46 extends across the entire width of the oven chamber to receive any escaped gases. With the door in broil position, the blower 54 will

be effective to draw smoke and odor through both the duct inlet 46 and conduit 50 into the exhaust or outlet duct 58.

The control circuit for this invention is shown schematically in FIGURE 3. To effect two-speed blower operation, the motor 60 includes a high speed winding 70 and a low speed winding 72. The control circuit also includes a manually operable switch 74 which includes a switch blade 76 operable by the control panel knob 40. The switch blade 76 pivots about a single pole 78 and between a manual contact 80 and an automatic contact 82. In addition, the switch blade 76 has a central Off position completely disengaged from either contact 80 or 82. A door actuated switch 84 is included in the circuit and installed on the oven casing 16 in any suitable position which will make the switch actuatable by the movement of the door 26. More specifically, the switch 84 includes an actuator 85 to manipulate a switch blade 86 which is normally spring-biased against a contact 98 whenever the door 26 is opened. When the door 26 is closed, a switch blade 86 is pressed against a contact 90 which is connected to the low speed winding 72 of the blower motor 60. Any suitable power source L1, L2 may be used to energize the circuit in accordance with the operation to be explained next following. In one situation the selector knob 40 is positioned in its Off position wherein switch blade 76 is disengaged from any contact and the circuit is deenergized. In such a situation the fan motor 60 remains deenergized regardless of the position of the oven door 26.

With the selector switch blade 76 in the Manual contact position against contact 80, the motor 60 is energized positively and permanently for high speed operation and the blower 54 will operate to exhaust 100 to 125 c.f.m. through the exhaust duct 58. In this system situation (knob 40 on M and switch 76 on 80) the positioning of door 26 is immaterial to the operation of the blower 54. In this position also the blower 54 may be used as a kitchen exhaust fan whether the oven is in operation or not.

A third positioning of the switch blade 76 may place it in contact with the Automatic terminal 82 (knob 40 on A) wherein the power supply is put in series electrical flow relationship with the door actuated switch 84 and the blower motor 60. Two door position situations arise when the selector switch 76 is adjusted for automatic operation. With the door 26 closed, the actuator button 85 is depressed to move the switch blade 86 against the door closed contact 90. Thus, the motor 60 is energized for low speed from L1 through switch blade 76, contact 82, line 94, spring-biased switch blade 86, contact 90, and low speed motor winding 72 to L2. This low capacity exhaust situation exists during baking operations to remove a small amount of heat and odor from the front of the oven 10 to prevent over heating of the kitchen.

Now assume that a broiling operation is taking place and the door 26 is placed in a slightly open position wherein the actuating knob 85 is not depressed. The blower selector switch blade 76 is still on the Automatic contact 82. In this situation, the switch blade 86 will be spring-biased to its normal position against contact 98 and the motor 60 will be energized through its high speed winding 70 as follows: From L1 through switch blade 76, contact 82, line 94, switch blade 86, door open contact 98, line 96, high speed winding 70 to L2. Thus, there is established a high capacity exhaust through the outlet duct 58 with the impeller 55 of blower 54 operating in high speed. The intake to the duct 44 will be through both its outside inlet opening 46 and its oven inlet or conduit 50 within the oven chamber 24. Broiling smoke and odors will be immediately withdrawn from the oven chamber and the surrounding area into the duct system and removed by the blower to the atmosphere.

It should be recognized that the integral arrangement

for the exhaust system 42 shown and taught in FIGURE 2 may be separated from the oven 10 and provided as a venting auxiliary for a wall oven wherein the necessary circuit connection extends between the venting or exhaust assembly 42 and the oven 10—the addition of a switch 84 in the path of any type oven door being easily facilitated.

It should now be seen that an improved exhaust system for a wall oven has been provided wherein a two-speed blower is connected through an oven door-actuated switch so that the blower runs automatically at high speed when the door is open for broiling or food removal and at low speed when the door is closed. High speed operation of the exhaust prevents a user from being burned by sudden surges of heat from the oven cavity when the door is opened. With the door closed, however, very little capacity is required and, consequently, a low speed blower operation will suffice. This control arrangement for a blower system also provides for manual shut off, automatic operation or kitchen ventilation as the user may desire.

While the embodiments of the present invention as herein disclosed, constitute preferred forms, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In combination with an oven having an opening, a door for selectively closing said opening and having a broil position and a bake position, said oven having a high and low speed exhaust fan having its inlet selectively associated with said opening in accordance with said door positions, a two-speed motor for said exhaust fan having a high speed winding and a low speed winding, a door actuated switch connected through a normally closed first contact to said high speed winding when said door is in said broil position and through a normally open second contact to said low speed winding when said door is in said bake position, a manually actuated switch having a first position for continuous operation of said motor, a second position for automatic operation of said motor and a third position for deenergizing said motor, said manually actuated switch when in said second position being connected to said door actuated switch, said manually actuated switch when in said first position being connected to said high speed winding, and a power supply having one lead connected to said manually actuated switch and another lead connected to said high and low speed windings.

2. In combination with an oven having an opening, a door for selectively closing said opening and having a broil position and a bake position, said oven having a high and low speed exhaust fan selectively associated with said opening in accordance with said door positions, a motor for said exhaust fan having a high speed winding and a low speed winding, an automatically actuatable first switch connected through a first contact to said high speed winding when said door is in said broil position and through a second contact to said low speed winding when said door is in said bake position, a presettable second switch having a first position for continuous operation of said motor and a second position for automatic operation of said motor, said second switch when in said second position being connected to said first switch, said second switch when in said first position being connected to said high speed winding, and a power supply having one lead connected to said second switch and another lead connected to said high and low speed windings.

3. In combination, an oven casing defining a chamber, a door for closing said chamber and having a first position adjacent said casing and a second position remote from said casing, an exhaust duct overlying said chamber and having a first inlet adjacent said door, a second inlet extending into said chamber and an outlet, a blower housing connected to said outlet and having an exhaust outlet connected to the atmosphere, an impeller in said blower housing, a motor in driving relationship to said impeller

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and having high speed and low speed windings, and a control circuit for said motor including a first manually actuated switch having a manual position, an off position and an automatic position, and a second door actuated switch on said casing and having an actuating member in the path of said door and operable to move said second switch between a door remote contact in series electrical flow relationship with said high speed winding and a door adjacent contact in series electrical flow relationship with said low speed winding, whereby said motor is energized for high speed operation when said first switch is in said automatic position and said door is in said remote position and for low speed operation when said first switch is in said automatic position and said door is in said adjacent position.

4. In combination with an oven having an opening, a door for selectively closing said opening and having a broil position and a bake position, said oven having a high and low speed exhaust fan selectively associated with said opening in accordance with said door positions, a motor for said exhaust fan having a high speed winding and a low speed winding, an automatically actuatable first switch connected through a first contact to said high

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speed winding when said door is in said broil position and through a second contact to said low speed winding when said door is in said bake position, a presettable second switch having a first position for preventing operation of said motor and a second position for automatic operation of said motor, said second switch when in said second position being connected to said first switch, said second switch when in said first position being disconnected from said high speed winding, and a power supply having one lead connected to said second switch and another lead connected to said high and low speed windings.

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