EXHAUST DUCT CONNECTION FOR VENTILATION HOOD

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The present invention relates to kitchen ventilating hoods and particularly to such a hood which is capable of either top discharge or rear discharge.

The hood of the present invention was designed principally to be formed as an integral unit over an eye-level oven of a free-standing range such as is marketed by the present assignee as an Americana range, where the position of the hood is determined by the position of the range from which it is carried. Such a hood is designed to be adaptable to either top discharge or rear discharge. In either case there must be provided ductwork in the wall for carrying the exhaust gases out of the kitchen. In new home construction, this wall ductwork is installed either between the wall studs or within the wall-hung kitchen cabinets, and several weeks usually transpire between the completion of the ductwork and the installation of the range and the other kitchen appliances. Hence, it is necessary to provide an adjustable hood exhaust outlet with side-to-side movement to compensate for any misalignment that may occur between the hood exhaust outlet and the wall ductwork.

Moreover, when installing a free-standing range with an eye-level oven having an integral hood thereover, there might be difficulty in obtaining a close-fitting relationship between the underside of the overhead wall cabinets and the top surface of the hood. Usually the hood exhaust outlet is provided with duct-connecting collar for telescopic relationship with the wall ductwork. Hence it is necessary to be able to lower this duct-connecting collar into the hood before the range is slid into place so that there will be no interference between the collar and the wall cabinets. Also, it is well to be able to quickly and easily install the collar for mating with the wall exhaust ductwork, as well as to have an inherent adjustable feature in a front-to-back direction to complement the side-to-side adjustment of the hood exhaust outlet member.

The principal object of the present invention is to provide a ventilating hood with an exhaust outlet capable of either top or rear discharge, and which has the facility for side-to-side adjustability.

A further object of the present invention is to provide a ventilating hood of the class described with a duct-connecting collar for use in the hood exhaust outlet and which is removable as well as adjustable in its location in a front-to-back direction.

A still further object of the present invention is to provide a ventilating hood with an adjustable and reversible cover plate mounted in the top and rear surface thereof and having an exhaust outlet for either top or rear discharge, there being a duct-connecting collar removable mounted in the exhaust outlet of the cover plate for easy removability and adjustability in a front-to-back direction.

The present invention, in accordance with one form thereof, is embodied in a ventilating hood which has a single notch at the top of the wall near the back thereof. A cover plate is adapted to be mounted in the aperture and to form with certain walls of the hood a plenum chamber downstream of a motor-blower unit provided for the hood. One wall of the cover plate includes an air exhaust opening in which a duct-connecting collar for mating with the wall exhaust ductwork is provided.
hood shell 20 is a motor-blower unit 24 comprising an electric motor 25 having a vertical shaft 26 supporting a blower wheel 27 which partially encircles the housing of the motor 25. Enclosing the motor 25 and blower wheel 27 is a scroll-shaped blower housing 28 with an inlet opening 29 in the bottom wall encircling the motor housing forming an annular inlet opening. The lower wall 30 of the blower wheel 27 also includes an annular inlet opening 31 so that air is drawn into the center of the blower wheel 27 and directed radially outward by the vanes or blades that form the blower wheel construction.

Suitable rods or straps 33 are employed to suspend the motor 25 within the blower housing 28. These straps are of generally Z-shape having an inwardly directed top leg 34 and an outwardly directed bottom leg 35. The motor-blower unit 24 is suspended in the hood shell 20 by means of a pair of resiliently supported bolt members 37. Such a mounting means is not fully described herein as it is disclosed and claimed in my copending patent application Serial No. 486,930 entitled “Mounting Means For Motor-Blower Unit” which was filed concurrently herewith.

Surrounding the motor 25 is a cooling means 40 to insure that the motor does not become overheated during service. This cooling means comprises two elements, first, a heat shield 41 vertically positioned at one side of the motor closely adjacent thereto, and secondly, a semi-circular collar 42 encircling the remaining sides of the motor adjacent the lower portion thereof and just outside the blower inlet of the housing 28 as is best seen in FIGURE 1. The particular construction and function of this cooling means is not fully discussed here as it is disclosed and claimed in my copending application Serial No. 486,928 entitled “Cooling Means For Blower Motor” which was also filed concurrently herewith.

The lower blower housing 28 has a scroll-shaped configuration with a tangential exhaust duct 44 that is rearwardly directed into a plenum chamber 46 at the rear of the hood shell 20. A spring biased back draft damper 45 is located within the mouth of the exhaust duct 44. The plenum chamber 46 is of generally rectangular box-like configuration formed by walls which will now be described. First looking at FIGURE 5, which is a perspective showing of the rear portion of the hood shell 20, it will be clear that there is a rectangular opening in the top wall of the hood shell, and a similar shaped opening 48 in the rear wall of the hood shell. These two openings are disposed adjacent the junction of the top and rear walls to form a single notched aperture 49 in the hood shell.

As best seen in FIGURE 1, there is an angular cover plate 50 that is adapted to close the single aperture 49 in the hood shell and thereby form two walls of the plenum chamber 46. This cover plate 50 is provided with an air exhaust opening 51 in one of its walls to serve as a discharge outlet from the hood.

Turning back to a consideration of FIGURE 5 there are also fixed walls in the hood shell forming an angular base plate 53 arranged in opposition to the angular cover plate 50. For example, there is a lower horizontal wall 54 and a vertical wall 55. Notice that the vertical wall 55 includes an air inlet opening 56 that is adapted to receive the exhaust duct 44 of the blower housing 28 as is best seen in FIGURE 1. Thus, the angular cover plate 50 and the angular base plate 53 establish four walls of the plenum chamber 46. Two additional walls are necessary to close the ends of the chamber and this is provided by a pair of end caps 57, 58, best seen in FIGURE 4, that are mounted within the cover plate 50 just out-side the exhaust opening 51. These end caps are adapted to become seated on the base plate 53 as is best seen in FIGURE 1. Notice that the locations of compartments formed by the horizontal wall 54 and vertical wall 55 of the base plate 53 are stepped inwardly slightly as at 60 and 61 respectively as seen in FIGURE 1. Also the end caps 57 and 58 are fitted to conform to the stepped contour of the base plate 53 as is clear from FIGURE 1. A curved air-turning vane 59 of thin sheet metal is used in the plenum chamber when the cover plate 50 is positioned for top discharge as is illustrated in FIGURE 1. This vane is held in position by a simple tab and slot connecting means at the four the motor rear, where the tabs are carried by the vane 59 and mating slots are formed in the cover plate and end caps.

Comparing FIGURES 3–5 it will be clear that the width of the base plate 53 is less than the width of the single aperture 49 in the hood shell, and that the width of the cover plate 50 is greater than the width of the aperture 49. This facilitates the ease of installing the cover plate from outside the hood by inserting the cover plate down through the top of the aperture 49 and sliding it into the hood shell until the other end of the cover plate is able to drop into the shell. Then the cover plate may be slid in the opposite direction towards a generally central position as seen in FIGURE 3. Notice that the rear wall of a hood shell 20 is formed by a pair of individual plates 60 and 61 which are attached to the hood shell by fastening screws 62. The screws adjacent the aperture 49 serve as limit means to restrict the movement of the cover plate 50. Hence, to remove the cover plate it is necessary to first remove certain of the fastening screws 62 which would otherwise interfere with such movement.

As mentioned previously, one wall of the angular cover plate 50 is provided with an exhaust opening 51. Positioned in this opening is a duct-connecting collar 64 which is provided with a rectangular shaped flange 65 that protrudes through the exhaust opening 51. Two of the opposite sides of the collar are each provided with a bracket member 66 within the cover plate 50, as best seen in FIGURE 6. Each bracket is furnished with a stud member 67 having a ball-tipped pin 68. This stud member cooperates with an elongated C-shaped spring clip 69 which is formed on the back side of the cover plate adjacent the exhaust opening 51. Attention is drawn to the fact that the collar 65 is smaller in outside dimension than the opening 51 so that it is capable of moving within the opening, especially in a front-to-back direction that is transverse to the longitudinal axis of the cover plate 50. Since the spring clip 69 is elongated, the stud member 67 may be held by the spring clip 69 is elongated, the stud member 67 may be held by the spring clip 69 in many different positions. Moreover, it is possible to angle the collar within the opening 51 if this is necessary in order to make the flange 65 of the collar with the wall mounted ductwork.

It should be understood by those skilled in this art that in order to slide the free-standing range into the kitchen counter opening and beneath the kitchen cabinet it may be necessary to lower the duct-connecting collar 64 so that the collar would not strike the cabinet. Once the range is in position, the collar 64 should then be raised. This is effected by first removing the shutter 12 of the hood as well as the motor-blower unit 24 and then by reaching through the opening 56 in the plenum chamber pushing the collar upwardly until the ball-tip 68 of the stud is captured by the spring fingers of the clip member 69.

Modifications of this invention will occur to those skilled in this art therefore it is to be understood that this invention is not limited to the particular embodiments disclosed but that it is adapted to cover all modifications which are within the true spirit and scope of this invention as claimed.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A kit of parts comprising walls forming a hood shell with a top wall, a rear wall, opposite side walls and a front wall having an air inlet opening, a first rectangular opening in the top wall and a second rectangular opening in the rear wall, said first and sec-
and openings both being disposed adjacent the junction of the top and rear walls to form a single aperture in the shell, an angular cover plate for mounting in the hood shell through the said aperture, said cover plate having an air exhaust opening in one face thereof, fixed walls in the hood shell forming an angular base plate arranged in opposition to the angular cover plate, one wall of the base plate being a vertical wall with an air inlet opening, and a pair of spaced parallel end caps mounted within the cover plate just outside the said exhaust opening and adapted to become seated on the base plate for forming a plenum chamber of box-like configuration using the base plate and the cover plate with integral end caps, and a motor-driven air mover located within the hood shell and discharging through the air inlet opening of the base plate, the base plate being shorter in width than the width of the said shell aperture, while the cover plate is longer in width than the width of the shell aperture for ease in installing the cover plate into the hood shell through the aperture in the shell, the cover plate being transversely adjustable within the hood shell, and a duct-connecting collar adjustable mounted in the air exhaust opening of the cover plate to be movable in a direction perpendicular to the transverse direction of adjustability of the cover plate.

2. A kitchen ventilating hood comprising walls forming a hood shell that is adapted to be exhaustible either out through a vertical rear wall or up through a horizontal overhanging wall of the kitchen construction, a top wall of the shell having a first rectangular opening, and a rear wall of the shell having a second rectangular opening, said first and second openings communicating with each other to form a single notched aperture in the top rear edge of the shell, an angular cover plate for closing the notched aperture, one face of the cover plate having an air exhaust opening, and a duct-connecting collar loosely positioned within the said air exhaust opening, and a snap-acting fastening means for supporting the collar from the cover plate, one portion of the said fastening means being of elongated shape in a direction perpendicular to the longitudinal axis of the cover plate so that the position of the collar may be adjusted with respect to the cover plate, fixed walls within the hood shell forming an angular base plate arranged in opposition to the angular cover plate, one wall of the base plate being a vertical wall having an air inlet opening formed therein, and a pair of spaced end caps formed on the inner side of the cover plate, one cap being at each side of the said air exhaust opening to close the space between the cover plate and base plate and form a box-like plenum chamber, and a motor driven air handling device supported within the hood shell for collecting and discharging air through the said air inlet opening of the plenum chamber.

4. A kitchen ventilating hood as recited in claim 3 wherein the notched aperture is wider than the base plate but narrower than the cover plate, and the cover plate is substantially symmetrical so the cover plate is reversible and may be installed through the notched aperture with its air exhaust opening in either the top of the hood shell or in the rear of the hood shell.

5. A kitchen ventilating hood as recited in claim 4 wherein the duct-connecting collar is provided with one set of holding flanges for engaging the sides of the air exhaust opening in the cover plate and another set of duct-engaging flanges that protrude through the said air exhaust opening, and wherein the said snap-acting fastening means is a relatively slidable spring clamping means which allows the position of the collar to be adjusted.

6. A kitchen ventilating hood as recited in claim 5 wherein the said relatively slidable spring clamping means between the collar and the cover plate is represented by a mechanism at two of the opposite sides of the collar, where each mechanism has a male member on either the collar or cover plate and a mating spring socket on the other member.

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