

[54] **SELF-CONTAINED AIR
CONDITIONING UNIT**

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62/429

[57] **ABSTRACT**

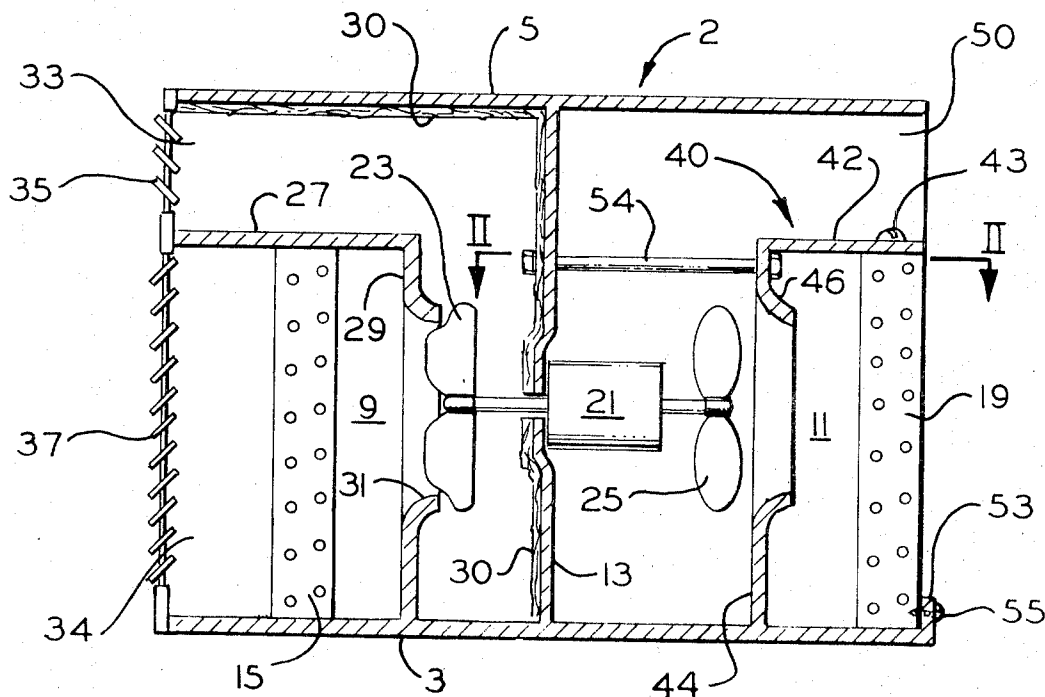
A self-contained air conditioning unit adapted for passage of air into and out of the condenser section of the unit through the back fence thereof, the condenser air inlets being arranged to provide improved fan loading for increased condenser efficiency and minimal sound generation.

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UNITED STATES PATENTS

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4 Claims, 2 Drawing Figures



SELF-CONTAINED AIR CONDITIONING UNIT

BACKGROUND OF THE INVENTION

It is common practice to mount self-contained air conditioning units in a window or through the wall of the building to be served by the air conditioning unit. A self-contained air conditioning unit having the condenser air inlet and the condenser air discharge on the back face thereof to provide a casing having solid sides, top and bottom may be installed in a variety of locations including relatively thick walls which might interfere with the intake or discharge of condenser air from the side, top, or bottom of the casing. However, passage of air into and out of the back face of the casing may result in less than optimum air flow through the condenser section due to the restricted inlet and discharge area ordinarily available.

SUMMARY OF THE INVENTION

This invention relates to an air conditioning unit including a casing having a first partition therein dividing the casing into an interior compartment and an exterior compartment. A refrigeration system including a compressor, a condenser, expansion means and an evaporator forming a closed circuit is disposed within the casing, the compressor and condenser being located in the exterior compartment; the evaporator being located in the interior compartment. The condenser is disposed adjacent the rear face of the casing to provide a first condenser air inlet between the top of the condenser and the bottom surface of the top panel of the casing and a second condenser air inlet between the side of the condenser and the inside surface of one side of the casing. A fan is provided for cooperation with an orifice partition for drawing ambient air through the condenser air inlets and discharging the air across the condenser for cooling the refrigerant within the condenser.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view in section of a self-contained air conditioning unit; and

FIG. 2 is a view taken along line II—II of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, there is illustrated a self-contained air conditioning unit including a casing 2 comprising a base pan 3, a top panel 5 and side panels 7. The casing is divided into an interior compartment 9 and an exterior compartment 11 by a vertical partition member 13.

A compressor 17, a condenser 19, expansion means (not shown) and an evaporator 15 are located within the casing and connected to form a closed circuit refrigeration system, the compressor 17 and condenser 19 being located within the exterior compartment 11, evaporator 15 being located within interior compartment 9. A double ended fan motor 21 mounted on partition 13 is provided with an evaporator fan 23 and a condenser fan 25 for passage of air across evaporator 15 and condenser 19. Means, (not shown) associated with fan 25 may be provided for disposal of condensate from evaporator 15.

The interior compartment 9 is provided with a horizontal partition 27 and a vertical partition 29, par-

tion 29 having a fan orifice 31 formed therein. Partition 29 cooperates with partition 13 and partition 27 cooperates with top panel 5 to form a L-shaped plenum within compartment 9 for discharging conditioned air into the area being conditioned through an outlet 33 formed in the front of the casing. Suitable sound absorbent material such as fiberglass mats 30 may be secured to partition 13 and top panel 5 within the L-shaped plenum to absorb sound energy generated by fan 23.

It can be seen by reference to the drawing that air drawn through inlet opening 34 and evaporator 15 by fan 23 is discharged through the L-shaped plenum and outlet 33 into the area served by the air conditioning unit. A suitable outlet grille 35 covering outlet 33 and a suitable inlet grille 37 covering inlet 34 are provided to cover the front of the unit.

The exterior compartment containing compressor 17, condenser 19 and a fan motor 21 is provided with a fan orifice partition 40. The partition includes a horizontal top wall 42, a vertical wall 44 having a fan orifice 46 formed therein and a second vertical wall 48. The top wall 42 of the partition cooperates with the top panel 5 of the casing to provide an air inlet 50 above the top portion of condenser 19. The vertical portion 48 of the partition cooperates with the side wall 7 of the casing to provide an air inlet 52 between the side of condenser 19 and the wall of the casing. The bottom edges of vertical wall 44 and vertical wall 48 may be secured to base pan 3 by any suitable means. Top wall 42 may be secured to the top of condenser 19 by suitable means such as screw 43 and vertical wall 48 may be secured to the side of condenser 19 by suitable means such as screw 49. A brace 54 interconnecting partition 40 and vertical center partition 13 is provided for locating the top portion of partition 40 within the casing.

A lip 53 is formed on base pan 3 for receiving screws 55 for securing the bottom of condenser 19 to the base pan, the top of the condenser being secured and positioned by top wall 42 which in turn is located and secured by brace 54.

It can be seen from the foregoing that the air inlet 50 allows air to be drawn into the upper portion of the fan and also allows air to pass into the compartment on the compressor side of the fan, while inlet 52 allows air to pass into the compartment on the side of the fan opposite the compressor. Air is thus supplied to the fan around substantially the entire periphery thereof. This air distribution equalizes the loading of the fan, thereby decreasing fan noise and increasing fan efficiency to obtain optimum air flow into and out of the back face of the air conditioning unit.

While I have described a preferred embodiment of my invention, it should be understood that the invention is not limited thereto, but may be otherwise embodied within the scope of the following claims.

I claim:

1. In an air conditioning unit, the combination of:

A. a casing;

B. a first partition within said casing dividing said casing into an interior compartment and an exterior compartment;

C. a refrigeration system including a compressor, a condenser, expansion means, and an evaporator connected to form a closed circuit disposed within said casing, said condenser being disposed in said

exterior compartment adjacent the rear face of said casing and said evaporator being disposed in said interior compartment;

D. a fan orifice partition disposed in said exterior compartment adjacent said condenser to provide a first condenser air inlet between the top of said condenser and the top of said casing and a second condenser air inlet between the side of said condenser and the side of said casing; and

E. fan means associated with said orifice partition for drawing ambient air through said inlets to supply said fan means with air from substantially all directions around the fan, and for discharging the air across said condenser for cooling said condenser.

2. A unit according to claim 1 wherein said orifice partition includes first and second substantially vertical walls and a substantially horizontal wall, said first substantially vertical wall being disposed between said first partition and said condenser, said first wall having a fan orifice formed therein, said fan means cooperating with said orifice for passing air through said orifice toward said condenser, said horizontal wall interconnecting the top of said first vertical wall with said condenser

and being spaced from the top of said casing to provide an air inlet to said fan between the top of said condenser and the inner surface of the top of said casing, said second vertical wall interconnecting one side of said condenser and the vertical edge of said first wall, said second wall being spaced from the side of said casing to provide an inlet therebetween for passage of air from the back face of the casing into said exterior compartment.

3. A unit according to claim 2 further including support means interconnecting the top of said first partition with the top of said orifice partition to position the upper portion of said condenser and said fan orifice partition relative to said first partition; and,

an upstanding lip formed on the bottom of said casing, the bottom of said condenser being affixed to said lip for positioning the lower portion of said condenser relative to said casing.

4. A unit according to claim 3 wherein the side of said condenser opposite said second vertical wall is disposed in sealing engagement with the side of said casing to prevent passage of air therebetween.

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