

March 23, 1965

T. C. BRANDT ETAL

3,174,541

AIR CONDITIONING UNIT

Filed July 12, 1963

FIG. 1

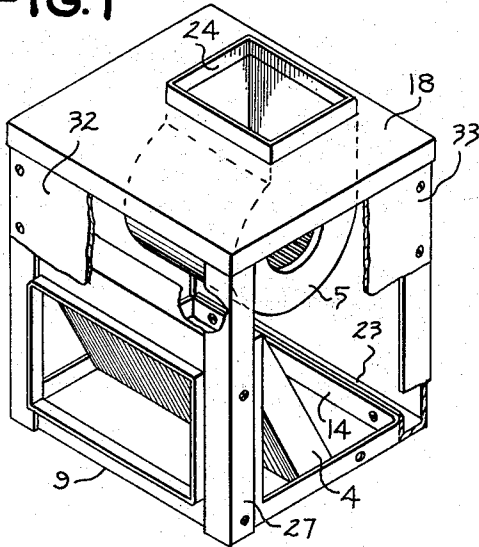


FIG. 2

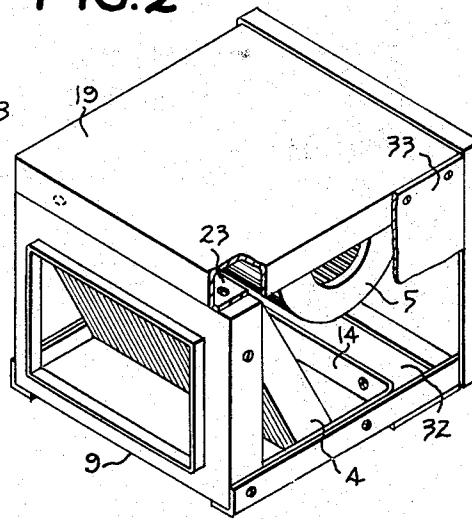
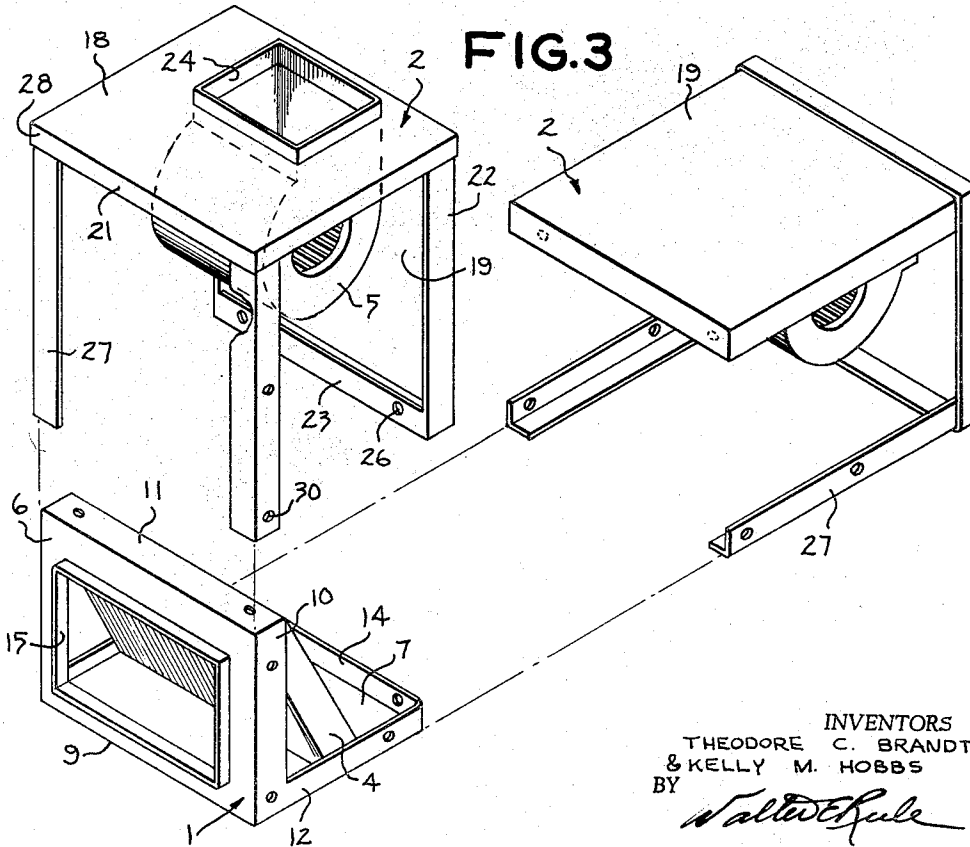


FIG. 3



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AIR CONDITIONING UNIT

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Filed July 12, 1963, Ser. No. 294,529

2 Claims. (Cl. 165-122)

The present invention relates to an air conditioning unit and is more particularly concerned with a convertible unit adapted for discharge of conditioned air in either a horizontal or a vertical direction.

It is customary for manufacturers of air conditioning units to make two models of the given performance capacity size in order to meet different installation requirements. One of these units is designed for vertically upward air discharge and the other unit for horizontal air discharge.

The present invention has as its primary object the provision of an air conditioning unit which by simple rearrangement of two major components thereof can provide the functions of both the vertical and horizontal discharge units.

A more specific object of the invention is to provide an air conditioning unit including a first component including means for conditioning the air passing through the unit and a second component including means for passing air through the conditioning means, the two components being adapted to be interconnected for discharge of the conditioned air in either the horizontal or the vertical direction.

Additional objects and advantages of the invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

In accordance with one embodiment of the present invention, there is provided an air conditioning unit comprising a rectilinear casing including top, bottom and opposed ends, the casing being formed in part of a heat exchanger component and blower component. The heat exchanger component is of generally L-shaped construction and includes a vertical wall adapted to form at least part of one end of the casing and a horizontal wall adapted to form at least part of the bottom of the casing. The vertical wall of this component has an air opening therein and a heat exchanger through which the air to be conditioned passes is disposed in front of the opening. The blower component of the unit comprises a first wall and a second wall adapted to form the top and opposite end. The first wall has an air outlet opening therein and a blower unit is supported thereon for discharge of air through the air outlet opening. The two components are adapted to be interchangeably connected whereby the first wall of the blower component will form either the top or the opposite end of the casing for discharge of air in either a vertical or a horizontal direction.

For a better understanding of the invention reference may be had to the accompanying drawing in which:

FIGURE 1 somewhat schematically illustrates the air conditioning unit of the present invention arranged for vertical discharge of air;

FIGURE 2 similarly illustrates the unit arranged for horizontal discharge of air; and

FIGURE 3 somewhat schematically illustrates the manner in which the two components of the air conditioning unit are positioned to be interchangeably connected for

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providing either of the units illustrated in FIGURES 1 and 2.

The embodiment of the invention illustrated in the accompanying drawing comprises a heat exchanger component 1 and a blower component 2, the blower component 2 being designed to be interchangeably connected to the heat exchanger component 1 to provide an air conditioning unit for vertical discharge of conditioned air as illustrated in FIGURE 1 or a unit for horizontal discharge of conditioned air as illustrated in FIGURE 2. In either case the major components 1 and 2 combine to provide or form the top, bottom and two ends of a generally rectilinear casing enclosing the essential elements of an air conditioning unit as represented by a heat exchanger 4 and air moving means in the form of a blower 5. Such a unit comprises the indoor section of a split air conditioning system and is adapted to be connected by refrigerant conduits (not shown) to an outdoor section which normally contains the compressor and outdoor heat exchanger components of the refrigerating system.

The heat exchanger component 1 is of a unitary generally L-shaped construction and includes a vertical wall 6 forming at least part of one end of the unit casing and a horizontal wall 7 forming at least part of the bottom of the casing. Thus, this component also forms a horizontal bottom corner 9 of the unit casing.

The walls 6 and 7 may be formed, for example, from a single sheet of metal of suitable gauge bent or formed to provide the vertical wall 6 and the horizontal wall 7 as well as strengthening and attaching flanges about the peripheral edges of the walls 6 and 7. More specifically the vertical wall 6 includes inwardly extending flanges 10 on the opposite sides thereof and a horizontally extending flange 11 along the top edge thereof. The horizontal wall 7 includes upwardly extending side flanges 12 and an upwardly or vertically extending flange 14 along the inner or transverse edge of the horizontal wall 7.

The component 1 also includes an air inlet opening 15 in the wall 6 through which returned air from the enclosure being conditioned passes into the unit. The heat exchanger 4 is mounted in front of the opening 15 and is preferably inclined for the proper drainage of condensate from this heat exchanger when it operates as an air cooling means or evaporator. In the preferred embodiment of the invention, the heat exchanger 4 extends from the horizontal flange 11 downwardly to a point adjacent the bottom wall 7 intermediate the flange 14 and the corner 9. It will be understood, of course, that component 1 may include a drain pan beneath the heat exchanger 4 and means for discharging condensate collecting in the drain pan to a point exterior of the air conditioning unit. Alternatively, the horizontal wall 7 with the upturned flanges 12 and 14 may be employed as a pan for receiving this condensate.

The blower unit 2 comprises a first wall 18 and a second wall 19 formed of sheet metal or the like and extending at right angles to one another. The wall 18 includes flanges 20 and 21 on the respective sides and free edge of this wall while the wall 19 is provided with strengthening flanges 22 on its side edges and a U-shaped or return bent flange 23 on its free or transverse edge. As will be more fully described hereinafter the U-shaped flange 23 provides means for securing or attaching the blower component to either the flange 11 or the flange 14 of the heat exchanger component 1.

The wall 18 also has an air outlet opening 24 therein and the blower 5 is mounted on the wall 18 for discharge

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of air through this outlet opening. It will be understood, of course, that the blower unit 2 also includes a motor for driving the blower and suitable controls for controlling the operation of the motor, these elements have been omitted from the drawing for clarity.

The blower component 2 is adapted to be connected to the heat exchanger component 1 with the wall 18 having the air outlet opening 24 forming either the top wall of the casing or the end wall of the casing opposite the casing wall defined, at least in part, by the vertical wall 6 of the heat exchanger component 1.

When the two components are assembled as shown in FIGURE 1 of the drawing to provide a unit having a vertical discharge air flow the wall 18 forms the top of the unit while wall 19 forms the wall opposite the vertical wall 6 of the component 1. The flange 23 then provides means for securing the wall 19 to the vertical flange 14 on the component 1 as illustrated in FIGURE 1 of the drawing, there being provided in each of these flanges a plurality of matching holes 26 for receiving bolts or equivalent fastening means. In order to secure the top wall 18 of the blower component 2 to the vertical wall 6 of the component 1, the blower component 2 is provided with spaced right angle straps or legs 27 extending from the outermost corners 28 of the top wall 18 substantially parallel to the wall 19. These straps, as shown in FIGURE 1 of the drawing, are adapted to overlie the side edge flanges 10 and the adjacent face portions of the wall 6 and both the flanges 10 and the straps 27 are provided with suitable matching holes 30 for receiving fastening bolts or the like.

The dimensions of the casing are such as to provide sufficient space for the housing of the heat exchanger 4, the blower 5 and the remaining components of the unit referred to hereinbefore. In the illustrated embodiment of the invention, the wall 19 is of a greater length than the wall 18 and accordingly when the two components 1 and 2 are assembled as illustrated in FIGURE 1 of the drawing, there is a space remaining between the upper edge of the vertical wall 6 and the wall 18. This space is closed by removable panel 32.

Likewise, panels 33 are provided for forming the opposite sides of the casing. These panels 33 are also removable to provide access to the interior of the casing for servicing the operating parts contained therein.

When the components 1 and 2 are assembled for horizontal air discharge, as illustrated in FIGURE 2 of the drawing, the flange 23 on the transverse wall 19 is suitably secured to the horizontal flange 11 along the top edge of the wall 6 while the flanges 27 engaging the side flanges 12 on the bottom wall 7 of the component 1 are secured to these flanges. The removable panels 32 and 33 are then employed to close the opposite sides of the horizontal unit while the panel 32 is used to complete the bottom wall of the casing as illustrated in FIGURE 2. Since the two units illustrated in FIGURES 1 and 2 have the same relative dimensions, the panels 32 and 33 are of the proper size to perform their functions in either structure.

While there has been shown and described a particular embodiment of the present invention, it is to be understood that the invention is not limited thereto and it is intended by the appended claims to cover all such modifications as fall within the true spirit and scope of the invention.

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

1. An air conditioning unit comprising a rectilinear casing including top, bottom and opposed ends, said casing comprising a heat exchanger component and a blower component, said heat exchanger component being of generally L-shaped construction and including a vertical wall forming a part of one opposed end of said casing and a horizontal wall forming a part of the bottom of said casing, said vertical wall having an air inlet opening therein,

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a heat exchanger supported on said horizontal wall in front of said opening, a blower component comprising a first wall and a second wall, said first wall having an air outlet opening therein and means for interchangeably connecting said blower component to said heat exchanger component whereby said first wall forms either the top or the other opposed end of said casing, said connecting means including a pair of legs having one ends thereof secured to the free corners of said first wall and the other ends thereof extending parallel to said second wall for overlapping engagement with said horizontal wall of said heat exchanger component when said first wall forms the other opposed end of said casing and with said vertical wall when said first wall forms the top of said casing, a first removable panel mounted across said legs adjacent said first wall, said first panel closing the remainder of said one opposed end of said casing when said first wall of said blower component forms the top of said casing and said first panel closing the remainder of the bottom of said casing when said first wall of said blower component forms the other opposed end of said casing, and second and third removable panels for closing the remaining two sides of said rectilinear casing.

2. Air conditioning unit comprising a rectilinear casing including a heat exchanger component and a blower component adapted to be interconnected to form a unit for vertical discharge of conditioned air or a unit for horizontal discharge of conditioned air,

said heat exchanger component being of L-shaped construction and forming a horizontal bottom corner portion of said casing and including a vertical wall forming a part of one end of said casing and a horizontal wall forming a part of the bottom of said casing,

said heat exchanger component walls having respectively inwardly and upwardly extending flanges about the peripheral edges of said component including a horizontal flange along the top edge of said vertical wall and a vertical flange along the transverse edge of said horizontal wall,

said vertical wall having an air inlet opening, an inclined heat exchanger in front of said opening extending from said horizontal flange to an intermediate portion of said horizontal wall,

said blower component comprising first and second interconnected walls extending at right angles to one another and adapted to interchangeably form the top and other end of said casing,

said first wall having an air outlet opening therein, a blower forming part of said blower component for discharge of air through said outlet opening,

said second wall having a U-shaped flange along the transverse edge thereof adapted to be connected to said horizontal flange of said heat exchanger component vertical wall when said components are assembled in one form for vertical discharge of conditioned air or to said vertical flange of said heat exchanger component horizontal wall when said components are assembled in a second form for horizontal discharge of conditioned air,

said blower component including a pair of legs having one end thereof secured to the free corners of said first wall and the other end thereof extending parallel to said second wall for overlapping engagement with the side edges of either said horizontal or vertical wall of said heat exchanger component when said components are respectively assembled in said one or said second form,

a first removable panel mounted across said legs adjacent said first wall, said first panel closing the remainder of said one end of said casing when said components are assembled in said one form for vertical discharge of conditioned air and said first panel closing the remainder of the bottom of said casing

when said components are assembled in said second form for horizontal discharge of conditioned air, and second and third removable panels forming the remaining two sides of both forms of said unit.

References Cited by the Examiner**UNITED STATES PATENTS**

2,282,373 5/42 Minkler et al. ----- 165—137 X
2,776,797 1/57 Suesserott ----- 126—110

3,020,820 2/62 Hopkinson et al. ----- 98—43 X

OTHER REFERENCES

5 Mueller Climatrol Publication, 2005 West Oklahoma Ave., Milwaukee 1, Wis., Form A569RD, received in the U.S. Patent Office on April 4, 1963; copy can be found in Group 380 of the U.S. Patent Office in 126/110A-1, all 4 pages relied upon.

CHARLES SUKALO, *Primary Examiner*.