United States Patent [19]

Woods

[11] **3,783,637**

[45] **Jan. 8, 1974**

[54] ROOM AIR CONDITIONER

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[22] Filed: **Mar. 6, 1972**

[21] Appl. No.: **231,905**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 21,105, March 19, 1970, abandoned.

[52] **U.S. Cl.** **62/427**, 62/262, 62/263, 62/429, 98/94

[51] **Int. Cl.** **F25d 17/06**

[58] **Field of Search** ..... 62/262, 263, 427, 62/261, 428, 429; 98/94 AC

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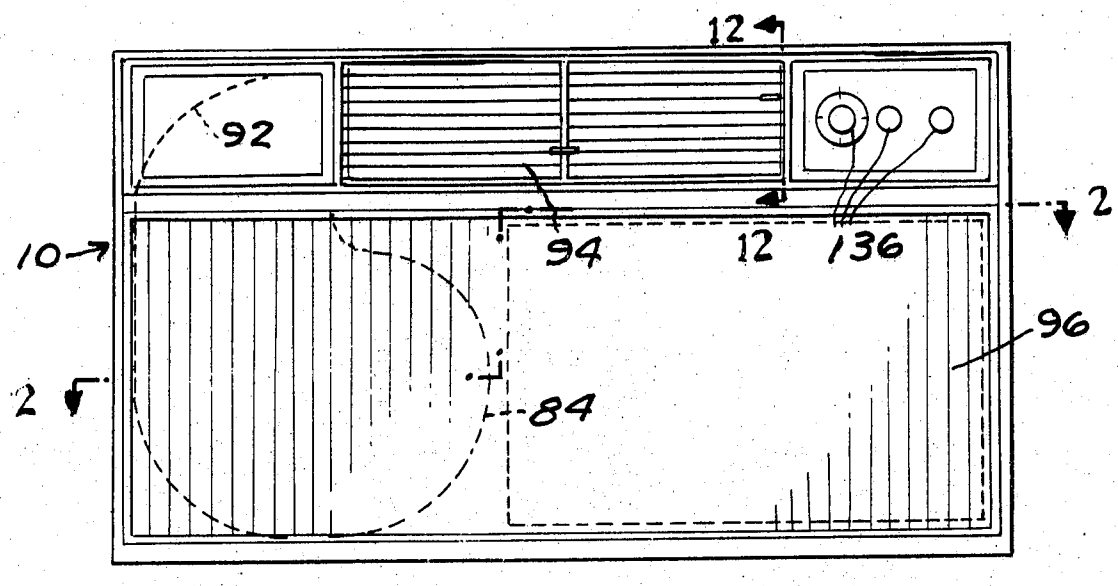
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Primary Examiner—William J. Wye
Attorney—Barnes, Kisselle, Raisch & Choate

[57] **ABSTRACT**

A room air conditioner having a relatively short front to back dimension made possible by a novel compact arrangement of the condenser, compressor and evaporator on the chassis of the unit in combination with a novel air flow pattern through the unit. The interior of the air conditioner casing is divided lengthwise by an upright partition into a rear compartment in which the condenser and compressor are located and a front compartment in which the evaporator and blower are arranged. The blower is of the axial intake, radial discharge type and has its inlet facing the partition rather than the front grille of the unit so as to reduce the noise incident to the high velocity air stream. The unit also includes a pair of ventilating doors on the partition arranged to be operated by a single manually operable control knob for selectively admitting outside air to the room and discharging room air to the outside. The front grille inside the room is provided with a novel air scoop and vane arrangement for directing the conditioned air effectively in the desired direction. The air conditioner also includes in the condenser compartment a slinger ring and deflector arrangement for picking up evaporator condensate and depositing it on the coils of the condenser to evaporate the condensate and discharge it from the unit with the condenser cooling air.

19 Claims, 19 Drawing Figures



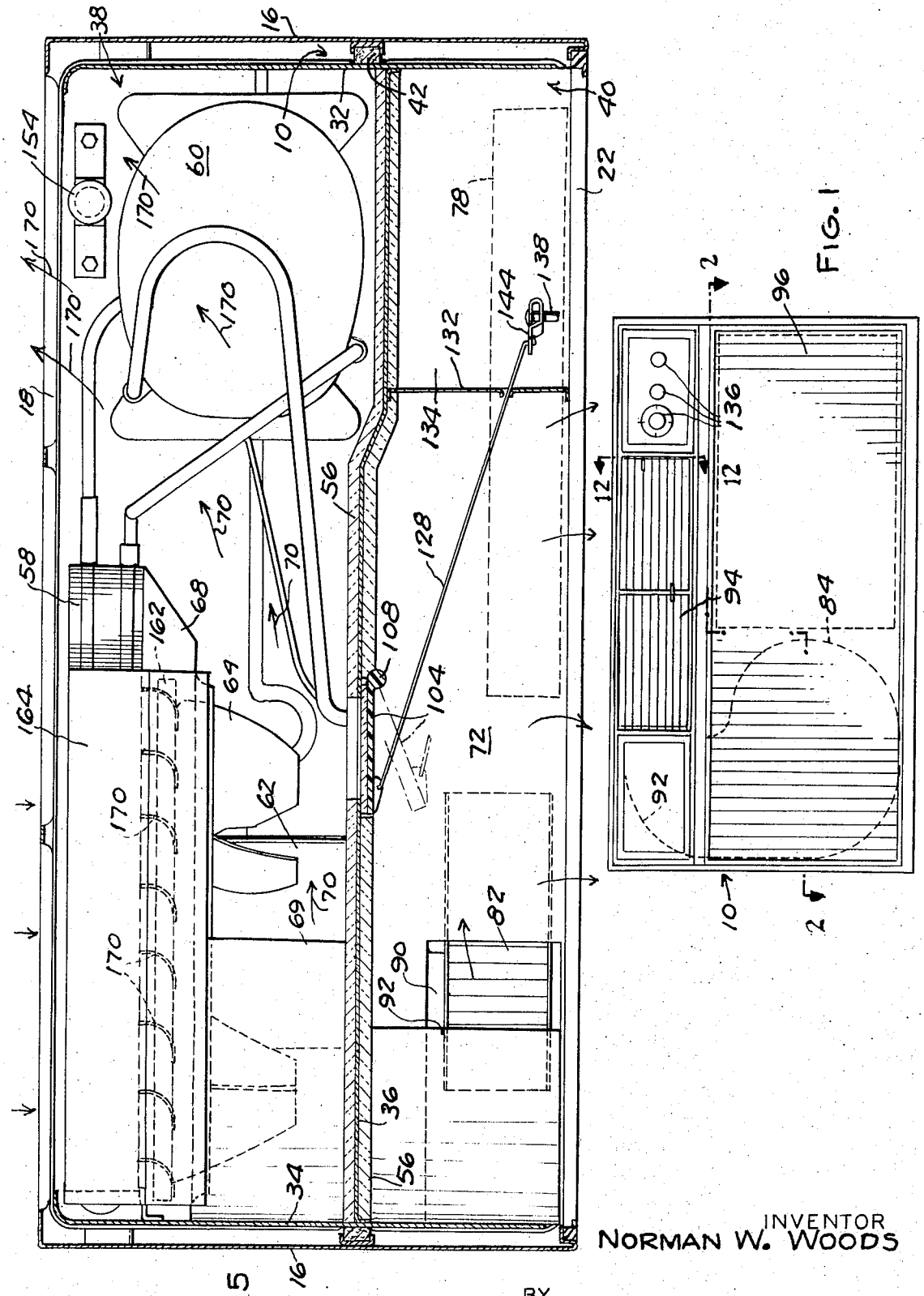


FIG. 1

FIG. 5

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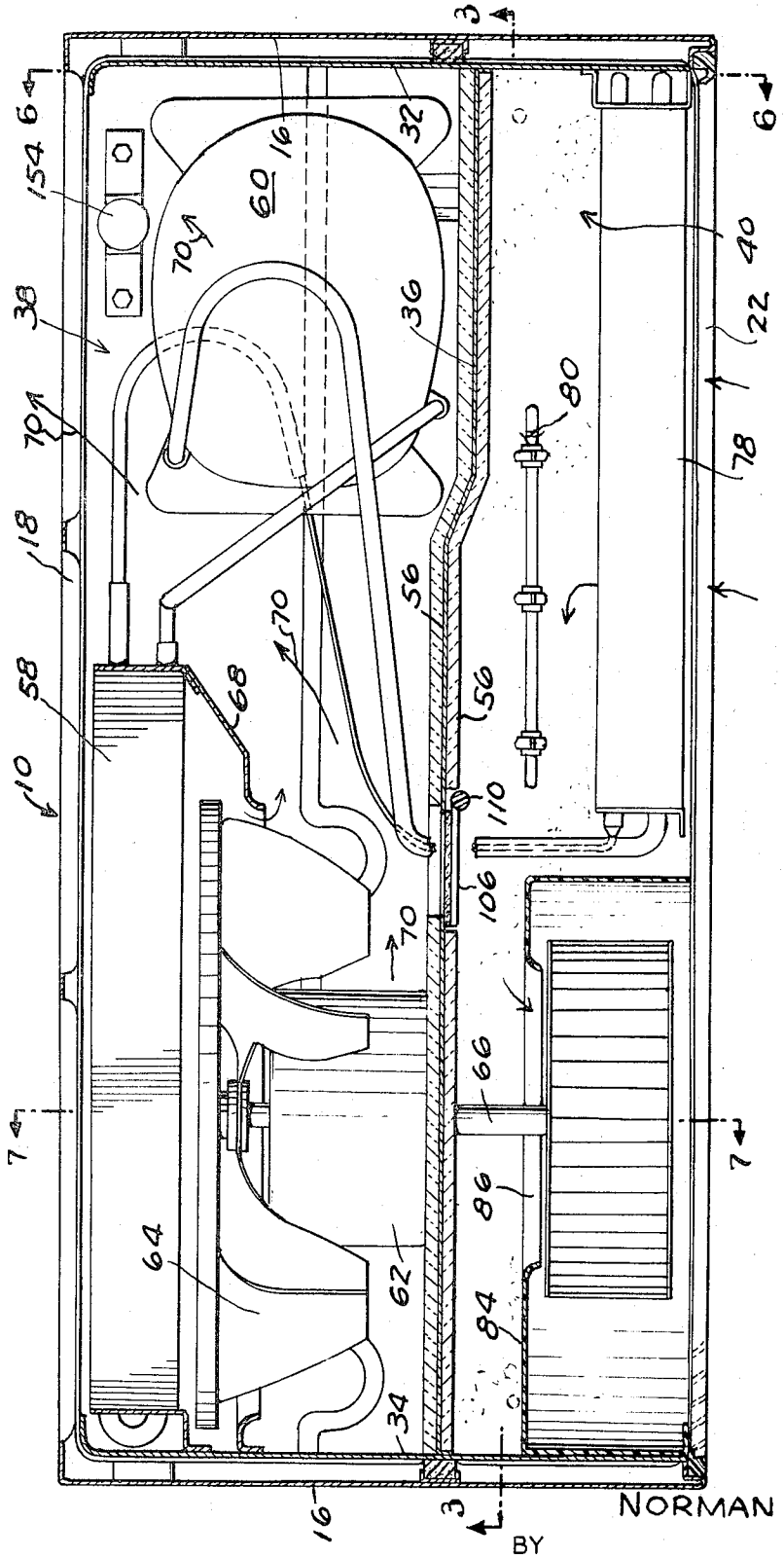
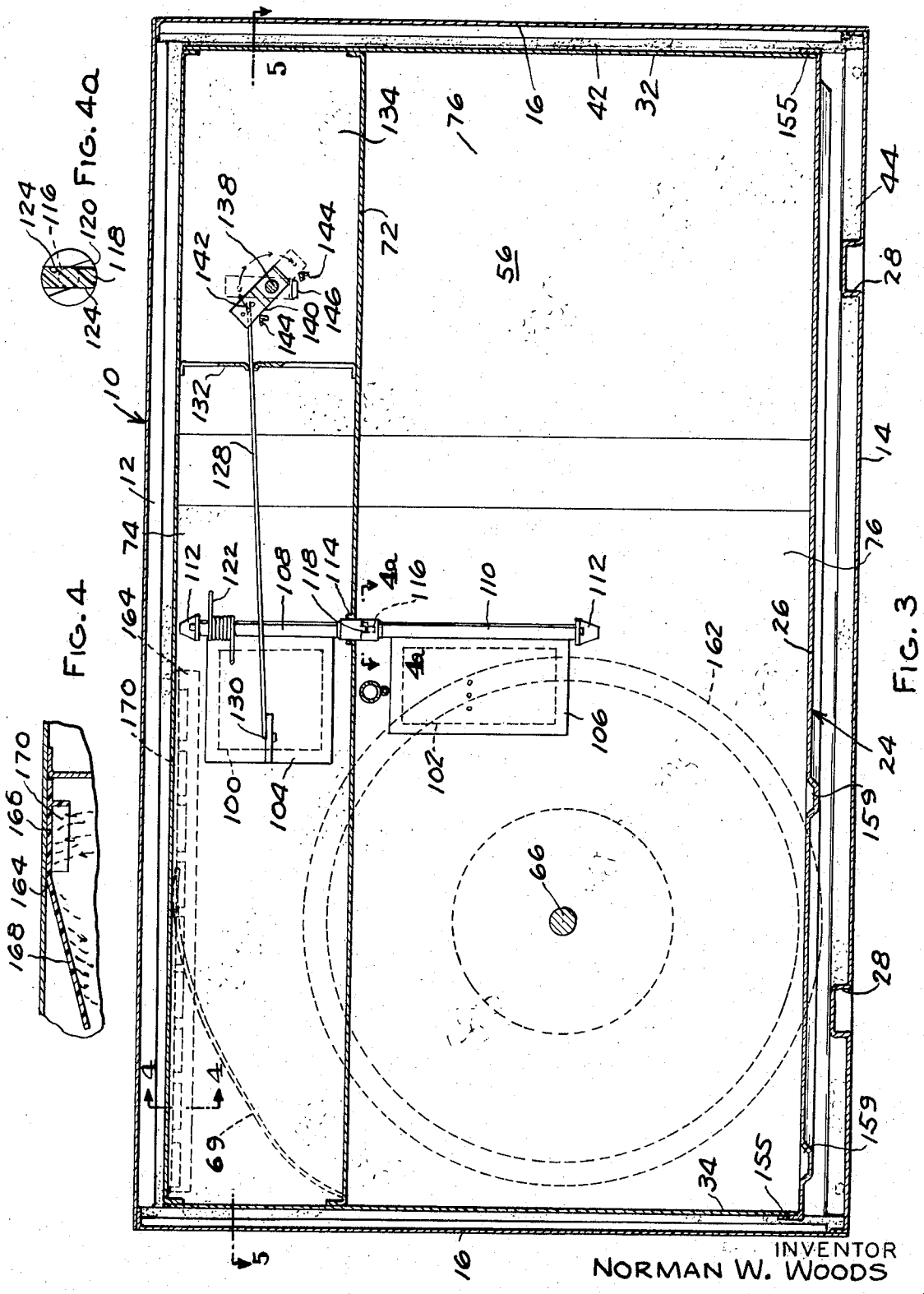


FIG. 2

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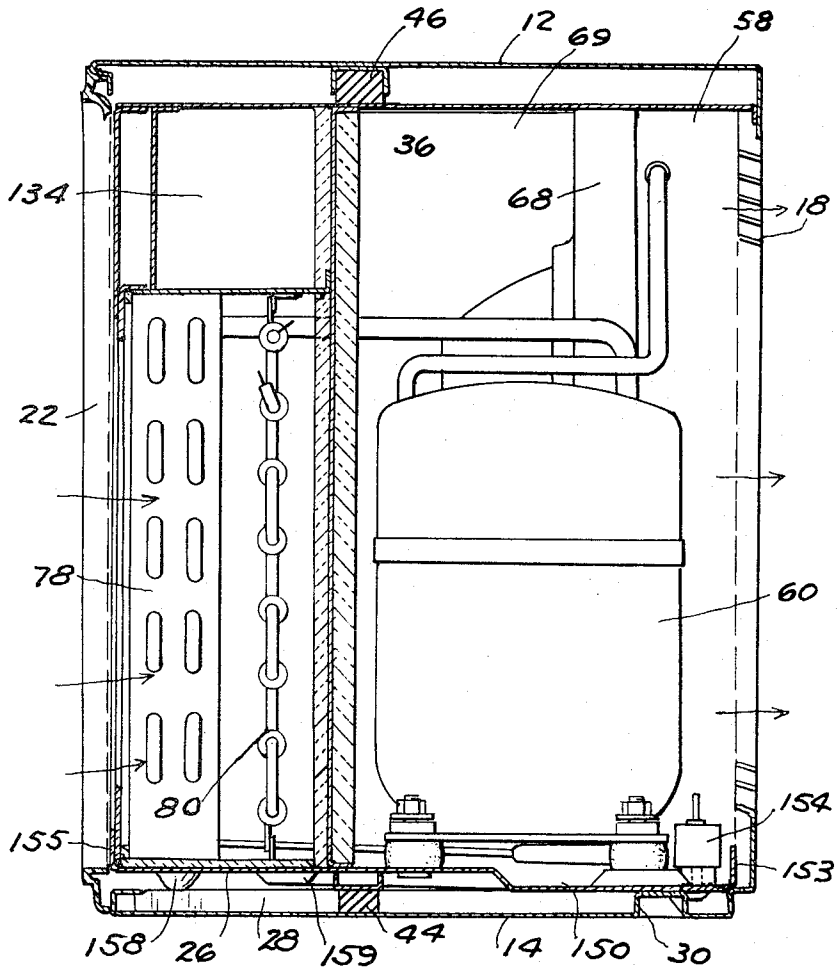


FIG. 6

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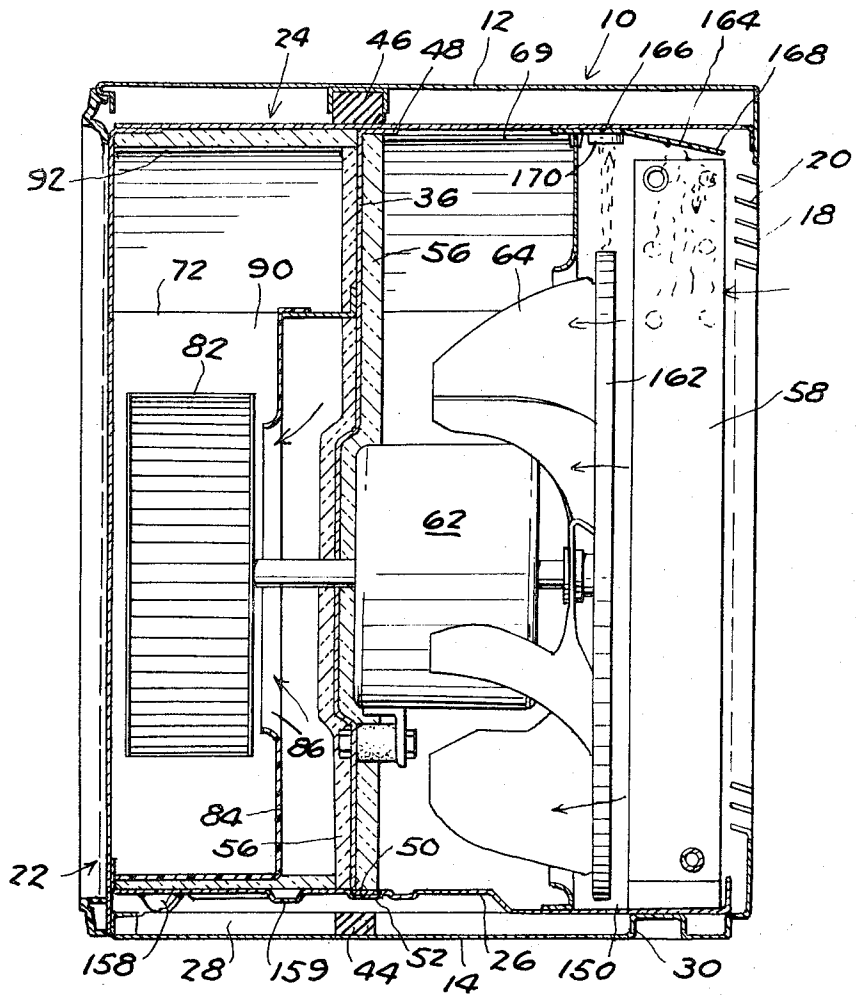


FIG. 7

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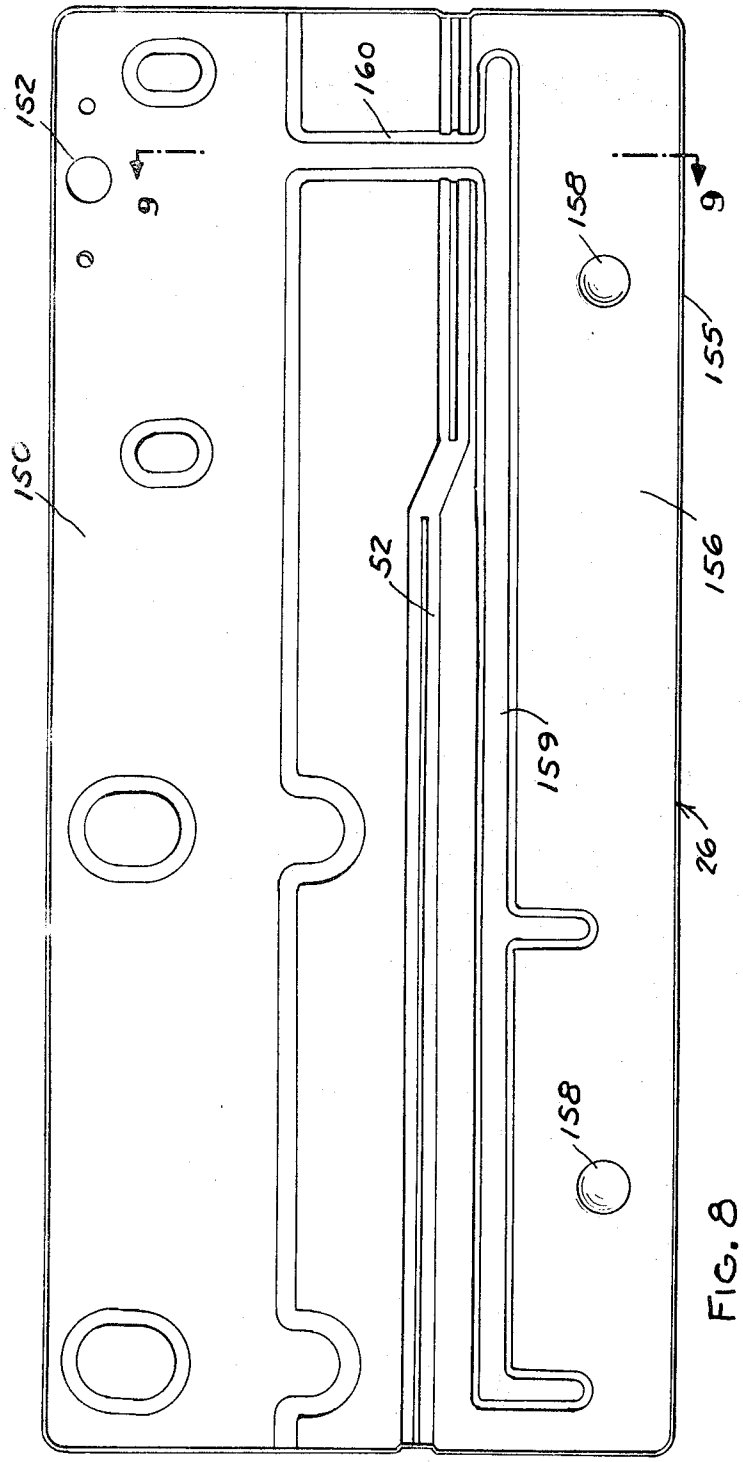


FIG. 8

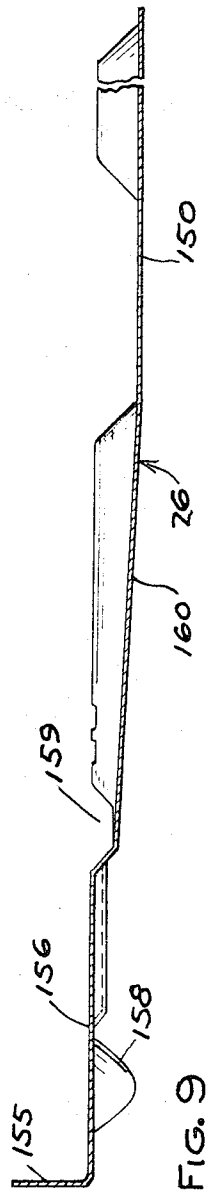


FIG. 9

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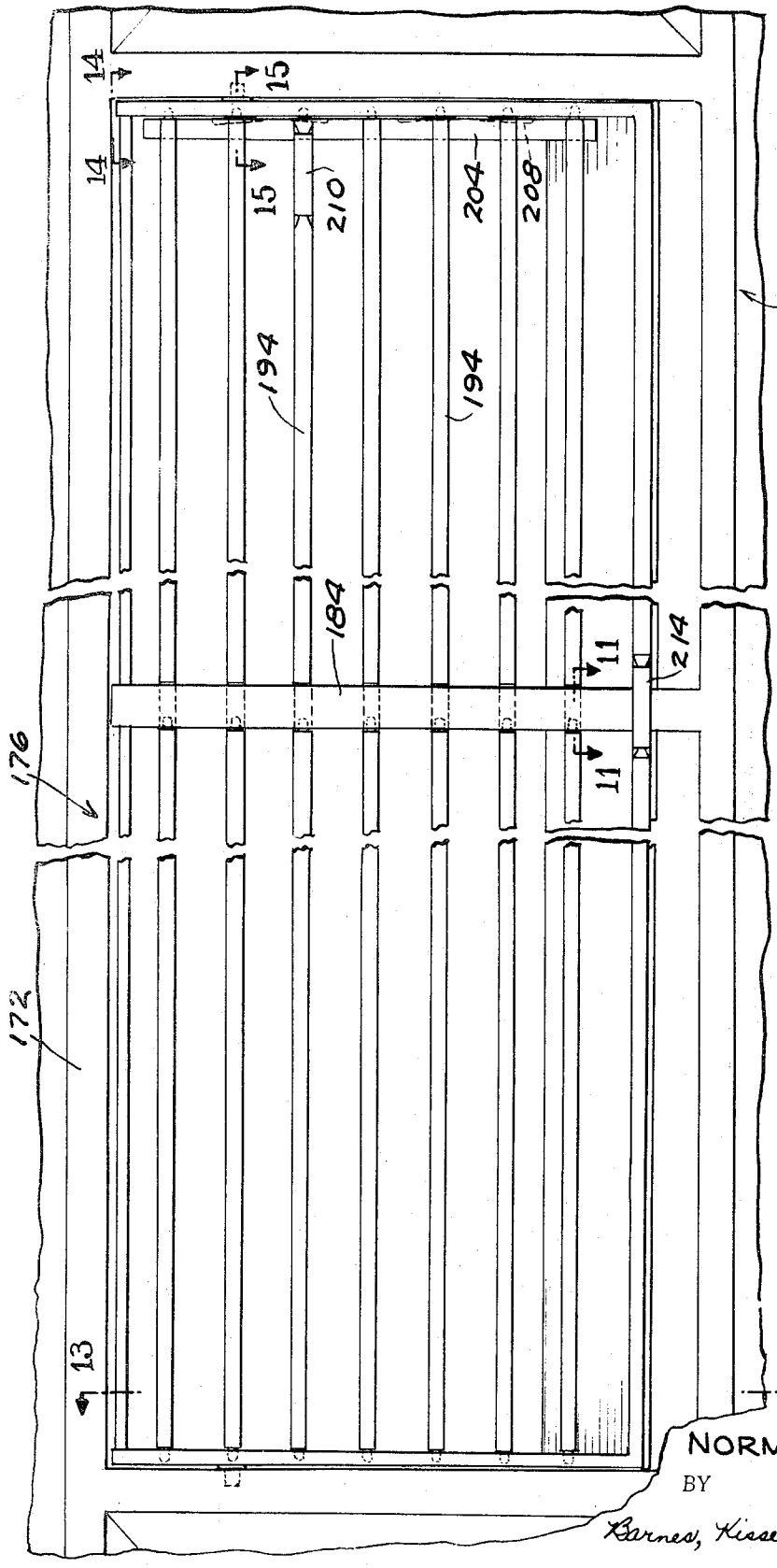


FIG. 10

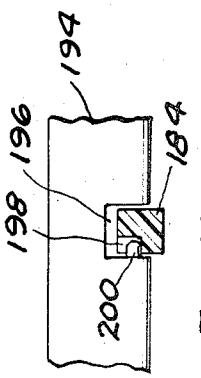


FIG. 11

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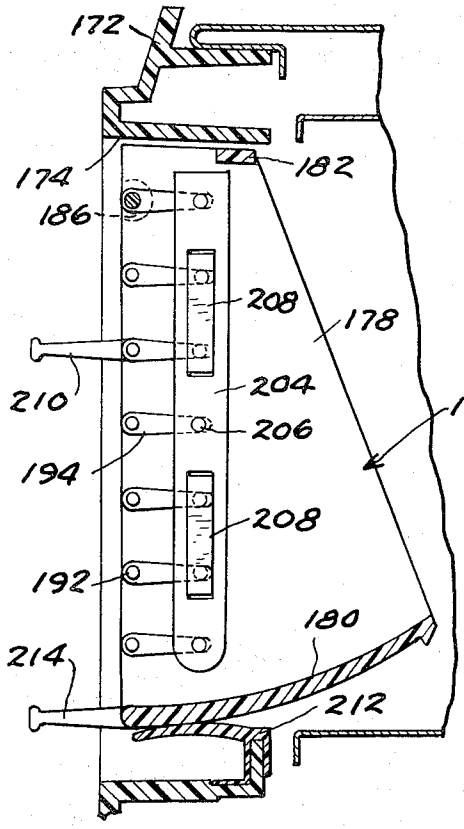


FIG. 12

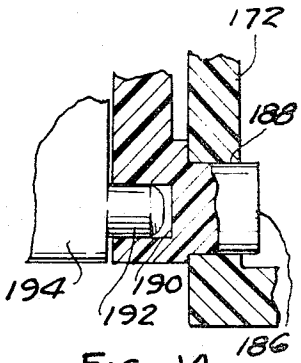


FIG. 14

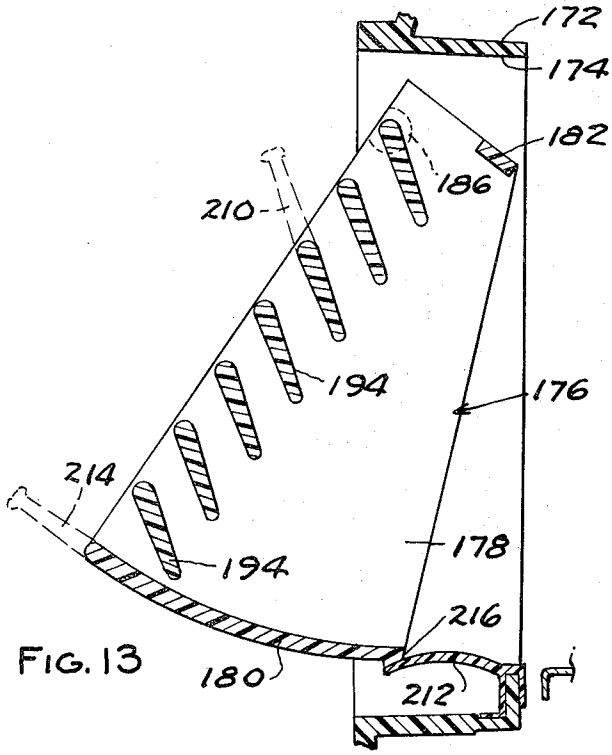


FIG. 13

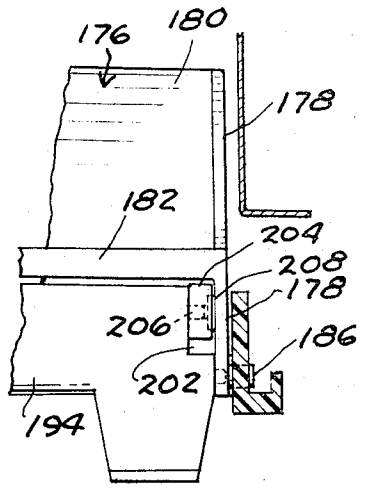


FIG. 15

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ROOM AIR CONDITIONER

This application is a continuation-in-part of my prior application Ser. No. 021,105, filed Mar. 19, 1970, entitled ROOM AIR CONDITIONER, now abandoned.

This invention relates to a room air conditioner of the type adapted to be mounted in an outside wall or window opening of a room.

One of the shortcomings of the room air conditioners as presently constructed resides in the excessive depth of the unit in a fore-and-aft direction which results in an excessive overhang on either the inside or the outside of the wall in which the unit is mounted. In addition, air conditioners of this type normally have a blower fan for the evaporator which has its inlet facing the front grille and produces excessive noise. This is particularly disturbing in a relatively small room, such as a bedroom, where such noise may interfere with a person's ability to sleep or rest.

Further shortcomings of such air conditioners involve the inability to direct the conditioned air into the room at a relatively steep, upwardly inclined direction, the lack of a conveniently operable and effective venting system and the lack of an efficient and economical arrangement for condensate removal.

The primary object of the present invention resides in the provision of a room type air conditioner designed to avoid the above-mentioned shortcomings.

More specifically, the room air conditioner of the present invention has a condenser, compressor, evaporator and blower arranged in the air conditioner casing such that the overall dimension of the unit in a fore-and-aft direction is relatively short and thus reduces to a minimum the overhang of the unit on either the inside or the outside of the wall in which it is mounted. The interior of the unit is divided by an upright insulated partition into a rear compressor-condenser compartment and a front evaporator-blower compartment. The evaporator compartment is further divided by a generally horizontal partition into a lower air inlet chamber in which the evaporator is located and an upper air outlet chamber. The evaporator blower fan is of the axial intake, radial discharge type and has its inlet in the lower chamber facing the upright partition and its outlet in the upper chamber. Thus, the blower draws room air into the lower chamber across the coils of the evaporator and then directs the air upwardly into the upper chamber and out through the front grille of the casing into the room. The grille includes a movable air scoop with a plurality of adjustable vanes thereon which enable the air to be directed at a steeply-inclined upward angle.

In a modified form of the air conditioner the front grille of the casing is blocked at the outlet of the upper chamber and an opening is formed in the top wall so that the conditioned air can be directed to an auxiliary outlet duct which can be extended vertically or laterally.

The condenser is located adjacent the rear open end of the rear compartment and a fan is located between the condenser and the upright partition so as to draw outside air into the rear compartment across the coils of the condenser, direct the air laterally across the rear compartment and then outwardly through the rear wall of the casing to the outside atmosphere. A slinger ring on the condenser fan projects into a well in which condensate from the evaporator collects. The condensate picked up by the slinger ring is impelled in a generally upward direction tangentially of the slinger ring against a deflector above the slinger ring which directs the condensate onto the condenser coils so that it evaporates and is discharged with the condenser cooling air.

The air conditioner of this invention also includes a novel ventilating arrangement including two doors on the upright partition for controlling air communication between the rear compartment and the evaporator chamber of the front compartment and between the rear compartment and the upper air outlet chamber of the front compartment. The two doors are controlled by a single manually-operable knob for selectively admitting outside air into the room and for exhausting room air to the outside.

Other features and objects of the present invention will become apparent from the accompanying description and drawings, in which:

FIG. 1 is a front elevational view of a room air conditioner according to the present invention.

FIG. 2 is a horizontal sectional view along line 2—2 in FIG. 1.

FIG. 3 is a vertical sectional view along line 3—3 in FIG. 2 and generally showing the ventilating door arrangement on the upright partition within the unit.

FIG. 4 is a fragmentary sectional view along line 4—4 in FIG. 3 showing the deflector baffle for directing the evaporator condensate onto the coils of the condenser.

FIG. 4*a* is a sectional view along line 4*a*—14*a* in FIG. 3 showing the lost motion connection between the spindles of the two ventilating doors.

FIG. 5 is a horizontal sectional view along line 5—5 in FIG. 3.

FIG. 6 is a vertical sectional view along line 6—6 in FIG. 2.

FIG. 7 is a vertical sectional view along line 7—7 in FIG. 2.

FIG. 8 is a plan view of the bottom pan of the air conditioner chasis.

FIG. 9 is a sectional view along line 9—9 in FIG. 8.

FIG. 10 is a fragmentary enlarged view of the front grille of the air conditioner showing the adjustable air outlet grille section.

FIG. 11 is a fragmentary sectional view along line 11—11 in FIG. 10.

FIG. 12 is a sectional view along line 12—12 in FIG. 1 and showing details of the adjustable air outlet grille section.

FIG. 13 is a sectional view along line 13—13 in FIG. 10.

FIG. 14 is a fragmentary sectional view on an enlarged scale along line 14—14 in FIG. 10.

FIG. 15 is a fragmentary sectional view on an enlarged scale along line 15—15 in FIG. 10.

FIG. 16 is a perspective view of the air conditioner modified to direct air to an adjoining room.

FIG. 17 is a fragmentary view, with parts broken away, of the air conditioner shown in FIG. 16.

FIGS. 18 and 19 show further modifications of the air conditioner.

Referring first to FIGS. 5 through 7, the air conditioner includes an outer sheet metal casing 10 in the form of a rectangular sleeve having a top wall 12, a bottom wall 14 and opposite end walls 16. The rear side of casing 10 is closed by a panel 18 provided with louvers 20 throughout substantially the entire extent thereof. The front open end of casing 10 is closed by a removable grille 22. A chasis 24 is slideably arranged

within casing 10. Chasis 24 includes a bottom pan 26 which is slideably supported on a pair of inverted channel-shaped rails 28 extending from front to back on the top side of bottom wall 14 (FIG. 3) and an inverted U-shaped rail 30 extending lengthwise on the inside of bottom wall 14 adjacent, but spaced from, the rear edge thereof (FIGS. 6 and 7).

At each end of bottom pan 26 there is mounted an upright panel; these upright panels are designated 32 and 34. Between panels 32 and 34 and running lengthwise within the interior of casing 10 there is an upright partition 36. The opposite vertical end edges of partition 36 are suitably secured to panels 32,34, respectively. Panels 32,34 and partition 36 extend the full height within casing 10 and divide the interior of the casing into a rear compartment 38 and a front compartment 40. Chasis 24 is sealed within outer casing 10 generally around the periphery of partition 36 by plastic foam strips 42 between the end walls 16 of the casing and the end panels 32,34, a similar strip 44 between the bottom wall 14 of the casing and the bottom pan 26 and an additional similar sealing strip 46 between the top wall 12 of the casing and the upper flanged edge 48 of partition 36.

The lower flanged edge 50 of partition 36 is disposed within a groove 52 (FIGS. 7 and 8) recessed into the bottom pan 26 of the chasis 24. Actually the bottom pan 26 is formed with two grooves 52 into which the lower end of partition 36 can be selectively located depending upon the size of the air conditioning unit. Upright partition 36 has a layer of sound and heat insulation material 56 on opposite sides thereof throughout a major portion of its extent.

Within compartment 38 there is arranged directly adjacent the back louvered panel 18 an upright, finned coil condenser 58. Condenser 58 is located adjacent one end of compartment 38. Adjacent the opposite end of compartment 38 there is located a motor-compressor unit 60. A motor 62 in compartment 38 has a fan 64 mounted on one end of its shaft 66. As is shown in FIG. 7, the blades of fan 64 extend radially outwardly beyond motor 62 and axially overlap the outer periphery of the motor. Fan 64 is located directly adjacent the inner upright face of condenser 58. A shroud 68 extends from the inner face of condenser 58 around the periphery of fan 64 such that when the fan is rotated outside air is drawn inwardly through louvers 20 by the fan, through condenser 58 and into compartment 38. This outside air is then directed laterally by a curved deflector 69 located over the fan (FIG. 3) generally in the direction of the arrows 70 in FIG. 2 and outwardly through the portion of louvered panel 18 behind compressor unit 60.

Referring now to FIGS. 2, 3 and 5, within front compartment 40 there is arranged a horizontal partition 72 which divides compartment 40 into an upper air outlet chamber 74 and a lower air inlet chamber 76. A finned coil evaporator 78 is located in an upright position in lower chamber 76 directly adjacent the front grille 22. An electric resistance heating element 80 is also arranged in lower compartment in an upright fashion between evaporator 78 and partition 36. As shown in FIG. 2, evaporator 78 is located within casing 10 adjacent the end thereof opposite condenser 58.

Shaft 66 of motor 62 extends through partition 36 and an impeller 82 is mounted on the end thereof within compartment 40. A blower housing 84 extends around impeller 82 and is provided with an axial inlet opening 86 to the impeller. As shown in FIG. 2, opening 86 is located on the side of housing 84 facing partition 36. The opposite side wall 88 of blower housing 84 is imperforate. Housing 84 is generally located in the lower chamber 76 of compartment 40. However, the housing has a radially disposed outlet opening 90 (FIGS. 5 and 7) formed in partition 72. A curved air deflector (FIGS. 1 and 5) 92 in upper chamber 74 overlies outlet opening 90 and is shaped such that the air discharged upwardly through opening 90 is directed laterally across upper chamber 74 and is discharged from the upper chamber through the central upper grille section 94 (FIG. 1). Thus, with the blower arrangement illustrated, when motor 62 is operating impeller 82 draws air into lower chamber 76 through the open grille section 96, across the coils of evaporator 78 and into blower housing 84 through the axial inlet opening 86. The air is then discharged radially upwardly through outlet 90 into the upper chamber 74 and then outwardly back into the room through section 94 of the front grille 22. With this arrangement, since the inlet opening 86 to blower housing 84 faces insulated partition 36, the sound incident to the operation of blower 82 is dampened considerably and the siren effect normally produced when a blower has its inlet facing the front grille is substantially eliminated.

As is shown in FIG. 3, partition 36 is formed with two openings 100 and 102 therein. These openings are vertically spaced so that the upper opening 100 establishes communication between rear compartment 38 and the upper air outlet chamber 74 of front compartment 40 and lower opening 102 establishes communication between rear compartment 38 and the lower air inlet chamber 76 of front compartment 40. Opening 100 is controlled by a door 104 and opening 102 is controlled by a door 106. Each of the doors is mounted for pivotal movement by vertically extending spindles, the upper spindle being designated 108 and the lower spindle 110. As shown in FIG. 3 these spindles are vertically aligned and are journalled on partition 36 by brackets 112 and a central bearing portion 114 on horizontal partition 72.

The lower end of spindle 108 has an axial projection 116 which projects into the upper end of lower spindle 110. Upper spindle 108 has at its lower end a diametrically extending rib 118 which extends into an angular slot 120 in the upper end of spindle 110. Slot 120 has a circumferential extent slightly greater than the thickness of rib 118 so as to provide a lost motion rotary connection between the two spindles. A torsion spring 122 urges upper door 104 to a normally closed position. Likewise, when door 104 closes opening 100, rib 118 engages the flat sides 124 of slot 120 (FIG. 4*a*) so that door 106 is also urged to a position closing opening 102.

Doors 104 and 106 are adapted to be adjusted by means of a control rod 128 connected to upper door 104 as at 130 and extending through an upright partition 132 in upper chamber 74. Partition 132 defines control compartment 134 at one end of upper chamber 74. Within control compartment 134 conventional controls are enclosed for manually adjusting the operation of the unit. The controls in compartment 134 are provided with control knobs 136 at the front side of front grille 22 (FIG. 1). One of the controls in compartment 134 includes a ventilating control which com-

prises a rotatably supported shaft 138 (FIG. 3) on which an arm 140 is fixed. Control rod 128 is connected to arm 140 as at 142. The upper end of arm 140 is offset inwardly from the lower end thereof and the pivotal movement of arm 140 in opposite directions through about 180° is limited by a pair of stops 144. A leaf spring 146 is adapted to engage and retain the lower end of arm 140 when in the upright position shown in broken lines in FIG. 3.

When control knob 136 connected to shaft 138 is rotated in a clockwise direction as viewed in FIG. 3 from the position shown in solid lines to the generally vertically extending broken line position, top door 104 is opened slightly (for example, about 22°) while bottom door 106 remains closed by reason of the lost motion connection provided by rib 118 and slot 120. The arm 140 is releasably retained in this position by leaf spring 146. When shaft 138 is rotated further in a clockwise direction top door 104 continues to open and bottom door 106 begins to open. When arm 140 is rotated 180° (the inclined position shown in broken lines), the top door 104 is open to about 52° and bottom door 106 is open to about 30°. When arm 140 is rotated 180° it abuts against lower stop 144 and is retained in this position since the connection 142 has shifted over center. With this arrangement if it is desired to merely exhaust a portion of the room air, arm 140 is rotated to the upright position so that only door 104 is open. Since the pressure in upper chamber 74 is slightly above atmospheric and the pressure in rear compartment 38 is slightly below atmospheric a portion of the room air directed into the upper chamber 74 by blower 82 escapes through opening 100. If it is desired to simultaneously exhaust room air to the outside and admit outside air to the room, then arm 140 is rotated clockwise to a position beyond the upright broken line position shown in FIG. 4 so as to open both doors 104 and 106. Spring 146 enables arm 140 to be rotated to and retained in a position intermediate the upright broken line position and the fully rotated position in which upper door 104 would be open to about 26° and bottom door 106 opened to about 4°. Thus, a single control knob 136 can be utilized for selectively obtaining the type and extent of ventilation desired.

Referring now to FIGS. 8 and 9, the configuration of bottom pan 26 is shown. The rear portion thereof is generally flat as indicated at 150 and is provided with a drain opening 152 controlled by a temperature responsive valve 154. At a temperature above a predetermined value (for example, 40° F.) valve 154 closes opening 152 and below a predetermined temperature valve 154 opens drain opening 152. Thus, when the outside temperature drops to near freezing, valve 154 opens and permits any water accumulating in bottom pan 26 to drain out through opening 152. Water is permitted to accumulate in bottom pan 26 by reason of the upstanding peripheral lip 155.

The front end portion of bottom pan 26 is generally elevated above the rear portion 150 as indicated at 156. The front end portion 156 is provided with a pair of embossments 158 which are adapted to rest upon the inverted channels 28 on the wall 14 of casing 10 (FIG. 3) so as to support the air conditioner as a whole in a generally level position. Front portion 156 is also formed with a depressed trough section 159 in which water is adapted to collect. Between the front portion 156 and the rear portion 150 the wall of bottom pan 26 slopes downwardly through a channel portion 160 connected with trough 159 so that any condensate or other water which tends to accumulate in trough 159 drains downwardly towards the rear end of the bottom pan and drains out through the bottom pan in the event valve 154 is open.

Referring now to FIGS. 3, 4 and 7, it will be observed that fan 64 includes a peripheral slinger ring 162 around the outer periphery of the fan blades. At its lower end slinger ring 162 extends downwardly into the depressed portion 150 of bottom pan 26 so that it will be submerged in any water collecting in the lower portion of the bottom pan. Directly above slinger ring 162 there is arranged a deflector 164. Deflector 164 has a flat portion 166 supported on the upper edge of shroud 68 and a rearwardly extending portion 168 which inclines downwardly over the upper end of condenser 58 (FIG. 7). The under side of flat portion 166 of the deflector is fashioned with a plurality of arcuate ribs 170 (FIG. 5) so that the water picked up by the slinger ring and impelled tangentially upwardly against the deflector strikes the arcuate ribs 170 and is caused to flow along the under side of deflector 164 downwardly over the upper end of condenser 58. As the water drips off the inclined portion 168 of deflector 164 onto the hot coils of the condenser it is evaporated and picked up by the air stream flowing into rear compartment 38 and discharged therefrom through the rear louvered panel 18 in the direction of arrows 70 (FIG. 2).

Referring now to FIGS. 1 and 10 through 15, the construction of the outlet grille section 94 of front grille 22 is illustrated. This grille section comprises a generally rectangular frame section 172 formed integrally with front grille 22. Frame section 172 defines a generally rectangular opening 174 in which an air scoop 176 is arranged. Air scoop 176 is fashioned with a pair of end walls 178 and an arcuate bottom wall 180. The upper ends of end walls 178 are interconnected by a horizontal strut 182 and an upright vertical strut 184 is located centrally between the end walls 178 and interconnects the arcuate bottom wall 180 with the top horizontal strut 182. The upper front corners of upper end walls 178 are formed with pintles 186 (FIGS. 14 and 15) which are pivotally supported in openings 188 in frame 172. Pintles 186 are located at the axis of curvature of bottom wall 180.

The front vertical edge portion of each side wall 178 is fashioned with a plurality of vertically spaced sockets 190 which are adapted to receive pintle portions 192 formed at the ends of horizontally extending vanes 194. As shown in FIG. 14, pintle portions 192 are formed adjacent the front or leading edges of vanes 194. Intermediate their opposite ends vanes 194 are notched as at 196 (FIG. 11) to accommodate vertical strut 184. Strut 184 is likewise formed with a plurality of vertically spaced sockets 198 for receiving pintle portions 200 formed at the notched portion 196 of vanes 194. Thus, each of the vertically spaced vanes 194 is pivotally supported on air scoop 176 adjacent the front or leading edges thereof.

At one end each of the vanes 194 is notched at the rear corner thereof as indicated at 202 in FIG. 15. A link 204 extends vertically in the notched sections 202 and interconnects each of the vanes as by a small pintle portion 206 on each vane. A pair of slightly bowed springs 208 is arranged between the flat faces of link 204 and the adjacent end wall 178 of air scoop 176.

Springs 208 provide sufficient frictional drag on link 204 to retain the vanes in the position to which they are adjusted. One of the vanes is formed with a forwardly extending handle 210 which when actuated is adapted to pivot all of the blades vertically about horizontal axes adjacent the front edges thereof.

Referring to FIG. 12, the flexible seal and tension strip 212 is located along the lower edge of opening 174 in frame 172. Sealing strip 212 is adapted to frictionally engage the outer surface of arcuate bottom wall 180 of air scoop 176 so as to frictionally retain the air scoop in the position to which it is manually adjusted by means of a handle 214 extending forwardly from the front edge of bottom wall 180 at the center thereof.

As shown in FIGS. 12 and 13, air scoop 176 is adapted to be pivoted from the retracted position shown in FIG. 12 to the outwardly extended position shown in FIG. 13. The air scoop is retained in the fully extended position by a lug 216 at the rear edge of bottom wall 180 which engages with the flexible sealing strip 212. In addition, it will be noted that vanes 194 are adapted to be pivotally adjusted from a generally horizontally extending position such as shown in FIG. 12 to a position where they incline downwardly at their rear edges. Since vanes 194 are pivotally supported adjacent the front edges, when the vanes are adjusted to the position shown in FIG. 13 the air flowing outwardly through the vanes is directed upwardly at a steep angle. The angularity of the vanes is determined not only by the inclination of the vanes relative to air scoop 176 but also by the angular position of air scoop 176 relative to the front grille 22. Thus, in the position shown in FIG. 13 the air flowing through the vanes would be directed upwardly at a steep angle toward the ceiling of the room. This arrangement is highly desirable since in many instances the flow of air in a generally horizontal direction from the outlet of the air conditioner would be objectionable to a person located near and directly in front of grille 22. It will furthermore be noted that since vanes 194 can be adjusted to incline downwardly at their lower edges the lowest vane 194 effectively prevents any substantial air flow between the lower edge of the bottom vane and bottom wall 180 when the vanes are adjusted to the position shown in FIG. 13.

The unit described is adapted to be used in winter weather as a heater by energizing heating coil 80 and simply operating motor 62 so that room air will be drawn into casing 10 through grille section 96 and heated air will be directed back into the room through grille section 94.

In the modified arrangements shown in FIGS. 16 through 19 the air conditioner construction and the arrangements of the components therein are substantially the same as previously described, except with respect to the air outlet arrangement for the upper air outlet chamber 74. In the modified construction shown in these figures the upper wall of chamber 74 is formed with a generally rectangular opening 220 directly above the outlet opening 90 formed in partition 72 (see FIG. 5). The top wall 12 of the air conditioner casing is likewise formed with an opening 222 which registers vertically with opening 220. A sealing strip 224 is arranged between these openings. In this arrangement deflector 92 (FIGS. 1 and 2) is removed so that the air directed out of the outlet 90 of the blower housing 84 is enabled to flow directly upwardly through openings 220,222. An auxiliary air duct 226 is arranged on top wall 12 of casing 10 overlying opening 222. Air duct 226 is of generally rectangular cross section and provided with a cap 228 at one end. At its other end auxiliary duct 226 is connected to a lateral duct extension 230 which extends through a wall 232 which divides the room in which the air conditioner is located from an adjoining room. Within duct 226 in a position overlying outlet opening 222 there is arranged an air deflector damper 234 which comprises an arcuate shield 236 mounted on an arm 238 pivotally supported on duct 226 as at 240. Shield 236 is shaped and dimensioned so that in the solid line position shown in FIG. 17 the shield engages top wall 12 as at 242 at one end and at its other end it tangentially engages the top wall 244 of auxiliary duct 226 at 246. In this solid line position of damper 234 the maximum amount of air discharged from the blower will be directed into auxiliary duct 226. If damper 234 is arranged so that arm 238 extends vertically, then about half of the total air from the blower is directed into auxiliary duct 226 and the remaining amount of air is directed outwardly through front grille section 94. If damper 234 is adjusted to the broken line position shown in FIG. 17, then a lesser amount of air will be directed into duct 226 than is directed outwardly through grille section 94. Thus, with the arrangement shown in FIGS. 16 and 17 a portion of the cooled air or heated air from the air conditioner can be selectively directed into the auxiliary duct 226 and into an adjoining room.

The arrangement shown in FIG. 18 is generally the same as that shown in FIGS. 16 and 17 except that duct 226 is provided with a second lateral extension duct 248 instead of the end cap shown at 228. In this arrangement extension ducts 226 and 248 are provided with outlet grilles 250 on the top walls thereof for directing air vertically upwardly at desired locations. A similar outlet grille may also be located in the top wall of auxiliary duct 226. This arrangement has utility in the event that the air conditioner is located at a large window wall. It is understood, of course, that in the arrangement shown in FIG. 18 damper 234 is omitted and the front grille section 94 is blocked by an imperforate panel 252.

In the arrangement shown in FIG. 19 the air conditioner is formed with the outlet openings 220,222 and the grille section 94 is likewise blocked by an imperforate panel 252. However a vertically extending duct 254 is extended upwardly from the air conditioner to adjacent the ceiling 256 of the room. Adjacent the upper end of duct 254 there is provided an outlet grille 258 for directing the cooled air from the conditioner upwardly and outwardly adjacent the ceiling of the room.

The front face of duct 254 is designed to form the wall surface of the room in which the air conditioner is located. Thus, in the version illustrated in FIG. 19, duct 254 can be prefabricated as a modular wall section and installed at the building site as a single assembly.

I claim:

1. A room air conditioner of the type adapted to be mounted in an outside wall of a room comprising a casing having front and rear panels, opposite end panels and a top panel, an upright partition in said casing extending lengthwise therein and dividing the interior of the casing into a rear compartment and a front compartment, an upright generally flat condenser in the

rear compartment extending generally parallel to and adjacent said rear panel, a compressor unit in said rear compartment located laterally adjacent the other end of said compartment, said compressor unit and condenser being disposed in end to end relation in a direction laterally of said end compartment with the rear side of the compressor unit disposed adjacent said rear panel, a fan motor in said rear compartment disposed between said condenser and said partition, said motor having an output shaft extending transversely and through said partition, a fan on said shaft within said rear compartment and located adjacent the condenser, said rear compartment having openings therein so that when the fan is operated air is directed across the condenser, an upright generally flat evaporator in said front compartment, said evaporator extending generally parallel to and adjacent said panel, said evaporator being located in said front compartment laterally adjacent the end thereof opposite the condenser, a blower in said front compartment located laterally adjacent the other end of said front compartment, said evaporator and said blower being located in end to end relation in a direction laterally of said front compartment, said blower having an impellor connected to the portion of said motor shaft extending through said partition and having an axial air intake and a radially disposed outlet, said axial air intake of the blower facing said partition and being spaced forwardly therefrom, air inlet and outlet openings in said front compartment disposed such that when the blower is operated room air is drawn across the evaporator, into the inlet of said blower and is then directed through the blower outlet and back into the room.

2. An air conditioner as set forth in claim **1** including means forming a horizontal partition in said front compartment above said evaporator and above said blower intake, said horizontal partition dividing said front compartment into top and bottom chambers, the outlet of said blower extending upwardly through said horizontal partition for discharging air from the lower chamber into the upper chamber, said front compartment having an air inlet below and an air outlet above said horizontal partition so that when the blower is operated room air is drawn into said lower chamber through said last-mentioned air inlet, across said evaporator and is directed by the blower into said upper chamber and then outwardly through said last-mentioned air outlet back into the room.

3. A room air conditioner including a casing having an upright partition therein dividing the interior of the casing into front and rear compartments, a condensing unit in said rear compartment, means for drawing outside air into said rear compartment across said condensing unit and then discharging said air to the outside, a partition in said front compartment dividing the front compartment into an air inlet chamber and an air outlet chamber, an evaporator in said air inlet chamber, means for drawing room air into said inlet chamber across the evaporator, directing said air into said outlet chamber and then discharging the air back into the room, said upright partition having a pair of openings therein, one of said openings establishing communication between said rear compartment and said outlet chamber and the other opening establishing communication between said rear compartment and said inlet chamber, a door for controlling each of said openings, each of said doors being provided with a vertical spindle by means of which the doors are pivotally supported, each of said spindles being supported for rotation about their longitudinal axes on said upright partition and each of said doors being pivotable with and in response to rotation of its respective spindle, said second partition extending generally horizontally between said two openings, said spindles being axially aligned vertically one above the other with their adjacent ends interconnected by a rotary lost motion coupling, both of said doors being adapted to be pivoted to the open position by rotation of said spindles in the same direction.

4. An air conditioner as set forth in claim **3** wherein said coupling includes a radially extending lug at the end of one of said spindles and an angular slot in the end of the other spindle into which said lug extends, said lug permitting said one door to open a predetermined extent before establishing an operating connection with the slot in the end of the other spindle.

5. An air conditioner as set forth in claim **3** including a single control rod operatively connected with said upper door and adapted to operate said lower door through said coupling.

6. A room air conditioner including a casing having a front grille, an evaporator in said casing positioned adjacent the front grille, a blower in said casing for drawing room air into said casing through the portion of the grille adjacent the evaporator and for discharging the conditioned air back into the room through another portion of the grille, said blower being of the axial intake, radial discharge type, a generally imperforate upright partition in said casing spaced inwardly from said front grille and defining at least in part a compartment in which said evaporator and said blower are disposed, said blower having its inlet facing inwardly of the casing toward said partition.

7. An air conditioner as set forth in claim **6** wherein said partition has a sound insulating material on the side thereof facing the inlet of the blower.

8. An air conditioner as set forth in claim **6** wherein said compartment has a generally horizontally extending partition therein dividing said compartment into a lower evaporator chamber and an upper air out-let chamber, the outlet of said blower communicating with said upper chamber.

9. An air conditioner as set forth in claim **6** wherein the outlet of the blower extends upwardly through said horizontal partition.

10. An air conditioner as set forth in claim **6** including means connected with the outlet of the blower and forming a duct extending to said other portion of the front grille.

11. An air conditioning unit comprising a casing having top, bottom, end, front and rear panels, a partition in said casing dividing the casing into a front compartment and a rear compartment, a compressor-condenser unit in said rear compartment, an evaporator in said front compartment, a fan motor in said rear compartment having an output shaft extending transversely through said partition into said front compartment, a blower in said front compartment having an impellor connected to the portion of the motor shaft extending through the partition, said blower having an axial air intake and a radially disposed air outlet, said axial air intake of the blower facing said partition and being spaced forwardly therefrom, means forming air inlet and outlet openings in said front compartment disposed

such that when the blower is operated it draws air into said front compartment through said air inlet means, across said evaporator to condition the air and then directs the air outwardly through said last-mentioned air outlet means.

12. An air conditioner as set forth in claim **11** wherein said radial outlet directs air generally vertically upwardly in said front compartment.

13. An air conditioner as set forth in claim **12** wherein said air outlet means comprises an opening in said top panel.

14. An air conditioner as set forth in claim **12** wherein said air outlet means comprises an opening in said top panel generally vertically aligned with said radially disposed outlet of said blower.

15. An air conditioner as set forth in claim **12** wherein said air outlet means comprises an opening in said top panel and including means forming an air duct communicating with the outlet means in said top panel, said duct having an outlet opening therein located remotely from the air outlet means in the top panel.

16. An air conditioner as set forth in claim **15** wherein said duct extends vertically upwardly from said top panel and the outlet opening therein is located adjacent the upper end thereof.

17. An air conditioner as set forth in claim **15** wherein said duct extends laterally beyond said casing and the outlet opening therein is located adjacent an end thereof disposed laterally beyond the casing.

18. An air conditioner as set forth in claim **15** wherein the air outlet means for the front compartment also includes an opening in the front panel of the casing.

19. An air conditioner as set forth in claim **18** including means for varying the amount of air from the blower outlet directed outwardly of said front compartment into said duct and out of the opening in the front panel of the casing.

* * * * *

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,783,637 Dated January 8, 1974

Inventor(s) WOODS, Norman W.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Indicate the Assignee as follows:

KeepRite Products Limited
Brantford, Ontario, Canada

Add the following figures: 16, 17, 18 and 19 as shown on the attached sheet.

Signed and sealed this 10th day of December 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

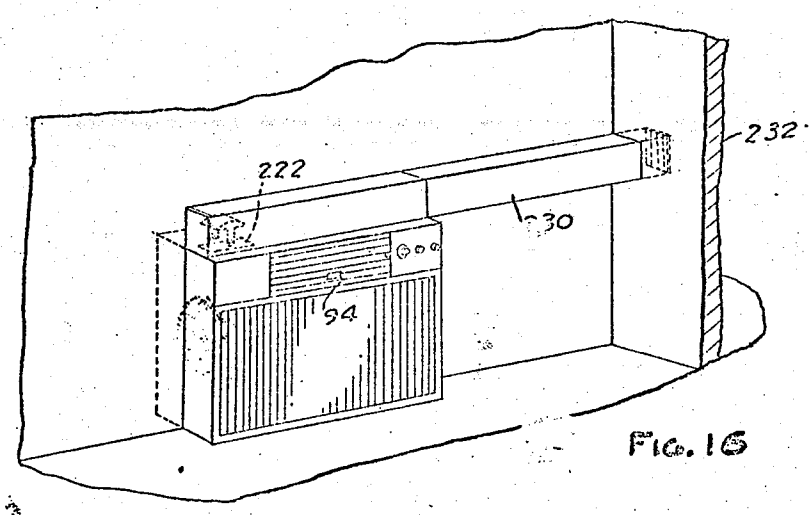


Fig. 16

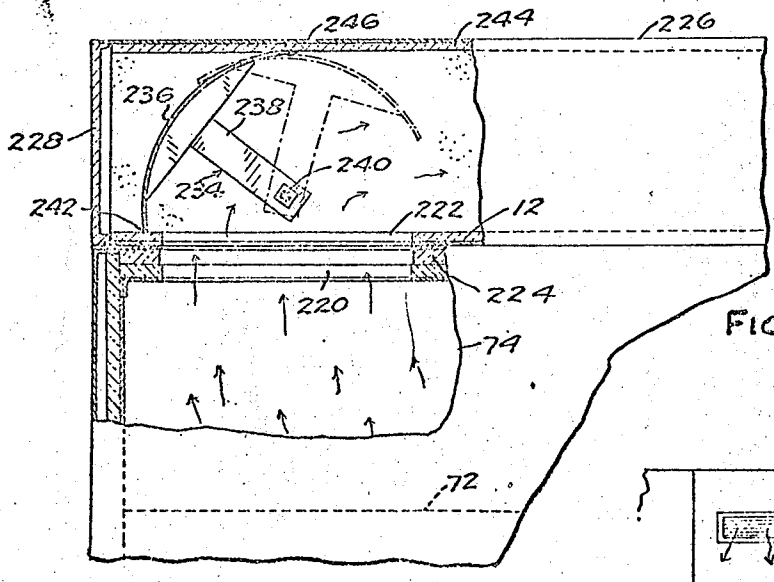


Fig. 17

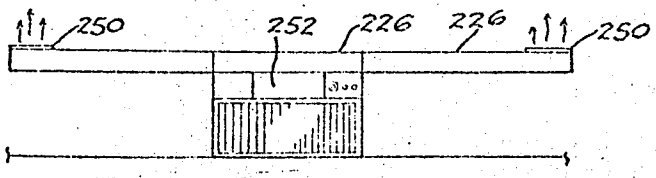


Fig. 18

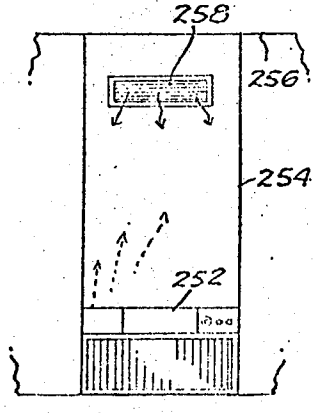


Fig. 19