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FLOOR MOUNTED AIR CONDITIONING UNIT

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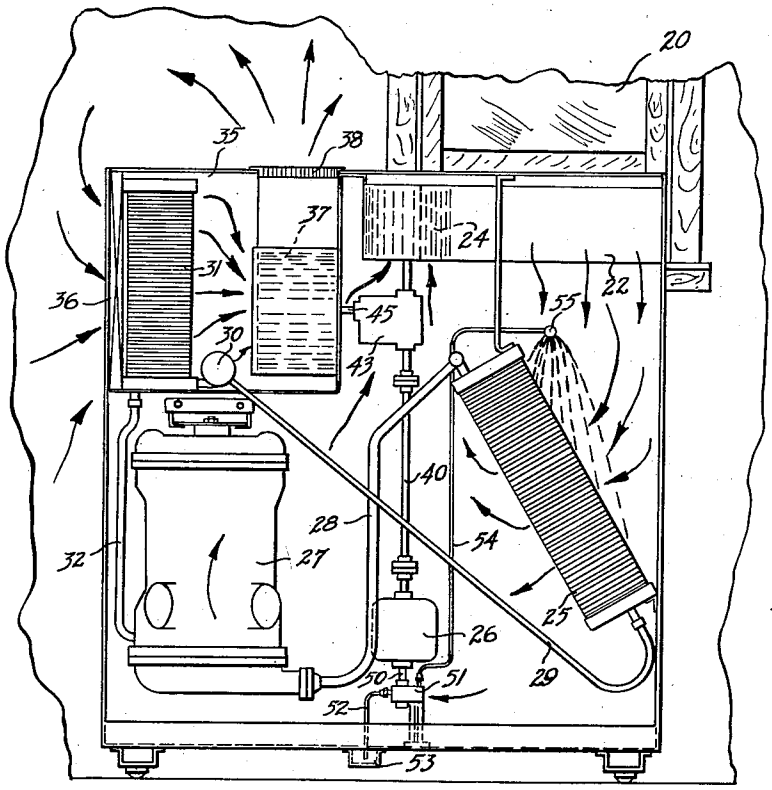


Fig. 1

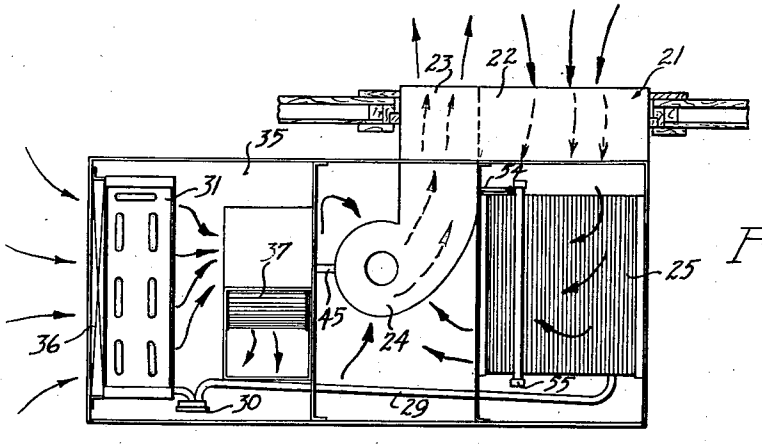


Fig. 2

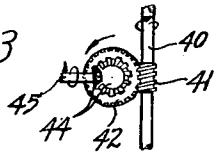


Fig. 3

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FLOOR MOUNTED AIR CONDITIONING UNIT

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1 Claim. (Cl. 62—140)

My present invention relates to a floor mounted air conditioning unit of the self-contained type comprising means whereby a compact simple arrangement of the various parts is achieved. The invention consists of the arrangement of a motor-compressor assembly, condenser, evaporator, blowers for conducting air over the condenser and evaporator, and means for driving the two blowers by one motor. A problem in designing small self-contained units is to obtain sufficient flow of air to cool the condenser and to cool the air in the enclosures served by the unit while maintaining the size of the unit as small as possible without causing excessive air handling noises. In any arrangement of which I am aware a large amount of space is utilized by the motor and blowers, whereas in my present invention one motor serves to drive both blowers and, in addition, serves to drive a fluid-circulating pump for dispensing with the moisture condensed from the air by the evaporator.

The objects and advantages of my invention will be apparent from the following specification taken in connection with the accompanying drawing wherein like numerals refer to like parts throughout. In the drawing, Fig. 1 is an elevation of the unit with a wall of the unit removed in order to show the internal construction; Fig. 2 is a plan view of the unit with the top of the unit removed in order to show the construction; and Fig. 3 is an enlarged detail view of a portion of the apparatus.

The unit is shown as being mounted upon the floor of an enclosure provided with a window 20, the unit being of such a height as to reach above the window sill in order that a duct 21 may extend through the window for the admission of condenser cooling air through the passage 22 and the ejection thereof through the passage 23. The condenser cooling air is drawn through the unit by a blower 24 which pulls the air through the passage 22, through the condenser 25, through the space enclosing a blower motor 26 and motor-compressor unit 27, and then forces the air outward through the passage 23. The motor-compressor unit 27 forces refrigerant through the high pressure pipe 28, the air-cooled condenser 25, the liquid line 29, the expansion valve 30, the evaporator 31, and the suction pipe 32. The evaporator 31 is preferably placed in a small enclosure 35 occupying an upper corner of the air conditioning unit, and the room air is drawn through a filter 36 and the evaporator 31 by a blower 37 which then ejects the air upward through an outlet grille 38.

The two blowers are operated by the motor 26 which drives a vertically extending shaft 40, the upper end of which is connected to the blower 24 so that the blower 24 is rotated at the speed in revolutions per minute of the motor 26. Since the blower 24 ejects the air out of the room the high tip speed of the blower blades is not objectionable since any noise created thereby is directed outward. The shaft 40 is provided with a worm 41 which drives a gear 42, the worm and gear being mounted in a gear box 43. Beveled gears 44 further reduce the speed imparted to a horizontal shaft 45 which is connected to the evaporator blower 37. The evaporator blower therefore operates at a low speed and does not create objectionable noises in the room.

By this arrangement I am able to use a horizontally positioned, high speed, small diameter blower 24 for the condenser air which will bring in a large volume of cooling air for the purpose of condensing the refrigerant, and a vertically positioned, slow speed, large diameter blower 37 for the evaporator air which will handle the proper amount of air without creating objectionable noises.

The motor 26 is preferably provided with a shaft extension 50 which drives a pump 51 having a suction inlet 52 extending into a sump 53 in the bottom wall of the unit, the sump collecting the moisture condensed by the evaporator 26 and forcing it upward through the discharge pipe 54 from which it is sprayed through a spray head 55. The condensed moisture is thereby sprayed onto the air inlet side of the condenser and assists in cooling the refrigerant. The air passing through the condenser serves to distribute the moisture in intimate contact with the condenser surface, and in order to further increase efficiency the condenser is preferably inclined, as shown, in order that the moisture will tend to pass slowly downward through the plates of the condenser and be evaporated thereby and ejected by the blower 24 as water vapor. Any moisture which may not be evaporated is recollected in the sump 53 and again passed over the condensing surfaces.

Having described a preferred embodiment of my invention, it should be apparent to those skilled in the art that modifications in arrangement and detail thereof are permissible within the scope of the following claim.

I claim:

An air conditioning unit of the self-contained type comprising a cabinet having side walls and a top, a partition therein defining a duct leading

from the upper portion of a side wall of said cabinet into the interior space thereof, a condenser positioned across the inner end of said duct, a second partition within said cabinet defining a second duct leading from the upper portion of a side wall of said cabinet to an outlet in the top of said cabinet, an evaporator positioned across the entrance to said second duct, a compressor within the interior space of said cabinet in refrigerant flow relationship with said condenser and said evaporator, an air inlet connection communicating with said first duct and extending outwardly from a wall of the cabinet, an air outlet connection communicating with the interior space of said cabinet and extending alongside of said air inlet connection, said inlet and outlet connections being adapted to extend through an opening in the wall of a room in which the unit may be placed, a first blower for inducing a stream of outside air through said air inlet connection into said first duct and over the surface of said condenser into the interior space of the cabinet containing said compressor to cool the condenser and compressor, and for ejecting said outside air through said air outlet connection, a second blower for inducing a stream of room air over the surface of said evaporator and through said second duct, and for ejecting said room air vertically upward into the room, said first blower comprising a high-speed, small diameter blower wheel having a vertical axis of rotation and said second blower comprising a low-speed, large diameter blower wheel having a horizontal axis of rotation, a single motor for driving said blower wheels, and driving connections between said motor and said blower wheels comprising a shaft directly connected to said first blower wheel and to said motor, and a speed reducing connection between said shaft and said second blower wheel.

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