

Dec. 21, 1943.

F. M. YOUNG ET AL.

2,337,518

UNIT FOR DEHUMIDIFYING, FILTERING, COOLING, AND RECIRCULATING AIR

Filed Sept. 13, 1939

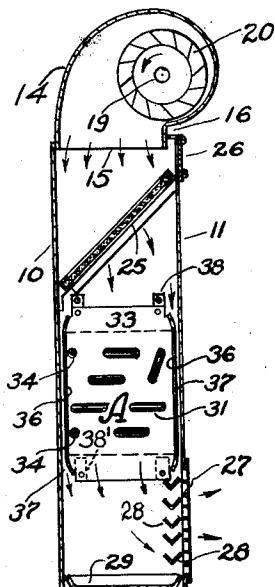


FIG. 1

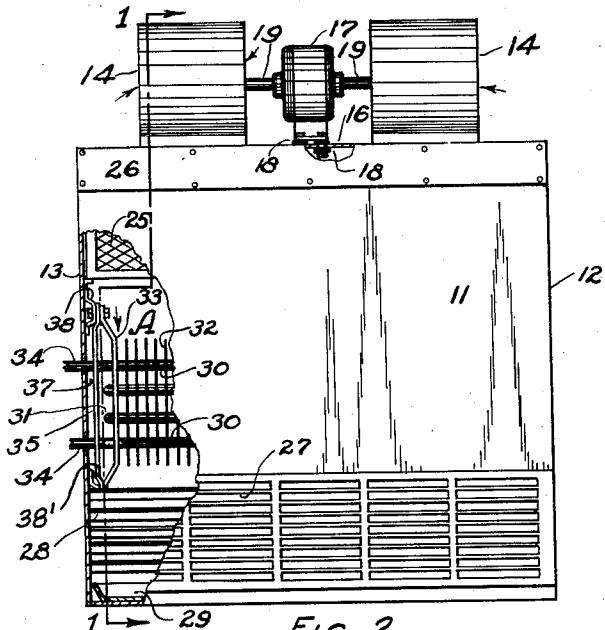


FIG. 2

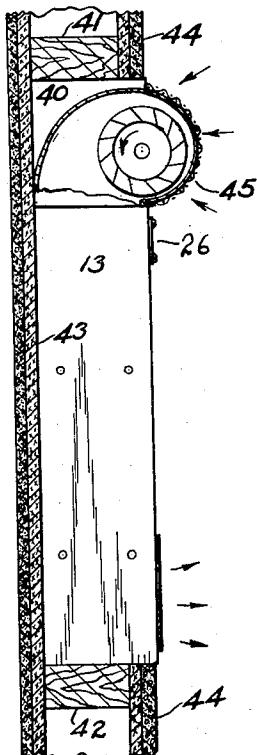


Fig. 3

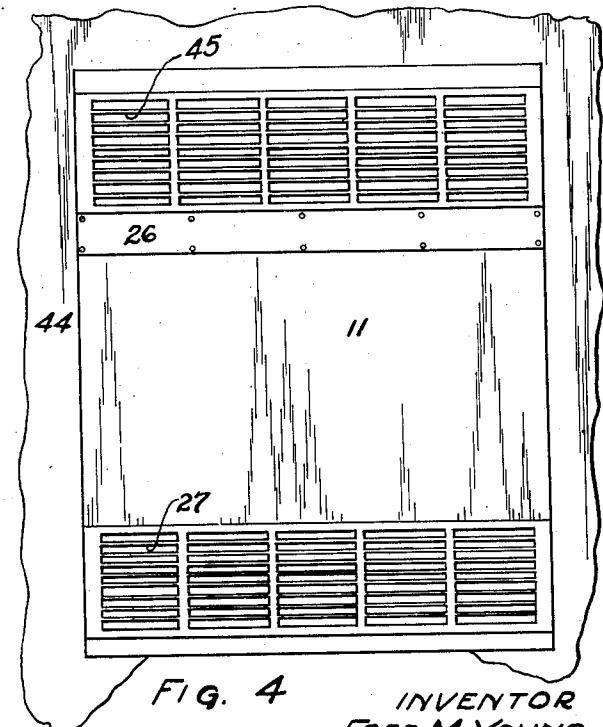


FIG. 4

4 INVENTOR
FRED M. YOUNG
SOREN K. ANDERSEN
BY ASKnotch
ATTORNEY

UNITED STATES PATENT OFFICE

2,337,518

UNIT FOR DEHUMIDIFYING, FILTERING,
COOLING, AND RECIRCULATING AIRFred M. Young and Soren K. Andersen, Racine,
Wis.; said Andersen assignor to Young Radi-
ator Company, Racine, Wis.

Application September 13, 1939, Serial No. 294,586

1 Claim. (Cl. 62—129)

The present invention relates to air conditioning units which are adapted to be placed in or on the wall or on the floor of the room to be served, particularly small rooms wherein it is desired to filter, condition and dehumidify the air as it is recirculated in the room.

The principal object of the present invention is to accomplish the desired results by means of a unit which may be manufactured and shipped in a complete assembly and placed in the room to be served in any desired position.

An object of the present invention is to provide a unit which will be efficient, low in cost, attractive and easily installed.

In devices of the class, when used for cooling and recirculating air, the air is dehumidified. This is not easily accomplished in a simple and low priced cabinet which will not frost or sweat and cause more or less harmful moisture on the inside and outside surfaces of the cabinet itself.

An object of the present invention, in addition to supplying an easily removed and replaced filter pad is to provide a narrow passageway for air around the cooling unit and between this unit and the cabinet walls thus to prevent chilling of the cabinet walls and collection of moisture on these walls.

A further object of the present invention is to provide a grilled outlet for the conditioned air in which may be positioned suitable eliminators.

A still further object of the present invention is to provide a unit which, when desired, may be placed in the wall of the room served.

To these and other useful ends, my invention consists of parts, combinations of parts, or their equivalents, and mode of operation, as herein-after set forth and claimed and shown in the accompanying drawing in which:

Fig. 1 is a transverse sectional view of the preferred form of our invention, taken on line 1—1 of Figure 2.

Fig. 2 is a front elevational view of the design illustrated in Figure 1, a fraction of the front panel and grille being cut-away so as to illustrate in plan a fraction of the filter pad, a fraction of the cooling unit and its supporting means and a fraction of the eliminators.

Fig. 3 is a fractional view of a wall illustrating our unit positioned therein, one of the fans being sectioned transversely so as to illustrate the grille covering for the motor and fans of the device.

Fig. 4 is a front elevation as illustrated in Figure 3.

As thus illustrated and referring particularly

to Figures 1 and 2, the housing of the unit comprises a rear panel 10, a front panel 11 and end panels 12 and 13.

We position, preferably, two cage type fans 14—14 on the top of the unit, each fan having an outlet as at 15 which extends through the top panel 16 of the unit. A motor 17 is cushion supported on member 16 by means of resilient composition washers 18.

Motor shafts 19 extend into the housings of fans 14 to carry on their ends fan cages 20. Thus it will be seen that the rotating parts of the fan do not come in contact with the fan housing, but are cushion supported on the top of the main housing thus to avoid noises being set up by the vibration of the motor or fan cages.

In Figure 1, a curvilinear arrow indicates the direction of travel of the fan cage thus the air will be directed downward into the housing as indicated by arrows.

We position a filter pad 25 on an acute angle in the housing as clearly illustrated in Figure 1 and provide a lid 26 which covers an opening in panel 11 whereby the filter pad may be conveniently removed and replaced.

In the bottom of panel 11 we position a grille 27 and immediately in rear of the grille we preferably position eliminators 28. Thus any moisture that is released by the cooling coil will be trapped and drained into a drip pan 29 which is positioned in the bottom of the cabinet as illustrated in Figures 1 and 2.

We provide a cooling coil which in its entirety is designated by reference character A comprising a number of tubes 30 which are connected at their ends by means of loops 31.

Tubes 30 extend through a multiplicity of closely spaced fins 32 forming a core. The tube ends extend through tube plates 33 and the inlet and outlet ends of core A are provided with suitable connections 34—34 which extend through panel 13 or these connections may be provided with elbows and bends so as to extend downwardly and through some other part of the cabinet. Tube plates 33 at the upper and bottom ends preferably extend slightly outwardly as illustrated in Figure 2.

We provide end and side plates 35 and 36. These plates are secured together to thereby form narrow air passageways 37 around core A. The top and bottom edges of members 35 extend inwardly slightly and contact the upper and lower ends of members 33. These ends in turn rest on brackets 38 and 38' which act to maintain the air duct in a central position and prevent

these members from contacting members 10, 11, 12 and 13.

Thus it will be seen that core A will be rigidly and centrally supported within the housing and that a free and isolated passageway for the warm air is provided between the core A and the cabinet walls. Without this air duct 37 the walls of the cabinet adjacent the core would sweat because of the close proximity of the core.

The present invention is particularly adaptable for the use of water as a cooling medium. Therefore, water connections are made to pipes 34 for the purpose and have a suitable inlet valve (not shown) for regulating the quantity of water used.

It will be understood that we may elect to use a refrigerant in coil A. Furthermore, the coil may be adapted for the use of steam or hot water for heating the air moved through the unit. In any event, the air passageway 37 will prevent the housing from being unduly heated or cooled.

Thus it will be seen that the room air will be filtered, cooled, dehumidified and recirculated and that any moisture removed from the air will be caught in pan 29 and that the filter may be easily removed and replaced.

Since the air enters the fans at the top of the cabinet and leaves the cabinet at its bottom, the device will be inclined to circulate all of the air within a reasonable distance from the cabinet.

Clearly the cabinet may be secured to the wall in any desired position or for that matter, it may be positioned on the floor of the room served.

In Figures 3 and 4 we illustrate our improved unit as positioned within the wall of the room served. This may be done so as to expose the front of the cabinet or all of the cabinet may be set within the wall except the two grilles 27 and 45 and member 26.

In Figures 3 and 4 I illustrate the panel 11 as being flush with the wall. In view of the action of the air duct 37 it will be seen that the heating or cooling medium will clearly not affect the walls of the cabinet and therefore the cabinet may be positioned in the walls as illustrated with safety.

In Figure 3, numeral 40 designates a studding, numerals 41 and 42 designate the upper and lower sills, numeral 43 designates the plaster or wall board of the adjacent room and numeral 44 5 designates the plaster or wall board of the room served.

It will be noted that in a narrow wall, the fans will project slightly. We preferably supply a wire screen or grille 45 which extends the full length 10 of the cabinet as illustrated in Figure 4 thus to shield the opening in the wall and improve the appearance of the installation.

Thus it will be seen that we have provided a simple and efficient air conditioning device which 15 may be positioned in any convenient place in the room served or two or more cabinets may be positioned in a single large room if necessary in order to insure complete circulation of the air in the room, that the cabinet, when fully exposed, is 20 neat in appearance and that when placed within the wall of the room served, the installation will be neat and efficient.

Having thus shown and described our invention, we claim:

A device of the class described, comprising a vertically extending elongated cabinet being rectangular in cross section and having mounted on its top panel a transversely centrally positioned motor and blower fans on opposite sides thereof adapted to receive air from the room served and discharge it downwardly into the cabinet, an outlet grille in the bottom of the front panel of said cabinet, a core positioned in said cabinet and above said grille and being surrounded by a relatively narrow independent air passageway, said relatively narrow air passageway formed by a core enclosure extending a distance above and below the core, the core being supported directly thereby, said enclosure being secured to the walls 30 of said cabinet by means of narrow brackets the lower bracket extending upwardly to thereby prevent the flow of moisture from said core inclosure to the cabinet walls.

FRED M. YOUNG.
SOREN K. ANDERSEN.