

Dec. 9, 1941.

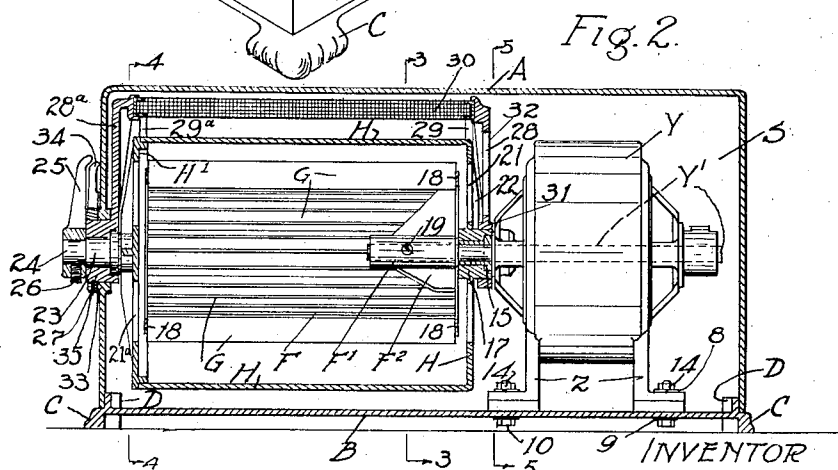
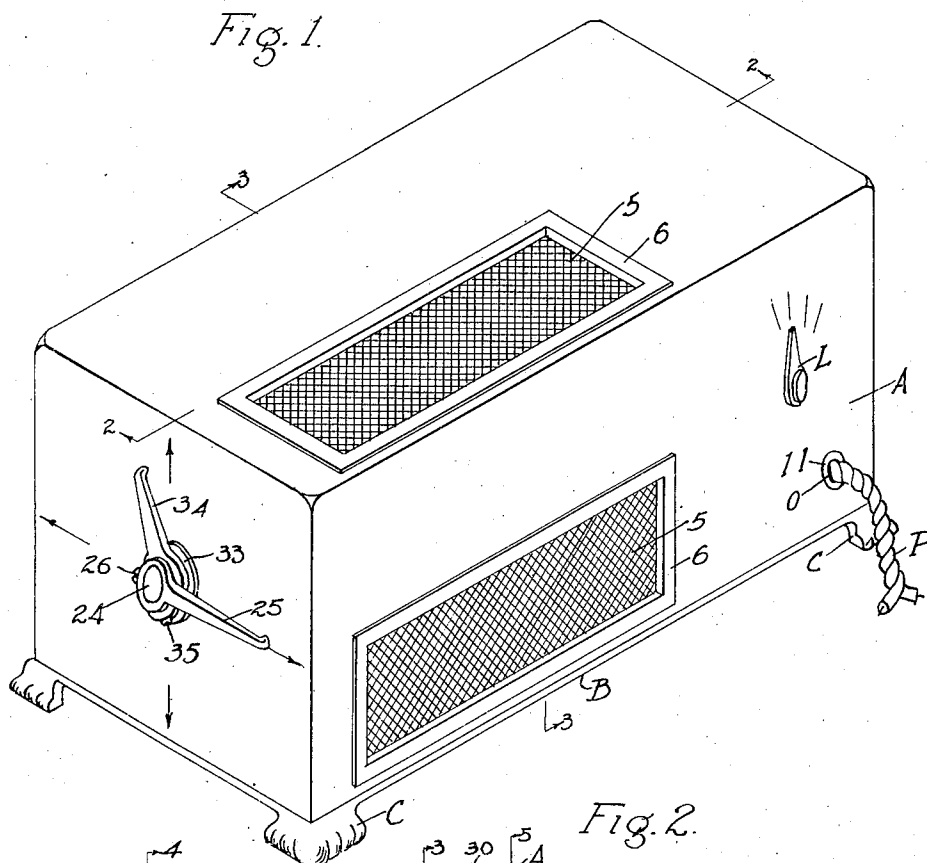
R. P. SCHLIRF

2,265,317

AIR CONDITIONING APPARATUS

Filed July 14, 1939

2 Sheets-Sheet 1



INVENTOR
Robert P. Schlirf
By

H. S. Johnson
His Attorney.

Dec. 9, 1941.

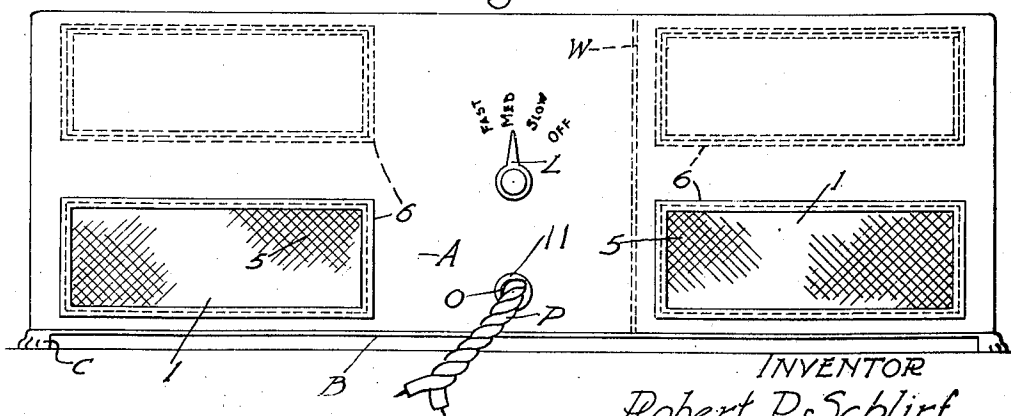
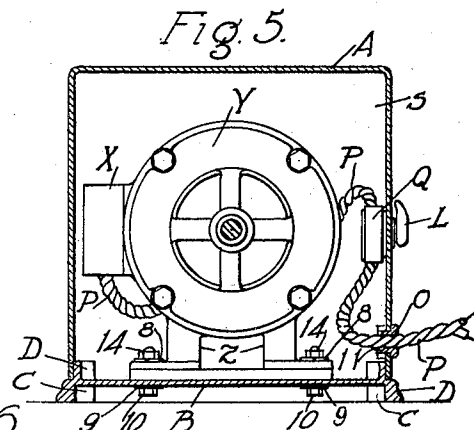
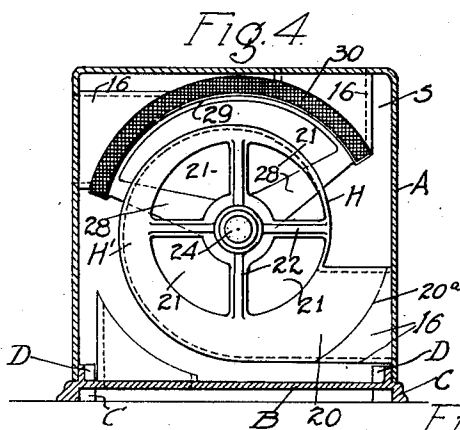
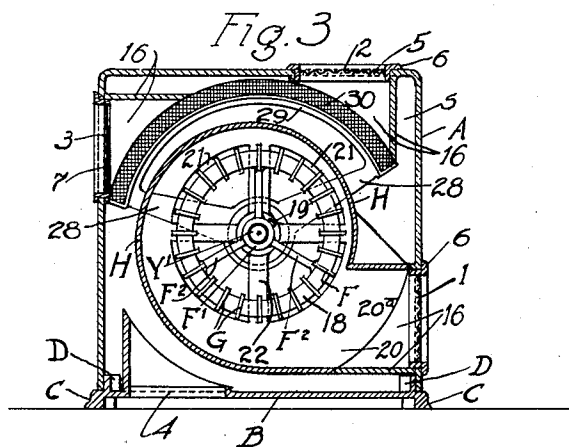
R. P. SCHLIRF

2,265,317

AIR CONDITIONING APPARATUS

Filed July 14, 1939

2 Sheets-Sheet 2



INVENTOR
Robert P. Schlirf.
BY *W. L. Wilson*
His Attorney.

UNITED STATES PATENT OFFICE

2,265,317

AIR CONDITIONING APPARATUS

Robert P. Schlirf, St. Paul, Minn.

Application July 14, 1939, Serial No. 284,478

7 Claims. (Cl. 183—35)

The invention herein referred to relates to improvements in portable air conditioning units and is specifically designed for use in small apartments or offices.

The object of the invention is to provide air circulating means whereby the room air may be kept dust clean and in constant circulation and wherein the air may be taken from the present room radiation and cleaned and circulated.

A further object of the invention is to provide an air recirculation means in the room.

Another object of the invention is to provide a portable means of a foul air ejection apparatus with which foul air of rooms may be expelled from the rooms through wall openings.

A further object of the invention is a means of circulating fresh outside air and mixing the same with recirculating air in given rooms.

A further object of the invention is to provide an air filtering means in the recirculation of air within the room.

A further object is to provide simple means for manually setting the flow direction of the propelled air and,

A further object is to provide a means for manually regulating the air filtering element for the air filtering to each of the several intakes.

The further objects and the advantages of the invention reside in certain novel features of the construction, combination and arrangement of parts which will be more fully described and particularly pointed out in this specification and the appended claims, reference being had to the accompanying drawings forming part of the specification in which,

Figure 1 is an exterior perspective view of my invention.

Figure 2 is a longitudinal section taken on approximately line 2—2 of Figure 1.

Figure 3 is a cross section of my invention showing the multi-blade power blower and curved rotatable filtering element upon the motor shaft together with the several inlets or outlets; taken on the line of 3—3 of Figures 1 and 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 2 showing the fan housing and its rotatable bearing whose center is the same as the motor shaft together with the arced rotatable filtering element.

Figure 5 is a cross section taken on 5—5 of Figures 1 and 2 showing the power inlet and secondary speed control; the current capacitor together with the motor acting as power means for the multi-blade fan, and

Figure 6 is a picture of a dual cabinet in which

air may be projected simultaneously in two directions as taken in from any of the other directions and permitting fresh air to be taken from the outside to be expelled into the room and the foul air of the room expelled to the outside.

In referring to the drawings, A represents the air conditioning cabinet which is mounted upon a base B provided with legs C and a set of cabinet top positioning lugs D. The cabinet A is provided with a series of openings 1, 2, 3, and 4 which act as air inlet or outlets as desired and are positioned at predetermined points. These openings being uniform in size are provided with inter-positional inset screens 5 or grilles secured within screen frames 6. The screen frames 6 fit into any of the before mentioned outlets and act as guards. When openings for either inlet or outlet are not to be used, the same are fitted with a closure 7 which in resemblance actually is a screen frames 6 provided with closure sheet 7.

The cabinet A is likewise provided with an internal mechanical working space S for the operating mechanism of this invention. A cabinet's face is provided with an opening O into which is positioned the power cord bushing 11 through which the power cord of an electric conductor P is threaded and which terminates in a rheostatic speed control switch Q manually operated by its controlling lever L positioned upon a switch shaft upon the outer face of the cabinet A.

The power conductor cable P is then passed on to the motor capacitor X and thence into the motor Y for its power delivery. The motor Y through its base X is rigidly made fast to the cabinet base B by means of holding bolts 10 held in locked position by nuts 14 held in locked position by lock washers 8 and washers 9.

The motor Y through its shaft Y1 imparts power to a multi-blade fan F through its cantilevered fastening F1 which acts as the fan support and is bracketed by a series of supporting wing arms or wings F2 to suspend the multi-blade fan F in an overhanging manner as best shown in Figure 2.

Imposed between the motor Y and the fan hub cantilevered fastening F1 on the shaft Y1 is a self-lubricating bearing 15 which acts as a bearing for the multi-blade fan housing H. The self-lubricating bearing 15 and fan housing hub 17 act as a spacer for the proper positioning of the multi-blade fan F from the motor.

The multi-blade fan F is composed of a series of fins G made integrally fast at their ends into rings 18 spaced apart a predetermined distance.

The ring 18 at the fan's power end is integrally made fast to the supporting wing brackets F2 onto the hub F1 and powered by the motor shaft Y1. The fan hub cantilevered fastening F1 is securely locked upon the shaft Y1 by the set screw 19.

The fan housing H which is snail like in formation and acting as an air suction and air impelling means for the rotating fan, is provided at its motor end with air inlets or openings 21 formed between the sustaining housing ribs 22. The fan housing H likewise is provided with an air outlet 20 at the larger snail air-dispelling opening.

The projecting air outlet 20 is provided with a curved face 20a which will align itself with any of the cabinet intakes or exhausts. The arcuation 20a of the fan housing H for the several air inlets or outlets causes a seal between the blower outlet and the walls 16 of the several openings 1, 2, 3, and 4.

The fan housing H at its opposite end is supported by a lip closure H1 which is likewise provided with air inlets 21a and forming a lipped closure end for the snail like housing. This lipped closure is provided with a shaft 23 whose center centers upon that of the motor shaft, thereby making it rotatable about a common point. The cabinet shaft 23 is provided with a projection shaft 24 upon which is locked an indicating finger 25 held in position by set screw 26. The housing closure H1 whose shaft 23 journals within a rotatable shaft 27 is provided with arms 28a carrying the curved guide 29a which holds the curved spun glass filtering element 30 in contact with the curved portion of the walls 16 of the openings 1, 2, 3, and 4. At the motor end of the fan, the bearing 17 of the fan housing h acts as a shaft for a similar filtering element supported as previously described in a rotatable manner, supporting the hub 31 and its arms 32 so as to sustain the inner curved guide 29 which support the filter element 30 at the motor end.

The first mentioned filtering element support is provided with a shaft 27 of such sufficient length as to project through and beyond the housing cabinet A and its bearing 33 to permit the placement of an indicating finger 34 which is held locked thereon by holding means 35 to show the directional setting of the rotatable filtering element.

In operation, the appliance herein referred to and as hereinbefore specified will discharge air in any of the predetermined directions. Assuming that the air from below the cabinet shall be recirculated in the room to the right of the cabinet as best shown in Figures 2, 3, and 4. The opening 4 would remain open as indicated while the openings 2 and 3 would be fitted with closure as best shown at opening 3 and the opening 1 would be grilled as shown in Figure 3.

The lever 25 would be set in the direction of the outflow of air from the cabinet while the lever 34 would be placed in an inoperative position as is best shown in Figure 3. The cabinet is now positioned for operation.

The power entering through the power cord P to the control switch Q is then turned on by means of control lever L permitting a predetermined amount of power to pass through the conductor to the motor capacitor X and then rotate the motor Y in its predetermined rotation which in this particular case is counterclockwise.

The motor shaft Y1 being rotated would be- cause of its multiblade fan fastening 19 upon the cantilever support F1 which through its fan wing

brackets F2 made fast rings 18, spin the several blades G made fast thereto in a counterclockwise position, creating suction within the housing H permitting air to be sucked in through opening 21 into the fan housing H and expelled through the fan housing exit opening 20 out through the opening 1 into the room. The fan housing exit opening 20 is curved at its outer periphery so as to form a snug fit with the exit opening 1, 2, 3, and 4, so that the rotation of the fan housing about its center to any of the predetermined directions would make it possible for the air to be expelled in any of the predetermined directions.

The air within the chamber S of the cabinet is admitted through the opening 4 in this particular setting. Should it now be desired that the inflowing air be clarified of dust, the lever 34 would be moved about its turnable point to the direction in which the air is to be taken, namely, downward.

The indicator 34 which is rigidly made fast to the bearing 27 by the pin 35 through its bracket arms 28a suspending the arc guides 29a that support the filtering element 30 would be rotated so the filtering element would slide over to inlet 4.

The rotatable guide 29 which rests upon the arms 28 extending from the hub 31 about the hub bearing 17 at the opposite end, is because of the rigidity of the filtering element, likewise turned so that the filtering element 30 will completely cover the cabinet opening 4, thereby removing all dust, lint and other impurities generally collected by spun glass filtering elements from the air entering into the inner chamber S from the exterior.

Should it be further desired that said cabinet be placed upon a radiator of common construction so that the heated air of the radiator enter the opening 4 to be circulated by the spinning of the fan F and expelled out through the opening 1 into the room and should it further be desired to intermingle the heated air with fresh air from outside source, the screen 5 within the screen frame 6 would be interchanged with the closure 7 as shown in Figure 3 thereby closing the top opening 2 of the cabinet and placing the grille 5 in opening 3. By rotating the arm 34 to a point mid-positioned between the openings 3 and 4 of the cabinet, the filtering element is rotated to align with both openings allowing both incoming heated air and new fresh air to be filtered before circulating in the room. Where a dual cabinet is employed for the recirculation of air and the possible intaking of fresh air and the possible expulsion of foul air from a room and in which two fans within a cabinet are employed, a divisional wall W is provided to separate the air chamber of the working space S.

I claim:

1. An air conditioning apparatus comprising a casing having a plurality of inlet and outlet openings, air ducts extending inwardly from each of said openings and communicating therewith, each duct terminating at its inner extremity on a common cylindrical surface, a fan casing having an outlet of a size and shape to correspond with that of said ducts, means supporting said fan casing to swing about the axis of said common cylindrical surface, and to place said outlet into communication with any of said ducts, and a fan in said casing.

2. An air conditioning apparatus comprising a casing having a plurality of angularly spaced inlet and outlet openings, air ducts communicat-

ing with said openings and terminating on a common cylindrical surface, a fan casing within said cylindrical surface, means pivotally supporting said fan casing swingable about the axis of said common surface, an outlet duct on said fan casing terminating on said common cylindrical surface and registrable with any of said air ducts, and a fan within said fan casing.

3. An air conditioning apparatus comprising a casing, a fan motor mounted in said casing, a fan shaft connected to said motor for rotation thereby, a fan on said shaft, a fan casing, means mounting said fan casing rotatable about the axis of said fan shaft, an outlet duct on said fan casing terminating on a cylindrical surface coaxial with said fan shaft, said casing having a series of openings terminating substantially on said cylindrical surface, said outlet duct on said fan casing registrable with any of said openings.

4. An air conditioning apparatus comprising a casing, a fan propelling means mounted in said casing, a shaft rotated by said fan propelling means, a fan on said shaft, a fan casing, means mounting said fan casing rotatable about the axis of said fan shaft, an outlet duct on said fan casing terminating on a cylindrical surface coaxial with said fan shaft, said casing having a series of openings terminating substantially on said cylindrical surface, said outlet duct on said fan casing registrable with any of said openings, and means secured to said fan casing and extending through said casing by means of which said fan casing may be rotatably adjusted.

5. An air conditioning apparatus comprising a casing, a fan propelling means mounted in said casing, a fan shaft rotated by said fan propelling means, a fan on said shaft, a fan casing, means mounting said fan casing rotatable about the axis of said fan shaft, an outlet duct on said fan casing terminating on a cylindrical surface coaxial with said fan shaft, said casing having a series of ducts terminating substantially on said cylindrical surface, arcuate filter means arranged

with its outer surface substantially on said cylindrical surface, and means supporting said filter means swingable about the axis of said fan shaft to extend in the path of air entering any of said ducts.

6. An air conditioning apparatus comprising a casing, a fan propelling means mounted in said casing, a fan shaft rotated by said fan propelling means, a fan on said shaft, a fan casing, means mounting said fan casing rotatable about the axis of said fan shaft, an outlet duct on said fan casing terminating on a cylindrical surface coaxial with said fan shaft, said casing having a series of ducts terminating substantially on said cylindrical surface, arcuate filter means arranged with its outer surface substantially on said cylindrical surface, means supporting said filter means swingable about the axis of said fan shaft, and means connected to said filter means and extending through said casing by means of which said filter means may be rotatably adjusted with relationship to the path of air entering any of said ducts.

7. An air conditioning apparatus comprising a casing, a fan shaft rotatably supported within said casing, a fan on said fan shaft, a fan casing, means supporting said fan casing rotatable about the axis of said fan, an outlet duct on said fan casing terminating on a cylindrical surface coaxial with said shaft, said casing having a plurality of inlet and outlet ducts extending substantially onto said common surface, said outlet duct being registrable with any of said inlet and outlet ducts, an arcuate filter means having its outer surface lying substantially on said common cylindrical surface, means supporting said filter means adjustable about the axis of said fan shaft, and means for adjusting the position of said filter means, said filter means being registrable with any of said inlet and outlet ducts in said first named casing.

ROBERT P. SCHLIRF.