Aug. 3, 1943. G. R. MADDOX 2,325,692

AIR CONDITIONER

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Fig. 1.

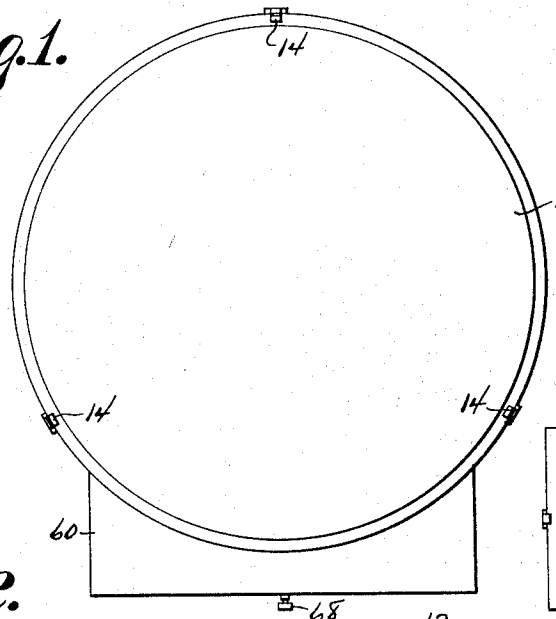


Fig. 7.

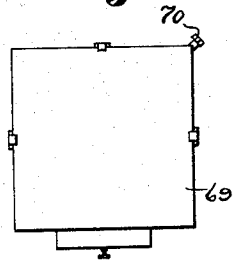
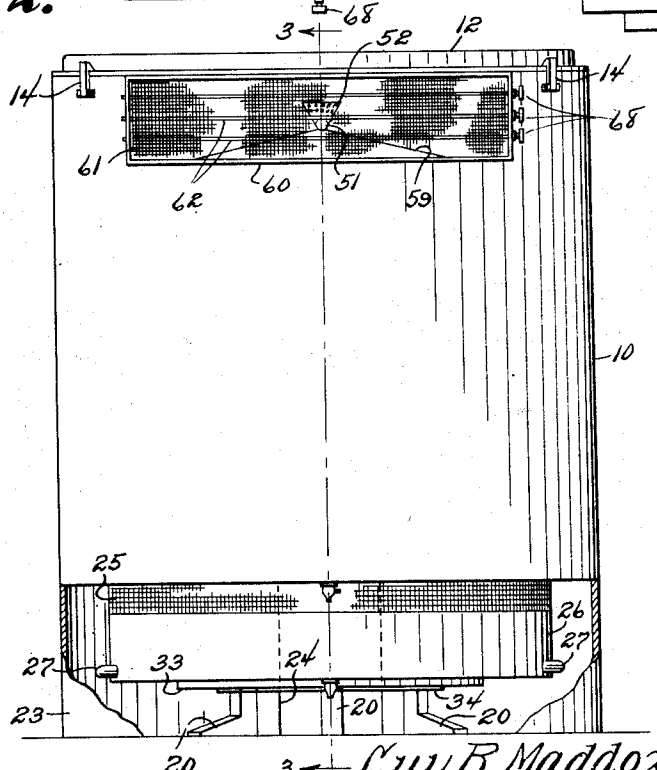


Fig. 2.



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Fig. 3.

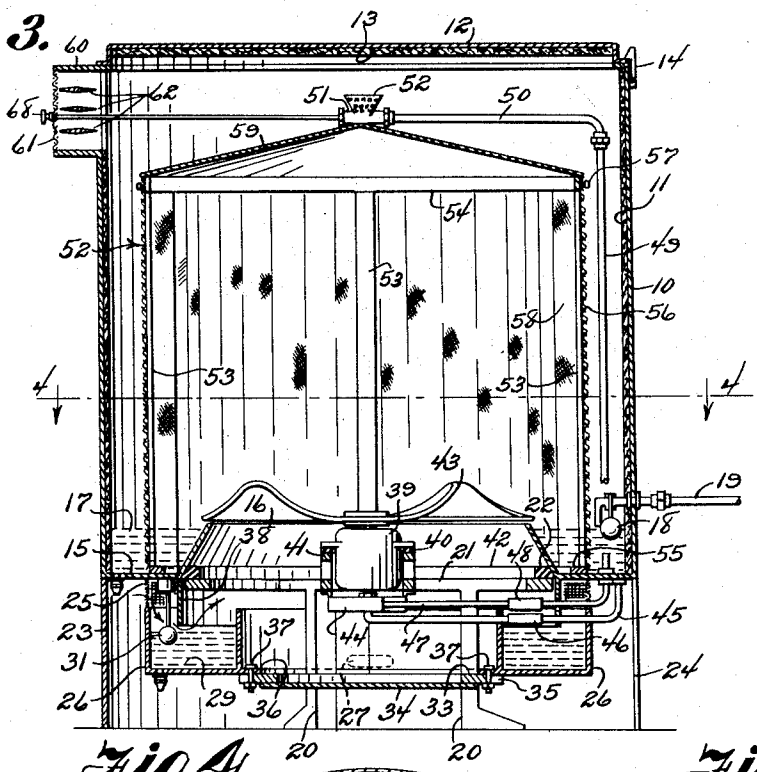


Fig. 4.

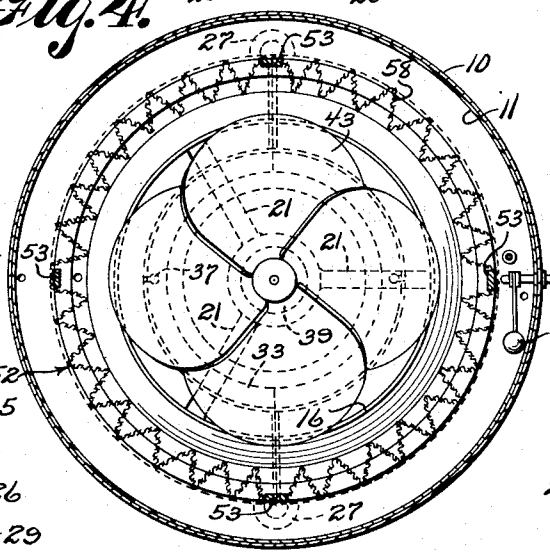


Fig. 6.

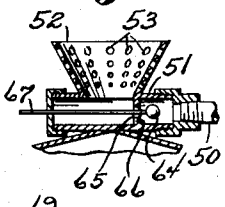


Fig. 5.

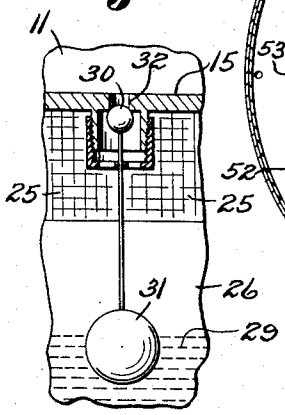
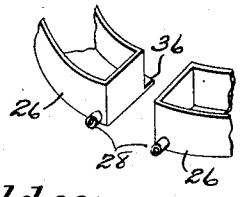


Fig. 8.



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2,325,692

AIR CONDITIONER

Guy R. Maddox, Borger, Tex.

Application September 19, 1941, Serial No. 411,562

4 Claims. (Cl. 261—29)

This invention relates to an air conditioner and has for an object to provide a device of this character in which the indrawn air will be screened to prevent access of insects and rodents and then the screened air will be directed through a sharp turn to a pass across the surface of a water bath to cause separation of dust and foreign matter and precipitation of the same into the water bath, and then will be directed upwardly by forced draft and passed through a water curtain in an evaporation chamber to thoroughly wash and condition the air for use in rooms and other places.

A further object is to provide a device of this character having a frustrum shaped air inlet in which is supported a motor and a pump, the motor driving a fan, for forcing the air through the water screen to the outlet louvers of the device, means being provided to regulate the depth of a circulating water bath which surrounds the air inlet so that water cannot reach the fan or motor and impair the efficiency of the device.

A further object is to provide a device of this character which will have rubber cushions between contacting metal parts to reduce vibration and noise.

A further object is to provide a device of this character having two interconnected semi-annular water bath pans below the insect screens adapted to be withdrawn laterally from the device to permit removal of sediment without dismantling the device.

A further object is to provide a device of this character having a water distributor of inverted frustrum shape provided with rows of perforations, the perforations being smallest at the bottom of the distributor and progressively becoming larger toward the top of the distributor so that water will run out of the perforations in all directions with a slight jetting effect rather than merely flowing over the top of the distributor.

A further object is to provide a device of this character which will be formed of a few strong simple and durable parts, which will be inexpensive to manufacture, and which will not easily get out of order.

With the above and other objects in view, the invention consists of certain novel details of construction and combinations of parts hereinafter fully described and claimed, it being understood that various modifications may be resorted to within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings forming part of this specification,

Figure 1 is a top plan view of the air conditioner constructed in accordance with the invention.

Figure 2 is a front elevation of the distributor with parts broken away to show the insect screens and the sediment collecting pans.

Figure 3 is a vertical sectional view of the distributor.

Figure 4 is a cross sectional view of the distributor taken on the line 4—4 of Figure 3.

Figure 5 is a detail sectional view showing the float valve for regulating the water level in the sediment pans.

Figure 6 is a detail cross sectional view of the water distributor.

Figure 7 is a top plan view of a modified form of casing for the air conditioner.

Figure 8 is a fragmentary perspective view showing two adjacent ends of the sediment pans.

Referring now to the drawings in which like characters of reference designates similar parts in the various views, the air conditioner is shown to comprise a shell 10 lined with insulating material 11 and closed at the top by a flanged lid 12 lined with insulating material 13 and removably secured to the shell by hinged hooks 14. The shell is provided at the bottom with an annular flange 15 which is integral at the inner edge with the bottom of a frustum shaped air inlet 16. The bottom of the shell forms a tank to receive a water bath 17 which surrounds the air inlet. The level of the water bath is held below the top of the air inlet by a conventional float valve 18 which controls a water supply pipe 19 which enters the shell.

The shell is supported upon preferably three legs 20 the upper ends of which are integral with a horizontally disposed ring 21. A ring 22, formed of rubber or other vibration absorbing material, is wedged in the open lower end of the air inlet 16 and is seated on the ring 21 to support the shell on the ring 21.

The legs are concealed from view through the medium of a casing 23 formed of desired material. The casing is provided with an opening 24 through which atmospheric air may enter the device.

A circular screen 25 extends downward from the flange 15. The screen removes insects from air entering the device and keeps rodents from gaining access.

A pair of semi-annular pans 26 are supported by the legs below the screen 25. The pans are placed end to end to form an annulus, concentric with the herein mentioned frustum shaped air inlet 16, and are connected by flexible hose connections 27 engaged on nipples 28 carried by the pans so that a water bath 29 in both pans may have a common level. The outer walls of both semi-annular pans are in registration with, and engage the lower edge of the screen 25. A predetermined water level is maintained in the pans through the medium of an upwardly closing ball check valve 30, see Figure 5, which is controlled by a float 31. The check valve controls an opening 32 in the flange 15 of the shell so that when the water level in the pans recedes the valve 30 will gravitate and unseal the opening to permit a predetermined water level being restored in the pans from the water bath 17 in the bottom of the shell.

For supporting the pans on the legs 20 a ring 33 is supported upon a base plate 34 carried by the legs and is provided at intervals with radially disposed slots 35. The inner wall of each pan is formed with an inwardly extending flange 36. Bolts 37 are engaged through the flange and through the slots to hold the pans assembled. When the bolts are loosened the pans may be moved radially outward from each other until the flanges 36 pass off of the ring 33 whereupon the pans may drop down and are removed laterally from below the shell 10 after the casing 23 has been removed. This saves dismantling the device to remove sediment which is collected by the pans as will now be described.

A vertically disposed circular baffle wall 38 is secured to the flange 15 of the shell at the bottom of the frustum shaped air inlet 16 and extends to a point below the screen 25. The baffle wall is concentric with the screen and terminates just above the water level in the pans 26. The function of the baffle wall is to cause a sharp change of direction of atmospheric air drawn through the screens and underneath the baffle wall then upwardly through the air inlet 16. At this point of change of direction dust will be separated from the indrawn atmospheric air and deposited in the pans 26 for subsequent removal.

An electric fan is utilized to cause a forced draft of atmospheric air upwardly. The motor 39 is mounted on a rubber cushion 40 supported by a ring shaped skeleton base 41 which is formed at the center of a spider having radial arms 42 which are integral at the outer ends with the before mentioned ring 21. The blades 43 of the fan are preferably formed of rubber so as to be noiseless when the fan is running and extend at the tips beyond the upper open end of the frustum shaped air inlet 16.

The shaft of the motor is connected to a conventional water pump 44 supplied from the water bath 17 in the shell through a pipe 45 having a removable hose section 46 to permit disassembly of the device. The outlet side of the pump is connected to a pipe 47 having a rubber hose section 48. The pipe enters the shell through the flange 15 forming the bottom of the water tank in the shell and is connected to a stand pipe 49 which extends vertically along the insulating lining 11 and is connected at the upper end to a horizontally disposed pipe 50 which enters one end of a distributor 51, see Figure 6, for distributing water to an evaporating cylinder designated in general by the numeral 52.

The evaporating cylinder comprises upright frame bars 53 connected at the top by a ring 54 and connected at the bottom by a ring 55 which is removably supported upon the flange 15 of the shell, see Figure 1. A curtain 56 formed of fiber mesh material is secured at the upper end to the upper ring 54 by connectors 57 and extends around the vertical frame bars 53. To increase the area of the curtain, the curtain is formed with V-shaped vertically disposed corrugations 58, see Figure 4. The top 59 of the evaporating cylinder is conical and imperforate and extends at the base edge to the peaks of the corrugations of the screen.

The before mentioned distributor 51 is in the nature of a cylinder welded or otherwise secured to the apex of the top 59 of the evaporating cylinder. The distributor is provided with a funnel shaped outlet 52, see Figure 6, provided with perforations 53. The lowermost perforations are relatively small and the perforations increase in diameter progressively toward the open top of the outlet 52. Water forced by the pump into the distributor rises in the distributor and is expelled from the distributor with jet action due to the relatively different diameters of the openings, instead of merely flowing over the top edge of the distributor onto the top 59 of the evaporating chamber. The water gravitates down the conical top and from thence down the mesh curtain 56. Air forced upward by the fan blades is deflected downwardly and outwardly by the top 59 through the sheet of water falling down the curtain and all remaining dust and foreign matter is washed from the air draft.

The washed air travels upwardly in the shell to the lid 12 thereof and finds its way out of the shell through an outlet conduit 60 having a screen 61 at the outer end and controlled by conventional pivoted louvres 62 which are adjusted to vary the slant thereof through the medium of buttons 63, see Figure 2.

The supply of water to the distributor is controlled by a ball valve 64, see Figure 6, which controls an opening 65 in a diaphragm 66 in the intake side of the distributor. The valve is equipped with a stem 67 which extends outwardly through the screen 61 of the outlet conduit 60 and is equipped with a button 68. By pulling out the stem 67 the ball valve is closed and by pushing in the stem the ball valve is opened.

In some instances it is preferable to employ a shell 69 of substantially square cross section, as shown in Figure 7, instead of cylindrical cross section, as shown in the other figures. In this form of the invention the water supply pipe 70 enters the shell at one corner thereof. In other respects the shell is similar to the cylindrical shell previously described and the description need not be repeated.

Since the operation of the parts has been described as the description of the parts progressed it is thought the invention will be fully understood without further explanation.

What is claimed is:

1. An air conditioner, comprising a shell having an air outlet at its upper end, an inlet disposed co-axial with the shell at the bottom and forming a water tank therearound, an electric fan in the inlet, means for maintaining a predetermined water level in the tank, an evaporating cylinder in the shell and extending into the tank, means for supplying water to the upper end of the evaporating cylinder, a water pan below the bottom of the shell, a screen between the top of the pan and the bottom of the shell through which air is drawn

by the fan, and a baffle wall extending downwardly from the bottom of the shell into said pan to cause the air to travel downwardly and then upwardly through the air inlet of the shell.

2. An air conditioner, comprising a shell having an air outlet at its upper end, an air inlet disposed co-axial with the shell at the bottom and forming a water tank therearound, an electric fan in said inlet, means for maintaining a predetermined water level in the tank, an evaporating cylinder in the shell and extending into the tank, means for supplying water to the upper end of the evaporating cylinder, a water pan below the bottom of the shell, means for supplying water from the tank to the pan and maintaining a constant water level therein, a screen between the top of the pan and the bottom of the shell and through which air is drawn by the fan, and a baffle wall extending downwardly from the bottom of the shell into said pan and terminating slightly above the surface of the water in the pan.

3. An air conditioner, comprising a shell having an outlet at its upper end, an inlet disposed co-axial with the shell at the bottom and forming a water tank therearound, an electric fan in the inlet, means for maintaining a predetermined water level in the tank, an evaporating cylinder in the shell and extending into the tank, a pump driven by the fan motor and delivering water to the upper end of the evaporating cylinder, a water pan below the bottom of the shell, means for supplying water from the tank to the pan and maintaining a constant water level therein, a screen between the top of the pan and the bottom of the shell through which air is drawn by the fan, and a baffle wall extending downwardly from the bottom of the shell into said pan and terminating a short distance above the surface of the water in the pan.

4. An air conditioner, comprising a shell having an air outlet at its upper end, an air inlet disposed co-axial with the shell at the bottom and forming a water tank therearound, an electric fan in the inlet, a motor for driving the fan, means for maintaining a predetermined water level in the tank, an evaporating cylinder in the shell and extending into the tank, a pump driven by the fan motor for pumping the water from the tank and discharging it on the upper end of the evaporating cylinder, a water pan below the bottom of the shell, means for supplying water from the tank to the pan and maintaining a constant water level therein, a screen between the top of the pan and the bottom of the shell through which the air is drawn by the fan, and a baffle wall extending downwardly from the bottom of the shell on the inside of the screen and terminating a short distance above the surface of the water in the pan.

GUY R. MADDOX.