

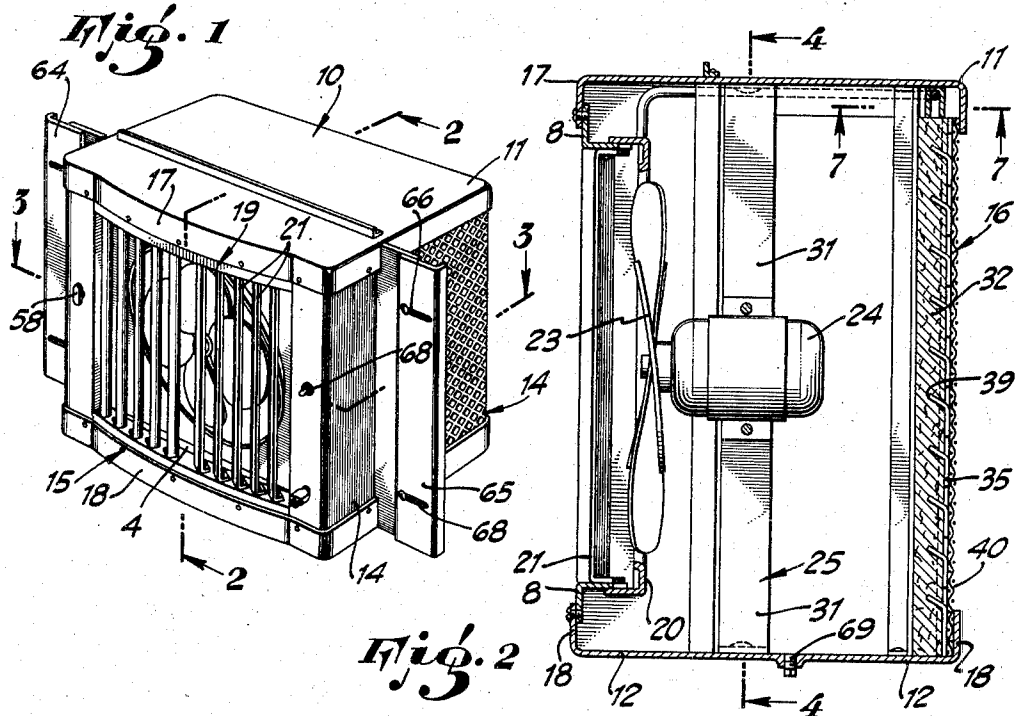
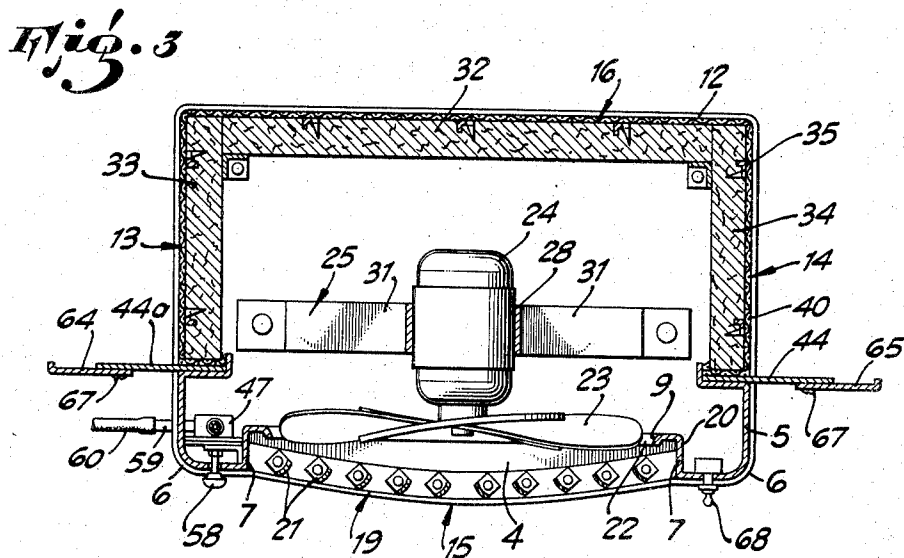
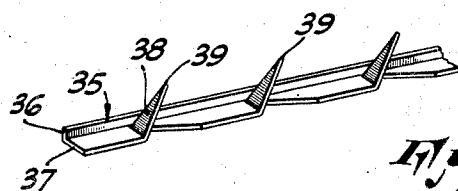
July 24, 1951

O. C. PALMER
EVAPORATIVE COOLER

2,561,592

Filed July 5, 1947

2 Sheets-Sheet 1



Oscar C. Palmer,
INVENTOR.

BY *Lyon & Lyon*
ATTORNEYS.

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2 Sheets-Sheet 2

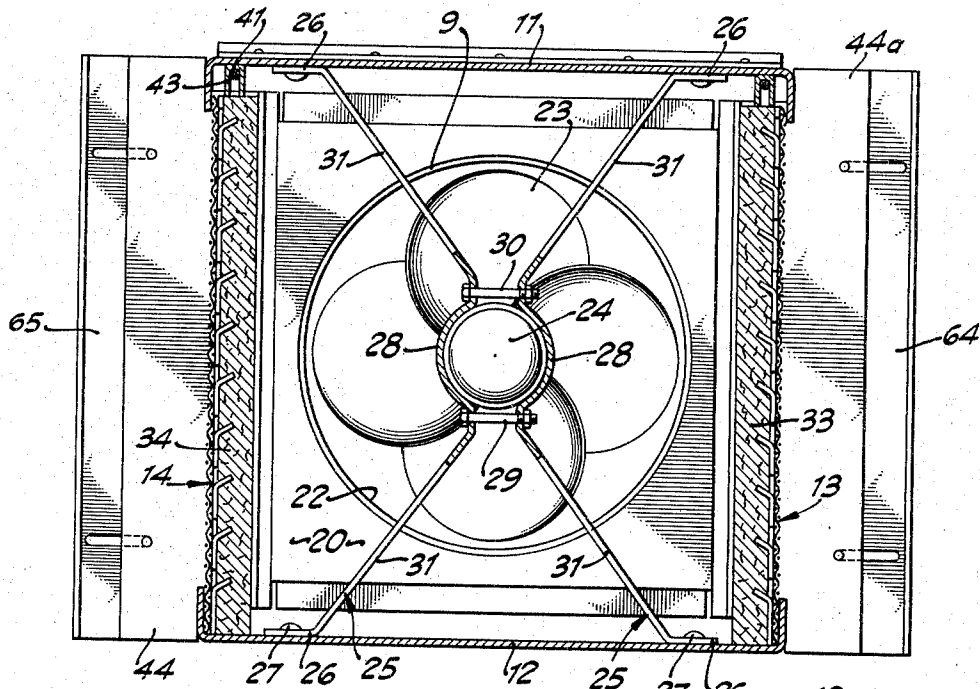


Fig. 4

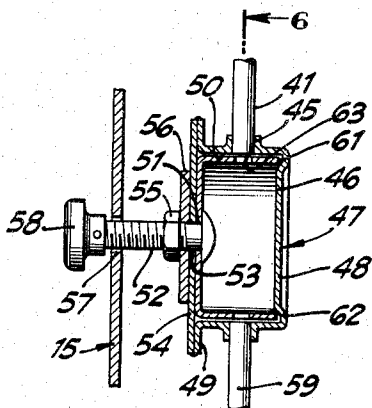


Fig. 5

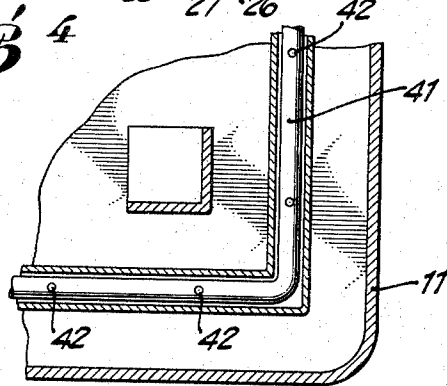


Fig. 7

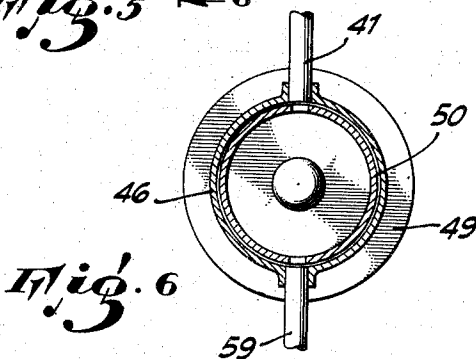


Fig. 6

Oscar C. Palmer,
INVENTOR.

BY

Lyon & Lyon

ATTORNEYS.

UNITED STATES PATENT OFFICE

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EVAPORATIVE COOLER

Oscar Charles Palmer, Phoenix, Ariz.

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4 Claims. (Cl. 261—24)

1

This invention relates to an air conditioning apparatus and is particularly concerned with improvements in evaporative coolers. Devices of this type are commonly employed in desert and semidesert locations and generally in any location having relatively high atmospheric temperature and relatively low humidity.

The principal object of this invention is to provide an evaporative cooler of greater efficiency and cooling ability than conventional types in use.

A particular object is to provide an evaporative cooler utilizing a power-driven fan within a casing and providing a recessed shroud encircling the fan to promote efficient air flow through a central orifice in the shroud.

Another object is to provide a device of this type in which the shroud is recessed back of the front wall of the casing and a plurality of louvers are provided flush with the front wall downstream from the orifice.

Another object is to provide a vibration-free four-point suspension for the fan motor for holding the motor in place within the casing and for automatically centering the fan within the orifice in the shroud.

A related object is to provide an improved means for holding the evaporator pads relative to the casing to prevent sag of the pads after a period of use.

A further object is to provide an improved form of flow control valve for regulating the flow of fluid to the evaporator pads.

Other objects and advantages will appear hereinafter.

In the drawings:

Figure 1 is a perspective view of an evaporative cooler showing a preferred embodiment of my invention.

Figure 2 is a longitudinal sectional elevation taken substantially on line 2—2 as shown in Figure 1.

Figure 3 is a sectional plan view taken substantially on line 3—3 as shown in Figure 1.

Figure 4 is a rear sectional elevation taken on the line 4—4 as shown in Figure 2.

Figure 5 is a fragmentary sectional view showing details of construction of a preferred form of flow control valve.

Figure 6 is a sectional view taken substantially on the line 6—6 as shown in Figure 5.

Figure 7 is a fragmentary sectional plan taken substantially on the line 7—7 as shown in Figure 2.

Figure 8 is a perspective view partly broken away showing a pad-holding prong strip employed in connection with my invention.

2

In the drawings, the casing generally designated 10 includes a top 11, a bottom 12, side walls 13 and 14, and front and rear walls 15 and 16, respectively. If desired, the top 11 and bottom 12 may be formed of single integral metal stampings. Another stamping 5 forms the marginal edges of the front wall 15 and the forward portions of the side walls 13 and 14. This stamping forms the curved front corners 6 and is provided with rearwardly extending parallel walls 7 which support the noncircular shroud 20. Curved flanges 17 and 18 on the top and bottom walls also form a portion of the front wall 15. Secured to these curved flanges 17 and 18 are curved strips 8 which cooperate with the walls 7 to define a noncircular recess 4 in the front wall of the casing 10. The grill 19 is composed of a plurality of individual louvers 21 fastened top and bottom to the strips 8. The louvers on one side of the device may be tilted to deflect air in one direction while louvers on the other side are tilted at another angle to deflect air in another direction.

The shroud 20 is provided with a curved lip 9 defining a central circular orifice 22. Mounted within the orifice 22 and concentrically therewith is a fan 23 carried on the shaft of an electric motor 24. Means are provided for supporting the motor 24 within the casing 10, and as best shown in Figure 4 of the drawings, this means includes a pair of double brackets 25 having foot portions 26 attached near the outer extremities of the top 11 and bottom 12 respectively. The attachment may be effected by any convenient means such as, for example, the rivets 27.

Each of the brackets 25 is provided with a central curved portion 28 adapted partially to encircle the housing of the motor 24. Threaded elements 29 and 30 are provided for securing the curved portions of the brackets to clamp the motor 24 therebetween, thereby supporting the motor 24 within the casing and automatically aligning the fan 23 with the orifice 22. The brackets extend diagonally from their curved portions 28 to their feet 26, and the effect of this diagonal portion 31 is to provide a substantially X-type support for rigidly holding the motor in place and providing substantially vibration-free mounting.

A plurality of evaporator pads 32, 33, 34 are positioned along the side walls 13 and 14 and back walls 16 of the casing 10. Means are provided for supporting the evaporator pads in position and for preventing their gradual sag or collapse, and this means includes a plurality of pad-holding prong strips 35 which extend vertically between the top 11 and bottom 12 and may be attached thereto by any convenient means such as,

3

for example, by welding. As clearly shown in Figure 8 each of these strips 35 may be formed of an angle section having a short side 36 and a long side 37. At spaced intervals along the long side 37 triangular wedges or prongs 38 are cut from the long side and bent along the uncut portion so that pointed ends 39 are directed outwardly transverse to the length of the strip 35. As shown in Figure 2 these pronged points 39 impale the evaporator pads at vertically spaced intervals thereby forming a simple yet effective initial support for the pad within the casing while also acting to prevent sag of the pad at any point after a period of use. A screen 40 may be provided which extends around the sides 13, 16 and 14 and acts as a protection to prevent damage to the evaporator pads 32, 33 and 34.

Means are provided for distributing water or other evaporative fluid to the pads 32, 33 and 34 and, as shown in the drawings, this means includes a drip tube 41 which extends around the casing near the top 11 above the evaporator pads and which is provided with small drilled holes 42 at intervals along its length. One end of this drip tube 41 is closed at 43 at a point above the pad 34 and adjacent the filler strip 44. The other end of the drip tube 41 connects with the outlet 45 of the shell 46 of the flow control valve generally designated 47. The shell 46 is cylindrical in form and has a blind side 48. The other side is flanged at 49. A cup 50, which is also cylindrical, is received within the shell 46 and mounted for relative rotational movement with respect thereto. The cup 50 is provided with a central aperture 51 through which extends a bolt element 52 in a direction along the axis of rotation of the cup 50.

The bolt 52 also extends through a central opening 53 in the cover 54 which forms an enclosure for the shell 46. The cover is preferably welded to the shell by any convenient means such as spot welding or stitch welding after the cup 50 and bolt element 52 are in place. A nut 55 may be threaded onto the bolt to engage a mounting bracket 56. The bolt 52 extends outwardly through a hole 57 provided in the front wall 15 and a manually operable knob 58 may be secured to the extending portion of the bolt.

A supply pipe for water or other evaporative fluid is provided at 59, and any convenient means, such as the tube 60 leading to a fluid source, may be connected to the pipe 59. Ports 61 and 62 are provided in the cylindrical skirt of the cup 50, and these ports may be turned to alignment with the drip tube 41 and supply pipe 59, respectively.

From the above description, it will be understood that manual rotation of the knob 58 serves to turn the cup 50 within the shell 46 and thus bring the ports 62 into any degree of registry desired with the supply pipe and drip tube in order to control the flow of fluid into the drip tube 41. The fit between the cup 50 and shell 46 is such that a very restricted annular clearance 63 is present between the exterior of the cylindrical cup 50 and the cylindrical bore in the shell 46. This simple construction has been found to give very sensitive control of the amount of the fluid admitted to the drip tube 41.

In operation, the casing 10 may be placed in a window of a room of a building so that the front wall 15 is within the room and the rear wall 16 is outside thereof. Filler strips 44 and 44a extend outwardly from the side walls 13 and 14 at the location of the center of the wall (not shown), and extension elements 64 and 65 may

4

be mounted on the filler strips to provide an effective barrier in windows of different widths. Slots 66 in the extensions 64 and 65 cooperate with threaded elements 67 to secure the extensions in the desired position, as will be readily understood.

Water or other evaporative fluid is admitted through the tube 60 into the flow control valve 47, and the knob 58 is adjusted to produce the desired rate of flow into the drip tube 41. Fluid passes through the drilled holes 42 in the drip tube to saturate the evaporator pads 32, 33 and 34. The switch 68 on the front wall 15 is then actuated to energize the motor 24 and thus rotate the fan 23. The interior of the casing is subjected to a partial vacuum by the action of the fan 23, and atmospheric pressure outside the room forces air inwardly through the screen 40 and through the evaporative pads into the interior of the casing. The air is humidified and cooled by this action and a temperature drop of 10° between the interior and the exterior of the casing is not uncommon. The air thus cooled is then blown by the fan 23 outwardly through the orifice 22 and into the room. The air is not delivered as a solid blast of limited area, however, but is spread and diffused laterally by means of the louvers 21 comprising the grill 19. Fan efficiency is increased by the provision of the shroud 20 and the curved portion or lip 9 further contributes toward efficient air flow through the orifice 22. This arrangement provides maximum outlet with minimum efficiency loss by recirculation.

It will be observed that the grill 19 is flush with the front wall 15, and this freedom from projections is both pleasing from a design standpoint and has functional utility in avoiding sharp corners and projections which might catch on clothing of anyone passing nearby within the room.

The device may be operated continuously or may be shut down when desired. In order to avoid water loss, the knob 58 is turned to closed position when the switch 68 is actuated to shut off the motor. A drain plug 69 is provided in the bottom 12 to drain any excess fluid which falls from the evaporator pads.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein set forth, but my invention is of the full scope of the appended claims.

I claim:

1. In an evaporative cooler, the combination of a casing; a power driven fan in the casing, the casing having one of the walls thereof provided with parallel reentrant portions defining a non-circular recess; a noncircular shroud carried on said reentrant portions and positioned within the casing, the shroud having a central circular discharge orifice in axial alignment with the fan; and a plurality of louvers positioned within the noncircular recess and extending flush with the exterior surface of said wall.

2. In an evaporative cooler, the combination of a casing having evaporative pads carried on certain of the walls thereof; a power driven fan in the casing adapted to draw air into the casing through the evaporative pads, one of the walls of the casing having parallel reentrant portions defining a noncircular recess; a noncircular shroud carried on said reentrant portions and positioned within the casing, the shroud having a central circular discharge orifice in axial alignment with the fan; and a plurality of louvers positioned

5

within the noncircular recess and extending flush with the exterior surface of said wall.

3. In an evaporative cooler, the combination of a casing having evaporative pads carried on certain of the walls thereof; a power driven fan in the casing adapted to draw air into the casing through the evaporative pads, one of the walls of the casing having parallel reentrant portions defining a noncircular recess; a noncircular shroud carried on said reentrant portions and positioned within the casing, the shroud having a central circular discharge orifice defined within a curved lip, the orifice being in axial alignment with the fan; and a plurality of louvers positioned within the noncircular recess and extending flush with the exterior surface of said wall.

4. In an evaporative cooler, the combination of a casing having evaporative pads carried on certain of the walls thereof; a power driven fan in the casing adapted to draw air into the casing through the evaporative pads, one of the walls of the casing having integrally formed vertical reentrant portions; horizontal strips secured to

6

the casing and cooperating with the reentrant portions to define a noncircular recess; a noncircular shroud carried on said reentrant portions and positioned within the casing, the shroud having a central circular discharge orifice in axial alignment with the fan; and a plurality of louvers secured to said strips and positioned within the noncircular recess.

OSCAR CHARLES PALMER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
268,006	Dibble	Nov. 28, 1892
2,021,437	Walsh	Nov. 19, 1935
2,048,911	Zimmerman	July 28, 1936
2,160,003	Slayter et al.	May 30, 1939
2,253,418	Crandall et al.	Aug. 19, 1941
2,289,825	Burton et al.	July 14, 1942