PAD RETAINER FOR EVAPORATIVE COOLERS

Eli Shapiro, Dallas, Tex., assignor to Dearborn Stove Company, Dallas, Tex.

Application April 15, 1950, Serial No. 156,139

4 Claims. (Cl. 261—97)

This invention relates to evaporative coolers and more particularly to evaporative coolers provided with pads of fibrous material through which air is drawn to be cooled.

This application is a continuation in part of applicant's application, Serial No. 144,802, filed February 17, 1950, now Pat. No. 2,694,688, issued April 24, 1952.

In many evaporative coolers the air whose temperature is to be lowered is drawn through moistened pads of fibrous material in order that it be cooled by the evaporation of the water which covers the individual fibers of the pad. The moistened fibers of the pad afford a very large surface area from which evaporation may take place. The fibrous material of the pad, however, must be uniformly distributed throughout the pads in order not to impede the passage of the air to a degree greater than is absolutely necessary and also to ensure that all air drawn through the fibrous material is exposed to the cooling action of evaporation of the moistened surfaces of the fibers. If the fibrous material of the pads sags, large gaps may be opened in the pads which will permit the passage of the air without subjecting it to the cooling effects of evaporation. If the fibrous material of the pads sags, some portions of the pads will be compressed and the rate of flow of air through these portions will be decreased. For optimum results, the pads of fibrous material must be so supported that the fibrous material is held firmly in place and not allowed to sag or compact. At the same time, the supporting means must allow the fibrous material to be sufficiently loose that the passage of air is not impeded to a greater degree than is necessary and that the greatest possible moistened surface is provided from which evaporation may take place.

Accordingly, it is an object of the invention to provide a new and improved evaporative cooler.

It is another object of the invention to provide a new and improved evaporative cooler having pads of fibrous material.

It is another object of the invention to provide new and improved means for supporting pads of fibrous material.

It is another object of the invention to provide a new and improved cooler having pads of fibrous material which are supported to prevent sagging and compacting.

It is still another object of the invention to provide readily demountable supporting means for pads of fibrous material.

Briefly stated, the new and improved evaporative cooler is provided with pads of fibrous material which are held in place adjacent to and abutting the louvered sides of the evaporative cooler. The pads are held and supported by means of channel shaped members which are demountably secured parallel to the sides of the cooler. The forward edges of the sides of each of the channel members are provided with teeth which pierce the fibrous material of the pads to hold the fibrous material against sagging and compacting.

For a better understanding of the invention reference may be had to the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing,

Figure 1 is a perspective view of a preferred embodiment of the invention, some parts of the evaporative cooler not being shown;

Figure 2 is a vertical section of one side of the evaporative cooler illustrated in Figure 1 showing the pad supporting means;

Figure 3 is an end view of the upper end of the supporting means shown in Figure 5;

Figure 4 is an end view of the lower end of the supporting means shown in Figure 5; and,

Figure 5 is a perspective view of one of the channel members which supports the pads of fibrous material.

Referring now to the drawing, the evaporative cooler 10 is provided with a top 11 and a bottom pan 12 which are rigidly secured to a wall member 13 by any conventional means such as screws 14. Wall member 13 forms three sides of the cooler 10, only one side 15 being visible in Figure 1. Wall member 13 is provided with louver 16 through which air is drawn into the interior of the cooler 10. The lower end of wall member 13 is bent inwardly at right angles to form flanges 17 which are spaced from each other by slots 18. Flanges 17 form a shelf on which rest the lower edges of the fibrous material 19. A water trough 20 is secured to the upper edge of wall member 13 and extends along the three sides of the cooler formed by wall member 13.

Water trough 20 and flanges 17 are provided with slots 21 and 22, respectively, which receive tongues 23 and 24, respectively, of the inner channel members 25. Inner channel members 25 have side portions 26 and 27 which are connected by a web 28. The ends 29 and 30 of sides 26 and 27, respectively, extend at an acute angle from web 28 equal to the angle of the side of trough 20 which abuts ends 29 and 30. Ends 31 and 32 of sides 26 and 27, respectively, extend perpendicularly from web 28 and contact the up-
When the channel member 25 is disposed in its operative position in cooler 10. It is apparent that tongues 23 and 24 are extensions of web 28. Tongue 24 is bent at an angle away from sides 26 and 27 for a purpose which will be described below. The edges of sides 26 and 27 are provided with teeth 33 and 34, respectively. It will be noted that teeth 33 are disposed in staggered relation to teeth 34 so that when a channel member 25 is in operative position, the teeth 33 and 34 will not tend to form a gap in the fibrous material 19 as would be more probable if teeth 33 coincided in vertical positions with teeth 34.

Outer channel members 35, one of which is shown in Figure 2, are secured to the inner side of wall member 13 by any conventional means, such as spot welding. Outer channel members 35 are similar to inner channel members 25, having staggered teeth 35 and 37, but are not provided with tongues such as tongues 23 and 24 of the channel members 25.

The process of installing or removing the pads of fibrous material will readily be apparent. The pads or pads of fibrous material 19 are placed against the three sides formed by wall member 13. In this step the teeth 36 and 37 of outer channel member 35 pierce, and extend into, the fibrous material 19. Between each outer channel member 35, an inner channel member 25 is then mounted by inserting tongue 23 in a slot 21 in trough 20 and then inserting tongue 24 in a slot 22 in a flange 17. The tongue 24 can then be inserted in slot 22 by depressing the flange 17 until tongue 24 slips into slot 22. Channel member 25 is then held rigidly between trough 20 and flange 17. The fibrous material is compressed between channel members 25 and 35 and exerts a resilient force which locks tongue 24 in slot 22, said tongue 24 is bent at an angle to the lower side of the flange 17. When it is desired to remove the pads of fibrous material 19, each flange 17 is depressed to allow the tongue 24 of the associated inner channel member 25 to be removed from slot 22. Tongue 23 can then be slid out from slot 21 and the channel member 25 removed from cooler 10. Fibrous material 19 can then be easily removed since only the outer channel member 35 will be maintaining it in place.

As can be readily seen in Figure 2, teeth 33, 34, 36 and 37 are staggered when inner channel members 25 are in their operative positions. This will minimize any tendency of these teeth to form holes or gaps in the pads of fibrous material 19. The pads of fibrous material 19 will be held firmly in place between channel members 25 and 35 and between trough 20 and flanges 17 to prevent sagging and compacting of fibrous material 19.

Water trough 20 is provided with a plurality of holes 30, one of which is shown in Figure 2, which allow the water in trough 20 to drain by gravity and moisten the fibrous material 19. A blower not shown, is mounted in the open side of the cooler 10 and draws air into the interior of cooler 10 through louvers 16 and fibrous material 19. The blower then expels the air from the interior of cooler 10 into the space which it is desired to cool. The cooler 10 illustrated in Figure 10 is adapted to be placed in a window and fastened to the sash of the window by means of the angle 39 which is secured to top 11. It will be evident that louvers 16 will communicate with the outside atmosphere and that the outdoor air drawn through louvers 16 will be cooled by evapo-

ration of the water in the fibrous material 19 in its passage through the fibrous material 19.

Tongues 23 have been shown as disposed in slots 21 in trough 20. Tongues 23, however, could be inserted in similar slots provided in any structure located above the pads of fibrous material 19. All parts of the water cooler with the exception of the pads may be formed of sheet metal. The pads may be formed of mineral, plant, or animal fiber.

While applicant has shown and described a preferred embodiment of his invention, it will be apparent to those skilled in the art that changes and modifications can be made without departing from the invention, it is therefore aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What applicant claims as new and desires to secure by Letters Patent of the United States is:

1. In an evaporative cooler: a wall member provided with a plurality of openings, said wall member having a lower end provided with a plurality of spaced and apertured flanges extending inwardly and substantially perpendicularly to said wall member and disposed intermediate said trough and said flanges and having adjacent one upper edge a plurality of longitudinally spaced slots; a plurality of channel members defining outer pad retaining means rigidly secured to said wall member, a trough secured to said wall member above and in spaced relation to said flanges and having adjacent one upper edge a plurality of longitudinally spaced slots; a plurality of channel members defining outer pad retaining means, each of said inner pad retaining means having an extension on its lower end entering a selected one of the plurality of slots in said trough and an extension on its lower end entering a selected aperture in one of said flanges.

2. In an evaporative cooler: a wall member provided with a plurality of openings, said wall member having a lower end provided with a plurality of spaced flanges and said trough; a plurality of channel members having serrated parallel flanges and defining outer pad retaining means rigidly secured to said wall member intermediate said spaced flanges and said trough; a plurality of channel members having serrated parallel flanges and defining inner pad retaining means, each of said inner pad retaining means having an extension on its upper end engaging a slot in said trough, and an extended lower end entering an aligned slot in one of said flanges; a plurality of fibrous material between said inner pad retaining means and said outer pad retaining means, said pad having a lower edge resting on the flanges of said wall members and an upper edge abutting said trough and a portion of said trough extending throughout its area by the serrated flanges of said inner and outer pad retaining means.

3. In combination: a member provided with a plurality of openings; a plurality of spaced flanges extending inwardly of said member and forming a slotted lower shelf, each of said flanges being provided with a slot; a plurality of vertically disposed inner pad retaining means, each of said pad retaining means comprising a channel member having an upper end provided with
a substantially straight tongue and a lower end provided with an inwardly bent tongue; tongue engaging means disposed above said flanges, said tongue engaging means being provided with a plurality of slots, each of said channel members having its straight tongue secured in one of said slots of said tongue engaging means and its bent tongue engaging in the slot of one of said flanges, and a plurality of vertically disposed outer pad retaining means secured to said first mentioned member intermediate said flanges and said tongue engaging means, said outer pad retaining means being staggered with respect to and in confronting relation to said inner pad retaining means.

4. The device of claim 1, said channel members of said inner pad retaining means each comprising a pair of parallel sides, a web perpendicular to and connecting said sides, each of said sides having an edge provided with a plurality of spaced teeth.

the teeth of one of said sides being disposed in staggered relation to the teeth of the outer of said sides, a normally straight tongue member extending from one end of said pad retaining means, and a normally bent tongue extending from the other end of said pad retaining means.

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