March 25, 1952 V. C. LEHMANN 2,590,779

WATER DISTRIBUTING APPARATUS FOR EVAPORATIVE COOLERS

Filed Nov. 12, 1948

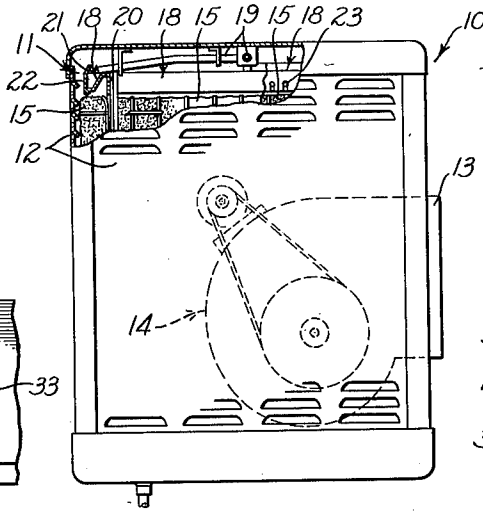


Fig. 1.

Fig. 4.

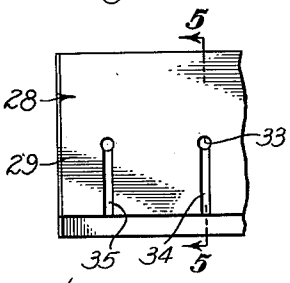


Fig. 5.

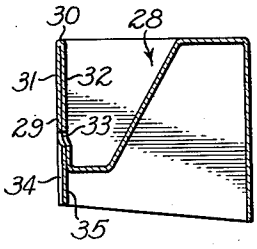


Fig. 6.

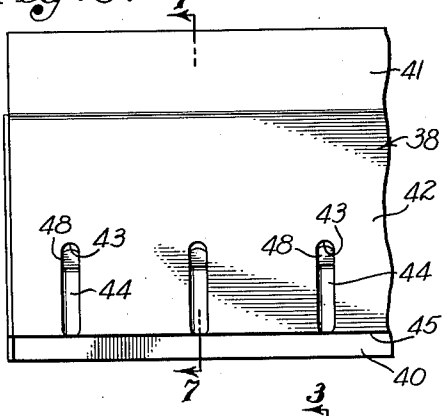
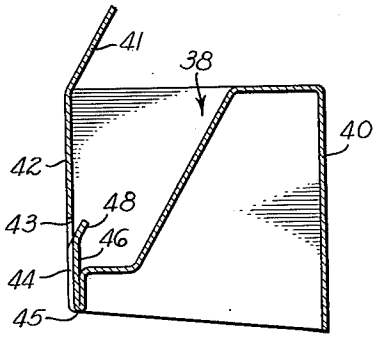


Fig. 7.



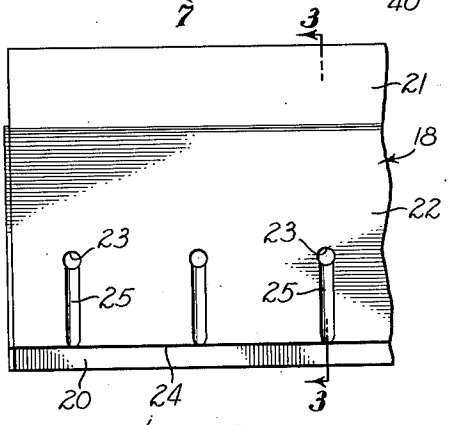
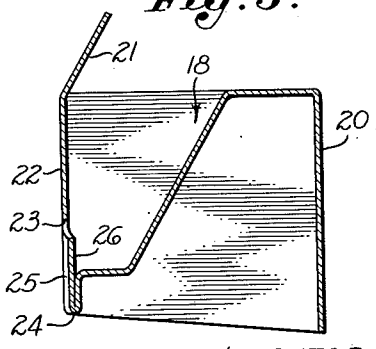


Fig. 2.

Fig. 3.



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Patented Mar. 25, 1952

2,590,779

UNITED STATES PATENT OFFICE

2,590,779

WATER DISTRIBUTING APPARATUS FOR EVAPORATIVE COOLERS

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Application November 12, 1948, Serial No. 59,624

2 Claims. (Cl. 299—58)

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My invention relates in general to evaporative coolers and, more particularly, to a water distributing apparatus for an evaporative cooler, a primary object of the invention being to provide an apparatus for uniformly distributing water in such an installation.

It will be understood that while I have elected to consider the present invention in connection with an evaporative cooler for purposes of illustration, the invention is not to be regarded as limited thereto since the distributing apparatus of the invention may be employed in other installations for distributing other liquids, as will be appreciated by those skilled in the art.

Considering the present invention in connection with evaporative coolers, my distributing apparatus may be used in an evaporative cooler of the type having a saturable element, usually a pad of fibrous material, which traverses an air stream moving through the cooler, the function of the distributing apparatus being to maintain the saturable element in a saturated, or substantially saturated, condition so that the air flowing therethrough is cooled by evaporation of water therein as is well known in the art.

Conventionally, such a water distributing apparatus comprises a reservoir or trough having discharge openings therein through which water flows onto the saturable element, the trough being located above the element so that the water flowing through the discharge openings is applied thereto by gravity and percolates downwardly through the element to saturate same.

Such a conventional water distributing apparatus is subject to a serious disadvantage in that the streams of water emanating from the discharge openings in the trough tend to merge with the result that the uniformity of water distribution throughout the pad is undesirably impaired.

An important object of the present invention is to provide a water distributing apparatus which eliminates any tendency of the streams emanating from adjoining discharge openings to merge, whereby to provide a more uniform distribution.

More specifically, an object of the invention is to provide an apparatus having channel means for conveying the water emanating from the discharge openings downwardly toward the saturable element along predetermined and well defined paths to prevent merging of adjacent streams.

Another object is to provide a water distributing apparatus wherein the aforementioned channel means takes the form of a plurality of grooves each of which is located beneath one of the discharge openings and communicates therewith so

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that the water discharged through each discharge opening flows therefrom into the corresponding groove.

Still another object is to provide an apparatus wherein the grooves or channels for conducting the water downwardly are formed by indenting a sheet metal wall in which the discharge openings are formed.

The foregoing objects and advantages of the present invention, together with various other objects and advantages thereof which will become apparent, may be attained through the employment of the exemplary embodiments of the invention which are illustrated in the accompanying drawing and which are described in detail hereinafter. Referring to the drawing:

Fig. 1 is a utility view on a reduced scale showing an evaporative cooler which embodies a water distributing apparatus of the invention;

Fig. 2 is an elevational view of one embodiment of a water distributing apparatus of the invention;

Fig. 3 is a transverse sectional view taken along the broken line 3—3 of Fig. 2;

Fig. 4 is an elevational view of another embodiment of the invention;

Fig. 5 is a transverse sectional view taken along the broken line 5—5 of Fig. 4;

Fig. 6 is an elevational view of a third embodiment of the invention; and

Fig. 7 is a transverse sectional view taken along the broken line 7—7 of Fig. 6.

Referring particularly to Fig. 1 of the drawing, the numeral 10 designates a suitable evaporative cooler with which a water distributing apparatus 11 of the invention may be employed. The evaporative cooler per se forms no part of the present invention and may be of any suitable construction so that the details thereof need not be considered herein. In general, the evaporative cooler 10 is provided with one or more inlets, shown as having the form of inlet grilles 12, and includes an outlet 13, a flow of air through the cooler from the inlet grille for inlet grilles 12 to the outlet 13 being maintained by a motor blower assembly 14. Disposed in the path of the air stream flowing through each inlet grille 12 is a saturable element 15, conventionally a pad of fibrous material. Each saturable element 15 is adapted to receive water from the water distributing apparatus 11, the latter being adapted to maintain the element or elements 15 in a saturated, or substantially saturated, condition so that the air flowing therethrough is cooled by evaporation of water as is well known in the art. In the particular construction illustrated, the

water distributing apparatus 11 takes the form of a reservoir, exemplified as a trough 18, located above each saturable element 15, the troughs 18 being supplied with water through pipes 19.

Considering the water distributing apparatus 11 in more detail with particular reference to Figs. 2 and 3 of the drawing, the trough 18 is provided with a mounting flange 20 for attachment to the structure of the cooler 10, and is provided with a flange 21 which serves to prevent splashing of water from the trough as it is discharged therein through one of the corresponding pipes 19. In the particular construction illustrated, the trough 18 is approximately V-shaped, although the invention is not to be regarded as limited thereto, and includes a generally vertical wall 22. The latter is provided with a plurality of discharge openings 23 therein above its lower edge 24 and is provided with a plurality of grooves or channels 25 which are located beneath and extend downwardly from the respective discharge openings. Each channel 25 communicates at its upper end with the corresponding discharge opening 23 and extends to the lower edge 24 of the wall 22.

As will be apparent, the channels 25 serve to guide the water emanating from the discharge openings 23 downwardly toward the saturable element 15 therebeneath along predetermined and well-defined paths so as to prevent merging of the streams of water from adjacent discharge openings, which is an important feature of the invention since it makes for more uniform water distribution throughout the saturable element. Also, since the channels 25 extend to the lowermost edge 24 of the wall 22, there is little or no tendency for water streams from adjacent discharge openings to flow along the lowermost edge 24 and merge. When the water distributing trough 18 is employed in connection with the evaporative cooler 10 as shown, the net result is more uniform distribution of water throughout the corresponding saturable element 15 and, thus, more uniform cooling of the air flowing through the element.

Although various materials may be employed for the trough 18, I prefer to fabricate same of sheet metal for convenience in manufacture and to form the channels 25 by indenting the sheet metal wall 22, as indicated at 26. The discharge openings 23 and the indentations 26 providing the channels 25 may be formed in a single stamping operation, if desired. Alternatively, the trough 18 may be formed of a suitable plastic material by a molding operation, or may be formed of other materials.

The embodiment illustrated in Figs. 4 and 5 of the drawing is similar to that described previously and comprises a reservoir, exemplified as a trough 28, which is provided with a generally vertical wall 29 corresponding to the wall 22 of the trough 18. In the particular construction illustrated, the wall 29 is of double thickness and is formed of a single piece of material which is doubled back on itself at 30 to provide two portions 31 and 32 which contact each other and which may be suitably secured together as desired. The wall 29 is provided with discharge openings 33 therethrough corresponding to the discharge openings 23 in the wall 22, and is provided with channels 34 which communicate with and extend downwardly from the respective discharge openings. As in the case of the channels 25, the channels 34 may be formed by indenting the wall 29 below the discharge opening 33 as

indicated at 35. The operation of the water distributing trough 28 is substantially the same as that of the water distributing trough 18 and need not be described in detail.

In Figs. 6 and 7 of the drawing, I show a water distributing apparatus comprising a reservoir, exemplified as a trough 38, which is similar to the trough 18, the trough 38 having a mounting flange 40 and an anti-splash flange 41. The trough 38 is provided with a generally vertical wall 42 having a plurality of discharge openings 43 therein and having a plurality of channels 44 which communicate with and extend downwardly from the respective discharge openings to the lower edge 45 of the wall 42. As in the case of the channels 25, the channels 44 may be formed by indenting the wall 42 beneath the discharge openings 43, as indicated by the numeral 46.

The water distributing trough 38 differs from the trough 18 principally in that the discharge openings 43 are formed by bending integral portions 48 at the wall 42 inwardly as best shown in Fig. 7 of the drawing. The mode of operation of the water distributing trough 38 is substantially the same as set forth in connection with the trough 18.

Although I have disclosed a specific application of my invention and have disclosed three exemplary embodiments thereof for purposes of illustration, the invention is susceptible of other applications, and various changes, modifications and substitutions may be incorporated in the exemplary embodiments disclosed without necessarily departing from the spirit of the invention as set forth in the appended claims.

I claim as my invention:

1. In an apparatus for distributing a liquid, a reservoir having an upwardly extending wall of relatively thin, sheet material, said wall being deformed inwardly into said reservoir along horizontally spaced lines which extend upwardly from the lower edge of said wall to provide a plurality of horizontally spaced, upwardly extending indentations which serve as channels for conducting liquid downwardly to the lower edge of said wall, said wall being provided with a plurality of horizontally spaced, discharge openings therein at the upper ends of said indentations, respectively, said discharge openings overlapping said indentations so that the lower edges of said discharge openings are deformed inwardly into said reservoir, said discharge openings being formed by bending portions of said wall at the upper ends of said indentations inwardly into the interior of said reservoir, said portions of said wall being bent inwardly along the lower edges thereof.

2. A liquid distributing apparatus according to claim 1 wherein the spacings between said indentations are large as compared to the widths of said indentations.

VALENTINE C. LEHMANN.

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