May 3, 1955 A. D. GOETTL 2,707,656

FLOW DISTRIBUTING HEAD FOR EVAPORATIVE COOLERS

Filed Jan. 27, 1953

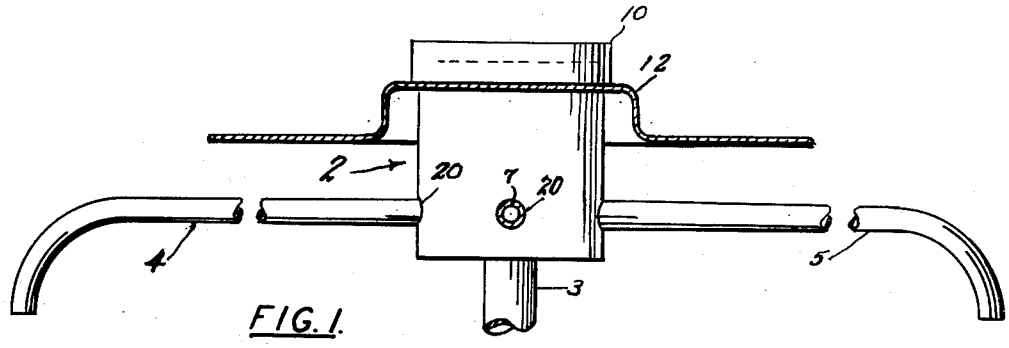


FIG. 1.

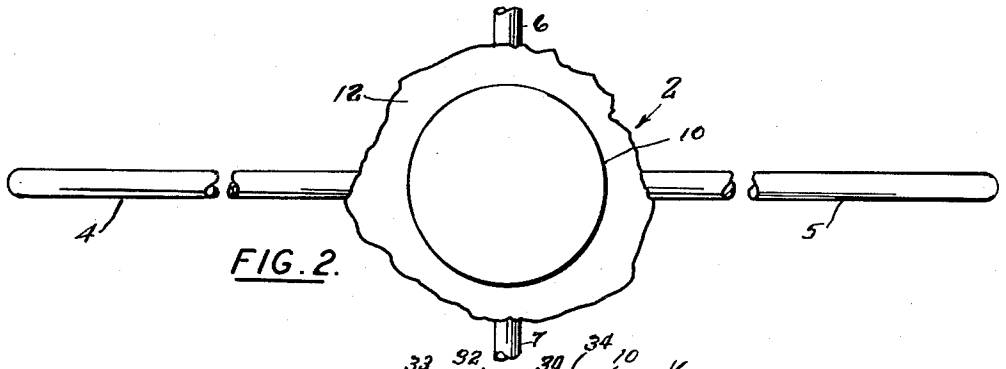


FIG. 2.

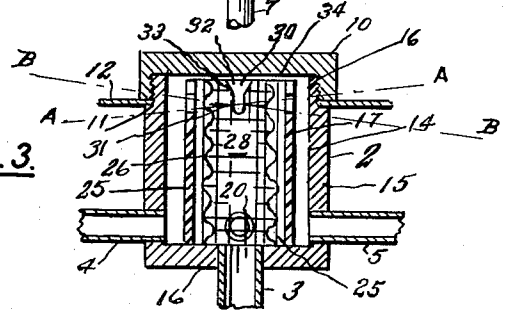


FIG. 3.

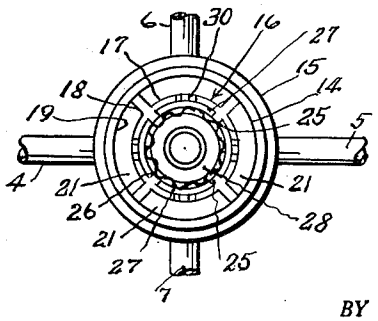


FIG. 4.

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United States Patent Office 2,707,656 Patented May 3, 1955

2,707,656

FLOW DISTRIBUTING HEAD FOR EVAPORATIVE COOLERS

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Application January 27, 1953, Serial No. 333,562

3 Claims. (Cl. 299—58)

This invention concerns a flow distributing head for evaporative coolers.

Heretofore it has been difficult to distribute water evenly to all the pads of an evaporative cooler, using the conventional type of distributing head, when there were changes in the city water pressure to which the head was connected. The difficulties of even distribution are even greater when a change is made from city water pressure to a low pressure large volume circulating pump water supply.

To distribute water from the head to the pads evenly, the head and distributing pipes must be leveled. This is ordinarily done as accurately as possible, but in practice, due to structural defects, warping of materials and inaccuracies in mounting bases, absolute level can rarely be maintained, and the distribution pipes on the low side of the cooler get too much water and rob those on the high side. Where the outlet holes from the central chamber of a conventional distributing head are small and the head is operated on city water pressure of from 40 to 80 pounds per square inch, inaccuracies in leveling are not important, because the high pressure head forces water equally (approximately) from all distributing pipe openings. If the pressure drops, however, the pipes on the lower side of any unleveled cooler not only get more water by gravity in the first place, but a secondary syphoning action takes place which causes the pipes on the low side to create a reduced pressure on the pipes on the high side or even a suction on these pipes.

If low pressure is supplied to the head, as from a recirculating pump, the distributing openings must be enlarged, or a different head installed, but the leveling required is even more critical than with low city water pressure.

In view of the foregoing, one of the objects of this invention is to provide an improved flow distributing head which will compensate for ordinary unleveling of a cooler installation, and distribute the water evenly to all the evaporating pads regardless of varying pressures of the water supply.

Another object is to provide a distribution head which will automatically distribute the water evenly when the pressure is either from the city water supply, under comparatively high pressure, or from a circulating pump under comparatively low pressure and with a larger volume.

Still another object is to provide a distribution head which will screen and strain the water supply flow so that dirt will not enter the distribution pipes, nor clog the screens, and can be easily removed without dismantling the head or removing the pads from the cooler case.

Other objects will appear hereinafter.

I attain the foregoing objects by means of the devices, construction, and combination of parts shown in the accompanying drawings, in which;

Figure 1 is a side elevation showing a fragment of the cooler case top under which the distributing head is installed;

Figure 2 is a plan view thereof;

Figure 3 is a vertical central sectional view thereof; and

Figure 4 is a plan view of the distributor body with the top cap removed.

Similar numerals refer to similar parts in the several views.

In the drawing, 2 indicates the distributor body, 3 the water supply pipe, and 4, 5, 6, and 7 indicate the water distributing pipes that go to the several evaporative pads of the cooler. This body is closed at the top by a screw on cap 10, which holds the body 2, in a hole 11, in the cooler case top 12. The distributing pipes extend radially from the body to the tops of the pads (not shown) which are arranged around the perimeter of the cooler case.

The distributor head body 2 is centrally bored to provide a central opening 14 surrounded by a cylindrical side wall 15 and closed by a flat bottom 16, into which the supply pipe 3 is centrally inserted. The above parts are preferably made of copper or bronze.

Within opening 14 there is an insert 16 preferably molded of plastic. This consists of a cylinder 17, of smaller diameter than opening 14, from the outer surface of which fins 18 extend radially outward and abut against the inner wall 19 of side 15. These fins are positioned and proportioned so that they are spaced equally on each side of each distribution tube opening 20. They form vertically extending arcuate compartments 21 adjacent each distribution opening which may be termed feed chambers. It is to be noted that the radial depth of these chambers is governed by the space between the outer surface of cylinder 17 and the inner face of side wall 15. This space is made sufficient to form a feed chamber of adequate capacity to supply the pipe inserted in the opening 20 into which it empties.

Shorter radial fins 25 extend inwardly to provide supports and positioners for centrally positioned cylindrical screen 26. Together with the screen, these form arcuate chambers 27 communicating with the central distributing chamber 28.

When cap 10 is in place on body 2 its lower face contacts the upper edges of cylinder 17, fins 18 and 25 and screen 26.

In the top edge portion of cylinder 17, between each of the fins 18, and opposite each opening 20, there are flow notches 30. These are made with a bottom cut 31 having vertical parallel sides. Above this cut is an upwardly widening V notch portion 32 having upwardly diverging edges 33 which extend to the top edge 34 of cylinder 17.

In use water flows from central chamber 28 to arcuate screen chambers 27, through each of the several notches 30, and into outer arcuate feed chambers 21. From these water flows through openings 20 into the several corresponding distributing pipes.

From the foregoing it will be understood that water is distributed to pipes 4, 5, 6, and 7, not by the force or pressure system but by gravity from the respective arcuate chambers opening through holes 20 into each of the respective distribution pipes. Water is fed from main chamber to these arcuate chambers through notches. When water from the city water supply is used and the flow from the bottoms of the cooler pads allowed to go to waste, the flow is metered so that only sufficient water goes through the supply pipes to the top of the pads to barely wet the bottom of the pads. A minimum waste flow is desired. The flow through the central chamber of the head 2 is slow enough so that water rises high enough in the chamber to only flow out through the lower straight edged portion 31 of the notches 30. The lines A—A and B—B indicate levels at which water will flow from notch portions, when the head is tilted correspondingly. Considerable latitude in leveling is indicated. When low pressure pump water is supplied, greater excess flow from the bottom of the pads is permissible be-

cause this excess flows into the cooler sump and is recirculated. Greater volume of flow is therefore metered through the head and the level rises in chamber and flows through the V shaped portion of the notches. Since all pads are receiving an excess flow the slightly less amount that may be received by the pads on the higher side of an unleveled installation is still adequate. Since the diameter of cylinder 17 is small in proportion to the length of distribution pipes 4, 5, 6 and 7, which approximate the circumference of the cooler case, and the pads contained in it, and since the outer ends of said pipes are seldom more than a half inch out of level, it will be readily understood that the difference in height between the notches 30 on the high and the low side of a tilted installation will be very little, in actual measurement. The difference in flow due to this unevenness is of secondary importance, and is minimized by the narrow lower portion 31 of the notches. The more important spyhoning effect, found in heads heretofore used, is, however, entirely eliminated. The water is, therefore, distributed more evenly than has heretofore been possible.

In no case will the distribution pipe on the lower side of a tilted unlevel installation syphon off excessive amounts of water and rob the distribution pipes on the high side of the installation of sufficient water to wet the pads on that side. Syphoning, if it occurs at all, is limited to the contents of the arcuate chamber 21 on the low side of any such unlevel installation.

Screening of all water flowing through the head takes place through the whole area of screen covering the space between each pair of inwardly extending fins 25. Possibilities of clogging by particles of dirt are minimized according to the extent of this screen area. Accumulated dirt may be cleaned out by removing cap 10 and flushing out the central compartment 23. This may be done from the outside of the cooler without removing the pads or disturbing the head body 2.

From the foregoing it will be seen that I have provided a very practical distributing head which may be easily and quickly installed in the center of the top of a cooler case, and which will distribute water to all the pads in an improved manner, from either minimum flow city water pressure, or a larger flow from a circulating pump, without the need for structural changes, reboring of distribution holes, or pinching the walls of the distribution pipes on the low side of a tilted unlevel installation.

I claim:

1. A flow distrubing head for evaporative coolers having cases with circumferentially arranged pads, comprising a cylindrical body centrally disposed within the top portion of the case, having a central bore open at the top and closed at the bottom; an inlet pipe opening into the center of said bottom, distribution pipes in openings in the walls of said body and extending radially outward therefrom to the pads of said cooler; a cap covering the open top of said body; an insert cylinder within the central bore of said body having fins extending radially outward from its outer surface bearing against the inner wall of said body bore between said distribution pipe openings forming arcuate feed chambers; radial fins extending inwardly from the inner wall of said insert cylinder, a cylindrical screen enclosing the central area of said body above said inlet opening held in concentric position by said inwardly extending radial fins; said insert cylinder being formed with notches along its upper edge to flow water from the central portion of said central bore to said arcuate distribution chambers, said notches having parallel walls throughout their lower portions to distribute a minimum flow of water and diverging walls throughout their upper portions to distribute a maximum flow of water.

2. A flow distributing head for evaporative coolers having cases with circumferentially arranged pads composed of a cylindrical body having a central bore forming a central opening surrounded by a side wall, and a flat closed bottom, a water inlet in the center of said bottom, outlet openings spaced around said side walls; feed distribution pipes extending radially outward from said outlet openings; a removable cap closing the top of said body; an insert cylinder concentrically positioned within said central bore having outwardly extending radial fins forming arcuate distribution chambers adjacent said outlet openings, inwardly extending screen positioning fins and flows distributing notches formed in its upper edge between said radial fins; said notches having parallel walls throughout their lower portions to distribute a minimum flow of water, and outward diverging walls throughout their upper portions to accommodate and to distribute a full flow of water entering the central portion of said bore from said inlet to said arcuate chambers and to eliminate syphoning of water from any of said feed pipes to any other feed pipes.

3. A flow distributing head for evaporative coolers having cases with circumferentially arranged pads composed of a cylindrical body having a central bore forming a central opening surrounded by a side wall, and a flat closed bottom, a water inlet in the center of said bottom, outlet openings spaced around said side wall; a removable cap closing the top of said body; an insert cylinder concentrically positioned within said central bore having outwardly extending radial fins forming arcuate distribution chambers adjacent said outlet openings, inwardly extending screen positioning fins and flow distributing notches formed in its upper edge between said radial fins; said notches having parallel walls throughout their lower portions, and outward diverging walls throughout their upper portions, to distribute water entering the central portion of said bore from said inlet to all of said arcuate chambers when said head body is tilted; the upper portions of said notches distributing greater flow to all of said arcuate chambers when the level of water within said body rises above the lower portions of said notches having parallel side edges.

References Cited in the file of this patent

UNITED STATES PATENTS

1,105,242	Bilyer	July 28, 1914
1,152,901	Naylor	Sept. 7, 1915
2,044,455	Witzel	June 16, 1936