EVAPORATOR PLATE ANTIDRIP CHANNEL

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This invention relates to enclosed hot-air space-heater humidifiers for imparting moisture to the air circulated through the space-heater and more particularly to an improvement in the humidifier for preventing the dripping of excess water from the evaporator plates into the interior of the space-heater.

The use of humidifiers in space-heaters and space-heater systems has come into almost universal acceptance. However, the devices of the prior art have either been too large for easy installation or too small for delivering the required amount of moisture to the heated air. The presently accepted humidifiers are suitably small and easy to install. They employ T-shaped evaporator plates with the stem of the plate disposed in the water reservoir pan and with the cross-arms of the plate disposed to overhang the sides of the water pan so that the ends of the plate cross-arms are located in the path of the air as it rises in the space. In this way, the ability of the humidifier and the evaporator plates themselves to deliver moisture to the heated air is increased.

In humidifiers employing T-shaped evaporator plates wherein the cross-arm ends of the plates project outwardly from the sides of the water pan, it has been found that surplus or excess water drops from the projecting ends or arms of the plates past the water pan into the interior of the space-heater under certain conditions such as when the heater is not in operation or when the air is already heavy with moisture. Obviously, such dripping causes rust and corrosion in the interior of the heater.

It is, therefore, the primary object of this invention to provide means or apparatus such as a spring-clip channel shaped drainage member for attachment to the projecting cross-arm ends of the evaporator plates to be supported solely thereby and to collect and to channel the surplus water on the overhanging ends of the evaporator plate arms back into the humidifier water pan, thereby eliminating dripping into the heater interior.

An object of the invention is to provide a simple, inexpensive spring-clip channel shaped drainage member which can be easily mounted on any humidifier evaporator plate and included in any humidifier assembly to channel any excess water on the projecting evaporator plate cross-arms back into the water pan.

These and other objects and advantages of the invention will become apparent by reference to the following description of the humidifier and channel shaped drainage member embodying the invention taken in connection with the accompanying drawing, in which:

Fig. 1 is a sectional view of a humidifier assembly incorporating the inventive channel shaped drainage member and shows the evaporator plate independently supported relative to the water pan.

Fig. 2 is an enlarged cross-sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a partial side elevational view of the assembly seen in Fig. 1 and is taken in the direction of the arrow 3.

Fig. 4 is a perspective view of the inventive channel shaped drainage member.

Fig. 5 is a view similar to Fig. 1 and shows the evaporator plate supported by the water pan; and

Fig. 6 is a cross-sectional view of Fig. 5 taken on the line 6—6 thereof.

Referring now to the drawing wherein like numerals refer to like and corresponding parts throughout the several views, the humidifier and channel shaped drainage member disclosed herein to illustrate the invention comprises a water reservoir pan 10 mounted inside the space-heater, a strap-like evaporator-plate hanger 11 surrounding the top of the pan 10 supported by suitable means such as by a cross-strap support 12 and a longitudinal support strap 13. The hanger 11 is equipped with indexed notches or sockets 14 for receiving and properly spacing the evaporator plates disposed thereon. The pan 10 contains a suitable amount of water 15, the level of which is automatically controlled. The T-shaped evaporator plate 16 comprises projecting cross-arm ends 17 and 18 disposed in the notches 14 of the hanger 11 and a stem portion 19 partially disposed in the water 15 contained in the pan 10.

The plate 16 is made of porous, wick-like material such as clay or fibre-glass and is adapted by capillary action to lift water up onto its surfaces from the pan 10 so that the side surfaces of the plates 16 are wet and present suitable surfaces from which the heated air passing upwardly in the direction of the arrows in Fig. 1 can absorb moisture.

Due to the fact that the side surfaces of the plate 16 are wet, in the event that the air passing thereover does not absorb a suitable amount of moisture from the plate 16, the water collects on the surface of the plate 16 and runs downwardly in response to gravitational force. Since the arms or ends 17 and 18 project sidewise outwardly past the sides of the pan 10, the plate ends
or arms 17 and 18 sometimes drip the surplus surface water into the interior of the space heater.

To obviate this undesirable condition, channel shaped drainage members 20 are disposed on the bottom of the arms 17 and 18 and are so inclined as to direct the water thus collected back into the pan 10.

The preferred embodiment of each channel shaped drainage member 20 is a non-corrosive, preferably stainless-steel or plastic, spring-torsioned member having vertical sides 21 and 22, an interconnecting bottom 23, and receiving flanges or lips 24 and 25 on the sides 21 and 22. The bottom 23 is preferably wider than the width of the plate 10, to which the channel shaped drainage member 20 is attached so that it acts as a spacer to hold the sides 21 and 22 away from the plate 10 at the bottom to create water flow areas or troughs A and B between the sides 21 and 22 and the plate 10. The bottom 23 is preferably formed with an indented or raised segment 28 in its longitudinal central area which contacts the bottom of the plate 10 and spaces the remainder of the channel bottom 23 away from the plate 10 to create water flow areas or troughs C and D therebetween.

In attaching a channel shaped drainage member 20 to a plate 10, the user merely presses the lips 24 and 25 against the plate and pushes the channel shaped drainage member 20 on the plate 10 with the lips 24 and 25 acting as cams to spread apart the sides 21 and 22. This spreading of the member 20 causes the sides 21 and 22 to grip the plate 10 in frictional engagement and the channel shaped drainage member 20 is then attached to the plate for purposes of handling, mounting, and dismounting, and is supported solely by the plate.

In operation, Figs. 1 to 3, the channel shaped drainage members 20 are assembled on the evaporator plate 10 at the bottom portion of the cross-arms 17 and 18 and it is to be noted that the channel shaped drainage members 20 rest directly on the plate hanger 11 in the sockets 18 thereof thereby lifting the plate arms 17 and 18 out of contact with the hanger 11 and that the inner ends of the channel shaped drainage members 20 are over the pan 10. It is to be further noted that the channel shaped drainage members 20 are inclined inwardly toward the pan 10 so as to direct flow of the water in the trough areas A to D towards the pan.

The flanges or lips 24 and 25 in conjunction with the adjacent plate 16 form water flow areas or troughs E and F to collect the water running down the sides of the plate 10.

The embodiment illustrated in Figs. 5 and 6 includes a pan 30, a bracket 31 disposed in the pan 30 and having notches 32 of the plate 30 and disposed in the notches 32 of the bracket 31 for lateral support. The channel shaped drainage members 20 are disposed on the bottom of the plate cross-arms 17 and 18 as hereinbefore described. It is to be noted that a channel shaped drainage member 20 support themselves on the plate arms 17 and 18 by spring-pressed frictional engagement.

In all embodiments of the invention, the channel shaped drainage member 20 is inclined with its lower end over the pan 10 or 30 so that excess water collected in the flow or trough areas flows toward the pans 10 or 30.

Although the invention has been described in detail, it is obvious that many changes may be made in the size, shape, detail, and arrangements of the various elements of the invention within the scope of the appended claims.

I claim:

A humidifier comprising an evaporator pan, a plurality of evaporator plates, each of T shape, means for supporting the plates in the pan so that the stem portion of each plate is within the pan but is spaced from its sides and so that the cross arm of each plate, providing two lateral portions, is spaced above and laterally outside the sides of the plate, each lateral portion of each plate removably supporting on its lower edge a channel shaped drainage member whose inner end is within the adjacent side of the pan and whose outer end is adjacent the outer edge of the associated plate, each member being separate and independent of the plate supporting means, each member having a bottom and two vertical sides formed with contractile spring torsion so as to grip the plate so as to be supported solely thereby with spring grip and friction therewith, the upper edges of each member being spaced from the sides of the plate to form with them troughs for draining water on the sides of the plate back into the pan, the lower portion of each member being spaced from the lower portion of the plate supporting it to provide a lower trough in the member.

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