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EVAPORATOR PAD

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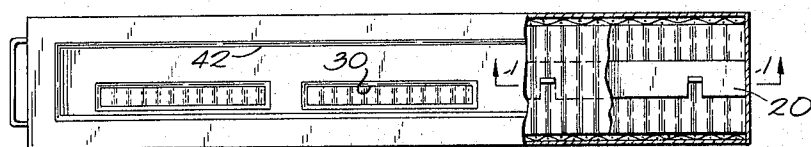
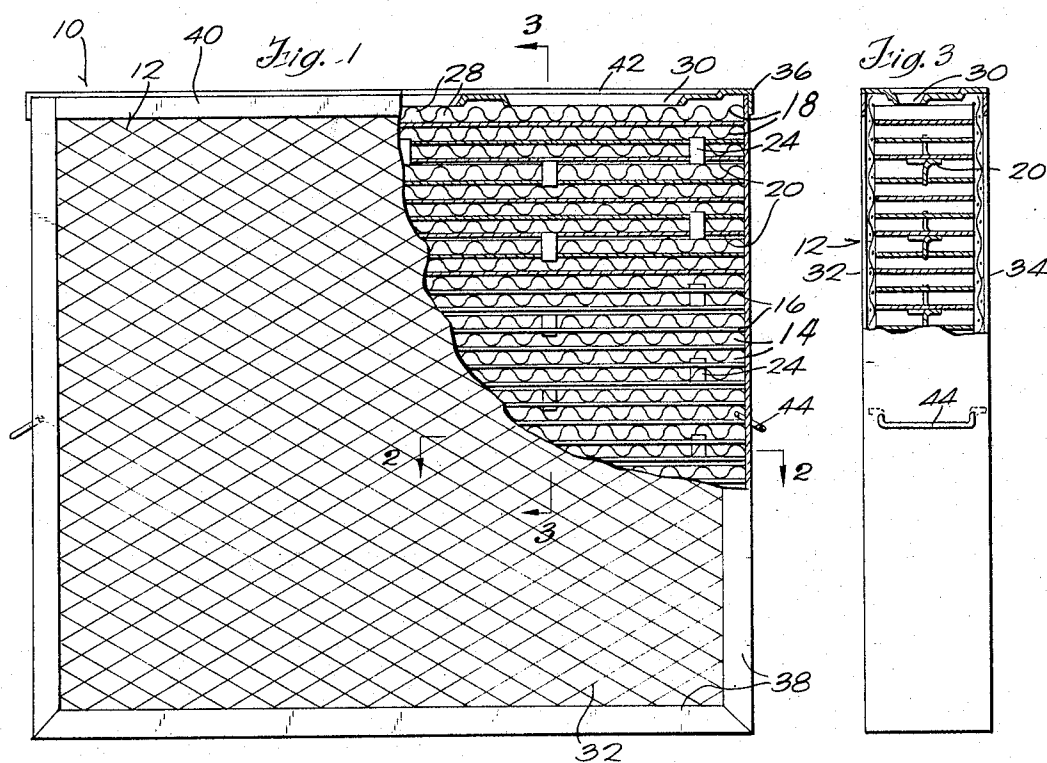


Fig. 2

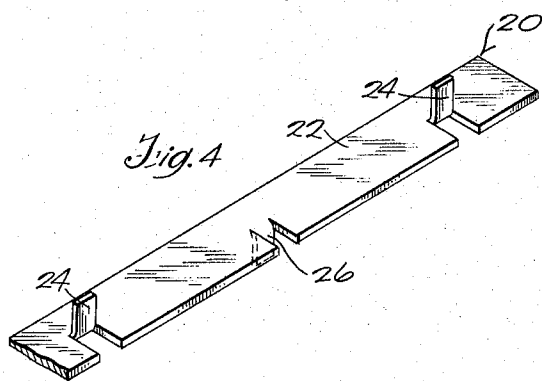


Fig. 4

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EVAPORATOR PAD

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9 Claims

ABSTRACT OF THE DISCLOSURE

A humidifier pad or evaporator having a body comprised of a plurality of corrugated strips of fibrous material arranged in laminated formation with securing strips interposed between selected laminae to prevent lateral displacement thereof, the body being surrounded by a peripheral frame to provide a unitary structure.

BACKGROUND

Various types of humidifiers have heretofore been proposed for use in conjunction with heating systems and the like. These humidifiers utilize the principle of evaporation and generally incorporate some means of exposing varying amount of water to the flow of heated air conducted to the area to be humidified. Thus, upon exposure to the heated air, the water is evaporated and is carried along with the air for distribution therewith as, for example, throughout the rooms of a house or other enclosure.

These humidifiers have, of course, enjoyed varying degrees of acceptance and success, and one of the presently popular types employs an evaporator of bibulous material such as corrugated paperboard or asbestos through which air can be circulated and into which water can be introduced, the water being absorbed by or evaporated into the air to humidify the same. The popularity of this type of humidifier is mainly attributable to its relatively low cost and ease of replacement of the evaporator or humidifier pads.

One of the more efficient humidifier pads employing corrugated paper-like material is that shown and described in United States Patent No. 3,278,175, issued Oct. 11, 1966 to John F. Hirtz wherein a continuous strip of the corrugated material is wound or rolled into a tight spiral and enclosed in a frame, the spirally wound body being provided with water distribution passages extending a substantial distance into the body from one edge thereof. Other pads of this general type have been built up of corrugated strips disposed in laminated formation, one on top of another, with the body in some instances being formed of two parts placed in face-to-face relation with a screen or mesh grill interposed therebetween to prevent lateral displacement of the strips or laminae, one of the body parts having a grooved face to provide water distributing passages therein.

While such prior humidifier or evaporator pads have proven quite satisfactory in use, they do require rather careful and time-consuming manufacturing and assembly operations. Accordingly, since these pads are intended to be disposable, the cost of the same to the ultimate consumer has heretofore been objectionably high.

SUMMARY

It is therefore an important object of the present invention to provide a humidifier or evaporator pad which is extremely simple in construction and which may be readily manufactured and sold at low cost to the ultimate consumer.

Another object of this invention is to provide an improved disposable evaporator pad which may be readily

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produced of inexpensive materials in a most economical manner with a minimum of simple machining and assembly operations.

Still another object of the invention is to provide an improved evaporator pad assembly which is highly efficient in actual use and which includes means for effectively distributing water over the outer faces of the pad to thereby obviate the need for providing water distributing passages extending into the body of the pad.

A further object of the present invention is to provide an evaporator pad comprising a plurality of elongated strips of fibrous material having transverse corrugations and arranged in face-to-face relation to form a laminated body structure wherein the corrugations define air passages extending transversely through the body, a flat elongated strip of metal interposed between adjacent selected fibrous strips of the laminated body, the metallic strip having a longitudinally spaced series of lateral projections penetrating the adjacent fibrous strips to prevent lateral displacement thereof, and a frame secured about the periphery of the laminated body to provide a unitary structure.

These and other objects and advantages of the invention will become apparent from the following detailed description.

THE DRAWINGS

A clear conception of the several features constituting the present invention and of the mode of constructing and utilizing evaporator pads embodying the improvements will be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the various views.

FIGURE 1 is a plan view of a typical evaporator or humidifier pad embodying the invention, portions of the front screen, the laminated body and the frame being broken away and shown in section to reveal normally concealed structure, the section through the body being taken generally along the line 1—1 of FIGURE 2;

FIGURE 2 is a part-sectional top view of the evaporator pad, the section being taken generally along the line 2—2 of FIGURE 1;

FIGURE 3 is a part-sectional end view of the pad assembly, the section being taken generally along the line 3—3 of FIGURE 1; and

FIGURE 4 is a fragmentary perspective view of one of the securing strips employed for preventing lateral displacement of the laminae.

DETAILED DESCRIPTION

Referring to the drawing, the evaporator pad illustrated therein as embodying the invention is designated generally by the numeral 10. The pad 10 is comprised of a laminated body structure 12 formed by a plurality of elongated strips 14 of fibrous material, each of which consists of at least one plain flat sheet 16 and one corrugated or sinuous sheet 18. Interposed between adjacent pairs of the fibrous strips 14 in selected areas of the body 12 are a number of retainers 20, each retainer comprising a flat elongated strip 22 of sheet metal or the like having a longitudinally spaced series of oppositely directed lateral projections 24, 26, formed to penetrate the adjacent fibrous strips 14. The laminated body structure 12 thus has a plurality of closely spaced air passages 28 extending transversely therethrough as defined by the corrugated sheets 18, and the retainers 20 act to resist lateral displacement of the laminae 14 by reason of the projections or prongs 24, 26 which penetrate the adjacent laminae.

The uppermost strip or laminae 14 is exposed via one or more elongated cut-outs 30 formed in the upper frame

member as hereinafter described and which are shown in FIGURE 2 as being preferably located laterally of the longitudinal center line of the strip, and these cut-outs 30 function as troughs for receiving water supplied to the evaporator or humidifier pad as will hereinafter more fully appear. The front and rear faces of the laminated body structure 12 are covered with screening 32, 34 such as wire mesh or the like, and the screening 32, 34 is preferably disposed with the network extending diagonally across the respective body faces.

The laminated body structure 12 as thus described is supported and retained in a rectangular frame 36 or the like which may be conveniently formed essentially of lightweight channel-shaped sheet metal or the like. The frame 36 may be fabricated in a known manner and is shown as comprising two parts, one of which is identified by the numeral 38 consisting of a channel-shaped strip bent to U-shape to embrace the ends and bottom of the body 12 and the other of which consists of a straight piece 40 of framing overlying the top of the body, the frame members 38, 40 being clinched together at their meeting ends to provide a frame secured about the entire periphery of the body 12. The upper frame member 40 is dished as at 42 and is formed with one or more longitudinal openings or cut-outs 30 to permit reception of the water supplied to the pad in normal use, and the screening 32, 34 is also held in position by the frame 36. As shown, a pair of wire handles 44 may also be provided, one in each of the opposite ends or on the top of the assemblage.

In use, the improved evaporator pad hereinabove described is supported in an upright manner as illustrated in FIGURE 1. Air is circulated through the transverse openings 28 in the body 12 from a suitable source as indicated by the arrows in FIGURE 3, and water is introduced from a suitable supply to the top of the pad. The water supplied to the top of the evaporator pad is introduced to the recess 42 and through the longitudinal openings 30 of the upper frame member 40. From the cut-outs 30, the water is distributed substantially over the entire upper portion of the body 12 and cascades or runs over the opposite faces thereof. The screening 32, 34 covering the opposite faces of the laminated body 12 aids in uniformly distributing the water which tends to run along the diagonal network. Accordingly, the screening 32, 34 not only functions as a filter for the air circulating through the body 12 but also effectively aids in proper uniform distribution of the water and as a guide therefor as it runs by gravity from the uppermost portion of the pad to the lowermost portion thereof. During his process, the circulating air picks up moisture and is thus humidified, and any excess water is collected in a suitable trough located below the evaporator or humidifier pad.

As hereinabove indicated, the corrugated strips which comprise the laminae of the body 12 are secured within the peripheral frame 36, and lateral displacement of these laminae is resisted by the several retainer strips 20 interposed between selected corrugated strips, the prongs or oppositely directed ears 24, 26 serving to penetrate at resist lateral displacement of the laminations in adjacent adjacent lamina. The screening 32, 34 also serves to resist lateral displacement of the laminations in addition to serving as a filter for the air circulating through the body 12 and properly distributing the water supplied to the pad over and across the opposite faces of the body in a uniform manner. The improved humidifier pad assem-

blies are thus constructed of inexpensive material and are capable of being produced at extremely low cost while being highly effective in their intended use.

Various modes of carrying out the invention are contemplated as being within the scope of the following claims particularly pointing out and distinctly claiming the subject matter which is regarded as the invention.

I claim:

1. An evaporator pad comprising, a plurality of elongated strips of fibrous material each having transverse corrugations and being arranged in face-to-face relation to form a laminated body structure wherein the corrugations define air passages extending transversely through said body, a flat elongated strip of sheet material interposed between adjacent selected fibrous strips of said laminated body, said flat strip sheet material having a longitudinally spaced series of lateral projections penetrating the adjacent fibrous strips to prevent lateral displacement thereof, and a frame secured about the periphery of said laminated body to provide a unitary structure.

2. An evaporator pad according to claim 1, wherein several of the flat strips of sheet material are interposed between adjacent fibrous strips over selected areas of the laminated body.

3. An evaporator pad according to claim 1, wherein the flat elongated strip of sheet material has a longitudinally spaced series of oppositely directed lateral projections which penetrate the adjacent fibrous strips on opposite sides of said flat strip.

4. An evaporator pad according to claim 3, wherein the flat elongated strip is formed of sheet metal having the lateral projections stamped therefrom.

5. An evaporator pad according to claim 3, wherein the lateral projections of the flat elongated metallic strip are of a length to penetrate through at least the entire adjacent fibrous strips and a portion of the next adjacent strips.

6. An evaporator pad according to claim 1, wherein the peripheral frame includes an upper frame member which has an elongated opening providing access to the adjacent uppermost strip of fibrous material for permitting water to be supplied thereto.

7. An evaporator pad according to claim 6, wherein the upper frame member is dished for aiding in the distribution of water to the opening therein.

8. An evaporator pad according to claim 6, wherein the opposite faces of the laminated body are covered by screening having the edges thereof secured within the frame.

9. An evaporator pad according to claim 8, wherein the screening has its network extending diagonally across the respective face of the laminated body.

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