

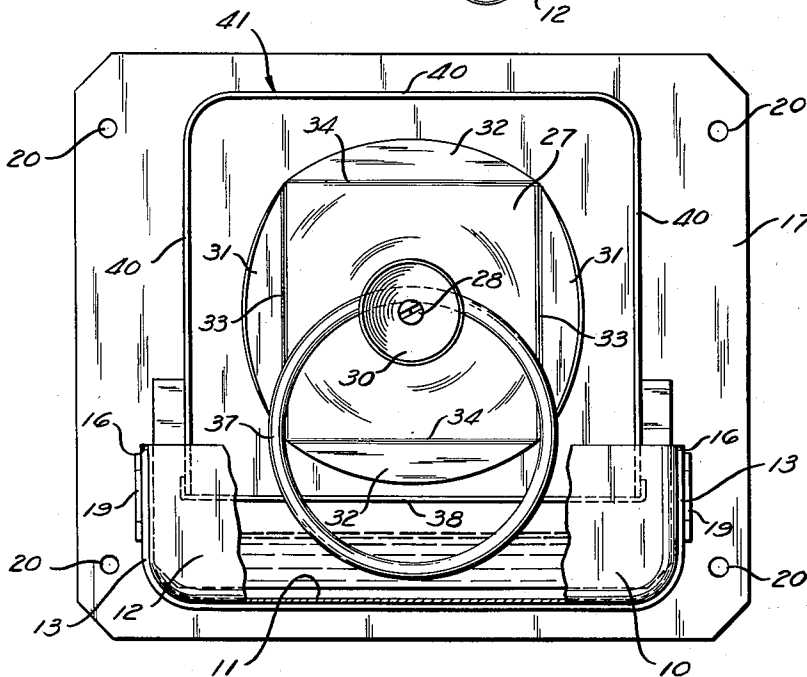
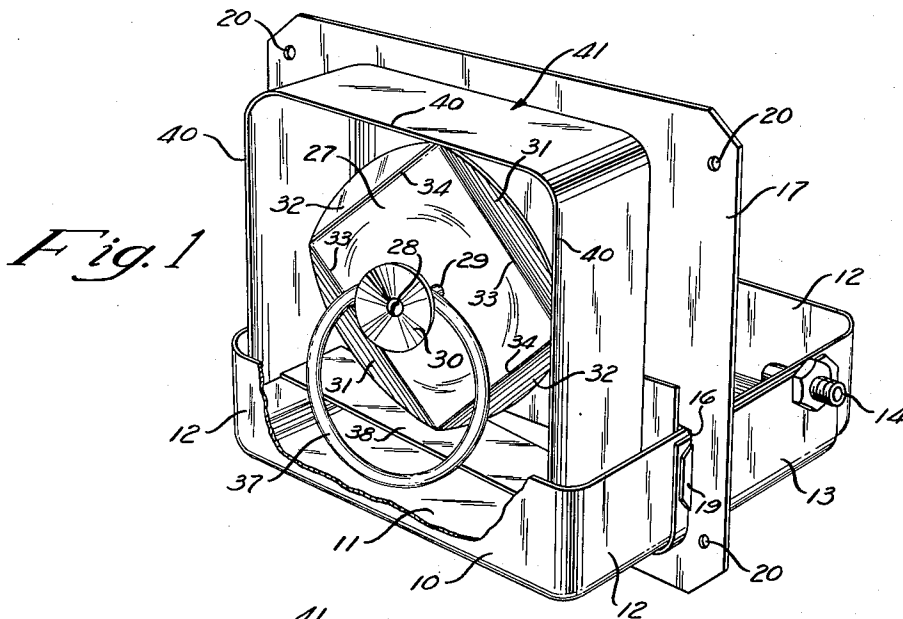
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A. I. CAPLOW
HUMIDIFIERS

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2 Sheets-Sheet 1



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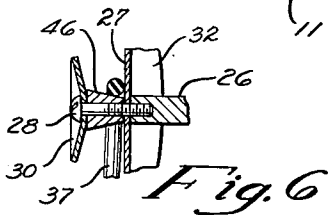
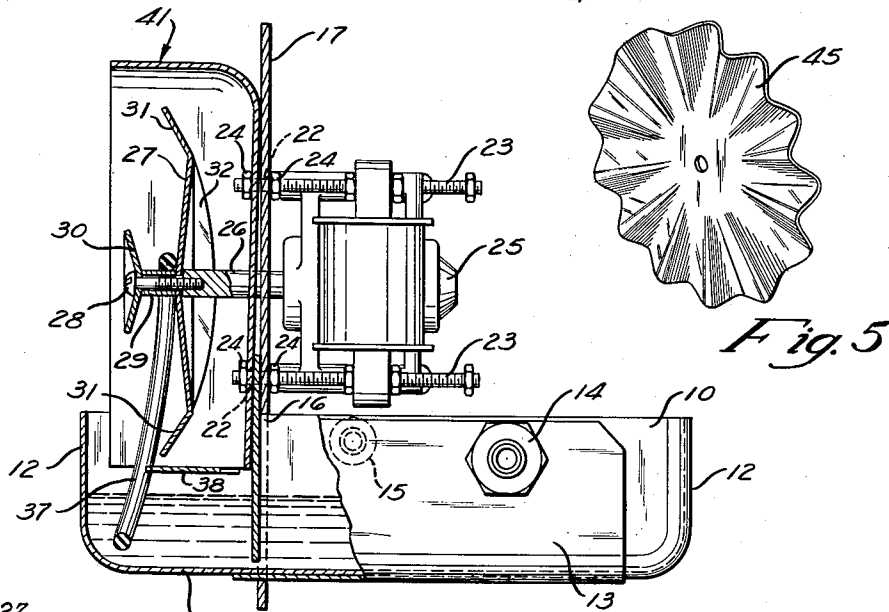
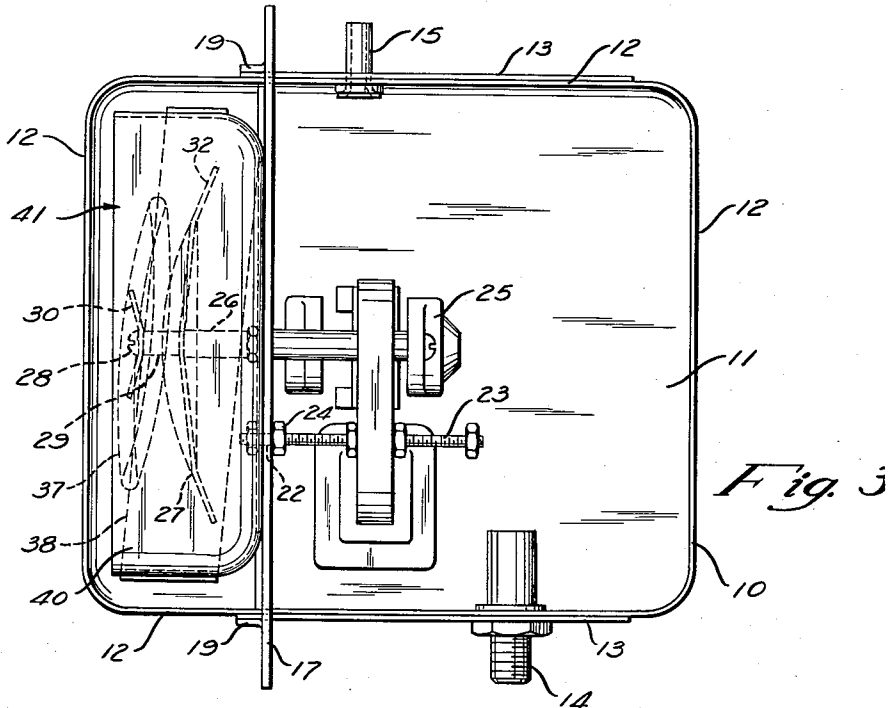
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HUMIDIFIERS

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4 Claims. (Cl. 261-92)

This invention relates broadly to air conditioners and more specifically to apparatus for humidifying a room or similar enclosure having a deficiency of moisture therein.

One of the objects of the invention is to provide apparatus for the dissemination of a liquid in a highly atomized state, free of visible diffused liquid or air born droplets.

Another object of the invention is to provide a humidifier embodying a rotor having a moistened endless belt in inclined contact with the face thereof to effect delivery of liquid to a fractional area of the face of the rotor.

Another object of the invention is to provide a rotor having tortuous circumferential edge designed to effect the dissipation of the liquid carried by the rotor in a direction divergent the plane of rotation thereof.

Another object of the invention is to provide, where desirable, a shroud around the circumferential edge of the rotor to arrest the flight of the liquid thrown from the rotor during the operation thereof.

Another object of the invention is to provide a shroud around the tortuous circumferential edge of said rotor to disperse the liquid by impingement on the shroud, whereby a particle of liquid which is deposited on the shroud is not followed immediately by another particle along the same path, thereby resulting in a high degree of dispersion.

Further objects of the invention reside in the provision of a humidifier which is efficient of operation, economic of manufacture, attractive of appearance and noiseless in operation.

Other objects and advantages more or less ancillary to the foregoing, and the manner in which all the various objects are realized, will appear in the following description, which considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

In the drawings:

Fig. 1 is a view in perspective of the improved humidifier;

Fig. 2 is a front elevational view thereof with portions of the pan broken away in the interest of clarity;

Fig. 3 is a plan view of the humidifier;

Fig. 4 is a side view shown partially in section;

Fig. 5 is a perspective view of a modified form of the rotor shown in Fig. 4; and

Fig. 6 is a fragmentary sectional view of a modified form of the hub of the rotor of Fig. 4.

Referring first to Fig. 1, the humidifier comprises a pan 10 of rectangular form embodying a horizontal base 11 and vertically disposed side walls 12. The central portion of the pan is partially enveloped by a channel plate 13 telescopically engaged with the base and side walls of the pan, and retained in place by a water inlet coupling 14 and an outlet fitting 15 (Fig. 3) mounted respectively in openings in the opposed side walls of the pan and the contiguous flanged portions of the channel. The forward end of the channel protrudes through an opening 16 in a vertically rectangular plate 17 constitut-

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ing the supporting medium for a motor. The side walls defining the opening 16 are fabricated with tongues 19 which are bent forwardly at right angles and affixed to the flanges of the channel 13 to assure a rigid assembly.

5 The corners of the plate 17 are drilled with openings 20 for attaching the humidifier to a suitable supporting panel, and additional openings 22 (see Fig. 3) are provided in the center of the plate for the reception of bolts 23 having jam nuts 24 thereon which are impinged respectively with the plate 17 and the frame of an electric motor 25. Referring to Fig. 4, the armature shaft 26 of the motor protrudes through an opening in the plate 17, and the outer end thereof abuts the inner face of a rotor 27. The end of the shaft is drilled and tapped to receive a screw 28 which supports a spacer sleeve 29 impinged in driving relation with the rotor. The free end of the screw supports an outwardly directed conical disc 30 to delimit outward movement of the belt abutting the sleeve 29. The rotor 27 preferably comprises a circular disc formed with a conical central portion and opposite segmental sections 31 and 32 (Fig. 2). The segments 31 are bent forwardly from chords 33 and the segments 32 are bent rearwardly from chords 34, both segments being inclined at an angle of approximately thirty degrees (30°) from the plane of the chords. An endless belt 37 is carried by the sleeve 29, the belt being preferably of circular transverse section like an O ring, and of a diameter slightly less than the distance from the center of the shaft 26 to the bottom 11 of the pan 10 so the lower depending loop thereof will be submerged in a liquid in the pan when the belt is placed over the sleeve with the inner circumferential face thereof supported thereby. The pan 10 is provided with horizontal transversely disposed plate 38 subjacent the circumference of the rotor 27 and forward the plane of rotation thereof. The plate 38 is mounted at an angle which positions the forward edge of one side thereof in wiping contact with the contiguous face of the belt 37 and with the other side of the plate remote therefrom. Thus, when the motor is energized, the shaft will rotate and the plate 38 will bias the belt against one side of the conical face of the rotor and transfer the liquid carried by the belt to the rotor. Obviously, a very small amount of liquid will be conveyed to the rotor by such structure since the r.p.m. of the belt is slow, relative to that of the shaft, and the wetted face of the belt is limited by the circular transverse section of the belt.

The circumferential edge of the rotor may be enveloped by a shroud 40 to restrain the flight of any air borne droplets thrown from the rotor by centrifugal force. The shroud is formed by the top and vertical side walls of a pan 41 supported by the plate 17 with the lower end thereof within the pan 10. The front of the pan is open and the lower side wall thereof is cut away to clear the belt 37 and plate 38 and also permit the liquid accumulated on the inner faces of the shroud to drain into the pan 10. The plate 38 is secured to the side walls or shroud 40 of the pan 41.

The movement of the rotor will effect the dispensation of the liquid into the room or a conduit within which the humidifier is associated and supply the deficiency of moisture therein. The conical face of the rotor and/or bent or corrugated edges thereof will cause the radial dispersement of air and/or liquid, and effect further evaporation of the moisture cast upon the shroud and absorption thereof by the ambient air.

As illustrated in Fig. 5, the rotor may be formed from a flat disc having a tortuous circumferential edge as at 45 designed to expell the liquid in a forwardly and rearwardly directed angle. In Figure 6 the sleeve on the armature shaft 26 is configured to form a truncated cone

46 having the smaller end thereof disposed in abutting relation with the disc in order to direct the belt 37 against the central portion thereof. The plate 38 is mounted at an angle which will guide the subtended portion of the belt away from the tortuous circumference of the rotor and the cone 46 is formed at an angle which will assure wiping contact of the belt with the cone and with the contiguous face of the rotor.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

What is claimed:

1. A humidifier having a liquid reservoir, a shaft rotatably supported above said reservoir and carrying a hub portion and a liquid throwing rotor disc projecting radially beyond said hub, means for rotating said shaft and a belt loosely resting on said hub portion to depend into liquid in said reservoir, and means engaging said belt below said hub for axially displacing the upwardly moving portion of the belt with respect to the downwardly moving portion, whereby the upwardly moving portion of the belt is biased into wiping engagement with an area on the upwardly moving side of said rotor disc.

2. A humidifier having a liquid reservoir, a shaft rotatably supported above said reservoir and carrying a hub portion and a liquid throwing rotor disc projecting radially beyond said hub, a motor for rotating said shaft and a belt loosely resting on said hub portion to depend into liquid in said reservoir, and means engaging said belt below said hub for axially displacing the upwardly moving portion of the belt with respect to the downwardly moving portion whereby the upwardly moving portion of the belt is biased into wiping engagement with an area on the upwardly moving side of said rotor disc and an arcuate shroud circumambient to said rotor disc and spaced in relation with the circumference thereof and support means therefor.

3. A humidifier having a liquid reservoir, a shaft rotatably supported above said reservoir and carrying a hub portion and a liquid throwing rotor disc projecting radially beyond said hub, a motor for rotating said shaft

and a belt loosely resting on said hub portion to depend into liquid in said reservoir and means engaging said belt below said hub for axially displacing the upwardly moving portion of the belt with respect to the downwardly moving portion, whereby the upwardly moving portion of the belt is biased into wiping engagement with an area on the upwardly moving side of said rotor disc, the said means including a plate having a belt engaging edge disposed so that the vertical plane of said edge shall intersect the axis of rotation of said rotor disc at an acute angle on the side of said belt that does the wiping.

4. A humidifier having a liquid reservoir, a shaft rotatably supported above said reservoir and carrying a hub portion and a liquid throwing rotor disc projecting radially beyond said hub and having circumferential segments bent with respect to the plane of rotation, a motor for rotating said shaft and a belt loosely resting on said hub portion to depend into liquid in said reservoir and means engaging said belt below said hub for axially displacing the upwardly moving portion of the belt with respect to the downwardly moving portion, whereby the upwardly moving portion of the belt is biased into wiping engagement with an area on the upwardly moving side of said rotor disc, the said means including a plate having a belt engaging edge and disposed so that the vertical plane of said edge shall intersect the axis of rotation of said rotor disc at an acute angle on the side of said belt that does the wiping.

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