

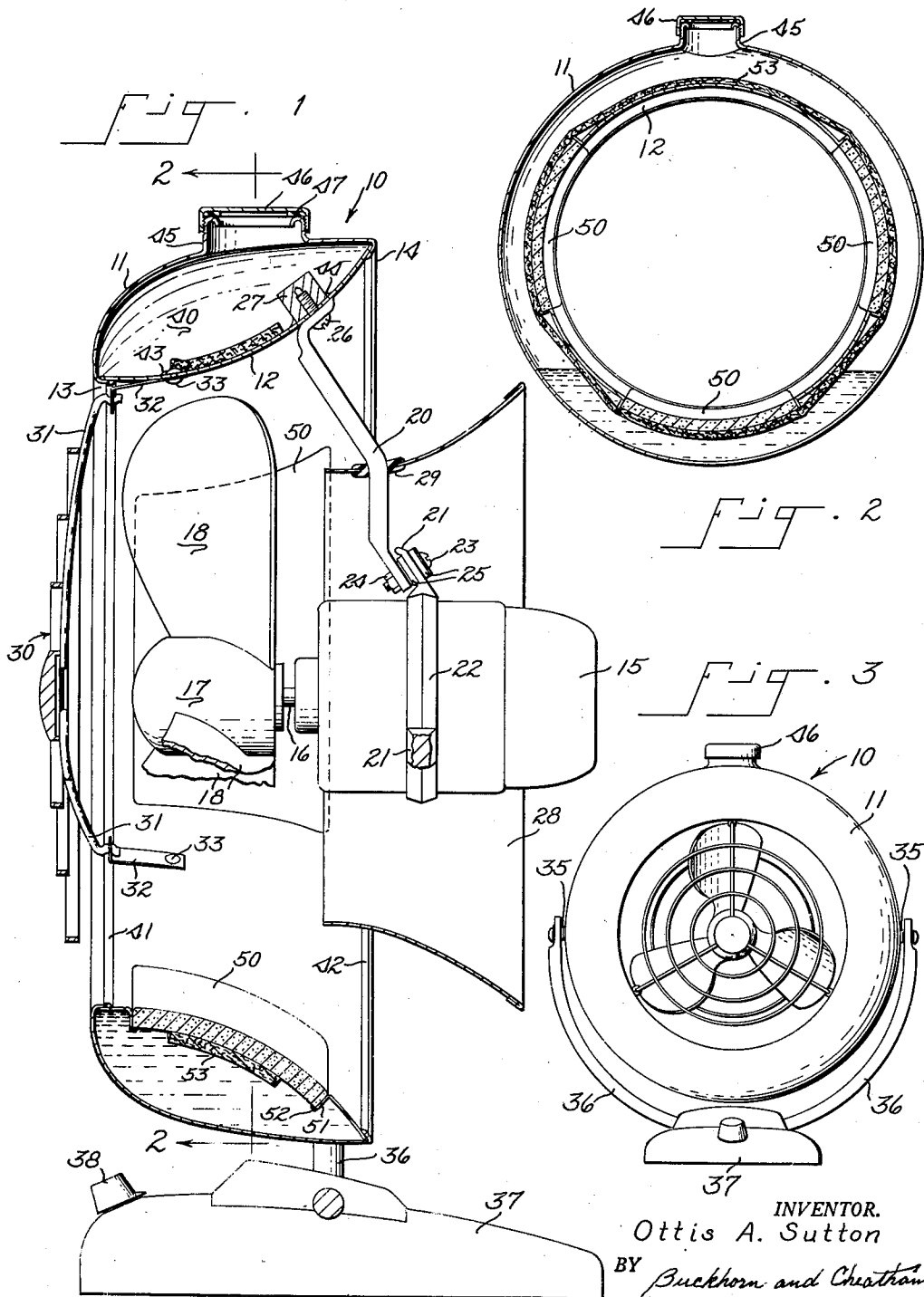
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2,603,468

FAN FOR HUMIDIFYING, DEODORIZING OR THE LIKE

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OR THE LIKE

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5 Claims. (Cl. 261-104)

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My present invention relates to a unit for circulating and treating air for human comfort or other purposes. The present invention comprises an air propeller mounted coaxially within an annular cowl within which liquid may be contained, the cowl comprising at least one large section of porous material through which liquid may escape by capillary action and from which the liquid may evaporate into the stream of air being moved through the cowl. The principal purpose of the present invention is to provide for air circulation and for treatment of the air being circulated by constantly evaporating thereinto a liquid having desired properties. One purpose of the present invention is to humidify air which is drier than that required for human comfort.

Another purpose of the present invention is to provide means for adding to the air in an enclosure a volatile substance having the property of masking or destroying cooking odors, cigar smoke and other obnoxious odors which may exist in a room.

A further object of the present invention is to provide means for evaporating a disinfectant into a room in order to sterilize the air of the room or to sterilize portions of the room.

A further object of the present invention is to provide, in a unit having desirable aerofoil characteristics and incorporating the principles of the patent to Odor et al., No. 2,330,907, issued October 5, 1943, means for adding volatile liquid components of any desired characteristic to the air being circulated.

The foregoing and other objects and advantages of the present invention will be more readily ascertained from inspection of the following specification taken in connection with the accompanying drawing wherein like numerals refer to like parts throughout, while the features of novelty will be more distinctly pointed out in the appended claims.

In the drawing,

Fig. 1 is a vertical section through a fan unit constructed in accordance with the present invention;

Fig. 2 is a vertical section, on a small scale, taken substantially along line 2-2 of Fig. 1; and

Fig. 3 is a front view in elevation of a fan constructed in accordance with the present invention.

The present invention comprises an annular cowl 10 comprising an outer wall 11 and an inner wall 12. In the preferred form of the invention the outer wall is outwardly convex and the inner wall is outwardly concave, each wall hav-

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ing an end of large diameter matching a corresponding end of the other wall and an end of small diameter matching the corresponding end of the other wall. Each wall is in the form of an annular ring, and the inner wall 12 is preferably in the form of a section of a curvedly flaring funnel taken at right angles to its axis. The walls are joined in end-to-end relation preferably as set forth in my copending application, Serial No. 120,504, filed October 10, 1949, now Patent No. 2,554,602, issued May 29, 1951, the outer wall being provided with a flange 13 at one end to embrace the smaller end of the inner wall whereby the two sections may be assembled in concentric, overlying relationship to each other, after which a flange 14 may be rolled or otherwise formed on the large end of the outer wall to embrace the large end of the inner wall.

As explained in the aforesaid Patent No. 2,554,602, a motor 15 is mounted coaxially within the cowl and comprises a shaft 16 extending axially forward toward the constricted end of the cowl, the shaft supporting an air propeller including a hub 17 conveniently connected to the shaft and a plurality of radially extending blades 18 having their ends extending to within a short distance of the inner wall 12. The motor is supported within the cowl by means of radially extending arms 20 having their inner ends fastened to lugs 21 on a motor-embracing ring 22 by means of screws 23 and associated nuts 24, there preferably being resilient washers 25 for preventing transmission of noise and vibration from the motor to the cowl. The outer ends of the arms 20 are fastened to the inner wall 12 by means of screws 26 passing through openings in the wall into internally threaded lugs 27 fastened to the inner surface of the wall, as set forth in my aforesaid Patent No. 2,554,602. Intermediate portions of the arms 20 are offset to provide means for concentrically locating a flaring, air-guiding funnel 28 having openings through which the arms 20 pass, the openings preferably being passed through rubber grommets 29 to eliminate or reduce noise and vibration transmission. A grille 30, including a plurality of radially extending rods 31, is mounted across the forward, constricted end of the cowl, the tips of the rods 31 extending rearwardly and being provided with offset portions for reception in spring clips 32 mounted on the inner wall 12 as by means of rivets 33, as set forth in my copending application, Serial No. 120,503, filed October 10, 1949, now Patent No. 2,554,601, issued May 29, 1951. Preferably the cowl is provided with a pair of

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radially extending, tapered mounting members 35, one at each end of the horizontal diameter of the cowl and extending outwardly from the outer surface of the wall 11, the tapered mounting members being received in correspondingly tapered holes in the ends of a pair of curved arms 36 mounted in a horizontal base 37, as set forth in my copending application, Serial No. 120,502, filed October 10, 1949, now Patent No. 2,554,600, issued May 29, 1951. A control switch knob 38 is mounted on base 37, the switch knob being connected by wires (not shown) to the motor and to a source of current.

In accordance with the present invention, the annular, aerofoil space 40 defined by the inner and outer cowl walls 11 and 12 is utilized as a liquid holding tank, the tank being made relatively impervious to the passage of moisture as by means of a bead of solder or the like 41 joining the flange 13 to wall 12 and a corresponding bead of solder or the like 42 joining the flange 14 to wall 12. The inner ends of the rivets 33 are likewise soldered to the inner surface of the wall 12 as indicated at 43, and the lugs 27 are soldered to the inner surface of the wall 12 as indicated at 44. Similarly, the mounting members 35 would be attached to the outer wall 11 in a watertight manner (not shown). In order that the tank may be filled with liquid a filling opening is provided by striking a neck 45 upwardly from the top of the outer wall 11, the neck being threaded or otherwise formed for reception of a separable cap 46 preferably having a gasket 47 therein for sealing the cap to the edge of the neck, in order that the fan may be rotated about the horizontal axis of the cowl to any desired position relative to the horizontal, without permitting the escape of liquid through the filling neck.

The inner wall 12 is modified in accordance with the present invention by having at least one relatively large section thereof composed of capillary material through which liquid may escape by passage through the capillaries thereof and evaporation from its inner surface into the moving airstream. In the present disclosure the porous portion of the inner wall is provided by a plurality of circumferentially spaced plates 50 each of which is preferably formed of porous metal such as sintered, powdered bronze, which is almost impossible to corrode and which may be soldered or brazed to the edges of openings in the inner wall so as to have the surfaces thereof flush with the inner wall. The plates conform to the surface of wall 11 so as not to interrupt the airstream. Preferably each opening in which a plate is seated is defined by an inwardly struck flange 51 defining an inwardly tapering opening for limiting inward movement of the plate, the edge of the flange being soldered or otherwise sealed to the inner edge of the plate as by means of a bead indicated at 52. One of the plates 50 is located at the bottom of the inner wall so as to be in contact with liquid when the level is very low, and the remainder of the plates may be supplied with liquid when the level is low by means of a wick 53 in the shape of an endless band stretched about the inner wall in contact with the inner surfaces of all the plates 50, or equivalent wick means depending into the lower portion of the tank.

It will be appreciated that in the assembly of the apparatus the members 35 are connected to the outer wall and sealed thereto prior to association thereof with the inner wall. Similarly,

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the plates 50, the lugs 27 and the rivets 33 are positioned on the inner wall and sealed thereto prior to assembly thereof with the outer wall.

The tank provided by the hollow, annular cowl may be filled or partially filled with the desired liquid. The liquid may be water when it is desired merely to humidify the air passing through the cowl, or it may be a disinfectant, a deodorant, a perfume, a medicament, or any other desired liquid.

Having illustrated and described preferred embodiments of the invention, it should be apparent to those skilled in the art that the invention permits of modification in arrangement and detail.

I claim as my invention all such modifications as come within the true spirit and scope of the appended claims.

I claim:

1. An air circulating and treating unit comprising an annular cowl including an outwardly convex outer wall having one end of larger diameter than the other and an outwardly concave inner wall having one end of substantially the same diameter as the large end of said outer wall and its other end of substantially the same diameter as the small end of said outer wall, said walls being arranged one within the other with their end edges of corresponding diameter sealed to each other to define an annular space within which liquid may be contained, a motor mounted coaxially within said cowl and supported thereby, said motor having a protruding shaft extending toward the end of said cowl of lesser diameter, an air propeller fixed to said shaft and including a plurality of radial blades having their free ends adjacent said inner wall, said blades being so arranged as to draw air through said cowl from its larger end and propel the air through the smaller end thereof, said inner wall having at least one large opening therethrough, a plate having an outer surface conforming to the exposed surface of said inner wall seated in said large opening with its outer surface flush with the outer surface of said inner wall, said plate being composed of material having capillary passages therethrough throughout its extent, and means to fill said cowl with liquid whereby air passing through said cowl may be tempered by liquid passing through said plate by capillary action and evaporating from the inner surface thereof.

2. The construction set forth in claim 1 wherein a plurality of such plates of capillary material are seated within a plurality of large openings spaced circumferentially about said inner wall.

3. The construction set forth in claim 1 wherein a plurality of such plates of capillary material are seated within a plurality of large openings spaced circumferentially about said inner wall, in combination with wick means extending from the lower interior of said cowl into contact with said plates whereby liquid may be elevated to said plates when said space is but partially filled with liquid.

4. An air circulating and treating unit comprising an annular cowl including an outwardly convex outer wall having one end of larger diameter than the other and an outwardly concave inner wall having one end of substantially the same diameter as the large end of said outer wall and its other end of substantially the same diameter as the small end of said outer wall, said walls being arranged one within the other with their end edges of corresponding diameter sealed to each other to define an annular space within

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which liquid may be contained, a motor mounted coaxially within said cowl and supported thereby, said motor including a protruding shaft, an air propeller fixed to said shaft and including a plurality of radial blades having their free ends adjacent said inner wall, said blades being so arranged as to draw air through said cowl from its larger end and propel the air through the smaller end thereof, said inner wall having at least one large opening therethrough, a plate having an outer surface conforming to the surface of said inner wall seated in said large opening with its outer surface flush with the exposed surface of said inner wall, said plate being composed of porous material, and means to fill said cowl with liquid whereby air passing through said cowl may be tempered by liquid passing through said plate by capillary action and evaporating from the inner surface thereof, said filling means comprising an open neck at the top of said cowl, a separable cap associated with said neck, and a gasket within said cap for sealing said cap to said neck.

5. An air circulating and treating unit comprising a hollow, annular cowl including an outwardly concave inner wall having one end of larger diameter than its other end, a motor mounted coaxially within said cowl and supported thereby, said motor including a shaft, an air propeller fixed to said shaft and including a plu-

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5 rality of radial blades having their free ends adjacent said inner wall, said inner wall having at least one large opening therethrough, a porous plate having an outer surface conforming to the surface of said inner wall sealed in said large opening with its outer surface flush with the outer surface of said inner wall, means to fill said cowl with liquid whereby air passing through said cowl may be tempered by liquid passing through said plate by capillary action and evaporating from the inner surface thereof, said filling means comprising an open neck, a separable cap associated with said neck, and a gasket within said cap for sealing said cap to said neck, and means pivotally supporting said cowl for rotation about a horizontal axis.

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The following references are of record in the file of this patent:

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