ABSTRACT

A dispenser for liquids controlling room odors in which limited amounts of liquid are deposited on a dispensing blade and the blade is brought into contact with a rough surface on a revolving disk of porous expanded plastic to intermittently compress the plastic in a circular path and distribute the liquid directly thereon for extensive permeation in the disk while propelling air to entrain and vaporize liquid from the remaining rough surface of the disk.

11 Claims, 7 Drawing Figures
3,864,080

ROOM ODOR CONTROL

RELATED APPLICATION

This application is a continuation-in-part application of the Valbona and Voglesonger application Ser. No. 264,135 now U.S. Pat. No. 3,829,071 filed June 19, 1972.

BACKGROUND OF THE INVENTION

Hereinafter, the major portion of a concentrated odor control liquid dropped upon a fast revolving surface splashes off to a limited area or puddle having comparatively little surface in contact with moving air. This greatly reduces potential vaporization and invites repeated manual applications for a quick odor build-up effect which ultimately results in a long continuing heavy aeration of the liquid which may become undesirably intense and be rather wasteful.

SUMMARY OF THE INVENTION

Incorporation herein by reference is expressly made of said application Ser. No. 264,135 essentially for the disclosure and use of the upper tubular feeder for liquid concentrate to have a scent that begins promptly with the actuation of the dispenser or the manual charging thereof and operates at a sustained pleasant scent level.

In the further embodiment of the invention set forth herein, a readily removable font of concentrate is reciprocably mounted with a depending outlet nozzle, preferably valved, which when pressed downwardly discharges a limited quantity of liquid upon the upper face of a spring blade located parallel to and above a continuously rotating porous disk. As the font is pressed downwardly to discharge the liquid on the blade, it engages the blade and flexes it into wiping contact with the surface of the disk. The blade preferably is provided with a capillary slot disposed tangentially to the central path of engagement with the disk and this slot terminates marginally at the trailing edge of the blade contact. With this arrangement even a small quantity of liquid concentrate is progressively wiped and spread onto and into the porous disk over a substantial area where it will be in immediate contact with entraining air. Any additional liquid that might be dispensed by repeated recirculations of the container will be moved into potential storage in deeper portions of the porous plastic due to successive compressions and expansions induced on the rapidly rotating disk when the blade is in contact therewith in the same path. This quickly charges the disk for a lasting effect.

To provide versatility, the disk is readily removable for washing or replacement to remove any earlier scent when selecting another, and when reinstalled, it readily dries itself for immediately renewed dispensing of a new scent when charged therewith.

Container fonts can be easily interchanged by withdrawal and reinsertion of another one in a carrier.

Fresh air is drawn over the motor and warmed by cooling the motor to reduce its humidity and then vaporizes and entrains odor control liquid from the rough-surfaced disk as it is propelled thereby for a soft discharge flow.

IN THE DRAWINGS

FIG. 1 is a perspective view of a room odor control device embodying the invention;

FIG. 2 is a bottom perspective view with the bottom thereof lowered to show the position of the rotating disk and coacting baffle;

FIG. 3 is an enlarged section taken on line 3—3 of FIG. 1;

FIG. 4 is an enlarged section taken on line 4—4 in FIG. 3;

FIG. 5 is a partial plan view of the relative positions of the coacting elements transferring an odor control liquid to the porous disk;

FIG. 6 is an enlarged view of a lower portion of FIG. 4 illustrating how depression of a dispenser font opens the lower valve to deposit drops on an applicator blade and the drops are then spread on a rotating disk; and

FIG. 7 is a section taken on line 7—7 of FIG. 4.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring more particularly to the drawings, a housing 10 is provided defining a motor compartment 12 having an electric motor 14 supported therein on depending studs 15 as located adjacent to inlet ventilation openings 16 in a vertical wall 18. The shaft 20 of the motor extends downwardly on an axis disposed eccentrically to the circular marginally flared bottom wall 22 of the housing 10 and supports in a driving relation a rotatable disk 28 releasably secured thereto. A horizontal air baffle 24 peripherally separates the disk from the motor compartment 12 and has an air passage or opening 26 therethrough. As the disk 28 is rotated at motor speed, air is drawn through the inlet openings 16, over the motor, and down through the portal 26 of the disk 28.

The disk 28 preferably is a circular section cut from a sheet of porous expanded plastic and has open porous rough surfaces 40 on all sides. When rotated the rough surfaces mildly but positively centrifugate air outwardly in a radial direction with an intimate interface contact therewith by which any moisture on the disk is entrained and carried away by the air.

The disk 28 is supported on the lower end of the motor shaft 20 by a plastic foraminated circular element 30 of plastic having a longitudinally split hub 32 circled by a C-spring 34 which urges the hub sections to slidably clamp on the motor shaft.

Four radially and angularly spaced upstanding pins 36 on the rim of the disk 28 (FIG. 3) have heads 38 on them and shoulders 48 to serve in locating the porous disk 28 coaxially on the spider 30. A foraminated plastic washer 42 having openings 44 that receive the heads 38 in snap relation to rest against the shoulders 48 supports the porous disk preferably without compressing it. The removal of the assembly from the shaft and the foraminated washer from the pins releases the porous disk for removal, washing and remounting, or replacement.

The supply assembly 50 of odor control liquid comprises a tubular container 51 (FIG. 4) telescopically replaceable in a cup-like carrier 53 that is externally offset or grooved to provide a downwardly facing shoulder 52. The container 51 is terminally tapered at the lower end 54 to provide a discharge opening 56 normally closed by a plunger valve 58 urged by a spring 60 to a closed position with a stem 62 on the valve extending beyond the lower end of the container for its actuable displacement. The supply assembly 50 is received from the top in a tube 63 for the carrier 53 to extend above the top of the housing 10 in its resting position, and the
A tube 63 is radially open along one side as at 64 from a shoulder 66 to the bottom end thereof beyond which the container extends in a guided relation.

A whip spring 68 (FIG. 4) is supported on hangers 71 integral with the housing 10 to intersect the interior of the tube 63 through the opening 64 at the shoulder 66 to engage the shoulder 52 in the container 50 in resilient supporting relation so that the container can be finger-pressed from above downwardly towards the disk 28. The spring 68 yields to permit this and then returns the container to its resting position.

Below the valve 58 in container 50 a leaf spring 70 is supported by a vane 72 as inclined slightly to the upper face of the disk 28 in the direction of its rotation (arrow 74) and is normally spaced a slight distance above it (FIG. 4). The end of the spring 70 has a small opening 76 (FIG. 5) through it in close proximity to the end 58 of the valve and from this opening the blade is split through to its end to provide a capillary slit 80. Then when the container 50 is pressed downwardly (FIG. 6), the nipple 62 on the valve 59 engages the spring blade 70 and opens the valve 58 to permit a limited amount of liquid to flow onto the blade 70 and from there into the hole 76, and through the slit 80 as the blade 70 is brought into contact with the rotating porous disk 28. With the disk turning, the blade progressively compresses the porous disk in a circular path while the liquid is spread from the slit 80 into contact with the compressed disk in the path. Then the wetted compressed portion progressively leaves contact with the blade, reexpansion of the porous disk body absorbs the liquid and prevents its being twirled from the surface 40. Thereafter, the liquid re-surfaces gradually to be progressively aerated by the air turbulating at the rough surface of the disk and be entrained thereby as the air is set into motion and circulated by the disk.

The container 50 is easily withdrawn and is semi-transparent so that the remaining supply of liquid can be ascertained from time to time and replaced when empty without disturbing the device.

Adhesively mounted tabs 82 (FIG. 3) of soft elastomer engage and hold the baffle 24 in place where they are folded around the axial flange 84 on the housing. A bottom closure member 86 has an upward extending flange 88 which overlaps the depending flange 84 to also engage the tab 82 is assembled relation.

The disk 28 is disposed off-center in the circular housing 10 as enclosed by the bottom closure member 86 carrying a circular shroud 90 (FIG. 2) closely following approximately 160° of the disk edge 92 on the internal side of the eccentricity. This provides an exhaust chamber 96 having narrow throats 98 and 100 at each end of the shroud 90. The closure member 86 has radial exhaust openings 102 in its chamber wall adjacent to the downstream throat 100 and extending approximately 125°. With this arrangement, air impelled by the disk through the upstream throat 98 has a chance to expand in the wider portion of the chamber 96 and be urged to escape through the circumferential openings 102 as it approaches the narrowing downstream throat 100, yet can return to contact with the lower side of the disk for further mixing and later escape through the exhaust openings 102 with minimized and practically unnoticeable sound of air movement.

The operation and structure of the device has been concurrently explained and it is to be noted that in absence of a liquid supply container, liquid can still be applied to the blade 70 through the container tube 63 for a run-off pick-up by the porous disk 28 before or during rotation without a drop bounce which could carom or splash a substantial amount of liquid from the disk. Moreover, the bottom 86 is easily removed and cleaned along with the disk to prevent foreign odors accumulating.

Suitable wiring, not shown, by an extension cord with a switch carried by the cord is provided, preferably for continuous full speed operation.

What is claimed is:

1. A dispenser for a room odor control liquid comprising:
   a housing having air inlet and outlet openings;
   a motor carried by said housing;
   means for circulating air through said openings including a resilient porous elastomer member disposed between said openings and rotated by the motor;
   a reciprocable distribution element means having a limited surface area movable to engage the porous member and progressively compress and release the porous member over a limited area in a circular path as the latter rotates; and
   odor control liquid supply means actuable to engage said distribution element means for supplying thereto room odor control liquid and to move said distribution element means into compressive contact over said limited surface area with the porous member, said porous member absorbing said supplied liquid from said element means as the porous member is progressively released from compression and leaves said limited surface area.

2. The dispenser defined in claim 1 including:
   means for supplying air from a room into contact with the elastomer member for evaporating liquid therefrom, said elastomer member agitating and returning the air and evaporated liquid to the room.

3. The dispenser defined in claim 1 in which said distribution element means includes a liquid receiving capillary slot means in said limited surface area for supplying odor control liquid to said limited area.

4. A liquid dispenser for odor control comprising:
   a housing having air inlet and outlet openings, a motor supported in said housing, a porous resilient disk impeller of expanded plastic disposed between said openings and rotated by the motor, said impeller having a porous rough surface means on at least one of two radially extending sides for inducing movement of air between the inlet and outlet openings, a feeder element means resiliently supported in close proximity to said rough surface means for movement into momentary contact with said rough surface means and having an exposed face remote from said surface means, liquid supply means supported in the housing for supplying to said exposed face of the feeder element means a small amount of odor control liquid, and manually movable means actuating said supply means and feeder element means for moving limited amounts of odor control liquid into contact with said rough surface means and for distributing liquid supplied to the feeder element means progressively over a circular path on said rough surface means for absorption by the disk impeller.
while the disk impeller is being rotated continuously.

5. The dispenser defined in claim 4 in which said feeder element means has a slot means of substantially capillary width and tangent to said circular path for transferring said liquid from said feeder element means to said rough surface means.

6. The dispenser defined in claim 4 in which said liquid supply means includes a depending valve means disposed above and actuated by contact with said feeder element means for delivering liquid to said feeder element means.

7. The dispenser defined in claim 6 including resilient support means carried by said housing for normally holding said valve means out of contact with said feeder element means,

said liquid supply means carrying said valve means and extending through the wall of the housing and constituting said manually movable means for manipulation to depress said resilient support means and move said feeder element means into contact with said rough surface means over a limited area.

8. A liquid dispenser comprising:
a housing having air inlet and outlet openings;
the combination of a rotatable resilient disk of porous expanded plastic disposed between said openings,
means for rotating said resilient disk in the air between said openings,
a blade proximate the face of the disk having a capillary slot means tangential to the direction of rotation for transferring liquid from said blade to said disk; and
liquid supply means for depressing the blade against the disk and depositing liquid via said slot means onto the rotating disk for absorption thereby and transfer of said deposited liquid to said air between said openings.

9. A dispenser for room odor control liquid comprising:
a housing defining a circular compartment with axially spaced air inlet and outlet openings through the wall of the housing,
a baffle intermediate said openings dividing the compartment into an air inlet compartment having the inlet openings and an outlet compartment having the outlet openings, said baffle having a portal through it,
a motor having a drive shaft mounted in said inlet compartment in heat exchange relation with incoming air to warm the air and disposed with said drive shaft extended through the portal,
a porous resilient disk of expanded plastic having a rough surface supported in the outlet compartment below the baffle and rotated by said shaft, and
liquid odor control supply means extending through said portal for depositing drops of liquid directly on said porous resilient disk at a distance spaced from the center thereof in the path of the flow of incoming air over the surface of the disk, said supply means including an element means for engaging the surface of said disk under compressive pressure over the area of engagement to distribute said liquid and to facilitate the absorption thereof by said disk.

10. A dispenser for room odor control liquid comprising:
a housing having a wall defining a circular compartment with axially spaced air inlet and outlet openings through the wall of the housing,
a baffle intermediate said openings dividing the compartment into an air inlet compartment having the inlet openings and an outlet compartment having the outlet openings, said baffle having a portal through it,
a motor having a drive shaft mounted in said inlet compartment with said drive shaft extended through the portal,
a porous resilient disk of expanded plastic supported in the outlet compartment below the baffle and rotated by said shaft,
liquid odor control supply means extending through said portal for depositing drops of liquid directly on said porous resilient disk and said porous resilient disk, and
resilient means associated with said supply means for reciprocative movement to and from said disk to progressively compress and release the disk in a limited area as said disk rotates to spread the drops over a circular path of the disk for partial absorption therein.

11. The method of controlling room odor comprising turbulating and circulating contaminated room air with a rough rotating surface of porous resilient material, simultaneously contacting and compressing a limited portion of the porous material along a circular path,
applying a flowing drops of odor control liquid onto the path at the point of compression, releasing the compression to expand the porous material to absorb the control liquid thereon into the pores of the material immediately following each compression at a given point to store a supply of liquid in the pores, centrifugating the absorbed control liquid to slowly expose it to the air at the rough surface, vaporizing and entraining liquid from the surface of the porous material through intimate contact with air circulated past the rough surface, and discharging the turbulated air into a room.

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