

[54] VOLATILIZING DISPENSER

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239/57

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206/5; 220/31 S, 38, 331, 339

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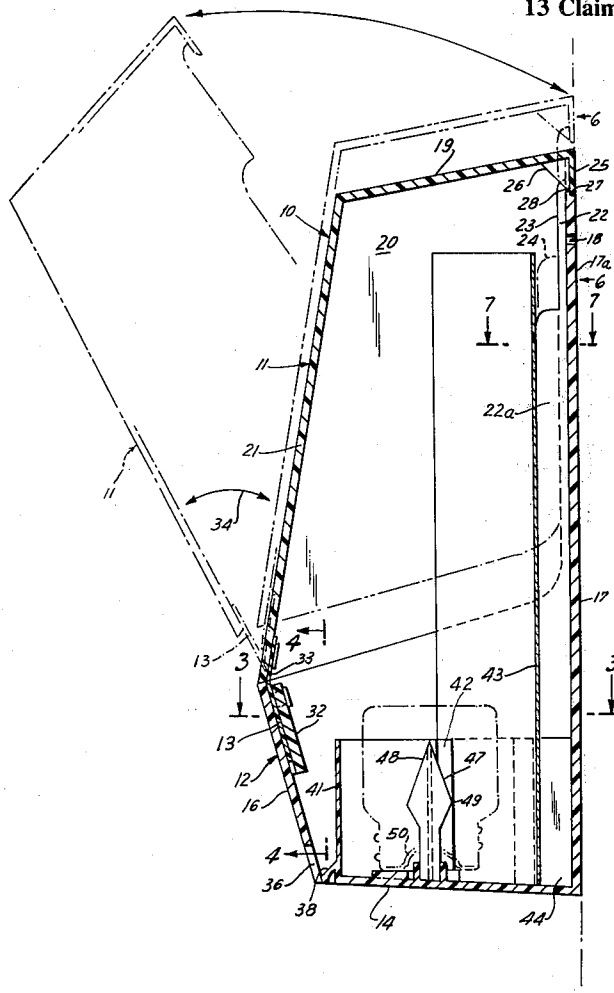
ABSTRACT

A volatilizing dispenser in the form of closely interfitting and vented housing parts adapted for mounting on a vertically oriented support surface provides effective means for the controlled vaporization of liquid air freshening, odor counteractant and other formulations adapted to the introduction of volatile components to ambient air. The device includes a base providing a liquid reservoir supplied by bulk liquid or replaceable liquid containers and from which liquid is fed to a vertically oriented evaporator element within the device. Vent means peripherally of the base, and in upper portions of the device facilitate a vertical circulation of air past the evaporator element to thereby effectively introduce odor-counteractant or other volatile components to the surrounding environment.

A unique flexible and slideable hinge, coupled with concealed interlock between said housing parts provides a relatively tamper-proof assemblage which is at the same time readily opened and closed for servicing by authorized personnel.

The liquid reservoir is provided with a plurality of ribs on the bottom wall thereof for supporting inverted liquid containers and further includes an upwardly extending spike element centrally of said ribs for piercing diaphragm seals as inverted liquid containers are inserted in said reservoir.

13 Claims, 7 Drawing Figures



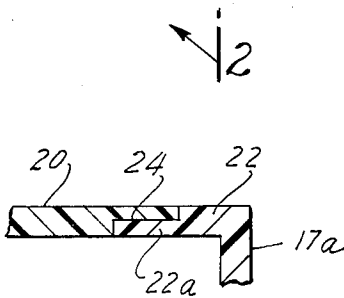
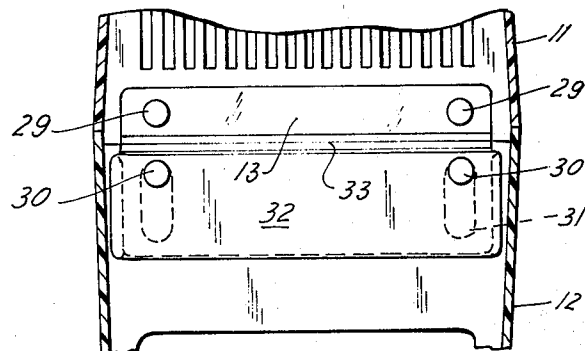
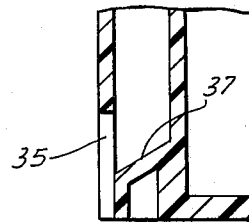
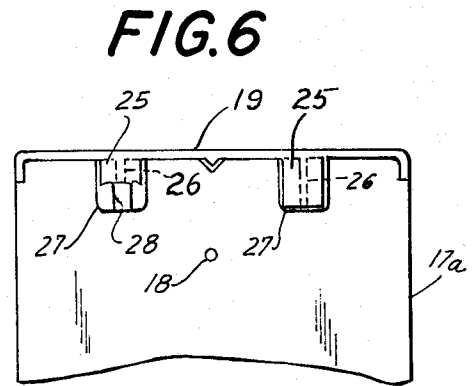
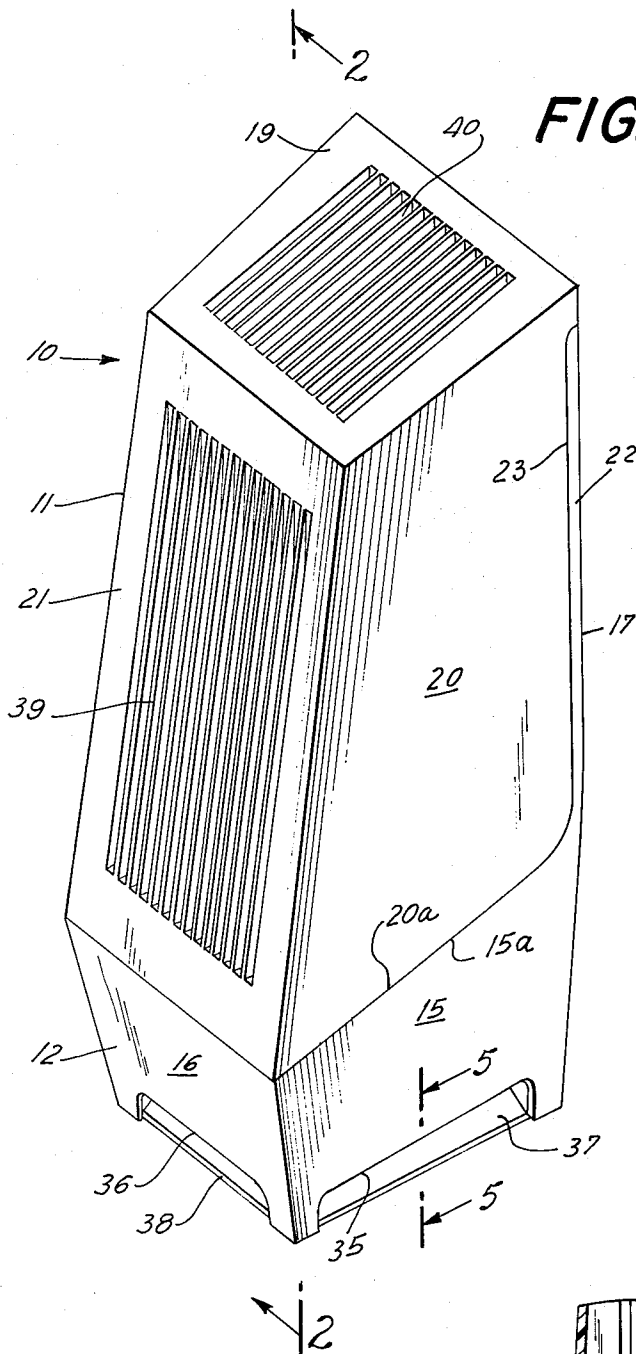
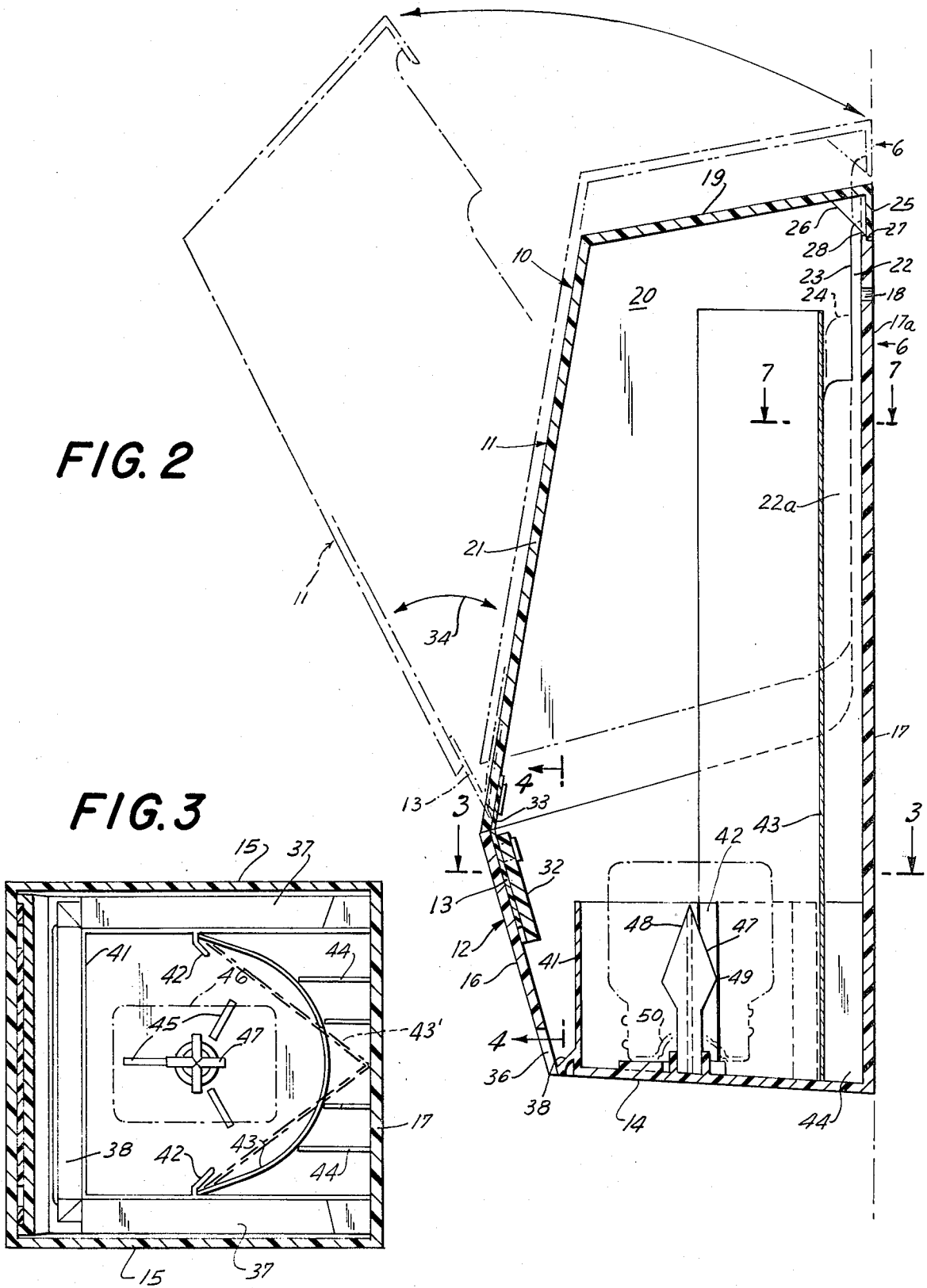


FIG. 2



VOLATILIZING DISPENSER

BACKGROUND OF THE INVENTION

It has long been the practice in various enclosed spaces such as kitchens, bathrooms, basements and particularly in public restrooms, to utilize volatilizable substances to counteract, mask, or otherwise reduce or eliminate objectionable odors which characterize such enclosed spaces. For such purposes a source of volatilizable components can be provided in liquid or solid as well as semi-solid or gel form, with liquid probably being most generally used due to the flexibility provided in liquid systems for effectively formulating to counteract various types of odors.

In the past, many types of devices have been employed for assisting the volatilization of odor counteractants from liquid formulations by generally incorporating porous or wicking members which will provide a substantially moist surface area for contact with the ambient air.

Such use of porous or wicking members present characteristic problems, however, such as the difficulty in providing a large enough area for effective volatilization of odor counteracting components, and the tendency during extended use for less volatile components, and/or contaminants in the ambient air to collect on the absorbent surfaces to an extent sufficient to alter or even destroy the odor counteracting effectiveness. There is accordingly considerable room for improvement in space deodorizers utilizing liquid odor counteractant and porous members for aiding volatilization.

THE INVENTION

The improved volatilizing dispenser in accordance with the present invention overcomes some of the problems above mentioned by providing, in conjunction with a replaceable source of liquid counteractant, an interchangeable and readily replaceable evaporator element, and further by providing a uniquely vented housing which facilitates intimate contact of vertically moving air with said evaporator element, to thereby achieve more nearly azeotropic evaporation in intended use of the device. A unitary, extensible hinge means permitting vertical locking and interlocking movement and forward tilting movement of the upper part of a two part housing assemblage facilitates authorized access, while minimizing the chance of unauthorized access, to the interior of said space deodorizer.

Novel features of the volatilizing dispenser will readily be understood from a consideration of the following description having reference to the accompanying drawing in which preferred adaptations of the invention are illustrated with the various parts thereof identified by suitable reference characters in each of the views and in which:

FIG. 1 is a perspective view of the volatilizing dispenser of the invention as set up and ready for use;

FIG. 2 is a vertical sectional view of the volatilizing dispenser taken substantially on the line 2,2 of FIG. 1 and including dot-dash showings of different positions of the movable upper housing part in the intended use thereof;

FIG. 3 is a sectional view taken substantially on the line 3,3 of FIG. 2;

FIG. 4 is a fragmentary view of the internal structure taken in the direction of the arrows 4,4 in FIG. 2;

FIG. 5 is a fragmentary view taken substantially on the line 5,5 of FIG. 1;

FIG. 6 is a fragmentary view of the upper portion of the assemblage taken in the direction of the arrows 6,6 in FIG. 2; and

FIG. 7 is a fragmentary sectional view taken substantially on the line 7,7 of FIG. 2.

As shown in the drawing, the improved volatilizing dispenser 10 comprises an upper housing part 11 hinged to a lower housing and mounting part 12 by an extensible hinge means 13 as clearly illustrated in FIGS. 2 and 4. The lower housing part 12 has a bottom wall 14, vertical side wall 15, a forwardly inclined front wall 16, and a vertically disposed rear wall 17 extending substantially above the front and side walls as clearly seen in FIG. 2 of the drawing. The upwardly extending portion 17a of the rear wall 17 is provided with a plurality of apertures 18 (one only being shown in FIGS. 2 and 6) facilitating mounting of the assemblage to a vertical support by screws or other fastening means.

The upper casing part 11 has a top wall 19, preferably somewhat downwardly inclined as seen in FIG. 2, vertically disposed side walls 20 and a rearwardly inclined front wall 21.

It will be noted that upper edges 15a of the side walls of the lower part and lower edges 20a of the side walls of the upper part abut with each other and have a slight upward inclination, front to rear, as clearly seen in FIGS. 1 and 2 facilitating opening movement of the upper part as hereinafter described.

The upward extension 17a of the rear wall of the base part is provided with forwardly extending flanges 22 interfitting with vertical cutouts 23 in the side walls 20 of the upper housing part which, as seen in FIGS. 1 and 2 terminate short of the top wall 19 thereof. Throughout the major portion of their length, the flanges 22 have extensions 27a of reduced thickness which interfit with internal recesses or cutouts 24 in the inner surface of said walls 20 of the upper casing part thereby providing effective lateral alignment of the assembled casing parts.

The casing parts are maintained in assembled position by a vertically slidable interlock between tabs 25 projecting downwardly from the top wall 19 and suitably reinforced by webs 26 which interfit with undercut recesses 27 and grooves 28 in the back wall extension 17a as clearly shown in FIGS. 2 and 6.

Considering now the extensible hinge 13 as shown in FIGS. 2 and 4, it should be understood that this extensible hinge constitutes a sheet of plastic material suitably polypropylene or the like which is anchored to the upper part 11 by studs 29 and movably secured to the lower part 12 by the engagement of studs 30 with elongated apertures 31 in the plastic sheet. The studs 30 suitably extend to a plate 32 overlying the plastic sheet 13 and acting as a guide in the intended movement thereof.

The plastic sheet 13 has a plurality of transverse ribs 33 in alignment with the juncture between the upper and lower parts 11 and 12 providing for flexure in one direction when the parts are disposed in the full line position shown in FIG. 2 and for flexure in the opposite direction when the upper part 11 is raised and pivoted forwardly to the dotted line position shown in FIG. 2. This "living hinge" action is readily provided by various plastic materials, including in particular polypro-

pylene and it should be noted that the thickness of the plastic material of the hinge 13 and the nature of the ribs 33 therein is preferably such that the hinge 13 will support the weight of the forwardly tilted upper part 11 at a tilt angle 34 as shown in FIG. 2 of not greater than 45°.

The lower portions of the side wall 15 and front wall 16 have cutouts 35 and 36 respectively with angularly disposed deflecting surfaces 37 and 38 respectively inwardly thereof for diverting horizontally moving air streams externally of the assemblage to vertically moving air streams in the assemblage. The upper part in turn is provided with a plurality of longitudinal slits 39 in the front wall 21 thereof and other parallel slits 40 in the top wall thereof, suitably aligned with the slits 39. The size and spacing of the slits 39 and 40 is such as to provide very little restriction to upwardly moving air streams escaping from the assemblage.

Internally of the lower part 12 and the deflecting means 37, 38 thereof is a liquid reservoir 41 of substantial depth having inwardly projecting means as shown by flanges 42 for engaging edges of a vertically flexed evaporator element 43. The reservoir 41 can have a curved contour following the curvature of the evaporator element 43 or alternately, as shown in the drawing, a plurality of fins 44 at the rear of reservoir 41 can act as backing members for the curved element 43. The inner fins 44 can also cooperate with the flanges 42 to support a scored or folded evaporator element 43' as shown in dot and dash lines in FIG. 3 of the drawing.

Centrally of the base of the reservoir 41 are a plurality of raised ribs 45, three radially disposed ribs being shown in FIG. 3 for engaging the discharge end of an inverted liquid container 46. Centrally of the ribs 45 there is an upstanding spike member 47 suitably in the form of a plurality of radial fins tapering to a sharp point 48 and having an enlarged mid-section 49. When an inverted container of odor-counteractant liquid having a diaphragm seal 50 is placed on to the spike, the diaphragm 50 is punctured and a sufficiently large hole made therein by the enlarged portion 49 that there is a free feed of liquid from the container 46 to the reservoir 41 while the inverted container rests on the ribs 45.

This arrangement of inverted liquid container 46 in the reservoir 41 maintains an appropriate liquid level in the reservoir by the "chicken feeder" effect, so that the lower end of the evaporator element 43 is constantly emersed in said liquid. The evaporator element 43 or 43' can be fashioned from various fibrous materials having sufficient stiffness to maintain the upstanding contour shown in FIGS. 2 and 3 of the drawing for extended periods while saturated with liquid from the reservoir 41.

It is intended that the evaporator element 43 be frequently replaced as when servicing the unit to replenish the reservoir from a bulk supply or insert a new container 46 of odor-counteractant liquid, and for this purpose felted fibrous material similar to conventional blotting paper can be effectively employed. It is to be understood, however, that there can be considerable variation in the material and structure of the evaporator element 43, the important factors being that the fibrous material thereof provides sufficient capillary action to maintain the entire area moistened by liquid from the reservoir 41 and that a normally flat evaporator element can be flexed or folded in the longitudinal

direction to provide the desired cross-sectional contour as shown in FIG. 3 when inserting the same in the assemblage.

The size and shape of the liquid container 46 can, of course, be varied considerably depending on the nature of odor-counteractant or other liquid being used in the device and the time desired between necessary replacements of the liquid container 46. In this regard also the size of the evaporator element 43 or 43' and the degree of capillary action provided therein provide additional variables which permit fairly accurate regulation of the time interval during which the device will function in the desired manner with one container 46 of liquid odor-counteractant or the like.

It will be seen that the air streams within the assemblage, upwardly deflected by the angular surfaces 37, 38 as earlier described, will pass in what might be referred to as chimney fashion a large surface area of the saturated evaporator element 43 or 43' thereby picking up desired amounts of volatile components before leaving the assemblage through the slits 39, 40. Such constant slow introduction of volatile odor-counteractant components provides effective means for odor control in confined areas such as public rest rooms and the like requiring a minimum of attention except for periodic checking by attendants to replace liquid container 46 and/or evaporator element 43 or 43' as needed. It will be noted in this connection that the somewhat unusual engagement of the parts provides a relatively tamper-proof construction. If desired, however, positive latch means could be provided internally of the device in the vicinity of the tabs 25 and reinforcing ribs 26 accessible to an authorized attendant by insertion of an appropriate implement through the slits 40. No detailed disclosure is made concerning such positive lock means, however, as its appearance in an issued patent would destroy its effectiveness as a security measure.

While the device has been described particularly in connection with its use as an odor-counteractant device, and this is probably the area in which it will receive most widespread commercial use, it should be understood that the unique structural features lend themselves to use in any situation in which limited amounts of volatile components from a liquid source are to be introduced into the ambient air. One example of an alternative use would be the introduction of insect repellent to the air around patios, picnic areas and the like. Another such alternative use would be the introduction of a particular desired scent to stimulate interest in the marketing of particular produce or merchandise.

The device as illustrated and described can be produced from various materials, but the structure as shown lends itself particularly to being fashioned from molded plastic parts, thus providing versatility in the provision of durable color and other ornamental effects.

Various changes and modifications in the volatilizing dispenser or space deodorizer as herein described may occur to those skilled in the art and to the extent that such changes and modifications are embraced by the appended claims, it is to be understood that they constitute part of the present invention.

I claim:

1. A volatilizing dispenser comprising closely interfitting and vented housing parts adapted for mounting on a support surface, vent means peripherally of one, lower part of said assemblage having angularly dis-

5

posed deflecting means at the lower extremity thereof adapted to divert horizontal air streams to vertically and upwardly directed air streams within said assemblage, vent means in the other, upper part of said assemblage arranged to provide limited restriction to the escape of upwardly directed air streams from said assemblage, a liquid reservoir within said lower part, and means within said liquid reservoir for positioning the lower end of a vertically elongated evaporator element for free standing within said assemblage, whereby liquid within said reservoir is introduced to upwardly moving air streams within said assemblage through prolonged contact with said evaporator element.

2. A volatilizing dispenser as defined in claim 1, wherein said assemblage is adapted for mounting on a vertical surface, the vent means in said lower part are disposed at the lower front and sides of said part, and said deflecting means are disposed inwardly of the front and side walls thereof.

3. A volatilizing dispenser as defined in claim 2, wherein said upper and lower parts are pivotally joined at the front walls thereof at a point substantially above the lower extremity of said lower part by extensible hinge means providing combined vertical and pivotal action, an upward extension on said lower part interfitting with top and side walls of said upper part providing the mounting means for the assemblage, and cooperating means on said upper and lower parts providing a vertically slidable lock engagement between said upwardly extending portion of the lower part and said top wall of the upper part.

4. A volatilizing dispenser as defined in claim 3, wherein said vertically slidable lock engagement is provided by slotted recesses in the upwardly extending portion of said lower part and interfitting tabs projecting downwardly from the top wall of said upper part.

5. A volatilizing dispenser as defined in claim 3, wherein said extensible hinge means comprises a sheet of plastic material extending transversely of the inner front wall of the assemblage spanning the juncture between said upper and lower parts, said sheet of plastic material being fixedly secured to said upper part and movably secured to said lower part by engagement between projecting lugs on said lower part and spaced, vertically elongated apertures in said plastic sheet, and the portion of said plastic sheet aligned with the juncture between said upper and lower parts having transverse deformations imparting "living hinge" characteristics to said sheet.

6. A volatilizing dispenser as defined in claim 5, wherein the thickness and flexibility of said plastic sheet is such that, when the upper part is raised to disengage said vertically slidable lock engagement and said upper part is pivoted forwardly through the action

6

of said "living hinge", said plastic sheet will support the weight of the forwardly tilted upper part at an angle of forward tilt not greater than about 45°.

7. A volatilizing dispenser as defined in claim 1, wherein the vent means in said upper part comprise a plurality of closely spaced elongated slits in a top wall thereof and a plurality of closely spaced vertically elongated slits in a front wall thereof, said slits in the top wall extending from front to back and being in substantial alignment with the vertically elongated slits in said front wall, and being substantially the same width as the spacings therebetween.

8. A volatilizing dispenser as defined in claim 1, wherein spacer means centrally of the bottom of said liquid reservoir facilitates interchangeable support of inverted liquid containers for prolonged feed of liquid to said reservoir.

9. A volatilizing dispenser as defined in claim 8, wherein said spacer means comprise a plurality of radially oriented ribs, and an upwardly extending spike element centrally of said ribs facilitates rupture of diaphragm seals as inverted liquid containers are mounted in said liquid reservoir.

10. A volatilizing dispenser as defined in claim 9, wherein said spike element comprises a plurality of radially disposed and vertical oriented fins tapering to a sharp point of the upper end thereof and having a substantial enlargement upwardly spaced from said ribs such that said spike element produces a hole in a container diaphragm seal which is substantially larger than the lower end of said element.

11. A volatilizing dispenser as defined in claim 1, wherein the support means for said evaporator element comprises inwardly extending side flanges within said liquid reservoir and ribs protruding from the rear wall thereof whereby a planar evaporator element is supported in vertically flexed or folded orientation within said assemblage.

12. A volatilizing dispenser as defined in claim 11, wherein said evaporator element comprises fibrous material providing capillary feed of liquid from the immersed lower end of said element throughout substantially the entire area of said element.

13. A volatilizing dispenser as defined in claim 11, wherein said evaporator element comprises fibrous material providing capillary feed of liquid from the immersed lower end of said element throughout substantially the entire area of said element, and said evaporator element having sufficient body and stiffness to maintain said vertically flexed or folded orientation for indefinite periods while substantially saturated with liquid.

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