Sept. 25, 1934. C. DUPUY 1,974,414

EVAPORATING DEVICE

Filed March 24, 1932

Fig. 1.

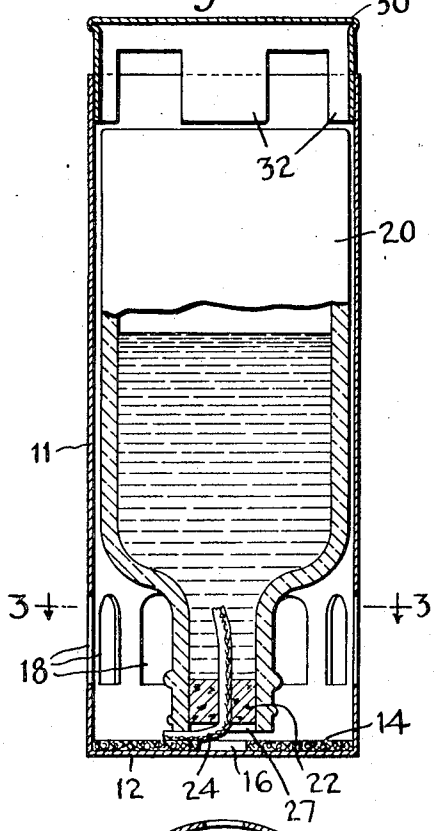


Fig. 2.

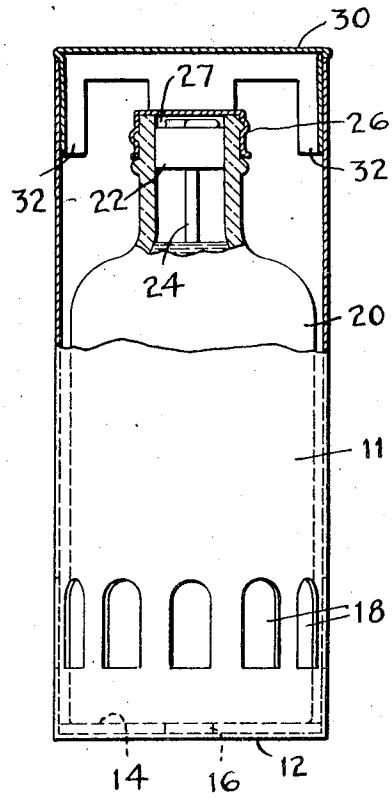


Fig. 3.

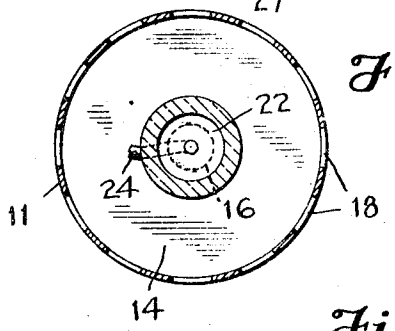
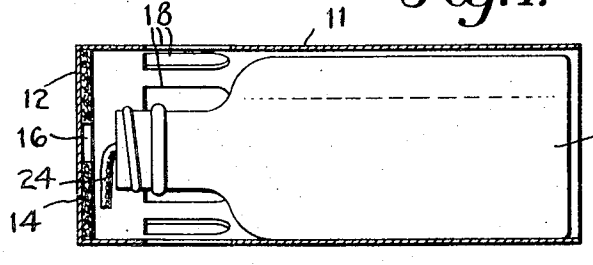


Fig. 4.



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EVAPORATING DEVICE

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6 Claims. (Cl. 299—24)

This invention relates to devices for diffusing by simple evaporation into the air of a closet or room the vapor of a liquid, whether for deodorizing or freshening the air to be breathed, or for disinfection, or for suppression of moths, or other special purpose. A bottle or container of liquid forms a part of the diffusion device, and these bottles are supplied as re-fill packages. The invention relates specifically to the inverted bottle class of device, the outlet from the bottle being at the bottom when the device is functioning to disseminate vapors.

There are two known types of inverted bottle evaporators. In one type the bottle has an outlet from which liquid would pass more or less freely but that provision is made to hold a pool of liquid at the mouth of the bottle, evaporation taking place from the surface of this pool. If one of these devices is knocked over, or its parts are displaced, the contents of the pool are spilled and liquid is lost from the bottle. Not merely mess and waste may result, for the increased concentration of vapors may be troublesome and the liquid itself may be one that should be confined.

In inverted bottle evaporators of the other type, the user must make a fine puncture in the closure end of the bottle to provide a seepage opening, and also assemble certain parts, the outcome of which operations may be a proper rate of evaporation, provided that the opening that is made is not too small or too large and that the parts are in proper relation.

The objects of this invention are to provide a device which requires the least thought and attention on the part of the user in order to place it in operation, which causes the liquid to be evaporated in a definite, predetermined manner, which conserves the liquid and does not admit of spilling or free flow, and which is entirely safe. Another object is to provide a device which is economical to manufacture. Still another object is to provide a re-fill bottle or sales container for the liquid which embodies an improved feed means, which is very simple in construction, very easy to place in condition for use, and which is absolutely closed until it is put in operation.

The device of this invention comprises a bottle inverted in a holder at the bottom of which there is an absorbent pad. To feed the liquid from the bottle to the evaporating pad, a small flexible wick is used, this wick being held closely in an aperture in the lower end of the bottle and being adapted to be trained laterally between the end of the bottle and the pad, on which the bottle rests with the wick thus interposed. The refill bottle disclosed herein is contrived in the following manner: a small hole is made through a simple cork or stopper and the wick is passed through this hole, wherein it is clasped, the stopper is pushed entirely into the neck of the bottle so that the end of the neck can make a tight seal with a closure cap, and the cap is then applied to the neck over the stopper and wick. The user of the refill package need only remove the closure cap and extend the outer portion of the wick before inserting the bottle in the holder.

Other objects and advantages of the invention will appear or be pointed out as the description proceeds.

In the accompanying drawing, forming a part hereof:

Fig. 1 is a side elevation, mostly in section, showing an evaporating device made in accordance with this invention;

Fig. 2 is a side elevation, partly in section, showing the evaporating device of Fig. 1 when the bottle is capped to prevent evaporation of the liquid;

Fig. 3 is a sectional view on the line 3—3 of Fig. 1; and

Fig. 4 is a sectional view of the device shown in Fig. 1, illustrating the manner in which the contact between the bottle and the evaporator pad is broken when the device is accidentally overturned.

A holder or housing 11 is provided with a bottom 12, on which is placed an evaporating pad 14. The evaporating pad is preferably made of absorbent material, such as felt, but any other material may be used which will spread a liquid by capillary action. The evaporating pad 14 is formed with an opening 16 through the upper surface of the pad, and in the drawing this opening 16 extends completely through the evaporating pad. The purpose of this opening 16 is to increase the rate of flow of liquid from the feed means to the evaporating pad.

The holder 11 is provided with ventilating openings 18, through which air circulates to evaporate liquid from the pad 14.

The liquid to be evaporated is contained in a bottle 20. A stopper 22 is held in the neck of the bottle 20. This stopper has an orifice filled by a small, flexible wick 24, the wick having a portion extending into the neck of the bottle and another portion extending outwardly from the stopper.

A cap 26 is provided to close tightly the top of the bottle and prevent evaporation of liquid from the wick until the bottle is to be put into use.

In the preferred embodiment of the invention, this cap 26 is provided with screw-threads for engaging the neck of the bottle, but the cap 26 may be secured to the bottle by any other suitable means which permit removal of the cap. A pocket 27 is provided between the inside of the cap and the adjacent side of the stopper to accommodate the outwardly extending portion of the wick, as shown in Fig. 2. This accommodation is preferably secured by setting the stopper in the bottle neck so that it is below the top of the neck.

The housing 11 is provided with a cover 30, which has downwardly extending projections 32. The complete device may be sold with the parts assembled, as shown in Fig. 2, the cap 26 being firmly secured to the bottle 20 so that the liquid can not spill or evaporate from the bottle, and the cover 30 being in closed position. When the device is to be used, the cap 26 is removed, the wick is released from its pocket and bent laterally over the neck of the bottle, and the bottle 20 is replaced in an inverted position, as shown in Fig. 1. With the bottle in this inverted position, the wick 24 is held against the evaporating pad 14 and separates the end of the bottle from the pad sufficiently for the entrance of air, and the liquid in the bottle will be fed by capillary action through the wick 24 into evaporating pad 14. Air passing through the openings 18, and across the pad 14, will cause the liquid to evaporate from the pad and its vapors to be distributed through the atmosphere of the cupboard or room in which the evaporating device is located. The circulation of air through the device may be increased by placing the cover 30 in the position shown in Fig. 1, so that air can pass under the edges of the cover and through the openings between the projections 32. The cover 30 is held in the raised position shown in Fig. 1 by friction between the projections 32 and the wall of the housing 11.

The liquid-containing bottle 20, with its wick-feed means, and the cap 26 comprise a self-contained evaporator unit which serves as a sales package or refill, the use of which is not limited to the particular holder and pad that have been described. The essential features of this self-contained unit include the liquid container or bottle 11 having a restricted outlet, which is preferably an orifice through the stopper 22, but may obviously be a small opening in the bottle neck itself, the wick feed means which fills the orifice and extends outwardly therefrom, and the cap 26 which tightly closes the top of the bottle and closes in the wick until such time as the bottle is to be put in use.

The self-contained unit will become operative at any time if the cap 26 is removed, the wick is withdrawn, and the bottle is inverted. The convenience of the self-contained unit provided by this invention over the previously known devices, in which it was necessary to punch holes in the cap, will be evident.

If the evaporator shown in Fig. 1 is accidentally overturned, the bottle 20 will usually slide away from the evaporating pad 14 into a position such as shown in Fig. 4. With previously known evaporators using inverted bottles, liquid can drip or flow from the mouth of the bottle when the bottle is displaced. With this invention, the wick 24 prevents flow or any substantial dripping from the bottle when the bottle is in the position shown in Fig. 4, but the wick is sufficiently porous so that liquid will be fed by capillary action to the evaporating pad 14 as long as the wick contacts with the evaporating pad.

When the bottle is in the inverted position shown in Fig. 1, the wick 24 is trained under the edge of the bottle neck and may hold the neck a slight distance away from the evaporating pad 14, or pressure on the bottle may cause the evaporating pad 14 and wick 24 to be slightly compressed until the edge of the bottle neck rests lightly on the evaporating pad, always permitting, however, air to enter and to pass up through the wick and stopper into the bottle so that the liquid continues to feed through the wick. It is not important whether the bottle touches the evaporating pad, but the wick is preferably made of material which is sufficiently stiff so that the combined weight of the bottle and liquid is not sufficient to crush the wick to such an extent that capillary action in the wick is seriously retarded.

This invention provides a very convenient and efficient liquid evaporator, and self-contained unit for such evaporators, and while the invention is illustrated in its preferred embodiment, changes and modifications may be made without departing from the invention as set forth in the appended claims.

I claim:

1. An evaporating device comprising a holder; a bottle of liquid mounted in an inverted position and freely slidable in the holder; an evaporating pad located adjacent the bottom of the holder; and wick feed means to supply liquid from the bottle to the evaporating pad while the bottle is in normal inverted position, said wick feed means being of sufficient density to prevent the flow of liquid from the bottle when the device is turned over on its side and the contact between the feed means and the evaporating pad is broken.

2. An evaporating device comprising a holder; an evaporating pad in the bottom of the holder; a bottle for mounting in an inverted position in the holder and slidable axially in said holder; and a porous feed element in the neck of the bottle for supplying liquid from the bottle to the evaporating pad and for cutting off the flow of liquid when the holder upsets and the bottle slides away from the pad.

3. An evaporating device including in combination a housing; an absorbent pad at the bottom of the housing, said pad having an opening in the upper surface thereof; a bottle mounted in the housing in an inverted position with the mouth of the bottle over the opening in the absorbent pad; and wick feed means in the neck of the bottle and extending therefrom to contact with the absorbent pad when the bottle is in the position described.

4. An evaporating device including in combination a cylindrical housing having a bottom; an absorbent pad on the bottom of the housing, said pad having an opening through its central portion; a bottle within the housing and supported thereby in an inverted position; a stopper having an opening therethrough and located in the neck of the bottle; and a wick filling the opening through the stopper, said wick having a portion extending beyond the stopper and into contact with the absorbent pad, when the bottle is in the inverted position described, to feed liquid from the bottle to the pad.

5. An evaporating apparatus comprising a bottle, a holder adapted to receive said bottle in inverted position and to permit the escape of vapors, an evaporating pad on the bottom of the holder, said bottle being provided with a small orifice, and a flexible wick held in said orifice with its outer portion trained laterally beneath

the end of the bottle and interposed between the same and the evaporating pad so as to support the bottle slightly away from the pad.

6. An evaporating bottle containing liquid to be evaporated and having a neck provided with means to receive a tight closure, a stopper having a small orifice through it, said stopper being inserted entirely within the neck, a small flexible wick held in and extending through the orifice of said stopper, and a tight closure removably secured on said neck and enclosing said stopper and wick.

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