March 17, 1959 A. D. RUSSO 2,878,060

VAPOR DIFFUSING DEVICE

Filed Jan. 10, 1957

Fig. 1.

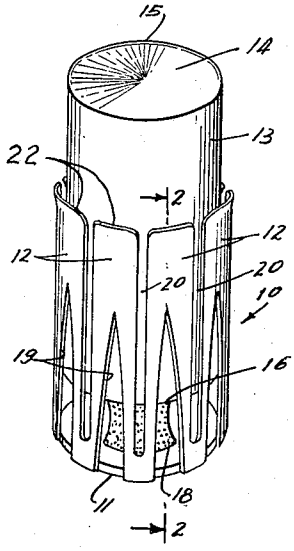


Fig. 2.

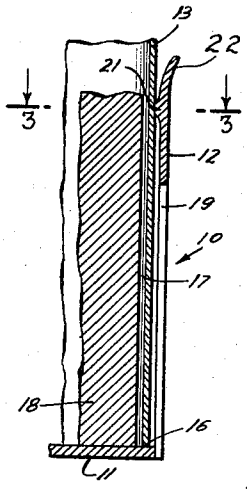


Fig. 3.

Fig. 4.

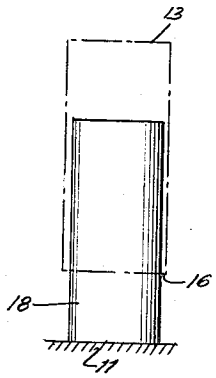


Fig. 5.

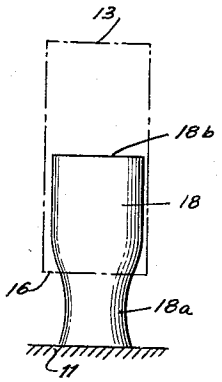
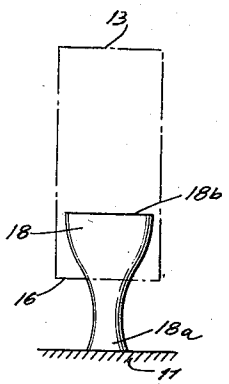


Fig. 6.



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VAPOR DIFFUSING DEVICE

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11 Claims. (Cl. 299—24)

This invention relates to vapor diffusing devices for introducing into air at regulated rates volatilizable air treating agents including in particular air treating agents in gel form of the type disclosed and claimed in United States Patent No. 2,691,615. More particularly the invention relates to vapor diffusing devices of the class described comprising telescopically arranged parts in which one lower part is provided with adjustable vapor openings and the other part is of solid walled construction adapted to bear against the bottom of said lower part in providing an essentially sealed chamber for volatilizable air treating material.

In dispensers or diffusing devices for volatilizable air treating materials, particularly of the solid or solidified type, numerous problems are encountered in providing structures which permit substantial control or variation of the rate of volatilization while at the same time preventing loss of air treating agent during periods of non-use. Efforts to achieve desired performance of such devices have generally resulted in devices which leave much to be desired from the standpoint of simplicity, cost of production, ease in operation and/or outward appearance.

The new vapor diffusing device in accordance with the present invention is characterized by a structural simplicity which makes it easy and inexpensive to produce, substantially fool-proof in operation and at the same time attractive in appearance and appropriate for use in many different environments.

Novel features of my invention will readily be understood from a consideration of the following description taken together with the accompanying drawing in which the several views show details of a preferred embodiment of my invention, with the parts thereof identified by suitable reference characters in each of the views and in which:

Fig. 1 is a perspective view of my vapor diffusing device showing the parts thereof in a partially extended position;

Fig. 2 is a partial section substantially on the line 2—2 of Fig. 1 with the parts indicated in contracted or closed position;

Fig. 3 is a partial sectional view substantially on the line 3—3 of Fig. 2; and

Figs. 4, 5 and 6 are corresponding schematic views diagrammatically indicating the behavior or performance of a gel type air treating agent in the use and operation of the device.

As shown in Figs. 1 to 3 of the drawing, my vapor diffusing device comprises a base part 10 having a bottom wall 11 and a plurality of circumferentially spaced upwardly extending resilient fingers 12 for tensionally engaging and supporting an essentially cylindrical closure part 13. The closure part 13 is provided with an upper closed end 14 which is preferably of slight inwardly domed contour so that the peripheral edge 15 can provide means for supporting the closure part in inverted

position on a horizontal surface when the same is detached from the base 10 for purposes of cleaning and filling the device.

The lower edge 16 of the closure member 13 in its lowermost position as shown in Fig. 2 of the drawing provides a close bearing engagement with the bottom 11 of the base part 10 forming a substantially vapor-tight chamber 17 within the device. The chamber 17 can suitably receive any solid or solidified type of air treating material, but is particularly adapted to receive a cylindrical slug of air treating gel of the type disclosed in United States Patent No. 2,691,615 as has been indicated at 18 in Fig. 2 of the drawing (and partially consumed at 18 in Fig. 1 of the drawing). The slug of gel 18, when initially inserted, can substantially fill the chamber 17 resting on the bottom wall 11, extending substantially to the inner surface of the top wall 14 and having a minimum clearance with the inner cylindrical surfaces of the closure part 13 which will permit the easy insertion of the gel slug.

The resilient fingers 12 are provided with lower dart-shaped openings or apertures 19 extending to the bottom surface of the bottom wall 11 as will readily be apparent from a consideration of Figs. 1 and 2 of the drawing. The resilient fingers 12 are also separated one from the other by elongated slots 20 extending from the spaced upper ends of the fingers 12 to a point slightly above the upper surface of the bottom wall 11 as will readily be seen from a consideration of Fig. 1 of the drawing.

The inner upper surfaces of the fingers 12 are each provided with an inwardly extending rib 21 which as shown in Fig. 3 of the drawing conforms closely to the curved cross-sectional contour of the finger 12 to provide a substantially arcuate contact with the closure part 13. The ribs 21 engaging the closure part 13 circumferentially thereof and at a point substantially spaced from the bottom wall 11 of the base part provide a uniform, tensional support of the closure part 13 sufficient to maintain it in different positions of vertical adjustment while at the same time permitting its free vertical movement with slight application of pressure. It will also be noted that the upper ends 22 of the fingers 12 are provided with a slight outward flare which serves both to enhance the appearance of the device and to facilitate insertion of the closure part 13.

The dart-shaped contour of the openings or apertures 19 provide in conjunction with the slits 20 passages for the flow of air and emission of vapors when the closure member 13 is elevated from the bottom wall 11 and through which the user of the device can readily gauge the extent of opening and hence the rate of operation of the device. Furthermore, the tapered or dart-shaped openings 19 provide a maximum size of air and vapor passage in the initial upward movement of the closure part 13 so that useful rates of vapor diffusion can be achieved with a limited elevation of the closure part 13.

It will be noted that the structure and arrangement of parts in the base 10 facilitate the fashioning of the base 10 either from metal or plastics in a single molding operation. Exterior surfaces of the fingers 12, the bottom wall 11 and the contour of the dart-shaped cut-outs 19 would be fashioned from the female mold part, whereas the slits 20 and the internal surfaces of the fingers 12 and bottom wall 11 would be fashioned from the male mold or die part. After molding, the female die part is first removed and the molded article stripped from the male die part with the resilience in the fingers 12 facilitating disengagement of the inwardly extending ribs 21 from the die part. As previously mentioned, the device can be fashioned from plastics or from metal and if desired, pleasing simulated metal effects can be achieved by molding in plastic and then vacuum plating

to provide a metallic sheen and lustre to the surfaces thereof.

The closure member 13 can also be fashioned from various materials including metals and plastics, and for ornamental purposes, is suitably formed or finished in a manner to provide a color contrasting with the base part.

The diagrammatic showings in Figs. 4, 5 and 6 are intended to illustrate performance of the device with a slug of air treating gel of the type previously described. The closure part 13 has been indicated in dot-and-dash lines in elevated position with respect to the bottom wall 11 of the base part corresponding with an average type of opening which would be employed in use of the device. In Fig. 4 a gel slug 18 is shown in its initial cylindrical form as would be the case when a fresh gel slug is in the device. Fig. 5 indicates the shape and contour assumed by the gel slug as it has been partly consumed through evaporation. Note that the bottom portion 18*a* has circumferentially contracted and the upper surface 18*b* has dropped due to vertical contraction, but that above the lower edge 16 of the closure part 13 the gel slug 18 has retained substantially its initial cylindrical contour. In Fig. 6 it will be seen that the lower end 18*a* of the gel slug has undergone further circumferential contraction and the upper surface 18*b* has dropped further due to additional longitudinal contraction, but at the same time the portion of the gel slug 18 above the lower edge 16 of the closure part has maintained substantially the original cross-sectional contour. The behavior of a cylindrical gel slug above described is of distinct importance and advantage in the device since it means that as the gel undergoes circumferential and longitudinal contraction due to evaporation of volatilizable materials therefrom it is continually bringing into the area for evaporation essentially fresh gel surfaces, i. e. portions of the gel slug which still have substantially the original cross-sectional dimension. In thus providing for bringing of fresh gel surfaces into the evaporation zone adjacent and below the lower edge 16 of the closure part, the composition or quality of vapors emitted from the evaporating gel slug remain substantially constant until the useful life of the gel has been completely expended, a point which in the diagrammatic showing of Figs. 4, 5 and 6 would be reached when the upper surface 18*b* of the gel slug had dropped substantially to the level of the lower edge 16 of the closure part as indicated in these figures. This progressive advance of fresh gel surfaces toward the evaporation zone takes place automatically and necessarily in the normal use of my improved vapor diffusing device and makes possible a quality of performance heretofore unattainable with diffuser devices employing a single body of air treating gel.

Various changes and modifications in the vapor diffusing device as herein disclosed 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 my invention.

I claim:

1. A vapor diffusing device comprising essentially cylindrical and telescopically interfitting base and closure parts which are detachable one from the other, said base part having a bottom wall, and means extending upwardly from the outer periphery of said bottom wall providing adjacent said bottom wall a plurality of circumferentially spaced apertures and remote from said bottom wall a plurality of circumferentially spaced members in alignment with said apertures for resiliently engaging outer surfaces of said closure part, said closure part having imperforate top and side walls and the lower edge thereof in its lowermost position providing vapor sealing engagement with the bottom wall of said base part, and the lower edge of said closure part when elevated from said bottom wall providing means for regulating the size of vapor passages formed by said apertures.

2. A vapor diffusing device as described in claim 1 wherein the circumferentially spaced apertures adjacent the bottom wall of said base part are of essentially dart-shaped contour extending upwardly from said bottom wall.

3. A vapor diffusing device as defined in claim 1 wherein said circumferentially spaced apertures are arranged in separate, circumferentially spaced, upwardly extending fingers integral with said bottom wall and wherein said fingers provide the resilient engagement with said closure part.

4. A vapor diffusing device as defined in claim 3 wherein said fingers are separated one from the other by elongated slots terminating slightly above said bottom wall and providing additional vapor passages circumferentially of said base part.

5. A vapor diffusing device as defined in claim 3 wherein the upper ends of said fingers are provided with inwardly extending protuberances for engagement with said closure part.

6. A vapor diffusing device comprising a base part and an essentially cylindrical closure part detachably and telescopically interfitting therewith, said base part having a bottom wall and a plurality of circumferentially spaced resilient fingers extending upwardly from the outer periphery of said bottom wall and providing supporting engagement with outer surfaces of said closure part, each of said fingers having an essentially dart-shaped aperture therethrough extending upwardly from said bottom wall, the lower edge of said closure part in the lowermost position thereof providing vapor sealing engagement with the bottom wall of said base part, and said lower edge of the closure part when elevated from said bottom wall forming means for regulating the size of vapor passages formed by the apertures in said fingers.

7. A vapor diffusing device as defined in claim 6 wherein the resilient fingers of said base part are separated by elongated slots terminating adjacent said bottom wall providing additional circumferentially spaced apertures in said base part.

8. A vapor diffusing device as defined in claim 6 wherein said resilient fingers have outwardly flared ends facilitating insertion of said closure part.

9. A vapor diffusing device as defined in claim 6 wherein said resilient fingers have outwardly flared ends facilitating insertion of said closure part, and are further provided adjacent said ends, with inwardly extending beads in circumferential alignment for engagement with said closure part.

10. A vapor diffusing device as defined in claim 9 wherein said inwardly extending beads are of essentially arcuate contour substantially conformed to the cylindrical contour of said closure part.

11. A vapor diffusing device as defined in claim 6 wherein said dart-shaped apertures extend to the bottom of said bottom wall.

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