Sept. 18, 1956 G. W. MEEK 2,763,395

DIFFUSER DEVICES

Filed June 6, 1952

Fig. 1.

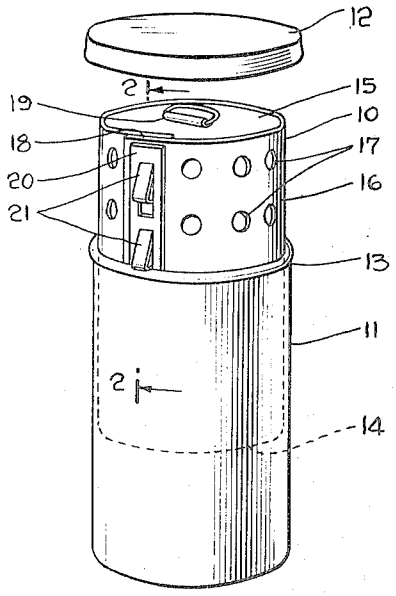


Fig. 2.

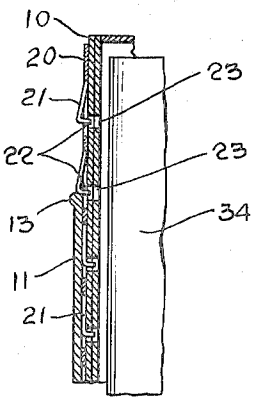


Fig. 3.

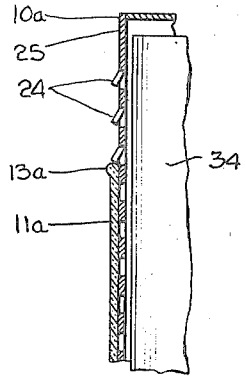


Fig. 4.

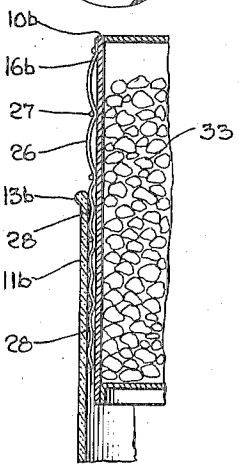
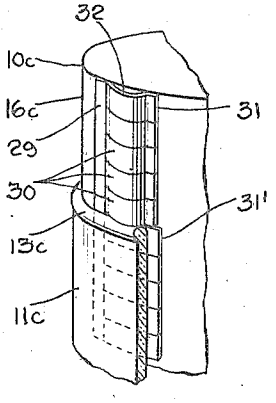


Fig. 5.



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DIFFUSER DEVICES

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8 Claims. (Cl. 220—8)

This invention relates to diffuser devices of the type utilized for introducing volatilizable material into air. More particularly, the invention relates to diffuser devices for use with volatilizable material in essentially solid or solidified form wherein the volatilizable material is contained within a diffuser unit telescopically arranged within a container or receptacle.

Still more particularly, the invention relates to an improved diffuser unit having resilient means thereon cooperating with the outer container or receptacle to selectively support the diffuser unit in different positions of vertical adjustment with respect to the receptacle in controlling the rate of diffusion therefrom.

The introduction of volatilizable material into air, as for example in the deodorizing and freshening of air, has, to a considerable extent, been carried out with wick bottles wherein a liquid volatilizable material is fed through a wick which in turn is exposed to the air. While the vertical adjustments of wicks in such bottles permits adjustment of the rate of volatilization, the wicks tend to become unsightly during use, and further the danger of spillage or leakage of the liquid volatilizable material presents a constant problem. The use of solid or solidified volatilizable materials is therefore of distinct advantage, but unfortunately, it has been difficult in the past to provide appropriate means for regulating the rate of volatilizable material from such solid or solidified materials.

I have now discovered a novel and practical means for regulating the rate of volatilization from solid or solidified materials. Regarded in certain of its broader aspects, my invention comprises the combination of a container part and a diffuser unit telescopically arrangeable within said container part, said diffuser unit having vapor penetrable means extending over vertical surfaces thereof, and resilient means co-extensive with at least one portion of said vertical surface and cooperating with said container for adjustably supporting said diffuser unit in different positions of telescopic arrangement with respect to said container.

The novel features of my invention will readily be understood from a consideration of the following specification and accompanying drawing in which various embodiments of the invention are disclosed, and in which the various parts are identified by suitable reference characters in each of the views, and in which:

Fig. 1 is a perspective view of a diffuser device in accordance with my invention showing the closure removed and the diffuser unit in the extended or operative position.

Fig. 2 is a partial section substantially along the line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing a modification.

Fig. 4 is another view similar to Fig. 2 showing a further modification; and

Fig. 5 is a partial perspective view of a diffuser device as shown in Fig. 1 indicating a still further modification.

In Fig. 1 of the drawing, I have shown a diffuser device

comprising a diffuser unit **10**, a container or receptacle part **11**, and a cover or closure member **12** adapted to close and seal the upper end **13** of the container part. As indicated in the drawing, the container part has a beaded upper edge **13** which may be frictionally engaged by the closure or cap **12** to provide a substantially vapor-tight seal. It is to be understood that any type of engagement between the cap and container may be provided and if desired, a supplemental sealing element may be employed overlying the joint between the cap and container part. The diffuser unit **10** is arranged for telescopic engagement with the container **11**, both the diffuser unit and container having essentially parallel side walls so that in different positions of vertical adjustment of the diffuser unit, the relative proximity of the walls of the diffuser unit and container remain substantially the same. While in the preferred form of the device, as shown in the drawings, both the diffuser unit and container are of essentially cylindrical form, it should be understood that any desired cross-sectional contour can be provided so long as the contour of the container corresponds closely with the contour of the diffuser unit.

The diffuser unit comprises a chamber for solid or solidified volatilizable material which is closed at the lower end **14** thereof as well as at the upper end **15** thereof and which has side walls **16** having vapor penetrable means arranged throughout the surface thereof. For purpose of illustration, the vapor penetrable means have been indicated in the drawing as holes or apertures **17** arranged at circumferentially and vertically spaced intervals. It is to be understood, however, that this showing of the holes or apertures is merely for purpose of illustration, and it is within the scope of my invention to employ as the wall **16** any material having sufficient porosity to permit free passage of the vapors therethrough. Thus, for example, the wall **16** may consist of a mesh or screen-like material having a large number of very small pores or openings therethrough. It will also be understood that the diffuser unit can be fashioned from various materials such, for example, as suitably treated paper or cardboard, suitably treated fabrics or even from plastic materials. As indicated in the drawing, the side wall **16** comprises a unitary sheet having ends overlapped and joined together at **18**. The side wall could, of course, be fashioned continuously by a spiral wrapping or the like, or when plastics are employed, the side wall **16** and bottom **14** could be molded as a single unitary body. The top wall **15** which is cemented or otherwise secured to the side wall **16**, after the diffuser unit **10** has been filled, is provided with a suitable pull or fingerpiece **19** facilitating withdrawal of the diffuser unit **10** from the container **11**. As shown in the drawings, the fingerpiece **19** is in a collapsed position which it may normally assume during shipment and when not in use.

The outer wall **16** of the diffuser unit is provided with an elongated strip **20** of resilient or spring-like material extending substantially throughout the entire height of the unit **10**, the strip **20** being provided with a plurality of vertically spaced cut-out spring fingers **21** which are flexed outwardly from the strip **20** and which have at the lower ends thereof inwardly depending flanges **22** adapted to form bearing surfaces for engaging the upper edge **13** of the container **11**. As indicated in the drawing, the spring fingers **21** will normally assume an extended position to bring the bearing surfaces **22** thereof in alignment with the upper edge **13** of the container. At the same time, the fingers **21** are readily flexed into substantial alignment with the strip **20**, when individual spring fingers **21** are arranged below the upper edge **13** of the container. The wall **16** or the overlapped edge portions **18** thereof, as shown in the drawing, is provided with a

series of spaced apertures **23** adapted to receive the inwardly extending ends **22** of the spring fingers **21**.

In the operation of the device, it will be noted that when the diffuser unit **10** is withdrawn from the container **11** by pulling on the fingerpiece **19**, the spring fingers **21** will, as they pass the upper edge **13** of the container, snap or flex outwardly into the operative position to provide a bearing or stop shoulder engaging the upper edge of the container. In this way the diffuser unit can be withdrawn or elevated to any desired position and retained in the elevated position by the lowermost of the spring fingers which are arranged above the upper edge **13** of the container. When it is desired to re-insert the diffuser unit into the container, it is merely necessary to depress the spring finger or fingers **21** which may be outwardly of the container and to slide the diffuser unit downwardly into the container.

While I have shown in the drawing a single strip **20** of resilient material having spring fingers **21** thereon, it will be understood that, if desired, a plurality of such members can be employed having spring fingers arranged in common alignment or, alternatively, having spring fingers arranged in a staggered relationship thereby providing for a greater number of positions of adjustment of the diffuser unit.

The strip **20** may be cemented, stapled, riveted or otherwise secured to the side wall **16** or the overlapped portions **18** thereof. On the other hand, when certain types of materials are employed in constructing the side walls **16**, it is possible to fashion the spring fingers by cut-outs in the wall itself. Thus, as indicated in Fig. 3 a plurality of spring fingers **24** are provided which are cut and flexed from the wall **25** of a diffuser unit **10***a* generally similar to the diffuser unit **10**, as shown in Figs. 1 and 2. The spring fingers **24**, as shown in Fig. 3 function in the same manner as the spring fingers **21**, the lowermost finger **24** externally of the container **11***a* acting as a stop member engaging the upper edge **13***a* thereof. It will be apparent, however, that the spring fingers **24** can be readily flexed to permit downward movement of the diffuser unit **10***a* in returning the diffuser unit to the storage or inactive position.

In Fig. 4 of the drawing is shown a further modification of my invention wherein a diffuser unit **10***b* is telescopically arranged in a container unit **11***b* generally corresponding to the diffuser unit and container shown in Figs. 1 and 2. The wall **16***b* of the diffuser unit is provided with a strip of resilient material **26** extending vertically throughout the height thereof and secured to the wall **16***b* by rivets, staples or other suitable means, as indicated at **27**, in a manner to provide a series of loops in the strip **26** protruding outwardly from the wall **16***b*. It will be noted that the loops in the strip **26**, when above the upper edge **13***b* of the container protrude somewhat beyond or outwardly of the inner wall of the container **11***b*. On the other hand, loops of the strip **26** which are arranged below the upper edge **13***b* are flexed inwardly to form a plurality of smaller loops as indicated at **28**. This resilient re-forming or reshaping of the loops in the strip **26** provides a firm frictional engagement between the diffuser unit **10***b* and the inner wall of the container **11***b* which is sufficient to support the diffuser unit in any desired position of vertical adjustment, while at the same time being insufficient to interfere with desired movement of the diffuser unit vertically in selectively adjusting the position thereof. In this construction, as in the constructions previously described the resilient supporting means may be said to assume an outwardly flexed position above the upper edge of the container and an inwardly flexed position below the upper edge of the container.

The further modification of the device, shown in Fig. 5, indicates a diffuser unit **10***c* arranged within a container **11***c*. The side wall **16***c* of the diffuser unit is provided with an elongated strip **29** of resilient material having a plurality of transversely arranged spring fingers **30** therein. It will be noted that the spring fingers **30** are integral with the strip **20** at one end thereof, but the opposed end of each finger is free to move transversely with respect to the strip **29**. Between the strip **29** and free ends **31** of the spring members **30**, it will be noted that the spring members are bowed outwardly as indicated at **32**, thus providing a stop shoulder for engaging the upper edge **13***c* of the container. When flexed inwardly the spring fingers assume substantially the curvature of the diffuser unit **10***c*, and the ends of the spring fingers assume positions indicated at **31'**. Thus, it will be apparent that as the diffuser unit is withdrawn from the container **11***c*, successive spring fingers **30** will flex into operative position and provide a support for the diffuser unit in any desired position of vertical adjustment. When it is desired to re-insert the diffuser unit in the container, it is merely necessary to depress the spring fingers, thereby allowing the diffuser unit to move downwardly into the container. Here again, it will be noted that the spring fingers above the upper edge **13***c* of the container are flexed outwardly, whereas below said upper edge, the spring fingers assume an inwardly flexed position.

In each of the devices shown in Figs. 3 to 5 of the drawing, it will be understood that the side walls are provided with suitable apertures as described in connection with Figs. 1 and 2 to permit the passage of vapors therethrough. For purpose of illustration, I have indicated in Fig. 5 the interior of the container unit **10***b* as filled with a particled or granular material **33** which may be, for example, pumice or some other absorbent material having a liquid air treating agent absorbed therein. In Figs. 2 and 3, on the other hand, I have indicated the diffuser unit as being filled with a solid or solidified body **34** which may be an air treating composition in gel form adapted to evaporate and volatilize as it is exposed to currents of air passing through apertured walls of the diffuser unit. It should be understood, however, that the particular type or composition of air treating material in solid or essentially solidified form employed within the diffuser unit does not constitute any part of the present invention. The diffuser device made in accordance with my invention as herein disclosed may be employed with any type of air treating composition which introduces air treating agents into the air by evaporation or volatilization.

The spring fingers or other resilient means arranged along a portion of the wall of the diffuser unit have been described primarily as providing for a bearing engagement with the upper edge of the container in supporting the diffuser unit in various positions of adjustment. It should be noted, however, by providing sufficient tension in the spring fingers or other resilient means, it is possible to engage inner surfaces of the container therewith in a manner to support the diffuser unit in different positions of vertical adjustment, even though there is no actual bearing engagement with the upper edge of the container. In other words, this resilient frictional engagement between the diffuser unit and container may be sufficient in itself to support the diffuser unit in extended position with respect to the container. Similarly this resilient frictional engagement can be utilized when the diffuser unit is suspended, as for example, by means of the finger piece or pull **19**, to support the container on the suspended diffuser unit. In this way, regulation of the rate of evaporation of volatile components within the diffuser unit can be effected by adjusting the telescopic arrangement of the container on the suspended diffuser unit.

Various changes and modifications in the diffuser device herein disclosed will occur to those skilled in the art, and to the extent that such changes and modifications fall within the purview of the appended claims it is to be understood that they constitute part of my invention.

I claim:

1. An adjustable supporting device for an elongated cylindrical container, said device comprising a strip

member co-extensive with a portion of the side wall of said container and extending longitudinally thereof, said strip member being fashioned from resilient material, longitudinally spaced portions of said strip member being normally flexed outwardly providing the supporting means of said device, and said spaced portions being resiliently and individually retractable from said protruding position by application of external pressure thereto when lowering said container.

2. A supporting device as defined in claim 1 wherein the longitudinally spaced portions of said member comprise longitudinally arranged spring fingers having inwardly extending bearing portions at the free ends thereof.

3. A supporting device as defined in claim 1 wherein the longitudinally spaced portions of said member comprise transversely arranged spring fingers having between fixed and movable ends thereof outwardly bowed portions forming transverse bearing edges.

4. A supporting device as defined in claim 1 wherein the longitudinally spaced portions comprise longitudinally disposed loops normally protruding outwardly a uniform distance, and each of said loops when flexed centrally thereof forming a plurality of smaller loops having a lesser outward protrudence.

5. A device for adjustably supporting telescoping containers in different positions of relative extension, said device comprising an elongated member fixedly secured to the inner of said telescoping parts and normally disposed between telescopically engaged surfaces of said parts, and said member having a plurality of longitudinally spaced portions normally assuming outwardly protruding positions and being resiliently and individually movable to positions of lesser outward protrudence by application of external pressure thereto when lowering said container.

6. A device as defined in claim 5 wherein said longitudinally spaced portions comprise longitudinally disposed spring fingers having inwardly extending bearing portions at the free ends thereof.

7. A device as defined in claim 5 wherein the longitudinally spaced portions of said member comprise transversely arranged spring fingers having between fixed and movable ends thereof outwardly bowed portions forming transverse bearing edges.

8. A device as defined in claim 5 wherein the longitudinally spaced portions comprise longitudinally disposed loops normally protruding outwardly a uniform distance, and each of said loops when flexed centrally thereof forming a plurality of smaller loops having a lesser outward protrudence.

References Cited in the file of this patent

UNITED STATES PATENTS

599,027	Thompson	Feb. 15, 1898
900,748	Leiser	Oct. 13, 1908
1,015,455	Neesham	Jan. 23, 1912
1,339,067	Marek	May 4, 1920
1,481,325	Gris	Jan. 22, 1924
1,680,539	Hadi	Aug. 14, 1928
1,707,841	Broadfoot	Apr. 2, 1929
2,229,475	Redmer	Jan. 21, 1941
2,459,247	Skold	Jan. 18, 1949
2,503,276	Kranitz	Apr. 11, 1950
2,540,758	Rinnman	Feb. 6, 1951
2,625,044	Christie	Jan. 13, 1953

FOREIGN PATENTS

572,751	France	June 12, 1924
292,205	Great Britain	June 5, 1928