

PATENT SPECIFICATION (11)

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(54) CONTAINER FOR AIR TREATING MATERIAL

(71) We, AIRWICK AG, a body corporate organised according to the laws of Switzerland, of Basle, Switzerland, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to dispensers for volatile materials.

Air treating materials provide effective means for gradual introduction into the air of volatile air treating components such as air freshening and insecticidal components. In the packaging of these volatile materials for commercial use, it is desirable to utilize dispensers which provide adequate retention of the material, which are attractive and simple in construction and which, most importantly, provide an effective mechanism for controlling and varying the rate of evaporation of the air treating material during use while preventing loss of material during periods of non-use. Typical approaches include raising or lowering of a cover to expose greater or lesser amounts of the material and increasing or decreasing the size of outlet apertures for the same purpose. Typical prior art dispensers are disclosed in U.S. Patent Specifications 2,657,090; 2,797,844; 2,878,060; 3,104,816; 3,239,145; and 3,804,331.

According to the present invention there is provided a dispenser for volatile materials comprising a base supporting a layer of volatile material, the base having a plurality of sidewall segments with apertures therebetween, and one or more supports positioned within the area defined by the sidewall segments for supporting the layer of volatile material in an elevated position intersecting the apertures as well as a cover for the base, wherein the sidewall segments comprise projections extending from the exterior surface of at least two opposed sidewall segments, the cover has at least one oblique groove on the inner face of a side wall thereof, and the projections engage in the groove so that rotation of the cover leads to corresponding raising and

lowering thereof to conceal or partially or substantially totally expose the apertures, and wherein at least one stop is present in the at least one oblique groove, the positive engagement of the stop and a corresponding projection securing the support of the cover in an elevated position.

Such a dispenser comprises an effective mechanism for controlling and varying the rate of emission of the air treating material, by varying the degree to which the apertures are exposed.

The cover can be readily adjusted vertically and can be readily supported in varying elevated positions relative to the base. The air treating material is secured in the container in such a position that control over the rate of vaporisation is facilitated, and the dispenser can be made to a simple design which avoids any tendency to suffer mechanical failure such as insufficient re-closing after opening.

The projections or pegs, which are preferably provided at the top of the sidewall segments, engage the grooves and facilitate the correspondence between the rotational and the upward and downward movement of the cover. Optionally, the grooves may be provided with a plurality of stops spaced along the length thereof such that when the projections contact the stops, the cover is elevated from the base by a predetermined distance corresponding to an exposure of a pre-determined area of the aperture. One or more supports are preferably provided on the inner surfaces of the sidewall segments for supporting or suspending the layer of air treating material. The layer is held in an elevated position which intersects the apertures, so that proper elevational positioning of the cover can expose either one or both surfaces of the layer. In this manner, maximum control of the rate of evaporation of the air treating material is achieved. Likewise, greater efficiency and flexibility of emission is achieved in contrast to many conventional air freshener dispensers wherein emission control is accomplished by a single method of either exposing a greater surface area

of the air treatment material or increasing the size of inlet and outlet apertures. Thus, control is achieved with the dispenser of the present invention by a dual approach inasmuch as raising the cover a minimum distance provides smaller openings for admitting convection air currents and enables these currents to flow only across the lower surface of the material so as to volatilize lesser amounts of said material. Correspondingly, raising the cover a greater distance allows for an increased air flow through larger openings which then flows across both surfaces of the horizontally suspended layer so as to release greater amounts of material. All sizes of enclosed areas as well as substantially all odor counteractant requirements can thus be properly handled.

Furthermore, the relationship between base and cover allows for ready rotation which is readily translated into efficient lowering and closing of the cover, relative to the base. The optional presence of the stops in the respective grooves allows for the establishment of pre-determined relationships regarding the amount of emission as well as for providing stability to the assembly by preventing undesired closing of the cover due to vibrational effects.

The present invention is illustrated, by way of example, with reference to the accompanying drawings, in which:—

Figure 1 is a view in perspective of one embodiment of a dispenser according to the present invention;

Figure 2 is an elevational view of the cover with part of the structure broken away and in section;

Figure 3 is a plan view of the dispenser containing a partial sectional view taken through line V-V of Figure 1;

Figure 4 is a partial sectional view depicting the contact between a sidewall projection and a stop in the groove;

Figure 5 is a top plan view of the base;

Figure 6 is a cross-sectional view of the base taken through line VI-VI of Figure 5;

Figure 7 is an elevational view of the dispenser in a first open operative configuration, and

Figure 8 is an elevational view of the dispenser in a second open operative configuration.

As shown in Figs. 1 and 3 of the drawing, the dispenser comprises a base 10 and a closure or cover 12. Both base 10 and cover 12 will generally comprise a unitary body of molded plastics material. While these parts are preferably made from polyethylene, polypropylene or polyvinyl chloride, it is to be understood that various types of plastics can be employed, and that

the parts can be formed from the same or different plastics materials.

As seen in Fig. 2, cover 12 is provided with a top wall 32 and a cylindrical side wall 34 terminating at its lower rim in an inwardly tapered wall section 36. When the dispenser is in closed position, wall section 36 engages an annular recess 24 in the sidewall 16 of base 10 to provide a complete seal between base 10 and cover 12. The inner surface of side wall 34 is provided with at least one, and preferably a plurality of oblique grooves 38. The number, length and angular relationship of grooves 38 may vary depending, in large part, on the dimensions of cover 12.

As seen in Figs. 5 and 6, base 10 is provided with a bottom wall 14, an upwardly projecting cylindrical side wall 16 having upper sidewall segments 18a, b, c, d, e, f, g, h defining apertures 20a, b, c, d, e, f, g, h therebetween. These apertures 20a-h constitute openings in the side wall of base 10 which, when cover 12 is elevated, permit circulation of air through the dispenser and emission of volatilizable material therefrom. Alternate sidewall segments 18a, c, e, g contain projections or pegs 22 on the top of the exterior surface thereof which, pegs extend into the groove or grooves 38. The number of pegs 22 may vary, although at least two are generally required for effective and stable rotational operation of cover 12. When the number of grooves 38 in cover 12 exceeds two, it is preferred to utilize one peg 22 for every groove present in cover 12. Sidewall 16 has a shoulder 17 which is provided with the above-mentioned annular recess 24 located therein in order to engage cover 12 in a sealed arrangement so as to eliminate undesired evaporation of the active air treating material when the dispenser is in closed position.

The inner surfaces of sidewall segments 18a-h are provided with support members 26a, b, c, d, e, f, g, h which serve to support a layer or disc 28 of air treating material. The number of support members 26a-h may also vary, although four or more will generally be utilized to provide sufficient stability to the air treating material layer 28. The height of support members 26a-h will be so established that layer 28 resting thereon will be at a level within the height of apertures 20a-h and be visible therethrough. It is also essential that layer 28 be positioned between the bottom and top boundaries of apertures 20a-h and not on a level with either. Optionally, as shown in Fig. 6, a post 30 may be centrally located on bottom wall 14 in order to provide additional support for layer 28. Post 30 may comprise a lower section, and an upper section 30a of reduced diameter such that a seat 31 is formed at the joint of said

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sections and at height equal to the height of support members 26a-h. Alternately, support members 26a-h may contain upwardly extending, tapered, support wedges (not shown) in order to secure layer 28 more firmly in position. Thus, where only support members 26a-h are present, layer 28 will require a diameter slightly larger than the distance between opposing sidewall segments, e.g. 18a, 18c, such that layer 28 will be wedged in position between opposing sidewall segments 18a-h. Post 30 is provided where, for example, additional support is required to eliminate buckling in the center of layer 28. Thus, layer 28 can be provided with a hole in the center thereof which enables layer 28 to be placed on post 30 and be supported by support members 26a-h and seat 31. Layer 28 may, thereafter, be fixed in place by providing the upper section of post 30 with a locking mechanism or, preferably, by heating said upper section to form a molten button which extends beyond the periphery of the hole of layer 28 and thereafter cooling said button. In this manner, layer 28 is fixedly supported between seat 31 and said button. Alternately, a layer 28 with a small diameter may be utilized when support wedges are present inasmuch as layer 28 will now be wedged against these members and firmly held in place. It should also be noted that support members 26a-h need not be affixed to the inner surfaces of segments 18a-h but may be free standing in the interior section defined by said segments 18a-h.

Thus, all of the above-mentioned variables should be selected keeping in mind the desirability of fully exposing apertures 20a-h without the need for a substantial number of complete rotations and the necessity for having a slope for the grooves 38 which facilitates retention of a desired opening of apertures 20a-h without encouraging slippage. Generally, four equally-spaced grooves 38 of identical configuration will provide the appropriate dimensions and angles so as to facilitate an efficient rotational relationship between cover 12 and base 10. Where a single groove 38 is contemplated, it will be necessary sequentially to stagger the height of projections 22 in order to convert the rotational movement of cover 12 relative to base 10 into a vertical movement.

Although projections or pegs 22 operating in grooves 38 will generally maintain cover 12 in a stationary position so as to achieve a fixed opening of apertures 20a-h, vibration or other such movement may alter the relationship. Accordingly, at least one stop 40, and preferably a plurality of stops 40, may be spaced along grooves 38 for the dual purposes of preventing slippage as well

as of providing indicia for establishing predetermined aperture openings. Thus, stops 40 may be spaced so that when pegs 22 encounter a first stop closest to the upper end of groove 38, an opening of established area will be achieved. The size of the opening will increase a pre-determined amount until the next stop 40 is encountered by a peg 22. Accordingly, each stop 40 can be equated to a specific area of exposed aperture 20. Correspondingly, stops 40 will limit the amount of slippage of cover 12 toward closing position, thereby minimizing the amount of undesired change in the size of the aperture opening. Stops 40 may comprise raised areas or nubs, as seen in Fig. 4, or may comprise indentations on the surface of grooves 38. It should be noted that stops 40 need not be present in all grooves 38 but should appear in at least two opposing grooves 38 for proper detent action.

The dispenser of this invention may include other optional features. For example, Fig. 6 illustrates the presence of tapered surfaces 22a on pegs 22. These tapered surfaces together with the resilience of sidewall segments 18a-h, enable cover 12 to be receivingly engaged by base 10 merely by exerting pressure thereon. Thus, wall section 36 contacts the tapered surfaces 22a and the exerted pressure results in the inward movement of segments 18a-h enabling pegs 22 to enter grooves 38 for an engaging relationship between base 10 and cover 12. Such an approach is independent of the relative positioning of base 10 and cover 12 at the moment of compression. It also eliminates the need for entry openings on wall segment 36 and the possibility of the inadvertent separation of base 10 and cover 12. A further option is to have a rod centrally located on the inside of top wall 32 of cover 12 to serve as a retaining member for air treating layer 28 when the dispenser is in a closed configuration. Thus, the dispenser may be moved, inverted, rotated, and the like, without dislocation of layer 28. This rod need not be present, however, when layer 28 is affixed to post 30. In addition, base 10 may be provided with means for attaching the dispenser to a wall, or automobile dashboard, said means including hooks, an opening on the bottom surface thereof, or a two-sided adhesive tape.

Still a further optional feature is depicted in Fig. 2. As noted, a plurality of retaining members 42 are positioned on the periphery of the inside of top wall 32 of cover 12 and spaced from side wall 34 by a distance approximating the thickness of sidewall segments 18a-h. Thus, when the dispenser is in a closed position, sidewall segments 18a-h are positioned between retaining members 42 and side wall 34 and held tightly in place. Accordingly, the possi-

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lity of slippage of cover 12 even slightly to expose apertures 20a-h and thereby occasion a loss of volatile material is substantially eliminated. In addition, retaining members 42 serve as guides for segments 18a-h, thereby preventing distortion of said segments 18a-h when the dispenser is in a closed position and preventing the displacement of projections 22 from grooves 38 when excess rotational pressure is exerted on cover 12.

Air treating layer 28 will generally comprise a substrate impregnated and/or coated on both surfaces with a conventional air treating material. The substrate may be paper, or cardboard or a sponge-type material. It may be impregnated or coated with liquid material such as essential oils, or coated with a layer of polymeric beads containing entrapped fragrance as disclosed in German patent application No. 26 08 533 published on September 30, 1976. Likewise layer 28 may be a self-supporting polymeric layer with entrapped air treating material.

More especially, the operation of the dispenser of this invention involves the separation of base 10 and cover 12 to permit positioning of circular air treating layer 28 on support members 26a-h. Cover 12 is then placed on the tapered surfaces 22a of projections 22 and pressed downward in order to cause pegs 22 to snap into grooves 38. The closed position is attained by rotating cover 12 until pegs 22 encounter the upper end of grooves 38. In this closed position, wall section 36 is seated in recess 24 to prevent evaporation of the air treating material. The rotation to raise cover 12 may be clockwise or counter-clockwise depending on the slope of grooves 38. In the embodiment shown in the accompanying drawing, counter-clockwise rotation of cover 12 is taken to result in a corresponding vertical movement of cover 12. Rotation is continued until pegs 22 engage stops 40. Cover 12 is thus raised a pre-determined distance to expose a pre-determined area of apertures 20a-h as seen in Fig. 7. This small opening attained in the position shown in Fig. 7 allows for air current to pass solely across the lower surface of the air treating layer 28, providing a limited amount of air treating material for small enclosed areas and/or for minimum air treating requirements. The exertion of rotational pressure on cover 12 combined with the resiliency of wall segments 18a-h allows pegs 22 to clear the first stop and continue until encountering a second stop. As seen in Fig. 8, cover 12 is now raised a greater distance so as to expose a larger area of apertures 20a-h. In this instance, layer 28 is visible through apertures 20a-h and is thus exposed to air currents passing across both surfaces of said layer 28 and

effecting an increased release of air treating material. While pegs 22 will generally retain cover 12 in this particular position of vertical adjustment, excessive vibration may cause downward rotational movement of cover 12. However, such movement will be limited by the distance traversed by projections 22 in re-encountering the first stop (see Fig. 6). Thus, only a minimal change in air-treating material release will be experienced. It will be apparent that, in this manner, grooves 38 permit adjustment of cover 12 through a range from a very slight opening (Fig. 7) to a substantially complete opening (Fig. 8), thus giving a wide range of control and providing a dispenser which can be adapted to many changing conditions. Finally, clockwise rotation of cover 12 until projections 22 encounter the upper end of grooves 38 will again seal the dispenser.

It will be recognized that cover 12 and base 10 can be opened and raised, or lowered and sealed, many times before the air-treating material is consumed; evaporation progressing only when the dispenser is open and being arrested when the dispenser is closed. The other advantages obtained with the dispenser of the invention include maximum control and variability of the release rate of the air treating material; dual emission mechanisms, i.e. both by increasing in size the inlet and outlet for the air currents and by exposing an additional surface of air treating material to said currents; and an attractive and simple construction.

Moreover, the dispenser will withstand rough handling, and there is no danger of the cover and base becoming wedged or bound together in a manner that will prevent closing and/or easy opening of the device.

WHAT WE CLAIM IS:—

1. A dispenser for volatile materials comprising a base supporting a layer of volatile material, the base having a plurality of sidewall segments with apertures therebetween, and one or more supports positioned within the area defined by the sidewall segments for supporting the layer of volatile material in an elevated position intersecting the apertures as well as a cover for the base, wherein the sidewall segments comprise projections extending from the exterior surface of at least two opposed sidewall segments; the cover has at least one oblique groove on the inner face of a side wall thereof, and the projections engage in the groove so that rotation of the cover leads to corresponding raising and lowering thereof to conceal or partially or substantially totally expose the apertures, and wherein at least one stop is present in the at least one oblique groove, the posi-

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lity of slippage of cover 12 even slightly to expose apertures 20a-h and thereby occasion a loss of volatile material is substantially eliminated. In addition, retaining members 42 serve as guides for segments 18a-h, thereby preventing distortion of said segments 18a-h when the dispenser is in a closed position and preventing the displacement of projections 22 from grooves 38 when excess rotational pressure is exerted on cover 12.

Air treating layer 28 will generally comprise a substrate impregnated and/or coated on both surfaces with a conventional air treating material. The substrate may be paper, or cardboard or a sponge-type material. It may be impregnated or coated with liquid material such as essential oils, or coated with a layer of polymeric beads containing entrapped fragrance as disclosed in German patent application No. 26 08 533 published on September 30, 1976. Likewise layer 28 may be a self-supporting polymeric layer with entrapped air treating material.

More especially, the operation of the dispenser of this invention involves the separation of base 10 and cover 12 to permit positioning of circular air treating layer 28 on support members 26a-h. Cover 12 is then placed on the tapered surfaces 22a of projections 22 and pressed downward in order to cause pegs 22 to snap into grooves 38. The closed position is attained by rotating cover 12 until pegs 22 encounter the upper end of grooves 38. In this closed position, wall section 36 is seated in recess 24 to prevent evaporation of the air treating material. The rotation to raise cover 12 may be clockwise or counter-clockwise depending on the slope of grooves 38. In the embodiment shown in the accompanying drawing, counter-clockwise rotation of cover 12 is taken to result in a corresponding vertical movement of cover 12. Rotation is continued until pegs 22 engage stops 40. Cover 12 is thus raised a pre-determined distance to expose a pre-determined area of apertures 20a-h as seen in Fig. 7. This small opening attained in the position shown in Fig. 7 allows for air current to pass solely across the lower surface of the air treating layer 28, providing a limited amount of air treating material for small enclosed areas and/or for minimum air treating requirements. The exertion of rotational pressure on cover 12 combined with the resiliency of wall segments 18a-h allows pegs 22 to clear the first stop and continue until encountering a second stop. As seen in Fig. 8, cover 12 is now raised a greater distance so as to expose a larger area of apertures 20a-h. In this instance, layer 28 is visible through apertures 20a-h and is thus exposed to air currents passing across both surfaces of said layer 28 and

effecting an increased release of air treating material. While pegs 22 will generally retain cover 12 in this particular position of vertical adjustment, excessive vibration may cause downward rotational movement of cover 12. However, such movement will be limited by the distance traversed by projections 22 in re-encountering the first stop (see Fig. 6). Thus, only a minimal change in air-treating material release will be experienced. It will be apparent that, in this manner, grooves 38 permit adjustment of cover 12 through a range from a very slight opening (Fig. 7) to a substantially complete opening (Fig. 8), thus giving a wide range of control and providing a dispenser which can be adapted to many changing conditions. Finally, clockwise rotation of cover 12 until projections 22 encounter the upper end of grooves 38 will again seal the dispenser.

It will be recognized that cover 12 and base 10 can be opened and raised, or lowered and sealed, many times before the air-treating material is consumed; evaporation progressing only when the dispenser is open and being arrested when the dispenser is closed. The other advantages obtained with the dispenser of the invention include maximum control and variability of the release rate of the air treating material; dual emission mechanisms, i.e. both by increasing in size the inlet and outlet for the air currents and by exposing an additional surface of air treating material to said currents; and an attractive and simple construction.

Moreover, the dispenser will withstand rough handling, and there is no danger of the cover and base becoming wedged or bound together in a manner that will prevent closing and/or easy opening of the device.

WHAT WE CLAIM IS:—

1. A dispenser for volatile materials comprising a base supporting a layer of volatile material, the base having a plurality of sidewall segments with apertures therebetween, and one or more supports positioned within the area defined by the sidewall segments for supporting the layer of volatile material in an elevated position intersecting the apertures as well as a cover for the base, wherein the sidewall segments comprise projections extending from the exterior surface of at least two opposed sidewall segments, the cover has at least one oblique groove on the inner face of a side wall thereof, and the projections engage in the groove so that rotation of the cover leads to corresponding raising and lowering thereof to conceal or partially or substantially totally expose the apertures, and wherein at least one stop is present in the at least one oblique groove, the posi-



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tive engagement of the stop and a corresponding projection securing the support of the cover in an elevated position.

2. A dispenser according to claim 1 wherein the cover has at least two opposed oblique grooves and each of the opposed oblique grooves has at least one first stop position, respectively, at the same distance from the upper end of the groove such that when the projections contact the at least one first stop, the elevation of the cover is no greater than the elevation of the lower surface of the layer, and at least one second stop positioned at the same distance from the upper end of each groove and at a distance from the upper end of its groove greater than that of the first stop therein such that when the projections contact the second stops, the elevation of the cover is at least equal to the elevation of the upper surface of the layer.

3. A dispenser according to claim 2 wherein at least one equivalent first stop in each groove is positioned such that when the first stops are contacted by the projections, the cover is raised to a maximum height corresponding to the elevation of the lower surface of the layer, and at least one equivalent second stop in each groove positioned such that when the second stops are contacted by the projections, the cover will be raised to a height corresponding to at least the elevation of the upper surface of the layer.

4. A dispenser according to any one of claims 1 to 3 wherein the base has an annular recess on the periphery thereof for sealingly receiving the sidewall of the cover

when the cover is in a closed position on the base, and wherein the side wall of the cover terminates in an inwardly tapered wall section which sealingly engages the annular recess.

5. A dispenser according to any one of claims 1 to 4 wherein the sidewall segments are resilient and the projections are tapered inwardly upwards to facilitate initial engagement of the base and the cover.

6. A dispenser according to any one of claims 1 to 5 and including a post centrally positioned on the inside of the base to seat and retain the layer.

7. A dispenser according to any of claims 1 to 6 wherein the base has eight resilient sidewall segments with apertures therebetween and upwardly tapered projections extending from the exterior surface of each alternate sidewall segment.

8. A dispenser according to any one of claims 1 to 7 wherein the layer of volatile material comprises a solid substrate impregnated or coated on both surfaces thereof with a volatile ingredient.

9. A dispenser according to claim 8, wherein the solid substrate is a self-supporting disc or plate.

10. A dispenser according to claim 1 and substantially as hereinbefore described with reference to the accompanying drawings.

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