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(56) Documents Cited

GB 2298841 A

US 6039266 A

US 5060858 A

WO 2000/024434 A1

US 5419879 A

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UK CL (Edition S) A5G GV

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(54) Abstract Title

Air freshener device

(57) An air freshener device comprising a container 10 having a bottom wall 12 and a peripheral wall 14. The container houses a fragrance releasing composition exposed to the atmosphere at the open end. The composition may be a free-standing, self-supporting gel composition. The composition may comprise a fragrance component in which a wax or a polymer is dissolved to form a gel. The polymer may be a polyamide, or a styrene based polymer and may include a mineral oil component. The gels of these compositions avoid syneresis (cracking and crazing over time), permit a high loading of fragrance component and shrink only in the direction perpendicular to the exposed surface.

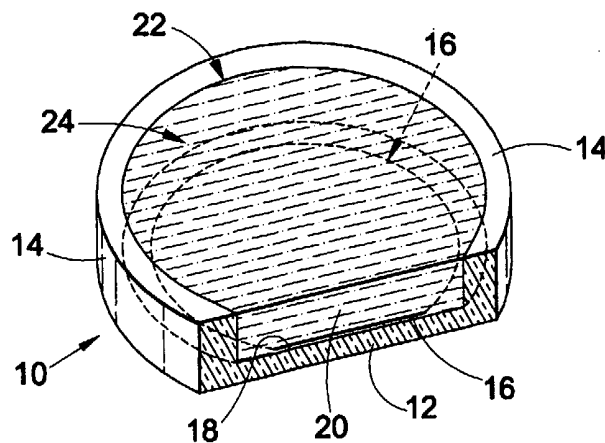


Fig.6

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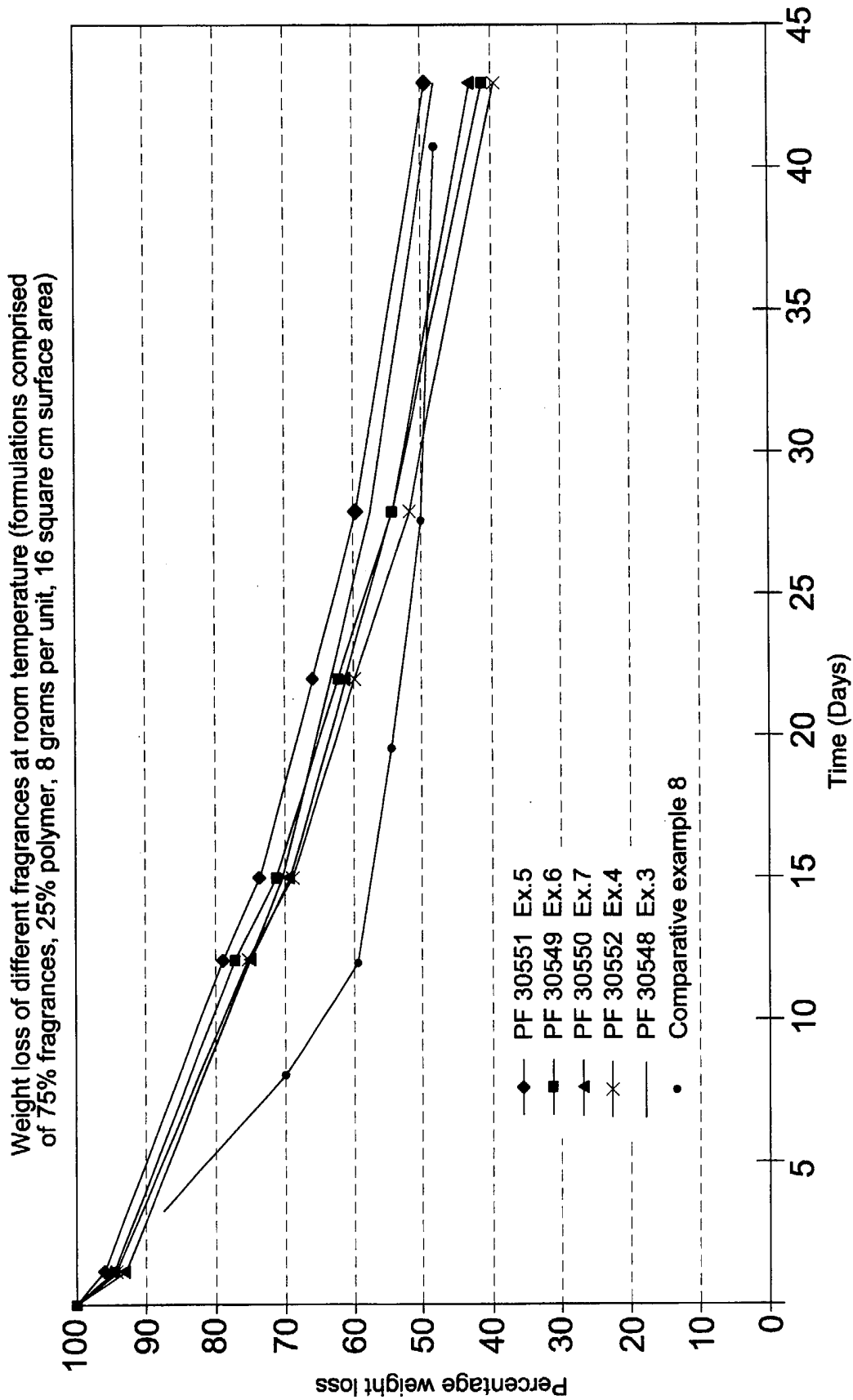


Fig.1

Maximum 75% weight loss corresponds to 6 grams of fragrance

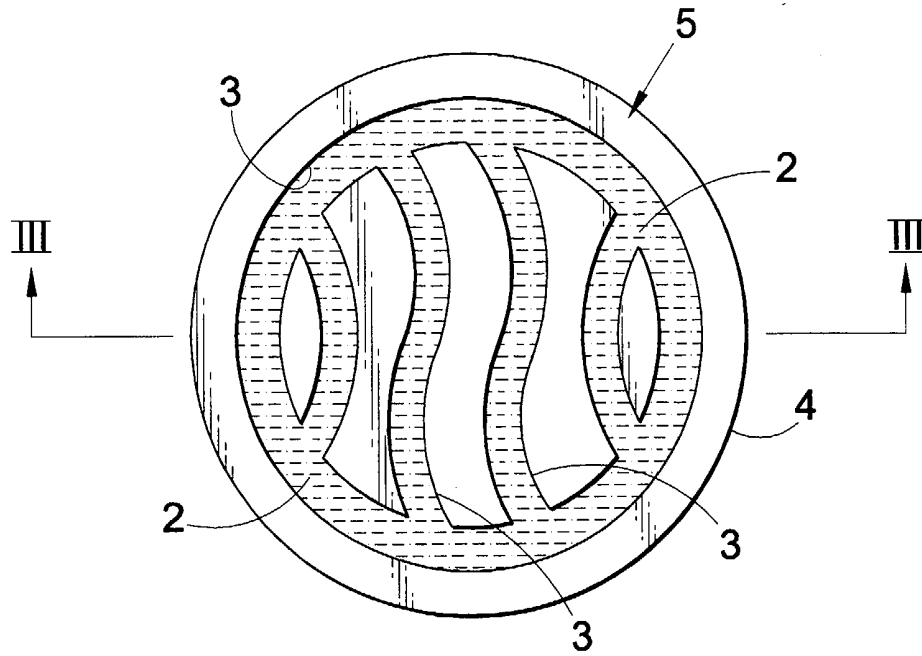


Fig.2

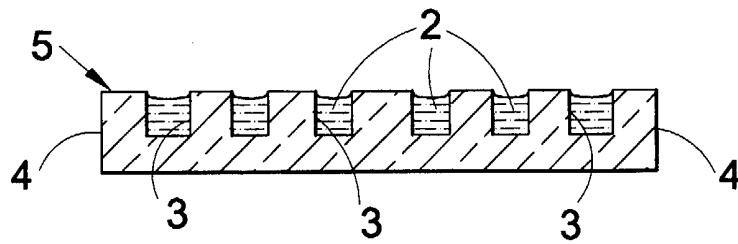


Fig.3

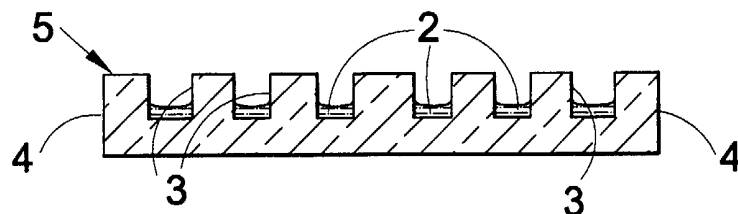


Fig.4

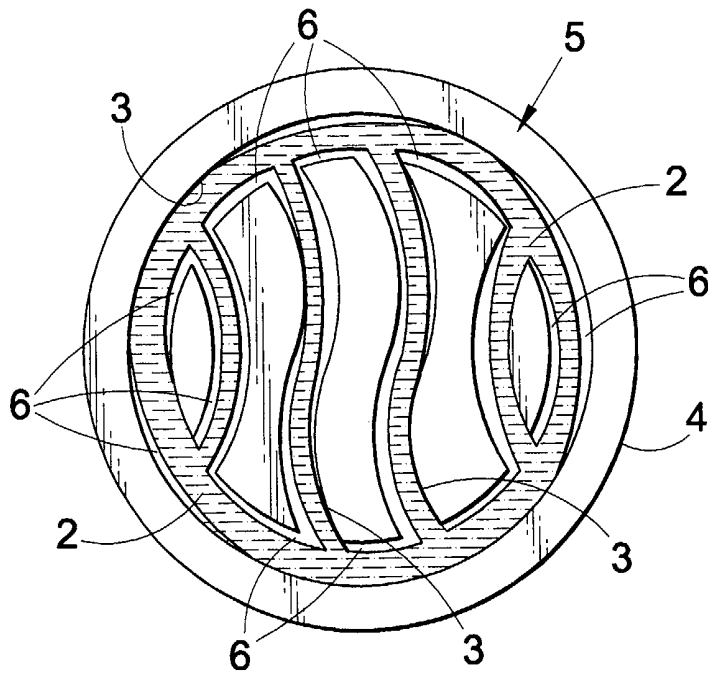


Fig.5

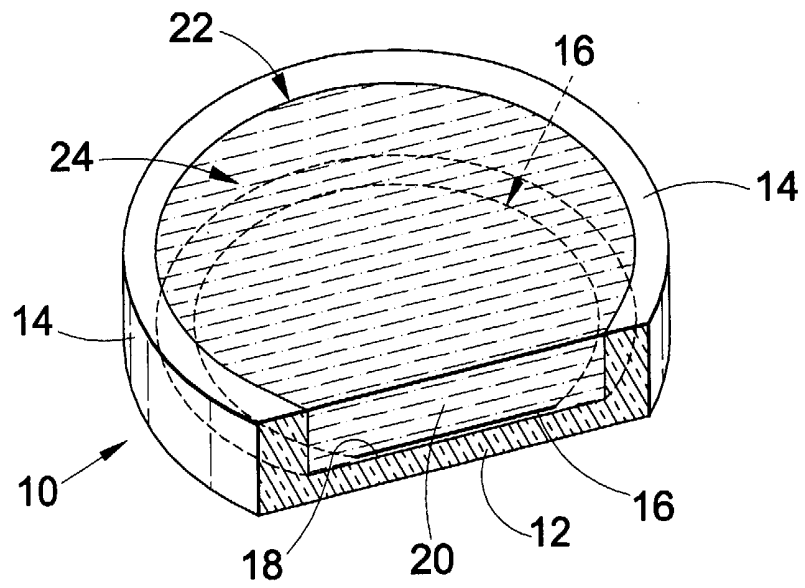


Fig.6

Air Fresheners

The present invention relates to an air freshener and in particular to substantially solid compositions for releasing fragrance or perfume into the ambient atmosphere over a prolonged period of time.

Water based gels of carrageenans have been used to carry a fragrance which is slowly released into the atmosphere. A drawback of these systems is that they carry a relatively low amount of the fragrance, typically 5% by weight, and the product will craze or crack over time as the fragrance is released and the remaining material shrinks. Water based gels can also suffer from syneresis.

US 5 780 527 describes a system in which a polymer is cross-linked in the presence of a fragrance to form a three dimensional network which contains the fragrance. These systems can contain 70 to 90% by weight of the fragrance. The preferred polymers are polyolefins, particularly maleinised polybutadiene and maleinised polyisoprene cross-linked with an ethoxylated molecule. Such products are typically quite brittle and will shrink towards a central point. This, again, provides an unsightly appearance as the gel shrinks away from the sides of the container.

WO 00/24434 describes a system in which the fragrance releasing composition is carried in a narrow recess, apparently in order to provide a more even release rate over the effective life of the product. WO 00/24434 mentions the polyolefin systems referred to above, but also mentions alginates, carrageenans, and a variety of other polymers including polyamides, as the carrier matrix.

The prior art gel compositions are typically housed in a container with a restricted view. In part this is because the compositions crack or craze as the fragrance evaporates, becoming unsightly. WO 00/24434 describes a product in which the composition is held in a series of channels formed in the surface of a glass block. This is attractive, but the use of channels reduces the surface area available to evaporation, and the product shrinks away from the channel walls during use, marring the appearance of the product.

The present invention provides an air freshener comprising a container which is open at one end, a fragrance containing composition contained in the container and having a surface exposed to the atmosphere at the one end, wherein the exposed surface of the composition is substantially uninterrupted.

By providing an uninterrupted exposed surface, a greater surface area of the composition is open to atmosphere for a given container size, enabling a greater rate of evaporation of the solvent.

Very preferably the composition will shrink away from the exposed surface only as the fragrance evaporates, and will stay in contact with side walls of the container.

A suitable composition can be prepared by dissolving a wax or a polymer in a liquid fragrance, to form a gel.

Preferably, the composition is substantially self-supporting.

We have found that by appropriate selection of the fragrance and the wax or polymer, it is possible to achieve a composition having a high fragrance content, 75% by weight or more. Such a high fragrance containing composition has improved performance characteristics such as giving a greater impact in use or maintaining a more even release of

fragrance over the product lifetime. More particularly, the composition shrinks one dimensionally as the fragrance evaporates, i.e. the product only shrinks away from the exposed surface.

If the dissolved wax or polymer content is too high, the available fragrance is reduced, and also the product is likely to be harder or more brittle and so may have less desirable shrinkage characteristics as the fragrance evaporates. The polymer fragrance ratio can be optimised by trial and error to meet the desired performance characteristics.

The composition preferably comprises more than about 50% by weight of fragrance component, more preferably more than about 70% by weight of fragrance component.

Very preferably the composition has from about 70% to about 90% by weight of fragrance component, more preferably from about 75% to about 85% by weight.

The fragrance component is a derivative of a liquid hydrocarbon. It may be a discrete chemical but more typically will be a complex mixture of volatile liquid ingredients of natural or synthetic origin. The fragrance component may be presented in an oily carrier liquid, typically 50% fragrance and 50% carrier. We prefer a fragrance having a high fragrance content, i.e. a little or no oily carrier, as this maximises the fragrance available for evaporation in use.

The wax or polymer should be matched to the fragrance component to achieve the desired degree of solubility in the fragrance component. If there is a mismatch, the wax or polymer may form a cloudy solution or gel: although this is not necessarily undesirable a clear product is usually preferred. More importantly, a higher wax or polymer content, and hence a

reduced fragrance content, may be required to achieve a sufficiently self supporting product.

Fragrance components with low polarity molecules are generally preferred. The fragrance should also have a relatively well defined working vapour pressure to provide the necessary evaporation rate at ambient temperatures.

Functional groups on the polymer structure will also affect the solubility of the polymer in the fragrance component.

Very preferably the, or the main, polymer component is a polyamide polymer. A particularly preferred polyamide is supplied as UNICLEAR 80V from Arizona Chemical Co., USA, which is solid at room temperature.

Another preferred polymer is a styrene based polymer.

A wax, a high molecular weight hydrocarbon, may also be used to form the gel.

The composition may include a variety of additives as commonly used in the art, including inert additives such as flowers or beads for aesthetic appearance, soluble additives such as colourants, or dispersed additives such as pearlescent particles.

A composition in accordance with the invention may be prepared by warming the polymer and the fragrance component with gentle mixing. At an elevated temperature, typically about 65°C, the polymer dissolves or disperses in the fragrance component. The warm solution is poured into containers or moulds. On cooling a single phase anhydrous gel may be formed. Depending on the vapour pressure characteristics of the fragrance, the mixing temperature should be kept as low as possible to avoid driving off too much of the fragrance components.

Preferably the composition is substantially transparent. A label or the like may be provided on the container and visible through the air freshener composition.

The invention will be further described by way of example. All amounts are % by weight of the total composition.

EXAMPLE 1.

A lemon fragrance product was produced by warming UNICLEAR 80V (20% by weight), Solvent Yellow 93 colorant (0.01%) (Clariant Sandoplast Yellow 3G) and Orange Turpene fragrance (balance %) to 65°C and mixing gently until a clear liquid was formed. The liquid was then poured into glass moulds and allowed to cool.

The cooled product had the following characteristics:

1. Shrinkage, due to fragrance evaporation, was one dimensional, i.e. the moulded product when exposed on one surface only became thinner with evaporation.
2. There was extended, slow release of fragrance.
3. Transparency was maintained through the effective life of the product - the polymer did not precipitate out.
4. The composition adhered well to the sides of the mould, even when inverted.

EXAMPLE 2

The following composition was prepared as in Example 1.

| | % W/W |
|---------------------|---------|
| UNICLEAR 80 | 50 |
| * Solvent Red 27 | 0.01 |
| * Solvent Blue 35 | 0.01 |
| French Lavender Oil | Balance |

* Clariant Fat-Red 5B02 and Clariant Fat Blue B01.

The cooled product had properties similar to those described in Example 1.

EXAMPLES 3 TO 7

The following compositions were prepared as for Example 1. The percentage loss (evaporation) of the fragrance was then measured

| Component/Ex | 3 | 4 | 5 | 6 | 7 |
|-------------------|-----|-----|-----|-----|-----|
| UNICLEAR 80V | 25 | 25 | 25 | 25 | 25 |
| Fragrance PF30551 | | | 75 | | |
| “ PF30549 | | | | 75 | |
| “ PF30550 | | | | | 75 |
| “ PF30552 | | 75 | | | |
| “ PF30548 | 75 | | | | |
| Dye | q.s | q.s | q.s | q.s | q.s |

All fragrances were supplied by Phoenix Fragrance.

UNICLEAR 80V was supplied by Arizona Chemical Co, USA and is a blend of 80% Polyamide, 20% Mineral Oil.

It is thought that the blending of the polyamide with the mineral oil, in UNICLEAR 80V, may help to promote dissolution of the polymer in the fragrance. The polymer is a hard waxy polymer melting at 90°C, but it will 'melt' at about 65°C in the presence of the fragrance.

8 gm of the warm polymer/fragrance mix was poured into a glass mould having an exposed upper surface of 16cm², giving a depth of about 5mm. The weight loss equates to the amount of volatile fragrance components which evaporate. This was measured over time, and is presented in Figure 1.

It can be seen that after an initial period of one or two days, the rate of evaporation of fragrance is substantially linear for an extended period of time. This provides for a product having substantially even performance for an extended period, four weeks or more.

Comparative Example 8

By way of comparison a similar test was performed on a commercial product, HAZE ^(R.T.M) CRYSTAL AIR EXOTIC FRUITS manufactured by Reckitt Benckiser which is believed to be made in accordance with WO

00/24434. This shows a steeper initial fragrance loss, but then a much lower rate of fragrance evaporation after about 10 days.

EXAMPLE 9

Perfume PF30551, 65% by weight, was mixed with KRATON^(R7M) 1652 (ex Shell Chemicals) 65% by weight and heated to 100°C. The KRATON^(R7M) polymer dissolved in the perfume and the mix was then poured into a shallow mould and allowed to cool to a gel. The gel was not as solid as Examples 1 to 7, but good fragrance release characteristics were obtained.

It will be appreciated that a fragrance with a flash point above the mixing temperature should be chosen.

KRATON^(R7M) is a styrenic block co-polymer. Such polymers are produced by polymerising styrene and then sequentially reacting with butadiene or isoprene to produce linear A-B-A, radial (A-B)_n or di-block (A-B) polymers as required.

EXAMPLES 10 to 15

Waxes were also dissolved in a fragrance composition to produce a solid gel composition. An opaque product is formed with a hard gel. Some are subject to cracking as the perfume evaporates but good performance with prolonged perfume release over several weeks is obtained.

| Ex. | Wax | % Wax | % Perfume ⁷ | Observations |
|-----|--------------------------------------|-------|------------------------|---------------------------------|
| 10 | Hydrogenated Castor Oil ¹ | 50 | 50 | Brittle and cracks on shrinkage |
| 11 | Polyglyceryl-3 Beeswax ² | 28 | 72 | Brittle and cracks on shrinkage |
| 12 | Beeswax ³ | 43 | 57 | No cracking |
| 13 | Microcrystalline Wax ⁴ | 18.5 | 81.5 | No cracking |
| 14 | Paraffin Wax ⁵ | 35 | 65 | No cracking |
| 15 | Carnauba Wax ⁶ | 46.4 | 53.4 | No cracking |

1. Liowax PM80 from Miracema-Nuodex
2. Cera Bellina from Jan Dekker
3. White Beeswax BP from Poth Hille
4. Microcrystalline Wax 3749 from Poth Hille
5. Paraffin Wax 125/130 from Astor Stag
6. Carnauba Wax from Stanley Black
7. Orange Turpenes

Figure 2 shows a plan view of an air freshener product containing a preferred composition for use in the invention;

Figure 3 is a cross-section on line III-III of Figure 2;

Figure 4 is similar to Figure 3, but showing the product part used;

Figure 5 shows a plan view of a prior art product.

Figure 6 shows a perspective view of an embodiment of the invention.

Figure 2 shows a plan view of an air freshener comprising a composition 2 prepared in accordance with Example 3 above, and contained in a glass mould 4. The composition 2 fills channels 3 provided in a major surface 5 of the mould 4. As seen in Figure 3, the channels 3 are initially filled with the composition 2. The cross-section of Figure 4 shows the product after exposure to the ambient atmosphere for about three weeks. Fragrance has evaporated, causing apparent shrinkage of the remaining composition into the channels 3. It can be seen that the composition shrinks one-dimensionally, that is it continues to fill the channels 3 across their full width. Hence the plan view is still as seen in Figure 2. If the product is left until substantially all the fragrance is evaporated, the polymer component will remain in the bottom of the channels 3.

Figure 5 shows a plan view of the composition of comparative example 8 after about three weeks. It can be seen that the remaining composition has shrunk away from the sides of the channels 3, forming gaps 5 and giving a quite different visual appearance, which is uncontrolled during the life of the product.

Figure 6 shows a perspective view of an embodiment of the invention. A glass container 10 has a bottom wall 12 which is flat and a peripheral wall 14. The container is about 6 mm deep. A label 16, which may carry a logo, flower design, etc., is stuck to the inner surface 18 of wall 12. A composition prepared in accordance with Example 3 above is poured into the container 10 while molten. The composition cools to a clear gel which adheres well to the side wall 14 and the label 16. (If preferred, the label could be provided on the underside of wall 12 and be visible through the

wall). As the fragrance evaporates, the gel becomes thinner, but does not shrink away from the side wall 14, and hence continues to provide an attractive appearance covering the label 16.

CLAIMS:

1. An air freshener comprising a container which is open at one end, a fragrance containing composition in the container and having a surface exposed to the atmosphere at the one end, the exposed surface of the composition being substantially uninterrupted.
2. An air freshener as claimed in claim 1, in which the composition comprises a fragrance component and a wax or a polymer dissolved in the fragrance component to form a gel.
3. An air freshener as claimed in claim 2, wherein the gel is self-supporting.
4. An air freshener as claimed in claim 2 or 3, wherein the polymer is a polyamide.
5. An air freshener as claimed in claim 4, wherein the polymer includes a mineral oil component.
6. An air freshener as claimed in claims 1, 2 or 3, wherein the polymer is a styrene based polymer.
7. An air freshener as claimed in claim 6, having at least 50% by weight of fragrance component.

8. An air freshener as claimed in claim 7, having at least about 70% by weight of fragrance component.
9. An air freshener as claimed in claim 7, having from 70 to 90% by weight of fragrance component.
10. An air freshener as claimed in claim 8, having from 75 to 85% by weight of fragrance component.
11. An air freshener as claimed in any one of claims 1 to 10, wherein the dimension of the composition reduces only in thickness as the fragrance evaporates.
12. An air freshener as claimed in any one of claims 1 to 11, wherein the container has a peripheral wall and the composition adheres to the peripheral wall in use.



Application No: GB 0104286.0
Claims searched: 1 to 12

Examiner: Graham S. Lynch
Date of search: 30 August 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): A5G (GV)

Int Cl (Ed.7): A61L 9/012, 9/04, 9/12

Other: On-line : WPI, EPODOC, JAPIO, Designs Registry

Documents considered to be relevant:

| Category | Identity of document and relevant passage | Relevant to claims |
|----------|--|--------------------|
| X | GB 2298841 A BOWER. Whole document. | 1, 11. |
| A | WO 00/24434 A1 RECKITT & COLMAN. Whole document. | |
| X | US 6039266 SANTINI. Whole document. | 1, 11. |
| X | US 5419879 VLAHAKIS et al. Whole document. | 1. |
| X | US 5060858 SANTINI. Whole document. | 1, 11. |

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|---|---|---|--|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category. | P | Document published on or after the declared priority date but before the filing date of this invention. |
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