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(54) Title: ARTICLE WITH SEPARATING LAYER FOR CONTROLLED RELEASE OF FRAGRANCES

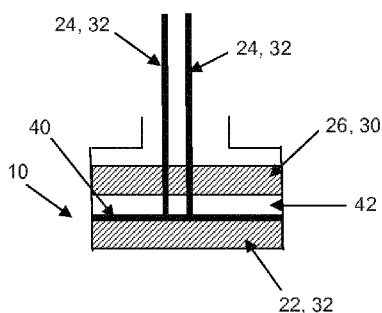


Fig. 3

(57) Abstract: The present invention discloses an article for delivery of a fragrance. The article comprises or consists of a first carrier material comprising at least one first fragrance, a second carrier material comprising at least one second fragrance, wherein the article is adapted for sequential or simultaneous release of the at least one first fragrance and the at least one second fragrance, wherein mass transfer between the first carrier material and the second carrier material is inhibited or prevented. The present invention further provides the use of the article for delivery of a fragrance as air freshener or in an air freshener for home, toilet, cellar, wardrobes, dish wash, suitcase, handbags, automobile and mattress applications.

Article with separating layer for controlled release of fragrances

The present invention relates to an article for delivery of a fragrance. The article is adapted for sequential or simultaneous release of the at least one first fragrance contained in a first carrier material and the at least one second fragrance contained in a second carrier material offering the adjustment of a combination of different fragrances by manual or automatic set up. One of the carrier materials is a liquid carrier material or a semisolid carrier material. Mass transfer between the first carrier material and the second carrier material is inhibited or prevented by including for instance a separating layer separating the first carrier material and the second carrier material. The separating layer may be used for providing desired release profiles of the fragrances comprised in adjacent carrier materials. The present invention further provides the use of the article for delivery of a fragrance as air freshener or in an air freshener for home, toilet, cellar, wardrobes, dish wash, suitcase, handbags, automobile and mattress applications.

Various types of air fresheners have been made to dispense fragrances and scents to mask or neutralize unpleasant odours or to simply provide a pleasant scent in a volume of air. Conventional liquid air fresheners generally comprise a reservoir containing a mixture which may be a true solution, a colloidal solution or a microemulsion of a perfume with a solvent into which dips a wick which is connected to an emanating surface. The perfume mixture travels up the wick to the emanating surface from which the perfume evaporates and freshens the surrounding atmosphere. Perfumes used in those air fresheners are

generally oils and are therefore generally insoluble in water in the absence of any other agents.

Other types of air freshener involve dissolving a fragrance in a liquid carrier, such as ethanol, isopropanol, or some other volatile organic compound. The fragrances may be
5 also dissolved in water, although it is often necessary to use a surfactant or other emulsifying agent to dissolve the fragrance in water. The fragrance evaporates with the carrier, scenting the air. Solid or gel form fragrances are more desirable for products such as air-freshener used in rooms and automobiles. Diluting the concentrated solid air freshener at the point of use or at an intermediate location to form a liquid reduces the
10 cost and space required to transport and store the air freshener.

Recent types of air fresheners provide in a sequentially and/or timely fashioned release of one or more fragrances to the environment. US 5,139,864 A discloses a multi-layer sequentially timed release polyfunctional volatilizable substance delivery article. An outermost matrix layer initially evolves its contained volatilizable substance at a rate
15 substantially greater than the rate at which its neighbouring matrix layer evolves its contained volatilizable substance until such point in time that sufficient volatilizable substance contained in the outermost matrix layer has been evolved into the environment surrounding said article, that a substantial portion of the surface of the neighbouring matrix layer is at least constructively exposed to the surrounding environment thereby
20 permitting a substantial increase in the rate of emission of volatilizable substance from the neighbouring matrix layer.

US 5,150,722 A discloses a multi-layer sustained release scent emitting article with a scent emitting exposure surface area comprising two barrier layers covering planar surfaces of a functional ingredient-containing material. An initial burst of a functional
25 material over a relatively short period of time may be provided.

The most common disadvantage of this type of air fresheners is that the consumer can experience only one fragrance all the time. Brain has tendency to shut the smell receptors after initial recognition of a fragrance. Therefore, over the time the consumer cannot enjoy the fragrance for a long time. A further drawback resides in that the consumer may not
30 freely select a specific fragrance and the release of a fragrance is limited to max. two months. Further drawbacks reside in that liquid constituents may be easily spelled.

The object of the present invention is to provide an article for delivery of a fragrance, in which the previously mentioned disadvantages are resolved. A further objective is to overcome scent related limitations. Another object of the present invention is to provide different release profiles and/or different intensities for different fragrances. Even another
5 object of the present invention is to provide an article which is optically elegant. Still another object of the present invention is to provide an article with a simple production and which can be easily adapted to various consumer requirements, including the design/form, loading with e.g. fragrances etc. Other objects, aspects and advantages of this invention will be apparent to one skilled in the art in view of the following disclosure,
10 the drawings and the appended claims.

These objectives are achieved by the article for delivery of a fragrance according to the invention and its use.

Therefore, an article for delivery of a fragrance is provided, the article comprising or consisting of

15 a first carrier material comprising at least one first fragrance,

a second carrier material comprising at least one second fragrance, wherein the article is adapted for sequential or simultaneous release of the at least one first fragrance and the at least one second fragrance, wherein mass transfer between the first carrier material and the second carrier material is inhibited or prevented.

20 Preferably, the at least one second fragrance is different from the at least one first fragrance. More preferably, the article is adapted for simultaneous release of the at least one first fragrance and the at least one second fragrance.

Inhibiting or preventing mass transfer between the first carrier material and the second carrier material is preferably performed by including at least one separating layer, which
25 at least partially separates the first carrier material and the second carrier material, wherein the first carrier material and/or the second carrier material is a liquid carrier material or a semisolid carrier material. Alternatively, inhibiting or preventing mass transfer may be accomplished by employing e.g. a first liquid carrier material and a second liquid carrier material, wherein the density of the first carrier material is different
30 from the density of the second carrier material to an extent of e.g. at least 0.1 g/l or more, such as 0.15 g/l or more, 0.2 g/l or more, 0.25 g/l or more, 0.3 g/l or more, 0.35 g/l or

more, 0.4 g/l or more, 0.5 g/l or more, or 0.75 g/l or more. Preferably, the densities of the first carrier material and the second carrier material, respectively, is determined at the same temperature for permitting an accurate comparison, more preferably the densities are measured at ambient temperature of 22°C to 24°C. In general, densities may be derived from any textbook. A suitable combination of liquid carrier materials comprises for instance glycerol and water.

It is particularly preferred that the first carrier material and the second carrier material are both liquid carrier materials. These liquid carrier materials may be the same or different. In case the same liquid carrier materials are used, such as water, at least one separating layer is employed for inhibiting or preventing mass transfer.

Additionally, the use of the article for delivery of a fragrance according to the invention as or in a softener, such as a fabric softener, or scent booster, such as a laundry scent booster, is provided. Alternatively, the use of the article for delivery of a fragrance or according to the invention as or in an air freshener is provided. In general, the present article may be employed in any liquid detergent system, particularly in a detergent system comprising a polyvinylalcohol as semisolid material.

An "article" or a "formulation composition" as used herein pertains to a member of a class of things, in particular an item of goods. The article may be in form of a finished product, i.e. a product which is ready to use after e.g. removing any packaging. Alternatively, the article may be provided in form of half-finished product, i.e. in form of various elements, such as puzzle pieces, which need to be combined by the customer to the finished product e.g. according to instructions and/or the customer's needs. The puzzle may be for instance a 2D or 3D jigsaw puzzle. Alternatively, the puzzle may comprise any object having slots therein for selectively accommodating puzzle pieces.

A "carrier material" as used herein pertains to any solid, semisolid or liquid material in which at least one fragrance is comprised and which is capable of releasing the fragrance to the environment. The use of different carrier materials enables controlling the release properties, including time and intensity, of the fragrance(s) contained therein. Hence, it is preferred to employ different carrier materials for different fragrances. The carrier material of the present article, particularly an air freshener, may have any shape and/or colour. The article may have any conceivable shape including basic 3-dimensional shapes, such as a cube, cuboid, cylinder or sphere, and complex shapes, which may result from a combination of a plurality of basic 3-dimensional shapes. The colour and shape may be therefore adapted according to the consumers' needs. It is even possible to provide the

article in form of a kit permitting the consumer to construct the article according to his/her needs. Each carrier material may have for instance a specific colour and/or shape, thereby creating a pleasing article. The at least one fragrance, particularly perfume oils, can be comprised, such as dissolved or adsorbed to a carrier, which ensures a fine
5 distribution of the therein included fragrances in the product as well as a controlled release when used. The selection of a suitable carrier material even enables the use of the carrier material as a portion of a housing, such as a wall, of e.g. an air freshener. Hence, production may be simplified and production costs may be reduced.

The carrier material may comprise, in addition to the at least one fragrance, any further
10 ingredient(s), which for instance facilitates the release of or assists in dissolving the at least one fragrance. Examples of further ingredients include solvents, stabilizers, surfactants, co solvents etc.

In principle each conceivable combination of carrier materials may be employed. Preferably, the first carrier material is a solid carrier material and the second carrier
15 material is a liquid carrier material, the first carrier material is a solid carrier material and the second carrier material is a semisolid carrier material, the first carrier material is a semisolid carrier material and the second carrier material is a liquid carrier material, the first carrier material is a semisolid carrier material and the second carrier material is a liquid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a semisolid carrier material. More
20 preferably, the first carrier material is a semisolid carrier material and the second carrier material is a semisolid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a liquid carrier material, or the first carrier material is a liquid carrier material and the second carrier material is a semisolid carrier material. Most preferably, the first carrier material is a liquid carrier material and the second carrier material is a liquid
25 carrier material. Even more preferably, the first carrier material is a semisolid carrier material and the second carrier material is a semisolid carrier material, or the first carrier material is a liquid carrier material and the second carrier material is a liquid carrier material. Most preferably, the first carrier material is a liquid carrier material and the second carrier material is a liquid
30 carrier material.

The release of the fragrance(s) usually takes place in a quantity that a consumer may perceive the smell as such, preferably that the consumer perceives also the identity of the underlying fragrance. It will be appreciated that such a quantity depends on the consumer and therefore as such is variable. The release of the fragrance from the carrier material
35 usually depends on environmental conditions, including temperature, pressure, humidity

and external factors influenced by the customer, such as air exchange frequency in a setup location, such as the kitchen. Preferably, the conditions allowing the consumer to perceive the smell of fragrance(s) as such and optionally also perceiving the identity of the underlying fragrance(s) takes place at a temperature of at least -20°C or more, preferably 18°C or more, such as 20 to 80°C , more preferably at room temperature of about 20°C to 25°C , at an ambient pressure of e.g. 98 kPa to 105 kPa, preferably 100 to 103 kPa, or 101 to 102 kPa, and a humidity of e.g. 10 to 100%, preferably 20 to 75%, 30 to 60%, or 40 to 50%. It will be appreciated that perceiving the smell and optionally also the identity of the at least one fragrance may be assisted by or even requires volatilizing and/or atomizing the at least one fragrance.

The terms "scent", "fragrance" and "aromatic substance" are used interchangeably herein and include compounds such as isobornyl acetate, limonene, ylanate, eucalyptol, dihydromyrcenol, amyl salicylate, benzyl acetate, geranyl nitrile, nerol, 2-methylundecanal, phenylethyl alcohol etc. Other suitable fragrances, which may be likewise used in the present article are listed hereinafter.

The term "fragrance" as used herein broadly pertains to compounds including active constituents, such as a fragrance (as understood by a person skilled in the art), a freshener or freshening agent, a malodour active, a neutral note and optionally also an insect repellent, in particular a mosquito repellent, or a pheromone.

The terms "at least a first fragrance", "at least one second fragrance" and "at least one further fragrance" may refer to a combination of fragrances, respectively, such as 2 or more fragrances, preferably, 3 or more, 4 or more, 5 or more, 6 or more, 7 or more, 8 or more, 9 or more, or 10 or more fragrances. The combination of fragrances may be also referred to as a "fragrance note" hereinafter.

The expression "the at least one second fragrance being different from the at least one first fragrance" designates a chemical difference between the at least one second fragrance and at least one first fragrance. Hence, the at least one first fragrance and the at least one second fragrance preferably encompass at least one distinguishing fragrance. Said at least one distinguishing fragrance preferably results in a distinguishing smell, more preferably the consumer additionally perceives the identity of the at least one distinguishing fragrance.

The term "the article is adapted for sequential simultaneous release of the at least one first fragrance and the at least one second fragrance" designates that the at least one first fragrance and the at least one second fragrance are provided either successively to the environment or in an at least partially overlapping manner, preferably at the same time, to the environment. The consumer preferably perceives the distinguishing smell arising from the simultaneous release of the at least one first fragrance and the at least one second fragrance. "Simultaneous release" is usually obtained by providing an article which is constructed such that at least a portion of the first carrier material and least a portion of the second carrier material is exposed at the same time to the environment. A portion designates any surface portion of the carrier material, which is preferably more than 0%, such as 1% to 20% but also 100%, of the total surface area of the carrier material. Preferably, exposure to the environment is obtained by indirectly contacting the first carrier material and/or the second carrier material with the environment. For instance, such an indirect contact may take place by employing capillary forces transporting a fragrance from the first carrier material and/or the second carrier material to the environment. A solid carrier material, such as reed or glass tubes, may be used to provide these capillary forces. This solid carrier material may be presoaked with a liquid, which optionally comprises a fragrance. The properties of suitable solid carrier material are known in the art.

The term "environment" as used herein refers to the surroundings of the present article during its use, i.e. upon establishing access of at least a portion of the first and second carrier materials, respectively, to the surroundings such that the consumer may perceive the fragrance(s).

The expression "mass transfer between the first carrier material and the second carrier material is inhibited or prevented" may have the meaning that mass transfer between said carrier materials does not take place at all. This may be achieved by including a separating layer which completely separates the first carrier material and the second carrier material. Inhibiting mass transfer may be accomplished for instance by including of a separating layer which is dissolvable in one of the carrier materials or by employing a first liquid carrier material and a second carrier material of different densities, preferably of the density difference indicated above. Inhibiting mass transfer is preferably described by the time period required until the customer may perceive the first fragrance and the second fragrance at the same time (with the proviso that e.g. two liquid carrier materials are not intermixed by external interference, such as shaking the container comprising two liquid carrier materials). Hence, intermixing resides on internal effects, such a diffusion and Brownian motion, only. This time period may be for instance 6 hours or more, 12

hours or more, 1 day or more, 5 days or more, 1 week or more, 2 weeks or more, or 4 weeks or more, more preferably 3 months or more.

The term "separating layer" as used herein pertains to any layer which at least partially prevents or inhibits mass transfer, i.e. the transfer of chemical compounds, in particular of a fragrance, between the first and second carrier materials or between one of these carrier materials and the environment. The separating layer may therefore have various advantageous functions including one or more of controlled release of fragrance(s) from an adjacent carrier material, preferably over a defined period of time, preventing intermixing of e.g. different carrier materials and/or their constituents including the at least one fragrance, and allowing controlled intermixing of e.g. different carrier materials and/or their constituents including the at least one fragrance. These functions may be inter alia used for adapting the present article according to the customer's various needs. The separating layer is particularly suitable for separating liquid carrier materials or a liquid carrier material and a semisolid carrier material.

The at least one separating layer separates the first carrier material and the second carrier material. A single separating layer is thereby in direct contact with the first carrier material and the second carrier material. In case two or more separating layers are employed, a first separating layer is in directed contact with the first carrier material and a second separating layer is in direct contact with the second separating layer. The first separating layer and the second separating layer are either in direct contact with each other or optionally sandwich one or more additional separating layers.

A separating layer may be furthermore employed in addition to a first liquid carrier material and a second liquid carrier material, wherein intermixing of the two liquids is already inhibited or prevented by different densities of the two liquid carrier materials, preferably to an extent as indicated above.

According to a preferred embodiment of the present invention, the first carrier material is selected from the group consisting of a solid carrier material, preferably cardboard, reed, or plastic, a liquid carrier material, preferably a solvent, more preferably water, and semisolid carrier materials, preferably a gel, a polyglycolether, or a polyvinylalcohol, and wherein the second carrier material is the liquid carrier material, preferably a solvent, more preferably water, or the semisolid carrier material, preferably a gel, a polyglycolether, or a polyvinylalcohol.

Each conceivable combination of carrier materials may be employed. Preferably, the first carrier material is a solid carrier material and the second carrier material is a liquid carrier material, the first carrier material is a solid carrier material and the second carrier material is a semisolid carrier material, the first carrier material is a semisolid carrier material and the second carrier material is a liquid carrier material, the first carrier material is a semisolid carrier material and the second carrier material is a semisolid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a liquid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a semisolid carrier material. More preferably, the first carrier material is a semisolid carrier material and the second carrier material is a semisolid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a liquid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a semisolid carrier material. Even more preferably, the first carrier material is a semisolid carrier material and the second carrier material is a semisolid carrier material, the first carrier material is a liquid carrier material and the second carrier material is a liquid carrier material. Most preferably, the first carrier material is a liquid carrier material and the second carrier material is a liquid carrier material.

It will be appreciated that essentially each solid, semi-solid, and liquid carrier material has a capability for carrying at least one fragrance. This may depend on e.g. the material, the structure of the solid or semisolid material, such as the presence of pores and their properties. Hence, essentially each material may be employed as carrier material.

Examples of preferred solid carrier materials include cardboard, reed, plastics or polymers, cotton, flees, tissue and fibers, such as cellulose fibers. Cardboard, reed, and plastic are particularly preferred.

Preferred examples of suitable semisolid carrier materials include gels, such as alginate gel, silicon gel, carrageenan gel, sylvaclear and stearate gel or combinations thereof. In general, any compound which may be used for thickening a liquid, in particular water, may be employed as gel.

Suitable solid or semisolid carriers are preferably porous materials, such as porous inorganic materials, including for instance low density sulfate (Leichtsulfat), silica gel, zeolites, gypsum, clays, aerosil, other silicate grades, clay granulates, aerated concrete or gas concrete etc. Alternatively, organic materials such as woods, cellulose based substances, sugar, dextrans (e.g. maltodextrin), or synthetic materials such as PVC,

polyvinyl acetates, cotton fibers or poly urethanes or fibers of any kind having high porosity can be employed.

Examples of preferred suitable solvents are selected from the group consisting of water, ethanol, isopropanol, diethylene glycol monoethyl ether, glycerine, glycerol, polyethylene glycol (PG), such as polyethylene glycol BB, for instance BB 300, 1,2-butylene glycol, dipropylene glycol (DPG), dipropylene glycol monomethyl ether (DPM) diethyl phthalate, methyl methoxy butanol, triethyl citrate, isopropyl myristate, paraffins, tripropylene glycol methyl ether (TMP), dioctyl adipate (DOA), isopropyl myristate (IPM), synthetic isoparaffinic solvents, such as Isopar L, triethyl citrate (TEC) and mixtures thereof.

However, also other volatile organic compound may be used. Other suitable and preferred solvents include ether acetates, such as propylene glycol methyl ether acetate and particularly dipropylene glycol methyl ether acetate (DPMA).

Optional other constituents of the carrier material preferably encompass one or more of surfactants, cosolvents, preservatives, abrasives, antibacterial agents, anti-inflammatory agents, anti-irritants, irritation suppressants, antimicrobial agents, antioxidants, antiseptics, binders, buffers, chelating agents, deodorisers, emollients, fixatives, foaming agents, foam stabilisers, antifoams, foam boosters, fungicides, humectants, moisturisers, bleaching agents, stain removers, soil repellents, insect repellents, opacifiers, plasticisers, brighteners, abrasive agents, skin care agents, skin-protecting agents, skin-softening agents, skin-cooling agents, skin-warming agents, stabilisers, UV-absorbers, thickeners, vitamins, oils, waxes, fats, phospholipids, mono- or polyunsaturated fatty acids, α -hydroxy acids, polyhydroxy fatty acids, dyes, colour-protection agents, pigments, plant extracts, electrolytes, organic solvents or silicone derivatives. The skilled person is well aware about employing one or more of said constituents in the required amount(s).

It will be readily understood that the skilled person is well aware about selecting the constituents in a manner that a reaction with the fragrance(s) and/or carrier material(s) is avoided.

In a water based carrier material, surfactants are a desirable component to confer a degree of water solubility. The surfactants of the article according to the present invention are substances that are preferably solid at 20°C. Preferred surfactants are non-ionic, cationic, anionic and amphoteric surfactants. Examples of suitable surfactants include fatty alcohol ethoxylates, preferably of C₁₄-C₁₈ fatty alcohols, preferably with 10 ethoxylated units or more, further preferred having 11-80 ethoxylated units, because these fatty alcohol ethoxylates may assist in adjusting the dissolution rate of the

fragrance(s) in water. Any conventional surfactant, also an anionic surfactant, such as alkyl benzene suffocates and laurel sulphates, may be used. Non-ionic surfactants with an ethoxylated value of 10 and above may be employed.

Aqueous based systems may also contain a cosolvent in addition to the fragrance and the optional other constituents, in particular a surfactant. Examples of cosolvents are ethanol; Dowanol DPM, dipropylene glycol (DPG), propylene glycol (PG), 3-methoxy-3-methyl-1-butanol (MMB) and diethylene glycol monoethyl ethers (DEGMEE).

The carrier material(s) may also include dyes and their lacquers to provide the present article a pleasant appearance. These are preferably food colorants, which are necessarily toxicologically and dermatologically harmless. The approved food colorants include E 129 to E 161: allura red AC E 129 red; aluminium E 173; amaranth E 123 red; anthocyanine E 163 violet, blue; Azorubine E 122 red; betanine E 162 red; brown FK E 154 yellowish brown; brown HT E 155 red brown; brilliant blue FCF E 133 blue; brilliant black BN E 151 violet, brown, black; calciumcarbonate E 170; canthaxanthine E 161 g; carotin; * annatto (norbixin); * capsanthine; * lycopine; * 8'-apo- β caroten-8'-al; * ethyl-8'-apo- β -caroten-8'-oate E 160 a; E 160 b; E 160 c; E 160 d; E 160 e; E 160 f ; chinoline yellow E 104; chlorophyll E 140 green; cochenele red A E 124; curcumin E 100; iron oxide E 172; erythrosine E 127; yellow-orange S E 110; gold E 175; green S E 142; indigotine E 132; cochineal E 120; copper containing complexes of chlorophylls and chlorophyllines E 141; lactoflavin E 101; litholrubine BK E 180; lutein E 161 b; patent blue V E 131; vegetable carbon E 153; riboflavine (vitamin B2) ; * riboflavine-5-phosphate E 101; E 101 a; Safflower cherry red to brown-yellow; silver E 174; tartrazine E 102; titanium dioxide E 171; caramel colour; * Sulphite lye-caramel colour; * Ammoniac-caramel colour; *Ammon sulphite-caramel colour E 150 a; E 150 b; E 150 c; E 150 d; und Zeaxanthine E 161 h. Suitable dyes can additionally be found in DE202013006887. In addition to food colorants, further dyes can be used, which are not listed above, but are approved by the FDA in the USA or other regional authorities of a country. Furthermore, cosmetic or other detergent industry specific dyes can be used. Also dyes fluorescing in black light or UV light, such as optical brighteners, may be employed to provide a pleasant appearance at appropriate light conditions.

The term "reed" as used herein is directed to a carrier material of the present article usually for providing a fragrance, which is an elongated rigid porous structure to draw at least one fragrance from a liquid carrier material comprised in e.g. a reservoir via capillary action and from which the at least one fragrance is permitted to evaporate. The term

"reed" is generically used to describe a number of different materials which perform the same function.

Alternatively or in addition, the reed may be already provided, e.g. soaked, with at least one fragrance which is evaporated to the environment. It will be readily understood that
5 such a reed does not need to exhibit a capillary action if it is only for providing at least one fragrance already contained therein. Advantageously, a reed may be also provided with at least one fragrance comprised therein and further with a reservoir, wherein the reservoir comprises at least one fragrance which is the same or different to the at least one fragrance contained in the reed. Hence, the reed may be used for subsequently
10 providing two fragrances and/or fragrance mixtures which are different from each other. In said case the second fragrance or a second mixture of fragrances is comprised in a liquid carrier material and drawn by the reed via capillary action.

Most commonly, the porous structure of a reed is formed from rattan stems and while the stems can be either straight, bent or formed into structures such as helices or spirals, the
15 portion inserted into the reservoir comprising at least one fragrance is usually straight. Any deviation from a straight section normally only occurs in the region of the reed which is outside the liquid carrier material. Other natural stems and materials derived from grasses, creepers, trees and other types of plant are also utilised in such devices as well as synthetic reeds composed of cellulose, ceramic, porous plastic or biodegradable
20 polymers.

As with the rattan stems, the generic composition is similar in that the reeds are composed of a straight, usually circular cross-section porous material that can absorb liquid and transfer it up the reed via internal capillary action. The reeds are also selected so that there is no significant change in rigidity or structural integrity once they have
25 absorbed the liquid. The precise material selected is performed so depending on the nature of the liquid to be evaporated. When the fragrance to be delivered is dissolved in a solvent, such as one of the above mentioned solvents, particularly dipropylene glycol, ethyl ether or ethanol, usually natural reeds are employed, whereas if it is desirable to use a water-based liquid carrier material then synthetic reeds composed of cellulose are
30 generally more effective.

Any type of plastic or polymer material, preferably a porous plastic or polymer material or a foam, is employed. Such a porous material may be provided, e.g. partially or completely soaked, with the at least one fragrance. The pore sizes and shapes of the pores effect a sustained release of the at least one fragrance upon exhibiting a portion of the plastic

material soaked with the at least one fragrance to the environment. The porous polymer preferably is physically and chemically compatible with the fragrance(s) and optionally other compounds, such as solvents, of choice.

5 Suitable polymers include any of a number of foams having cell sizes with a porosity range of from 0.1 to 0.8, preferably 0.2 to 0.7, 0.3 to 0.6, or 0.4 to 0.5. The porosity is preferably measured directly upon preparing the polymer by determining the bulk volume of the porous sample, and determining the volume of the skeletal material with no pores, wherein pore volume = total volume – material volume.

10 Appropriate foams are urethane foams, styrene foams, polyvinylchloride foams, polypropylene foams, polyethylene foams, silicone foams and rubber foams. Additionally, polymers which form porous morphologies such as the polypropylene, polyethylene, acrylates, and polyurethanes may be utilized.

15 The carrier material may be also in the form of a gel. Such a gel like carrier material is preferably employed in case the at least one fragrance is oil soluble. In case the at least one fragrance is a water soluble compound it may be incorporated into a gelled mixture of water and a polymer. In applications in which the at least one fragrance is required at high concentrations within the gel, the active compound itself can form the liquid portion of the gel without added oil and water. Any gelled mixtures of oil and polymer and gelled mixtures of water and polymer known in the art may be used. Among these gelled
20 mixtures are oil and polyisobutylene, oil and isoprene, oil and silicone, water and polyvinylpyrrolidone, water and hydroxyethylmethacrylate, and combinations including hydroxypropyl cellulose.

The carrier material may be also in form of a polyglycolether or a polyvinylalcohol which are well known to the skilled person.

25 According to a preferred embodiment, the article further comprises at least one separating layer, which at least partially separates the first carrier material and the second carrier material, wherein the first carrier material and/or the second carrier material is a liquid carrier material or a semisolid carrier material.

30 According to a preferred embodiment of the present invention, the at least one separating layer is a material permeable to the at least one first fragrance and/or the at least one second fragrance, preferably a membrane, or wherein the at least one separating layer is

an inert material impermeable to the at least one first fragrance and/or second fragrance, preferably glass or plastic.

For instance, the separating layer may provide controlled release of the at least one first fragrance and/or the at least one second fragrance. It will be appreciated that any number and type of separating layers may be employed. Preferably, each of the carrier materials has at least one, such as 2, 3, 4, 5, 6, 7, 8, 9, or 10 separating layers. These separating layers may be present in combination, i.e. as a pile, and/or formed on a portion of surface of the carrier material only while on the remainder surface portion of the carrier material another separating layer(s) or no separating layer(s) is/are formed. The at least one separating layer may be in form of a solid material, semisolid material or liquid material. The material of the at least one separating layer and its properties are usually selected in dependence from adjacent carrier material(s) and in dependence from desired release profile. The separating layer may be for instance a foil which is dissolvable in a solvent, particular water. Other examples of separating layers include solvents which separate e.g. liquid carrier materials. In said case the density of the particular solvents may be chosen such that intermixing is prevented, i.e. by selecting solvents of higher density in direction of gravity. Alternatively, intermixing of solvents may be promoted by layering solvents of approximately equal density, such as solvents having a difference in density which is less than 1%, such as less than 0.5%, less than 0.5%, less than 0.1% or less than 0.01% but still greater than 0%.

A separation layer may be also used for preventing spilling of liquids by covering a liquid carrier material. Thereby, leaking of the liquid carrier material to the environment is effectively prevented. Such a separation layer may be provided for instance at an inlet of one or more compartments of a receptacle, such as a bottle.

As indicated above, the separating layer at least partially prevents or inhibits mass transfer, i.e. the transfer of chemical compounds, in particular of a fragrance, between the first and second carrier materials or between one of these carrier materials and the environment. Complete prevention of mass transfer may be achieved by employing non-porous materials, such as glass or polymers. Partial prevention of mass transfer may be obtained by using for instance a non-porous material, such as glass or polymers, leaving a contacting portion between the first and second carrier materials or between a carrier material and the environment. Other possibilities are porous layers or membranes which permit controlled mass transfer, including the type of the chemical compound, preferably the at least one fragrance, and/or its quantity, between the first and second carrier materials or between a carrier material and the environment. Membranes of all types can

be used. Still other possibilities reside in the use of e.g. soluble foils, such as a water soluble foil, which provides access to a carrier comprising at least one fragrance in case the soluble foil is contacted with an appropriate solvent, such as water. Water soluble foils may be made from a water soluble polyvinylalcohol or a water soluble polysaccharide, such as starch or a modified starch.

A preferred example of partial prevention of mass transfer resides in using a solid, impermeable material, such as glass or polymers, leaving at least one contacting portion between the first and second carrier materials or between a carrier material and the environment. The at least one contacting portion provides direct contact between the first and second carrier materials, preferably liquid first and second carrier materials. Any number of contacting portions may be employed, such as 1 or more, 3 or more, or 5 or more. A single contacting portion is, however, preferred. Furthermore, the at least one contacting portion may be for instance about 10% referred to the total contact area between the first and second carrier materials, preferably 5% to 20%, or 10% to 15%. The use of such a separating layer assists in avoiding unintentional mixing of the carrier materials and the fragrances contained therein.

The separating layer, particularly a foil, may be chosen in line with different factors including one or more of thickness, porosity, dissolving behaviour, appearance, such as visibility to the customer, properties of one or more adjacent carrier materials, including for instance evaporation properties, such as evaporation rate, and/or thickness of the carrier material (layers) in relation to the thickness of the separating layer, properties of the receptacle, such as a bottle, including inter alia shape, size, presence of compartments and appearance.

Suitable polymers for the separating layer include polyethylene terephthalate, high density polyethylene, low density polyethylene, polypropylene, and polyvinylchloride, and polyethylene/aluminized polyester/ethylene vinyl acetate. Alternatively, a metal layer or a composite layer of a metal and polymer may be used for completely or partially preventing mass transfer. The polymer, glass, metal layer or composite may have a thickness of from 10 to 500 μm , preferably 20 to 250 μm , 30 to 200 μm , 40 to 150 μm , or 50 to 100 μm .

Liquid polymers may be also employed as separating layer. A preferred liquid polymer is a silicone, in particular a silicone rubber. Suitable silicones include dimethicone, decamethylcyclopentasiloxane, octamethylcyclotetrasiloxane, dimethylsiloxane and trimethylsiloxyl terminated dimethyl-, methyl-, phenyl-silicone resins. A silicone rubber is

an elastomer composed of silicone containing silicon together with carbon, hydrogen, and oxygen. Silicone rubbers are well known in industry, and there are multiple formulations. Silicone rubbers are often one- or two-part polymers, and may contain fillers to improve properties and/or reduce cost. Silicone rubber is generally non-reactive, stable, and resistant to extreme environments and temperatures while still maintaining its useful properties.

Porous layers for permitting mass transfer may be of the same type as indicated above. In said case, the porous layer is usually only provided with air and/or with solvent(s) in the pores. The porous layer may exhibit a thickness of from 10 to 200 μm , 30 to 150 μm , 20 to 100 μm , 40 to 80 μm , or 50 to 70 μm .

An example of a preferred membrane is a diffusion rate limiting membrane. Such a membrane may exhibit a thickness of from 10 to 500 μm , preferably 20 to 250 μm , 30 to 200 μm , 40 to 150 μm , or 50 to 100 μm . The membrane is preferably made of a microporous polymer which can be selected from any one of the polymers known in the art which is available as a microporous membrane with e.g. pore sizes in the range from 0.02 to 0.6 μm . Alternatively, it can be a non-porous polymeric membrane which transports the active compound through dissolution in the polymer. Suitable polymers include ethylene vinyl-acetate (EVA), which is also known as poly (ethylene-vinyl acetate) (PEVA), polyethylene, polypropylene, polyvinylchloride, cellulose acetate, cellulose nitrate, polyacrylonitrile, and polytetrafluoroethylene.

The release rate of such a membrane is usually a function of the thickness, the porosity, the tortuosity, the concentration gradient of the at least one fragrance and/or other compounds, such as a solvent, across the membrane, and the diffusion coefficient. The at least one fragrance and/or other compounds diffuses into the micropores of the diffusion rate limiting membrane layer and then is released at preferably a substantially constant rate over the life of the article. The use of such membranes therefore enables controlled release of the at least one fragrance over a long period of time under established conditions.

If in the scope of the present invention it is referred to the dimensions of a particle or a length, e.g. a layer thickness, which are e.g. in a range of $\leq 500 \mu\text{m}$, the following methods are preferably applied to determine the dimension or length. In case a diameter of a particle is mentioned, it refers to the median diameter. This median diameter is preferably determined with a Coulter counter according to ISO 13319:2007. In the scope of the present invention, a Beckman Coulter Multisizer 3 can be used, wherein the

measurements are performed according to the manufacturer specifications. Layer thicknesses or length measurements can be determined by white-light interferometry according to EN ISO 25178. In the scope of the present invention, preferably a Bruker VSI Contour K0 is used. The measurements are performed according to the manufacturer specifications.

A carrier material or a separating layer is preferably adapted to generate an exothermic reaction upon contacting any other carrier material. Such a contact may take place e.g. during dissolving a solvent soluble foil and/or upon contacting of two liquid carrier materials after a separating layer has been dissolved such that the two liquid carrier materials may get in contact with each other. The rise in temperature caused by the exothermic reaction may assist in promoting mixing of e.g. liquid carrier materials and/or promoting evaporation or trigger evaporation of one or more fragrances. For instance, a water soluble foil may have embedded therein one or more compounds, such as essentially water free calcium chloride, known to develop heat upon contacting with water.

According to a preferred embodiment of the present invention, the at least one first fragrance and/or the at least one second fragrance are selected from the group consisting of isobornyl acetate, limonene, ylanate, eucalyptol, dihydromyrcenol, amyl salicylate, benzyl acetate, geranyl nitrile, nerol, 2-methylundecanal and phenylethyl alcohol.

It will be readily understood that this are merely examples of suitable fragrances. Fragrances or aromatic substances, that are used in the article for delivery of a fragrance according to the invention may be generally selected from the group consisting of (customary product and brand names are given): 1-phenyl-2-methyl-2-propylacetate, 2-methylbutylbutyrate, aldron (4-[(3,3-dimethylbicyclo[2.2.1]hept-2-yl)methyl]-2-methylcyclohexanon), allyl-2-cyclohexyloxyglycolate, allyl-2-pentyloxyglycolate, allyl-3-cyclohexylpropionate, allylcapronate, amarocit (1,1-dimethoxy-2,2,5-trimethyl-4-hexene), ambreal (dodecahydro-3,8,8,11a-tetramethyl-5h-3.5a-epoxynaphth[2.1-c]oxepine), ambrettolide (9-hexadecene-16-olide), ambrinol S (1,2,3,4,4a,5,6,7-octahydro-2,6,6-trimethyl-2-naphthalinol), ambrinolepoxide, ambrocenide (4ar,5r,7as,9r)-octahydro-2,2,5,8,8,9a-hexamethyl-4h-4a,9-methanoazuleno(5,6-d)-1,3-dioxole), ambroxide (3a,6,6,9a-tetramethyldodecahydronaphtho[2,1-b]-furan), amylformiate, aurelione (7-cyclohexadecene-1-on und 8-cyclohexadecene-1-on), boronal [2-methyl-4-(2,6,6-trimethyl-1-cyclohexene-1-yl)-butenal], brahmanol [2-methyl-4-(2,2,3-trimethyl-3-cyclopentenyl)-butanol], buccoxime (1,5-dimethylbicyclo[3.2.1]octan-8-onoxim), butylacetate, cantryl (2,2,3-trimethyl-3-cyclopentenyl-1-acetonitrile), cassix 150 (4-

methoxy-2-methyl-2-butanthiol), chrysantheme [1-(2,4-dimethyl-3-cyclohexene-1-yl)-2,2-dimethyl-1-propanone], cis-3-hexenylacetate, citronellylbutyrate, citronellyltiglate (3,7-dimethyl-6-octenyl-2-methylcrotonate), citronitrile (3-methyl-5-phenyl-2-pentennitrile), citrowanil b (alpha-ethenyl-alpha-methyl benzeneproprannitrile), claritone (2,4,7-tetramethyl-6-octene-3-on), corps racine vs [2-(3-phenylpropyl)pyridinr], coumarone (1-(2-benzofuranyl)-ethanon), cyclogalbanate (allylcyclohexyloxyacetate), cyclohexylmagnol (alpha-methylcyclohexanpropanol), datilate (1-cyclohexylethylcrotonate), ethyl-2-methylbutyrate, ethylisobutyrate, ethylisovalerate, ethyltricyclo[5.2.1,02,6]decan-2-ylcarboxylate, farenal (2,6,10-trimethyl-9-undecenal), filbertone (5-methyl-2-heptene-4-on), fleursandol (4-(3a,4,5,6,7,7a-hexahydro-4,7-methano-1h-inden-6-yl)-3-methyl-3-butene-2-ol), florazon (4-ethyl-alpha,alpha-dimethyl benzenepropanal), floropal (2,4,6-trimethyl-4-phenyl-1,3-dioxane), fragolane [(2,4-dimethyl-[1,3]dioxolane-2-yl)acetic acid ethylester], frutinat (but-2-en acid-1,3-dimethylbutyl ester), gamma-decalactone, geranylacetate, geranylbutyrate, geranyltiglate (trans-3,7-dimethyl-2,6-octadienyl-2-methylcrotonate), globalide [(11/12)-pentadecen-15-olide], globanone (8-cyclohexadecene-1-on), hexylbutyrate, hydrocitronitrile (beta-methyl-benzenepentannitrile), indianol (4-[3a,4,5,6,7,7a-hexahydro-4,7-methano-1h-inden-5(6)-yl]-3-methyl-3-butene-2-ol), indoflor (4,4a,5,9b-tetrahydroindeno[1,2-d]-m-dioxin), irisnitrile (2-nonenylitrile), isoamylacetate, isoamylisovalerianate, isodamascon [1-(2,4,4-trimethyl-2-cyclohexene-1-yl)-2-butene-1-on], isomuscon (cyclohexadecanon), jacinthaflor (2-methyl-4-phenyl-1,3-dioxolan), ketamber (dodecahydro-3,8,8,11a-tetramethyl-5h-3,5a-epoxynaphth[2.1-c]oxepine), lactojasmon (4-hexyl-4-methylbutyrolactone), leguminal (propanal-methyl-cis-3-hexenyl-acetal), macrolide (oxacyclohexadecan-2-on), madranol (mixture of different hexahydro methylionone), magnolan (2,4-dimethyl-5,6-indeno-1,3-dioxan), majantol [2,2-dimethyl-3-(3-methylphenyl)-propanol], mandaril (3,12-tridecadiennitrile), menthylacetate, methylbutyrate, methylidihydrojasmonate, methylisobutyrate, mintonat (3,3,5-trimethylcyclohexylacetate), mugetanol [1-(4-isopropylcyclohexyl)-ethanol], nerolione [1-(3-methyl-2-benzofuranyl)-ethanon], octylacetate, ozonile (2-tridecennitrile), palisandal (1,1-dimethoxycyclododecan), palisandin (cyclododecylmethyl ether), parmanyil [3-(cis-3-hexenyloxy)-propannitrile], passifloran (3-acetylthiohexylacetate), peacholide (cis- und trans-3-methyl-gamma-decalacton), prenysalicylat, profarnesal (2,6,10-trimethyl-5,9-undecadienal), projasmon p (2-heptylcyclopentanon), pyroprunate (but-2-en acid bicyclopenten-2-yl-ester), rholiate (carbonic acid-ethyl-2,3,6-trimethylcyclohexylester), rosaphen (2-methyl-5-phenylpentan-1-ol), rosenoxid, sandel 80 (trans-3-isocamphylcyclohexanol), sandranol (2-ethyl-4-(2,2,3-trimethyl-3-cyclpentene-1-yl)-2-buten-1-ol), symrose (4-isoamylcyclohexanol), symroxane (4-(3-methylbutyl)-cyclohexanol (z)), tabanon [4-(2-butenyiden)-3,4,5-trimethyl-2-cyclohexene-1-on], terpineol-4, timberol (2,2,6-trimethyl-alpha-propyl-cyclohexanpropanol), tolylacetataldeyde d para (4-methyl-benzene-

acetaldehyde), tricyclodecenylpropionate, tropicol (2-mercapto-2-methyl-pentan-1-ol), vertosine [2-(2,4-(or 3,5)-dimethyl-3-cyclohexene-1-yl) -methylenaminobenzoic acid-methylester], vertral (octahydro-4,7-methano-1h-indencarbaldehyde), vetikolacetate (1,3-dimethyl-3-phenylbutylacetate), vetival (4-cyclohexyl-4-methylpentan-2-on), ysamber k
 5 (spiro hexahydro-1',1',5',5'-tetramethyl-[1,3-dioxolan-2,8'-(5'h)-[2h-2, 4a]-methanonaphthalene].

Further preferred aromatic substances are listed in S. Arctander, Perfume and Flavor Materials, Vol. I and II, Montclair, N. J. 1969, self-publishing, or K. Bauer et al., Common Fragrance and Flavor Materials, 5th Edition, Wiley-VCH, Weinheim 2006.

10 Alternatively or additionally, extracts of natural raw materials can be used, e.g. essential oils, concretes, absoluts, resins, resinoids, balms, tinctures, such as e.g. ambratincture; amyris oil; angelicaseed oil; angelicaroot oil; anise oil; valerian oil; basil oil; tree moss-absolue; bay oil; mugwort oil; benzoic resin; bergamot oil; beeswax-absolue; birch tar oil; bitter almond oil; savoury oil; bucco leaf oil; cabreuva oil; cade oil; calmus oil; campher
 15 oil; cananga oil; cardamomen oil; cascarilla oil; cassia oil; cassie-absolue; castoreum-absolue; cedar leaf oil; cedar wood oil; cistus oil; citronella oil; lemon oil; copaivabalm; copaivabalm oil; coriander oil; costus root oil; cumin oil; cypressoil; davana oil; dill herb oil; dill seed oil; eau de brouts-absolue; oakmoss-absolue; elemi oil; estragon oil; eucalyptus-citriodora- oil; eucalyptus oil; fennel oil; spruce needle oil; galbanum oil;
 20 galbanumresin; geranium oil; grapefruit oil; guajak wood oil; gurjunbalm; gurjunbalm oil; helichrysum-absolue; helichrysum oil; ginger oil; iris root-absolue; iris root oil; jasmin-absolue; kalmus oil; chamomile oil blue; chamomile oil roman; carrot seed oil; kaskarilla oil; pine needle oil; spearmint oil; caraway oil; labdanum oil; labdanum-absolue; labdanumresin; lavandin-absolue; lavandin oil; lavender-absolue; lavender oil; lemongras
 25 oil; lovage oil; lime oil distilled; limette oil pressed; linaloe oil; litsea-cubeba- oil; bay leaf oil; macis oil; majoram oil; mandarin oil; massoirinden oil; mimosa-absolue; musk grain oil; musk tincture; muscatel-sage oil; nutmeg oil; myrrh-absolue; myrrh oil; myrtlen oil; carnation leaf oil; carnation blossom oil; neroli oil; olibanum-absolue; olibanum oil; opopanax oil; orange blossom-absolue; orange oil; organum oil; palmarosa oil; patchouli
 30 oil; perilla oil; perubalm oil; parsley leaf oil; parsley seed oil; petitgrain oil; peppermint oil; pepper oil; piment oil; pine oil; poley oil; rose-absolue; rosewood oil; rose oil; rosemary oil; sage oil dalmatian; sage oil spanish; sandalwood oil; celery seed oil; spike lavender oil; star anise oil; styrax oil; marigold oil; fir needle oil; tea tree oil; turpentine oil; thyme oil; tolubalm; tonka-absolue; tuberose absolue; vanilla extract; violet leaf absolue; verbena
 35 oil; vetiver oil; juniper oil; wine yeast oil; vermouthe oil; wintergreen oil; ylang oil; ysaop oil;

zibet-absolue; cinnamon leaf oil; cinnamon bark oil as well as fractions thereof or ingredients isolated thereof.

Single aromatic substances selected from the group of carbohydrates can also be used. Particularly preferred single aromatic substances to be used and of the group of carbohydrates are e.g. 3-carene; alpha-pinene; beta-pinene; alpha-terpinene; gamma-terpinene; p-cymol; bisabolene; camphene; caryophyllene; cedrene; farnesene; limonene; longifolene; myrcene; ocimene; valencene; (e,z)-1,3,5-undecatriene; styrole; diphenylmethan; aliphatic alcohols such as e.g. hexanol; octanol; 3-octanol; 2,6-dimethylheptanol; 2-methyl-2-heptanol; 2-methyl-2-octanol; (e)-2-hexenol; (e)- und (z)-3-hexenol; 1-octen-3-ol; mixture of 3,4,5,6,6-pentamethyl-3/4-hepten-2-ol und 3,5,6,6-tetramethyl-4-methyleneheptan-2-ol; (e,z)-2,6-nonadienol; 3,7-dimethyl-7-methoxyoctan-2-ol; 9-decenol; 10-undecenol; 4-methyl-3-decen-5-ol; aliphatic aldehydes and their acetates as e.g. hexanal; heptanal; octanal; nonanal; decanal; undecanal; dodecanal; tridecanal; 2-methyloctanal; 2-methylnonanal; (e)-2-hexenal; (z)-4-heptenal; 2,6-dimethyl-5-heptenal; 10-undecenal; (e)-4-decenal; 2-dodecenal; 2,6,10-trimethyl-9-undecenal; 2,6,10-trimethyl-5,9-undecadienal; heptanaldiethylacetal; 1,1-dimethoxy-2,2,5-trimethyl-4-hexene; citronellyloxyacetaldehyde; 1-(1-methoxy-propoxy)-(e/z)-3-hexene; aliphatic ketones and their oximes such as e.g. 2-heptanon; 2-octanon; 3-octanon; 2-nonanon; 5-methyl-3-heptanon; 5-methyl-3-heptanonoxime; 2,4,4,7-tetramethyl-6-octene-3-on; 6-methyl-5-heptene-2-on; aliphatic sulphurous compounds such as e.g. 3-methylthio-hexanol; 3-methylthiohexylacetate; 3-mercaptohexanol; 3-mercaptohexylacetate; 3-mercaptohexylbutyrate; 3-acetylthiohexylacetate; 1-menthen-8-thiol; aliphatic nitriles such as e.g. 2-nonene acid nitrile; 2-undecene acid nitrile; 2-tridecene acid nitrile; 3,12-tridecadiene acid nitrile; 3,7-dimethyl-2,6-octadiene acid nitrile; 3,7-dimethyl-6-octene acid nitrile; esters of aliphatic carboxylic acids such as e.g. (e)- und (z)-3-hexenylformiate; ethylacetoacetate; isoamylacetate; hexylacetate; 3,5,5-trimethylhexylacetate; 3-methyl-2-butenylacetate; (e)-2-hexenylacetate; (e)- and (z)-3-hexenylacetate; octylacetate; 3-octylacetate; 1-octen-3-ylacetate; ethylbutyrate; butylbutyrate; isoamylbutyrate; hexylbutyrate; (e)- and (z)-3-hexenyl-isobutyrate; hexylcrotonate; ethylisovalerianate; ethyl-2-methylpentanoate; ethylhexanoate; allylhexanoate; ethylheptanoate; allylheptanoate; ethyloctanoate; ethyl-(e,z)-2,4-decadienoate; methyl-2-octinate; methyl-2-noninate; allyl-2-isoamyloxyacetate; methyl-3,7-dimethyl-2,6-octadienoate; 4-methyl-2-pentylcrotonate; acyclic terpene alcohols such as e.g. citronellol; geraniol; nerol; linalool; lavadulol; nerolidol; farnesol; tetrahydrolinalool; tetrahydrogeraniol; 2,6-dimethyl-7-octene-2-ol; 2,6-dimethyloctane-2-ol; 2-methyl-6-methylene-7-octene-2-ol; 2,6-dimethyl-5,7-octadiene-2-ol; 2,6-dimethyl-3,5-octadiene-2-ol; 3,7-dimethyl-4,6-octadiene-3-ol; 3,7-dimethyl-1,5,7-octatriene-3-ol 2,6-dimethyl-2,5,7-octatriene-1-ol; as well as their

formiates, acetates, propionates, isobutyrate, butyrate, isovalerianates, pentanoates, hexanoates, crotonates, tiglinates and 3-methyl-2-butenates; acyclic terpene aldehydes and ketones such as e.g. geranial; neral; citronellal; 7-hydroxy-3,7-dimethyloctanal; 7-methoxy-3,7-dimethyloctanal; 2,6,10-trimethyl-9-undecenal; geranylacetone; as well as the dimethyl and diethylacetals of geranial, neral, 7-hydroxy-3,7-dimethyloctanal; cyclic terpene alcohols such as e.g. menthol; isopulegol; alpha-terpineol; terpinenol-4; menthan-8-ol; menthan-1-ol; menthan-7-ol; borneol; isoborneol; linalooloxide; nopol; cedrol; ambrinol; vetiverol; guajol; as well as their formiates, acetates, propionates, isobutyrate, butyrate, isovalerianates, pentanoates, hexanoates, crotonates, tiglinates and 3-methyl-2-butenates; cyclic terpene aldehydes and ketones such as e.g. menthone; isomenthone; 8-mercaptomenthan-3-one; carvone; campher; fenchone; alpha-ionone; beta-ionone; alpha-n-methylionone; beta-n-methylionone; alpha-isomethylionone; beta-isomethylionone; alpha-irone; alpha-damascone; beta-damascone; beta-damascenone; delta-damascone; gamma-damascone; 1-(2,4,4-trimethyl-2-cyclohexene-1-yl)-2-buten-1-one; 1,3,4,6,7,8a-hexahydro-1,1,5,5-tetramethyl-2h-2,4a-methanonaphthalene-8(5h)-one; 2-methyl-4-(2,6,6-trimethyl-1-cyclohexene-1-yl)-2-butenal; nootkatone; dihydronootkatone; 4,6,8-megastigmatrien-3-one; alpha-sinensal; beta-sinensal; acetylated cedar wood oil (methylcedrylketone); cyclic alcohols such as e.g. 4-tert-butylcyclohexanol; 3,3,5-trimethylcyclohexanol; 3-isocamphylcyclohexanol; 2,6,9-trimethyl-2,2,5,9-cyclododecatriene-1-ol; 2-isobutyl-4-methyltetrahydro-2h-pyran-4-ol; cycloaliphatic alcohols such as e.g. alpha,3,3-trimethylcyclohexylmethanol; 1-(4-isopropylcyclohexyl)ethanol; 2-methyl-4-(2,2,3-trimethyl-3-cyclopent-1-yl) butanol; 2-methyl-4-(2,2,3-trimethyl-3-cyclopent-1-yl)-2-butene-1-ol; 2-ethyl-4-(2,2,3-trimethyl-3-cyclopent-1-yl)-2-butene-1-ol; 3-methyl-5-(2,2,3-trimethyl-3-cyclopent-1-yl)-pentan-2-ol; 3-methyl-5-(2,2,3-trimethyl-3-cyclopent-1-yl)-4-pentene-2-ol; 3,3-dimethyl-5-(2,2,3-trimethyl-3-cyclopent-1-yl)-4-pentene-2-ol; 1-(2,2,6-trimethylcyclohexyl)pentan-3-ol; 1-(2,2,6-trimethylcyclohexyl)hexan-3-ol; cyclic and cycloaliphatic ether such as e.g. cineol; cedrylmethyl ether; cyclododecylmethyl ether; 1,1-dimethoxycyclododecan; (ethoxymethoxy)cyclododecan; alpha-cedrenepoxide; 3a,6,6,9a-tetramethyldodecahydronaphtho[2,1-b]furan; 3a-ethyl-6,6,9a-trimethyldodecahydronaphtho[2,1-b]furan; 1,5,9-trimethyl-13-oxabicyclo[10.1.0]trideca-4,8-diene; rose oxide; 2-(2,4-dimethyl-3-cyclohexene-1-yl)-5-methyl-5-(1-methylpropyl)-1,3-dioxane; cyclic and macrocyclic ketones such as e.g. 4-tert.-butylcyclohexanone; 2,2,5-trimethyl-5-pentylcyclopentanone; 2-heptylcyclopentanone; 2-pentylcyclopentanone; 2-hydroxy-3-methyl-2-cyclopentene-1-one; 3-methyl-cis-2-pentene-1-yl-2-cyclopentene-1-one; 3-methyl-2-pentyl-2-cyclopentene-1-one; 3-methyl-4-cyclopentadecenone; 3-methyl-5-cyclopentadecenone; 3-methylcyclopentadecanone; 4-(1-ethoxyvinyl)-3,3,5,5-tetramethylcyclohexanone; 4-tert-pentylcyclohexanone; 5-cyclohexadecene-1-one; 6,7-

dihydro-1,1,2,3,3-pentamethyl-4(5h)-indanone; 8-cyclohexadecene-1-one; 9-cycloheptadecene-1-one; cyclopentadecanone; cyclohexadecanone; cycloaliphatic aldehydes such as e.g. 2,4-dimethyl-3-cyclohexencarbaldehyde; 2-methyl-4-(2,2,6-trimethyl-cyclohexene-1-yl)-2-butenal; 4-(4-hydroxy-4-methylpentyl)-3-cyclohexencarbaldehyde; 4-(4-methyl-3-pentene-1-yl)-3-cyclohexencarbaldehyde; cycloaliphatic ketones such as e.g. 1-(3,3-dimethylcyclohexyl)-4-pentene-1-one; 2,2-dimethyl-1-(2,4-dimethyl-3-cyclohexene-1-yl)-1-propanone; 1-(5,5-dimethyl-1-cyclohexene-1-yl)-4-pentene-1-one; 2,3,8,8-tetramethyl-1,2,3,4,5,6,7,8-octahydro-2-naphthalenylmethylketone; methyl-2,6,10-trimethyl-2,5,9-cyclododecatrienylketone; tert.-butyl-(2,4-dimethyl-3-cyclohexen-1-yl)ketone; esters of cyclic alcohols such as e.g. 2-tert-butylcyclohexylacetate; 4-tert-butylcyclohexylacetate; 2-tert-pentylcyclohexylacetate; 4-tert-pentylcyclohexylacetate; 3,3,5-trimethylcyclohexylacetate; decahydro-2-naphthylacetate; 2-cyclopentylcyclopentylcrotonate; 3-pentyltetrahydro-2h-pyran-4-ylacetate; decahydro-2,5,5,8a-tetramethyl-2-naphthylacetate; 4,7-methano-3a,4,5,6,7,7a-hexahydro-5, or 6-indenylacetate; 4,7-methano-3a,4,5,6,7,7a-hexahydro-5, or 6-indenylpropionate; 4,7-methano-3a,4,5,6,7,7a-hexahydro-5, or 6-indenylisobutyrate; 4,7-methanooctahydro-5, or 6-indenylacetate; esters of cycloaliphatic alcohols such as e.g. 1-cyclohexylethylcrotonate; esters of cycloaliphatic carboxylic acids such as e.g. allyl-3-cyclohexylpropionate; allylcyclohexyloxyacetate; cis- and trans-methyldihydrojasmonate; cis- and trans-methyljasmonate; methyl-2-hexyl-3-oxocyclopentancarboxylate; ethyl-2-ethyl-6,6-dimethyl-2-cyclohexencarboxylate; ethyl-2,3,6,6-tetramethyl-2-cyclohexencarboxylate; ethyl-2-methyl-1,3-dioxolan-2-acetate; araliphatic alcohols such as benzene alcohol; 1-phenylethylalcohol; 2-phenylethylalcohol; 3-phenylpropanol; 2-phenylpropanol; 2-phenoxyethanol; 2,2-dimethyl-3-phenylpropanol; 2,2-dimethyl-3-(3-methylphenyl)propanol; 1,1-dimethyl-2-phenylethylalcohol; 1,1-dimethyl-3-phenylpropanol; 1-ethyl-1-methyl-3-phenylpropanol; 2-methyl-5-phenylpentanol; 3-methyl-5-phenylpentanol; 3-phenyl-2-propen-1-ol; 4-methoxybenzene alcohol; 1-(4-isopropylphenyl)ethanol; esters of araliphatic alcohols and araliphatic carboxylic acids such as e.g. benzylacetate; benzylpropionate; benzylisobutyrate; benzylisovalerianate; 2-phenylethylacetate; 2-phenylethylpropionate; 2-phenylethylisobutyrate; 2-phenylethylisovalerianate; 1-phenylethylacetate; alpha-trichlormethylbenzylacetate; alpha,alpha-dimethylphenylethylacetate; alpha,alpha-dimethylphenylethylbutyrate; cinnamylacetate; 2-phenoxyethylisobutyrate; 4-methoxybenzylacetate; araliphatic ethers such as e.g. 2-phenylethylmethyl ether; 2-phenylethylisoamyl ether; 2-phenylethyl-1-ethoxyethyl ether, phenylacetaldehyddimethylacetale; phenylacetaldehyddiethylacetale; hydratropaaldehyddimethylacetale; phenylacetaldehydglycerinacetale; 2,4,6-trimethyl-4-phenyl-1,3-dioxan; 4,4a,5,9b-tetrahydroindeno[1,2-d]-m-dioxin; 4,4a,5,9b-tetrahydro-2,4-dimethylindeno[1,2-d]-m-dioxin; aromatic and araliphatic aldehydes such as e.g.

benzaldehyde; phenylacetaldehyde; 3-phenylpropanal; hydratropaaldehyde; 4-methylbenzaldehyde; 4-methylphenylacetaldehyde; 3-(4-ethylphenyl)-2,2-dimethylpropanal; 2-methyl-3-(4-isopropylphenyl)propanal; 2-methyl-3-(4-tert-butylphenyl)propanal; 2-methyl-3-(4-isobutylphenyl)propanal; 3-(4-tert-butylphenyl)propanal; cinnamic aldehyde; alpha-butylzimtaldehyde; alpha-amylzimtaldehyde; alpha-hexylzimtaldehyde; 3-methyl-5-phenylpentanal; 4-methoxybenzaldehyde; 4-hydroxy-3-methoxybenzaldehyde; 4-hydroxy-3-ethoxybenzaldehyde; 3,4-methylenedioxybenzaldehyde; 3,4-dimethoxybenzaldehyde; 2-methyl-3-(4-methoxyphenyl)propanal; 2-methyl-3-(4-methylenedioxyphenyl)propanal; aromatic and araliphatic ketones such as e.g. acetophenone; 4-methylacetophenone; 4-methoxyacetophenone; 4-tert.-butyl-2,6-dimethylacetophenone; 4-phenyl-2-butanone; 4-(4-hydroxyphenyl)-2-butanone; 1-(2-naphthalenyl)ethanone; 2-benzofuranylethanone; (3-methyl-2-benzofuranyl)ethanone; benzophenone; 1,1,2,3,3,6-hexamethyl-5-indanylmethylketone; 6-tert.-butyl-1,1-dimethyl-4-indanylmethylketone; 1-[2,3-dihydro-1,1,2,6-tetramethyl-3-(1-methylethyl)-1h-5-indenyl]ethanone; 5',6',7',8'-tetrahydro-3',5',5',6',8',8'-hexamethyl-2-acetonaphthone; aromatic and araliphatic carboxylic acids and their esters such as e.g. benzoic acid; phenylacetic acid; methylbenzoate; ethylbenzoate; hexylbenzoate; benzyl-benzoate; methylphenylacetate; ethylphenylacetate; geranylphenylacetate; phenylethyl-phenylacetate; methylcinnamate; ethylcinnamate; benzylcinnamate; phenylethylcinnamate; cinnamylcinnamate; allylphenoxyacetate; methylsalicylate; isoamylsalicylate; hexylsalicylate; cyclohexylsalicylate; cis-3-hexenylsalicylate; benzylsalicylate; phenylethylsalicylate; methyl-2,4-dihydroxy-3,6-dimethylbenzoate; ethyl-3-phenylglycidate; ethyl-3-methyl-3-phenylglycidate; nitrogenous aromatic compounds such as 2,4,6-trinitro-1,3-dimethyl-5-tert.-butylbenzol; 3,5-dinitro-2,6-dimethyl-4-tert-butylacetophenone; cinnamic acid nitrile; 3-methyl-5-phenyl-2-pentensäurenitrile; 3-methyl-5-phenylpentensäurenitrile; methylantranilate; methy-n-methylantranilate; schiff bases of methylantranilate with 7-hydroxy-3,7-dimethyloctanal, 2-methyl-3-(4-tert.-butylphenyl)propanal or 2,4-dimethyl-3-cyclohexencarbaldehyde; 6-isopropylchinoline; 6-isobutylchinoline; 6-sec.-butylchinoline; 2-(3-phenylpropyl)pyridine; indol; skatol; 2-methoxy-3-isopropylpyrazine; 2-isobutyl-3-methoxypyrazine; phenols, phenyl ethers and phenyl esters such as e.g. estragol; anethol; eugenol; eugenylmethyl ether; isoeugenol; isoeugenylmethyl ether; thymol; carvacrol; diphenyl ether; beta-naphthylmethyl ether; beta-naphthylethyl ether; beta-naphthylisobutyl ether; 1,4-dimethoxybenzol; eugenylacetate; 2-methoxy-4-methylphenol; 2-ethoxy-5-(1-propenyl)phenol; p-kresylphenylacetate; heterocyclic compounds such as e.g. 2,5-dimethyl-4-hydroxy-2h-furan-3-one; 2-ethyl-4-hydroxy-5-methyl-2h-furan-3-one; 3-hydroxy-2-methyl-4h-pyran-4-one; 2-ethyl-3-hydroxy-4h-pyran-4-one; lactones such as e.g. 1,4-octanolide; 3-methyl-1,4-octanolide; 1,4-nonanolide; 1,4-decanolide; 8-decen-

1,4-olide; 1,4-undecanolide; 1,4-dodecanolide; 1,5-decanolide; 1,5-dodecanolide; 4-methyl-1,4-decanolide; 1,15-pentadecanolide; cis- and trans-11-pentadecene-1,15-olide; cis- and trans-12-pentadecene-1,15-olide; 1,16-hexadecanolide; 9-hexadecene-1,16-olide; 10-oxa-1,16-hexadecanolide; 11-oxa-1,16-hexadecanolide; 12-oxa-1,16-hexadecanolide; ethylen-1,12-dodecandioate; ethylen-1,13-tridecandioate; coumarin; 2,3-dihydrocoumarin; and octahydrocoumarin.

The present article may be also employed for aroma-therapeutic applications. Examples for fragrance materials or perfumes with aroma-therapeutic properties that can be used in the present article are menthol, lavender, camphor, rosemary, eucalyptus, citronella, clove, jasmine, lemongrass, patchouli, peppermint, sandalwood etc.

The at least one fragrance may be incorporated into the carrier material by conventional methods known in the art. These methods may include forming the carrier material, such as a polymer foam or the porous polymer or hydrogel, and immersing the carrier material in the at least one fragrance or a solution of the at least one fragrance for a length of time sufficient to saturate the carrier material. It will be readily understood that some materials, such as cardboard, require drying upon performing such a procedure. The at least one fragrance may be incorporated with loading levels from 1 % to 200% by weight of the carrier material, preferably 1% to 99% by weight, 10% to 80% by weight, 20% to 70% by weight, 30% to 60% by weight, or 40% to 50% by weight of the carrier material.

The loading level usually depends from the formulation form, such as solid, liquid, or semisolid, and may be chosen accordingly. For instance, a pre-wetted reed may have a loading level of 1 to 30% by weight of the pre-wetted reed, such 5 to 25% by weight or 10 to 20% by weight of the pre-wetted reed. A dry reed may have a loading level of up to 200% by weight of the dry reed. A gel may have a loading level of 1 to 70% by weight of the gel, such 10 to 60% by weight or 25 to 50% by weight of the gel. A gel may have a loading level of 1 to 70% by weight of the gel, such 10 to 60% by weight or 25 to 50% by weight of the gel. A membrane may exhibit a loading level of up to 100% by weight of the membrane. A membrane may exhibit a loading level of up to 100% by weight of the membrane. For instance, a membrane made of ethylene vinyl-acetate may exhibit a loading level of up to 30% of the membrane and a membrane made of silicone may exhibit a loading level of up to 50% of the membrane. Other possible loading forms, which may be employed, include powder forms, which allow loading levels of 100% or more of the carrier material, adsorbents, fibres, or cardboards.

Alternatively, the at least one fragrance may be incorporated in the system utilized to produce the carrier material itself. For instance, a solution of the at least one fragrance may be employed in the course of preparing cardboard material.

Producing a plastic material or a polymer may be performed by dissolving a monomer or monomers forming the polymer in at least one fragrance or a solution of the at least one fragrance. The monomers are subsequently polymerized by conventional means to form the polymer. In this manner the at least one fragrance and the polymer form either a single phase system much like a plasticized polymer, or the active compound and the polymer form a two phase system in which particulates of the compound are dispersed throughout the polymer.

The fragrances, as e.g. perfume oils, can also exist in dependence from the employed carrier material in a microencapsulated or spray dried form or as inclusion complexes or as extrusion products. These forms are well known in the art.

In case the at least one fragrance is comprised in a solid form which does not provide independent release of the at least one fragrance, for instance in a microencapsulated form, the article may provide a solvent for dissolving the solid form, such as the capsule, and releasing the fragrance(s) contained therein. Alternatively or in addition, the article may provide mechanical means, such as a grinder, for breaking the solid form, such as the capsule, and releasing the fragrance(s) contained therein. The advantage of such "release forms" resides in an accurate sustained release of the fragrance(s) over a long period of time.

According to an embodiment of the present invention, the article further comprises at least one further carrier material, the further carrier material comprising at least one further fragrance, wherein the article is adapted for simultaneously or sequentially releasing the further fragrance with the at least one first fragrance and the at least one second fragrance.

The further carrier material and the at least one further fragrance are as already indicated above. The present article may therefore comprise or consist in addition to the first carrier material comprising at least one first fragrance and the second carrier material comprising at least one second fragrance a further carrier material comprising at least one further fragrance. Any number of further carrier materials, preferably one or more, 2 or more, 3 or more, 4 or more, 5 or more, 6 or more, 7 or more, 8 or more, or more, 10 or more, 13 or

more, or 18 or more may be employed. Each of the further carrier materials comprising at least one further fragrance is individually adapted for simultaneously or sequentially releasing the at least one further fragrance. For instance, in case of one further carrier material, the at least one further fragrance is released either simultaneously or sequentially.

The article may be advantageously designed for permitting the simultaneous or sequential release of further fragrance(s) in exchange or in addition to any of the first fragrance and/or second fragrance thereby permitting a variety of different fragrance combinations. Hence, the customer may select specific combination of fragrances according to his/her mood. Annoyance of the customer may be thereby prevented. The sequential release of further fragrance(s) permits extending shelf life of the present article to time periods 2 months or more, such as 3 months or more, 4 months or more, 5 months or more, 6 months or more, 1 year or more, or even 2 years or more, by permitting the customer the possibility to select further fragrance(s) in case any fragrance(s) has/have been faded or at least partially consumed/dissipated.

The article preferably provides the simultaneous and/or sequential release of further fragrance(s) manually and/or automatically. It is particularly preferred to provide simultaneous and/or sequential release of further fragrance(s) in an automated manner after expiry of a certain time period, such as 1 to 6 weeks, preferably, 2 to 5 weeks, or 3 to 4 weeks and/or in response to any triggering event, including one or more of fading of one or more fragrances, sunrise, sundown, and detection of presence or absence of one or more persons in the environment. The present article may comprise suitable sensors for detection of one or more triggering events.

It is preferred that the first carrier material and/or the second carrier material is/are at least partially separated from any further carrier material(s) by at least one separating layer. In case a plurality of further carrier materials is employed, it is preferred that these carrier materials are also at least partially separated by each other by at least one separating layer. Due to the various constructions of the present article, particularly in view of the present approach that the article may have any shape and/or the carrier materials may have any orientation with respect to each other, the number of separating layer(s) is not interrelated to the number of carrier materials.

The at least one further fragrance may be any fragrance(s). Preferably, the further fragrance(s) is/are different from the at least one first fragrance and the at least one

second fragrance. Hence, the present article may simultaneously release multiple different scents.

According to an embodiment of the present invention, the article further comprises at least one further separating layer, which at least partially separates the at least one
5 further carrier material and the first carrier material and/or the second carrier material.

As indicated above this further separating layer(s) at least partially separate the at least one further carrier material from the first carrier material and/or the second carrier material.

Hence, an exemplary article comprises the first carrier material, the second carrier
10 material and one further carrier material, wherein each carrier material comprises a single fragrance which are different from each other. The article further comprises two separating layers which are sandwiched by two of the carrier materials, respectively. Hence, the present article comprises an alternating sequence of carrier material and separating layer. The carrier materials and the separating layers are preferably liquid
15 materials. It will be appreciated that any number of alternating carrier material (layer) and separating layer may be employed.

An exemplary article may be provided in form of a kit encompassing the first and second liquid carrier materials (and optionally further liquid carrier material(s)) and liquid separating layer(s) provided in respective receptacles, such as bottles. In case the liquid
20 carrier material is water, an empty receptacle may be provided. The liquid carrier materials may be already provided with the at least one fragrance, respectively. Alternatively, the fragrances may be provided in individual receptacles. The kit may further comprise one or more dyes for individually colouring the liquid carrier material(s) and the separating layer(s). The kit may further encompass at least one transparent
25 receptacle, made e.g. of glass, for including the individual carrier materials and separating layer(s). In addition, the kit may encompass one or more reeds and instructions. The at least one transparent receptacle may have any shape and may provide one or more transparent compartments. Each of these transparent compartments has an aperture for filling the first and second liquid carrier materials (and optionally
30 further liquid carrier material(s)) and liquid separating layer(s). The kit may further encompass one or more refills for substituting consumed constituents, such as a fragrance and a mixture of fragrances. Optionally, the one or more refills may be resealed.

According to an embodiment of the present invention, the article simultaneously releases at least three fragrances, preferably at least four fragrances, more preferably at least five fragrances.

Each of the at least three fragrances, preferably at least four fragrances, more preferably at least five fragrances, pertains independent from each other to a single fragrance or to a mixture of fragrances. The single fragrance or the mixture of fragrances may be furthermore comprised in a carrier material which is preferably different from the first and second carrier materials. The present article may therefore encompass in addition to the first carrier material comprising at least one first fragrance and the second carrier material comprising at least one second fragrance any numbers of fragrances, alone or in combination, and which are comprised in any number of carrier materials.

According to a preferred embodiment of the present invention, the present article further comprises a housing and/or a packaging.

The housing and/or packaging may be made of any materials and may have any shape and/or colour(s). The materials are well known to the skilled person and encompass for instance glass, transparent or intransparent plastic materials, or cardboard. As indicated above, some parts of the housing or even the complete housing may be made of a carrier material, which comprises at least one fragrance, as indicated above. The housing is preferably made of transparent material(s) enabling the consumer to see the carrier materials, in particular their shape, color and arrangement. The housing and/or packaging is preferably biodegradable or recyclable.

It will be readily understood that opening of a packaging may coincide with using of the article. In said case the packaging is the only material isolating the fragrance(s) from the environment.

The housing may have no parts which are made of a carrier material comprising at least one fragrance. Hence, the at least one first carrier material and the at least one second carrier material are located inside the housing. The housing is adapted for simultaneously providing access to the at least one first carrier material and the at least one second carrier material. This may be achieved by mechanical means or electronic means which are well known to the skilled person.

According to a preferred embodiment of the present invention, the housing provides at least one outer layer, which at least partially separates the first carrier material and the environment and/or the second carrier material and the environment.

The outer layer may be made from the same materials as the separating layer. For instance, the outer layer may also provide controlled release of the at least one first fragrance and/or the at least one second fragrance. It will be appreciated that any number and type of outer layers may be employed. These outer layers may be present alone or in combination, i.e. as a pile, and/or formed on a portion of surface of the carrier material only while on the remainder surface portion of the carrier material another outer layer(s) or separating layer(s) or no separating layer(s) is/are formed.

The at least one outer layer may be the walls of a receptacle. A preferred example of a housing is a transparent receptacle, such as a bottle. The receptacle, such as a bottle, may be made of glass or plastics. The housing may be provided with one or more transparent compartments, wherein each of the compartments is adapted for including the carrier materials, preferably liquid carrier materials, and one or more separating layers. Each of the compartments may be provided with individual closing means. Advantageously, the receptacle may be made of biodegradable material or a recyclable material.

According to still another preferred embodiment of the present invention, the housing provides at least a first closable compartment comprising the first carrier material and a second closable compartment comprising the second carrier material, wherein the first closable compartment and the second closable compartment are adapted for simultaneous opening.

The closure(s) may be any conceivable mechanical means. Such means are well known to the skilled person. The closure(s) may be either engaged manually or in an electric manner. It will be appreciated that between the closure of the compartment and the respective carrier material also a separating membrane, preferably a separating membrane, for providing controlled release of the fragrance(s) may be provided. More preferably, the separating membrane is at least partially or completely water soluble. Alternatively or in addition, the control device may control vaporizing and/or atomizing of the at least one fragrance.

According to a preferred embodiment of the present invention, the housing comprises an electric or mechanical control device, the control device being adapted for simultaneously releasing at least two fragrances.

5 In case of electric engaging, the closure(s) may be (selectively) opened and/or (selectively) closed by a control device. The control device may be further adapted for opening and/or closing a specific closure at a specific time.

The closure(s) are also engaged in an electric manner. In case of electric engaging, the closure(s) may be (selectively) opened and/or (selectively) closed by a control device. The control device may be further adapted to open and/or close a specific closure at a
10 specific time.

According to another preferred embodiment of the present invention, the housing comprises a holder.

The holder provides the possibility to attach the housing and thereby the article to any surface. Preferred surfaces encompass walls of a building, surfaces of an automobile,
15 such as the driving mirror, a rim of any toilet rimblock cage, or an inside surface of a laundry dryer. The skilled person is well aware about the construction of holders according to the intended use.

According to a special embodiment of the present invention, the article is a or is used as/in scent booster, preferably a laundry scent booster in/for a washing dryer, or as/in air
20 freshener.

The scent booster may encompass a liquid scent booster. A preferred example of a scent booster pertains to a laundry scent booster which encompasses for instance hand washing or dishwashing. The formulation of such agents for laundry care, hand laundry washing or dishwashing is well known to the person skilled in the art. Depending on the
25 kind of use, skin protecting or skin caring compounds and/or additives can be used herein. The hand laundry washing agent can particularly be a hygienic composition. Usually, the hygienic composition is used for the application on skin or hair. The term "hand laundry washing" is to be understood as manual laundry washing or laundry washing by hand. Therefore, a "hand laundry washing agent" is to be understood as an
30 agent used in such manual laundry washing or laundry washing by hand, such as a hand

detergent. The article, such as a laundry scent booster, may be also realisable or fixedly installed, preferably fixedly installed, in a washing dryer.

The use of the article as/in an air freshener encompasses various purposes including home, toilet, cellar, wardrobes, dish wash, suitcase, handbags, automobile and/or
5 mattress applications.

Preferably, the article is adapted for attaching to the rim of any toilet rim block cage or the inside of a laundry dryer. An article adapted for attaching to the inside of a laundry dryer may have a similar socket like an article which is adapted for attaching to the rim of any toilet rim block cage. The article can provide constant release of fragrance(s),
10 antimalodour or freshening agent(s) under elevated temperature usually prevailing in a dryer, preferably at a temperature in the range of from 30°C to 100°C, such as 40°C to 90°C, 30°C to 70°C, 40°C to 60°C or about 50°C, more preferably without negatively affecting or damaging cloths. Preferably a long lasting fragrance is used which can be better experienced on dry laundry later on. This provides the advantage that the
15 fragrance(s) is/are only released upon using the dryer.

According to still another preferred embodiment of the present invention, at least parts of the article are made by one or more of a 3D-printing technique, an injection moulding technique, glass moulding, and my plastic extrusion technique, preferably by the 3D-printing technique.

20 The present article may be made in any manner. 3D-printing and injection moulding techniques are well known to the skilled person. 3D-printing techniques, preferably inkjet based 3D-printing techniques, are particularly preferred since these techniques also offer the possibility to construct and handle not only parts of the housing but also the individual carrier materials and the at least one fragrances contained therein, and optionally
25 constructing of one or more separating layers, etc. Hence, the present article alone, or in combination with a housing, in conjunction with other optional constituents may be prepared by a single technique. This has the additional advantage that the 3D-printing device used for instance for preparing the housing may be simply reprogrammed to provide another shape of the housing and the article contained therein. In general any
30 technique available in the art for creating the article or parts thereof may be employed.

The present article or housing may be provided as a ready-to-use article or housing. It is furthermore conceivable to provide the present article or housing in form of a kit which

requires that the consumer performs one or more construction steps before using the article. For instance, the consumer may be provided with a plurality of carrier materials each comprising at least one fragrance. The individual carrier materials may further exhibit different shapes and/or colours. The carrier materials may be interconnected by clicking or another appropriate mechanism according to the consumer's needs. The kit may encompass in addition to the plurality of carrier materials each comprising at least one fragrance also one or more separating layers, a manual, etc.. The kit may further encompass one or more refills for substituting consumed constituents, such as a fragrance, and a mixture of fragrances. Optionally, the one or more refills may be resealed.

A preferred embodiment of the kit is a two dimensional or three dimensional puzzle, preferably a three dimensional puzzle, in which a plurality of puzzle pieces are provided which may be interconnected by the customer. Preferably, there is a single correct manner for interconnecting the puzzle pieces. The puzzle pieces are hereby carrier materials, such as the first and second carrier materials and optionally further carrier materials. Alternatively frames or compartments in form of puzzle pieces may be provided, wherein the frames or compartments comprise carrier materials, such as the first and second carrier materials and optionally further carrier materials. Other optional puzzle pieces comprise one or more separating layers and/or other, preferably solid, constituents. The puzzle pieces may comprise one or more of solid, semisolid, or liquid carrier materials to delivery fragrance at predetermined rate.

It will be appreciated that not all puzzle pieces need providing a carrier material having at least one fragrance. Rather one or more carrier materials may be provided as such, i.e. without at least one fragrance. Preferably, for each puzzle piece, which comprises or consists of a carrier material comprising at least one fragrance, a corresponding puzzle piece is present, which comprises or consists of a puzzle piece as such. In said case, the puzzle pieces may be freely combined to e.g. a complete picture shown on a two dimensional puzzle or a complete three dimensional object of a three dimensional puzzle at the same time providing any combination of fragrances.

According to a preferred embodiment of the present invention, the present article is a or is used as/in air freshener for home, toilet, cellar, wardrobes, dish wash, suitcase, handbags, breath and mattress applications.

The content of fragrance(s) in an article can, depending on the type or application range of the article, be varied in wide ranges. Typically, the content is in the range of 0.01 to

100 wt.% based on the total weight of the article, advantageously in the range of 0.1 to 90 wt.%, preferably in the range of 0.1 to 90 wt.%, such as 1 to 80 wt.%, 10 to 70 wt.%, 20 to 60 wt.% or 30 to 50 wt.%. In air fresheners the content can also be more than 10 wt.% based on the total weight of the article, preferably at least 20 wt.%, at least 30 wt.%, at
5 least 40 wt.%, or at least 50 wt.%.

The present invention also relates to the use of a solid/liquid/semisolid air freshener according to the invention, in particular in one of the preferred embodiments, for controlled release of fragrance into the air. Preferred is a use according to the invention for controlled release of fragrance into the air contained in a bathroom.

10 Another aspect of the present invention relates to a sanitary or bathroom appliance comprising a receptacle containing a solid air freshener according to the invention, in particular according to one of the preferred embodiments, wherein the receptacle comprises one or more water inlets and one or more discharge outlets for an aqueous solution of the air freshener.

15 In the context of the present invention, the expression "have/contain" or "having/containing" designates an open enumeration and does not exclude other components apart from the expressly named components.

In the context of the present invention, the expression "consists of" or "consisting of"
20 designates a closed enumeration and excludes any other components apart from the expressly named components.

In the context of the present invention, the expression "essentially consists of" or "essentially consisting of" designates a partially closed enumeration and designates
25 preparations which apart from the named components only have such further components as do not materially alter the character of the preparation according to the invention.

When in the context of the present invention a preparation is described with the use of the
30 expression "have" or "having", this expressly includes preparations which consist of said components or essentially consist of said components.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter. In the Figures shows

Fig. 1 an exemplary article for delivery of a fragrance;

Fig. 2 a first embodiment of an article for delivery of a fragrance according to the present invention;

5

Fig. 3 a second embodiment of an article for delivery of a fragrance according to the present invention;

10 Fig. 4 a third embodiment of an article for delivery of a fragrance according to the present invention;

Fig. 5a and 5b a third embodiment of an article for delivery of a fragrance according to the present invention;

15 Fig. 6 a variation of the third embodiment of an article for delivery of a fragrance according to the present invention;

Fig. 7a and 7b another variation of the third embodiment of an article for delivery of a fragrance according to the present invention; and

20

Fig. 8 an exemplary article for delivery of a fragrance in use.

Fig. 1 schematically discloses a layer structure 18 for delivery of a fragrance. The layer structure 18 comprises a first carrier material 20 comprising at least one first fragrance 30, and a second carrier material 22 comprising at least one second fragrance 32 which is different from the first fragrance 30. It will be appreciated that the layer structure 18 may comprise any number of further carrier materials, wherein each of said further carrier materials comprises at least one fragrance. The first carrier material 20 and the second carrier material 22 are made from a solid or semisolid material, such as cardboard or gel, and do not encompass any separating layer, in particular no separating layer which separates the first carrier material 20 and the second carrier material 22 from the environment, respectively. Hence, the first and second fragrances 30, 32 may be simultaneously released to the environment.

35 Fig. 2 schematically shows an article 10 for delivery of a fragrance. The article 10 comprises a first carrier material 20 comprising at least one first fragrance 30, and a second carrier material 22 comprising at least one second fragrance 32 which may be different from the first fragrance 30. The first carrier material 20 and the second carrier

material 22 are made from different liquid materials, such as water and ethanol, and are provided in a layered structure sandwiching a separating layer 40, such as a water soluble foil having a thickness of 50 to 500 nm. The water soluble foil may be made of a polyvinylalcohol or a water soluble polysaccharide, such as starch or a modified starch.

5 The liquid carrier material dissolves the water soluble foil after a certain period of time allowing simultaneous release of the first fragrance 30 and the second fragrance 32.

Fig. 3 shows an article 10 in form of a reservoir, in which two fragrances 30, 32 containing liquid carrier materials 22, 26 are provided. Intermixing of the two liquid carrier materials 22, 26 and thereby the two fragrances 30, 32 is prevented by employing a combination of
10 separating layers 40, 42. In the present case, the liquid carrier material 22 is water comprising fragrance 32 and the other liquid carrier material 26 is a solvent, such as DPMA, comprising fragrance 30. The lower separating layer 40 is a water insoluble material made of high density polyethylene with a thickness of 100 μm . The upper separating layer 42 is made of a liquid silicone rubber (LSR). Preferably, the solvent of
15 liquid carrier material 26 has a density higher than that of the upper separating layer 42. Two reeds 24 are shown comprising fragrance 32 or a combination of fragrances 30, 32 depending on immersion depth of the reeds 24. The reeds 24 may be used to pierce through the lower separating layer 40, thereby enabling the reeds 24 to provide the fragrance 32 of the liquid carrier material 22 to get into the environment. The upper
20 separating layer 42 prevents intermixing of the two liquid carrier materials.

Fig. 4 shows an article 10 in form of a reservoir, in which two fragrances 30, 32 containing liquid carrier materials 22, 26 are provided. Intermixing of the two liquid carrier materials 22, 26 and thereby the two fragrances 30, 32 is prevented by employing a combination of separating layers 40, 42. In the present case, the liquid carrier material 22 is a solvent
25 comprising fragrance 32 and the other liquid carrier material 26 is another solvent comprising fragrance 30. The lower separating layer 40 is a water soluble foil, such as a starch foil of 250 μm thickness, and the upper separating layer 42 is water. The other liquid carrier material 26 preferably has a density lower than that of water. The reeds 24 may be used to pierce through the lower separating layer 40, thereby enabling the reeds
30 24 to provide the fragrance 32 of the liquid carrier material 22 to get into the environment. Alternatively, water of the upper separating layer 42 dissolves the lower separating layer 40 after a certain period of time thereby enabling contact of the liquid carrier material 22 and the upper separating layer 42. Thereby, fragrances 30, 32 are simultaneously released. Simultaneous release may be promoted by selecting the solvent of liquid carrier
35 material 22 such that its density is higher than that of water and preferably also higher than that of the another solvent of liquid carrier material 26. In said case portions, such as

droplets or bubbles, of the liquid carrier material 22 comprising fragrance 32 rise to the surface of the liquid carrier material 26.

Fig. 5a and 5b show another embodiment of the present article 10. The article 10 exhibits a reservoir which is shared by inert material 44, in particular a glass material, into two compartments. The first compartment exhibits a liquid carrier material 22 with fragrance 32 and liquid carrier material 20 with fragrance 30 disposed thereon. The second compartment exhibits a liquid carrier material 26 with fragrance 34 and liquid carrier material 28 with fragrance 36 disposed thereon. The liquid carrier materials 22, 26 are separated by separating layer 40, such as a metal foil of a thickness of 50µm, for preventing intermixing. For instance, liquid carrier materials 22, 26 may be glycerol and liquid carrier materials 20, 28 may be water. Reeds 24 may be used to provide selective release of the different fragrances 30, 32, 34, 36 to the environment. Fig. 5a shows reeds 24 positioned in carrier materials 20, 22, 26 thereby enabling simultaneous release of fragrances 30, 32, 34 into the environment. Fig. 5b shows reeds 24 in another position, i.e. in carrier materials 22, 26, 28 thereby enabling simultaneous release of fragrances 32, 34, 36 into the environment.

Fig. 6 corresponds to Fig. 5a with the proviso of omitting the separating layer 40. In this case separating of the liquid carried materials 20, 30 is only obtained by employing liquids of different densities, such as glycerol as liquid carrier materials 22, 26 and water as liquid carrier materials 20, 28.

Fig. 7a and 7b show a further embodiment of the present article 10 which is similar to Fig. 5a. In said case, the separating layer 40 may be in form of a solid, impermeable material. In other words the separating layer 40 is preferably not pierceable by reed 24. Alternatively, the separating layer is merely intentionally pierceable, i.e. the customer has to act with a certain and controlled force for piercing the separating layer 40. As may be derived from Fig. 7a, the separating layer 40 is not continuously formed between the carrier materials 20, 22 and carrier material 26, 28. The separating leaves a contacting portion between these carrier materials of about 10% referred to the total contact area between carrier materials 20, 22 and carrier materials 26, 28, respectively. The contacting portions allow introducing reeds 24 in carrier materials 22, 26 with fragrances 32, 34, respectively. Contacting portions, in which the separating layer 40 is formed, stop the reeds 24 at the separating layer 40 with the consequence that these reeds 24 only contact carrier materials 20, 28 with fragrances 30, 36. This embodiment therefore allows selectively combining any of fragrances 30, 32, 34, 36 employing a corresponding number of reeds 24. It will be furthermore appreciated that the contact area is not

confined to 10% but may be e.g. from 1% to 30% referred to the total contact area between carrier materials 20, 22 and carrier materials 26, 28, respectively, preferably 5% to 20%, or 10% to 15%. The use of such a separating layer 40 assists in avoiding unintentional mixing of the carrier materials 20, 22 and carrier materials 26, 28, respectively. In addition, the article 10 provided with such a separating layer 40 may be reused by the customer by filling the lower and upper compartments successively with liquid carrier materials of different densities.

Fig. 7b shows a variation of the embodiment of Fig. 7a, wherein the separating layer 40 is formed with two contacting portions in form of holes 50 allowing contact of the carrier materials 20, 22 and carrier materials 26, 28, respectively. The holes 50 provide the only possibility for contacting a reed 24 with carrier materials 22, 26 and fragrances 32, 34, respectively.

Fig. 8 shows an example of the present article 10 provided with a housing 12 and a holder 60 for attaching the article 10 to the rim 80 of any toilet rim block cage. The present article 10 may have e.g. the same structure as disclosed in Fig. 2, preferably with the proviso of using a separating layer 40 or a combination of separation layers which withstands the employed solvents for a long period of time such as 4 to 5 weeks or more. The article 10 thereby offers release of fragrances for an elongated period of time. Alternatively, a similar socket can be created for a laundry dryer, wherein the article or formulation composition can provide constant release of fragrance(s), antimalodour or freshnening agent under elevated temperature usually prevailing in a dryer, preferably at a temperature in the range of from 30 to 100°C and without damaging cloths. Preferably, a long lasting fragrance is used which can be better experienced on dry laundry later on.

The present article thus offers, inter alia, the following advantages: Scent related limitations can be overcome by using the present multiple scent delivery. Single or multiple fragrance use is rendered possible at same time. The combination of solid, liquid, gel systems or formats in combination with one or more separating layers offers individually controlled release of fragrances alone or in combination with others. The adaptation of fragrance intensity and fragrance switch is possible by manual or electric setting. The article may be optically elegant through presence of e.g. different layers, which optionally have different colours. The customers may choose their own fragrance notes and intensity according to their mood. 3D printing or injection moulding technique can make the design more customized and acceptable. Biodegradable or recyclable receptacles or containers may be employed.

CLAIMS

1. Article (10) for delivery of a fragrance, the article (10) comprising or consisting of:

a first carrier material (20) comprising at least one first fragrance (30),

a second carrier material (22) comprising at least one second fragrance (32),
wherein the article (10) is adapted for sequential or simultaneous release of the at least one first fragrance (30) and the at least one second fragrance (32), characterized in that mass transfer between the first carrier material (20) and the second carrier material (22) is inhibited or prevented.
2. Article (10) according to claim 1, further comprising at least one separating layer (40, 42), which at least partially separates the first carrier material (20) and the second carrier material (22), wherein the first carrier material (20) and/or the second carrier material (22) is a liquid carrier material or a semisolid carrier material.
3. Article (10) according to claim 2, wherein the at least one separating layer (40, 42) is a material permeable to the at least one first fragrance (30) and/or the at least one second fragrance (32), preferably a membrane, or wherein the at least one separating layer (40, 42) is an inert material (44) impermeable to the at least one first fragrance (30) and/or second fragrance (32), preferably glass or plastic.
4. Article (10) according to any of the preceding claims, wherein the at least one first fragrance (30) and/or the at least one second fragrance (32) are selected from the group consisting of isobornyl acetate, limonene, ylanate, eucalyptol, dihydromyrcenol, amyl salicylate, benzyl acetate, geranyl nitrile, nerol, 2-methylundecanal and phenylethyl alcohol.
5. Article (10) according to any of the preceding claims, further comprising at least one further carrier material (26, 28), the further carrier material (26, 28) comprising a further fragrance (34, 36), wherein the article (10) is adapted for simultaneously or sequentially releasing the further fragrance (34, 36) with the at least one first fragrance (30) and the at least one second fragrance (32).

6. Article (10) according to claim 5, further comprising at least one further separating layer, which at least partially separates the at least one further carrier material (26, 28) and the first carrier material (20) and/or the second carrier material (22).
7. Article (10) according to any of the preceding claims, wherein the article (10) simultaneously releases at least three fragrances (30, 32, 34, 36), preferably at least four fragrances, more preferably at least five fragrances.
8. Article (10) according to any of the preceding claims, further comprising a housing (12) and/or a packaging.
9. Article (10) according to claim 8, wherein the housing (12) provides at least one outer layer, which at least partially separates the first carrier material (20) and the environment and/or the second carrier material (22) and the environment.
10. Article (10) according to any of claims 8 to 9, wherein the housing (12) provides at least a first closable compartment (50) comprising the first carrier material (20) and a second closable compartment (52) comprising the second carrier material (22), wherein the first closable compartment (50) and the second closable compartment (52) are adapted for simultaneous opening.
11. Article (10) according to any of claims 8 to 10, wherein the housing (12) comprises an electric or mechanical control device, the control device being adapted for simultaneously releasing at least two fragrances.
12. Article (10) according to any of claims 8 to 11, wherein the housing (12) comprises a holder (60).
13. Article (10) according to any of claims 8 to 12, wherein at least parts of the article (10) are made by one or more of a 3D-printing technique, an injection moulding technique and glass moulding, preferably wherein the complete article (10) is made by the 3D-printing technique.
14. Use of the article (10) according to any of the preceding claims as/in a scent booster, preferably a laundry scent booster in/for a washing dryer, or as/in an air freshener.

15. Use of the article (10) according to claim 14, as/in air freshener for home, toilet, cellar, wardrobes, dish wash, suitcase, handbags, automobile and/or mattress applications.

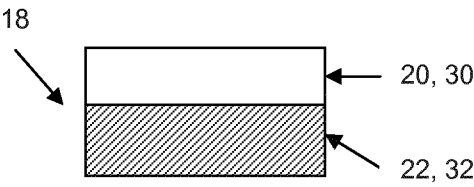


Fig. 1

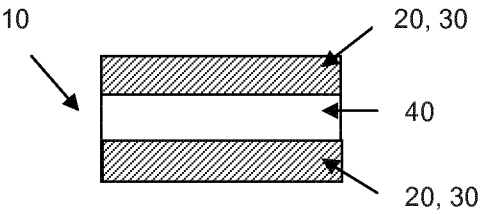


Fig. 2

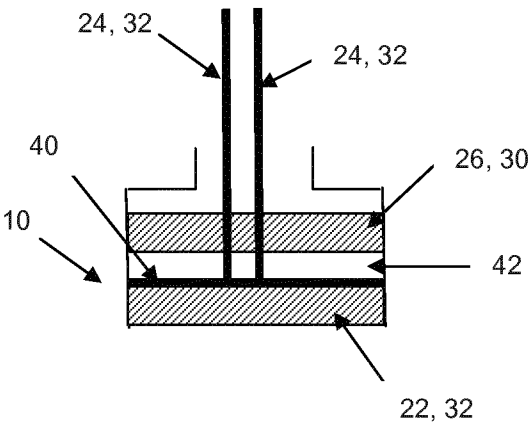


Fig. 3

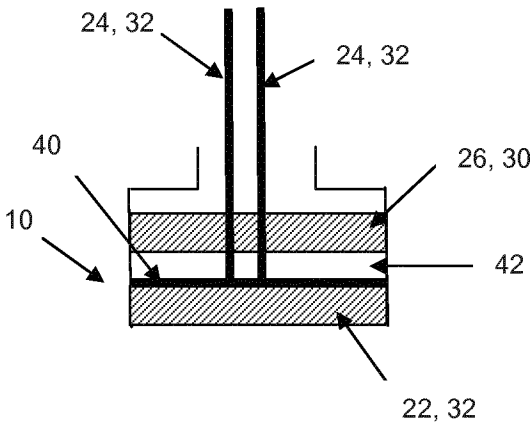


Fig. 4

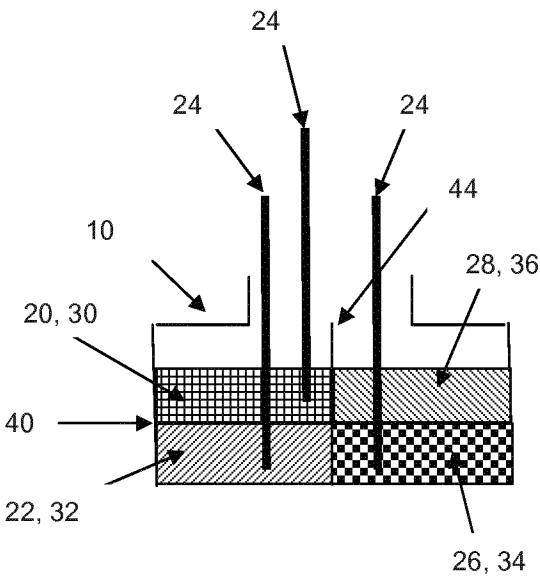


Fig. 5a

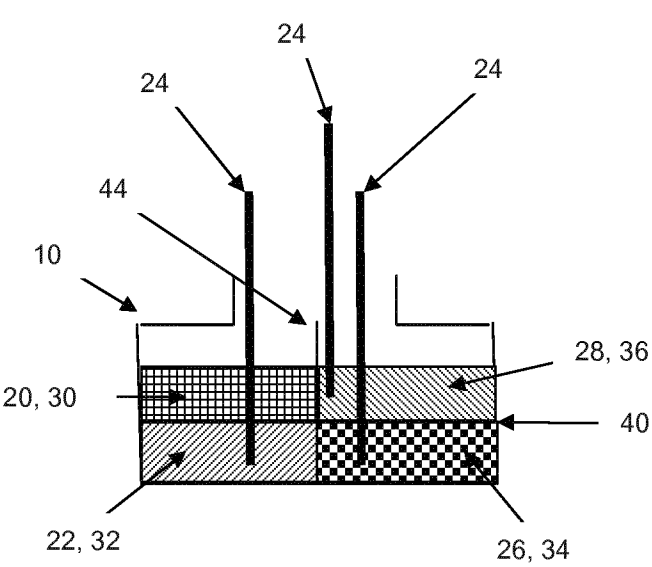


Fig. 5b

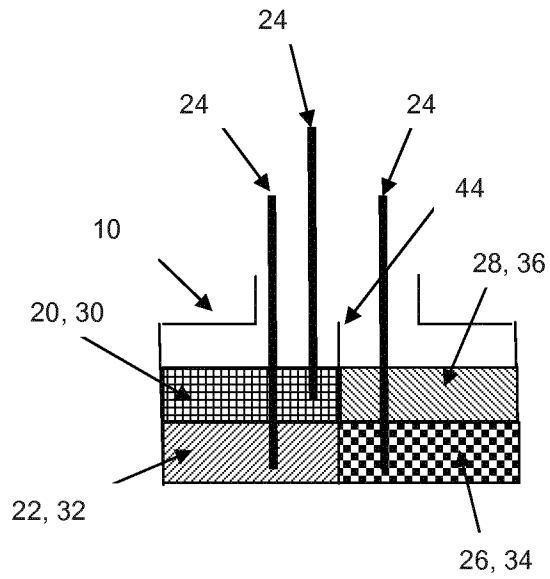


Fig. 6

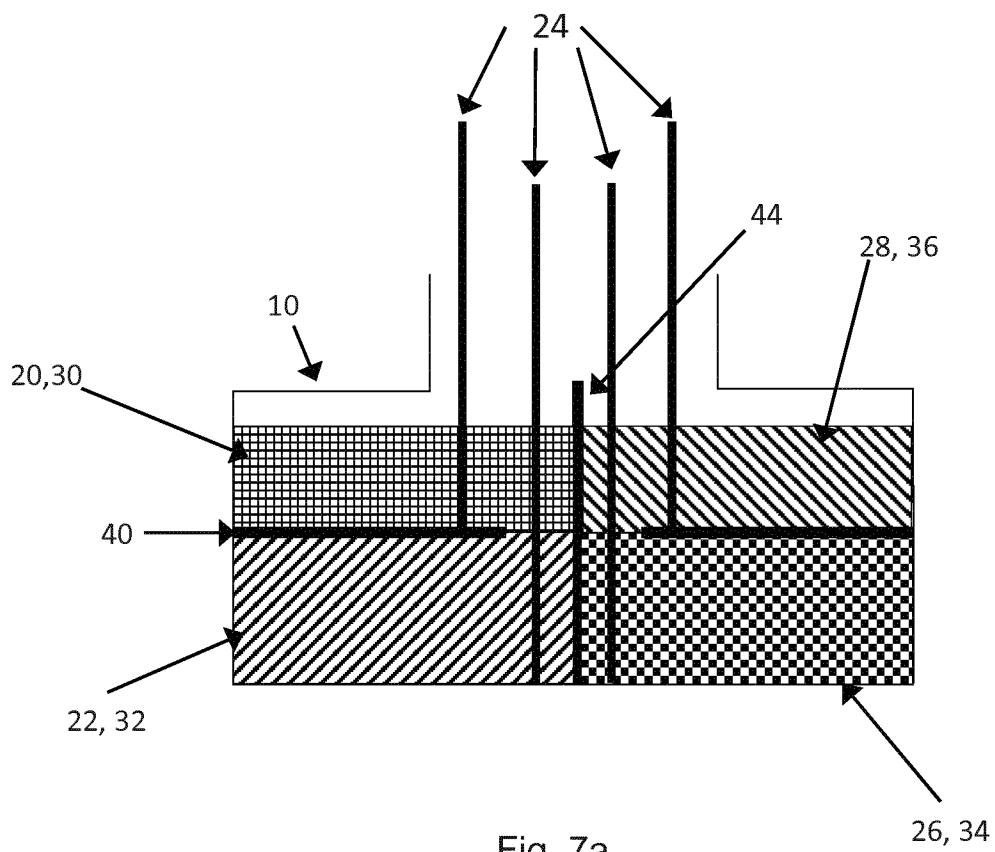


Fig. 7a

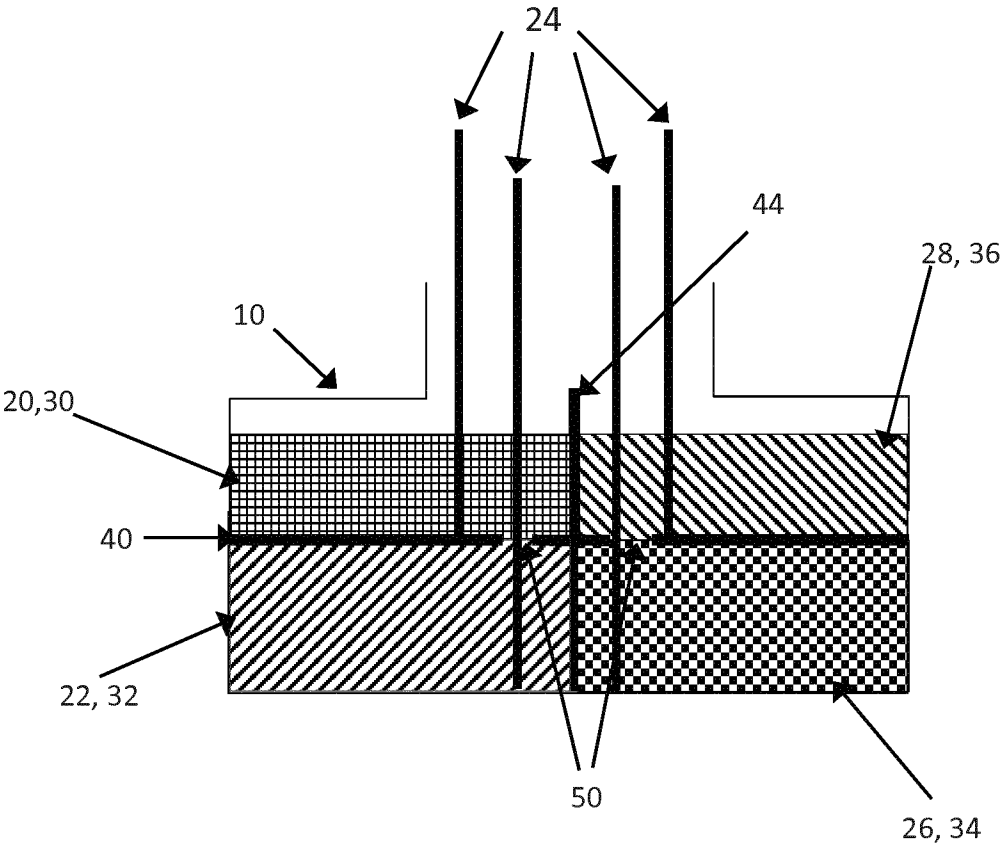


Fig. 7b

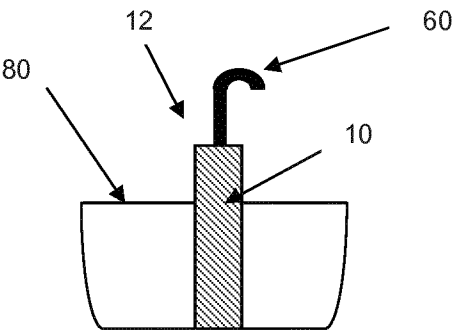


Fig. 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/050786

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61L9/03 A61L9/12
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 8 662 409 B2 (JOHNSON & SON INC S C [US]) 4 March 2014 (2014-03-04) column 3: line 20-25, line 46-47, line 50-56; column 4: line 47-50; column 5: line 50-57; column 6: line 7-12; figure: 1	1-3,5-9, 12-14
X	WO 2016/098114 A1 (AGAN AROMA & FINE CHEMICALS LTD [IL]) 23 June 2016 (2016-06-23) page 5: line 20-22 page 6: line 3-8, line 30-32; page 7: line 1-2; figure: 3A page 8: line 16-20 page 11: line 11-16	1,4,5,7, 8,10-15



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

12 September 2018

Date of mailing of the international search report

04/10/2018

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Authorized officer

Nania, Manuela

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2018/050786

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