



US 20090250371A1

(19) **United States**

(12) **Patent Application Publication**
Nicoll

(10) **Pub. No.: US 2009/0250371 A1**

(43) **Pub. Date: Oct. 8, 2009**

(54) **SYNERGISTICALLY-EFFECTIVE
COMPOSITION OF ZINC RICINOLEATE
AND ONE OR MORE SUBSTITUTED
MONOCYCLIC ORGANIC COMPOUNDS
AND USE THEREOF FOR PREVENTING
AND/OR SUPPRESSING MALODORS**

Publication Classification

(51) **Int. Cl.**
B65D 30/02 (2006.01)
B65D 85/00 (2006.01)
(52) **U.S. Cl.** **206/524.3; 383/116**

(57) **ABSTRACT**

(76) Inventor: **Stephen P. Nicoll**, Summit, NJ (US)

Correspondence Address:
**INTERNATIONAL FLAVORS & FRAGRANCES
INC.
521 WEST 57TH ST
NEW YORK, NY 10019 (US)**

Described are synergistically-effective compositions consisting essentially of zinc ricinoleate or solutions thereof and one or more of the substituted monocyclic organic compounds:
1-cyclohexylethan-1-yl butyrate;
1-cyclohexylethan-1-yl acetate;
1-cyclohexylethan-1-ol;
1-(4'-methylethyl)cyclohexylethan-1-yl propionate; and/or
2'-hydroxy-1'-ethyl(2-phenoxy)acetate
and uses of same and compositions containing same for preventing and/or suppressing malodors. Also described for the purpose of application to an inanimate laminar substantially solid surface are malodor-suppressing composition-containing stick articles containing an ester-terminated polyamide or an amide-terminated polyamide structural support polymer in combination with the aforementioned synergistically-effective zinc ricinoleate-substituted monocyclic organic compound composition. Also described is a package for conveniently handling the aforementioned stick article.

(21) Appl. No.: **12/343,129**

(22) Filed: **Dec. 23, 2008**

Related U.S. Application Data

(63) Continuation-in-part of application No. 10/706,888, filed on Nov. 13, 2003.

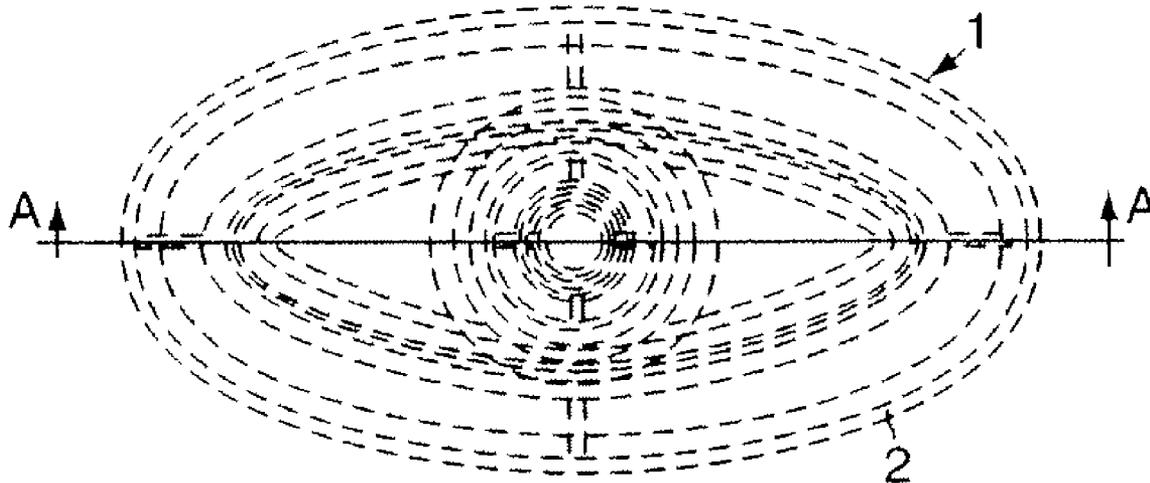


FIG. 1

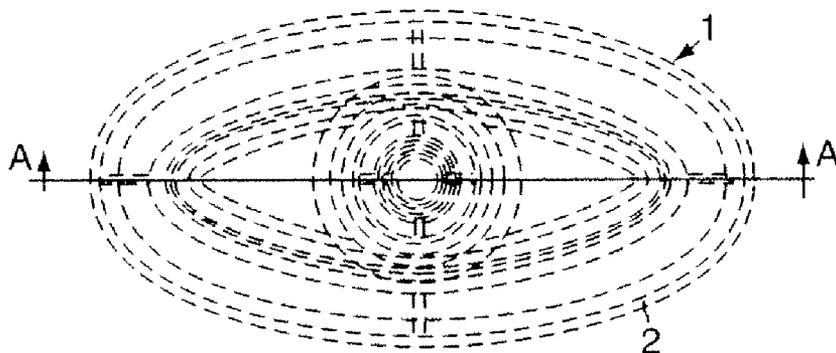


FIG. 2

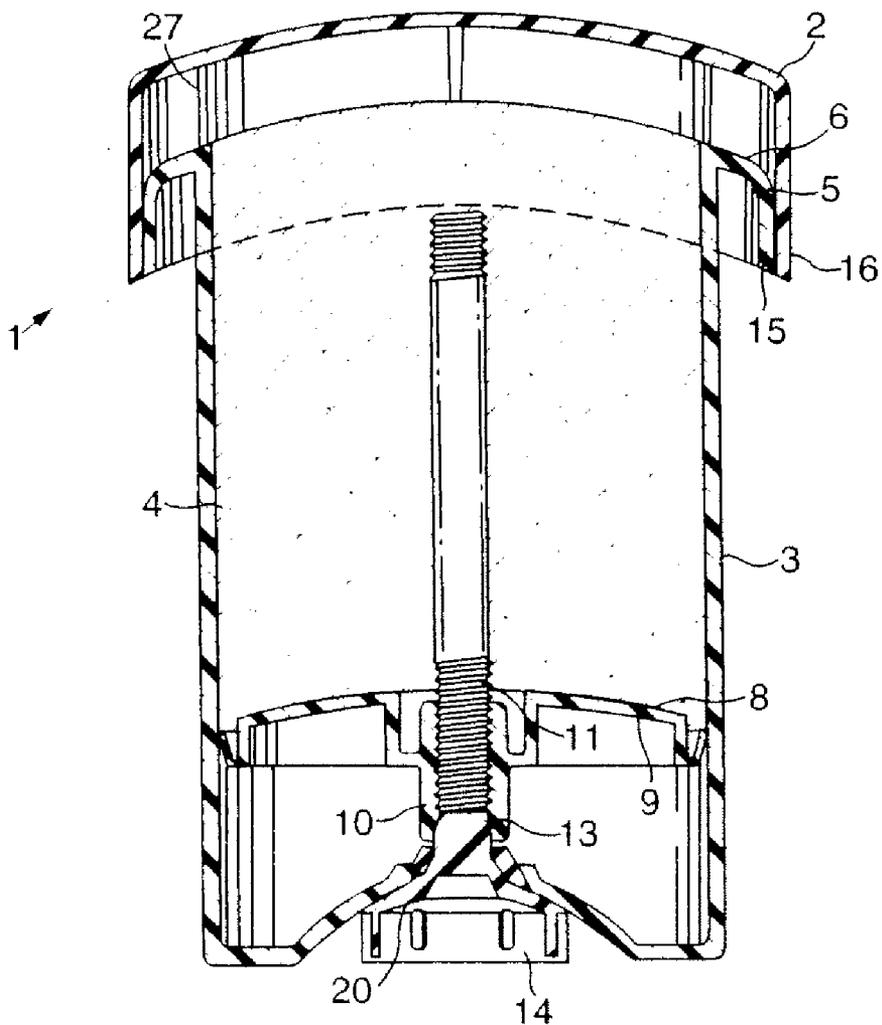
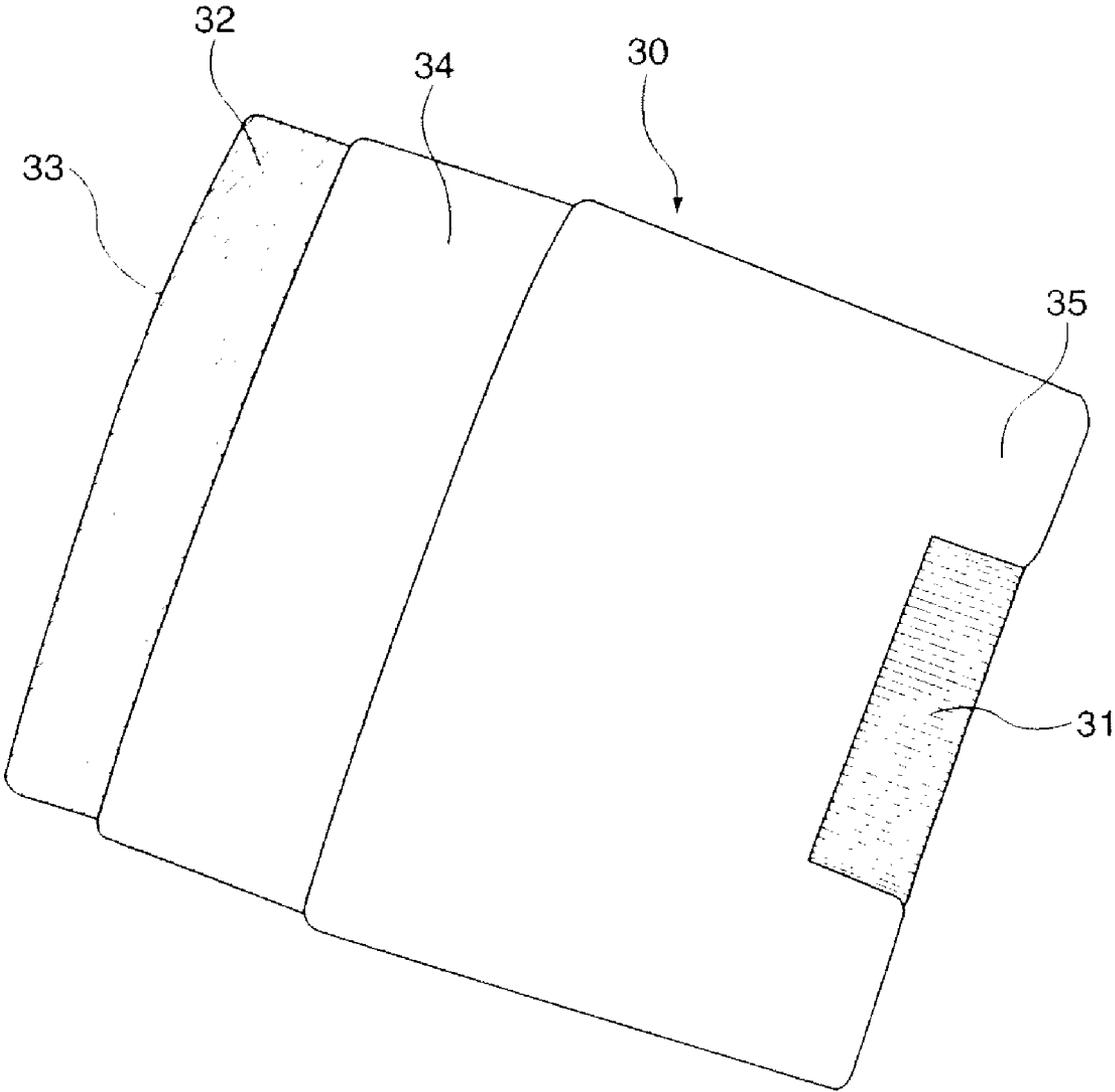
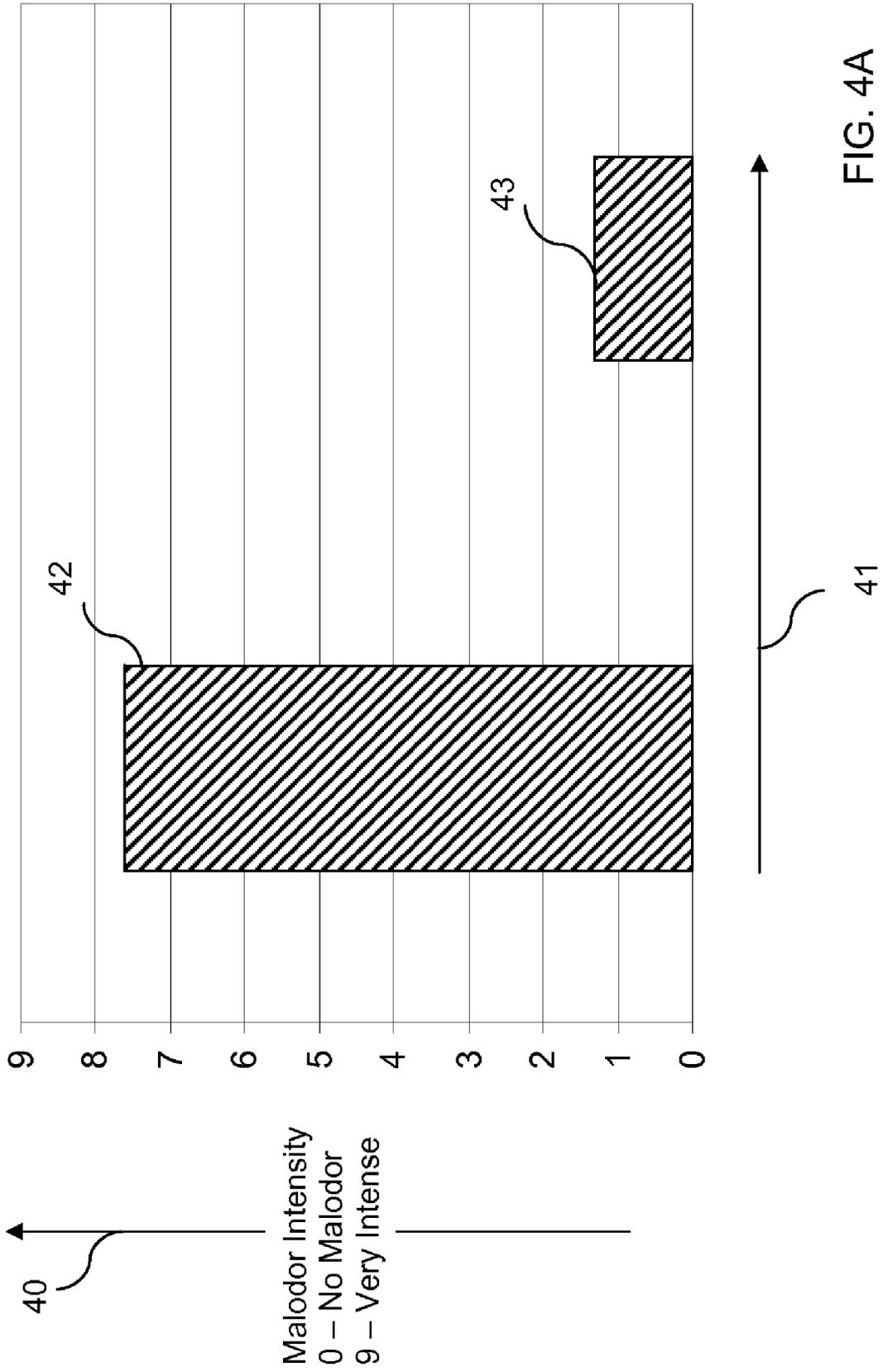


FIG. 3





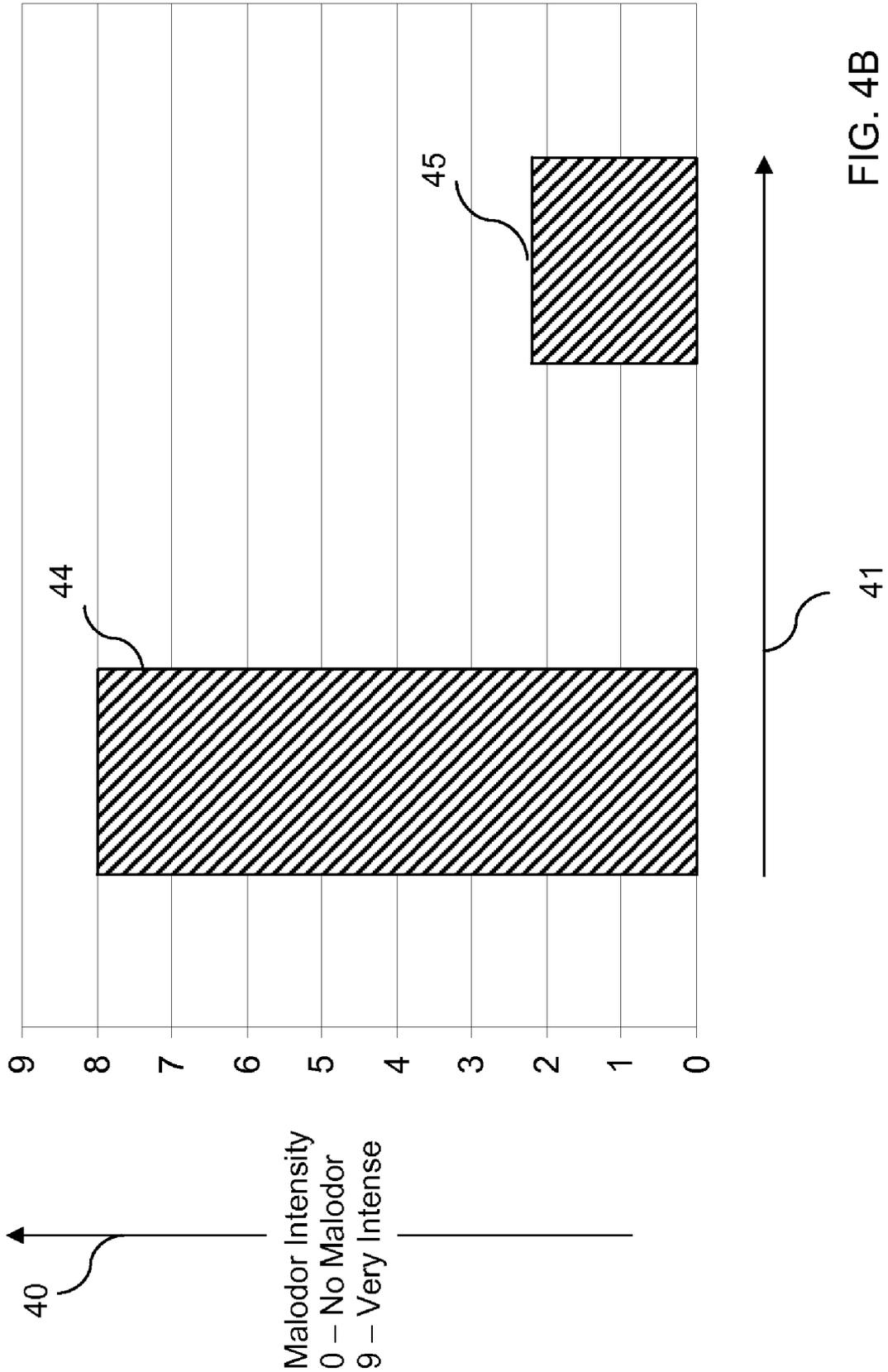


FIG. 4B

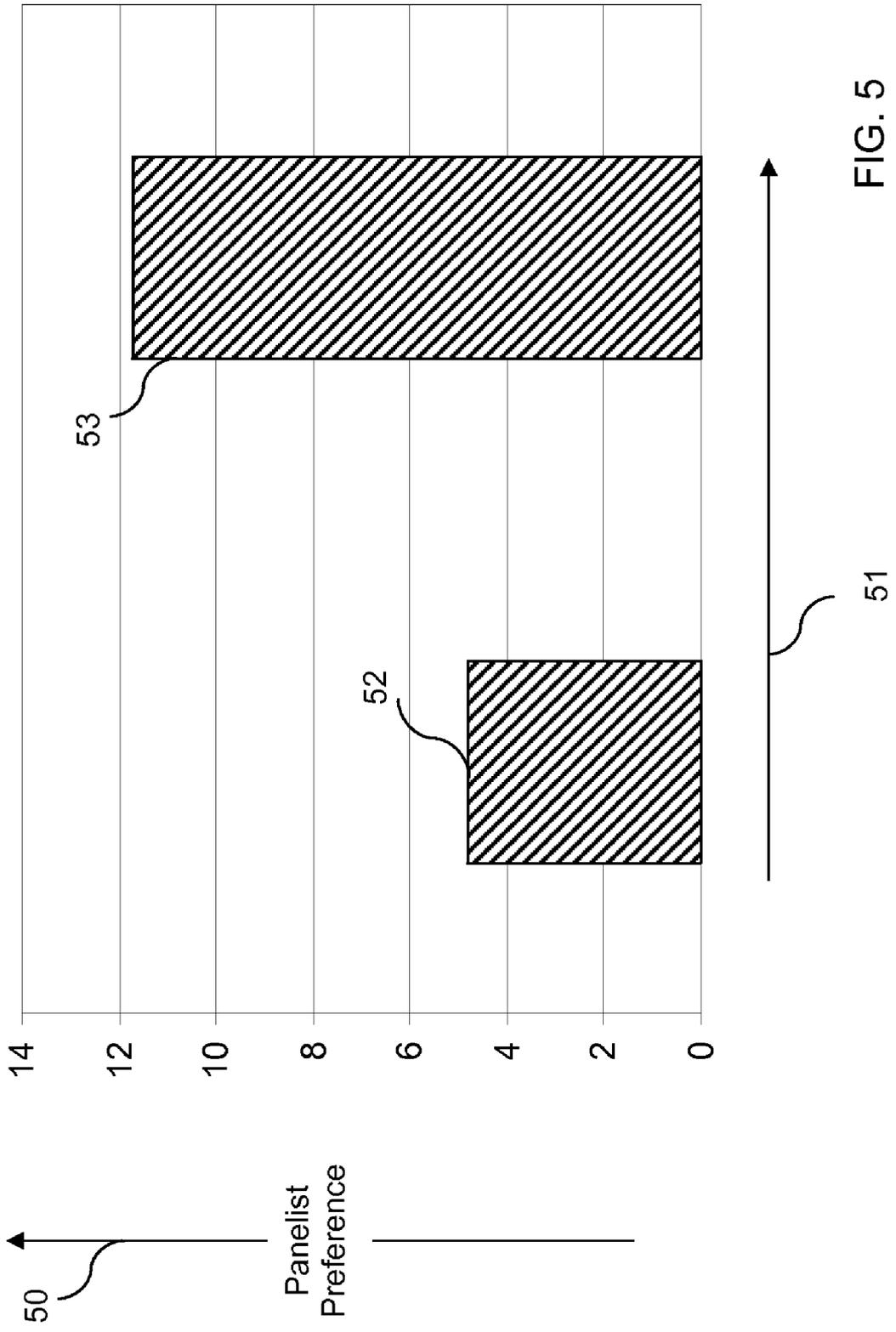


FIG. 5

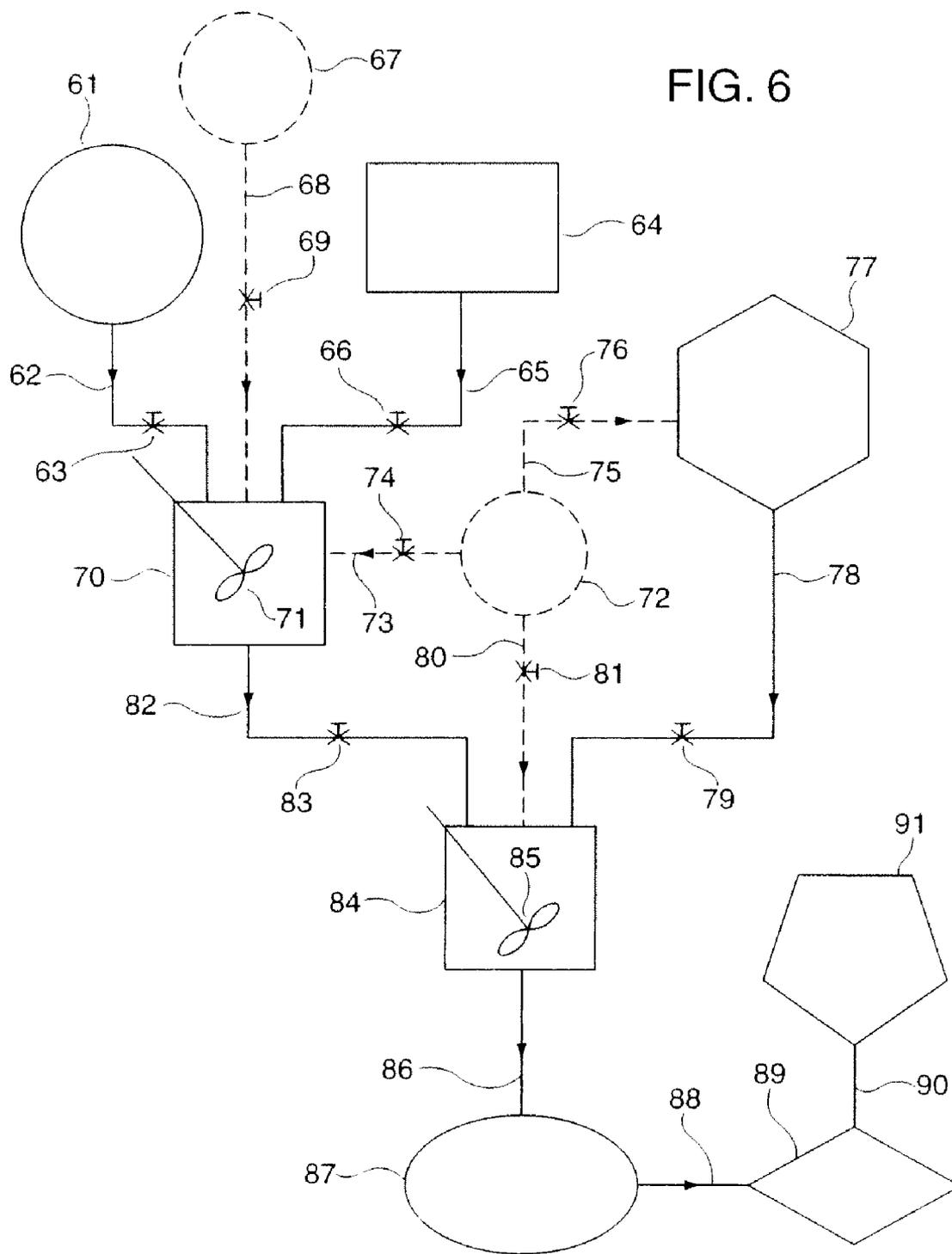
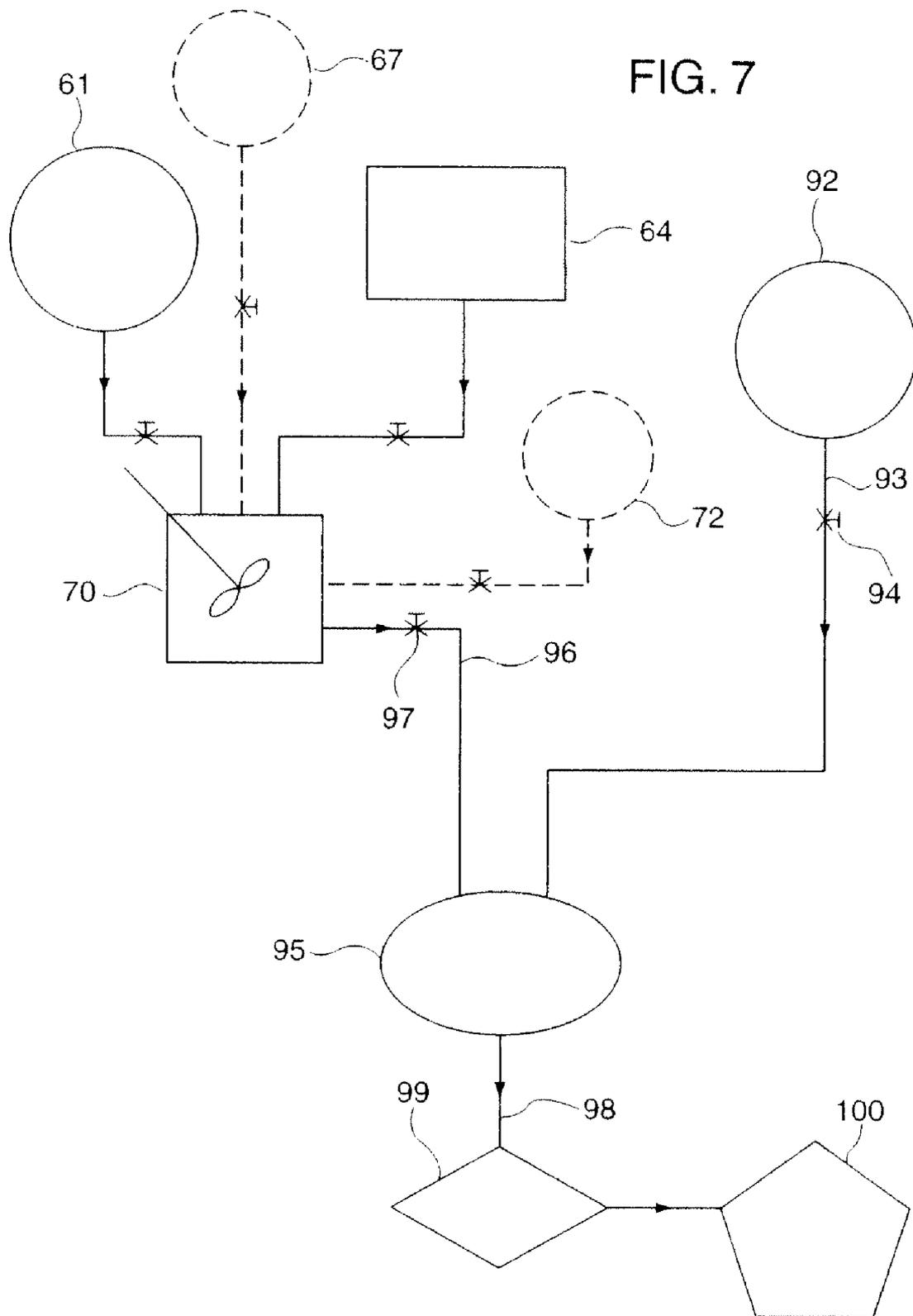
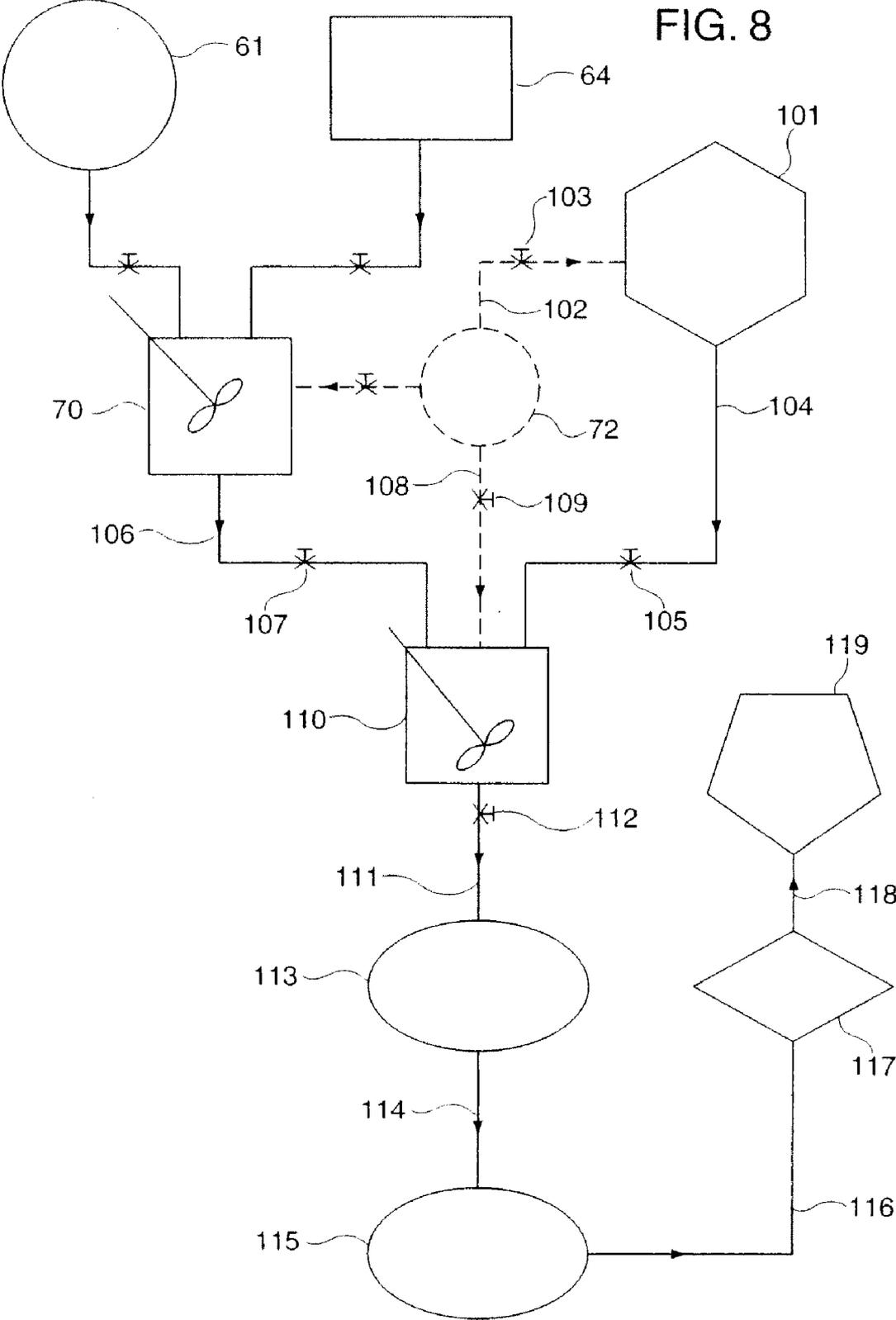


FIG. 7





**Reduction in Garbage Malodor Intensity as a
Function of IFF Malodor Technology**

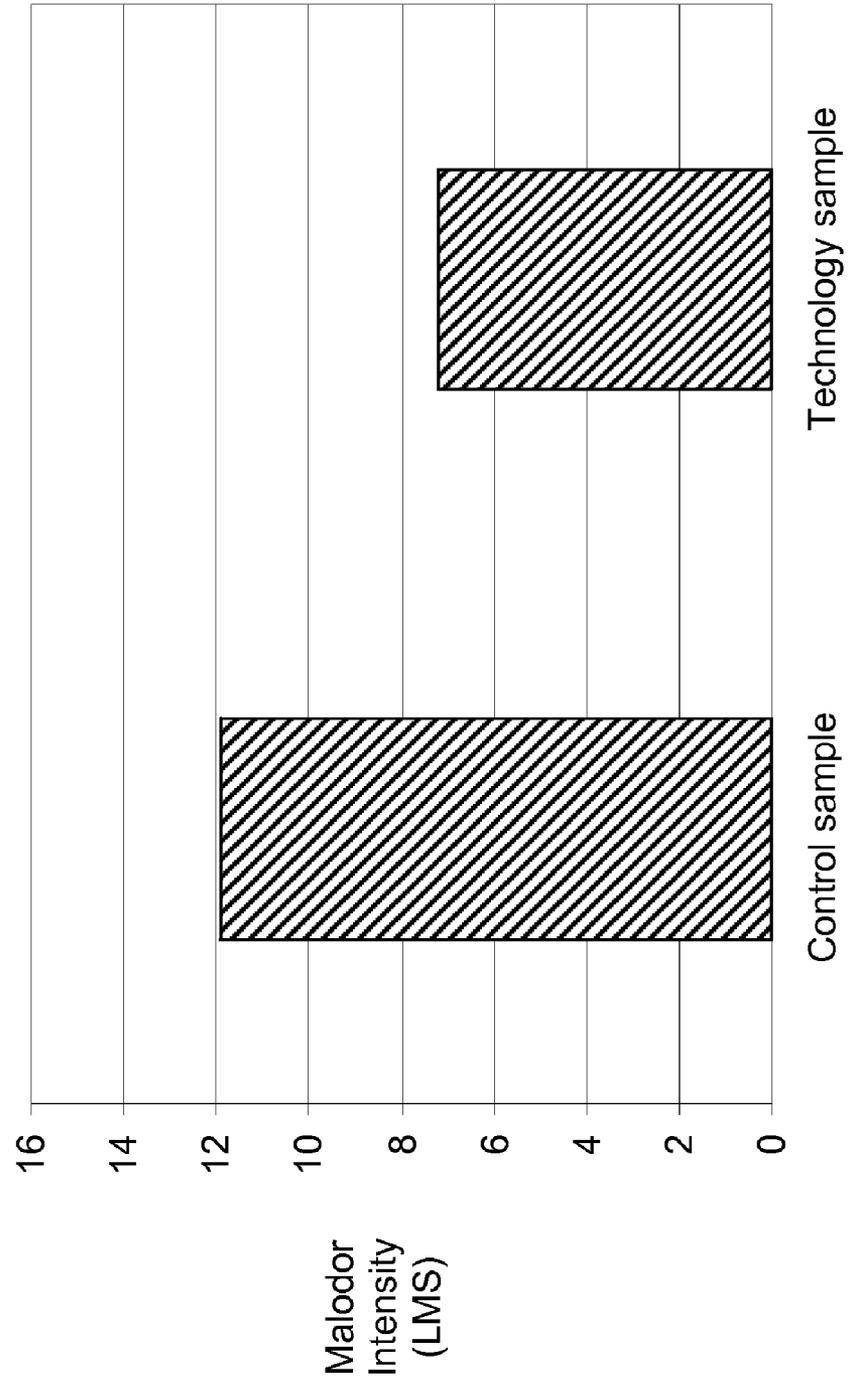


Figure 9

**SYNERGISTICALLY-EFFECTIVE
COMPOSITION OF ZINC RICINOLEATE
AND ONE OR MORE SUBSTITUTED
MONOCYCLIC ORGANIC COMPOUNDS
AND USE THEREOF FOR PREVENTING
AND/OR SUPPRESSING MALODORS**

STATUS OF RELATED APPLICATIONS

[0001] This application is a continuation-in-part of U.S. Ser. No. 10/706,888, filed on Nov. 13, 2003, now pending.

FIELD OF THE INVENTION

[0002] Synergistically effective compositions comprising zinc ricinoleate or solutions thereof and one or more of the substituted monocyclic organic compounds: 1-cyclohexylethan-1-yl butyrate;

[0003] 1-cyclohexylethan-1-yl acetate;

[0004] 1-cyclohexylethan-1-ol;

[0005] 1-(4'-methylethyl)cyclohexylethan-1-yl propionate; and/or

[0006] 2'-hydroxy-1'-ethyl(2-phenoxy)acetate and uses of same and compositions containing same for preventing and/or suppressing malodors.

BACKGROUND OF THE INVENTION

[0007] A wide variety of solid, liquid and gaseous functional materials including body deodorants, anti-perspirants, anti-perspirant/body deodorant devices, air fresheners which include air freshening devices, and solid and liquid air freshening and room freshening compositions, room deodorants, herbicides, antiviral compositions, fungicides, bactericides, parasiticides, insecticides, depilatory compositions, bleach compositions, hard surface-cleaning compositions, skin cleansing compositions, anti-microbial nail preparations including anti-fungal nail lacquers, hair setting compositions, hair conditioning compositions, trichological lotions, detergent compositions, soap compositions, sunscreen compositions, fabric stain-removal compositions, fabric softener compositions, fabric conditioning compositions, fabric anti-wrinkle compositions, skin softening compositions, skin texture enhancement compositions, such as line and wrinkle corrective compositions, skin lightening compositions, steam iron aroma compositions including stress relief compositions, candle compositions, plant growth regulating compositions, plant growth stimulating compositions, fertilizer compositions, insect attractant compositions, insect repelling compositions, drain cleaning compositions and molluskicide compositions have been developed that, although useful for their respective purposes, on use thereof emanate odours which are offensive to the human sense of smell.

[0008] In addition, a number of defined 3-dimensional spaces the use of which is required for various business and service operations and personal matters including indoor gymnasiums, indoor sporting event arenas, locker rooms, hair salons, nail salons, tanning salons, beauty salons, tattoo parlors, pig pens, chicken coops, cow barn enclosures, horse barn enclosures, indoor fresh fish markets, plant processing factory rooms, clothing dry cleaning rooms, garment laundry interiors, rooms containing in-use animal litter containers, abattoirs, cattle cars, zoo animal pens, morgues, autopsy rooms, lavatories, medical patient care rooms, hospital wards and dental patient care rooms have continuously prevailing odours which are offensive to the human sense of smell. Such odors which are offensive to the human sense of smell are caused by aliphatic halohydrins, aliphatic amines, aliphatic

N-oxides, dialkylamines, cycloaliphatic amines, cycloaliphatic N-oxides, cyclo-olefinic amines, cyclo-olefinic N-oxides, cycloaromatic amines, cycloaromatic N-oxides, hydroxyalkylamines, imine compounds, amide compounds, amino acids, polypeptides, modified antimicrobial proteins, diureides, nitriles, aliphatic mercaptans, cycloaliphatic mercaptans, mercaptoalkanoic acids, mercaptoalkanoic acid esters, aliphatic monosulfides, disulfides, trisulfides, sulfur oxides, sulfones and sultones, cycloaliphatic monosulfides, disulfides, trisulfides, sulfur oxides, sulfones and sultones, cyclo-olefinic monosulfides, disulfides, trisulfides, sulfur oxides, sulfones and sultones, cycloaromatic monosulfides, disulfides, trisulfides, sulfur oxides, sulfones and sultones, alkali metal sulfites, bisulfites and metabisulfites, isothiocyanates, thiocyanates, dithiocyanates, isothiazolones, isothiazolinones, thiodiazinethiones, halosulfamates, aryl sulfonamides, lower aliphatic carboxylic acids, phenols, phosphines, aliphatic phosphites and phosphonates, cycloaliphatic phosphites and phosphonates, arsines, lower alcohols, lower ketones, hops, hops acids, aryl pyrazoles, oxazolines, isocyanurates, biguanides, extracts of krameria, hydantoin, pyrrolidones, pyrrolidone carboxylic acids, pyrrolidone carboxylic acid esters, nitrophenols, N-substituted aspartic acids and pyrethroids. Compounds of these classes that have unpleasant odours are referred to herein as malodor compounds.

[0009] The aforementioned functional materials are known to include and/or have applied thereto or in a 3-dimensional space proximate thereto, fragrance materials that are intended to provide pleasant fragrances which mask the malodor.

[0010] In addition, the aforementioned defined 3-dimensional spaces are known to have introduced therein compositions such as fragrance materials that are intended to provide pleasant aromas which mask the malodor, present therein and/or introduced thereto.

[0011] The masking effect is provided by one of three mechanisms. In the first mechanism, the masking composition components blend with the malodor compound or compounds in an effort to effect formation of a different and more desirable aroma. In the second mechanism the masking composition components are employed in a large quantity and concentration whereby the compound or composition responsible for the malodor is overwhelmed. In the third mechanism, one or more masking composition components overwhelm the compound or composition responsible for the malodor and one or more masking composition components chemically react with the malodor compound or composition thereby effecting formation of a more desirable aroma.

[0012] Each of the aforementioned mechanisms have serious disadvantages. Thus, in the case where a fragrance composition is used as a malodor maskant, it will not completely eliminate the perception of malodor and, accordingly, there is a tendency to use increasing quantities and concentrations of fragrance in an effort to eliminate the perception of malodor. Furthermore, the masking effect is an additive effect and so the total odor level in the malodor-masked functional product or in the malodor-masked defined 3-dimensional space is increased by consumption of the fragrance. Even though the fragrance so used may be very pleasant at low concentration, the total odour level in the 3-dimensional space proximate the in-use functional product and the total odour level in the aforementioned defined 3-dimensional space at the relatively high concentrations required to achieve even moderate masking of the malodor will itself be offensive to the human sense of smell.

[0013] The prior art contains evidence of a large number of efforts to overcome the aforementioned disadvantages.

[0014] Thus, the use of zinc ricinoleate, also known as TEGO Sorb (Goldschmidt A. G. of Essen, Germany) for suppressing malodors is disclosed in U.S. Pat. No. 6,528,047, U.S. Pat. No. 6,592,813, U.S. Pat. No. 4,968,496 and U.S. Patent Application 2003/007945 A1 published on Jan. 9, 2003. Furthermore the, use of one or more of the substituted cyclic organic compounds:

[0015] 1-cyclohexylethan-1-yl butyrate;

[0016] 1-cyclohexylethan-1-yl acetate;

[0017] 1-cyclohexylethan-1-ol;

[0018] 1-(4'-methylethyl)cyclohexylethan-1-yl propionate; and/or

[0019] 2'-hydroxy-1'-ethyl(2-phenoxy)acetate

sold under VEILEX (International Flavors & Fragrances Inc., New York, N.Y.) for suppressing malodors are disclosed in, for example, in U.S. Pat. No. 6,432,891, U.S. Pat. No. 6,592,813 and U.S. Pat. No. 4,622,221.

[0020] Furthermore the use of zinc ricinoleate in functional substance such as fragrance containing polyamide sticks and packages dispensing same are disclosed in U.S. patent application Ser. No. 10/683,525 filed on Oct. 10, 2003 but no mention is made therein of the use of polyamide sticks for malodor suppression or prevention.

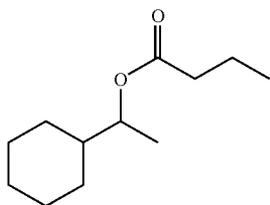
[0021] However, nothing in the prior art discloses the synergistically-effective compositions of our invention; or such compositions being used to prevent and/or suppress malodors.

SUMMARY OF THE INVENTION

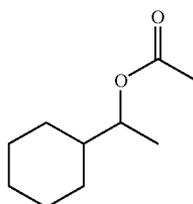
[0022] Our invention is directed to a synergistically-effective composition for preventing and/or suppressing malodors comprising:

[0023] (i) from about 10 to about 90 parts by weight of at least one substituted monocyclic organic compound-containing material selected from the group consisting of:

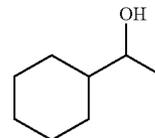
[0024] (a) 1-cyclohexylethan-1-yl butyrate having the structure:



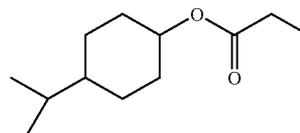
[0025] (b) 1-cyclohexylethan-1-yl acetate having the structure:



[0026] (c) 1-cyclohexylethan-1-ol having the structure:

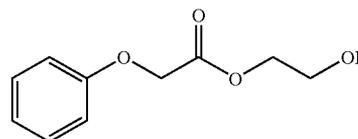


[0027] (d) 1-(4'-methylethyl)cyclohexylethan-1-yl propionate having the structure:



[0028] and

[0029] (e) 2'-hydroxy-1'-ethyl(2-phenoxy)acetate having the structure:



[0030] and

[0031] (ii) from about 90 to about 10 parts by weight of a zinc ricinoleate-containing composition selected from the group consisting of zinc ricinoleate and solutions of zinc ricinoleate containing >30% by weight of zinc ricinoleate.

[0032] Preferably, the zinc ricinoleate-containing composition of our invention is a mixture of about 50% by weight of zinc ricinoleate and about 50% by weight of at least one 1-hydroxy-2-ethoxyethyl ether of a C₁₂-C₁₄ fatty alcohol.

[0033] Our invention is also directed to a process for counteracting a malodor emanating from a solid or liquid malodorous source into a 3-dimensional space proximate said source (e.g., malodorous garbage contained in a polyethylene-fabricated garbage bag) comprising the step of introducing into the 3-dimensional space proximate said source a synergistically-effective malodor-counteracting quantity and concentration of the aforementioned zinc ricinoleate-substituted cyclic organic compound-containing composition of our invention as a single dose, as a continuous dose over a malodor-counteracting period of time, or as periodic doses over a malodor-counteracting period of time whereby the perceived total malodor intensity is substantially reduced or eliminated.

[0034] Our invention is also directed to a process for preventing a malodor from emanating from a solid or liquid malodorous source into a 3-dimensional space proximate said source comprising the step of admixing with said source a synergistically-effective malodor-counteracting quantity and concentration of the aforementioned zinc ricinoleate-substituted cyclic organic compound-containing composition of our invention.

[0035] More specifically our invention is directed to a process wherein the solid or liquid malodorous source evolving

or capable of evolving the malodor is, for example, one of: a herbicide; an antiviral composition; a fungicide; a bactericide; a parasiticide; an insecticide; a depilatory preparation; a bleach composition; a hard surface-cleaning preparation; a skin cleansing composition; an anti-microbial nail preparation; a hair setting composition; a hair conditioning composition; a trichological lotion; a skin lightening composition; a skin softening composition; a skin texture enhancement composition; a detergent composition; a soap composition; a sunscreen composition; a fabric stain removal composition; a fabric softening composition; a fabric conditioning composition; a fabric anti-wrinkle composition; a steam iron aroma composition; a candle composition; a plant growth regulating composition; a plant growth stimulating composition; a fertilizer composition; an insect attractant composition; an insect repelling composition; a drain cleaning composition; a molluskicide composition; an anti-perspirant composition; a body deodorant composition; a body deodorant/anti-perspirant device; a waste-disposal container; an air freshener device and an air freshener composition; and wherein the malodor is caused by, for example, a malodor-causing quantity and concentration of at least one compound selected from the group consisting of malodor compounds as described herein.

[0036] In addition, in order to effect delivery of the zinc ricinoleate-substituted cyclic organic chemical composition of our invention to an inanimate laminar surface such as the surface of a polypropylene garbage bag containing malodor-evolving garbage, another aspect of our invention is directed to a malodor-suppressing stick article having a consistently-maintained system-compatible malodor-suppressing composition of our invention and dimensional integrity comprising a stiff, substantially monophasic, thermally-reversible composition comprising:

[0037] (a) a structural support polymer which is, in the alternative or in combination an ester-terminated polyamide (herein also referred to as ETPA) and/or a tertiary amide-terminated polyamide (herein also referred to as ATPA) and

[0038] (b) a composition of zinc ricinoleate and a substituted monocyclic organic compound as described supra,

with the provisos that the weight ratio range of the structural support polymer:composition of claim 1 is from about 90:10 to about 55:45 and the weight percent of zinc ricinoleate in the stick article is from about 0.5% to about 10% by weight of the stick article. The stick article of our invention may optionally also contain other system compatible functional compositions including, but not limited to insect repellents, antimicrobial compositions, fragrance components, air freshener compositions and animal repellent compositions.

[0039] In one embodiment of the invention a malodor reducing garbage bag system comprising, in combination, a garbage bag including an impermeable, flexible inelastic sheet constructed from a polyethylene material and including a side wall with a closed bottom and an open top; a malodor reducing composition impregnated within the sheet of the garbage bag.

[0040] In a further embodiment of the invention the malodor reducing garbage bag system contains a malodor reducing composition containing the following ingredients:

[0041] cyclohexanol, 4-isopropyl: propionate, cis;

[0042] cyclohexanemethanol, alpha-methyl: acetate;

[0043] butyric acid: 1-cyclohexylethyl ester;

[0044] cyclohexanemethanol, alpha-methyl;

[0045] zinc ricinoleate;

[0046] and mixtures thereof.

[0047] In yet a further embodiment, the malodor reducing composition contains

[0048] from about 2.8 weight % up to about 4.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis;

[0049] from about 0.5 weight % up to about 2.5 weight % of cyclohexanemethanol, alpha-methyl: acetate;

[0050] from about 0.1 weight % up to about 1 weight % of butyric acid: 1-cyclohexylethyl ester;

[0051] from about 0.25 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and

[0052] from about 1 weight % up to about 3 weight % of zinc ricinoleate.

[0053] In still another embodiment, the malodor reducing composition used in combination with the garbage bag contains the following ingredients:

[0054] about 3.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis;

[0055] about 1.5 weight % of cyclohexanemethanol, alpha-methyl: acetate;

[0056] about 0.4 weight % of butyric acid: 1-cyclohexylethyl ester;

[0057] about 0.5 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and about 2 weight % of zinc ricinoleate.

[0058] In still another embodiment of the invention the malodor reducing composition may additionally comprise a solvent.

[0059] In yet another embodiment of the invention the malodor reducing garbage bag system contains from about 1 to about 5 weight % of the malodor reducing composition, more preferably about 2.5 weight % of the malodor reducing composition.

[0060] In another embodiment of the invention the malodor reducing garbage bag system of reduced the malodor intensity by about 20%, more preferably 30%, even more preferably by 40% and most preferably by 50%.

[0061] In yet another embodiment of the invention, a substantially fragrance free odor blocking garbage bag system comprising, in combination, a garbage bag including an impermeable, flexible inelastic sheet constructed from a polyethylene material and including a side wall with a closed bottom and an open top; a malodor reducing composition impregnated within the sheet of the garbage bag.

[0062] The terms system-compatible malodor-suppressing composition and system-compatible functional composition are herein intended to mean the malodor-suppressing, compositions of our invention and other functional compositions, for example, fragrance compositions which, when made part of the support polymer-zinc ricinoleate/substituted monocyclic organic compound system do not compromise the transparency of the stick article by causing haze or cloudiness, due to, for example, phase separation or synerisis to occur as a result of the composition being admixed with the support polymer-zinc ricinoleate/substituted monocyclic organic compound system of our invention. The term consistently-maintained malodor-suppressing composition and dimensional integrity is intended herein to mean that when the stick article of our invention is in use in applying a film to an inanimate solid laminar surface, the proportions of the constituents and the chemical properties of the malodor-suppressing composition of our invention and, optionally, other functional composition, such as a our invention are substantially identical to the proportions and chemical properties of the constituents originally present in the stick article and originally admixed with the support polymer-zinc ricinoleate/substituted monocyclic organic compound system; and

the geometric dimensions thereof with reference to the “x”, “y” and “z” axes on use thereof are substantially identical to the geometric dimensions originally existent in the stick article.

[0063] The term, stiff is herein intended to mean that the stick article of our invention is self-supporting and non-flowable at ambient temperatures or less and at ambient pressures, e.g., at temperatures of less than or equal to 35° C. and at pressures of about 1 atmosphere absolute.

[0064] The term monophasic is herein intended to mean that the stick article of our invention on use or when not in use exists in one unitary phase without any phase separation resulting from the inclusion in the support polymer-zinc ricinoleate/substituted monocyclic organic compound system of a functional composition, e.g., a malodor-suppressing or preventing composition or an optional fragrance composition.

[0065] The term thermally reversible is herein intended to mean that the stick article of our invention retains the original proportions of the constituents of its composition and retains its original physical characteristics and original dimensions on use thereof, and subsequent to use thereof.

[0066] The term malodor reducing is herein intended to mean the ability to reduce the perceived malodor intensity in the garbage bag system.

[0067] The term odor-blocking is herein intended to mean the reduction of perceived malodor in the garbage bag system.

[0068] The term substantially fragrance free is herein intended to mean wherein fragrance is not detectable in the garbage bag system.

[0069] Our invention is also directed to packages containing such stick articles, and a process for employing such stick articles whereby an inanimate laminar surface is controllably coated with a thin film of ETPA or ATPA polymer which (a) effects malodor suppression at and proximate to said inanimate laminar surface and (b) releases the volatile components of the malodor-suppressing composition at a controllable rate into the environment proximate said inanimate laminar surface and (c) optionally releases aesthetically pleasing fragrance at a controllable rate into the environment proximate said inanimate laminar surface. The coating is effected, for example, by means of manually rubbing an exposed end of the malodour-suppressing stick of our invention onto the said inanimate laminar solid surface, using a package containing a partially-exposed malodor-suppressing stick article of our invention.

[0070] The term odor-blocking is herein intended to mean the reduction of perceived malodour in the garbage bag system.

DETAILED DESCRIPTION OF THE INVENTION

[0071] The zinc ricinoleate component of the malodor-suppressing and/or preventing composition of our invention is preferably utilized in combination with a solvent which is at least one ethoxylated C₁₂-C₁₄ fatty alcohol, preferably one or

more of a 1-hydroxy-2-ethoxyethyl ether of a C₁₂-C₁₄ fatty alcohol, for example, the 1-hydroxy-2-ethoxyethyl ether of stearyl alcohol in a concentration of greater than 30%, preferably at a concentration of about 50%.

[0072] In admixture with the zinc ricinoleate component of the malodor-suppressing and/or preventing compositions of our invention, is one or more of the substituted monocyclic organic chemicals.

[0073] A preferred substituted monocyclic organic compound composition useful in combination with the zinc ricinoleate component is a mixture of:

[0074] (A) 1-cyclohexylethan-1-yl butyrate;

[0075] (B) 1-cyclohexylethan-1-yl acetate; and

[0076] (C) 1-(4'-methylethyl)cyclohexylethan-1-yl propionate.

[0077] More preferably, the weight ratio of components of the immediately-forementioned zinc ricinoleate-substituted monocyclic organic compound mixture is one where the zinc ricinoleate-containing composition: 1-cyclohexylethan-1-yl butyrate: 1-cyclohexylethan-1-yl acetate: 1-(4'-methylethyl)cyclohexylethan-1-yl propionate is about 2:1:1:1.

[0078] Another preferred substituted monocyclic organic compound composition useful in combination with the zinc ricinoleate component is a mixture of:

[0079] (A) 1-cyclohexylethan-1-yl acetate; and

[0080] (B) 1-(4'-methylethyl)cyclohexylethan-1-yl propionate.

[0081] More preferably, the weight ratio of components of the immediately-forementioned zinc ricinoleate-substituted monocyclic organic compound mixture is one where the zinc ricinoleate-containing composition: 1-cyclohexylethan-1-yl acetate: 1-(4'-methylethyl)cyclohexylethan-1-yl propionate is about 3:1:1.

[0082] As stated above, the synergistically-effective compositions of our invention substantially eliminate the perception of malodors, and/or prevent the formation of such malodors while simultaneously refraining from reduction of the perception of pleasant fragrance aromas emanating from the same source or from the proximity of said source. The synergistically-effective zinc ricinoleate-substituted monocyclic organic compound compositions of our invention can be utilized with a vast number of functional products in order to prevent malodors evolved by such functional products during use thereof and/or to suppress malodors evolved by such functional products into the 3-dimensional space proximate the functional products while they are being used.

[0083] Examples of such functional products which are compositions, effective specific malodorous ingredients or classes of ingredients contained in and/or emanated from said functional products and exemplary defined air dimensional spaces where such functional products are used, together with U.S. patent references setting forth specific examples of the utilities of such functional products are set forth in the following Table I:

TABLE I

Functional Product	U.S. Pat. No.	Ingredient or Ingredient Class	Defined Air 3-dimensional Space
hair fixative composition	5,968,494	2,2-hydroxymethyl-substituted carboxylic acid	hair salons
hair fixative anti-microbial compositions	6,291,580 6,294,186	polyurethanes and diisocyanates retinoids	hair salons health care facilities

TABLE I-continued

Functional Product	U.S. Pat. No.	Ingredient or Ingredient Class	Defined Air 3-dimensional Space
pesticides	6,488,949	thiacloprid	plant greenhouse
laundry and cleaning compositions	6,489,279	xyloglucanase enzymes	laundries
fungicides	6,489,348	substituted benzopyridyl ethers	hospital ward
fungicides	6,489,360	phenyl benzyl ether imines, carbamates and dinitrophenols	plant greenhouse
antibacterial liquid detergents	6,492,313	amine oxides and sodium paraffin sulfonates	kitchens
cleaning wipes	6,492,318	amine oxides	kitchens
floor cleaning wipes	6,492,499	cocoamido-propyldimethyl amine oxide	kitchens
skin treatment compositions	6,531,142	sulfopolyester resins	health care facilities
fabric care products	6,531,444	polyalkyleneimines	clothing dry cleaning rooms
cleaning compositions	6,465,404	coconut diethanolamide	laundries
dish cleaning compositions	6,465,406	ethylenediamine-N,N-disuccinate	kitchens
laundry detergents	6,465,410	N-vinylimidazole N-vinyl pyrrolidone copolymers	laundries
pesticides	6,468,555	fluorophenyl oxazolines	plant greenhouses
antimicrobial compositions	6,471,974	N-chlorosulfamates	health care facilities
liquid cleaning compositions	6,472,361	sodium cumene sulfonate	kitchens
biocide compositions	6,475,505	isothiazolinones	health care facilities
anti-viral compositions	6,475,526	t-butyl alkoxyphenols	health care facilities
antimicrobial cosmetic formulations	6,475,536	extract of krameria	beauty salons
antimicrobial compositions	6,475,537	hops acids	health care facilities
cleaning compositions	6,479,449	triethanolamine	kitchens
aerosol antimicrobial compositions	6,482,392	amine oxides	kitchens
antimicrobial compositions	6,482,423	2-pyrrolidone-5-carboxylic acid	kitchens
wipes	6,482,425	imidazolyl pyridines	indoor farm facilities
parasitocidal compositions	6,488,943	halogenated carbanilides	kitchens
antimicrobial wipes	6,488,948	behentrimonium methosulfate	beauty salons
antibacterial compositions for skin care	6,503,488	hydrogenated castor oil	beauty salons
nail care compositions	6,613,338	benzimidazole sulfonic acids	beauty salons
cosmetic and skin care sticks			

[0084] Preferably, the synergistically-effective zinc ricinoleate-substituted monocyclic organic compound-containing malodor preventing and/or suppressing compositions are employed in compatible solvents prior to the composition being incorporated into functional products. Such compatible solvents are, preferably, 1,2-propylene glycol, and di(1,2-dihydroxypropyl)ether, commonly known as dipropylene glycol or DPG. The range of dilution of the zinc ricinoleate-substituted monocyclic organic compound-containing mal-

odor preventing and/or suppressing compositions in the compatible solvents is from about 2% to about 50% by weight of the zinc ricinoleate-containing composition of our invention, preferably from about 10% to about 30% and most preferably about 15% by weight of the zinc ricinoleate-containing composition of our invention.

[0085] When used in conjunction with malodorous solid or liquid functional products, e.g., soap and detergent compositions, the synergistically effective zinc ricinoleate-substituted

monocyclic organic compound-containing malodor preventing and/or suppressing mixtures of our invention may be employed in a concentration of from about 75 ppm to about 300 ppm based on the weight of the solid or liquid composition preferably from about 100 ppm to about 250 ppm.

[0086] When used in conjunction with malodorous gaseous functional products, the synergistically effective zinc ricinoleate-substituted monocyclic organic compound-containing malodor preventing and/or suppressing mixtures of our invention may comprise from about 1.0 gram/liter to about 5.0 grams/liter, preferably from about 1.5 grams/liter to about 3.0 grams/liter of the air 3-dimensional space which contains the malodor to be counteracted.

[0087] As stated above, the functional products with which the zinc ricinoleate-substituted monocyclic organic compound compositions of our invention may be used also may optionally include fragrances, anti-microbial substances, animal repellents, insect attractants, and insect repellents, each of the components of which has a C log₁₀P in the range of from about 3.0 to about 8.0, without restriction on the molecular weight of each of said components wherein P is the n-octanol/water partition coefficient of the fragrance component. Examples of fragrance/anti-microbial compositions useful in the practice of our invention are set forth in U.S. Pat. No. 6,495,512 and U.S. Pat. No. 6,517,759.

[0088] The values of C log₁₀P of many functional product ingredients, for example, fragrance ingredients and/or anti-microbial ingredients, contained in personal treatment compositions and/or cosmetic compositions is discussed in U.S. Patent Application US 2003/0110682 A1 published on Jun. 19, 2003, U.S. Pat. No. 5,348,667, U.S. Pat. No. 5,652,206 and U.S. Pat. No. 6,528,013. Furthermore, values of log₁₀P have been reported; for example, the Pomona92 database, available from Daylight Chemical Information Systems, Inc., Daylight CIS, Irvine, Calif. However, the log₁₀P values are most conveniently calculated by the "CLOGP" program, also available from Daylight CIS. This program also lists experimental log₁₀P values when they are available in the Pomona92 database. The calculated log₁₀P (C log₁₀P) is determined by the Hansch and Leo "fragment" approach based on the chemical structure of each perfume ingredient, and takes into account the numbers and types of atoms, the atom connectivity and the chemical bonding. The C log₁₀P values which are the most reliable and widely used estimates for this physicochemical property, are preferably used instead of the experimental log₁₀P values for the selection of functional ingredients, including perfume ingredients which are useful in the stick articles of our invention.

[0089] Specific examples of preferred fragrance components useful in the stick articles of our invention, and the molecular weights and C log₁₀P values of each of said components are set forth in Table II as follows

TABLE II

Fragrance Component	Clog ₁₀ P value	Molecular Weight
amyl salicylate	4.601	208.26
benzyl salicylate	4.383	228.25
β-caryophyllene	6.333	204.36
cedrol	4.530	222.37
ethyl undecylenate	4.888	212.34
geranyl anthranilate	4.216	273.38
α-irone	3.820	206.33
phenyl ethyl benzoate	4.058	226.28
phenylethyl phenyl acetate	3.767	240.31
1-phenyl hexanol-5	3.299	178.28
α-santalol	3.800	220.36
amyl salicylate	4.601	208.26

TABLE II-continued

Fragrance Component	Clog ₁₀ P value	Molecular Weight
benzyl salicylate	4.383	228.25
β-caryophyllene	6.333	204.36
cedrol	4.530	222.37
cedryl acetate	5.436	264.41
cedryl formate	5.070	238.37
cyclohexyl salicylate	5.265	220.29
γ-dodecalactone	4.359	198.31
ethyl undecylenate	4.888	212.34
geranyl anthranilate	4.216	273.38
β-phenylethyl benzoate	4.058	226.38
β-phenylethyl phenyl acetate	3.767	240.31
5-acetyl-1,1,2,3,3,6-hexamethyl indane	5.977	258.41
cyclopentadecanolide	6.246	240.39
d-limonene	4.232	136.24
cis-p-t-butylcyclohexyl acetate	4.019	198.31
amyl cinnamic aldehyde	4.324	202.30
linalyl benzoate	5.233	258.36

[0090] As stated above, the zinc ricinoleate-substituted monocyclic organic compound compositions of our invention may be employed in stick articles having an ETPA or ATPA polymeric structure.

[0091] Thus, the support polymer used in the stick article of our invention is, in the alternative or in combination (a) at least one ester-terminated polyamide or (b) at least one tertiary amide-terminated polyamide.

[0092] Preferable ester-terminated polyamides useful in the practice of our invention are those disclosed in U.S. Pat. No. 5,783,657 and U.S. Pat. No. 6,552,160 and include those ester-terminated polyamides prepared by reacting "x" equivalents of a dicarboxylic acid wherein at least 50% of those equivalents are from polymerized fatty acid, "y" equivalents of ethylenediamine and "z" equivalents of an alcohol which is in the alternative, or in combination cetyl alcohol and/or stearyl alcohol wherein:

$$0.9 \leq \frac{x}{y+z} \leq 1.1 \text{ and } 0.1 \leq \frac{z}{y+z} \leq 0.7$$

[0093] More preferably, the ester-terminated polyamide is one of a group having a weight-average molecular weight of about 6000 and a softening point in the range of from 88° C. to 94° C. prepared by reacting "x" equivalents of C₃₆ dicarboxylic acid, "y" equivalents of ethylenediamine and "z" equivalents of an alcohol which is, in the alternative or in combination cetyl alcohol and/or stearyl alcohol wherein

$$0.9 \leq \frac{x}{y+z} \leq 1.1 \text{ and } 0.1 \leq \frac{z}{y+z} \leq 0.7.$$

[0094] Most preferable are the mineral oil-free ester terminated polyamides, SYLVACLEAR 100LM, UNICLEAR 100 and UNICLEAR 100V, Arizona Chemical Company, Panama City, Fla.

[0095] Preferable tertiary amide-terminated polyamides useful in the practice of our invention are those disclosed in U.S. Pat. No. 6,268,466 and U.S. Pat. No. 6,469,131 and include those tertiary amide-terminated polyamides prepared by reacting "x" equivalents of dicarboxylic acid wherein at

least 50% of those equivalents are from polymerized fatty acid, “y” equivalents of ethylenediamine and “z” equivalents of a monofunctional reactant having a secondary amine group as the only reactive functionality wherein

$$0.9 \leq \frac{X}{y+z} \leq 1.1 \text{ and } 0.1 \leq \frac{z}{y+z} \leq 0.7$$

[0096] Most preferable are those tertiary amide-terminated polyamides disclosed in Example I of U.S. Pat. No. 6,268,466.

[0097] The stick articles of our invention, when used in a preferred manner in the practice of our invention are contained, for example, in a package as illustrated in FIGS. 1, 2 and 3 described infra. Packages which are so useful in the practice of our invention are described in detail in U.S. Pat. Nos. 5,275,496 and 6,386,778 and U.S. Patent Application US 2001/0002962 A1 published on Jun. 7, 2001.

[0098] Such packages for the stick article of our invention comprise means for supporting the functional substance-providing stick article of our invention such that an end portion of said stick article can be exposed for use, with the means for supporting said stick article including a stick-surrounding member for surrounding the stick article, the stick-surrounding member having an opening such that the stick article can be exposed for use, and a border of the stick-surrounding member forming the opening, said border forming a top end of the supporting means, such that said end portion can be elevated from said means for supporting and can protrude therefrom so as to be exposed for use, said stick article being contained within said stick-surrounding member. Thus for example, the means for elevating includes a screw feed mechanism having an elevator screw such that upon rotation of the elevator screw the stick article is pushed up from the bottom such that the end portion protrudes and is exposed for use. As a second example, the means for elevating is a means for pushing up the stick article so that the end portion protrudes from the means for supporting and is exposed for use.

[0099] Furthermore, as stated above, our invention is directed to a process for applying a controllably releasable functional substance such as a perfume composition, an insect repellent composition, an animal repellent composition, an anti-microbial composition, an insect attractant composition and/or an air freshener composition to an inanimate laminar substantially solid surface comprising the steps of providing a package as described supra; exposing for use the end portion of said stick article contained within said package; providing an inanimate laminar substantially solid surface to be treated; and applying the end portion of said stick article contained within said package to a finite area of said laminar substantially solid surface.

[0100] In one embodiment of the invention a malodor reducing garbage bag system comprising, in combination, a garbage bag including an impermeable, flexible inelastic sheet constructed from a polyethylene material and including a side wall with a closed bottom and an open top; a malodor reducing composition impregnated within the sheet of the garbage bag.

[0101] In a further embodiment of the invention the malodor reducing garbage bag system contains a malodor reducing composition containing the following ingredients:

[0102] cyclohexanol, 4-isopropyl: propionate, cis;

[0103] cyclohexanemethanol, alpha-methyl: acetate;

[0104] butyric acid: 1-cyclohexylethyl ester;

[0105] cyclohexanemethanol, alpha-methyl;

[0106] zinc ricinoleate;

[0107] and mixtures there of.

[0108] In yet a further embodiment, the malodor reducing composition contains

[0109] from about 2.8 weight % up to about 4.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis;

[0110] from about 0.5 weight % up to about 2.5 weight % of cyclohexanemethanol, alpha-methyl: acetate;

[0111] from about 0.1 weight % up to about 1 weight % of butyric acid: 1-cyclohexylethyl ester;

[0112] from about 0.25 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and

[0113] from about 1 weight % up to about 3 weight % of zinc ricinoleate.

[0114] In still another embodiment, the malodor reducing composition used in combination with the garbage bag contains the following ingredients:

[0115] about 3.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis;

[0116] about 1.5 weight % of cyclohexanemethanol, alpha-methyl: acetate;

[0117] about 0.4 weight % of butyric acid: 1-cyclohexylethyl ester;

[0118] about 0.5 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and about 2 weight % of zinc ricinoleate.

[0119] In still another embodiment of the invention the malodor reducing composition may additionally comprises a solvent.

[0120] In yet another embodiment of the invention the malodor reducing garbage bag system contains from about 1 to about 5 weight % of the malodor reducing composition, more preferably about 2.5 weight % of the malodor reducing composition.

[0121] In another embodiment of the invention the malodor reducing garbage bag system of reduced the malodor intensity by about 20%, more preferably 30%, even more preferably by 40% and most preferably by 50%.

[0122] In yet another embodiment of the invention, a substantially fragrance free odor blocking garbage bag system comprising, in combination, a garbage bag including an impermeable, flexible inelastic sheet constructed from a polyethylene material and including a side wall with a closed bottom and an open top; a malodor reducing composition impregnated within the sheet of the garbage bag.

BRIEF DESCRIPTION OF THE DRAWINGS

[0123] FIG. 1 is a top view of a package useful for containing the malodor-suppressing stick article of our invention and for carrying out the process of applying the malodor-suppressing stick article of our invention to an inanimate solid laminar surface whereat the volatile components of the malodor-suppressing composition contained in the stick article of our invention is emitted via a controlled release mechanism.

[0124] FIG. 2 is a cut-away side elevation view of the package of FIG. 1.

[0125] FIG. 3 is a perspective view of a second embodiment of the package of our invention showing the exposed stick article of our invention contained therein and ready for use.

[0126] FIG. 4A shows a pair of comparative bar graphs showing malodor intensity, on the “Y” axis, on a scale of 0-9, for dry cloth initially having tobacco malodor treated with (a)

unfragranced liquid detergent and (b) liquid detergent containing a mixture of 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and zinc ricinoleate, 15% in dipropylene glycol.

[0127] FIG. 4B shows a pair of comparative bar graphs showing malodor intensity, on the "Y" axis, on a scale of 0-9, for damp cloth initially having tobacco malodor treated with (a) unfragranced liquid detergent and (b) liquid detergent containing a mixture of 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and zinc ricinoleate, 15% in dipropylene glycol.

[0128] FIG. 5 shows a pair of comparative bar graphs showing panelist preference, on the "Y" axis, on a scale of 0-14, for damp cloth initially having tobacco malodor treated with (a) unfragranced liquid detergent and (b) liquid detergent containing a mixture of 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and zinc ricinoleate, 15% in dipropylene glycol.

[0129] FIG. 6 sets forth a schematic block flow diagram showing the steps from (a) creation of the zinc ricinoleate-substituted monocyclic organic compound-containing malodor-suppressing and/or preventing composition of our invention to (b) the utilization by consumers of a liquid cosmetic base or detergent base containing the zinc ricinoleate-substituted monocyclic organic compound-containing malodor-suppressing and/or preventing composition of our invention.

[0130] FIG. 7 sets forth a schematic block flow diagram showing the steps from (a) creation of the zinc ricinoleate-substituted monocyclic organic compound-containing malodor-suppressing and/or preventing composition of our invention to (b) the utilization by consumers of an aerosol product containing the zinc ricinoleate-substituted monocyclic organic compound-containing malodor-suppressing and/or preventing composition of our invention.

[0131] FIG. 8 sets forth a schematic block flow diagram showing the steps from (a) creation of the zinc ricinoleate-substituted monocyclic organic compound-containing malodor-suppressing and/or preventing composition of our invention to (b) the application by consumers to a malodorous solid laminar surface of an ETPA or ATPA stick product containing the zinc ricinoleate-substituted monocyclic organic compound-containing malodor-suppressing and/or preventing composition of our invention.

[0132] FIG. 9 illustrates the reduction in Garbage Malodor Intensity as a Function of IFF Malodor Technology as demonstrated in Example VI.

DETAILED DESCRIPTION OF THE DRAWINGS

[0133] Referring to FIG. 1 and FIG. 2, the package 1 is adapted for use with the malodor-suppressing stick article comprising a removable cap 2 for closing the package to protect the product therein. The cap is removed to permit application of the malodor-suppressing product with optional fragrance composition contained in the ETPA and/or ATPA to an inanimate solid laminar surface, e.g., a garbage bag or porcelain sink surface. The package 1 further comprises a barrel 3 containing the malodor-suppressing stick article 4 of our invention. The wall of the barrel 3 closely surrounds the stick article 4. An applicator 5 having an upwardly facing applicator surface 6 is formed integrally with the barrel 3 at the top end thereof. The lower end or bottom 8 of the stick 4 is supported within the package on an oval-shaped, movable support member 9 for movement up or down within the package relative to the barrel 3. A central portion of the movable support member 9 is provided with a threaded coupling sleeve

10 for cooperation with an elevator screw 11. The lower end of the elevator screw is axially fixed but rotatable within an opening in the closed, bottom end of the barrel 3. The elevator screw 11 includes a tapered section 13 which can be snap fitted within the opening using resilient tabs 20, in the bottom of the barrel 3 to retain the elevator screw 11 in the position shown in FIG. 2 while permitting the screw to be rotated by means of a knob 14 provided on the lower end of the screw. The bottom of the barrel 3 is dished inwardly to accommodate the knob 14 so that the package 1 can stand upright with the lower, outer, peripheral portion of the barrel, 3, resting on a flat supporting surface. Rotation of the knob 14 permits the user to raise or lower the movable support member 9 relative to the barrel 3 and thus raise and lower the malodor-suppressing stick article 4 of our invention relative to the barrel 3. The stick article 4 is shown in its lowered position in FIG. 2 with the top of the stick flush with the applicator surface 6. The several components of the package 1, including the cap 2, barrel 3, applicator 5 and coupling sleeve 10 are preferably each formed of plastic, e.g., polypropylene or high density polyethylene including talc-filled polypropylene using techniques well-known to those skilled in the art. The outer surface portion of the applicator surface 6 is rounded, curved downward, for reducing drag during application of the polyamide-containing malodor-suppressing/optional fragrance (and/or additional functional ingredient, e.g., insect repellent) composition contained in the stick article to the inanimate solid laminar surface being treated. The outer surface portion ends in free end 15, which is below the applicator surface edge adjacent the barrel. The outer surface portion part that downwardly extends to free end 15 of the applicator is a cooperating surface upon which the lower skirt 16 of the cap 2 can be slidably fitted and removed with slight resistance. The cap 2 can have ribs 27 associated therewith to maintain the cap in a proper position relative to the barrel 3.

[0134] Referring to FIG. 3, the malodor-suppressing stick article of our invention, 32, having application surface 33 is contained in package 30 which has a retaining wall 34 surrounding stick article 32. Holding wall 35, the purpose of which is to provide a convenient surface for an individual using package 30 in applying polyamide-containing malodor-suppressing/optional fragrance composition from stick article 33 to an inanimate solid laminar surface, e.g., a garbage bag or porcelain toilet bowl surface, surrounds retaining wall 34 in close proximity thereto and is juxtaposed thereto. As the stick article 32 is used during application to the inanimate solid laminar surface, it is moved by the user upward past retaining wall 34 using the rotatable manual positioning knob 31 which rotates about the vertical axis of package 30 as the stick article 32 moves up and down relative to retainer wall 34.

[0135] FIG. 4A sets forth a pair of comparative bar graphs showing malodor intensity, on the "Y" axis, indicated by reference numeral 40, on a scale of 0-9, for dry cloth initially having tobacco malodor. The bar graphs are located along the "X" axis, indicated by reference numeral 41. The bar graph for the cloth treated with unfragranced liquid detergent is indicated by reference numeral 42. The bar graph for the cloth treated with liquid detergent containing a mixture of 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and zinc ricinoleate, 15% in dipropylene glycol is indicated by reference numeral 43.

[0136] FIG. 4B sets forth a pair of comparative bar graphs showing malodor intensity, on the "Y" axis, indicated by

reference numeral 40, on a scale of 0-9, for damp cloth initially having tobacco malodor. The bar graphs are located along the "X" axis, indicated by reference numeral 41. The bar graph for the cloth treated with unfragranced liquid detergent is indicated by reference numeral 44. The bar graph for the cloth treated with liquid detergent containing a mixture of 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and zinc ricinoleate, 15% in dipropylene glycol is indicated by reference numeral 45.

[0137] FIG. 5 sets forth a pair of comparative bar graphs showing panelist preference, on the "Y" axis, indicated by reference numeral 50, on a scale of 0-14, for damp cloth initially having tobacco malodor. The bar graphs are located along the "X" axis indicated by reference numeral 51. The bar graph for the cloth treated with unfragranced liquid detergent is indicated by reference numeral 52. The bar graph for the cloth treated with liquid detergent containing a mixture of 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and zinc ricinoleate, 15% in dipropylene glycol is indicated by reference numeral 53.

[0138] Referring to the schematic block flow diagram of FIG. 6, a solution, preferably a 50-50 solution of zinc ricinoleate and a 1-hydroxy-2-ethoxyethyl ether of a C₁₂-C₁₄ fatty alcohol in tank 61 is passed through line 62 past control valve 63 into vessel 70 equipped with agitator 71 where it is mixed, with agitation, with at least one component,

[0139] 1-cyclohexylethan-1-yl butyrate;

[0140] 1-cyclohexylethan-1-yl acetate;

[0141] 1-cyclohexylethan-1-ol;

[0142] 1-(4'-methylethyl)cyclohexylethan-1-yl propionate; and/or

[0143] 2'-hydroxy-1'-ethyl(2-phenoxy)acetate

which is passed from tank 64 through line 65 past valve 66 into said vessel 70. Optionally, simultaneously, compatible diluent, e.g., propylene glycol or DPG, is passed from vessel 67 through line 68 past valve 69 into vessel 71. The resulting mixture is then passed through line 82 past valve 83 into vessel 84 equipped with agitator 85. Simultaneously, liquid cosmetic base or detergent base in vessel 77 is passed through line 78 past control valve 79 into vessel 84 where the detergent mixture is blended using agitator 85. Optionally, simultaneously, additional functional ingredient(s), e.g., compatible fragrance composition each of the components of which has a C log₁₀P of between 3.0 and 8.0 is passed from tank 72 (a) through line 73 past control valve 74 into vessel 70; (b) through line 75 past control valve 76 into vessel 77 for admixing with the cosmetic base or the detergent base and/or (c) through line 80 past valve 81 into vessel 84. The resulting mixture from vessel 84 is passed through conveyance 86 to location 87 whereat it is packaged. The packages are conveyed via conveyance 88 to marketing location 89 and marketed via marketing scheme 90 for ultimate consumer use, 91.

[0144] Referring to the schematic block flow diagram of FIG. 7, a solution, preferably a 50-50 solution of zinc ricinoleate and a 1-hydroxy-2-ethoxyethyl ether of a C₁₂-C₁₄ fatty alcohol in tank 61 is passed into vessel 70 equipped with an agitator where it is mixed, with agitation, with at least one component,

[0145] 1-cyclohexylethan-1-yl butyrate;

[0146] 1-cyclohexylethan-1-yl acetate;

[0147] 1-cyclohexylethan-1-ol;

[0148] 1-(4'-methylethyl)cyclohexylethan-1-yl propionate; and/or

[0149] 2'-hydroxy-1'-ethyl(2-phenoxy)acetate

which is passed from tank 64 into said vessel 70. Optionally, simultaneously, compatible diluent, e.g., propylene glycol or DPG, is passed from vessel 67 into vessel 71. The resulting mixture is then passed through line 96 past valve 97 into aerosol packaging unit 95. Simultaneously, aerosol diluent, e.g., 1,1,1-trifluoroethane in pressure vessel 92 is passed through high pressure line 93 past control valve 94 into aerosol packaging unit 95 where the aerosol diluent mixture is inserted into pressurized aerosol cans at location 95. Optionally, simultaneously, additional functional ingredient(s), e.g., compatible fragrance composition each of the components of which has a C log₁₀P of between 3.0 and 8.0 is passed from tank 72 into vessel 70. The resulting filled aerosol cans are passed through conveyance 98 to location 99 whereat they are marketed for ultimate consumer use as malodor counteractant devices, 100.

[0150] Referring to the schematic block flow diagram of FIG. 8, a solution, preferably a 50-50 solution of zinc ricinoleate and a 1-hydroxy-2-ethoxyethyl ether of a C₁₂-C₁₄ fatty alcohol in tank 61 is passed into vessel 70 equipped with an agitator where it is mixed, with agitation, with at least one component:

[0151] 1-cyclohexylethan-1-yl butyrate;

[0152] 1-cyclohexylethan-1-yl acetate;

[0153] 1-cyclohexylethan-1-ol;

[0154] 1-(4'-methylethyl)cyclohexylethan-1-yl propionate; and/or

[0155] 2'-hydroxy-1'-ethyl(2-phenoxy)acetate

which is passed from tank 64 into said vessel 70. The resulting mixture is then passed through line 106 past valve 107 into vessel 110 equipped with an agitator. Simultaneously, ester-terminated polyamide (ETPA) and/or amide-terminated polyamide (ATPA) in vessel 101 is passed through line 104 past control valve 105 into vessel 110 where the ETPA and/or ATPA-VEILEX-malodor mixture is blended. Optionally, simultaneously, additional functional ingredient(s), e.g., compatible fragrance composition each of the components of which has a C log₁₀P of between 3.0 and 8.0 is passed from tank 72 (a) into vessel 70; (b) through line 102 past control valve 103 into vessel 101 for admixing with the ETPA and/or the ATPA and/or (c) through line 108 past valve 109 into vessel 110. The resulting mixture from vessel 110 is passed through conveyance 111 past control valve 112 to stick molding operation 113 whereat the ATPA and/or ETPA-malodor blend is formed into malodor prevention and/or suppression sticks. The resulting sticks are passed via conveyance 114 to packaging operation 115. The resulting packages created at 115, for example, those shown in FIGS. 1, 2 and 3 are conveyed via conveyance 116 to marketing location 117 and marketed via marketing scheme 118 for ultimate consumer use, 119, e.g., application of the stick to a malodorous solid laminar surface such as the outer surface of a polyethylene-fabricated garbage bag containing malodorous garbage or other solid malodorous waste, e.g., kitty litter.

[0156] The following examples are not meant to define or otherwise limit the scope of the invention. Rather the scope of the invention is to be ascertained according to the claims that follow the examples. Unless noted to the contrary, all percentages are given on a weight percent on a dry basis.

[0157] All U.S. patents and published applications are hereby incorporated by reference as if set forth in their entirety.

Example A

[0158] The following fragrance composition was prepared:

Fragrance Component	Clog ₁₀ P value	Molecular Weight	Parts by Weight
ethyl undecylenate	4.888	212.34	3.0
geranyl anthranilate	4.216	273.38	7.5
α-irone	3.820	206.33	6.3
phenyl ethyl benzoate	4.058	226.28	3.2
d-limonene	4.232	136.24	3.2
cis-p-t-butylcyclohexyl acetate	4.019	198.31	5.8
amyl cinnamic aldehyde	4.324	202.30	7.3
hexyl cinnamic aldehyde	5.473	216.33	12.6
hexyl salicylate	5.260	222.29	12.6

$$V = \frac{V_M^{-1} + V_F}{2}$$

wherein V_M is a scaled value representing malodor intensity and V_F is a scaled value representing fragrance intensity and pleasantness) for each of the coatings is set forth in each of the examples; and is in the range of $7.5 \leq V \leq 10$. Those with skill in the art will appreciate that a higher score is superior to a lower score, for example a score of 10 is superior to a score of 7.5.

Example I

[0161] The following mixtures were prepared and molded into stick articles as set forth above:

Ingredients	Parts by Weight			
	Example IA	Example IB	Example IC	Example ID
Fragrance of Example A, supra	30.0	0	30.0	30.0
Fragrance of Example B, supra	0	30.0	0	0
UNICLEAR 100-LM	67.5	67.5	68.25	68.0
1-(4'-methylethyl)cyclohexylethan-1-yl propionate	2.0	2.0	1.20	1.50
TEGO Sorb Conc. 50	4.0	4.0	2.40	3.00

Example B

[0159] The following fragrance was prepared:

Fragrance Component	Clog ₁₀ P value	Molecular Weight	Parts by Weight
ethyl undecylenate	4.888	212.34	10.5
geranyl anthranilate	4.216	273.38	35.4
α-irone	3.820	206.33	5.3
phenyl ethyl benzoate	4.058	226.28	5.3
phenylethyl phenyl acetate	3.767	240.31	5.3
5-acetyl-1,1,2,3,3,6-hexamethyl indane	5.977	258.41	2.5
cyclopentadecanolide	6.246	240.39	7.5
d-limonene	4.232	136.24	25.0
cis-p-t-butylcyclohexyl acetate	4.019	198.31	4.0
amyl cinnamic aldehyde	4.324	202.30	4.0

[0160] In each of the following Examples I-IV, fragrance formulation and a mixture in the ratio of 2 parts by weight of a 50% solution of zinc ricinoleate in a 1-hydroxy-2-ethoxyethyl ether of a C12-C14 fatty alcohol, referred to herein as TEGO Sorb Conc. 50:1 part by weight of one or more VEILEX compounds, such as 1-(4'-methylethyl)-cyclohexylethan-1-yl propionate was premixed and added, with stirring to UNICLEAR-100-LM ester-terminated polyamide at a temperature of 40° C. The resulting mixture was then placed into molds designed to produce stick articles which fit into packages as illustrated in FIG. 3. The resulting packaged stick articles were then employed in coating malodor-suppressing and fragrance-emitting films on garbage bags initially emitting intense garbage malodors. The resulting scaled value "V" on a scale of 0-10 (where

[0162] The "V" value of the resulting coatings for each of Examples IA, IB, IC and ID is 9.75. This example demonstrates the improvement of the combination of the TEGO sorb and malodor blocking materials in view of the malodor blocking materials alone.

Example II

[0163] The following mixtures was prepared and molded into stick articles as set forth above:

Ingredients	Parts by Weight	
	Example IIA	Example IIB
Fragrance of Example A, supra	30.0	30.0
UNICLEAR 100-LM	69.50	69.75
50:50 mixture of 1-cyclohexylethan-1-yl butyrate and 1-cyclohexylethan-1-yl acetate	0.50	1.50
TEGO Sorb Conc. 50	1.0	3.00

[0164] The "V" value of the resulting coating for Example IIA is 7.75. The "V" value of the resulting coating for Example IIB is 8.10. This example demonstrates the superiority and the synergism of the combination of the TEGO Sorb when used with a 50:50 mixture of 1-cyclohexylethan-1-yl butyrate and 1-cyclohexylethan-1-yl acetate, as compared to using the 50:50 mixture alone or using the TEGO Sorb material alone.

Example III

[0165] The following mixtures were prepared and molded into stick articles as set forth above:

Ingredients	Parts by Weight	
	Example IIIA	Example IIIB
Fragrance of example B, supra	30.0	30.0
UNICLEAR 100-LM	69.50	69.75
30:30:40 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate	3.00	4.00
TEGO Sorb Conc. 50	6.00	8.00

[0166] The “V” value of the resulting coating for Example IIIA is 8.65. The “V” value of the resulting coating for Example IIIB is 8.35.

[0167] The same examples are carried out (a) in the absence of the TEGO Sorb but in the presence of the 30:30:40 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate and (b) in the absence of any known malodor blocking compounds but in the presence of the TEGO Sorb. In each example that is carried out in the absence of TEGO Sorb and in the presence of the 30:30:40 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate the “V” values are 3.6 for Example IIIA without the TEGO Sorb and 3.8 for Example IIIB without the TEGO Sorb. In each example that is carried out in the absence of any known malodor blocking compound but in the presence of TEGO Sorb, the “V” values are 4.65 without any known malodor blocking compound for Example IIIA and 4.55 without any known malodor blocking compound for Example IIIB. This example demonstrates the superiority and synergism of the combination of TEGO Sorb when used with a 50:50 mixture of 1-cyclohexylethan-1-yl butyrate and 1-cyclohexylethan-1-yl acetate, as opposed to using a 50:50 mixture of 1-cyclohexylethan-1-yl butyrate and 1-cyclohexylethan-1-yl acetate alone, or using TEGO Sorb, alone.

Example IV

[0168] The following mixtures were prepared and molded into stick articles as set forth above:

Ingredients	Parts by Weight		
	Example IVA	Example IVB	Example IVC
Fragrance of example A, supra	30.0	30.0	30.0
UNICLEAR 100-LM	69.00	65.00	60.00
10:10:10:10 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate, 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate	5.00	3.00	1.50
TEGO Sorb Conc 50	10.00	6.00	3.00

[0169] The “V” value of the resulting coating for Example IVA is 8.75. The “V” value of the resulting coating for Example IVB is 8.90. The “V” value of the resulting coating for Example IVC is 9.10.

[0170] The same examples are carried out (a) in the absence of the TEGO Sorb but in the presence of the 10:10:10:10 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate, 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate and (b) in the absence of any malodor blocking compounds but in the presence of the TEGO Sorb. In each example that is carried out in the absence of TEGO Sorb and the presence of the 10:10:10:10 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate, 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate the “V” values are 3.9 for Example IVA without the TEGO Sorb, 3.8 for Example IVB without the TEGO Sorb and 3.65 for Example IVC without the TEGO Sorb. In each example that is carried out in the absence of any malodor blocking compound but in the presence of TEGO Sorb, the “V” values are 4.95 without any malodor blocking compound for Example IVA, 4.85 without any malodor blocking compound for Example IVB and 4.70 without any malodor blocking compound for Example IVC. This example demonstrates the superiority and synergism of the combination of TEGO Sorb when used with a 10:10:10:10 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate, 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate, as opposed to using a 10:10:10:10 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate, 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate alone, or using TEGO Sorb, alone. This example also demonstrates that when using the combination of TEGO Sorb with a 10:10:10:10 mixture of 1-cyclohexylethan-1-yl butyrate, 1-cyclohexylethan-1-yl acetate, 1-(4'-methylethyl)cyclohexylethan-1-yl propionate and 2'-hydroxy-1'-ethyl(2-phenoxy)acetate, a lower concentration of the combination in a molded stick article, such as about 4.75% was found to be more effective than a higher concentration of the combination, such as about 13%.

Example V

[0171] Two 1 foot square damp cotton cloth swatches (Identified as Swatch A and Swatch B) and two 1 foot square dry cotton cloth swatches (Identified as Swatch C and Swatch D) were each exposed to cigar smoke evolved from 4 King Edward VII fresh cigars in four separate 3 ft air-tight enclosed chambers for a period of 12 hours thereby imparting an intense tobacco malodor to each swatch. The four swatches were then removed from the chambers and each swatch was separately washed for a wash time of 6 minutes and a rinse time of 2 minutes as follows:

[0172] (a) Swatch A and Swatch C:

[0173] A liquid detergent composition was prepared as described in Example 4 on Page 6 of U.S. Patent Application US 2003/0114323 A1 published on Jun. 19, 2003, containing 99.775% detergent base (HLB Value of 13.2) and 0.225% of the following mixture:

Ingredients	Parts by Weight
TEGO Sorb. Conc. 50	10
1-(4'-methylene)cyclohexylethan-1-yl propionate	5
Dipropylene Glycol	85

[0174] (b) Swatch B and Swatch D:

[0175] A liquid detergent composition as described in Example 4 on Page 6 of U.S. Patent Application US 2003/0114323 A1 published on Jun. 19, 2003, containing 100% detergent base (HLB Value of 13.2).

[0176] Each of the swatches were then measured by a 10 member expert panel for tobacco malodor intensity, scaled on a scale of 0-9, and the results are summarized in FIGS. 4A and 4B, described above and set forth on the following table. In addition, the damp cloth swatches, A and B were measured for preference by a 10 member experienced panel, scaled on a scale of 0-14:

Cloth Swatch Identification	Malodor Intensity Scaled Value (FIGS. 4A and 4B)	Panelist Preference Scaled Value (FIG. 5)
A (Damp Cloth-FIG. 4B, Reference Numeral 45 and FIG. 5, Reference Numeral 53)	2.3	12
B (Damp Cloth-FIG. 4B, Reference Numeral 44 and FIG. 5, reference numeral 52)	8.0	5.2
C (Dry Cloth-FIG. 4A, Reference Numeral 43)	1.3	—
D (Dry Cloth-FIG. 4A, Reference Numeral 42)	7.7	—

[0177] Based upon the scoring criteria set forth above, a lower score is desirable for the malodor intensity and a higher score is more desirable for panelist preference. The test results reported above are consistent in their result. With the combination of TEGO Sorb and malodor blocking compounds, Swatches A and C, the resulting malodor intensity is low and the panelist preference is high. When the TEGO Sorb material is not provided, Swatches B and D, the resulting malodor intensity is high and the panelist preference is low.

Example VI

Malodor Reducing Garbage Bag System

Sensory Evaluation: Film in Jar Protocol

Materials:

- [0178] Garbage bags or laboratory prototype film
- [0179] 8 oz. glass jars and plastic lids
- [0180] Self adhesive labels
- [0181] Scissors
- [0182] Ruler
- [0183] Scotch® tape
- [0184] Glass rod or spatula
- [0185] Powder free nitrile gloves, Micro Flex®
- [0186] Disposable transfer pipette 3 ml, Sanco Scientific® 225
- [0187] Electronic weighing scale, Mettler® Delta Range

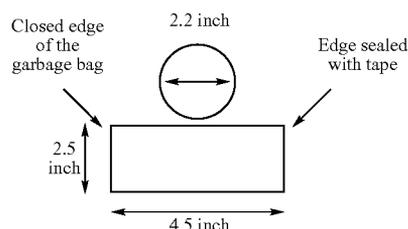
Sample Preparation

[0188] Malodor: 3% IFF synthetic Garbage Malodor in Diethyl Phthalate (DEP)

Bag Lining Preparation:

[0189] Garbage bag (double film layer) was cut with scissors into two portions; a rectangle of 2.5×4.5 inch (L×W) dimension and a circle of 2.2 inch diameter (see figure). Note: Garbage bag number varies with test so it is indicated with the result table.

[0190] The rectangular portion was cut such that the closed edge of the garbage bag (which was taken from the side of the bag, 12" from the bottom) is 2.5 inches and the longer side is 4.5 inches. The other 2.5 inch edge of rectangular portion was sealed using tape making the rectangle into a cylinder of 4.5 inch diameter. This cylindrical tube was placed inside the 8 oz jar to provide single bag layer interior lining.



[0191] The 2.2 inch circle (which is a single layer taken from 1" below the rectangle piece) was placed inside the jar to cover the bottom of the jar.

[0192] A glass rod or spatula was used to adjust the lining such that it covers the sides and bottom of the jar completely. The jar was labeled with 3-digit blinding code for evaluation.

[0193] Under a fume hood, the lined jar was placed on weighing scale and 0.12 g of synthetic garbage malodor was added such that the malodor fell on the bottom and did not spray on the sides of jar. The lid was securely placed and the sample jars were not opened again until the evaluation.

[0194] All samples jars were prepared 17-19 hours prior to evaluation.

Sample for Analytical:

[0195] The remainder of the bag that was used for sensory testing is folded and placed in a foil bag.

[0196] Each sample was sealed in foil bag immediately after use.

[0197] The samples were submitted to analytical by late afternoon on the day before the test.

Subjects: 17-21 Sensory Panelists (Female) Trained on Malodor Intensity Evaluation

Test Procedure:

[0198] Panelists follow standard procedure for sniffing jars. The jars were sniffed from a distance of about 3 inches from the top of the jar for 3 seconds by taking short sniffs.

[0199] Prior to the test panelists smell the synthetic garbage malodor presented in a jar lined with untreated film for familiarization.

[0200] The sample jars are presented in pairs. Each sample jar evaluated for malodor intensity using labeled magnitude scale (LMS) according to the procedure disclosed in

[0201] Barry G. Green, Gregory S. Shaffer and Magdalena M. Gilmore, *Derivation and Evaluation of a Semantic Scale of Oral Sensation Magnitude with Apparent Ratio Properties*, Chemical Senses Vol. 18 no. 6 pp. 683-702, 1993.

[0202] Panelists enter their rating on tablet computers using Compusense® data collection software

[0203] Sample evaluation order is randomized between and within sample pairs

Analysis:

[0204] ANOVA to compare malodor intensities of samples within a pair. Significance established at $p \leq 0.05$. See FIG. 9.

Sample	Mean	Std. Error of Mean
Control sample	11.86	1.14
Technology sample	7.15	1.18

The garbage bag formulation comprises a combination of linear low density polyethylene and an acrylic styrene methyl methacrylate copolymer and a malodor reducing composition.

50%—Plastic LLDPE (Linear Low Density Polyethylene)

[0205] 30%—Plastic Elvaloy® commercially available from Dupont

20%—Malodor reducing composition loaded in polyethylene material, the malodor reducing composition is loaded at 2.5%.

The formulation comprises a combination of malodor technology, zinc ricinoleate and neobee oil.

The malodor reducing composition comprises the following ingredients:

1	100.000	Zinc Ricinoleate
2	588.500	Neobee M5
3	189.322	CYCLOHEXANOL, 4-ISOPROPYL: PROPIONATE, CIS (VEILEX 4)
4	76.650	CYCLOHEXANEMETHANOL, ALPHA-METHYL: ACETATE (VEILEX 2)
5	18.933	BUTYRIC ACID: 1-CYCLOHEXYLETHYL ESTER (VEILEX 1)
6	26.595	CYCLOHEXANEMETHANOL, ALPHA-METHYL (VEILEX 3)
Total	1000.00	

What is claimed is:

1. A malodor reducing garbage bag system comprising, in combination, a garbage bag including an impermeable, flexible inelastic sheet constructed from a polyethylene material and including a side wall with a closed bottom and an open top; a malodor reducing composition impregnated within the sheet of the garbage bag.

2. The malodor reducing garbage bag system of claim 1 wherein the malodor reducing composition comprises ingredients selected from the group consisting of cyclohexanol, 4-isopropyl: propionate, cis;

cyclohexanemethanol, alpha-methyl: acetate; butyric acid: 1-cyclohexylethyl ester; cyclohexanemethanol, alpha-methyl; zinc ricinoleate; and mixtures there of.

3. The malodor reducing composition of claim 2 wherein the composition comprises

from about 2.8 weight % up to about 4.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis; from about 0.5 weight % up to about 2.5 weight % of cyclohexanemethanol, alpha-methyl: acetate; from about 0.1 weight % up to about 1 weight % of butyric acid: 1-cyclohexylethyl ester; from about 0.25 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and from about 1 weight % up to about 3 weight % of zinc ricinoleate.

4. The malodor reducing composition of claim 2 wherein the composition comprises

about 3.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis; about 1.5 weight % of cyclohexanemethanol, alpha-methyl: acetate; about 0.4 weight % of butyric acid: 1-cyclohexylethyl ester; about 0.5 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and about 2 weight % of zinc ricinoleate.

5. The malodor reducing composition of claim 2 wherein the composition additionally comprises a solvent.

6. The malodor reducing garbage bag system of claim 1 wherein the garbage bag contains from about 1 to about 5 weight % of the malodor reducing composition.

7. The malodor reducing garbage bag system of claim 1 wherein the garbage bag contains about 2.5 weight % of the malodor reducing composition

8. The malodor reducing garbage bag system of claim 1 wherein the malodor intensity is reduced by about 20%.

9. The malodor reducing garbage bag system of claim 1 wherein the malodor intensity is reduced by about 30%.

10. The malodor reducing garbage bag system of claim 1 wherein the malodor intensity is reduced by about 40%.

11. The malodor reducing garbage bag system of claim 1 wherein the malodor intensity is reduced by about 50%.

12. A substantially fragrance free odor blocking garbage bag system comprising, in combination, a garbage bag including an impermeable, flexible inelastic sheet constructed from a polyethylene material and including a side wall with a closed bottom and an open top; a malodor reducing composition impregnated within the sheet of the garbage bag.

13. The garbage bag system of claim 12 wherein the malodor reducing composition comprises ingredients selected from the group consisting of

cyclohexanol, 4-isopropyl: propionate, cis; cyclohexanemethanol, alpha-methyl: acetate; butyric acid: 1-cyclohexylethyl ester; cyclohexanemethanol, alpha-methyl; zinc ricinoleate and mixtures there of.

14. The garbage bag system of claim **12** wherein the malodor reducing composition comprises
from about 2.8 weight % up to about 4.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis;
from about 0.5 weight % up to about 2.5 weight % of cyclohexanemethanol, alpha-methyl: acetate;
from about 0.1 weight % up to about 1 weight % of butyric acid: 1-cyclohexylethyl ester;
from about 0.25 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and
from about 1 weight % up to about 3 weight % of zinc ricinoleate.

15. The malodor reducing composition of claim **12** wherein the composition comprises
about 3.8 weight % of cyclohexanol, 4-isopropyl: propionate, cis;
about 1.5 weight % of cyclohexanemethanol, alpha-methyl: acetate;
about 0.4 weight % of butyric acid: 1-cyclohexylethyl ester;

about 0.5 weight % up to about 1 weight % of cyclohexanemethanol, alpha-methyl; and
about 2 weight % of zinc ricinoleate.

16. The malodor reducing composition of claim **12** wherein the composition additionally comprises a solvent.

17. The malodor reducing garbage bag system of claim **12** wherein the garbage bag contains from about 1 to about 5 weight % of the malodor reducing composition.

18. The malodor reducing garbage bag system of claim **12** wherein the garbage bag contains about 2.5 weight % of the malodor reducing composition.

19. The malodor reducing garbage bag system of claim **12** wherein the malodor intensity is reduced by about 20%.

20. The malodor reducing garbage bag system of claim **12** wherein the malodor intensity is reduced by about 30%.

21. The malodor reducing garbage bag system of claim **12** wherein the malodor intensity is reduced by about 40%.

22. The malodor reducing garbage bag system of claim **12** wherein the malodor intensity is reduced by about 50%.

* * * * *