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(54) Title: COMPOSITION COMPRISING A HOP EXTRACT BENEFIT AGENT

(57) Abstract: The invention relates to a home-care or fabric-care or institutional-cleaning or industrial-cleaning composition comprising a benefit agent. The composition can provide benefits such as preventing bacteria proliferation. Thus the invention also relates to a process of treating a surface for example against bacteria proliferation, comprising the step of applying onto the surface a composition according to the invention. This can provide cleaning, disinfection, suppression of odors, and/or prevention of mal-odors.



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TITLE**Composition comprising a hop extract benefit agent**BACKGROUND OF THE INVENTION

5 The invention relates to a home-care or fabric-care or institutional-cleaning or industrial-cleaning composition comprising a benefit agent. The composition can provide benefits such as preventing bacteria proliferation. Thus the invention also relates to a process of treating a surface for example against bacteria proliferation, comprising the step of applying onto the surface a composition according to the invention. This can
10 provide cleaning, disinfection, suppression of odors, and/or prevention of malodors.

 The relationship of a consumer to some products used for example to clean clothes, houses and more generally to clean its environment is changing.

 A product must bring more than the basic cleaning benefit: It has to provide a safe,
15 healthy and pleasant environment which explains for example the success for formulations that "clean and disinfect and suppress malodors" at the same time. The bleach systems that are still used today both in laundry detergents and hard surface cleaning detergents meet that request. The drawbacks of these "bleach systems" are that they are sometimes very aggressive on delicate fabric or surfaces. On top of that,
20 for the particular case of liquid laundry formulations, these bleach may lead to restrictions regarding freedom to formulate because of stability problems at alkaline pH or because of incompatibility with some ingredients of the formulation (enzymes).

 An alternative to bleach formulations in hard surface cleaners to provide cleaning, disinfecting and/or malodor control has been found with the development of
25 antimicrobial formulations containing quaternary ammonium compounds. However these quaternary ammonium compounds may lead to skin irritation and even allergy and acute dermatitis problems at the concentration level they are used in home care detergent. They may be detrimental to environment because of their toxicity versus algae and aquatic environment. Another limitation for the use of the quaternary ammonium
30 compounds in the wipes is that they interact with some fibers and are difficult to release on the surfaces.

 There is therefore a growing demand, for example in home and fabric care compositions, for products providing cleaning, disinfecting, preventing and/or suppressing malodor, while being safer and more respectful of the environment.

In Hard Surface Cleaners, formulations containing ingredients derived from natural sources such as limonene, orange or citrus oil are known. Some relevant references about using essential oils for the disinfection of hard surfaces include the following:

- 5 - EP 1146111: disinfection of hard surfaces and dishes with cinnamon oil, thymol, geraniol or eugenol, terpineol, verbenone.
- WO02085109: disinfection of hard surfaces in the house with thymol, geraniol, carvacrol, citral, terpinene, carvone, limonene.

In fabric care detergent there is also a need to provide odour and/or malodour control benefits to the clothes:

- 10 - during the cleaning step to remove source of malodour, and/or
- while the consumer wears the clothes to neutralize the malodour resulting from perspiration.

For example WO9802044 describes the use of thymol, eugenol, verbenone, eucalyptol, terpineol, cinnamic acid in hard surfaces and laundry detergent formulations.

- 15 However the natural ingredients mentioned above are not considered as completely safe, although they benefit from a great impact in consumers mind because they have a natural origin. There is today a growing concern regarding the safety and the ecotoxicity of some "natural extracts" such as limonene that are widely used in detergent formulations.

- 20 Limonene (extracted from orange peel) for instance has been evidenced to be sensitizing with skin contact and to provide acute toxicity to fish and algae. Others essential oils are under scrutiny and the Directive European 2003/15/EC now limits the amount of some fragrances or oils in cosmetics and detergents in order to reduce the risk of skin irritation or sensitization that may occur by repeated exposure to these
- 25 compounds.

Limonene, geraniol, eugenol cinnamal and cinnamyl alcohol are amongst the essential oils that need to be incorporated at levels below 100 ppm for rinse off formulations and below 10 ppm for leave on formulations, in order to limit the risk of allergy and sensitization. These low amounts can limit the benefits thereof.

- 30 The SCCNFP (Scientific Committee on cosmetic products and non food products intended for consumers) has published opinions proposing to extend these restrictions to a lot of others essential oils like costus root oil, peru balsam, pine needle oil, turpentine, cumin oil, hydroxycitronellal, verbenone.....

- 35 There is a need for new products (compositions to be used by consumers such as home-care or fabric-care compositions or institutional cleaning compositions or industrial cleaning compositions) comprising compounds that address at least partially, at least

some of the drawbacks and/or needs above, and which are Generally Recognised As Safe ("GRAS").

Hop extracts such as hop acids (alpha acids also referred as to Humulone and Beta acids also referred as to Lupulone) present in hop have been long known and used for their bacteriostatic and bacteriocidal functions in the beer industry. Hop acids include the alpha and beta acids and their GRAS derivatives traditionnaly used for the preparation of beer like: humulone, cohumulone, adhumulone, iso humulone, iso cohumulone, iso adhumulones, dishydro iso alpha acids, tetrahydro isoalpha acids, hexahydro iso alpha acids, hexahydrolupulone, hexahydrocolupulone (hexahydro beta acids)...

A lot of literature is available on the use of these hop acids (used alone or in blends) to prevent the proliferation of gram+ bacteria such as Lactobacilli which is a major contaminant in beer fermentation. It is assumed that hop compounds like iso alpha acids are weak acids that can cross cytoplasmic membranes and disrupt the pH gradient of the cell, which results in the starving of the cell. Examples of references about this topic include the following documents:

- Simpson,W.J., Smith, A.R.W., J.appl.Bacteriol., 1992,72,327-334.
Simpson,W.J.,J.Inst.Brew.,1993,139,1041-1045.
Sakamoto,K., Van veen H.W, Saito. H, Kobayashi.H, Konings,W.N, Appl. And Environmet.l Microbiol., 2002,68,11, 5374-5378.

Methods have been described to extract bacteriostatic agents from hop flower and use these extracts to neutralize resident gram + bacteria on skin, that when in contact with sweat will be responsible for the development of malodor. A method for producing a skin deodorant based on this bactericidal extract is described in document US 4,170,638.

Beta acids from hop have been shown as demonstrating superior efficiency against development of gram + bacteria and claimed for use in food preservation. This is for example described in documents US 5,286,506 and US 6,475,537.

New methods have been described to optimize the stability of hop beta acids by converting them to hexahydro beta acids. This is for example described in document US 5,166,449.

Blends of hexahydrocolupulone and tetrahydroisohumulone have been described to inhibit listeria growth, in document US 5,455,038.

The efficacy of hop extracts as herbal medicine has been long established by tradition and is now supported by current research. Hop extract is reported to have been

used topically to treat sores and skin injuries. It is used in skin creams and lotions as a skin emollient (Hops, Presentation to Herbal Medicine Seminar, Canterbury College of Natural medicine, New Zealand July, 2001). There is a revived interest for hop properties in modern medicine as evidenced by the recent scientific publications dealing with applications of its relaxant and bacteriostatic properties. Relevant references include the following:

- Pharmacodynamic study of the lupulus' tranquilizing action. Boll Chim. Farm 1974.
- Antifungal (candida) activity of hops bitter resins and relative compounds , Report Research laboratories, Kirin Brewery, Muizobuchi and Sato , Vol 28, P39-44 (1985).

None of the references above describes compositions to be used by consumers such as home-care or fabric-care compositions or institutional-cleaning compositions or industrial cleaning compositions. None suggests that incorporating hop extracts into such compositions be possible.

BRIEF SUMMARY OF THE INVENTION

The invention provides a home-care, or fabric-care, or institutional-cleaning or industrial-cleaning composition comprising a hop extract.

The composition can be for example a hard surface cleaner or detergent composition.

According to another aspect, the invention provides a process of treatment a surface for preventing bacteria proliferation, cleaning, disinfecting, suppressing odors, and/or preventing malodor, comprising the step of applying onto the surface a composition comprising a hop extract.

According to another aspect, the invention provides the use of a hop extract in a home-care, or fabric-care, or an institutional-cleaning or industrial-cleaning composition, as an agent for preventing bacteria proliferation, cleaning, disinfecting, suppressing odors, and/or preventing malodor.

The composition, the process, can provide the treating for preventing bacteria proliferation, cleaning, disinfecting, suppressing odors, and/or preventing of malodors, while addressing at least some concerns about safety (the composition being GRAS), and/or being non sensitizing for users.

For clothes the composition can provide disinfecting as well as odor and/or malodor control benefits, while trying to prevent any risk of sensitization by skin contact and/or inhalation, during the cleaning step to remove source of malodor and/or while the consumer wears the clothes to neutralize the gram + bacteria that can be present on

skin and are responsible for the malodor generation. This is believed to be true for the detergent used to clean clothes in the home as well as for the detergents used to clean linen and clothes, carpets and upholstery in collectivities such as schools, restaurants, hotels, hospitals, elderly homes where the risk of contamination by gram + bacteria is even greater. This operation of disinfecting clothes and/or preventing malodor generation due to resident bacteria on skin (like staphylococcus aureus and staphylococcus epidermis) can be done without being detrimental to the skin and without risking to generate irritation and sensitization through skin contact and inhalation.

10

For home surfaces like kitchen, fridge, bathroom, floors, toilet bowl, upholstery, carpets, the composition can provide bacteriostatic, bactericidal and/or malodor treatment to surfaces in the home, like those that are susceptible to be contaminated by gram + bacteria, while diminishing the risks of sensitization of the consumer by skin contact and/or inhalation.

15

In public places such as restaurants, restaurants kitchen and crockery, restaurant and hotel bathrooms, public lavatories, surfaces in hospitals, the composition can provide bacteriostatic, bactericidal and/or malodor treatment, while preventing any risk of sensitization by skin contact and/or inhalation.

20

For surfaces in contact with food or animals (dead or alive) in the industrial environment like vessel tanks for food and beverage preparation, animal farms , animal transportation, garbage trucks, the composition can provide bacteriostatic , bactericidal and/or malodor treatment to surfaces while trying to prevent any risk of sensitization by skin contact and/or inhalation.

25

It is believed that the hop extract of the composition can be especially efficient against proliferation of the following:

- Listeria monocytogenes (+)
- Staphylococcus aureus (+)
- 30 • Salmonella enteritidis (-)
- Streptococci (+)
- Lactobacilli (+) (first use as bacteriostatic agent in beer....)
- Corynebacteria (+)
- Diplococci (+)
- 35 • Mycobacteria (+)
- Streptococci (+)

- Streptomyces (+)
- Clostridia bacteria (+)
- Bacillus bacteria (+), and/or
- Micrococci (+).

5

DETAILED DESCRIPTION OF THE INVENTION

Definitions

In the present specification "hop extract" refers to compounds or compositions of matter obtained from hop, as well as compounds or compositions of matters chemically derived thereof.

10

In the present specification "composition comprising a hop extract" refers to a composition that can be used as such, or to a composition that is to be diluted before or during use (it can be referred to a "concentrate composition") or to a composition in a diluted form (it can be referred to a "diluted composition").

15

In the present specification "hard surface" refers to any surface found in homes or institutional buildings, or in industrial buildings, or in furniture, provided that the surface is not a fabric such as clothes, furniture fabrics, curtains, sheets. Hard surfaces especially include dishware, silverware, and any other surfaces that need to be cleaned regularly. Of course hard surfaces do not include skin or hair.

20

Hop extract

The composition of the invention comprises a hop extract.

The composition of whole hop varies according to the varieties. An example of a typical composition has been given by Stevens, R. (1987), Hops, an Introduction to Brewing Science and Technology, Series II, Vol.I, p23.

25

An example of a whole hop composition is the following:

Alpha acids: 8%

Beta acids: 4%

30

Other resins: 3%

Essential oils: 1%

Tannins: 4%

Proteins: 15%

Water: 9,5%

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Monosaccharides: 2%

Lipids and waxes: 3%

Aminoacids: 0,1%

Pectin: 2%

Ash: 8%

Cellulose, lignin: 40,4%

5

Whole hop is usually processed through liquid CO₂ or supercritical CO₂ to obtain the useful fractions of active components like alpha acids, beta acids and essential oils. The alpha and beta acids can be further processed and isomerised.

Typical commercial hop extracts of interest for the invention are available on the market
10 for brewery applications at Hopsteiner (Germany), John I. Haas (USA), Botanix (UK) .
They comprise blends or pure extracts of active matter such as hop beta acids, hop alpha acids and their isomerised or reduced derivatives. Some examples of hop extracts composition are given hereafter for illustration:

1) solutions of iso alpha acids, available for instance as alkaline solution of potassium
15 salt of isoalpha acids (commercial product: Iso- extract -30% from Hopsteiner).

2) solutions of reduced (rho) iso alpha acids, available for instance as alkaline solutions of potassium salts (commercial product: Rho-Iso-Extract-10% from Hopsteiner).

3) Solutions of tetrahydro iso alpha acids, available as alkaline solutions of potassium salts (commercial product: Tetra Iso extract-10% from Hopsteiner).

20 4) Solutions of tetrahydro iso alpha acids and hexahydro alpha acids, available as alkaline solutions of the potassium salts (commercial product: Hexahop Gold from John I Haas).

5) Solutions of beta acids available for instance as alkaline solutions of the potassium salts (commercial product: Beta acid solution 10% from John I Haas).

25 6) Amber resins consisting of purified reduced (Rho) iso alpha acids(commercial product: Rho Concentrate from Hopsteiner).

7) Amber resins consisting of Beta acids (40-50%) and oils (commercial product: Light stable Beta aroma extract from Hopsteiner).

30 The bitter acids component of the hops used in beer making and particularly the beta-acids have now been found to be useful as bactericides in food products. The most prevalent groups of bitter acids found as components of hops are the alpha-acids and the beta-acids, also referred to as humulones and lupulones, respectively. Both contribute bitterness to beer, but the alpha-acids are much more intense in this regard
35 than the beta-acids. Producers of hop extracts isolate the alpha and beta acids commercially by various chromatographic techniques and have recently developed a

technique to separate the two acid fractions using liquid carbon dioxide under supercritical conditions. A by-product of the operation is a product which contains approximately 61 weight percent beta-acids, the remainder consisting essentially of hops resins. This by-product can be standardized with malto-dextrin or other food grade carrier, spray-dried, and used as an antibacterial food ingredient. A preferred beta hop acids component is commercially available as a natural flavor extract containing 1 weight percent beta hop acids.

The alpha-acids contained in hops are commonly known as humulone, cohumulone and adhumulone, while the beta-acids contained in hops are commonly known as lupulone, colupulone and adlupulone. Derivatives of the hop acids or hop resins which have demonstrated antibacterial properties such as hexahydrocolupulone and tetrahydroisohumulone, as disclosed in U.S. Pat. No. 5,455,038, are specifically contemplated for use in association with the present invention. Also considered as specifically contemplated for use in association with the present invention is the use of the acid salt forms of the hops acids or hops resins.

The hop extract advantageously comprises an active matter having:

- alpha hop acid (Humulone), isomers thereof, reduced derivatives thereof,
- beta hop acid (Lupulone), isomers thereof, reduced derivatives thereof, or
- mixtures thereof.

The hop extract comprises preferably at least 5% by weight the active matter.

Composition comprising the hop extract

The composition comprising the hop extract can be in different forms. The form usually depends upon the use of the composition. Thus the composition can be a for example liquid, a gel, a foaming liquid, foam, a powder, or a tablet.

Liquid compositions can be dispensed for example by spraying, by pouring or applying with a liquid dispensing device such as rollers or pumps.

The compositions can be diluted prior to being used, or during use. Dilution is preferably performed with water. Dilution rates usually depend upon the use of the composition. Furthermore dilutions approaches can depend upon the very consumer that uses the composition. For compositions that are to be diluted, dilution rates can be of from 5 to 500 for example.

The amount of hop extract in the composition is preferably of lower than 5% by weight, and preferably of higher than 100 ppm by weight.

Concentrate compositions can advantageously comprise from 0.5% to 5% by weight of the hop extract.

Diluted compositions can advantageously comprise from 100 ppm to 0.5% by weight of the hop extract.

5

Where the composition is a liquid composition, for example a liquid concentrate composition, said composition can comprise a liquid medium, preferably an aqueous medium, an alcoholic medium, or a hydroxy-alcoholic medium. The medium can be a part of the composition, a part of a concentrate composition, or a part of a diluted composition, for example the diluting medium.

10

Further ingredients

The composition will usually comprise further ingredients of home-care or fabric-care or institutional-cleaning or industrial-cleaning compositions. The further ingredients usually depend upon the use, destination and/or form of the composition. These further ingredients are known by the one skilled in the art of preparing compositions comprising several ingredients (or "formulations") to serve a use or a market.

15

Thus, the composition can comprise at least one surfactant. Compositions that comprise a surfactant are for example useful in compositions that are to provide cleaning or degreasing, such as dish-washing compositions (hand dishwashing or automatic dishwashing), laundry compositions, hard-surface cleaning compositions, industrial cleaning or degreasing compositions.

20

Useful surfactants include anionic, non ionic, cationic, amphoteric (including zwitterionic) surfactants and mixtures thereof.

25

Anionic Surfactants

Anionic surfactants useful in the present invention are preferably selected from the group consisting of, linear alkylbenzene sulfonates, alpha olefin sulfonates, paraffin sulfonates, methyl ester sulfonates, alkyl sulfates, alkyl alkoxy sulfates, alkyl sulfonates, alkyl alkoxy carboxylate, alkyl alkoxylated sulfates, sarcosinates, taurinates, and mixtures thereof.

30

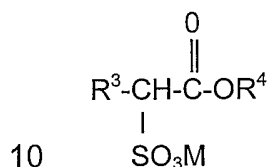
One type of anionic surfactant which can be utilized encompasses alkyl ester sulfonates. These are desirable because they can be made with renewable, nonpetroleum resources. Preparation of the alkyl ester sulfonates surfactants components can be effected according to known methods disclosed in the technical literature. For instance, linear esters of C₈-C₂₀ carboxylic acids can be sulfonated with

35

gaseous SO₃ according to "The Journal of the American Oil Chemists Society," 52 (1975), pp. 323-329. Suitable starting materials would include natural fatty substances as derived from tallow, palm, and coconut oils, etc.

The preferred alkyl ester sulfonate surfactant, especially for laundry applications,

5 comprises alkyl ester sulfonate surfactants of the structural formula:



wherein R³ is a C₈-C₂₀ hydrocarbyl, preferably an alkyl, or combination thereof, R⁴ is a C₁-C₆ hydrocarbyl, preferably an alkyl, or combination thereof, and M is a soluble salt-forming cation. Suitable salts include metal salts such as sodium, potassium, and lithium
15 salts, and substituted or unsubstituted ammonium salts, such as methyl-, dimethyl-, trimethyl-, and quaternary ammonium cations, e.g. tetramethyl-ammonium and dimethyl piperdinium, and cations derived from alkanolamines, e.g. monoethanol-amine, diethanolamine, and triethanolamine.

Preferably, R³ is C₁₀-C₁₆ alkyl, and R⁴ is methyl, ethyl or isopropyl. Especially preferred
20 are the methyl ester sulfonates wherein R³ is C₁₄-C₁₆ alkyl.

Alkyl sulfate surfactants are another type of anionic surfactant of importance for use herein. In addition to providing excellent overall cleaning ability when used in combination with polyhydroxy fatty acid amides (see below), including good grease/oil cleaning over a wide range of temperatures, wash concentrations, and wash times,
25 dissolution of alkyl sulfates can be obtained, as well as improved formulability in liquid detergent formulations are water soluble salts or acids of the formula ROSO₃M wherein R preferably is a C₁₀-C₂₄ hydrocarbyl, preferably an alkyl or hydroxyalkyl having a C₁₀-C₂₀ alkyl component, more preferably a C₁₂-C₁₈ alkyl or hydroxyalkyl, and M is H or a cation, e.g., an alkali or alkaline (Group IA or Group IIA) metal cation (e.g., sodium,
30 potassium, lithium, magnesium, calcium), substituted or unsubstituted ammonium cations such as methyl-, dimethyl and trimethyl ammonium and quaternary ammonium cations, e.g., tetramethylammonium and dimethyl piperdinium, and cations derived from alkanolamines such as ethanolamine, diethanolamine, triethanolamine, and mixtures thereof, and the like. Typically, alkyl chains of C₁₂-C₁₆ are preferred for lower wash
35 temperatures (e.g., below about 50°C) and C₁₆-C₁₈ alkyl chains are preferred for higher wash temperatures (e.g., above about 50°C). Examples of these surfactants include surfactants sold by Rhodia under the Rhodapan Trade Name.

Alkyl alkoxyated sulfate surfactants are another category of useful anionic surfactant. These surfactants are water soluble salts or acids typically of the formula $RO(A)_mSO_3M$ wherein R is an unsubstituted C_{10} - C_{24} alkyl or hydroxyalkyl group having a C_{10} - C_{24} alkyl component, preferably a C_{12} - C_{20} alkyl or hydroxyalkyl, more preferably C_{12} - C_{18} alkyl or hydroxyalkyl, A is an ethoxy or propoxy unit, m is greater than zero, typically between about 0.5 and about 6, more preferably between about 0.5 and about 3, and M is H or a cation which can be, for example, a metal cation (e.g., sodium, potassium, lithium, calcium, magnesium, etc.), ammonium or substituted-ammonium cation. Alkyl ethoxylated sulfates as well as alkyl propoxylated sulfates are contemplated herein.

Specific examples of substituted ammonium cations include methyl-, dimethyl-, trimethyl-ammonium and quaternary ammonium cations, such as tetramethyl-ammonium, dimethyl piperidinium and cations derived from alkanolamines, e.g. monoethanolamine, diethanolamine, and triethanolamine, and mixtures thereof. Exemplary surfactants are C_{12} - C_{18} alkyl polyethoxylate (1.0) sulfate, C_{12} - C_{18} alkyl polyethoxylate (2.25) sulfate, C_{12} - C_{18} alkyl polyethoxylate (3.0) sulfate, and C_{12} - C_{18} alkyl polyethoxylate (4.0) sulfate wherein M is conveniently selected from sodium and potassium. Surfactants for use herein can be made from natural or synthetic alcohol feedstocks. Chain lengths represent average hydrocarbon distributions, including branching. Examples of these surfactants include surfactants sold by Rhodia under the Rhodapex Trade Name.

Other Anionic Surfactants - Other anionic surfactants useful for deterative purposes can also be included in the compositions hereof. These can include salts (including, for example, sodium, potassium, ammonium, and substituted ammonium salts such as mono-, di- and triethanolamine salts) of soap, C_8 - C_{20} linear alkylbenzenesulphonates, for example sold by Rhodia under the Rhodacal trade name, C_8 - C_{22} primary or secondary alkanesulphonates, C_8 - C_{24} olefinsulphonates, sulphonated polycarboxylic acids prepared by sulphonation of the pyrolyzed product of alkaline earth metal citrates, e.g., as described in British patent specification No. 1,082,179, alkyl glycerol sulfonates, fatty acyl glycerol sulfonates, fatty oleyl glycerol sulfates, alkyl phenol ethylene oxide ether sulfates, paraffin sulfonates, alkyl phosphates, isothionates such as the acyl isothionates, N-acyl taurates, fatty acid amides of methyl tauride, alkyl succinamates and sulfosuccinates, monoesters of sulfosuccinate, for example sold by Rhodia under the Geroon trade name (especially saturated and unsaturated C_{12} - C_{18} monoesters) diesters of sulfosuccinate (especially saturated and unsaturated C_6 - C_{14} diesters), N-acyl_sarcosinates, sulfates of alkylpolysaccharides such as the sulfates of alkylpolyglucoside (the nonionic nonsulfated compounds being described below),

branched primary alkyl sulfates, alkyl polyethoxy carboxylates such as those of the formula $\text{RO}(\text{CH}_2\text{CH}_2\text{O})_k\text{CH}_2\text{COO}^-\text{M}^+$ wherein R is a $\text{C}_8\text{-C}_{22}$ alkyl, k is an integer from 0 to 10, and M is a soluble salt-forming cation, and fatty acids esterified with isethionic acid and neutralized with sodium hydroxide. Resin acids and hydrogenated resin acids
5 are also suitable, such as rosin, hydrogenated rosin, and resin acids and hydrogenated resin acids present in or derived from tall oil.

Further examples are given in "Surface Active Agents and Detergents" (Vol. I and II by Schwartz, Perry and Berch). A variety of such surfactants are also generally disclosed in U.S. Patent 3,929,678, issued December 30, 1975 to Laughlin, et al. at
10 Column 23, line 58 through Column 29, line 23.

Nonionic Surfactants

Suitable nonionic detergent surfactants are generally disclosed in U.S. Patent 3,929,678, Laughlin et al., issued December 30, 1975, at column 13, line 14 through column 16, line 6, incorporated herein by reference. Exemplary, non-limiting classes of
15 useful nonionic surfactants include: alkyl dialkyl amine oxide, for example sold by Rhodia under the Rhodamox trade name, alkyl ethoxylate, for example sold by Rhodia under the Rhodasurf trade name, alkanoyl glucose amide, alkyl betaines, for example sold by Rhodia under the Mirataine trade name, and mixtures thereof.

Other nonionic surfactants for use herein include:

20 The polyethylene, polypropylene, and polybutylene oxide condensates of alkyl phenols. In general, the polyethylene oxide condensates are preferred. These compounds include the condensation products of alkyl phenols having an alkyl group containing from about 6 to about 12 carbon atoms in either a straight chain or branched chain configuration with the alkylene oxide. In a preferred embodiment, the ethylene
25 oxide is present in a amount equal to from about 5 to about 25 moles of ethylene oxide per mole of alkyl phenol. Commercially available nonionic surfactants of this type include surfactants sold by Rhodia under the Igepal trade name. These are commonly referred to as phenol alkoxylates, (e.g., alkyl phenol ethoxylates).

The condensation products of aliphatic alcohols with from about 1 to about 25
30 moles of ethylene oxide. The alkyl chain of the aliphatic alcohol can either be straight or branched, primary or secondary, and generally contains from about 8 to about 22 carbon atoms. Particularly preferred are the condensation products of alcohols having an alkyl group containing from about 10 to about 20 carbon atoms with from about 2 to about 18 moles of ethylene oxide per mole of alcohol.

35 Examples of commercially available nonionic surfactants of this type include TergitolB 15-S-9 (the condensation product of $\text{C}_{11}\text{-C}_{15}$ linear secondary alcohol with 9 moles

ethylene oxide), Tergitol 24-L-6 NMW (the condensation product of C₁₂-C₁₄ primary alcohol with 6 moles ethylene oxide with a narrow molecular weight distribution), both marketed by Union Carbide Corporation; Neodol® 45-9 (the condensation product of C₁₄-C₁₅ linear alcohol with 9 moles of ethylene oxide), Neodol® 23-6.5 (the
5 condensation product of C₁₂-C₁₃ linear alcohol with 6.5 moles of ethylene oxide), Neodol® 45-7 (the condensation product of C₁₄-C₁₅ linear alcohol with 7 moles of ethylene oxide), Neodol® 45-4 (the condensation product of C₁₄-C₁₅ linear alcohol with 4 moles of ethylene oxide), marketed by Shell Chemical Company, Rhodasurf IT, DB, and B marketed by Rhodia, Plurafac LF 403, marketed by BASF, and Kyro® EOB (the
10 condensation product of C₁₃-C₁₅ alcohol with 9 moles ethylene oxide), marketed by The Procter & Gamble Company. Other commercially available nonionic surfactants include Dobanol 91-8® marketed by Shell Chemical Co. and Genapol UD-080® marketed by Hoechst. This category of nonionic surfactant is referred to generally as "alkyl ethoxylates."

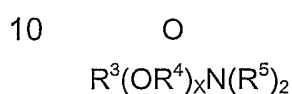
15 The condensation products of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol. The hydrophobic portion of these compounds preferably has a molecular weight of from about 1500 to about 1800 and exhibits water insolubility. The addition of polyoxyethylene moieties to this hydrophobic portion tends to increase the water solubility of the molecule as a whole,
20 and the liquid character of the product is retained up to the point where the polyoxyethylene content is about 50% of the total weight of the condensation product, which corresponds to condensation with up to about 40 moles of ethylene oxide. Examples of compounds of this type include certain of the commercially-available Pluronic® surfactants, marketed by BASF, and Antarox, marketed by Rhodia.

25 The condensation products of ethylene oxide with the product resulting from the reaction of propylene oxide and ethylenediamine. The hydrophobic moiety of these products consists of the reaction product of ethylenediamine and excess propylene oxide, and generally has a molecular weight of from about 2500 to about 3000. This hydrophobic moiety is condensed with ethylene oxide to the extent that the
30 condensation product contains from about 40% to about 80% by weight of polyoxyethylene and has a molecular weight of from about 5,000 to about 11,000. Examples of this type of nonionic surfactant include certain of the commercially available TetronicB compounds, marketed by BASF.

Semi-polar nonionic surfactants are a special category of nonionic surfactants
35 which include water-soluble amine oxides containing one alkyl moiety of from about 10 to about 18 carbon atoms and 2 moieties selected from the group consisting of alkyl

groups and hydroxyalkyl groups containing from about 1 to about 3 carbon atoms; water-soluble phosphine oxides containing one alkyl moiety of from about 10 to about 18 carbon atoms and 2 moieties selected from the group consisting of alkyl groups and hydroxyalkyl groups containing from about 1 to about 3 carbon atoms; and water-soluble
 5 sulfoxides containing one alkyl moiety of from about 10 to about 18 carbon atoms and a moiety selected from the group consisting of alkyl and hydroxyalkyl moieties of from about 1 to about 3 carbon atoms.

Semi-polar nonionic detergent surfactants include the amine oxide surfactants having the formula:



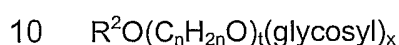
wherein R^3 is an alkyl, hydroxyalkyl, or alkyl phenyl group or mixtures thereof containing from about 8 to about 22 carbon atoms; R^4 is an alkylene or hydroxyalkylene group
 15 containing from about 2 to about 3 carbon atoms or mixtures thereof; x is from 0 to about 3; and each R^5 is an alkyl or hydroxyalkyl group containing from about 1 to about 3 carbon atoms or a polyethylene oxide group containing from about 1 to about 3 ethylene oxide groups. The R^5 groups can be attached to each other, e.g., through an oxygen or nitrogen atom, to form a ring structure. These amine oxide surfactants in
 20 particular include C_{10} - C_{18} alkyl dimethyl amine oxides and C_8 - C_{12} alkoxy ethyl dihydroxy ethyl amine oxides.

Alkylpolysaccharides disclosed in U.S. Patent 4,565,647, Llenado, issued January 21, 1986, having a hydrophobic group containing from about 6 to about 30 carbon atoms, preferably from about 10 to about 16 carbon atoms and a polysaccharide,
 25 e.g., a polyglycoside, hydrophilic group containing from about 1.3 to about 10, preferably from about 1.3 to about 3, most preferably from about 1.3 to about 2.7 saccharide units. Any reducing saccharide containing 5 or 6 carbon atoms can be used, e.g., glucose, galactose and galactosyl moieties can be substituted for the glucosyl moieties. (Optionally the hydrophobic group is attached at the 2-, 3-, 4-, etc. positions thus giving
 30 a glucose or galactose as opposed to a glucoside or galactoside.) The intersaccharide bonds can be, e.g., between the one position of the additional saccharide units and the 2-, 3-, 4-, and/or 6- positions on the preceding saccharide units.

Optionally, and less desirably, there can be a polyalkylene-oxide chain joining the hydrophobic moiety and the polysaccharide moiety. The preferred alkyleneoxide is
 35 ethylene oxide. Typical hydrophobic groups include alkyl groups, either saturated or unsaturated, branched or unbranched containing from about 8 to about 18, preferably

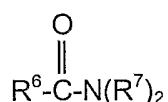
from about 10 to about 16, carbon atoms. Preferably, the alkyl group is a straight chain saturated alkyl group. The alkyl group can contain up to about 3 hydroxy groups and/or the polyalkyleneoxide chain can contain up to about 10, preferably less than 5, alkyleneoxide moieties. Suitable alkyl polysaccharides are octyl, nonyl, decyl, undecyldodecyl, tridecyl, tetradecyl, pentadecyl, hexadecyl, heptadecyl, and octadecyl, di-, tri-, tetra-, penta-, and hexagluco-
 5 sides, galactosides, lactosides, glucoses, fructosides, fructoses and/or galactoses. Suitable mixtures include coconut alkyl, di-, tri-, tetra-, and pentagluco-
 sides and tallow alkyl tetra-, penta-, and hexa-glucosides.

The preferred alkylpolyglycosides have the formula:



wherein R^2 is selected from the group consisting of alkyl, alkyl-phenyl, hydroxyalkyl, hydroxyalkylphenyl, and mixtures thereof in which the alkyl groups contain from about 10 to about 18, preferably from about 12 to about 14, carbon atoms; n is 2 or 3, preferably 2; t is from 0 to about 10, preferably 0; and x is from about 1.3 to about 10, preferably from about 1.3 to about 3, most preferably from about 1.3 to about 2.7. The glycosyl is preferably derived from glucose. To prepare these compounds, the alcohol or alkylpolyethoxy alcohol is formed first and then reacted with glucose, or a source of glucose, to form the glucoside (attachment at the 1-position). The additional glycosyl units can then be attached between their 1 position and the preceding glycosyl units 2-,
 15 3-, 4- and/or 6-position, preferably predominantly the 2-position.

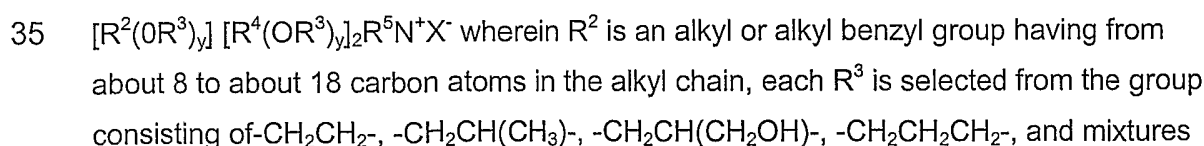
Non ionic surfactant include fatty acid amide surfactants having the formula:



wherein R^6 is an alkyl group containing from about 7 to about 21 (preferably from about 9 to about 17) carbon atoms and each R^7 is selected from the group consisting of hydrogen, C_1 - C_4 alkyl, C_1 - C_4 hydroxyalkyl, and $-(C^2H_4O)_xH$ where x varies from about 1 to about 3. Preferred amides are C_8 - C_{20} ammonia amides, monoethanolamides, diethanolamides, and isopropanolamides.

Cationic Surfactants

Cationic deterative surfactants can also be included in detergent compositions of the present invention. Cationic surfactants include the ammonium surfactants such as alkyldimethylammonium halogenides, and those surfactants having the formula:



thereof; each R^4 is selected from the group consisting of C_1 - C_4 alkyl, C_1 - C_4 hydroxyalkyl, benzyl, ring structures formed by joining the two R^4 groups,

- $CH_2CHOHCHOHCOR^6CHOH-CH_2OH$ wherein R^6 is any hexose or hexose polymer having a molecular weight less than about 1000, and hydrogen when y is not 0; R^5 is the same as R^4 or is an alkyl chain wherein the total number of carbon atoms of R^2 plus R^5 is not more than about 18; each y is from 0 to about 10 and the sum of the y values is from 0 to about 15; and X is any compatible anion.

Other cationic surfactants useful herein are also described in U.S. Patens 4,228,044, Cambre, issued October 14, 1980, incorporated herein by reference.

10 Other Surfactants

Ampholytic surfactants can be incorporated into the detergent compositions hereof. These surfactants can be broadly described as aliphatic derivatives of secondary or tertiary amines, or aliphatic derivatives of heterocyclic secondary and tertiary amines in which the aliphatic radical can be straight chain or branched. One of the aliphatic substituents contains at least about 8 carbon atoms, typically from about 8 to about 18 carbon atoms, and at least one contains an anionic water-solubilizing group, e.g., carboxy, sulfonate, sulfate. See U.S. Patent No. 3,929,678 to Laughlin et al., issued December 30, 1975 at column 19, lines 18-35 for examples of ampholytic surfactants. Preferred amphoteric include C_{12} - C_{18} alkyl ethoxylates ("AE") including the so-called narrow peaked alkyl ethoxylates and C_6 - C_{12} alkyl phenol alkoxyates (especially ethoxylates and mixed ethoxy/propoxy), C_{12} - C_{18} betaines and sulfobetaines ("sultaines"), C_{10} - C_{18} amine oxides, and mixtures thereof.

Zwitterionic surfactants can also be incorporated into the detergent compositions hereof. These surfactants can be broadly described as derivatives of secondary and tertiary amines, derivatives of heterocyclic secondary and tertiary amines, or derivatives of quaternary ammonium, quaternary phosphonium or tertiary sulfonium compounds. See U.S. Patent No. 3,929,678 to Laughlin et al., issued December 30, 1975 at column 19, line 38 through column 22, line 48 for examples of zwitterionic surfactants.

Ampholytic and zwitterionic surfactants are generally used in combination with one or more anionic and/or nonionic surfactants.

Other optional ingredients of the composition include:

- thickening polymers,
- hydrophilizing polymers,
- soil-release polymers,

- deposition agents or deposition aid agents, for example deposition polymers, such as silicones,
- anti-foaming agents,
- foaming agents,
- 5 - foam stabilizing and/or enhancing agents,
- perfumes or fragrances,
- builders (detergency adjuvants), including organic builders and inorganic builders,
- buffers,
- salts or fillers,
- 10 - chelatants,
- colorants,
- preservatives,
- enzymes,
- corrosion inhibitors,
- 15 - scale inhibitors,
- dyes,
- optical brighteners,
- soiling suspending agents,
- freezing-thawing stabilizers,
- 20 - solvents,
- opacifiers,
- pearlescence agents,
- mixtures or associations thereof.
- 25 According to some advantageous embodiments, the composition is:
 - a fabric care composition, for example a pre-spotting composition, a detergent composition, or a rinsing composition,
 - a carpet cleaning composition, for example a carpet cleaning spray, foam, or foaming liquid,
- 30 - a softening and/or antiwrinkling and/or easy-ironing composition,
- a laundry product composition in a liquid form, powder form or tablet form, that can be use in hand washing or in automatic washing,
- a hand dishwashing composition,
- an automatic dishwashing composition, in a liquid form, in a powder form, or in a tablet
- 35 form,

- a glass cleaning composition, including a window cleaning composition or a car windshield composition,
- a floor cleaning composition,
- a versatile cleaning hard surface cleaning composition,
- 5 - a kitchen cleaning composition,
- a bathroom cleaning composition,
- a toilet bowl cleaning composition, a rim block, or a rim liquid,
- a wood treatment composition,
- a shower rinse (daily shower),
- 10 - a spray for providing disinfection and/or suppression of odors and/or prevention of malodor for clothes, curtains, sheets, furniture fabrics or car fabrics,
- a car cleaning composition,
- an air freshener, or
- a tile or plastic floor cleaning composition.

15

Process of use of the composition

- The composition can be used for treating a surface against proliferation of bacteria. Accordingly, the composition can be used in a process of treating a surface
- 20 against bacteria proliferation, comprising the step of applying onto surface a composition comprising a hop extract. The process (or treatment or use) can provide cleaning, disinfection, suppression of odors, and/or prevention of malodors. The surface can be for example a fabric or a hard surface.

- 25 According to one embodiment:

- the surface is a fabric surface,
 - the composition is fabric-care composition,
 - the composition comprising the hop extract is applied onto the surface during a washing process, preferably an automatic process, comprising the following steps:
- 30
- optionally applying a pre-spotting composition onto the fabric surface,
 - washing with a deterative composition,
 - rinsing with water optionally comprising a rinsing composition,
 - optionally further rinsing,

- the composition comprising the hop extract being the pre-spotting composition, the
- 35 deterative composition, or the rinsing composition.

In this embodiment, the composition comprising the hop extract can be a rinsing composition such as a softening and/or antiwrinkling and/or easy-ironing composition.

In this embodiment, the composition comprising the hop extract can also be a
5 detergent laundry-product composition in a liquid form, in a powder form, or in a tablet
form, optionally being a multiple benefit composition providing cleaning and softening
and/or antiwrinkling and/or easy-ironing.

In another embodiment:

- the surface is a fabric surface, for example clothes, curtains, sheets, furniture fabrics or
10 car fabrics, and
- the composition comprising the hop extract is applied onto the surface by spraying.

In this embodiment, the composition can be a spray, used on a regularly basis or
not, to prevent malodors and/or to suppress them, such as for example some spray
compositions marketed as "Febreze" by the Procter and Gamble company. The
15 composition can also be used in ironing ("starching" compositions or "ironing
moisturizing" compositions).

In another embodiment:

- the surface is a carpet, and
- 20 - the composition is a carpet cleaning composition, in the form of a liquid, a foaming
liquid, a spray, or a spraying composition,
- the composition is applied onto the carpet, the carpet is cleaned, and then optionally
rinsed.

Cleaning the carpet can be performed by any mean, for example by washing and/or
25 shampooing.

According to another embodiment:

- the surface is a hard surface,
- the composition is applied onto the surface by a process comprising the following
30 steps:
 - optionally diluting the composition comprising the hop extract,
 - applying the composition optionally diluted, and
 - optionally rinsing.

The composition can be applied onto the surface by any appropriate mean. The
35 applying processes and means can depend upon the surface to be treated, and upon
the user.

The surface in this embodiment can be:

- glass, for example comprised in windows, or cars windshields,
- tile or ceramic, for example comprised in kitchens, bathrooms, toilet bowls, showers, china, dishware, floors,
- 5 - metal, for example comprised in silverware, car body parts, window frames, or floors,
- plastic, for example comprised in dishware, silverware, cars, windows, furniture, or floors,
- wood or leather, optionally waxed, for example comprised in furniture or floor,
- concrete, optionally waxed , for example comprised in floors.

- 10 In hand dishwashing, the composition can be applied by immersing the dishware into a diluted composition, by applying a concentrate composition directly onto the dishware, or by applying the composition onto a cleaning device such as a sponge, cloth, pad, scrub, brush or any other mean.

- 15 In automatic dishwashing, the composition can be applied in diluted form through conventional automatic dishwashing schemes.

In windows, floors, furniture or any other hard surface different from dishware or silverware, the composition can be applied by any conventional mean, including direct spraying, spraying after dilution, application with using vehicles such as mops, pads, wipes, cloths, sponges, papers...

CLAIMS

1. A home-care or fabric-care or institutional-cleaning or industrial-cleaning composition comprising a hop extract.
5
2. A composition according to one of the preceding claims, wherein the hop extract comprises an active matter having:
 - alpha hop acid, isomers thereof, or reduced derivatives thereof,
 - beta hop acid, isomers thereof, or reduced derivatives thereof, or
 - 10 - mixtures thereof.
3. A composition according to one of the preceding claims wherein the hop extract comprises at least 5% by weight the active matter.
- 15 4. A composition according to one of the preceding claims, wherein the amount of hop extract in the composition is of lower than 5% by weight, and preferably of higher than 100 ppm by weight.
5. A composition according to one of the preceding claims, wherein the amount of active
20 matter in the composition is of lower than 5% by weight, and preferably of higher than 100 ppm by weight.
6. A composition according to one of the preceding claims, further comprising at least one surfactant.
25
7. A composition according to one of the preceding claims, further comprising at least one deposition agent or deposition-aid agent, preferably at least one deposition polymer.
8. A process of treating a surface for preventing bacteria proliferation, cleaning,
30 disinfecting, suppressing odors, and/or preventing malodors, comprising the step of applying onto the surface a composition according to one of the preceding claims.
9. A process according to claim 8, wherein the surface is a fabric, or a hard surface.
- 35 10. A process according to claim 9, wherein:
 - the surface is a fabric surface,

- the composition is fabric-care composition,
- the composition comprising the hop extract is applied onto the surface during a washing process, preferably an automatic process, comprising the following steps:

- 5 - optionally applying a pre-spotting composition onto the fabric surface,
- washing with a deterative composition,
- rinsing with water optionally comprising a rinsing composition, and
- optionally further rinsing,

the composition comprising the hop extract being the pre-spotting composition, the deterative composition, or the rinsing composition.

10

11. A process according to the preceding claim, wherein the composition comprising the hop extract is a rinsing composition being a softening and/or antiwrinkling and/or easy-ironing composition.

15

12. A process according to claim 10, wherein the composition comprising the hop extract is a deterative laundry-product composition in a liquid form, in a powder form, or in a tablet form, optionally being a multiple benefit composition providing cleaning and softening and/or antiwrinkling and/or easy-ironing.

20

13. A process according to claim 9, wherein:

- the surface is a fabric surface, for example clothes, curtains, sheets, furniture fabrics, carpets, or car fabrics, and
- the composition comprising the hop extract is applied onto the surface by spraying.

25

14. A process according to claim 9, wherein

- the surface is a carpet, and
- the composition is a carpet cleaning composition, in the form of a liquid, a foaming liquid, a spray, or a spraying composition,
- the composition is applied onto the carpet, the carpet is washed, and then optionally

30

rinsed.

15. A process according to claim 9, wherein:

- the surface is a hard surface,
- the composition is applied onto the surface by a process comprising the following

35

steps:

- optionally diluting the composition comprising the hop extract,

- applying the composition optionally diluted, and
- optionally rinsing.

16. A process according to the preceding claim, wherein the surface is:
- 5 - glass, for example comprised in windows, or cars windshields,
 - tile or ceramic, for example comprised in kitchens, bathrooms, toilet bowls, showers, china, dishware,
 - metal, for example comprised in silverware, car body parts, or window frames,
 - plastic, for example comprised in dishware, silverware, cars, windows, or furniture, or
 - 10 - wood or leather for example comprised in furniture.
17. A process according to one of the preceding claims, wherein the composition is:
- a hand dishwashing composition,
 - an automatic dishwashing composition, in a liquid form, in a powder form, or in a tablet
 - 15 form,
 - an automatic laundry cleaning composition, in a liquid form, in a powder form, or in a tablet form,
 - a fabric softening composition,
 - a shower rinse,
 - 20 - a carpet cleaning composition,
 - a spray for providing disinfection and/or suppression of odors and/or prevention of malodor for clothes, curtains, sheets, furniture fabrics or car fabrics,
 - a toilet-bowl cleaning composition, a rim block, or a rim liquid,
 - a car cleaning composition,
 - 25 - a glass cleaning composition,
 - a kitchen or bathroom cleaning composition, or
 - a tile or plastic floor cleaning composition.

INTERNATIONAL SEARCH REPORT

PCT/EP2005/011171

A. CLASSIFICATION OF SUBJECT MATTER

C11D3/382 C11D7/44 A01N65/00 A61L2/16

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)

C11D A01N 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 practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Section Ch, Week 200365 Derwent Publications Ltd., London, GB; Class B04, AN 2003-683231 XP002363384 & JP 2003 113013 A (LION CORP) 18 April 2003 (2003-04-18) abstract	1,2, 14-17
X	WO 01/06877 A (RHODIA INC) 1 February 2001 (2001-02-01) page 9; claims; examples	1-9,11, 15,17
X	RU 2 038 366 C1 (FIRMA "KOMITEKS"; MOSKOVSKIY ZAVOD SINTETICHESKIKH MOYUSHCHIKH SREDSTV) 27 June 1995 (1995-06-27) English abstract	1-12,17
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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- *Z* document member of the same patent family

Date of the actual completion of the international search

19 January 2006

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

PCT/EP2005/011171

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 800 247 B1 (SUH JANETTE ET AL) 5 October 2004 (2004-10-05) column 3 - column 5; claims; example 10 -----	1-6,8,9, 11,13, 14,17
X	WO 2004/024861 A (RECKITT BENCKISER INC; RECKITT BENCKISER LIMITED) 25 March 2004 (2004-03-25) page 19; claims -----	1-9,11, 15-17
X	US 4 170 638 A (OWADES, JOSEPH L) 9 October 1979 (1979-10-09) cited in the application examples -----	1-8

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