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(54) **Stable and homogeneous concentrated all purpose cleaner.**

(57) A clear and homogeneous concentrated hard surface liquid cleaner, free of builder salts, containing water, a water soluble surfactant system comprising a mixture of anionic and nonionic surfactants, a foam control agent, a polar water soluble ethylene or propylene glycol ether derivative solvent, and a perfume, suitable to be sold in a pouch for spot cleaning, and also to be diluted four times with water for general cleaning. These products are stable over a wide range of temperatures both 'as is' (neat) or when diluted four times with soft or hard water.

EP 0 347 110 A1

Stable and Homogeneous Concentrated All Purpose Cleaner

Field of the Invention

The present invention relates to the formulation of a stable, clear, concentrated all purpose liquid cleaning composition and containing more than 10% active ingredients, having improved shining properties, and degreasing properties. The composition comprises a mixture of anionic and nonionic detergents, a foam control agent, a minimal level of a water miscible organic solvent compatible with the fragrance ingredient, and an aqueous vehicle, and is capable of being diluted four times with tap water without a loss in stability while providing a satisfactory cleaning performance.

Background of the Invention

All purpose liquid cleaning compositions for hard surfaces such as metal, glass, ceramic, plastic, and linoleum surfaces have met with commercial acceptance because they have the advantage that they can be applied to hard surfaces in neat (as is) or concentrated form so that a relatively high level of surfactant material is delivered directly to the soils. However, instability problems can occur when the concentrated products are diluted with tap water by the user. Another problem associated with the previously available concentrated formulations (more than 10% active ingredients) is that a high level of solubilizers (solvents) is generally required in order to obtain a clear and stable composition over a wide range of temperatures.

This invention provides an all purpose liquid cleaning composition in concentrated form which retains its stability upon dilution with water, and provides superior cleaning performance of the ready to use product both in neat and dilute usages. The good cleaning performance is obtained without the need of builders. Consequently, the shining properties are significantly improved over built all purpose cleaning compositions. The concentrated products of present invention offer a further advantage in terms of cost savings for packaging, storage and transportation.

The prior art is replete with liquid all purpose hard surface cleaning compositions which are generally classified in two types. The first type is a particulate aqueous suspension having water-insoluble abrasive particles suspended therein, which particles are palpable. Some of the cleaners of this type suffer a stability problem and consumers may object to their "gritty" feel, the potential for scratching surfaces and the need for extensive rinsing to remove abrasive deposits. The second type is the liquid detergent without suspended abrasive and, seemingly, this latter type is preferred by consumers. While this second type generally is a mixture of surfactant and builder salt in an aqueous medium, the product formulations in the market place have varied widely in composition.

The presence of builder salts as an essential ingredient in all purpose hard surface cleaning compositions to improve the cleaning action of the organic surface active agents, commonly used in an aqueous cleaning composition, i.e. anionic and nonionic surfactants, and to maintain an alkaline pH range, is disclosed in U.S. Patents 4,576,738 and 4,597,887, and in European Patent applications 0165885 and 0080749 and in UK Patent Application 2166153A.

The prior art also discloses cleaning compositions containing a high boiling temperature, water-miscible organic solvent such as propylene glycol or ethylene glycol - monobutyl ether as disclosed in GB patent 2,166,153A. The prior art discloses a binary solvent system of Pinane and an ethylene glycol - or propylene glycol - monoethyl or monobutyl ether as disclosed in U.S. Patents 4,576,738 and 4,597,887; a dual solvent system of dipropylene glycol methyl ether and mineral spirits as disclosed in U.S. patent 4,673,524; and a propylene glycol monomethyl ether and/or dipropylene glycol monomethyl ether as a penetrant to penetrate road film as disclosed in U.S. Patent 4,670,171.

Also disclosed in the prior art is the preparation of a concentrated all-purpose cleaning composition which is diluted with tap water approximately four times prior to usage or storage by the consumer, as disclosed in European Patent 0165885.

However, none of the above-mentioned patents disclose a stable, clear, homogeneous concentrated all purpose unbuilt liquid cleaning composition containing more than 10% active ingredients and comprising a mixture of anionic and nonionic detergents, a foam control agent, and a water miscible organic solvent selected from the group consisting of C_1-C_4 alkyl ethers of ethylene glycol or diethylene glycol or mono-, di- or tripropylene glycol compatible with the fragrance ingredient, in an aqueous vehicle, capable of being

diluted about four times with tap water without any loss in stability, clarity and homogeneity.

Summary of the Invention

It has now been found that a stable, clear, homogeneous concentrated liquid all purpose cleaning composition having improved cleaning and shining properties can be prepared in the absence of a builder salt comprising as the essential ingredients, about 18-30% by weight of a dual surfactant system of a mixture of anionic and nonionic surfactants preferably in a 4:3 weight ratio, a fatty acid foam control agent and about 5-15% of a water soluble (miscible) organic solvent selected from the group consisting of an ethylene or propylene glycol ether derivative compatible with the fragrance ingredient, in an aqueous medium. The cleaning performances of the ready to use product, both in neat and diluted usages, are particularly effective in the removal of grease and oily soil and leaves a shining clean surface. These products are effective at varying water hardness levels, have desirable foaming characteristics and leave substantially no spots or streaks either with or without rinsing. Furthermore, the resultant product is clean and homogeneous and stable at temperatures over a wide range, about 5°C-49°C. Optionally, the multivalent magnesium cation, which is normally found in hard tap water, can be added to improve cleaning performances in soft water areas.

Accordingly, the primary object of the invention is to provide a clear concentrated all purpose liquid cleaning composition which is stable over a wide range of temperatures and contains minimal levels of a water soluble organic solvent selected from the group consisting of an ethylene or propylene glycol ether derivative compatible with the fragrance ingredient.

Another object of this invention is to provide a clear, homogeneous and stable concentrated all purpose liquid cleaning composition containing about 16-30% by weight of a dual surfactant system of a mixture of anionic and nonionic surfactants.

Another object of this invention is to provide a clear and stable concentrate of an all purpose liquid cleaning composition capable of being diluted four-fold with hard or soft tap water, to produce a clear stable diluted liquid cleaning composition.

Another object of this invention is to provide an all purpose liquid cleaning composition having improved cleaning and shining properties both as a neat and diluted product.

Still another object of this invention is to provide an all purpose liquid cleaning composition free of builder salts, having improved cleaning and shining properties.

Additional objects, advantages and novel features of the invention will be set forth in part in the description which follows, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by practice of the invention. The objects and advantages of the invention may be realised and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

To achieve the foregoing and other objects and in accordance with the present invention, so embodied and broadly described herein, the novel stable, clear and homogeneous concentrated liquid all purpose cleaning composition of this invention comprises by weight, about 16-30% of a water soluble dual detergent system of a mixture of anionic and nonionic surfactants, and about 5-15% of a water soluble polar organic solvent selected from the group consisting of an ethylene-, diethylene-, propylene-, or polypropylene glycol ether derivative, in an aqueous medium free of builder salts, and having a pH of about 6-7.

More specifically, the present invention relates to clear and stable concentrated liquid all purpose cleaning compositions free of builder salts, comprising, by weight, about 16-30% fo a dual detergent system consisting of a mixture of about 8-16% of water soluble synthetic anionic surfactant(s) and about 6-12% of water soluble nonionic surfactant(s) selected from the group consisting of ethoxylated fatty alcohol, ethoxylated/propoxylated fatty alcohol, and an alkyl polyglycoside, about 0.5-2% of a fatty acid foam control agent, and about 5 - 15% of a water soluble organic solvent selected from the group consisting of C_1-C_4 alkyl ethers of ethylene or diethylene glycols or mono-, di-, or tripropylene glycol, about 2-5.5% of a fragrance compatible with the organic solvent, in an aqueous medium, and having a pH of about 6-7.

The present novel concentrated liquid all purpose cleaning product, which is suitable to be sold in a pouch or similar packing, can readily be diluted with tap water by the consumer about four times by volume before use. The products are stable in a wide range of temperatures, both "as is" (neat) or when diluted with soft or hard water, and can be used in neat or diluted form.

A preferred optional ingredient is a C_8-C_{18} fatty acid as a foam control agent in an amount of about 0.5-2% by weight of the composition.

The foam behaviour of the ready to use all purpose cleaning composition can be adapted to consumer requirements by properly selecting the nonionic surfactants, i.e., ethoxylated fatty alcohol, ethoxylated/propoxylated fatty alcohol or mixtures thereof.

Detailed Description of the Invention

The essential detergent active ingredients of the present all purpose liquid cleaning composition (APC) constitutes more than 10% active ingredients, and preferably about 16-30% by weight of a dual surfactant system comprising at least one water soluble anionic surfactant and at least one water soluble nonionic surfactant, preferably in a weight ratio of 5:4. The combination of anionic and nonionic surfactants exhibit synergistic cleaning performance.

The anionic surfactants which may be used in the detergent composition of the invention include at least one surfactant selected from the group consisting of water soluble salts, particularly alkali metal salts, e.g., sodium or potassium salts of a C_8-C_{18} alkyl sulfonate or paraffin sulfonate or a C_8-C_{16} alkyl benzene sulfonate such as dodecyl benzene sulfonate. The multivalent salts of anionic surfactants have a lower water solubility than the alkali metal salts and solubility decreases with increasing concentration of the bivalent ions. The calcium salt of paraffin sulfonate has very poor solubility compared to the magnesium salt. This poor solubility compromises cleaning performance. The preferred anionic surfactant is sodium paraffin sulfonate, preferably phosphate free. The anionic surfactant constitutes about 8-16% of the concentrated all purpose cleaner.

The incorporation of minimal amounts of magnesium ions has been found to boost the cleaning power of the anionic detergent. The grease cutting ability of the various compositions is directly related to the Mg concentration; the higher the Mg concentration the better the degreasing. In the concentrated APC, paraffin sulfonate: Mg cations ratios may be reduced to less than 2:1 to allow for additional magnesium ion brought into the solution from hard water when the user dilutes the cleaner. All of the magnesium containing compositions are sensitive to phosphate contamination. Magnesium ions react with phosphate anion (more particularly pyrophosphate) yielding an insoluble precipitate of Mg phosphate. Most compositions with high paraffin sulfonate levels (16%) show a precipitate due to the phosphate ions present as a by product in ordinary grades of paraffin sulfonate. For this reason, when higher levels of paraffin sulfonate are present, it is preferable to use phosphate free paraffin sulfonate in the concentrated composition containing magnesium salts. Such grades are commercially available from several major suppliers.

Accordingly, magnesium ions in the form of a water soluble magnesium salt, such as magnesium sulfate heptahydrate, which is commercially available, are an optional ingredient present in amount of 1.5-6% by weight. The boosting action of the magnesium ions is particularly useful in soft water areas. A stoichiometric ratio between paraffin sulfonate ions and magnesium ions in the compositions give satisfactory results in terms of cleaning performance and water solubility, however, it is not necessary to add magnesium ions because the performance objectives of the all purpose cleaning compositions can be obtained without the magnesium ion booster.

The nonionic detergents used in the cleaners according to the present invention can be broadly described as water-soluble or water-dispersible compounds produced by the condensation of hydrophilic ethylene oxide groups, and/or propylene oxide groups, with an organic hydrophobic aliphatic or alkyl aromatic compound having a terminal hydroxy group. Such detergents are prepared readily by condensing the hydrophobic organic compound with ethylene oxide, and/or propylene oxide or with a polyglycoside. Further, the length of the polyethylenoxy chain can be adjusted to achieve the desired balance between the hydrophobic and hydrophilic elements.

The satisfactory nonionic detergents include the condensation products of a higher alkanol containing about 8 to 18 carbon atoms in a straight or branched-chain configuration condensed with about 2.5 to 30 moles of ethylene oxide. Preferred examples of these detergents are the condensates of C_8-C_{11} alkanol with 2.5 moles of ethylene oxide or 5 moles ethylene oxide, condensates of C_{13}-C_{15} alkanol with 7 moles of ethylene oxide and 4 moles of propylene oxide and the like. The nonionic surfactant, preferably selected from the group consisting of ethoxylated fatty alcohol, ethoxylated/propoxylated fatty alcohol and an alkyl polyglycoside, constitutes about 6-12% by weight of the composition.

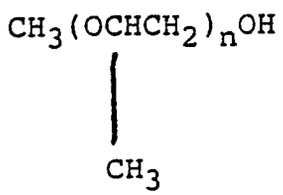
The use of a mixture of sodium paraffin sulfonate and nonionic surfactants provides very good cleaning performance for removal of greasy soils, both when the product is used neat as well as when it is diulted with water.

The nonionic surfactant ingredient not only optimises the cleaning performance of the anionic surfac-

tant, but also assists in adapting the foam behaviour of the ready to use all purpose cleaning formulation to consumer requirements. Foam behaviour is adjusted by using a mixture of medium and low foaming nonionics. One such suitable foam control mixture is an ethoxylated fatty alcohol such as C_8-C_{11} alcohol ethoxy oxide 5:1, and an ethoxylated/propyoxylated fatty alcohol such as C_{13}-C_{15} alcohol ethoxy oxide 7:1 propoxy oxide 4:1 in a 2:1 weight ratio.

The primary foam control agent is a fatty acid containing 12-18 carbon atoms or a mixture of such fatty acids, such as coconut oil fatty acids, in an amount of about 0.5-2% by weight of the composition. The use of 0.5% fatty acid provides a foam control similar to regular AJAX APC, a commercial product on the martket, in hard and medium water hardness areas (respectively 300 and 150 ppm as $CaCO_3$). However, 1% fatty acid provides better foam control in hard water as well as in soft water.

The water soluble polar, organic solvents used in the present all purpose cleaning compositions are nonvolatile (high boiling point), and may be described generally as a C_1-C_4 alkyl ether of a compound selected from the group consisting of monoethylene glycol, diethylene glycol, and mono-, or di- or tri-propylene glycol. The methyl ether of mono-, di-, or tri-propylene glycol conforms to the formula:



wherein n has a value of 1-3. The mono- propylene glycol methyl ether has an n value of 1. The dipropylene glycol methyl ether has an n value of 2. The tripropylene glycol methyl ether has an n value of 3. Specific examples of the water soluble organic solvents include the following propylene glycol ether derivatives: mono-, di-, and tripropylene glycol methyl ether, mono-, di-, and tripropylene glycol butyl ether. The ethylene glycol ether derivatives include mono- and diethylene glycol butyl ether. The solvent is optimized to obtain a stable product using a minimal level, preferably about 5-15% by weight of the composition. The solvent is also selected based on its odour which is easily covered by APC fragrance and to be compatible with the selected fragrance ingredient. Diethylene glycol monomethyl and monobutyl ether, and tripropylene and dipropylene glycol monomethyl ether have odours easily covered with the perfume ingredient.

The level of fragrance is also optimized to achieve a cleaner with high cosmetic impact both as is, in the ready to use form, and when diluted preferably in an amount about 2-5% by weight of the composition. The perfume or fragrance, which is a nonwater miscible material, is readily solubilised by the water soluble organic solvent in the aqueous vehicle, yielding a clear single phase. Suitable types of fragrances are floral, pine and lemon.

The final essential component of the present novel composition is water, ether hard or soft water or deionized water. This component represents the balance of said compositions reduced by any optional ingredients which may be present.

The all purpose cleaning compositions of this invention also may contain minor amounts of conventional additional components in order to impart any desired characteristic, which are compatible with the essential ingredients and do not adversely effect the stability and cleaning performance of the liquid composition. Suitable additives include colouring agents, or dyes, preservatives such as formaldehyde (Formalin) and Kathon 886 molecular weight, hydrotropes such as sodium cumene sulfonate, antiseptic agents and the like. These additives constitute a maximum of 5% and preferably a maximum of 3.2% by weight of the composition.

In the concentrated or diluted form, the all purpose liquid cleaners are clear and homogeneous and exhibit stability at reduced and increased temperatures. More specifically, the compositions are stable at 4°C, room temperature, 35°C and 43°C. Such compositions exhibit a pH in the range of about 6.0 to 7.0, preferably 6.1-6.8. Product stability is also a function of the pH of the finished product. The liquids are readily pourable and free flowing from any suitable container such as metal, plastic, or glass bottles, bags, cans or drums.

Typically, the inventive compositions are manufactured in an agitated mixing vessel optionally equipped with a heating and/or cooling jacket. Generally, the temperature of the mixture will be maintained in the range of 15°C to 38°C, during manufacture. While the order in which the individual ingredients are added can be varied, best results are obtained by adding the anionic surfactant to the water with mild agitation. After complete dissolution of the anionic surfactant the nonionic surfactant(s) is added. Next, the organic

nonaqueous solvent is added with moderate agitation to form a homogeneous mixture. Thereafter, the perfume is added with moderate agitation until dissolved. Usually, the optional ingredients such as colour, preservative, and magnesium sulfate salt are the final ingredients added with agitation to form a homogeneous all-purpose clear liquid cleaning composition. The final product both in concentrated and diluted form has long term stability and exhibits improved shine, improved foam control and cleaning performance, mildness to hands and safety to cleaned surfaces, as well as cosmetic attributes including clarity, low viscosity and pleasant fragrance.

The following examples illustrate liquid cleaning compositions of the described invention. Unless otherwise specified, all percentages are by weight. The exemplified compositions are illustrative only and do not limit the scope of the invention.

Examples 1 and 2

Concentrated APC		
Ingredients	Ex. 1	Ex. 2
	%	%
Water	Bal.	Bal.
Sodium paraffin sulfonate	10	10
C9-C11 alcohol EO 5:1	5	5
C13-C15 alcohol EO 7:1 PO 4:1	2.5	2.5
Distilled coconut oil fatty acids	1.25	1.25
Dipropylene glycol n butyl ether	7.0	-
Diethylene glycol butyl ether	-	12.5
Perfume (Twinkle* ex Firmenich)	-	3.5
Dye	Q.S.	Q.S.
Perfume	2.4	-
Adjust pH to 6.5 +/- 0.2 . Optional ingredient: preservative		

* : this perfume contains 10% terpenes

The compositions of Examples 1 and 2 are clear homogeneous liquids, stable at temperatures of 4°C to 43°C, and have improved cleaning and shine performance in soft and hard water.

Examples 3-6

Concentrated APC Compositions

Ingredients	Ex. 3 %	Ex. 4 %	Ex. 5 %	Ex. 6 %
Water	Bal.	Bal.	Bal.	Bal.
Na paraffin sulfonate	16	16	16	16
Na paraffin sulfonate without phosphate	-	-	-	-
C9-C11 alcohol EO 5.1	8	8	8	8
C13-C15 alcohol EO 7:1 PO 4:1	4	4	4	4
Coco fatty acids	2	2	2	2
DEGMBE[1]	15	15	15	15
MgSO4 7H20	3	2.5	2	1.5
Nicky II or Nicky vers. I	2.0	2.0	2.0	2.0
pH = 6.5 +/- 0.3				
Stability :	2 phas. 43°C deposit 43°C 35°C	dep. 43°C	dep. 43°C	dep. 43°C

Examples 7-9

Concentrated APC Compositions

Ingredients	Ex. 7 %	Ex. 8 %	Ex. 9 %
Water	Bal.	Bal.	Bal.
Na paraffin sulfonate	16	16	-
Na paraffin sulfonate without phosphate	-	-	16
C9-C11 alcohol EO 5.1	8	8	8
C13-C15 alcohol EO 7:1 PO 4:1	4	4	4
Coco fatty acids	2	2	2
DEGMBE[1]	15	15	15
MgSO4 7H20	-	3	3
Nicky II or Nicky Vers. 1	2.0	2.0	2.0
pH = 6.5 +/- 0.3			
Stability :	OK 43°C	dep. 43°C	OK 43°C

[1]Diethylene glycol monobutyl ether

Example 7, free of Mg salts and containing phosphates, an impurity present in some grades of commercial Na paraffin sulfonate, is a clear homogeneous stable liquid composition at room and high temperatures; whereas Exs. 3-6 and 8, containing the magnesium salts in varying amounts (1.5-3%), are not stable due to the reaction of the $MgSO_4$ salt with the phosphate to form the Mg phosphate precipitate.

Ex. 9, containing phosphate-free Na paraffin sulfonate, can contain the $MgSO_4$ salt in amounts as high as 3% and yield a clear, homogeneous stable liquid because there is no phosphate present in the composition.

Ex. 10 - 16

APC Formulae Compositions

Ingredients	Ex. 10 %	Ex. 11 %	Ex. 12 %	Ex. 13 %
Water	Bal.	Bal.	Bal.	Bal.
Na paraffin sulfonate	10	10	10	10
C9-C11 alcohol EO 5:1 C13-C15 alcohol EO 7:1	5	5	5	5
PO 4:1	2.5	2.5	2.5	2.5
Coco fatty acids	1.25	1.25	1.25	1.25
DEGMBE	12.5	-	12.5	5.0
Na cumene sulfonate (SCS)	-	3.2	-	3.2
MgSO4 7H20	3.75	3.75	2.5	1.5
Formalin	0.2	0.2	0.2	0.2
Kaltron 886 MW 13.9% soln (preservative)	-	-	-	-
Nicky II or Nicky vers. I	2.0	2.0	2.0	2.0
Citroshine perf.	-	-	-	-
Twinkle	-	-	-	-
pH = 6.5 +/- 0.3				
Stability :	OK	2 ph. at low t°	OK	Ok

Ex. 14-16

APC Formulae Compositions			
	Ex. 14	Ex. 15	Ex. 16
Ingredients	%	%	%
Water	Bal.	Bal.	Bal.
Na paraffin sulfonate	10	10	10
C9-C11 alcohol EO 5:1	5	5	5
C13-C15 alcohol EO 7:1 PO 4:1	2.5	2.5	2.5
Coco fatty acids	1.25	1.25	1.25
DEGMBE	12.5	8.0	12.5
Na cumene sulfonate (SCS)	-	2.0	-
MgSO4 7H20	-	-	-
Formalin	0.2	0.2	.32->.8 or
Kathon 886 MW 13.9% soln. (preservative)	-	-	0.011> 0.040
Nicky II or Nicky vers. I	0	3.2	-
Citroshine perf.	-	-	2.4
Twinkle	3.5	-	-
pH = 6.5 +/- 0.3			
Stability :	OK	OK	OK

The compositions of Examples 10 and 12 containing a considerably lesser amount of Na paraffin sulfonate (10%) than the 16% in Example 3 provide a low amount of the phosphate impurity, insufficient to react with the $MgSO_4$ ingredient to form a Mg phosphate precipitate. Clear homogeneous stable liquid cleaners at low and high temperatures are formed having improved cleaning and shine properties.

Example 11 containing no organic solvent is an unstable composition.

In Example 13, the addition of the hydrotope, Na cumene sulfonate, in the presence of MgS_{O4} and decreased DEGMBE solvent content, produces a clear, homogeneous stable liquid cleaner having improved cleaning performance.

Examples 14 and 16, free of the optional ingredients $MgSO_4$ salt and the hydrotrope salt, produce clear, homogeneous stable liquid APC cleaner having improved cleaning and foam control properties.

Example 15, containing the optional ingredient, SCS hydrotrope salt, also produces a clear, homogeneous stable liquid cleaner having improved cleaning and shine properties.

Ex. 17 - 20

APC Formulae COmpositions				
	Ex. 17	Ex. 18	Ex. 19	Ex. 20
Ingredients	%	%	%	%
Water	Bal.	Bal.	Bal.	Bal.
Na paraffin sulfonate	10	10	10	10
C9-C11 alcohol EO 5:1	5	5	5	5
C13-C15 alcohol EO 7:1 PO 4:1	2.5	2.5	2.5	2.5
Coco fatty acids	1.25	1.25	1.25	1.25
DPGMBE[1]	7	-	-	-
DPGME[2]	-	8	-	-
PGME[3]	-	-	10	-
TPGME[4]	-	-	-	9
EtOH[3]	-	-	-	-
IPA[6]	-	-	-	-
PGMBE[7]	-	-	-	-
Citroshine	2.4	2.4	2.4	2.4
pH = 6.5 +/-0.2				
Stability	OK	OK	OK	OK

[1] Dipropylene glycol monobutyl ether
[2] Dipropylene glycol methyl ether
[3] Propylene glycol methyl ether
[4] Tripropylene glycol methyl ether
[6] Isopropyl alcohol
[7] Propylene glycol monobutyl ether

Ex. 21 - 23

APC Formulae Compositions

Ingredients	Ex. 21 %	Ex. 22 %	Ex. 23 %
Water	Bal.	Bal.	Bal.
Na paraffin sulfonate	10	10	10
C9-C11 alcohol EO 5:1	5	5	5
C13-C15 alcohol EO 7:1			
PO 4:1	2.5	2.5	2.5
Coco fatty acids	1.25	1.25	1.25
DPGMBE[1]	-	-	-
DPGME[2]	-	-	-
PGME[3]			
TPGME[4]	-	-	-
EtOH[3]	10	-	-
IPA[6]	-	8	-
PGMBE[7]	-	-	6
Citroshine	2.4	2.4	2.4
pH = 6.5 +/- 0.2			
Stability	OK	OK	OK

[1] Dipropylene glycol monobutyl ether
[2] Dipropylene glycol methyl ether
[3] Propylene glycol methyl ether
[4] Tripropylene glycol methyl ether
[5] Ethanol
[6] Isopropyl alcohol
[7] Propylene glycol monobutyl ether

The compositions of Examples 17 - 23 are all clear, homogeneous stable liquids having improved cleaning and shine properties. However, Examples 21 and 22, containing ethanol and isopropyl alcohol, have lower boiling and flash points which may preclude manufacture or use of these compositions at higher temperatures.

Examples 24-28

APC FORMULAE COMPOSITIONS					
	Ex. 24	Ex. 25	Ex. 26	Ex. 27	Ex. 28
Ingredients	%	%	%	%	%
Water	Bal.	Bal.	Bal.	Bal.	Bal.
Na paraffin Sulfonate	10	10	10	10	10
C9-C11 alcohol EO 5:1	5	5	5	5	5
C13-C15 alcohol EO 7:1 PO 4:1	2.5	2.5	2.5	2.5	2.5
Coco fatty acids	1.25	1.25	1.25	1.25	1.25
DPGME	10	10	10	10	-
TPGME	-	-	-	-	10
PGME	-	-	-	-	-
Citroshine perf.	2.4	-	-	-	2.4
GM 372/C perf.	-	5.2	-	-	-
Citrolime perf.	-	-	3.2	-	-
GM 639 perfume	-	-	-	2.0	-
Formalin	0.8	0.8	0.8	0.8	0.8
Dye	QS	QS	QS	QS	QS
pH = 6.5 +/- 0.3					
Stability	OK	OK	OK	OK	OK

Examples 29-33

APC FORMULAE COMPOSITIONS					
	Ex.29	Ex.30	Ex.31	Ex.32	Ex.33
Ingredients	%	%	%	%	%
Water	Bal	Bal	Bal	Bal	Bal
Na paraffin Sulfonate	10	10	10	10	10
C9-C11 alcohol EO 5:1	5	5	5	5	5
C13-C15 alcohol EO 7:1 PO 4:1	2.5	2.5	2.5	2.5	2.5
Coco fatty acids	1.25	1.25	1.25	1.25	1.25
DPGME	-	-	-	-	-
TPGME	10	10	-	-	-
PGME	-	-	12	12	12
Citroshine perf.	-	-	2.4	-	-
GM 372/C perf.	5.2	-	-	5.2	-
Citrolime perf.	-	3.2	-	-	3.2
GM 639 perfume	-	-	-	-	-
Formalin	0.8	0.8	0.8	0.8	0.8
Dye	QS	QS	QS	QS	QS
pH = 6.5 +/- 0.3					
Stability	OK	OK	OK	OK	OK

The composition of Examples 24-33, containing a variety of perfumes in amounts of 2.4 to 5.2% by weight, are clear, homogeneous stable liquid cleaners having improved cleaning and shine performance.

Examples 34 - 36

APC Compositions			
	Ex.34	Ex. 35	Ex. 36
Ingredients	%	%	%
Distilled Coconut Oil Fatty Acids	1.25	1.00	1.50
38% NA20 Caustic Soda	QS		
C9-11 Alcohol EO 5:1	5.00	4.00	6.00
C14-17 Paraffin Na Sulfonate	10.00	8.00	12.00
C13-15 Fatty Alcohol EO 7:1/ PO 4:1	2.50	2.00	3.00
Dye	0.005	0.004	0.006
Kathon 886 MW 13.9% Soln. (preservative)	0.036	0.036	0.036
Formalin (alternative to Kathon)	0.2		
Citroshine Perfume	2.40	1.92	2.88
Dipropylene Glycol Methylether	10.00	5.00	15.00
Softened Water	BALANCE		
pH = 6.10 - 6.50			
Total	100%	100%	100%

The compositions of Examples 34 - 36 are clear homogeneous stable concentrated liquids having improved cleaning and shine performance and foam control, dilutable 4:1 with soft, medium, or hard water.

It is understood that the foregoing detailed description is given merely by way of illustration and that variations may be made therein without departing from the spirit of the invention.

Claims

1. A stable, clear homogeneous concentrated liquid all purpose cleaning composition free of builder salts, comprising, by weight, about 16 - 30% of a water soluble dual detergent system consisting essentially of a mixture of anionic and nonionic surfactants, about 5-15% of a water soluble, polar organic solvent selected from the group consisting of C_1-C_4 alkyl ethers of ethylene or diethylene glycol or mono-, di- or tripropylene glycol, and about 2-5.5% of a fragrance compatible with the organic solvent in an aqueous medium and having a pH of about 6-7.

2. A composition as claimed in Claim 1 wherein the dual detergent system comprises about 8-16% of an anionic surfactant selected from the group consisting of a water soluble alkali metal salt of a C_{8-18} alkyl sulfonate, paraffin sulfonate, or a C_8-16 alkyl benzene sulfonate and about 6-12% of water soluble nonionic surfactant selected from the group consisting of ethoxylated fatty alcohol, ethoxylated/propoxylated fatty alcohol and an alkyl polyglycoside.

3. A composition as claimed in Claim 1 or Claim 2, further comprising about 0.5-2% of a fatty acid foam control agent.

4. A composition as claimed in Claim 1, 2 or 3 wherein the weight ratio of anionic surfactant to nonionic surfactant is 5:4.

5. A composition as claimed in anyone of Claims 1 to 4 which is diluted with water to form a stable diluted all purpose liquid cleaner composition.

6. A composition as claimed in Claim 5 which is diluted about four times by volume with water prior to use.

7. A composition as claimed in anyone of Claims 1 to 6 wherein the anionic surfactant is a phosphate-free sodium paraffin sulfonate.

8. A composition as claimed in anyone of Claims 1 to 7 further comprising a water soluble magnesium salt in an amount of about 1.5-4% by weight.

9. A composition as claimed in any one of Claims 1 to 8 wherein the water soluble nonionic surfactant is a mixture of nonionic surfactants selected from the group consisitng of ethoxylated fatty alcohol, ethoxylated/propoxylated fatty alcohol and an alkyl polyglycoside.

10. A composition as claimed in anyone of claims 1 to 9 wherein the nonionic surfactant is a mixture of an ethoxylated fatty alcohol and an ethoxylated/propoxylated fatty alcohol.

11. A composition as claimed in any one of claims 1 to 10 wherein the nonionic surfactant is a mixuture of an ethoxylated C_9-C_{11} alcohol with 5 ethoxy groups per alcohol molecule, and an ethoxylated/propoxylated C_{13}-C_{15} alcohol with 7 ethoxy groups and 4 propoxy groups per alcohol molecule, in a 2:1 weight ratio.

12. A composition as claimed in any one of Claims 3 to 11 wherein the foam control agent is coconut oil fatty acids.

13. A composition as claimed in any one of Claims 1 to 12 wherein the water soluble organic solvent is dipropylene glycol n butyl ether.

14. A composition as claimed in any one of Claims 1 to 12 wherein the water soluble organic solvent is diethylene glycol mono butyl ether.

15. A compositon as claimed in any one of Claims 1 to 12 wherein the water soluble organic solvent is dipropylene glycol methyl ether.

16. A composition as claimed in any one of Claims 1 to 15 wherein the anionic surfactant is 10% sodium paraffin sulfonate, and which further comprises 2.5 to 3.75% of magnesium sulfate heptahydrate.

17. A composition as claimed in any one of Claims 1 - 16 wherein the anionic surfactant is 10% sodium paraffin sulfonate, and which further comprises 1.5 to 3.75% of magnesium sulfate heptahydrate and 2.0 to 3.2% sodium cumene sulfonate hydrotrope salt.

18. A composition as claimed in any one of Claims 1 to 17 comprising 1-2% coconut fatty acids and having a pH of 6.1 to 6.8.

19. A composition as claimed in any one of Claims 1 to 18 wherein the water soluble polar organic solvent is selected from the group consisting of diethylene glycol monomethyl ether, diethylene glycol monobutyl ether, tripropylene glycol monomethyl ether and dipropylene glycol monomethyl ether.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 30 5821

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	GB-A-2 190 681 (COLGATE-PALMOLIVE COMPANY) * whole document *	1-10,12-16,18,19	C 11 D 1/83 C 11 D 3/43 C 11 D 3/50
Y	EP-A-0 243 685 (MIRA LANZA S.P.A.) * claims *	1,2,5,9,10,13-15,19	
Y	US-A-4 285 841 (C. R. BARRAT et al.) * claims 1-8 *	1,2,5,9,10,13-15,19	
A		3,4,12,17,18	
A	US-A-4 239 662 (O. OKUMURA et al.) * claims; column 3, lines 16-29,38-49 *	1,2,7-10,16	
A	FR-A-2 189 505 (COLGATE-PALMOLIVE COMPANY) * claims 1,2,5-7,9 *	1,2,5,9,10,13-15,19	
A	EP-A-0 109 022 (MIRA LANZA S.P.A.) * claims 1,5-9 *	1,2,5,6,9,10,13-15,19	TECHNICAL FIELDS SEARCHED (Int. Cl.4) C 11 D
A	US-A-3 962 150 (L. J. VIOLA) * claim 1 *	1	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
BERLIN	06-09-1989	PELLI-WABLAT B

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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