(CONVENTION - Company)

FORM 8 - REGULATION 12 (2)

COMMONWEALTH OF AUSTRALIA
Patents Act, 1952-1973

DECLARATION IN SUPPORT OF A CONVENTION APPLICATION FOR A PATENT

In support of the Convention Application No. 41970/89 made by COLGATE PALMOLIVE COMPANY, a corporation organized under the laws of the State of Delaware, United States of America

(hereinafter referred to as "Applicant") for a patent for an invention entitled:

"LIGHT DUTY LIQUID DETERGENT COMPOSITIONS"

I, ROBERT C. SULLIVAN, Vice President & Chief Patent Counsel,

of 300 Park Avenue, New York, New York 10022, United States of America

do solemnly and sincerely declare as follows:

1. I am authorised by Applicant to make this declaration on its behalf.

2. The basic Application~~(s)~~ as defined by section 141 of the Act was/~~were~~ made in the United States of America on August 19, 1988

by Edward Paul Duliba, Cuong Nguyen, Gregory Donald Riska, Gregory William Hawrylak, Francis Joseph Bala, Jr.

3. Edward Paul Duliba, of 30 Cantebury Ct., Piscataway, NJ 08854, USA; Cuong Nguyen, of 78-1/2 Woodbridge Ave.,Apt.A., Highland Park, NJ 08904, USA; Gregory Donald Riska, of 280 River Road, Apt. 358, Piscataway, NJ 08854, USA; Gregory William Hawrylak, of 28 Dana Estates Drive, Parlin NJ 08859, USA; Francis Joseph Bala, Jr. of 2114 Westminister Blvd., Parlin, NJ 08859, USA

~~is~~/are the actual Inventor(s) of the invention and the facts upon which Applicant is entitled to make the Application are as follows:
Applicant is the Assignee of the said Inventor(s).

4. The basic Application~~(s)~~ referred to in paragraph 2 of this Declaration was/~~were~~ the first Application(~~s~~) made in a Convention country in respect of the invention, the subject of the Application.

DECLARED at Piscataway, New Jersey

this day of APR 17 1991 19 .

COLGATE PALMOLIVE COMPANY

Robert C. Sullivan

Robert C. Sullivan
Vice President & Chief Patent Counsel

TO THE COMMISSIONER OF PATENTS.

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(57) Claim

1. A liquid dishwashing detergent composition providing stable foaming characteristics and which is effective in removing greasy soils at ambient temperature, said composition comprising:

(A) from 33 to 42% by weight of a surfactant system comprising:

(1) from 45 to 58% by weight of a magnesium salt of a C_{10}-C_{12} alkyl benzene sulfonate anionic surfactant;

(2) from 0 to 5% by weight of an alkali metal salt of a C_{10}-C_{12} alkyl benzene sulfonate anionic surfactant; and

(3) from 40 to 60% by weight of an alkyl mono- or polyglucoside having from 9 to 13 carbon atoms, on average, in the alkyl chain, and an average degree of polymerization in the range of from 1 to 3;

(B) from 1 to 5% by weight of a foam stabilizing system comprising at least one lower alkanolamide of higher alkanoic acid;

(C) from 2 to 5% by weight of a low irritant organic solvent;

(D) from 1 to 6% by weight of a hydrotrope;

(E) up to 10% by weight in total of one or more optional

.../2

additives chosen from chelating or sequestering agents, coloring agents, dyes, perfumes, bactericides, fungicides, preservatives, sunscreening agents, pH modifiers, pH buffering agents, opacifiers, antioxidents, thickeners, proteins and the balance, water.

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(54) Title: LIGHT DUTY LIQUID DETERGENT COMPOSITIONS

(57) Abstract

An aqueous liquid detergent composition for handwashing soiled dishware includes magnesium linear dodecyl benzene sulfonate, C_9-C_{13} alkyl mono- or polyglucoside (from 1 to 3 glucoside units), lauric/myristic monoethanolamide, lauric diethanolamide, hydrotrope, ethanol, and water, in certain proportions. The compositions are capable of generating a stable foam and are effective in cleaning greasy soils in ambient temperature wash water.

LIGHT DUTY LIQUID DETERGENT COMPOSITIONS

This invention relates to light duty liquid detergents having particular utility in the hand washing of dishware, including dishes, pots, pans, glassware and silver/flatware. More particularly, it relates to a liquid dishwashing detergent composition which provides stable, persistent foaming characteristics combined with effectiveness in removing greasy soils from dishes under ambient, i.e. low water temperature, conditions.

Foam generation by detergent compositions is associated by the consumer with good detersive ability. However, it is apparent that long lasting foam, whether considered copious or medium to low-medium foam content is, by itself, not a sufficient measure of cleaning ability. Nevertheless, much effort has been extended to optimize foaming characteristics, without necessarily improving cleaning ability.

Greasy soils are generally considered to be one of the most difficult soil types to be removed by hand washing. Effective grease removal is nearly always associated with requiring high temperature water to help dissolve and remove the grease.

Clearly, there would be a great advantage to formulate a mild, foaming, liquid hand dishwashing composition, which is capable of and effective in removing greasy soils as well as other soil types from dishware using water at ambient temperature.

The present invention provides compositions which accomplish this objective. The compositions, although prepared from otherwise known ingredients, but in unique combinations and proportions, is capable of achieving a new and beneficial result.

In accordance with the present invention, the liquid dishwashing detergent composition comprises, as essential ingredients:

(A) from about 30 to 50% of a surfactant system comprising (1) from about 35 to 65% of a magnesium salt of a C_{10}-C_{15} alkyl benzene sulfonate anionic surfactant; (2) from 0 to 15% of an alkali metal salt of a C_{10}-C_{16} alkyl benzene sulfonate anionic surfactant; and (3) from about 35 to 65% of an alkyl mono- or polyglucoside having from 9 to 16 carbon atoms, on average, in the alkyl chain, and an average degree of polymerization in the range of from about 1 to 3; and (B) from about 0.5 to 6% of a foam stabilization system comprising at least one lower alkanolamide of higher alkanoic acid, the balance water. Optional, but often beneficial ingredients which can, and often are included in the composition include:

(C) a low irritant organic solvent, up to about 10%;

(D) hydrotrope, up to about 8%;

(E) other adjuvants, such as, chelating or sequestering agents, coloring agents, dyes, perfumes, bactericides, fungicides, preservatives, sunscreening agents, pH modifiers, pH buffering agents, opacifiers, antioxidants, thickeners, proteins, and the like, up to about 20%, in total, with a maximum of any individual component being about 10%.

Unless indicated otherwise all percents and percentages given herein are on a by weight basis.

The components of the invention compositions will now be described in greater detail.

(A) The Surfactant System

(1) The first essential surfactant ingredient is the anionic magnesium salt of an alkyl benzene sulfonic acid, preferably a linear C_{10} to C_{16} alkyl benzene sulfonate. The linear alkyl group more preferably averages from 10 to 12 carbon atoms, and most preferably averages 12 carbon atoms. Thus, the most preferred Mg alkyl benzene sulfonate is the magnesium salt of linear dodecylbenzene sulfonic acid.

Furthermore, the magnesium salt may be, for example, a magnesium oxide neutralized linear dodecyl benzene sulfonic acid, or alternatively, the magnesium salt may be formed by adding a magnesium salt, such as magnesium chloride, magnesium sulfate, etc. to sodium dodecyl benzene sulfonate. In the latter alternative, any excess of the magnesium salt electrolyte will raise the cloud/clear point of the composition. This undesirable effect can, however, be compensated for by addition of hydrotrope, as described below.

The Mg salt anionic surfactant (1) is present in an amount of from about 15% to about 25%, based on the total composition, or in an amount of from about 35 to 65%, based on the total surfactants (A)(1), (2) and (3). The more preferred range of amounts of the anionic magnesium salt surfactant is from about 15 to 22%, especially about 20 to 21%, based on the total composition, or about 37 to 58%, especially about 48 to 54%, based on the sum of the surfactants (A)(1), (2) and (3).

At below the 15% (total) level the improvement in low temperature grease removal becomes insufficient, while at amounts above 25% (total) there is a tendency for the composition to be mildly irritating to the hands.

(2) The surfactant system may also include a small amount, up to about 5% of the total composition, or up to about 15% of the total surfactant component, of an alkali metal salt of a linear C_{10}-C_{15} alkyl benzene sulfonic acid anionic surfactant. The preferred amounts are up to about 3% (total) or about 8% (surfactant), respectively, such as about 0.5, 1.0, 1.5, 2.0, or 3.0 percent, of the total composition. The alkali metal may be sodium or potassium, preferably sodium. The linear alkyl group preferably contains from 10 to 12 carbon atoms, especially 12 carbon atoms, on average, e.g.

sodium linear dodecyl benzene sulfonate. The sodium salt anionic is generally considered to be a milder detergent than the magnesium salt but is less effective for greasy soil removal and is also less effective in generating foam, especially in the presence of soil and, therefore, its presence in the composition will be minimized or eliminated wherever possible.

However, where the magnesium salt anionic is obtained by reacting an electrolyte magnesium salt with sodium alkyl benzene sulfonate, it is not generally necessary to remove any remaining sodium ion and, in fact, this is a convenient means for introducing the magnesium salt into the composition when its presence is desired.

(3) Another essential surfactant in the invention composition is an alkyl glucoside, preferably an alkyl polyglucoside, although alkyl monoglucoside can also be used.

The alkyl mono- and polysaccharides have received much attention recently for their beneficial detergent, foaming and viscosity modifying properties. Examples of patent literature relating to light duty liquid compositions containing alkyl monosaccharides include U.S. Patents 4,732,704 and 4,732,696. The alkyl polysaccharides are used in the liquid detergent compositions disclosed in U.S. Patents 4,396,520, 4,536,318, 4,565,647, 4,599,177, 4,663,069, and 4,668,422 (including monoglucosides), as well as many of the patents and literature cited in these patents.

In the present invention, a narrow subgenus of the alkyl saccharides have been found to effectively enhance low temperature grease removal when used in combination with the magnesium salt surfactant.

The alkyl glycosides used in this invention are those having an alkyl group of from 9 to 13 carbon atoms, preferably 9 to 11 carbon atoms, on average, and a glucoside hydrophilic group containing from 1 to about 3, and most preferably from about 1.2 to about 3, glucoside units, such as 1.3, 1.4, 1.5, 2.0 or 2.8 glucoside units. Of course, the number of glucoside units in any particular surfactant molecule will be a whole number (i.e. an integer), however, for any actual physical sample of alkyl glucoside surfactants there will, in general, be a range of glucoside units, and it is the average value which characterizes a particular surfactant product.

The alkyl group is preferably attached at the 1-position of the sugar molecule, but may be attached at the 1-, 3-, or 4-positions, thus giving a glucosyl rather than a glucoside. Furthermore, in the polyglucosides, the additional glucoside units are predominantly attached to the previous glucoside at the 2-position, but attachment at the 3-, 4- and 6-positions can also occur.

Optionally, and less desirably, there may be a polyalkylene oxide chain (e.g. polyethylene oxide) joining the alkyl moiety and the glucoside units).

The preferred alkyl polyglucosides have the formula

$$R^2O(C_nH_{2n}O)_t(Z)_x$$

wherein Z is derived from glucose, R^2 is an alkyl group containing from about 9 to about 11 carbons, n is 2 or 3, preferably 2, t is from 0 to about 6, preferably 0, and x is from 1 to 3, preferably from 1.2 to 3, most preferably from 1.3 to 2.7. To prepare these compounds a long chain alcohol (R^2OH) can be reacted with glucose, in the presence of an acid catalyst to form the desired glucoside. Alternatively the alkyl polyglucosides can be prepared by a two step procedure in which a short chain alcohol (C_1-C_6) is reacted with glucose or a polyglucoside (x=2 to 4) to yield a short chain alkyl glucoside (x=1 to 4) which can in turn be reacted with a longer chain alcohol (R^2OH) to displace the short chain alcohol and obtain the desired alkyl polyglucoside. If this two step procedure is used, the short chain alkyl glucoside content of the final alkyl polyglucoside material should be less than 50%, preferably less than 10%, more preferably less than 5%, most preferably 0% of the alkyl polyglucoside.

The amount of unreacted alcohol (the free fatty alcohol content) in the desired alkyl polyglucoside surfactant is preferably less than about 2%, more preferably less than about 0.5% by weight of the total of the alkyl polyglucoside plus unreacted alcohol. The amount of alkyl monoglucoside is preferably about 20% to about 70%, more preferably 30% to 60%, most preferably 30% to 50% by weight of the total of the alkyl polyglucoside. For some uses it is desirable to have the alkyl monoglucoside content less than about 10%.

The amount of the alkyl glycoside surfactant to achieve the desired foam and detersive properties is in the range of from about 15 to 25% of the total composition, or from about 35 to 65% of the sum of the surfactants (A)(1), (2) and (3). The preferred amounts range from 16 to 22%, especially from 18 to 20%, based on the total composition, or from about 40 to 60%, especially from 45 to 55%, based on the total surfactant content.

Within these ranges the relative amounts of the magnesium alkyl benzene sulfonate surfactant and alkyl mono- or polyglucoside surfactant is not particularly critical, but will generally be within the range of from about 1.3:1 to 1:1.3, more preferably from about 1.2:1 to 1:1.2.

In the invention compositions, the total amount of active surfactant components will be in the range of from about 30% to 50% of the total composition, preferably from about 33% to 42%, such as 35%, 36%, 38%, 39% or 40%.

(B) Foam Stabilization System

The foam stabilization system which may also itself contribute to the foaming capacity as well as foam stabilizing effect is comprised of the lower alkanolamide of higher alkanoic acid which is the reaction product of a lower alkanol of 2 to 3 carbon atoms and an alkanoic acid of 10 to 16 carbon atoms, preferably with 80% or more of the lower alkanol being ethanol and a similar proportion of the alkanoic acid being of 12 to 14 carbon atoms. Other lower alkanols that are also useful are n-propanol and isopropanol. The preferred alkanoic acid is a mixture of lauric and myristic acids, generally in proportions of 1:2 to 2:1, with about 50% of each being preferable. Alternatively, coconut oil or hydrogenated coconut oil may be used as a source of the alkanoic acids. Suitable alkanoic acid alkanolamides include the monoethanolamides, diethanolamides and the monoisopropanolamides.

Specific examples include mixed lauric/myristic diethanolamide, lauric/myristic monoethanolamide, lauric monoethanolamide, lauric diethanolamide, coco diethanolamide, coco monoethanolamide, and the like.

In place of a part of the alkanoic acid alkanolamide content of the present compositions, trialkyl amine oxides or lower alkoxylated alkanoic acid alkanolamides may be employed. The amine oxides are usually dilower alkyl higher alkyl amine oxides wherein the lower alkyls are of 1 to 3 carbon atoms and the higher alkyls contain from 10 to 16, preferably 12 to 14 carbon atoms. The alkoxylated alkanoic acid alkanolamide has from 1 to 10, preferably 2 to 4 ethoxy groups in the molecule. The alkanol and the fatty acid are the same as for the present alkanoic acid alkanolamides. Normally, the replacement of alkanolamide will be to the extent of only 5 to 40% by weight of the proportions thereof given above. While the alkanolamide may, for some uses, be completely replaced by the amine oxide, ethoxylated alkanolamide or mixture thereof, such complete replacement is not preferred. Most preferably, none of the alkanoic acid alkanolamide content is replaced by the amine oxides.

The amount of the alkanoic acid alkanolamide may be up to about 6% of the composition, such as 0.5 to 6%, preferably 1 to 6%, more preferably 1 to 5%, such as 2, 3 or 4%, of the composition.

The compositions of this invention which include the magnesium salt surfactant, alkyl polyglucoside and foam stabilization system, in the specified proportions, as essential ingredients are formulated in an aqueous carrier to provide mild, stable foaming liquid compositions especially effective in cleaning, by hand washing, dishware, such as dishes, glasses, flatware, pots, pans, etc., at ambient wash water temperature, as well, of course, at warm or hot wash water temperatures. The invention formulations are mild to the hands and are clear and homogeneous. Clarity and homogeneity may often, however, be improved by inclusion of, for example, organic solvents and/or hydrotropes, and these and other optional additives may also be included in the compositions in amounts which do not adversely influence the desirable properties.

(C) Organic Solvent

Cosmetically acceptable organic solvents, usually lower alcohols, such as ethanol, propanol, isopropanol, propylene glycol, or mixtures thereof, may be included in the composition for its thinning effect, lowering of clear point, and for its solubilizing effect for any components which may not be readily soluble in the main aqueous medium. The amount of solvent, when present, will usually be limited to about 10%, preferably 8%, especially about no more than 6% of the composition, such as from 2 to 5%. Ethanol is the preferred organic solvent.

(D) Hydrotrope

In order to assist in solubilizing various components of the composition, maintain a low clear point, and possibly modifying viscosity, it is customary to include a hydrotropic substance in the composition. Typical hydrotropes include primarily urea and the lower alkyl aryl sulfonate salts, such as sodium xylene sulfonate, potassium xylene sulfonate, sodium cumene sulfonate, ammonium xylene sulfonate, and the like. Mixtures of two or more hydrotropes may also be used. The hydrotrope, when used, is generally present in amounts below about 8%, preferably below about 6%, such as from 1 or 2 to 6%.

(E) Other Optional Functional and Aesthetic Additives

Various other materials may also be included in the present compositions for their desirable functional or aesthetic effects. Among these, those material employed to increase the mildness of the detergent composition to the human hands, such as the water soluble proteins, are often very useful.

Although solvents, including water, tend to make the products clear liquids, it is sometimes desirable to opacify them or make them appear pearly. For such purpose there may be employed opacifying agents, e.g. behenic acid, or a pearlescent or pearlizing composition, such as an approximately equal mixture of high fatty acid ester of polyethoxy ethanol, coconut oil fatty acid alkanolamide and sodium lauryl ether sulfate. The higher fatty acid will usually be of 10 to 18 carbon atoms and the polyethoxy content will be of 1 to 20, preferably 1 to 10 ethoxy groups. The alkanolamide will preferably by ethanolamide, but can be mixed with isopropanolamide, too.

Additional adjuvant components of the present compositions include perfumes; sequestrants, e.g. monohydrogen ethylene diamine tetraacetate, tetrasodium ethylene diamine tetraacetate, trisodium nitrilotriacetate; bactericides, e.g. trichlorocarbanilide, tetrachlorosalicylanilide, hexachlorophene, chlorobromosalicylanilide; antioxidants; thickeners, e.g. sodium carboxymethyl cellulose, polyacrylamide, Irish moss; dyes; water dispersible pigments; salts, e.g. sodium sulfate, magnesium sulfate, as the heptahydrate or anhydrous, sodium chloride; preservatives, such as formaldehyde or hydrogen peroxide, pH modifiers, etc.

The total amount of the additional additives is usually no more than about 20% of the composition, preferably not exceeding 15%, while the amount of any individual ingredient will not generally exceed 10%, especially 5%, and usually no more than 2 or 3%.

In the above description of the compositions of this invention and the various adjuvants employable therein, and in the claims, although individual constituents are mentioned for various classes or types of components it is within the invention that mixtures thereof be employed, such as mixtures of two or three anionic detergents or mixtures with the nonionic detergents, both possibly with other anionic and nonionic detergents known in the art, mixtures of skin treating materials and mixtures of solvents, among others.

For example, the present inventors have found that under certain circumstances paraffin sulfonate surfactants, such as sodium or magnesium (C_{12}-C_{18}) paraffin sulfonate, usually together with minor amounts of C_{10}-C_{18} alkyl ether ethyleneoxy sulfates of the formula $R(OC_2H_4)_nOSO_3M$ wherein n is 1-10, preferably 1-5, such as 2 or 3, R is alkyl containing 10 to 18 carbon atoms, preferably 12 to 15 carbon atoms, and M is a cation, preferably sodium, potassium or ammonium, or magnesium, together with an amine oxide nonionic foam stabilizer, preferably mono C_8-C_{18} alkyl di-(C_1-C_4 alkyl or C_1-C_2 alkanolamine) oxides, can be used with the alkyl polyglucosides described above to also achieve good foam and grease removal characteristics. In particular, compositions containing from 13 to 18% paraffin sulfonate, 4 to 6% magnesium sulfate heptahydrate, 2 to 4% amine oxide, 9 to 13% of alkyl polyglucoside (C_9-C_{11} alkyl polyglucoside with 1.2 to 3 glycoside units), and 0 to 8% of the alkyl ether sulfate are especially effective.

The viscosities of the detergent compositions may be further varied by the addition of thickening agents, such as gums and cellulose derivatives. The product viscosity and flow properties should be such as to make it pourable from a bottle and not so thin as to tend to splash or pour too readily, since usually only small quantities of the liquid detergent are to be utilized in use. Viscosities from 20 to 1000 centipoise (Brookfield Viscometer spindle no. 1, 12 r.p.m.) are found useful with those from 100 to 500 cps. being preferred and a viscosity of about 200 centipoise being considered best by most consumers, although at somewhat lower viscosities, e.g. 100 cps., consumer acceptance is almost the same.

In manufacturing the described formulations, usually it is preferred to heat the detergent constituents to a somewhat elevated temperature, e.g. 40° to 50°C and then admix them with the water and, optionally, all or a portion of the ethanol. Thereafter, other anionic and nonionic detergents, urea, amide, protein and other adjuvants are added with the more volatile materials, such as perfumes, preferably being added last and after cooling of the composition to about room temperature. Normally when making opaque or pearly detergents, the pearlizing mixture will also be added near last at about room temperature. Although the described method of making the compositions is preferred, various other known techniques may also be employed, depending upon the particular detergent composition.

The pH of the formulation will generally be near neutral, e.g. about 6 to 8, preferably about 6.5 to 7.5.

The following representative non-limiting examples will help to further understand the present invention.

Example 1

The following compositions are prepared:

Component	Run No.	
	1	2
Mg linear dodecyl benzene sulfonate $[Mg(LDBS)_2]$	15.5	18
Alkyl polyglycoside1)	20.5	18
Na LDBS	1.5	-
Lauric/myristic monoethanolamide (LMMEA)	1.25	3
Lauric diethanolamide (LDEA)	0.75	1
Ethanol (3A)	4.3	4.3
Sodium cumene sulfonate (SCS)	0.7	0.7
Sodium xylene sulfonate (SXS)	2.4	2.4
Monohydrogen ethylene diamine tetraacetate, trisodium salt (HEDTA)	0.08	0.08
Perfume	0.3	0.3
Color	0.3	0.3
Water, deionized	9.5	9.5

1) APG 325 from Horizon Chemical, hydrophobe chain length of 9 to 11 carbon atoms, average of 1.52 glycoside units.

Each of the compositions of Runs 1 and 2 are evaluated by the following criteria:

(1) Emulsification Stability

The emulsification stability of corn oil in a 1% surfactant solution at 50 ppm hardness (Ca:Mg = 2:1), 100 ppm HCO_3 -. For the test, 0.20 g of Mazola corn oil is added to 19.80 g of the diluted (1%) surfactant solution and placed in a vial. The vial is inverted 25 times by hand and allowed to stand 5.0 min. The turbidity is read both before and after the test on a Hach turbidimeter and the change in turbidity (NTU) is calculated. The higher the turbidity the better the emulsion stability.

(2) Miniplate Test

A diluted (0.1% test solution is titrated with Crisco (hydrogenated cotton seed) soil to a foam end point under constant agitation in 50 ppm hardness water. This test measures the total number of plates which can be washed with the detergent composition until the foam is killed, i.e., before there is no longer the appearance of foam on top of the wash water.

(3) Tergotometer Foam Test

A diluted (0.1%) test solution is agitated in a standard tergotometer while planchets filled with lard (Armour) are periodically added. The number of planchets required to reduce the foam height to 50 ml is measured.

In all of the above test procedures, water at ambient temperature (75 to 80°F, 25°C) is used for dilution and for washing. The results of the testing for the compositions of Run Nos. 1 and 2 and the results for two different best selling commercial light duty liquid dishwasher compositions are shown in Table 1.

Table 1

Diluent Grease Cleaning		Foaming Stability	
Test Composition	Emulsification (Change of NTUs)	Tergotometer # of planchets	Miniplate Test # of units
Run No. 1	105	40.5	52
Run No. 2	202	38.5	55
Control No. 1*	100	44	50
Control No. 2**	8	36	51

*Control No. 1: Leading commercial brand of hand dishwashing composition containing anionic surfactant; foam booster; hydrotropes; inorganic salts; ethanol; water.

**Control 2: A second leading commercial brand of hand dishwashing composition containing: anionic surfactants; foam booster; hydrotrope; inorganic salts; ethanol; water.

Example 2

The following composition is prepared:

	wt. %
Mg $(LDBS)_2$	21.0
APG 325	18.0
LMMEA	1.0
LDEA	3.0
Ethanol (3A)	4.3
SCS 2.1	
SXS 2.2	
Urea	2.0
HEDTA	0.1
Perfume	0.2
Colorant	0.3
Water, deionized	q.s to 100

and is subjected to the test procedures described above in Example 1 but using water at both 50 ppm and 150 ppm hardness. In addition, the composition is subjected to the following additional tests:

(4) Grease Removal (Cup) Test

This test measures amount of greasy soil (lard) removal from the surface of a plastic beaker. In this test 0.55 to 0.60 g of lard is spread on the walls of a 250 ml plastic beaker and the beaker is then filled with 250 grams of a 1% diluted solution of the test composition. The test composition is mechanically agitated with a stirrer at 200 rpm for 5 minutes. The percent transmittance (%T) is measured by a fiber optic probe at 490 nm light using a Brinkman PC 800 colorimeter. The lower the value of %T as time progresses the better is the greasy soil removal capability of the test composition. This test, however, is only valid for compositions that are initially clear enough to be standardized at zero absorbance with the PC 800 colorimeter.

(5) Modified Grease Removal (Cup) Test

The procedure described for the grease removal test (5) is modified by using hamburger grease as the soil and tap water at 105°F for dilution.

(6) Baumgartner Soil Removal

This test also measures the ability of a diluted (1%) solution in 50 ppm or 150 ppm hardness water to remove a greasy soil (lard) from a test surface (a cleaned glass slide 2.5 cm x 0.1 cm). The soil is applied by spreading about 0.2 to about 0.3 gram lard onto each cleaned glass slide. The soiled slides are cleaned in a 1% product solution by dipping the soiled slide into the solution 600 times. The solution is maintained at ambient temperature (75°F). After washing, the slides are dried in a desiccator for two hours. The difference in weight of the lard before and after the cleaning process is taken as a measure of grease removal, the greater the difference the more effective is the detergent composition.

The results of the tests are shown in Table 2 together with the results obtained for the same two commercial products (Control 1 and Control 2) used in Example 1.

Table 2

TESTS FOR GREASE REMOVAL, DILUTE

TEST	Control 1	Control 2	Example 2
Cup Test (%T)			
50 ppm	28.2	99.8	--1)
150 ppm	9.5	25.7	--
Baumgartner (g removal)			
50 ppm	0.11	0.003	0.14
150 ppm	0.12	0.067	0.18
Emulsification (NTU)			
50 ppm	100	15	--2)
150 ppm	100	75	--
Modified Cup Test (% soil removed)	97	20	98
FOAM STABILITY TESTS			
Miniplate (Crisco)			
50 ppm	51	41	57
150 ppm	--3)	--3)	55
Tergotometer (Crisco)			
50 ppm	13.2	10.5	13.2
150 ppm	12.2	9.5	7.8
Tergotometer (Grease)			
50 ppm	5.6	3.5	4.6
150 ppm	5.3	3.9	3.9

1) solution too cloudy for reading
2) solution too cloudy for accurate initial value
3) not measured

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A liquid dishwashing detergent composition providing stable foaming characteristics and which is effective in removing greasy soils at ambient temperature, said composition comprising:

(A) from 33 to 42% by weight of a surfactant system comprising:

(1) from 45 to 58% by weight of a magnesium salt of a C_{10}-C_{12} alkyl benzene sulfonate anionic surfactant;

(2) from 0 to 5% by weight of an alkali metal salt of a C_{10}-C_{12} alkyl benzene sulfonate anionic surfactant; and

(3) from 40 to 60% by weight of an alkyl mono- or polyglucoside having from 9 to 13 carbon atoms, on average, in the alkyl chain, and an average degree of polymerization in the range of from 1 to 3;

(B) from 1 to 5% by weight of a foam stabilizing system comprising at least one lower alkanolamide of higher alkanoic acid;

(C) from 2 to 5% by weight of a low irritant organic solvent;

(D) from 1 to 6% by weight of a hydrotrope;

(E) up to 10% by weight in total of one or more optional additives chosen from chelating or sequestering agents, coloring agents, dyes, perfumes, bactericides, fungicides, preservatives, sunscreening agents, pH modifiers, pH buffering agents, opacifiers, antioxidents, thickeners, proteins and the balance, water.

2. The composition of claim 1 wherein the foam stabilization system (B) comprises at least one compound selected from the group consisting of lauric diethanolamide, lauric monoethanolamide, myristic diethanolamide, myristic monoethanolamide, coco diethanolamide, and coco monoethanolamide.

DATED this 15 day of December 1992

COLGATE-PALMOLIVE COMPANY
Patent Attorneys for the
Applicant:

F.B. RICE & CO.

INTERNATIONAL SEARCH REPORT

International Application No PCT/US 89/03469

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

Int.Cl. 5 C11D1/86

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
Int.Cl. 5	C11D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category °	Citation of Document, [11] with indication, where appropriate, of the relevant passages [12]	Relevant to Claim No.[13]
X	EP,A,0070076 (PROCTER & GAMBLE) 19 January 1983 see page 6, lines 10 - 16 see page 14, lines 4 - 30 see claims and examples ---	1-5
A	EP,A,0070077 (PROCTER & GAMBLE) 19 January 1983 see claims and examples ---	1
A	EP,A,0216301 (HENKEL) 01 April 1987 see claims and examples ---	1

° Special categories of cited documents : [10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

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

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

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

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search 12 JANUARY 1990	Date of Mailing of this International Search Report 12. 02. 90
International Searching Authority EUROPEAN PATENT OFFICE	Signature of Authorized Officer T.K. WILLIS

1

Form PCT/ISA/210 (second sheet) (January 1985)

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

PCT/US 89/03469

SA 30860

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
The members are as contained in the European Patent Office EDP file on 03/02/90
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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		AU-A- 8591482	19-01-84
		CA-A- 1180973	15-01-85
		DE-A- 3278670	21-07-88
		EP-A,B 0070074	19-01-83
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		US-A- 4732704	22-03-88

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82