

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



WIPO | PCT



(10) International Publication Number  
**WO 2013/144603 A1**

(43) International Publication Date  
3 October 2013 (03.10.2013)

(51) International Patent Classification:

*C11D 3/20* (2006.01)      *C11D 3/48* (2006.01)  
*A61Q 19/00* (2006.01)      *C11D 10/04* (2006.01)

(21) International Application Number:

PCT/GB2013/050776

(22) International Filing Date:

26 March 2013 (26.03.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/617,789      30 March 2012 (30.03.2012)      US  
61/790,836      15 March 2013 (15.03.2013)      US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))



WO 2013/144603 A1

(54) Title: BAR SOAPS

(57) Abstract: Improved bar soaps provide finely celled lather or foam when used to clean the epidermis, and especially hands, which at the same time retains a good 'skin feel' of the treated epidermis, e.g., hands.

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**BAR SOAPS**

The present invention relates to improved bar soaps for use in personal washing, particularly of the epidermis, and hair.

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While many bar soaps are known, per se, to the art, there still remains a real and continuing need for improved bar soaps, particularly those which are adapted for and used in personal washing compositions.

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In one aspect the present invention there is provided an improved bar soap composition for use in personal washing, particularly of the epidermis and hair of a mammalian body (human, animal) which composition comprises as essential constituents:

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fatty acid based soap, preferably in the form of 'soap noodles' which are technical grade mixtures which predominantly comprise one or more metal salts of fatty acids; a ternary system comprising at least one of each of the following: (a) an alkyl lactate; (b) a fatty acid ester oil and, (c) a sucrose ether based nonionic surfactant.

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In a further aspect the present invention provides an improved bar soap composition for use in personal washing, particularly of the epidermis and hair of a mammalian body (human, animal) which composition comprises as essential constituents:

fatty acid based soap, preferably in the form of 'soap noodles' which are technical grade mixtures which predominantly comprise one or more metal salts of fatty acids; a binary system comprising at least one of each of the following: (a) an alkyl lactate and (b) a fatty acid ester oil.

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In a further aspect the present invention provides an improved bar soap composition according to any of the foregoing aspects of the invention, which bar soaps further necessarily include a non-cationic compound which provides an antimicrobial or germicidal benefit, and preferably is one or more halogenated carbanilides.

In a further aspect of the invention there are provided methods for the manufacture of bar soaps according to any of the prior aspects of the invention recited herein, as well as a bar soap according to any of the prior aspects of the invention recited herein as a vendible product.

5           These and further aspects of the invention will become more apparent from a further reading of this patent specification.

The predominant constituent present in the bar soaps of the invention are fatty acid based soaps. Such include anionic materials (i.e. alkali metal salts, e.g., sodium or potassium salts) of fatty acids, typically having from about 8 to about 24 carbon atoms, preferably from about 10 to about 20 carbon atoms. Further suitable soaps include alkali metal, ammonium and alkanolammonium salts of aliphatic alkane or alkene monocarboxylic acids having about 8 to about 18 carbon atoms. Sodium, potassium, ammonium, mono-, di-, and triethanolammonium cations or combinations thereof, are preferred. The fatty acids used in making the soaps can be obtained from natural sources such as, for instance, plant or animal-derived glycerides (e.g., palm oil, coconut oil, soybean oil, castor oil, tallow, lard, etc.). The fatty acids can also be synthetically prepared. Soaps may be prepared by either direct saponification of fats and oils or by neutralization of free fatty acids. Particularly useful are the sodium, potassium, ammonium and alkanolammonium salts of lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid, linoleic acid, ricinoleic acid, coconut fatty acid, palm kernel fatty acid and tallow fatty acid, as well as technical grade mixtures thereof which are frequently vended in the form of "soap noodles" which predominantly contain one or more of the aforesaid compounds, and which soap noodles may contain in further but minor amounts other additional constituents such as water, glycerine, inorganic salts (e.g., sodium chloride), as well as chelating agents, e.g. tetrasodium ethylene diamine tetraacetic acid. The fatty acid based soap constituents from at least about 75%wt. more preferably at least about 80%wt., and especially preferably comprise at least about 82.5%wt. of the bar soap compositions of which they form a part. The fatty acid based soap constituent may be present in any amount which, in conjunction with the one or more of the (a) an alkyl lactate, a (b) a fatty acid ester oil and (c) a sucrose ether based surfactant constituents present, provides 100%wt. of the bar soap composition.

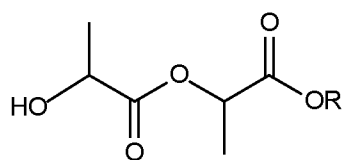
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In certain embodiments, the bar soaps of the invention necessarily include a ternary system comprising at least one of each of the following constituents: (a) an alkyl lactate, a (b) a fatty acid ester oil and (c) a sucrose ether based surfactant. In such embodiments, advantageously the respective weight ratios of the (a) an alkyl lactate: (b) a fatty acid ester oil: (c) a sucrose ether based surfactant, are present in respective weight ratios of (a):(b):(c) of about 1:0.25-3:0.1-35, preferably about 1:0.5-2:0.2-2, and still more preferably of about 1:0.5-0.9:0.25-0.75. Especially preferred respective weight ratios of (a):(b):(c) are disclosed with reference to one or more of the Examples.

The total amount of this ternary system present in the bar soap compositions comprises from about 0.25%wt. to about 1.25%wt., preferably comprises from about 0.35%wt. to about 0.1%wt., based on the total weight of the bar soap composition of which it forms a part.

In certain further embodiments, the bar soaps of the invention necessarily include a binary system comprising at least one of each of the following constituents: (a) an alkyl lactate, and a (b) a fatty acid ester oil. In such embodiments, advantageously the respective weight ratios of the (a) alkyl lactate: (b) fatty acid ester oil are present in respective weight ratios of (a):(b) of about 1:0.05-0.75, preferably about 1:0.15-0.75. Especially preferred respective weight ratios of (a):(b) are disclosed with reference to one or more of the Examples. The total amount of this binary system present in the bar soap compositions comprises from about 0.3%wt. to about 1%wt., and preferably comprises from about 0.35%wt. to about 0.80%wt., based on the total weight of the bar soap composition of which it forms a part.

The (a) alkyl lactate is preferably a reaction product of a C<sub>8</sub>-C<sub>18</sub> fatty alcohol with lactic acid, which may be represented by the following general structural formula (Ia):



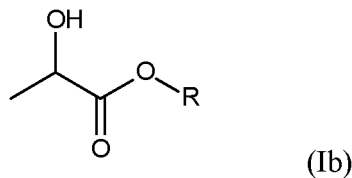
(Ia)

in which R is a C<sub>8</sub>-C<sub>18</sub> alkyl moiety, preferably is a C<sub>10</sub>-C<sub>14</sub> alkyl moiety and especially preferably is predominantly (at least 85%, more preferably at least 90%, particularly preferably at least 95% and most preferably at least about 98%) of a C<sub>12</sub> alkyl moiety.

The alkyl moiety may be branched but is preferably substantially linear. A particularly preferred alkyl lactate conforming to formula (Ia) is lauryl lactyl lactate.

The (a) alkyl lactate preferably may be also be represented by following structural formula (Ib):

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in which R is a C<sub>8</sub>-C<sub>18</sub> alkyl moiety, preferably is a C<sub>10</sub>-C<sub>14</sub> alkyl moiety and especially preferably is predominantly (at least 85%, more preferably at least 90%, particularly preferably at least 95% and most preferably at least about 98%) of a C<sub>12</sub> alkyl moiety. The alkyl moiety may be branched but is preferably substantially linear. A particularly preferred alkyl lactate conforming to formula (Ib) is lauryl lactate.

Other alkyl lactates not specifically encompassed by the compounds of formula (Ia) and/or (Ib) may also be utilized to provide the (a) alkyl lactate constituent of the invention. While one or more different alkyl lactates may be used in the (a) alkyl lactate constituent, in certain preferred embodiments the (a) alkyl lactate constituent comprises, or consists of only one or both of the alkyl lactates which are represented by formulae (Ia) and/or (Ib).

In the bar soaps of the invention, the (a) alkyl lactate constituent may comprise from 0.001%wt. to about 3%wt., but more preferably comprise at least about 0.05%wt. up to about (in order of increasing preference) 2.9%, 2.8%, 2.7%, 2.6%, 2.5%, 2.4%, 2.3%, 2.2%, 2.1%, 2%, 1.9%, 1.8%, 1.7%, 1.6%, 1.5%, 1.4%, 1.3%, 1.2%, 1.1%, 1%, 0.95%, 0.9%, 0.85%, 0.8%, 0.75%, 0.7%, 0.65%, 0.6%, 0.55%, 0.5%, all of the foregoing being %wt. of the (a) alkyl lactate constituent. Particularly preferred amounts of the (a) alkyl lactate constituent are disclosed with reference to one or more of the Examples.

The (b) fatty acid ester oil may be one or more of ester oils selected from: isopropylmyristate, isopropylpalmitate, isopropylstearate, isopropyl isostearate,

isopropylolate, n-butylstearate, n-hexyllaurate, n-decylolate, isooctyl-stearate, isononyl stearate, isononyl isononanoate, 2-ethylhexylpalmitate, 2-hexyllaurate, 2-hexyldecylstearate, 2-octyldodecylpalmitate, oleylolate, oleylerucate, erucylolate, erucyl-erucate, cetearyl octanoate, cetyl palmitate, cetyl stearate, cetyl oleate, cetyl behenate, cetyl acetate, myristyl myristate, myristyl behenate, myristyl oleate, myristyl stearate, myristyl palmitate, myristyl lactate, propylene glycol dicaprylate/caprinate, stearyl heptanoate, diisostearyl malate, octyl hydroxystearate, and the like. Of these, preferred are stearyl esters, of which stearyl heptanoate is particularly preferred. Whereas a mixture of fatty acid ester oils may be used, in certain particularly preferred embodiments it is preferred that the predominant fatty acid ester oil present is stearyl heptanoate. In certain preferred embodiments, stearyl heptanoate comprises at least 60%wt, and in order of increasing preference at least 70%, 75%, 80%, 85%, 90%, 95%, 98%, 99% and 100% by weight of the fatty acid ester oils present.

In the bar soaps of the invention, the (b) fatty acid ester oil constituent may comprise from 0.001%wt. to about 3%wt., but more preferably comprise at least about 0.05%wt. up to about (in order of increasing preference) 2.9%, 2.8%, 2.7%, 2.6%, 2.5%, 2.4%, 2.3%, 2.2%, 2.1%, 2%, 1.9%, 1.8%, 1.7%, 1.6%, 1.5%, 1.4%, 1.3%, 1.2%, 1.1%, 1%, 0.95%, 0.9%, 0.85%, 0.8%, 0.75%, 0.7%, 0.65%, 0.6%, 0.55%, 0.5%, 0.45%, 0.4%, and 0.35%, all of the forgoing being %wt. of the (b) fatty acid ester oil constituent. Particularly preferred amounts of the (b) fatty acid ester oil constituent are disclosed with reference to one or more of the Examples.

The (c) sucrose ether based nonionic surfactant constituent is one or more sucrose esters consisting largely of the sucrose mono- and di-esters of the natural fatty acids having 12 to 20 carbon atoms and preferably those having 16 to 20 carbon atoms. By way of non-limiting example, sucrose esters that may be used in the present invention include sucrose cocoate, sucrose dilaurate, sucrose distearate, sucrose laurate, sucrose myristate, sucrose oleate, sucrose palmitate, sucrose poly laurate, sucrose polylinoleate, sucrose polyoleate, sucrose polystearate, sucrose stearate, sucrose tetrastearate, sucrose tribehenate, sucrose tristearate or any combination thereof. Of these, preferred are sucrose cocoate and sucrose laurate, of which sucrose cocoate is particularly preferred. Whereas a mixture of sucrose ester based nonionic surfactants may be used, in certain

particularly preferred embodiments it is preferred that the predominant sucrose ester based nonionic surfactant present is sucrose cocoate. In certain preferred embodiments, sucrose cocoate comprises at least 60%wt, and in order of increasing preference at least 70%, 75%, 80%, 85%, 90%, 95%, 98%, 99% and 100% by weight of the sucrose ether based nonionic surfactant constituent.

In the bar soaps of the invention, the (c) sucrose ether based nonionic surfactant constituent may comprise from 0.001%wt. to about 3%wt., but more preferably comprise at least about 0.05%wt. up to about (in order of increasing preference) 2.9%, 2.8%, 2.7%, 2.6%, 2.5%, 2.4%, 2.3%, 2.2%, 2.1%, 2%, 1.9%, 1.8%, 1.7%, 1.6%, 1.5%, 1.4%, 1.3%, 1.2%, 1.1%, 1%, 0.95%, 0.9%, 0.85%, 0.8%, 0.75%, 0.7%, 0.65%, 0.6%, 0.55%, 0.5%, 0.45%, 0.4%, 0.35%, 0.3%, and 0.25%wt. all of the foregoing being %wt. of the (b) fatty acid ester oil constituent. Particularly preferred amounts of the (c) sucrose ether based nonionic surfactant constituent are disclosed with reference to one or more of the Examples.

The present inventor has surprisingly found that the inclusion of the foregoing binary system of constituents, (viz., the (a) alkyl lactate constituent with the (b) fatty acid ester oil constituent) and in particular the foregoing ternary system of constituents (viz., the (a) alkyl lactate constituent with the (b) fatty acid ester oil constituent further with the (c) sucrose ether based nonionic surfactant constituent) in solid bar soaps provides an unexpected improvement to the technical properties of the bar soap of which these systems form a part. This is particularly true of the ternary system of constituents as unexpectedly that present inventor found that the use of a sucrose based, e.g., sucrose ether based surfactant provided significantly improved foaming characteristics, including but not limited to the generation of a finely celled lather or foam when used to clean the epidermis, and especially hands, which at the same time retains a good 'skin feel' of the treated epidermis, e.g., hands. Alternately the use of the ternary system which includes a sucrose ether based surfactant does not reduce the efficacy of emollients which may also be present in the bar soaps. Further, it was observed that the inclusion of the sucrose ether based surfactant imparted a very favorable sensory effect of "skin cooling" when the soap lather was rinsed from the epidermis, which provided a sensory impression of increased cleanliness.

The bar soap compositions of the present invention may comprise one or more further constituents, which in some instances, may be considered as further essential constituents of the inventive bar soap compositions, while in other instances are considered to be optional constituents which may be included in order to impart one or more technical and/or aesthetic benefits to the bar soaps of which they form a part. Typically the cumulative amount of said comprise one or more further constituents comprise up to about 50%wt, preferably up to about 35%wt., more preferably up to about 25%wt. of the total weight of the bar soap compositions of which they form a part. Individual weight ranges of such further constituents are described in more detail hereinafter. Particularly preferred optional constituents and particularly preferred weight percentages of both essential and optional constituents are disclosed with reference to one or more of the Examples.

The bar soap compositions may additionally include one or more anionic, nonionic, amphoteric or zwitterionic surfactants, particularly where such are provided to increase the production of foam or lather when the bar soap is used in a manual cleaning operation, e.g., washing of the hands, body or hair. Such are frequently referred to as synthetic surfactants, or "syndets" as they are distinguished from the fatty acid based soaps (frequently supplied as "soap noodles") which is the major constituent of the present invention. By way of non-limiting example, such include anionic surfactants which may be used in this capacity in the bar soaps include one or more of: alcohol sulfates and sulfonates, alcohol phosphates and phosphonates, alkyl ester sulfates, alkyl diphenyl ether sulfonates, alkyl sulfates, alkyl ether sulfates, sulfate esters of an alkylphenoxy polyoxyethylene ethanol, alkyl monoglyceride sulfates, alkyl sulfonates, alkyl ether sulfates, alpha-olefin sulfonates, beta-alkoxy alkane sulfonates, alkyl ether sulfonates, ethoxylated alkyl sulfonates, alkylaryl sulfonates, alkylaryl sulfates, alkyl monoglyceride sulfonates, alkyl carboxylates, alkyl ether carboxylates, alkyl alkoxy carboxylates having 1 to 5 moles of ethylene oxide, alkylpolyglycoethersulfates (containing up to 10 moles of ethylene oxide), sulfosuccinates, octoxynol or nonoxynol phosphates, taurates, fatty taurides, fatty acid amide polyoxyethylene sulfates, acyl glycerol sulfonates, fatty oleyl glycerol sulfates, alkyl phenol ethylene oxide ether sulfates, paraffin sulfonates, alkyl phosphates, isethionates, N-acyl taurates, alkyl

succinamates and sulfosuccinates, alkylpolysaccharide sulfates, alkylpolyglucoside sulfates, alkyl polyethoxy carboxylates, and sarcosinates or mixtures thereof.

Further examples of anionic surfactants include water soluble salts or acids of the formula  $(\text{ROSO}_3)_x\text{M}$  or  $(\text{RSO}_3)_x\text{M}$  wherein R is preferably a  $\text{C}_6\text{-C}_{24}$  hydrocarbyl, preferably an alkyl or hydroxyalkyl having a  $\text{C}_{10}\text{-C}_{20}$  alkyl component, more preferably a  $\text{C}_{12}\text{-C}_{18}$  alkyl or hydroxyalkyl, and M is H or a mono-, di- or tri-valent cation, e. g., an alkali metal cation (e. g., sodium, potassium, lithium), or ammonium or substituted ammonium (e. g., methyl-, dimethyl-, and trimethyl ammonium cations and quaternary ammonium cations, such as tetramethyl-ammonium and dimethyl piperdinium cations and quaternary ammonium cations derived from alkylamines such as ethylamine, diethylamine, triethylamine, and mixtures thereof, and the like) and x is an integer, preferably 1 to 3, most preferably 1.

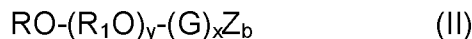
Further examples of anionic surfactants include alkyl-diphenyl-ethersulphonates and alkyl-carboxylates. Other anionic surfactants are  $\text{C}_6\text{-C}_{20}$  linear alkylbenzenesulfonates,  $\text{C}_6\text{-C}_{22}$  primary or secondary alkanesulfonates,  $\text{C}_6\text{-C}_{24}$  olefinsulfonates, sulfonated polycarboxylic acids prepared by sulfonation of the pyrolyzed product of alkaline earth metal citrates,  $\text{C}_6\text{-C}_{24}$  alkylpolyglycoethersulfates, alkyl ester sulfates such as  $\text{C}_{14-16}$  methyl ester sulfates; acyl glycerol sulfates, fatty oleyl glycerol sulfates, alkyl phenol ethylene oxide ether sulfates, paraffin sulfonates, alkyl phosphates, isethionates such as the acyl isethionates, N-acyl taurates, alkyl succinamates and sulfosuccinates, monoesters of sulfosuccinate (especially saturated and unsaturated  $\text{C}_{12}\text{-C}_{18}$  monoesters) diesters of sulfosuccinate (especially saturated and unsaturated  $\text{C}_6\text{-C}_{14}$  diesters), 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.

When present, such one or more anionic surfactants may be present in any effective amount, and advantageously comprise up to about 20%wt. of the bar soap compositions of which they form a part.

Non-limiting examples of nonionic surfactants which may be used in the bar soaps include one or more of: alkyl glucosides, alkyl polyglucosides, polyhydroxy fatty acid amides, alkoxyated fatty acid esters, amine oxides, and mixtures thereof. Further nonionic surfactants include almost any hydrophobic compound having a carboxy, hydroxy, amido, or amino group with a free hydrogen attached to the nitrogen which can be condensed with alkylene oxide (e.g, ethylene oxide, propylene oxide) or with the polyhydration product thereof, polyethylene glycol, to form a water soluble nonionic surfactant compound. Further, the length of the polyethenoxy hydrophobic and hydrophilic elements may various. Exemplary nonionic compounds include the polyoxyethylene ethers of alkyl aromatic hydroxy compounds, e.g., alkylated polyoxyethylene phenols, polyoxyethylene ethers of long chain aliphatic alcohols, the polyoxyethylene ethers of hydrophobic propylene oxide polymers, and the higher alkyl amine oxides.

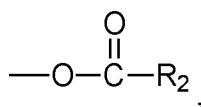
Examples of nonionic surfactants include primary and secondary linear and branched alcohol ethoxylates, such as those based on C<sub>6</sub>-C<sub>18</sub> alcohols which further include an average of from 2 to 80 moles of ethoxylation per mol of alcohol. Examples include the Genapol® series of linear alcohol ethoxylates from Clariant Corp., Charlotte, NC. Further nonionic surfactants include secondary C<sub>12</sub>-C<sub>15</sub> alcohol ethoxylates, including those which have from about 3 to about 10 moles of ethoxylation. Such are available in the Tergitol® series of nonionic surfactants (Dow Chemical, Midland, MI), particularly those in the Tergitol® “15-S-“ series. Still further examples of suitable nonionic surfactants for use as the (b) at least one nonionic surfactant include which may be advantageously included in the inventive compositions are alkoxy block copolymers, and in particular, compounds based on ethoxy/propoxy block copolymers. Polymeric alkylene oxide block copolymers include nonionic surfactants in which the major portion of the molecule is made up of block polymeric C<sub>2</sub>-C<sub>4</sub> alkylene oxides. Such nonionic surfactants, while preferably built up from an alkylene oxide chain starting group, and can have as a starting nucleus almost any active hydrogen containing group including, without limitation, amides, phenols, thiols and secondary alcohols. Such are available in the Pluronic® series of block copolymer surfactants (ex. BASF).

Examples of alkylpolyglycoside compounds include those which include alkyl monoglycosides and polyglycosides which may be prepared generally by reacting a monosaccharide, or a compound hydrolyzable to a monosaccharide with an alcohol such as a fatty alcohol in an acid medium. Exemplary alkyl glycoside surfactants alkyl glycoside surfactants suitable for use in the bar soaps of the present invention may be represented by formula (II) below:

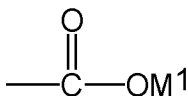


wherein:

- R is a monovalent organic radical containing from about 6 to about 30, preferably from about 8 to about 18 carbon atoms;
- R<sub>1</sub> is a divalent hydrocarbon radical containing from about 2 to about 4 carbon atoms;
- O is an oxygen atom;
- y is a number which has an average value from about 0 to about 1 and is preferably 0;
- G is a moiety derived from a reducing saccharide containing 5 or 6 carbon atoms; and
- x is a number having an average value from about 1 to 5 (preferably from 1.1 to 2);
- Z is O<sub>2</sub>M<sup>1</sup>,



- O(CH<sub>2</sub>), CO<sub>2</sub>M<sup>1</sup>, OSO<sub>3</sub>M<sup>1</sup>, or O(CH<sub>2</sub>)SO<sub>3</sub>M<sup>1</sup>; R<sub>2</sub> is (CH<sub>2</sub>)CO<sub>2</sub>M<sup>1</sup> or CH=CHCO<sub>2</sub>M<sup>1</sup>; (with the proviso that Z can be O<sub>2</sub>M<sup>1</sup> only if Z is in place of a primary hydroxyl group in which the primary hydroxyl-bearing carbon atom, —CH<sub>2</sub>OH, is oxidized to form a



group);

b is a number of from 0 to  $3x+1$  preferably an average of from 0.5 to 2 per glycosal group;

p is 1 to 10,

5  $M^1$  is  $H^+$  or an organic or inorganic cation, such as, for example, an alkali metal, ammonium, monoethanolamine, or calcium.

As defined in Formula II above, R is generally the residue of a fatty alcohol having from about 8 to 30 and preferably 8 to 18 carbon atoms. Examples of such alkylglycosides as described above include, for example, APG® 225 which is described as being an alkyl polyglycoside in which the alkyl group contains 8 to 10 carbon atoms and having an average degree of polymerization of 1.7, APG® 325 CS GLYCOSIDE  
10 which is described as being a 50%  $C_9$ - $C_{11}$  alkyl polyglycoside, also commonly referred to as D-glucopyranoside, Glucopon® 425, described to be an alkyl polyglycoside in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.48, Glucopon® 625 CS which is described as being a 50%  $C_{10}$ - $C_{16}$   
15 alkyl polyglycoside, also commonly referred to as a D-glucopyranoside, (available from Cognis Corp., Ambler PA), Plantaren® 2000, described as being an alkyl polyglycoside in which the alkyl group contains 8 to 16 carbon atoms and having an average degree of polymerization of 1.4, and Plantaren® 1300, described to be an alkyl polyglycoside in which the alkyl group contains 12 to 16 carbon atoms and having an average degree of  
20 polymerization of 1.6.

Further nonionic surfactants which may be used in the bar soaps of the invention include certain alkanolamides including monoethanolamides and diethanolamides, particularly fatty monoalkanolamides and fatty dialkanolamides. Commercially available monoethanol amides and diethanol amides include those marketed under the trade names  
25 Alakamide® and Cyclomide® by Rhône-Poulenc Co., (Cranbury, NJ).

Exemplary useful amphoteric and zwitterionic surfactants include one or more of: alkyl betaines, alkyl amidobetaines, aminopropionates, aminoglycinates, imidazolinium betaines and sulfobetaines. Alkyl betaines are known surfactants which are mainly produced by carboxyalkylation, preferably carboxymethylation of aminic compounds.  
30 Typical examples are the carboxymethylation products of hexyl methyl amine, hexyl dimethyl amine, octyl dimethyl amine, decyl dimethyl amine, dodecyl methyl amine,

dodecyl dimethyl amine, dodecyl ethyl methyl amine, C<sub>12/14</sub> cocoalkyl dimethyl amine, myristyl dimethyl amine, cetyl dimethyl amine, stearyl dimethyl amine, stearyl ethyl methyl amine, oleyl dimethyl amine, C<sub>16/18</sub> tallow alkyl dimethyl amine and technical mixtures thereof. Alkyl amidobetaines which represent carboxyalkylation products of  
5 amidoamines are also suitable. Typical examples are reaction products of fatty acids containing 6 to 22 carbon atoms, namely caproic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, palmitoleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselic acid, linoleic acid, linolenic acid, elaeostearic acid, arachic acid, gadoleic acid, behenic acid and erucic acid and technical mixtures thereof, with N,N-  
10 dimethylaminoethyl amine, N,N-dimethylaminopropyl amine, N,N-diethylaminoethyl amine and N,N-diethylaminopropyl amine which are condensed with sodium chloroacetate.

When present, one or more of such anionic, nonionic, amphoteric or zwitterionic surfactants may be included in any effective amount. When present, such one or more  
15 said surfactants comprise about 0.1 – 25%wt. of the bar soap of which they form a part.

The bar soaps of the invention may include one or more antimicrobial constituents which provide an antimicrobial benefit against one or more undesired microorganisms, such as gram positive and/or gram negative bacteria which may be present on the bar soap, and especially which may be present on the dermal surface or hair of a mammal,  
20 e.g., the user of the bar soap such as may be present upon the hands, face or other topical surface of a human user of the bar soap. In such a use, the bar soap is used to form an dermal or topical treatment composition which in addition to providing a cleaning treatment benefit to the hands, face or other topical surface also provides an appreciable antimicrobial benefit thereto.

25 While certain quaternary ammonium compounds which are also known for use as cationic surfactants are known to provide a good antimicrobial benefit, as the major constituent of the bar soaps are anionic in nature, the combination of such materials would be expected to form an insoluble complex thus defeating the benefits of both and for this reason germicidally effective cationic surfactant species, e.g., the alkyl  
30 ammonium halides such as decyl trimethyl ammonium chloride, decyl dimethyl benzyl ammonium chloride, lauryl trimethyl ammonium chloride, lauryl dimethyl benzyl

ammonium chloride, myristyl trimethyl ammonium chloride, myristyl dimethyl benzyl ammonium chloride, myristyl trimethyl ammonium bromide, cetyl trimethyl ammonium chloride, cetyl trimethyl ammonium bromide, dioctyl dimethyl ammonium chloride, didecyl dimethyl ammonium chloride and dilauryl dimethyl ammonium chloride, alkyl  
5 aryl ammonium halides such as octadecyl dimethyl benzyl ammonium bromide, N-alkyl pyridinium halides such as N-cetyl pyridinium bromide, and the like. are desirably avoided and omitted from the bar soaps.

Although certain quaternary ammonium compounds are desirably avoided and omitted from the bar soaps of the invention, other non-cationic compounds which provide  
10 an antimicrobial or germicidal benefit may be included as a constituent. In certain preferred embodiments such a constituent is a necessary constituent. Such non-cationic compounds or materials avoid interaction with the anionic soap constituent of the invention (and, any other anionic surfactant, if also included in the bar soap compositions); non-limiting examples of which include: pyrrithiones (especially zinc  
15 pyrrithione which is also known as ZPT), dimethyldimethylol hydantoin (Glydant), methylchloroisothiazolinone/methylisothiazolinone (Kathon CG), sodium sulfite, sodium bisulfite, imidazolidinyl urea (Germall 115), diazolidinyl urea (Germaill II), benzyl alcohol, 2-bromo-2-nitropropane-1,3-diol (Bronopol), formalin (formaldehyde), iodopropenyl butylcarbamate (Polyphase P100), chloroacetamide, methanamine,  
20 methyldibromonitrile glutaronitrile (1,2-Dibromo-2,4-dicyanobutane or Tektamer), glutaraldehyde, 5-bromo-5-nitro-1,3-dioxane (Bronidox), phenethyl alcohol, o-phenylphenol/sodium o-phenylphenol, sodium hydroxymethylglycinate (Suttocide A), polymethoxy bicyclic oxazolidine (Nuosept C), dimethoxane, thimersal dichlorobenzyl alcohol, captan, chlorphenenesin, dichlorophene, chlorbutanol, glyceryl laurate,  
25 halogenated diphenyl ethers like 2,4,4-trichloro-2-hydroxy-diphenyl ether (Triclosan or TCS), 2,2-dihydroxy-5,5-dibromo-diphenyl ether, phenolic compounds like phenol, 2-methyl phenol, 3-methyl phenol, 4-methyl phenol, 4-ethyl phenol, 2,4-dimethyl phenol, 2,5-dimethyl phenol, 3,4-dimethyl phenol, 2,6-dimethyl phenol, 4-n-propyl phenol, 4-n-butyl phenol, 4-n-amyl phenol, 4-tert-amyl phenol, 4-n-hexyl phenol, 4-n-heptyl phenol,  
30 mono- and poly-alkyl and aromatic halophenols such as p-chlorophenol, methyl p-chlorophenol, ethyl p-chlorophenol, n-propyl p-chlorophenol, n-butyl p-chlorophenol, n-

amyl p-chlorophenol, sec-amyl p-chlorophenol, n-hexyl p-chlorophenol, cyclohexyl p-chlorophenol, n-heptyl p-chlorophenol, n-octyl p-chlorophenol, o-chlorophenol, methyl o-chlorophenol, ethyl o-chlorophenol, n-propyl o-chlorophenol, n-butyl o-chlorophenol, n-amyl o-chlorophenol, tert-amyl o-chlorophenol, n-hexyl o-chlorophenol, n-heptyl o-chlorophenol, o-benzyl p-chlorophenol, o-benzyl-m-methyl p-chlorophenol, o-benzyl-m, m-dimethyl p-chlorophenol, o-phenylethyl p-chlorophenol, o-phenylethyl-m-methyl p-chlorophenol, 3-methyl p-chlorophenol, 3,5-dimethyl p-chlorophenol, 6-ethyl-3-methyl p-chlorophenol, 6-n-propyl-3-methyl p-chlorophenol, 6-iso-propyl-3-methyl p-chlorophenol, 2-ethyl-3,5-dimethyl p-chlorophenol, 6-sec-butyl-3-methyl p-chlorophenol, 10 2-iso-propyl-3,5-dimethyl p-chlorophenol, 6-diethylmethyl-3-methyl p-chlorophenol, 6-iso-propyl-2-ethyl-3-methyl p-chlorophenol, 2-sec-amyl-3,5-dimethyl p-chlorophenol 2-diethylmethyl-3,5-dimethyl p-chlorophenol, 6-sec-octyl-3-methyl p-chlorophenol, p-chloro-m-cresol, p-bromophenol, methyl p-bromophenol, ethyl p-bromophenol, n-propyl p-bromophenol, n-butyl p-bromophenol, n-amyl p-bromophenol, sec-amyl p-15 bromophenol, n-hexyl p-bromophenol, cyclohexyl p-bromophenol, o-bromophenol, tert-amyl o-bromophenol, n-hexyl o-bromophenol, n-propyl-m,m-dimethyl o-bromophenol, 2-phenyl phenol, 4-chloro-2-methyl phenol, 4-chloro-3-methyl phenol, 4-chloro-3,5-dimethyl phenol, 2,4-dichloro-3,5-dimethylphenol, 3,4,5,6-terabromo-2-methylphenol, 5-methyl-2-pentylphenol, 4-isopropyl-3-methylphenol, para-chloro-meta-xylenol, dichloro meta xylenol, chlorothymol, 5-chloro-2-hydroxydiphenylmethane, resorcinol and its 20 derivatives including methyl resorcinol, ethyl resorcinol, n-propyl resorcinol, n-butyl resorcinol, n-amyl resorcinol, n-hexyl resorcinol, n-heptyl resorcinol, n-octyl resorcinol, n-nonyl resorcinol, phenyl resorcinol, benzyl resorcinol, phenylethyl resorcinol, phenylpropyl resorcinol, p-chlorobenzyl resorcinol, 5-chloro 2,4-dihydroxydiphenyl 25 methane, 4-chloro 2,4-dihydroxydiphenyl methane, 5-bromo 2,4-dihydroxydiphenyl methane, and 4-bromo 2,4-dihydroxydiphenyl methane, bisphenolic compounds like 2,2-methylene bis (4-chlorophenol), 2,2-methylene bis (3,4,6-trichlorophenol), 2,2-methylene bis (4-chloro-6-bromophenol), bis (2-hydroxy-3,5-dichlorophenyl) sulphide, and bis (2-hydroxy-5-chlorobenzyl)sulphide, benzoic esters (parabens) like methylparaben, 30 propylparaben, butylparaben, ethylparaben, isopropylparaben, isobutylparaben, benzylparaben, sodium methylparaben, and sodium propylparaben, halogenated

carbanilides (e.g., 3,4,4-trichlorocarbanilides (Triclocarban or TCC), 3-trifluoromethyl-4,4-dichlorocarbanilide, 3,3,4-trichlorocarbanilide, etc.). Particularly preferred are those based on halogenated carbanilides.

When present, one or more of such non-cationic antimicrobial agent(s) may be present in the bar soaps in any effective amount. Advantageously, such is from 0.05%wt. to about 15%wt., preferably from about 0.01%wt. to about 8%wt., and more preferably from about 0.05%wt. to about 5%wt. based on the total weight of the bar soap, and especially preferably comprise about 0.05 – 0.4%wt. of the bar soap.

In certain particularly preferred embodiments at least one non-cationic compound which provide an antimicrobial or germicidal benefit is necessarily present; and particularly preferred are halogenated carbanilides, e.g., TCC.

The soap bars may include one or more polyols. Such include compounds having two or more hydroxyl groups and which are highly water soluble, preferably freely soluble, in water. Non-limiting examples of suitable polyols include: relatively low molecular weight short chain polyhydroxy compounds such as glycerol and propylene glycol; sugars such as sorbitol, manitol, sucrose and glucose; modified carbohydrates such as hydrolyzed starch, dextrin and maltodextrin, and polymeric synthetic polyols such as polyalkylene glycols, for example polyoxyethylene glycol (PEG) and polyoxypropylene glycol (PPG).

Of these said polyols, preferred are relatively low molecular weight compounds which are either liquid or readily soluble in aqueous solutions, e.g., low molecular weight polyols and sugars. Particularly preferred polyols are glycerine, glycerol, sorbitol and their mixtures. Glycerine and glycerol are particularly preferred, as such may also provide benefits as humectants in the bar soaps.

When present, such one or more polyols may be included in minor but effective amounts, e.g., from about 0.001%wt. to about 0.25%wt., more preferably from about 0.1 - 2.5%wt. and especially preferably from about 0.5 – 1.25%wt. based on the total weight of the bar soap of which it forms a part. Particularly preferred polyols and amounts useful in the bar soaps of the invention are disclosed with reference to one or more of the Examples.

One or more insoluble filler materials, may also be present in the bar soaps. Advantageously such are provided as powders or comminuted particulates of aqueous insoluble materials, such that due to their small size they are readily incorporated into the compositions from which the bar soaps are produced. These filler materials may be  
5 inorganic or organic or a combination as long as it is insoluble in water. The insoluble particles should not be perceived by a user of the bar soap as unduly abrasive or granular and advantageously such filler materials have an average particle of size less than 300 microns, more preferably less than 100 microns and most preferably less than 50 microns. Preferably the insoluble particles have a maximum particle size of 300 microns  
10 or less, preferably 200 microns or less.

Non-limiting examples of inorganic particulate materials includes talc and calcium carbonate. Talc is a magnesium silicate mineral material, with a sheet silicate structure and a composition of  $Mg_3Si_4(OH)_{22}$ , and may be available in a hydrated form. Talc is considered hydrophobic as it is wetted by oil rather than water. Calcium  
15 carbonate or as it is interchangeable referred to as “chalk” exists in three crystal forms: calcite, aragonite and vaterite. The natural morphology of calcite is rhombohedral or cuboidal, acicular or dendritic for aragonite and spheroidal for vaterite. Commercially, calcium carbonate or chalk is also known as precipitated calcium carbonate and is produced by a carbonation method in which carbon dioxide gas is bubbled through an  
20 aqueous suspension of calcium hydroxide. In this process the crystal type of calcium carbonate is calcite or a mixture of calcite and aragonite.

Further non-limiting examples of suitable optional insoluble inorganic particulate materials include alumino silicates, aluminates, silicates, phosphates, insoluble sulfates such as sodium sulfate, borates and clays (e.g., kaolin, china clay) as well as mixtures  
25 thereof.

Non-limiting examples of organic particulate materials include: insoluble polysaccharides such as highly cross linked or insolubilized starch (e.g., by reaction with a hydrophobe such as octyl succinate) and cellulose; synthetic polymers such as various polymer lattices and suspension polymers; insoluble soaps and mixtures thereof.

30 When present one or more of the foregoing insoluble filler materials may comprise up to about 20%wt. of the bar soap of which it forms a part, but

advantageously, when present in included in an amount of from about 0.01%wt. to about 10%wt. Particularly preferred insoluble filler materials and amounts useful in the bar soaps of the invention are disclosed with reference to one or more of the Examples.

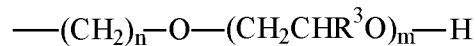
Optionally but preferably a slip modifier is also present in the bar soaps.

5 Typically such are one or more materials that when present at relatively low levels, e.g, generally less than 1.5% based on the total weight of the bar composition, may significantly reduce the perceived friction between the wet bar and the skin of a user of the bar soap. Non-limiting examples of useful slip modifiers include petrolatum, waxes, lanolines, polyalkane, polyalkene, polyalkylene oxides, high molecular weight  
 10 polyethylene oxide resins, silicones, polyethylene glycols and mixtures thereof. Further examples of such slip modifier are high molecular weight polyethylene oxide resins, e.g., one or more materials sold as Polyox® polyethylene oxide resins, which such materials preferably have a molecular weight of at least about 80,000 Daltons, but preferably have a molecular weight of at least about 1,000,000 Daltons. One such material is Polyox®  
 15 WSR N-301 (ex. Dow Chem. Co.) which is described to be a high molecular weight polyethylene oxide resin having a molecular weight of 4,000,000 Daltons. In certain embodiments a slip modifier is necessarily present. Particularly preferred slip modifiers and amounts useful in the bar soaps of the invention are disclosed with reference to one or more of the Examples

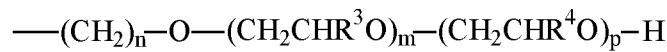
20 The bar soap compositions may include one or more organosiloxane containing constituents, especially polysiloxane containing compounds which may provide a skin treatment benefit to an epidermal surface treated with the bar soap of the invention. Such materials are known per se, and are often interchangeably referred to as silicone emulsifiers. Such silicone emulsifiers include polydiorganosiloxanepolyoxyalkylene  
 25 copolymers containing at least one polydiorganosiloxane segment and at least one polyoxyalkylene segment. The polyoxyalkylene segments may be bonded to the polydiorganosiloxane segments with silicon-oxygen-carbon bonds and/or with silicon-carbon bonds. The polydiorganosiloxane segments of consist essentially of siloxane units which are interlinked by Si-O-Si linkages and which have the formula:

30 
$$R_bSiO_{(4\{b\})/2}$$





and



in which n represents an integer from about 3 to about 10, R<sup>3</sup> and R<sup>4</sup> are selected  
 5 from hydrogen and C<sub>1</sub>-C<sub>6</sub> straight chain, or branched chain alkyl groups with the proviso  
 that R<sup>3</sup> and R<sup>4</sup> are not simultaneously the same, each of m, p, x and y are independently  
 selected from integers of zero or greater, such that the molecule has a molecular weight  
 of between about 200 to about 20,000,000 and wherein both m and p are not both  
 simultaneously zero, and z is selected from integers of 1 or greater.

10 When present, one or more of the foregoing organosiloxane containing  
 constituents may comprise up to about 5%wt. of the bar soap of which it forms a part, but  
 advantageously, when present in included in an amount of from about 0.01%wt. to about  
 1.5%wt. In certain embodiments a organosiloxane containing constituent is necessarily  
 present. Particularly preferred organosiloxane containing constituents and amounts  
 15 useful in the bar soaps of the invention are disclosed with reference to one or more of the  
 Examples

The bar soaps may include one or more optical modifying constituents, such as  
 reflecting materials and pearlizing agents which provide a frequently desirable  
 appearance to the bar soap. Such optical modifying constituents may be inorganic  
 20 materials, such as one or more of: titanium dioxide, coated micas and other interference  
 pigments; plate like mirror particles such as organic glitters. Further useful optical  
 modifiers may be based on organic materials or compounds, such as one or more of  
 latexes presently commercially available under the trademark ACUSOL (ex. Rohm &  
 Haas Inc.). which are characterized by pH of about 2 to about 3, having approximately  
 25 40% solids in water, with particle size of about 0.1 to about 0.5 micron;  
 styrene/polyvinylpyrrolidone co-polymers and styrene/acrylic emulsions, such as  
 styrene/polyvinylpyrrolidone co-polymers available as POLECTRON 430 (ex. ISP  
 Technologies, Inc.), as well as styrene/acrylamide emulsion such as OPULYN (ex. Rohm  
 & Haas Inc.).

The bar soaps may include as optical modifying constituents one or more optical brighteners. By way of nonlimiting examples, such include 4,4'-diamino-2,2'-stilbenedisulfonic acids (flavonic acids), 4,4'-distyrylbiphenyls, methylumbelliferones, coumarins, dihydroquinolinones, 1,3-diarylpyrazolines, naphthalimides, benzoxazole, benzisoxazole and benzimidazole systems, and the pyrene derivatives substituted by heterocycles. Specific examples of such optical brighteners include those sold under the trade name TINOPAL (ex. Ciba) such and as TINOPAL CBS which is described to be disodium 2,2'-bis-(phenyl-styryl)disulphonate as well as TINOPAL DMS which is described to be disodium 4,4'-bis-(2-morpholino-4-anilino-s-triazin-6-ylamino)stilbene disulphonate. Such optical brighteners may be included in useful amounts; exemplary useful amounts generally fall within the range on from 0.001%wt. to 0.1%wt.

When present, such optical modifying constituents are advantageously included in generally minor amounts such as from 0.001 - 1 %wt. but desirably are present in amounts from 0.01 – 0.75%wt. In certain preferred embodiments an optical modifying constituents is necessarily present in the bar soaps..

The bar soaps may include one or more fragrance materials which may be a one or more compounds which impart an olfactive effect from the bar soap. Exemplary fragrance materials may be based on natural and synthetic fragrances and most commonly are mixtures or blends of a plurality of such fragrances, optionally in conjunction with a carrier such as an organic solvent or a mixture of organic solvents in which the fragrances are dissolved, suspended or dispersed. Such may be natural fragrances, e.g. natural extracts of plants, fruits, roots, stems, leaves, wood extracts, e.g. terpeneols, resins, balsams, animal raw materials, e.g., civet and beaver, as well as typical synthetic perfume compounds which are frequently products of the ester, ether, aldehyde, ketone, alcohol and hydrocarbon type, e.g., benzyl acetate, linalyl acetate, citral, citronellal, methyl cedryl ketone, eugenol, isoeugenol, geraniol, linalool, and Typically it is preferred to use mixtures of different perfume compounds which, together, produce an agreeable fragrance. Other suitable perfume oils are essential oils of relatively low volatility which are mostly used as aroma components. Examples are sage oil, camomile oil, clove oil, melissa oil, mint oil, cinnamon leaf oil, lime-blossom oil, juniper berry oil, vetiver oil, olibanum oil, galbanum oil, labolanum oil and lavandin oil. When

present in a treatment composition, in accordance with certain of the preferred  
embodiments, the fragrance constituent may be present in any effective amount such that  
it can be discerned by a consumer of the composition, however is advantageously present  
in amounts of up to about 2%wt., preferably are present in amounts of from about  
5 0.00001%wt. to about 1.25%wt. of the bar soap.

The bar soaps may include one or more coloring agents, such as one or more dyes  
and/or pigments, which may be present in effective amounts. Advantageously such one  
or more coloring agents are present in amounts of about 0.0001 – 1%wt. of the bar soap  
which include said one or more coloring agents.

10 The bar soaps may include one or more vitamins. The treatment compositions of  
the invention may optionally further comprise one or more vitamins, antioxidants and/or  
coenzymes. Nonlimiting examples of vitamins include one or more of Vitamin A and  
derivatives thereof such as Vitamin A palmitate, acetate, or other esters thereof, as well  
as Vitamin A in the form of beta carotene, Vitamin C such as ascorbic acid and  
15 derivatives thereof including metal salts such as magnesium ascorbyl phosphate, the B  
vitamins such as thiamine, riboflavin, niacinamide, pyridoxin, and the like, Vitamin E  
and derivatives thereof such as Vitamin E acetate, nicotinate, or other esters thereof, as  
well as Vitamin D and Vitamin K. Nonlimiting examples of coenzymes include one or  
more of thiamine pyrophosphate, flavin adenin dinucleotide, folic acid, pyridoxal  
20 phosphate, tetrahydrofolic acid, and the like. Nonlimiting examples of antioxidants  
include one or more of potassium sulfite, sodium bisulfite, sodium erythrobate, sodium  
metabisulfite, sodium sulfite, propyl gallate, cysteine hydrochloride, butylated  
hydroxytoluene, butylated hydroxyanisole, and the like.

When present, such one or more vitamins, antioxidants and/or coenzymes may be  
25 individually present in effective amounts, and when present, advantageously comprise at  
least about 0.001%wt. of the treatment composition of which it forms a part. Preferably,  
when present, each of the one or more of said vitamins, antioxidants and/or coenzymes  
comprise from about 0.002%wt. – 0.10%wt. of the bar soap.

The bar soaps may also optionally include a preservative constituents which is  
30 used to control the undesired where the microorganisms within the treatment composition  
is particularly in long-term storage and at elevated temperatures. Such are usually

distinguished from the optional non-cationic compounds which provide an antimicrobial or germicidal discussed above, as preservative constituents typically are included in minor amounts which are effective in providing a useful benefit to regard spoilage or unwanted microbial growth in the bar soap itself, but are ineffective in providing a useful antimicrobial benefit when dissolved with water to form a washing solution and/or formed into a lather which washing solution and/or lather themselves provided a useful cleaning and/or antimicrobial benefit, particularly to treated dermal surfaces. Thus, such ancillary preservative constituents may be included in minor but effective amounts. Nonlimiting examples include one or more of parabens, including methyl parabens and ethyl parabens, glutaraldehyde, formaldehyde, 2-bromo-2-nitropropane-1,3-diol, 5-chloro-2-methyl-4-isothiazolin-3-one, 2-methyl-4-isothiazoline-3-one, and mixtures thereof. One exemplary composition is a combination 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one where the amount of either component may be present in the mixture anywhere from 0.001 to 99.99 weight percent, based on the total amount of the preservative. Further exemplary useful preservatives include those which are commercially including a mixture of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4-isothiazolin-3-one marketed under the trademark KATHON® CG/ICP as a preservative composition presently commercially available from Rohm and Haas (Philadelphia, PA). Typically, when present, the preservative constituent is advantageously present in an amount from about 0.00001 - 0.5%wt. of the bar soap.

The bar soaps may include one or more antioxidants such as, for example, butylated hydroxytoluene (BHT). One or more antioxidants when present, are advantageously present in any effective amount, e.g., 0.00001% - 0.5%wt. of the bar soap.

The bar soaps may include one or more chelating agents. Exemplary useful chelating agents include those known to the art, including by way of non-limiting example; aminopolycarboxylic acids and salts thereof wherein the amino nitrogen has attached thereto two or more substituent groups. Preferred chelating agents include acids and salts, especially the sodium and potassium salts of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, N-hydroxyethylethylenediaminetriacetic acid, and of which the sodium salts of ethylenediaminetetraacetic acid may be particularly

advantageously used. Such chelating may be included in generally minor amounts such as from about 0.001 - 0.5 %wt. based on the weight of the chelating agents and/or salt forms thereof.

The bar soaps may include one or more pH adjusting agents, (which may also be one or more pH buffers) which may be used to establish and/or maintain a desired pH of the compositions from which the bar soaps are formed, as well as to the bar soap itself. Essentially any material which may increase or decrease the pH of the bar soap composition is suitable as a pH adjusting agent. Suitable pH adjusting agents are one or more acids and/or bases whether such be based on organic and/or inorganic compounds or materials. By way of non-limiting example, pH adjusting agents include phosphorus containing compounds, monovalent and polyvalent salts such as of silicates, carbonates, and borates, certain acids and bases, tartrates and certain acetates. Further exemplary pH adjusting agents include mineral acids, basic compositions, and organic acids, which are typically required in only minor amounts. Further exemplary and useful pH adjusting agents include monoalkanolamines, dialkanolamines, trialkanolamines, and alkylalkanolamines such as alkyl-dialkanolamines, and dialkyl-monoalkanolamines. Such may also function as deterative surfactants. The alkanol and alkyl groups are generally short to medium chain length, that is, from 1 to 7 carbons in length.

By way of further non-limiting example, pH buffering agents include the alkali metal phosphates, polyphosphates, pyrophosphates, triphosphates, tetraphosphates, silicates, metasilicates, polysilicates, carbonates, hydroxides, and mixtures of the same. Certain salts, such as the alkaline earth phosphates, carbonates, hydroxides, can also function as buffers. It may also be suitable to use as buffers such materials as aluminosilicates (zeolites), borates, aluminates and certain organic materials such as gluconates, succinates, maleates, citrates, and their alkali metal salts. When present, the one or more pH adjusting agents are included in amounts which are effective in establishing and/or maintaining the pH of a treatment composition at or desired pH value or within a range of pH values. Advantageously the one or more pH adjusting agents, comprise from about 0.001 – 2.5%wt., preferably from about 0.01 – 1.5%wt. of the treatment composition of which the one or more pH adjusting agents form a part.

Optionally the bar soaps may include one or more skin benefit agents which may be used to promote an improved skin feel, or to improve skin health or appearance, or to promote hair health or appearance. Such include but are not limited to lipids such as cholesterol, ceramides, and pseudoceramides; sunscreens such as cinnamates; other types of exfoliant particles such as polyethylene beads, walnut shells, apricot seeds, flower petals and seeds, and inorganics such as silica, and pumice; additional emollients (skin softening agents) such as long chain alcohols and waxes e.g., lanolin; additional moisturizers; skin-toning agents; skin nutrients such as vitamins like Vitamin C, D and E and essential oils like bergamot, citrus unshiu, calamus, and the like; water soluble or insoluble extracts of avocado, grape, grape seed, myrrh, cucumber, watercress, calendula, elder flower, geranium, linden blossom, amaranth, seaweed, ginkgo, ginseng, carrot; impatiens balsamina, camu camu, alpine leaf and other plant extracts such as witch-hazel, and mixtures thereof.

It is to be understood here that while one or more of these forgoing optional constituents may be present as a constituent or component of “soap noodles”, however an additional amount of these constituents identified here may be added in addition to any amount already present as part of the essential constituents described with reference to the first and second aspects of the invention.

A minor amount of water may be present in the bar soap and the compositions from which the bar soaps are formed, although such is typically in an amount of not more than 7.5%wt., and preferably no more than about 3.5%wt. of “added water” is provided to the remaining constituents of a bar soap composition. It is to be realized that in certain of the other constituents, a minor amount of water may be present and may thus be supplied to a bar soap composition from which a bar soap is made; such sources of water are however not considered to be “added water” as defined herein.

The compositions described above may be formed into bar soaps according to conventional production methods known to the art.

Advantageously the bar soaps are made by a process which involved both the intensive mixing or working of the soap mass while it is in a semi-solid plastic state and its forming into a cohesive mass by the process of extrusion. The intensive mixing can be accomplished by one or more unit operations known in the art which can include roller

milling, refining, and single or multistage extrusion. Such processes work the bar soap composition, preferably at a temperature of between about 20°C. and about 70°C. to form a homogeneous network of insoluble materials in a viscous liquid and/or liquid crystalline phase containing the lower melting, more soluble surfactants (e.g., soaps and other water soluble/dispersible materials). The extruded mass must be thermoplastic within the process temperature of extrusion which is generally between about 20° C. and about 60°C., Thus, the bar soap composition must soften within this process temperature window but remain highly viscous, i.e., not softer excessively to form a sticky mass. The material must regain its structure and harden quickly as the temperature is lowered below its softening point. The softened mass although pliable must be sufficiently viscous so that it does not stick to the surfaces of the extruder in order to be capable of conveyance by the extruder screws but not bend excessively when exiting the extruder as a billet. However, if the mass is too viscous it will not be capable of extrusion at reasonable rates. The extruded mass of the bar soap compositions may be formed by cutting the extrudate into a final form of a bar soap having defined geometry.. The extruded mass may be further optionally formed into a formed bar soap, such as by stamping or compressing a cut mass of the bar soap composition into a formed three-dimensional shape having a defined geometry.

By such a process, bar soaps of the invention may be made. Such extruded bar soaps have physical-chemical properties and an internal structure which are quite different from soaps that are made by a melt-cast process wherein a bar composition is first melted and liquefied in order to form a liquid phase which is then poured into molds to solidify by quiescent cooling, after which the cooled “cast” bars may be removed and used.

Subsequently the bar soaps may be packaged for sale as vendible products.

The bar soaps are used in a conventional manner for personal washing of an mammalian body, e.g, human body and are advantageously used in personal washing, particularly of the epidermis, and hair. When used in a conventional washing process, typically the bar soap is wetted with water, and then contacted with one or more parts of the body, e.g., the epidermis, and hair. A quantity of the bar soap composition is thus eluted into the water and forms a washing composition which provides a useful cleaning

and/or microbicidal benefit to the contacted parts of the body. The washing composition when entraining air, may form a lather which is also useful in providing a useful cleaning and/or microbicidal benefit to the contacted parts of the body. Thereafter the washing composition is typically washed or rinsed off the treated parts of the body, e.g.,  
5 epidermis, hair, with an additional amount of water.

Examples:

A number of bar soaps were formed from bar soap compositions conforming to the defined invention, as well as a number of further bar soaps were formed from  
10 comparative compositions. These bar soap compositions are described on Tables 1C and 1. In these identified compositions, the raw materials / constituents were used “as supplied” from their respective suppliers and may constitute less than 100%wt. “actives”, or may have been supplied as constituting 100%wt. “active” of the named compound, as indicated below on Table 2. Bar soap compositions which are considered to fall within  
15 the scope of the present invention are identified by a digit prepended with the letter “E” which indicates this to be an “example” composition, while bar soap compositions which were provided only for the purposes of comparison are identified by a digit prepended with the letter “C”, which indicates this to be a comparative composition and falling outside of the scope of the present invention. In certain of these compositions, one or  
20 more constituents, e.g. a pH adjusting agent, or deionized water was added in “quantum sufficient” “q.s.” in order to provide to 100%wt. of each composition. The example compositions disclosed hereinafter include certain presently preferred embodiments of the invention. The comparative compositions are presented on Table 1C, while bar soap compositions of the invention are identified on Table 1.

25 The compositions of Tables 1C and Table 1 were formed into generally rectangularly shaped bar soaps having an average mass of 75 grams and having dimensions of approximately 5 cm wide, 2 thick (high) and 7.7 cm in length. The bar soaps were formed by a conventional extrusion process operating in a range of 20°C - 60°C, and subsequent to extrusion blocks of the extrudate were stamped in a die in order  
30 to form the final finished shape of the bar soaps.

The relative weight ratios of the binary systems comprising at least one of each of the following: (a) an alkyl lactate and (b) a fatty acid ester oil according to certain preferred aspects of the invention, and the relative ratios of ternary systems comprising at least one of each of the following: (a) an alkyl lactate; (b) a fatty acid ester oil and, (c) a  
5 sucrose ether based nonionic surfactant according to further preferred aspects of the invention are also provided in the following Table 1, as appropriate to a respective bar soap composition.

10

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
soap noodle	89.21	89.21	86.99	89.21	86.39	85.0	89.21	80.15	86.72	86.29
alkyl lactate (a)	--	0.60	0.30	--	--	--	--	--	0.37	--
fatty acid ester oil (b)	--	--	--	1.0	0.4	--	--	--	--	0.3
sucrose cocoate (c)	--	--	--	--	--	0.50	0.8	0.56	0.25	0.5
talc	7.58	7.38	7.6	7.38	7.6	9.68	7.38	14.52	7.6	7.6
titanium dioxide	0.3	0.3	0.1	0.3	0.1	0.1	0.3	--	0.1	0.1
sodium C14-C16 olefin sulfonate	0.206	0.206	1.70	0.206	2.0	1.50	0.206	1.50	1.0	1.5
Triclocarban	0.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
glycerin	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	1.0
silicone emulsion	0.10	0.10	0.10	0.10	0.3	0.50	0.10	0.50	0.75	0.50
color pigment(s)	--	--	0.003	--	0.003	0.011	--	0.011	0.008	0.003
fragrance	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
di water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.

Table 1C			
	C11	C12	C13
soap noodle	90.3	85.85	80.74
alkyl lactate (a)	--	--	--
fatty acid ester oil (b)	--	--	--
sucrose cocoate (c)	--	--	--
talc	6.18	11.0	15.0
titanium dioxide	0.3	0.12	0.10
sodium C14-C16 olefin sulfonate	0.5	0.206	0.75
Triclocarban	0.2	0.20	0.20
glycerin	1.0	1.0	1.1
silicone emulsion	0.5	0.10	0.1
optical brightener	0.02	--	--
color pigment(s)	--	0.015	0.009
fragrance	1.0	1.0	1.0
di water	q.s.	q.s.	q.s.

Table 1

	E1	E2	E3	E4	E5	E6	E7	E8	E9
soap noodle	85.14	85.13	87.29	88.03	87.09	85.13	85.12	85.07	85.08
alkyl lactate (a)	0.3	0.35	0.4	0.27	0.50	0.30	0.35	0.40	0.43
fatty acid ester oil (b)	0.1	0.06	0.3	0.10	0.25	0.10	0.06	0.10	0.06
sucrose cocoate (c)	--	--	--	--	--	--	--	--	--
talc	11	11	7.6	7.6	7.6	11.0	11.0	11.0	11.0
titanium dioxide	0.1	0.1	0.1	0.1	0.1	0.10	0.10	0.10	0.10
sodium C14-C16 olefin sulfonate	0.206	0.206	1.0	0.20	0.75	0.206	0.206	0.206	0.206
Trilocarban	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
glycerin	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
silicone emulsion	0.1	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1
color pigment(s)	0.052	0.052	0.003	0.091	0.003	0.064	0.064	0.024	0.018
fragrance	1.3	1.3	1.0	1.3	1.0	1.3	1.3	1.3	1.3
di water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.
ratio: (a):(b)	1:0.33	1:001	1:0.75	1:0.37	1:0.5	1:0.33	1:0.17	1:0.25	1:0.13

Table 1									
	E10	E11	E12	E13	E14	E15	E16		
soap noodle	89.44	88.74	87.04	86.54	86.99	84.14	84.09		
alkyl lactate (a)	0.4	0.475	0.35	0.15	0.30	0.35	0.30		
fatty acid ester oil (b)	0.2	0.35	0.20	0.30	0.25	0.20	0.25		
sucrose cocoate (c)	0.175	0.3	0.25	0.40	0.30	0.25	0.30		
talc	6.18	6.18	7.6	7.6	7.6	11.0	1.0		
titanium dioxide	0.1	0.1	0.1	0.1	0.1	0.1	0.1		
sodium C14-C16 olefin sulfonate	0.75	0.75	0.75	1.2	0.75	0.75	0.75		
Triclocarban	0.2	0.2	0.2	0.2	0.2	0.2	0.2		
glycerin	1.0	1.0	1.0	1.0	1.0	1.0	1.0		
silicone emulsion	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
color pigment(s)	0.009	0.003	0.003	0.003	0.003	0.003	0.003		
fragrance	1	1	1	1	1	1	1		
di water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.		
ratio: (a):(b):(c)	1:0.5:0.28	1:0.73:0.41	1:0.57:0.46	1:2:1.73	1:0.83:0.65	1:0.57:0.46	1:0.83:0.65		

	E17	E18	E19	E20	E21	E22
soap noodle	89.39	89.35	84.13	88.96	89.44	89.17
alkyl lactate (a)	0.35	0.30	0.35	0.40	0.40	0.45
fatty acid ester oil (b)	0.20	0.25	0.20	0.25	0.20	0.30
sucrose cocoate (c)	0.25	0.30	0.25	0.18	0.175	0.275
talc	6.18	6.18	11.0	6.18	6.18	6.18
titanium dioxide	0.10	0.10	0.10	0.10	0.10	0.10
sodium C14-C16 olefin sulfonate	0.75	0.75	0.75	0.75	0.75	0.75
Triclocarban	0.20	0.20	0.20	0.20	0.20	0.20
glycerin	1.0	1.0	1.0	1.0	1.0	1.0
silicone emulsion	0.50	0.50	0.50	0.50	0.50	0.50
optical brightener	0.02	0.02	--	--	--	--
color pigment(s)	0.0008	0.0008	0.0181	0.0042	0.0045	0.0208
fragrance	1.0	1.0	1.0	1.0	1.0	1.0
di water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.
ratio: (a):(b):(c)	1:0.57:0.46	1:0.83:0.65	1:0.57:0.46	1:0.62:0.29	1:0.5:0.28	1:0.66:0.38

Table 1

	E23	E24	E25	E26	E27	E28	E29	E30
soap noodle	79.54	79.34	79.05	79.21	79.46	79.53	79.33	79.51
alkyl lactate (a)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
fatty acid ester oil (b)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
sucrose cocoate (c)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
talc	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
titanium dioxide	0.10	0.30	0.30	0.10	0.10	0.10	0.30	0.10
sodium C14-C16 olefin sulfonate	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Triclocarban	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
glycerin	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
silicone emulsion	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
optical brightener	--	--	--	--	--	--	--	--
color pigment(s)	0.00313	--	--	0.0321	0.085	0.0177	0.020	0.0329
fragrance	1.0	1.0	1.3	1.3	1.0	1.0	1.0	1.0
magnesium ascorbyl phosphate	0.0001	0.0001	--	--	--	--	--	0.0001
niacinamide	0.0001	0.0001	--	--	--	--	--	0.0001
di water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.
ratio: (a):(b):(c)	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46

Table 1						
	E31	E32	E33	E34	E35	E36
soap noodle	82.44	74.64	82.46	74.31	82.77	74.62
alkyl lactate (a)	0.35	0.35	0.35	0.35	0.35	0.35
fatty acid ester oil (b)	0.20	0.20	0.20	0.20	0.20	0.20
sucrose cocoate (c)	0.25	0.25	0.25	0.25	0.25	0.25
talc	9.00	15.00	9.00	15.00	9.00	15.00
sodium sulfate	0.60	0.30	0.30	0.30	0.60	0.30
titanium dioxide	0.10	0.10	0.10	0.10	0.10	0.10
sodium C14-C16 olefin sulfonate	0.75	4.35	0.40	4.35	0.40	4.35
Triclocarban	0.20	0.20	0.20	0.20	0.20	0.20
glycerin	1.10	1.10	1.10	1.10	1.10	1.10
silicone emulsion	0.50	0.50	0.50	0.50	0.50	0.50
optical brightener	--	--	--	--	--	--
color pigment(s)	0.0016	0.1106	0.035	0.035	0.030	0.030
fragrance	1.0	1.0	1.3	1.3	1.0	1.0
magnesium ascorbyl phosphate	0.0001	0.0001	--	--	--	--
niacinamide	0.0001	0.0001	--	--	--	--
di water	q.s.	q.s.	q.s.	q.s.	q.s.	q.s.
ratio: (a):(b):(c)	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46	1:0.57:0.46

The identity of the constituents used to form the soap bar compositions described on Table 1C and Table 1 are described in the following Table 2:

Table 2	
soap noodle	commercially available "soap noodles", 100%wt. actives, e.g., described by its supplier as comprising: sodium palmate(CAS 61790-79-2), sodium palm kernelate(CAS 61789-89-7), water(CAS 7732-18-5), palm acid(CAS 68440-15-3), glycerine(CAS 56-81-5), palm kernel acid(CAS 101403-98-9), sodium chloride(CAS 7647-14-5), tetrasodium EDTA (CAS 64-02-8), etidronic acid(CAS 2809-21-4)
alkyl lactate (a)	lauryl lactyl lactate, provided as Stepan Mild L3, 100%wt. actives (ex. Stepan Co.)
fatty acid ester oil (b)	provided as Tegosoft SH, which comprised 70% of stearyl heptanoate, 30% of stearyl caprylate, 100%wt. actives (ex. Evonik)
sucrose cocoate (c)	provided as Tegosoft LSE 65K, 65%wt. actives (ex. Evonik)
talc	talc, technical grade, 100%wt. actives (laboratory grade)
sodium sulfate	technical grade sodium sulfate (free flowing particulate), 100%wt. actives
titanium dioxide	provided as Kemira AFDC, 100%wt. actives
sodium C14-C16 olefin sulfonate	provided as NANSA LSS495/H, 60-100%wt. actives (ex. Huntsman)
Triclocarban	Triclocarban, 100%wt. actives, technical grade
glycerin	glycerol, technical grade, 99.5%wt. actives
silicone emulsion	provided as Wacker Belsil 551 HP, comprising 28%wt. of amino glycol polydimethylsiloxane, the balance being PEG 7, Trideceth-10, acetic acid, tetrabutyl ammonium bromide, and water
optical brightener	provided as Tinopal CBS-X, described as a distyrylbiphenyl disulfonates, 100%wt. actives (Ex. Ciba)
color pigment(s)	provided as one or more of: Cosmenyl Carmine FB 01, 40%wt. actives (ex. Clariant); Cosmenyl Yellow G30, 46%wt. actives (ex. Clariant); Cosmenyl Blue A4R, 38%wt. actives (ex. Clariant); Cosmenyl Violet 23, 30%wt. actives (ex. Clariant)
fragrance	provided as one or a number of different fragrances (each having a proprietary composition of its respective supplier); used "as supplied"

magnesium ascorbyl phosphate	technical grade anhydrous magnesium ascorbyl phosphate, "Vitamin C", 100%wt. actives
niacinamide	Technical grade anhydrous niacinamide, "Vitamin B3", 100%wt. actives
di water	deionized water, as "added water"

Samples of the bar soaps formed from compositions according to one or more of those described in to Tables 1C and Table 1 were tested by a panel of human panelists in order to evaluate the technical performance of the soap bars. The tests were performed according to the following protocol: a human user was provided with a bar soap formed of one or the formulations of Table 1C or Table 1, after which the user placed their hands holding the soap in to a stream of tap water (approx. 20°C) for 5 – 20 seconds to thoroughly wet the hands and the bar soap. The hands holding the bar were withdrawn from the stream of tap water, and the bar was manually worked for 10 – 30 seconds to generate a foam/lather on the hands. Thereafter then bar was placed aside and then amount and quality of the foam/lather was visually observed and noted. The skin feel of the hands having the foam/lather was also evaluated both prior to rinsing off the foam/lather and thereafter. These observations were reported by the human user (human test subject.) Two or four human users evaluated each of the bar soaps tested.

According to this protocol, the following observations were made with respect to the bar soaps of Table 1C or Table 1:

- the bar soap of C1 was evaluated by 4 users; observations: good foaming
- the bar soap of C2 was evaluated by 4 users; observations: good foaming
- the bar soap of C4 was evaluated by 4 users; observations: good foaming
- the bar soap of C7 was evaluated by 2 users; observations: good foaming, but the soap was difficult to rinse off the hands
- the bar soap of E3 was evaluated by 2 users; observations: good foaming
- the bar soap of E13 was evaluated by 4 users; observations: good foaming, good skinfeel and good rinsability of the soap and foam; pleasant "cooling effect" was felt on the skin following rinsing.
- the bar soap of E17 and/or E18 was observed and judged to be significantly superior in its general performance over that of the bar soap of C11, as per the evaluation of in excess of 100 users

- the bar soap of E19 was observed and judged to be significantly superior in its general performance over that of the bar soap of C12, as per the evaluation of in excess of 100 users

Generally speaking, the soap bars according to the invention generated a finely celled lather or foam when tested in cleaning the epidermis, and especially hands, which at the same time retains a good 'skin feel' of the treated epidermis, e.g., hands. These results were improved over the comparative examples, viz., soap bars produced according to the bar soaps of Table 1C.

#### Evaluation of Foaming:

Several of the bar soap compositions disclosed on foregoing Table 1 were evaluated to determine the degree of foaming.

A bar soap (formed of composition of Table 1 or Table 1C) was comminuted into particles, through a 1.70 mm sieve, and the particles were stored into airtight containers immediately subsequent to comminution.

Thereafter for each tested bar soap composition, a 100 ml aliquot of a 300 ml hard water sample (with a water degree of hardness, Ca;Mg 3:2, according to IS 3785(1976)) at room temperature (20°C) was added to a clean and dried mixing jar (having a fluid capacity of 1 litre) of a three speed kitchen blender, to which was thereafter added a 5 gram quantity of a comminuted bar soap composition. The cover was placed over the open upper end of the mixing jar, and the kitchen blender was operated on a low speed to agitate the mixing blades for 60 seconds. Immediately thereafter, the top cover was removed, and the generated foam (alternatively, "lather") was quickly poured into a graduated cylinder (IS Standard 878 (1975)) and the measurement of the height of the top surface of the foam within the graduated cylinder was immediately measured. Additionally, a visual assessment was made as to the density, and nature of the foam within the graduated cylinder, and recorded. The foregoing test was repeated two more times, for each of the tested bar soap compositions.

The identity of the bar soap compositions (from Tables 1, and 1C) tested in this manner, the average of the foam heights, and the average of the visual assessment of the foam are reported on the following Table 3.

Table 3		
	Foam height	Foam appearance
C13 (comparative)	330 ml	Loose foam, large air bubbles
E27 (example)	385 ml	Tight, thicker foam, small air bubbles

As noted in Table 3, the tested bar soap of the invention had a 16% improvement in foam height and also had a much more thick foam with thicker lather.

## Claims:

1. Improved bar soap composition adapted for use in personal washing, particularly of the epidermis and hair of a mammalian body (human, animal) which composition comprises as essential constituents:

fatty acid based soap, preferably in the form of 'soap noodles' which are technical grade mixtures which predominantly comprise one or more metal salts of fatty acids;

a ternary system comprising at least one of each of the following: (a) an alkyl lactate; (b) a fatty acid ester oil and, (c) a sucrose ether based nonionic surfactant.

2. Improved bar soap composition according to claim 1, which further comprises a non-cationic compound which provides an antimicrobial or germicidal benefit.

3. An improved bar soap composition according to claim 1 or 2, which exhibits improved performance as compared to a comparative soap bar which omits one or more of: (a) an alkyl lactate; (b) a fatty acid ester oil and, (c) a sucrose ether based nonionic surfactant.

4. Improved bar soap composition adapted for use in personal washing, particularly of the epidermis and hair of a mammalian body (human, animal) which composition comprises as essential constituents:

fatty acid based soap, preferably in the form of 'soap noodles' which are technical grade mixtures which predominantly comprise one or more metal salts of fatty acids;

a binary system comprising at least one of each of the following: (a) an alkyl lactate and (b) a fatty acid ester oil.

5. Improved bar soap composition according to claim 4, which further comprises a non-cationic compound which provides an antimicrobial or germicidal benefit.

6. An improved bar soap composition according to claim 4 or 5, which exhibits improved performance as compared to a comparative soap bar which omits one or more

of: (a) an alkyl lactate; (b) a fatty acid ester oil and, (c) a sucrose ether based nonionic surfactant.

7. A method of manufacturing a bar soap according to any preceding claim.
  
8. A method of providing an cleaning and/or antimicrobial benefit to a dermal surface of a body, comprising the steps of: wetting a bar soap according to any of claims 1 – 6 with water to form a washing composition, which is then contacted with one or more parts of the body, e.g., the epidermis, and hair, to provide a cleaning and/or microbicidal benefit to the contacted parts of the body.

INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2013/050776

A. CLASSIFICATION OF SUBJECT MATTER  
INV. C11D3/20 A61Q19/00 C11D3/48 C11D10/04  
ADD.  
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED  
Minimum documentation searched (classification system followed by classification symbols)  
C11D A61Q

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/212323 A1 (POLONKA JACK [US] ET AL) 13 September 2007 (2007-09-13) paragraphs [0001], [0049], [0050], [0090], [0091]; claims; examples -----	1-8
X	US 7 015 179 B1 (MASSARO MICHAEL [US] ET AL) 21 March 2006 (2006-03-21) column 9, lines 15-65 column 11, lines 32-59 column 12, lines 9-16 claims; examples -----	1-8
X	EP 0 507 559 A2 (UNILEVER PLC [GB]; UNILEVER NV [NL]) 7 October 1992 (1992-10-07) page 3, lines 24-34; claims; examples -----	4-8
A	-/--	1-3

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent 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 when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search <b>5 June 2013</b>	Date of mailing of the international search report <b>14/06/2013</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <b>Péntek, Eric</b>
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## INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2013/050776

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2002/037818 A1 (SCHULTZ MICHAEL [DE] ET AL) 28 March 2002 (2002-03-28) claims; examples -----	1-8
A	US 3 867 301 A (WATANABE YUTAKA ET AL) 18 February 1975 (1975-02-18) column 1, lines 43-47; claims; examples -----	1-8

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Information on patent family members

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