

Brigard & Castro

Abogados

SUPERINDUSTRIA Y COMERCIO
Radicacion : 00028946 00000004 Folios: 2
Fecha (AMD): 2002-10-08 16:21:16
Tramite : 002 PATENTES D 1 REGISTRO/ 538 PETICION
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

Apartado 3692

Cra. 7 16-56
Bogotá - Colombia S.A.

Tel. Conm. 3802200
Tel./Fax: (57.1) 2827976
(57.1) 3802700

AS: 82.148

E.Mail:bricas@brigardycastro.com.co

Señores

**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES**

E. S. D.

REF.: Expediente No. 00 028.946 solicitud de Patente a nombre de
KIMBERLY – CLARK WORLDWIDE, INC.

RAMIRO CASTRO DUQUE, vecino de Bogotá, portador de la tarjeta profesional No. 1003 del Consejo Superior de la Judicatura, obrando como apoderado de la Sociedad KIMBERLY – CLARK WORLDWIDE, INC., según lo acredita el documento de poder protocolizado en la Secretaría General bajo el No. 17397, de acuerdo con el Artículo 44 de la Decisión 486 de la Comisión de la Comunidad Andina, me permito solicitar que se examine si la invención contenida en la solicitud en referencia es patentable.

De acuerdo con lo anterior, me permito anexar el recibo oficial de caja No. 02-67,134 por valor de \$318.000.

Señor Superintendente,


RAMIRO CASTRO DUQUE
C.C. No. 170.322 de Bogotá
Código 340
T.P. No.1003 del C.S.J.
Cra 7 No. 16-56 Piso 9

Octubre 07, 2002
CPB/hsr

Bogotá D.C. Colombia
WWW.ZIC.BOG.CO
E-MAIL: zic@zic.bog.co
FAX: 220 2350
CORREO: 383 0840
CÓDIGO 13 NO. 33-00 B202 2. 3. 10

RECIBO DE CASH PAGADO AL EXEDECENTE NO. _____

RESPONSABLE: _____

SOM: TRESCIENTOS DIEZ Y OCHO MIL PESOS

1 20002-01-01 201210022

TOTAL :
82 EXAMEN DE PATENTABILIDAD DE INVEN

278'000'00
278'000'00

CUM: REMITENTE CONCEPTO TOTAL CONCEPTO

***** C O N C E P T O *****

REMITENTE	CONSIGNACION	BANCO	CUENTA	NO. PAGAR	FECHA PAGAR	AL. PAGAR
REMITENTE	CONSIGNACION	BANCO BOGOTÁ	020-00770-P	7252048	03/10/2003	70'240'000'00
REMITENTE	CONSIGNACION	BANCO BOGOTÁ	020-00770-P	7252048	03/10/2003	7'882'000'00

REMITENTE TIPO PAGAR BANCO CUENTA NO. PAGAR FECHA PAGAR AL. PAGAR

***** CONSIGNACION *****

FECHA : OCTUBRE 3 DE 2003
RECIBO OFICIAL DE CASH : 03 - 01'124

MIT : 800719088-5

SECRETARÍA DE INDUSTRIA Y COMERCIO

315
308

2005-08-11
375

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISIÓN DE NUEVAS CREACIONES

2020

Bogotá, DC, 05 de agosto de 2005

Apoderado: Ramiro Castro Duque

Oficio:

68883

ASUNTO

Radicación: 00-28946

Trámite 002

Evento 001

Actuación 430

Folios

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la decisión 486 de la Comisión de la Comunidad Andina, se le comunica:

1. Documentos estudiados:

- ◆ capítulo descriptivo, folios 09 a 70 y 286 a 295;
- ◆ capítulo reivindicatorio modificado, folios 296 a 302 ;
- ◆ 1° examen de forma, folios 92 a 93;
- ◆ respuesta técnica al 1° examen de forma, folios 285 a 310;
- ◆ solicitudes de las cuales se reivindica prioridad, folios 98 a 568;
- ◆ 2° examen de forma, folio 311;
- ◆ solicitud del examen de patentabilidad 313 a 314.

Objeto de la invención:

El título de la invención es "COMPOSICIÓN INCREMENTADORA DE BARRERA DE LA PIEL Y MÉTODO DE ELABORACIÓN"

El objeto de la presente solicitud se refiere a la incorporación de una loción hidrófila que contenga lípidos sobre el material que queda unido al cuerpo, de los materiales absorbente desechables

Determinación del estado de la técnica:

Considerando que la fecha de presentación la solicitud de patente de la cual se reivindica prioridad 23 de abril de 1999, se buscaron documentos del estado de la técnica relacionados, con fecha de publicación anterior a esta.

Se hizo la búsqueda de documentos relevantes en el estado de la técnica, entendiendo como estado de la técnica la definición provista en el artículo 16 de la Decisión 486 de la Comisión de la Comunidad Andina y las excepciones establecidas en el artículo 17 de la misma.

Consultadas la fuente de información con que cuenta este despacho se encontraron los siguientes documentos, anteriores a la fecha de presentación.

D1	WO9913861	25-mar-99	Cleansing and conditioning article for skin or hair
----	-----------	-----------	---

Evaluación de Novedad:

Esta se evaluó por comparación entre lo reclamado como nuevo y los documentos citados arriba y de acuerdo con la definición de novedad del Artículo 16 de la Decisión 486 de la Comisión de la Comunidad Andina, y se determino la solicitud en estudio basa su novedad en una composición incrementadora de barrera de la piel que comprende desde 5% por peso a 90% por peso de solvente hidrofílico; desde 5% por peso a 95% por peso de polietilen glicol de peso molecular desde 720 o mayor; desde 1% a 22% por peso de un alcohol graso C₁₄ a C₃₀ o mayor; desde 0,5% a 10% en peso de un humectante; desde 1% a 20% en peso de un surfactante emulsificador de aceite en agua que tiene un rango de HLB mayor de 7; y desde 0,1 a 10% en peso de esterol o de un derivado de esterol.

-La anterioridad D1 describe artículos de limpieza y acondicionamiento para el cuidado personal, de un solo uso, que comprende un sustrato insoluble en agua que tiene impregnado un propilen glicoles por ejemplo PPG-14; tensioactivo de 0,5% a 12,5% en peso, alcoholes etoxiados C₁- C₃₀, un humectante como lanolina o glicerina; colesterol, esteres de colesterol y mezclas de los mismos, tales como colesterol/lanosterol.

Tal como puede verse los artículos de limpieza que comprenden embebido la composición que ahora se reclama como nueva, ya existían antes de la fecha de prioridad reclamada, porque la materia reclamada como nueva cae dentro de la materia descrita por la solicitud en estudio. Por lo tanto la composición y los artículos que llevan embebida dicha composición se considera que no tienen novedad.

317
310

No	Documento:	Reivindicaciones afectadas:	Requisito afectado
D1	WO9913861	1 a 31	Novedad

En cumplimiento del artículo 45 de la decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de la notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo 5° del título 1° de la Circular Única n°.10 de 2001.

ALIX CARMENZA CÉSPEDES DE VERGEL.

Jefe de la División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista de fecha **11 AGO. 2005**

CONCEPTO TÉCNICO No. 1155	EXAMINADOR TÉCNICO Código: 202012
----------------------------------	--------------------------------------

5

CLEANSING AND CONDITIONING ARTICLE FOR SKIN OR HAIR

TECHNICAL FIELD

The present invention relates to a substantially dry, disposable, personal cleansing article useful for both cleansing and conditioning the skin or hair, and more particularly to a disposable, cleansing, and conditioning article having a substrate which preferably comprises of multiple layers. These articles are used by the consumer by wetting the dry article with water. The article comprises a water insoluble substrate having at least a first portion that is wet extensible and at least a second portion that is less wet extensible than said first portion and a lathering surfactant. Preferably, the articles of the present invention further comprise a conditioning component.

Use of the substrate enhances lathering at low surfactant levels, increases cleansing and exfoliation, optimizes delivery and deposition of conditioning ingredients, and provides desirable characteristics such as texture, thickness and bulk. As a result, this invention provides effective cleansing using low, and hence less irritating, levels of surfactant while providing superior conditioning benefits by using a substrate having desirable characteristics.

The invention also encompasses articles comprising various active ingredients for delivery to the skin or hair.

The invention also encompasses a method for consistent deposition of conditioning agents to the skin or hair.

The invention also encompasses a method for cleansing and moisturizing the skin or hair using the articles of the present invention and also to methods for manufacturing these articles.

30

BACKGROUND OF THE INVENTION

Personal cleansing articles have traditionally been marketed in a variety of forms such as bar soaps, creams, lotions, and gels. These cleansing formulations have attempted to satisfy a number of criteria to be acceptable to consumers. These criteria include cleansing effectiveness, skin feel, mildness to skin, hair, and ocular mucosae, and lather volume. Ideal personal cleansers should gently cleanse the skin or hair, cause little or no irritation, and not leave the skin or hair overly dry after frequent use.

However, these traditional forms of personal cleansing articles have the inherent problem of balancing cleansing efficacy against delivering a conditioning benefit. One solution to this problem is to use separate cleansing and conditioning articles. However, this is not always convenient or practical and many consumers would prefer to use a single article which can both cleanse and condition the skin or hair. In a typical cleansing composition the conditioning ingredients are difficult to formulate because many conditioners are incompatible with the surfactants, resulting in an undesirable non-homogenous mixture. To obtain a homogeneous mixture with conditioning ingredients, and to prevent the loss of conditioning ingredients before deposition, additional ingredients, e.g. emulsifiers, thickeners, and gellants are often added to suspend the conditioning ingredients within the surfactant mixture. This results in an aesthetically pleasing homogenous mixture, but often results in poor deposition of conditioning ingredients, because the conditioners are emulsified and not efficiently released during cleansing. Also, many conditioning agents have the disadvantage of suppressing lather generation. Lather suppression is a problem because many consumers seek cleansing articles that provide a rich, creamy, and generous lather.

Therefore, it is seen that conventional cleansing articles which attempt to combine surfactants and conditioning ingredients suffer from disadvantages inherently resulting from the incompatibilities of surfactants and conditioners. A need clearly exists to develop cleansing systems which provide effective cleansing and yet consistently provide sufficient conditioning in a single article.

It is also highly desirable to deliver cleansing and conditioning benefits from a disposable, single use article. Disposable articles are convenient because they obviate the need to carry cumbersome bottles, bars, jars, tubes, and other forms of both cleansing and conditioning articles. Disposable articles are also a more sanitary alternative to the use of a sponge, washcloth, or other cleansing implement intended for multiple reuse, because such implements develop bacterial growth, unpleasant odors, and other undesirable characteristics related to repeated use.

In addition, consumer habits of using disposable articles having two surfaces vary considerably. When preparing to use such articles, consumers will generally wet the article and then "lather" it before contacting the article with their skin or hair. "Lathering" is achieved by rubbing the surfaces of the article on or against each other prior to use of the article. If the surface containing the conditioning agents is first used in lathering and the same surface is then used to contact the skin or hair, deposition of the conditioning agents is considerably decreased due to emulsification of the conditioning agents by the surfactant. If, however, the surface not containing the conditioning agents (e.g., a surfactant-containing surface) is rubbed together to produce the lather and the surface containing the conditioning

319
312

319

agents is then used to contact the skin or hair, maximum deposition of conditioning agents is achieved. If both surfaces of the article are treated with the conditioning agents, the same inconsistent deposition can result. Maximum deposition of conditioning agents would result only if a non-lathered surface containing conditioning agents is contacted with the skin or hair.

It has been surprisingly found that if the conditioning component (the combination of the conditioning agents) has a minimum lipid hardness value of 0.02 kg., this inconsistent deposition of conditioning agents is considerably diminished. It is believed that increasing conditioning component hardness decreases transfer within the substrate and also decreases emulsification of the conditioning agents by the surfactants during the lathering step. As a result, more of the conditioning agents remain available for mechanical transfer via contact with the skin or hair.

It is also highly desirable to provide a cleansing and conditioning article having the qualities of a washcloth. These desirable features can be realized in disposable articles by providing proper texture, thickness (caliper), and bulk (volume per unit weight). A relatively high value of texture is desirable for aiding in cleansing of skin and hair. Relatively high values of caliper and bulk are desirable for providing volume in the article for receiving and containing liquids. Typically, such washcloth-like articles have a substrate which includes one or more materials or layers. The substrate can be pre-moistened with a wetting agent prior to use, or alternatively, can be combined with a liquid at the point of use of the article. Pre-moistened wiping articles are also referred to as "wet wipes" and "towelettes."

One method of imparting texture and bulk to a washcloth-like article is by combining layers of plies having different properties. U.S. Patent 4,469,735 issued September 4, 1984 to Trokhan discloses a multiple ply tissue paper article having a wet microcontracted constraining paper ply and a dry creped constrained paper ply. Portions of the constrained ply are adhered to the constraining ply. When the multiple ply article is wetted, unadhered portions of the constrained ply pucker in the Z-direction to provide texture and bulk.

While the structure in U.S. 4,469,735 provides the advantage of texture and bulk upon wetting, it requires the use of wet microcontraction procedures on a paper machine in order to prepare such structures. Further, the structures in the '735 patent have reported wet calipers (thickness) which are lower than the corresponding dry calipers.

It has been surprisingly found in the present invention that articles can be developed to provide effective cleansing and consistent conditioning in a convenient, inexpensive, and sanitary disposable personal cleansing article having the desirable properties of a washcloth. The present invention provides the convenience of not needing to use both a separate cleansing and conditioning article. The present invention is highly

convenient to use because it is in the form of a substantially dry article that is wetted before use.

The present invention relates to a dry, disposable, personal cleansing article useful for both cleansing and conditioning the skin or hair. These articles are used by the consumer by wetting the dry article with water. The article consists of a water insoluble substrate having at least a portion that is wet extensible, a lathering surfactant, and preferably a conditioning component having a lipid hardness value of at least 0.02 kg. Without being limited by theory, it is believed that the substrate enhances lathering at low surfactant levels, increases cleansing and exfoliation, and optimizes delivery and consistent deposition of the conditioning ingredients. It is also believed that having a conditioning component lipid hardness value of at least 0.02 kg. provides greater efficient and consistent deposition of conditioning agents to the skin or hair. As a result, this invention provides effective cleansing using low, and hence less irritating, levels of surfactant while providing superior conditioning benefits in a consistent and efficient manner. It has also been found that these articles are useful for delivering a wide range of active ingredients to the skin or hair during the cleansing process.

Accordingly, it is an object of the present invention to provide substantially dry washcloth-like articles for both cleansing and conditioning the skin or hair wherein the articles are used in combination with water.

It is another object of the present invention to provide articles comprising a water insoluble substrate, a surfactant, and a conditioning component having a lipid hardness value of at least 0.02 kg.

It is another object of the present invention to provide articles which are disposable and intended for single use.

It is another object of the present invention to provide articles which are mild to the skin or hair.

It is another object of the present invention to provide articles which, upon wetting, are capable of generating an Average Lather Volume of greater than or equal to about 30 ml.

It is another object of the present invention to provide articles useful for delivering active ingredients to the skin or hair during the cleansing and conditioning process.

It is another object of the present invention to provide articles which consistently deposit the conditioning component and other active ingredients onto the skin or hair.

It is another object of the present invention to provide methods of cleansing and consistently conditioning the skin or hair.

It is another object of the present invention to provide methods of consistently providing deposition of the conditioning agents and other active ingredients.

It is another object of the present invention to provide methods of manufacturing the articles of the present invention.

It is another an object of the present invention to provide a disposable cleansing and conditioning articles which exhibits increased texture and bulk upon wetting.

5 Another object of the present invention is to provide a disposable cleansing and conditioning article having a wet caliper greater than the dry caliper of the article.

Another object of the present invention is to provide a disposable cleansing and conditioning article having an apertured paper layer which is foreshortened, and which provides increased texture and bulk upon wetting.

10 These and other objects of this invention will become apparent in light of the following disclosure.

SUMMARY OF THE INVENTION

The present invention relates to a disposable, single use personal care cleansing and conditioning article comprising: (A) a water insoluble substrate, wherein at least a first portion of said substrate is wet extensible and at least a second portion of said substrate is less wet extensible than said first portion, and (B) at least one lathering surfactant added onto or impregnated into the substrate. The article is substantially dry prior to use. Preferred embodiments of the present invention are capable of generating an Average Lather Volume of greater than or equal to about 30 ml upon wetting.

20 In further embodiments, the present invention further comprises a conditioning component added onto or impregnated into the substrate. The conditioning component preferably has a lipid hardness value of greater than about 0.02 kg.

In still further embodiments, the present invention relates to disposable, single use personal care cleansing and conditioning article comprising:

25 (A) a water insoluble substrate, wherein at least a first portion of said substrate is wet extensible and at least a second portion of said substrate is less wet extensible than said first portion, and

(B) a cleansing and conditioning composition added onto or impregnated into the substrate comprising:

30 (i) at least one lathering surfactant, and
(ii) a conditioning component having a lipid hardness value of greater than about 0.02 kg.

In this embodiment the lathering surfactant and the conditioning component are separately or simultaneously added onto or impregnated into the water insoluble substrate. In such an embodiment, the article is also substantially dry prior to use, and is preferably capable of generating the above-described Average Lather Volume upon wetting.

In still further embodiments, the present invention provides a multiple layer disposable cleansing and conditioning article. The wiping article includes at least two layers, or plies. The first layer is extensible when it is wetted and is preferably apertured. The second layer is less wet extensible when wetted than the first layer. Selected portions of the first layer are joined to the second layer to inhibit wet extension of the first layer in the plane of the first layer.

When the first layer is wetted, the second layer constrains extension of the first layer in the plane of the first layer. As a result, portions of the first layer deform, such as by buckling or puckering, in the Z-direction (perpendicular to the plane of the first layer).

10 The first layer preferably has a wet extensibility of at least about 4 percent, more preferably at least about 10 percent, and still more preferably at least about 20 percent as measured using the "Wet Extensibility Test" provided hereinafter. The first layer can be foreshortened to provide the desired wet extensibility. In one embodiment, the first layer comprises a wet laid, apertured paper web which is foreshortened about 30 percent by dry creping.

15 The second layer has a wet extensibility that is less than that of the first layer. The wet extensibility of the first layer minus the wet extensibility of the second layer is preferably at least about 4 percent, more preferably at least about 10 percent, and still more preferably at least about 20 percent. The second layer can comprise a nonwoven web of natural fibers, synthetic fibers, or combinations thereof. In one embodiment, the second layer comprises a hydroentangled nonwoven web of rayon and polyester fibers.

The disposable cleansing and conditioning article can have a wet caliper to dry caliper ratio greater than 1.0, more preferably at least about 1.1, even more preferably at least about 1.2, and most preferably at least about 1.4, where the wet to dry caliper ratio is a relative measure of the wet and dry thickness of the cleansing and conditioning article. The wet to dry caliper ratio is measured according to the procedure set forth hereinafter.

25 Preferably, selected portions of the first layer are joined to the second layer in a predetermined bonding pattern to provide a plurality of unbonded regions between the layers. In one embodiment, the first and second layers are bonded together using a hot melt adhesive.

30 In still further embodiments, the present invention relates to a method of manufacturing a disposable, single use personal care cleansing and conditioning article comprising the step of separately or simultaneously adding onto or impregnating into a water insoluble substrate having at least a portion that is wet extensible

35 (A) at least one lathering surfactant, and
(B) a conditioning component having a lipid hardness value of greater than about 0.02 kg.

321
314

321

The resulting article is substantially dry, and is preferably capable of generating the above-described Average Lather Volume upon wetting.

In still further embodiments, the present invention relates to methods for cleansing and conditioning the skin or hair with the personal cleansing articles described herein.

5 In even further embodiments, the present invention relates to methods of consistently depositing conditioning agents to the skin or hair.

10 All percentages and ratios used herein, unless otherwise indicated, are by weight and all measurements made are at 25°C, unless otherwise designated. The invention hereof can comprise, consist of, or consist essentially of, the essential as well as optional ingredients and components described therein.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Figure 1 is a plan view illustration of one embodiment of a cleansing and conditioning article of the present invention, the article including an extensible first layer and a less extensible second layer, with the first layer shown facing the viewer, and with a portion of the first layer shown cut away to show a continuous network of generally parallel sets of intersecting lines of adhesive which serve to bond the first layer to the second layer, the bonded region defining generally diamond-shaped unbonded regions.

20 Figure 2 is an illustration of another embodiment of a cleansing and conditioning article of the present invention, the article including an extensible first layer and a less extensible second layer, with the first layer shown facing the viewer, and with a portion of the first layer shown cut away to show a continuous network of adhesive which serves to bond the first layer to the second layer, the bonded region defining generally circular-shaped unbonded regions.

25 Figure 3 is a plan view illustration of another embodiment of a cleansing and conditioning article of the present invention, the article including an extensible first layer and a less extensible second layer, with the first layer shown facing the viewer, and with a portion of the apertured layer shown cut away to show generally parallel, spaced apart zones of adhesive extending generally parallel to the machine directions of the apertured layer and the nonwoven layer.

30 Figure 4 is an illustration of a portion of the cleansing and conditioning article shown in Figure 1, Figure 4 being enlarged relative to Figure 1 to illustrate the preferred apertures in the extensible first layer and creping ridges in the apertured layer.

35 Figure 5A is a cross-sectional illustration of the cleansing and conditioning article of the present invention taken along the direction indicated by line 5-5 in Figure 1, and showing the article prior to wetting of the first layer.

Figure 5B is a cross-sectional illustration taken along the direction indicated by line 5-5 in FIG. 1, and showing the article after wetting of the first layer.

Figure 6 is an illustration of a paper machine which can be used to make cellulosic paper webs that can be used in forming the substrate portion of the cleansing and conditioning articles herein.

Figure 7 is an illustration of a forming element which can be used to form a cellulosic paper web with apertures.

DETAILED DESCRIPTION OF THE INVENTION

10 The personal cleansing articles of the present invention are highly efficacious for cleansing the skin or hair while at the same time providing effective deposition of conditioning agents. The articles can also contain other non-conditioning active ingredients to be deposited onto the skin or hair.

15 Without being limited by theory it is believed that the substrate significantly contributes to generation of lather and deposition of conditioning agents and any other active ingredients. It is believed that this increase in lathering and deposition is the result of the surface action of the substrate. As a result, milder and significantly lower amounts of surfactants may be employed. The decreased amount of required surfactant is believed to relate to the decrease in the drying effect of the skin or hair by the surfactants. Furthermore, the diminished amount of surfactant dramatically lowers the inhibitory action (e.g., via emulsification or direct removal by the surfactants) which surfactants exhibit regarding deposition of conditioning agents.

20 Without being limited by theory, the substrate also enhances deposition of conditioning agents and active ingredients. Since the invention is in dry form, the invention does not require emulsifiers, which can inhibit deposition of conditioning agents and active ingredients. Furthermore, because the skin conditioners and active ingredients are dried onto or impregnated into the substrate, they are transferred directly to the skin or hair by surface contact of the wetted article to the skin.

25 The substrate also enhances cleansing. The substrate can have differing textures on each side, e.g. a rough side and a smooth side. The substrate acts as an efficient lathering and exfoliating implement. By physically coming into contact with the skin or hair, the substrate significantly aids in cleansing and removal of dirt, makeup, dead skin, and other debris.

30 Finally, a substrate having at least a portion that is wet extensible provides the desired qualities (e.g., proper texture, thickness, and bulk) of a washcloth. It is also believed that these particular types of substrates enhance lather generation.

322
315

322

It is also believed that having a minimum lipid hardness value of 0.02 kg. for the conditioning component provides consistent deposition of the conditioning agents to the skin or hair by decreasing transfer within the substrate and also decreasing emulsification of the conditioning agents by the surfactants during the lathering step.

5 By a "lathering surfactant" is meant a surfactant, which when combined with water and mechanically agitated generates a foam or lather. Preferably, these surfactants should be mild, which means that these surfactants provide sufficient cleansing or deterative benefits but do not overly dry the skin or hair (e.g., removing too much natural oil and/or moisture), and yet meet the lathering criteria described above.

10 The term "lathering product" or "lathering article," as used herein, means that the product or article contains enough of the surfactants described herein to generate ≥ 30 ml of Lather Volume, as described herein in the Lather Volume Test. These Lather Volume measurements are conducted with a medium hardness water (8-10 grains per gallon) at 95 °C.

15 The terms "disposable" or "single use", are used herein in their ordinary sense to mean an article that is disposed or discarded after one usage event.

The term "conditioning component," as used herein, means a combination of the conditioning agents. This combination can also include lipid hardening materials.

20 The term "water-activated," as used herein, means that the present invention is presented to the consumer in dry form to be used after it is wetted with water. It is found that these articles produce a lather or are "activated" by contacting them with water and then further subjecting the article to mechanical forces, such as rubbing.

25 The term "substantially dry," as used herein, means that prior to use the article is substantially free of water and generally feels dry to the touch. Thus, the articles of the present invention will generally comprise less than about 10% by weight of water, preferably less than about 5% by weight of water, and more preferably less than about 1% by weight of water, the forgoing measured in a dry environment, e.g., low humidity. One of ordinary skill in the art would recognize that the water content of an article such as in the present invention can vary with the relative humidity of the environment.

30 The term "mild" as used herein in reference to the lathering surfactants and articles of the present invention means that the articles of the present invention demonstrate skin mildness comparable to a mild alkyl glyceryl ether sulfonate (AGS) surfactant based synthetic bar, i.e. synbar. Methods for measuring mildness, or inversely the irritancy, of surfactant containing articles, are based on a skin barrier destruction test. In this test, the milder the surfactant, the lesser the skin barrier is destroyed. Skin barrier destruction is measured by the relative amount of radio-labeled (tritium labeled) water ($3H-H_2O$) which passes from the test solution through the skin epidermis into the physiological buffer

contained in the diffusive chamber. This test is described by T.J. Franz in the J. Invest. Dermatol., 1975, 64, pp. 190-195; and in U.S. Patent No. 4,673,525, to Small et al., issued June 16, 1987, which are both incorporated by reference herein in their entirety. Other testing methodologies for determining surfactant mildness well known to one skilled in the art can also be used.

5 The term "deposition consistency," as used herein, means that deposition of the conditioning agents comprising the conditioning component will be relatively unvarying no matter how the consumer prepares to use, and the actual uses, the cleansing and conditioning article (e.g., lathering the side of the substrate carrying the conditioning component versus lathering the substrate side with the surfactant). The articles of the present invention will have a deposition consistency of greater than about 60%, preferably greater than about 65%, more preferably greater than about 70%, and most preferably greater than about 75%. The deposition consistency measurement is the quotient obtained by dividing the amount of deposition of conditioning agents that occurs via "non-ideal lathering and use" by the amount of deposition of conditioning agents that occurs via "ideal lathering and use." Non-ideal lathering, as used herein, means that lathering is achieved by rubbing together or against itself the surface of the article containing the conditioning agents and then contacting the skin or hair with the same surface. This causes inefficient deposition of the conditioning agents because some of the conditioning agents become emulsified by the surfactant. Ideal lathering, as used herein, means that lathering is achieved by rubbing together or against itself the surface of the article containing surfactant, but not containing conditioning agents, and then contacting the skin or hair with the surface containing the conditioning component. The same reference points would apply if both surfaces of the substrate are treated with the conditioning agents (e.g. deposition obtained from lathering and contacting the skin with the same lathered surface containing emulsified conditioning agents versus contacting the skin with the non-lathered surface which contains non-emulsified conditioning agents). Deposition consistency is maximized when the lipid hardness value of the conditioning component is greater than about 0.02 kg.

25 The personal care articles of the present invention comprise the following essential components: (A) a water insoluble substrate, wherein at least a first portion of said substrate is wet extensible and at least a second portion of said substrate is less wet extensible than said first portion, and (B) at least one lathering surfactant added onto or impregnated into the substrate. The articles of the present invention can further comprise a conditioning component added onto or impregnated into the substrate.

35 **WATER INSOLUBLE SUBSTRATE HAVING
AT LEAST A PORTION THAT IS WET EXTENSIBLE**

323
316

323

The articles of the present invention comprise a water insoluble substrate wherein at least a first portion of said substrate is wet extensible and at least a second portion of said substrate is less wet extensible than said first portion. By "water insoluble" is meant that the substrate does not dissolve in or readily break apart upon immersion in water. By wet extensible is meant that the material has a tendency to elongate at least in one direction when wetted. A test for measuring extensibility is provided below. The water insoluble substrate is the implement or vehicle for delivering the lathering surfactant and the conditioning component of the present invention to the skin or hair to be cleansed and conditioned. Without being limited by theory, it is believed that the substrate, as the means for transmitting mechanical forces and providing agitation, provides a lather generating effect and also aids in the deposition of the conditioning component.

One embodiment of a water insoluble substrate having at least a portion that is wet extensible is illustrated in Figures 1-3. In this embodiment, the present invention comprises a multiple layer disposable wiping article 20. Figures 1-3 illustrate a two layer, or two ply, embodiment of the present invention. Alternatively, the disposable wiping article can include more than two layers.

The disposable cleansing and conditioning article 20 comprises a substrate designated generally by reference numeral 22. The substrate 22 comprises a first layer 100 and a second layer 200. The first layer 100 is extensible, and in particular is extensible when wetted, e.g., the first layer is wet extensible. By "wet extensible" is meant that a material has a tendency to elongate in at least one direction when wetted. In general, "wetted" refers to wetting with aqueous solutions, such as water, which are capable of inducing extension in the first layer. For example, water relaxes the crepe in foreshortened paper, thereby causing an extension of the paper in at least one direction in the plane of the paper. Without being bound by theory, the relaxation of crepe may be a result of the loss of hydrogen bonds within the paper structure due to the presence of water. However, any fluid, mixture, or solution which could cause this crepe relaxation would be considered to "wet" the article. The second layer 200 is relatively less wet extensible when wetted than the first layer 100. Extensibility is measured according to the "Wet Extensibility Test" described below, and is reported as a percentage.

Selected portions of the first layer 100 are joined, directly or indirectly, to second layer 200 to inhibit wet extension of the first layer in the plane of the first layer. In Figures 1 and 2, selected portions of the first layer 100 are joined to the second layer 200 to provide continuous bonded regions designated 110 and discrete unbonded regions 114.

In a preferred embodiment shown in Figure 1, the bonded regions 110 are shown as a continuous network of intersecting lines forming generally diamond-shaped unbonded regions 114. The width and spacing of the intersecting lines of bonded regions 110, may be adjusted to the desired size and spacing of the diamond-shaped unbonded regions 114. The continuous network of intersecting lines may be virtually any pattern, resulting in unbonded regions of virtually limitless geometric shapes, including, for example, squares, rectangles, and triangles. The network need not be completely continuous, nor limited to a pattern of straight or uniform lines, but may, for example, be a network resulting in circular, oval, or other non-polygonal geometric shapes. An adhesive, such as a hot melt adhesive, designated by reference numeral 300 in Figures 1-3, can be used to join the first layer 100 to second layer 200.

When the first layer is wetted, there is a tendency for the first layer 100 to expand along one or more directions in the plane of the first layer. (The plane of the first layer is parallel to the plane of Figure 1). However, because of the relatively lower wet extensibility of the second layer 200, the second layer constrains extension of the first layer 100 in the plane of the first layer. As a result, the unbonded regions 114 of the first layer 100 deform, such as by buckling or puckering in the Z-direction, perpendicular to the plane of the first layer 100.

Figure 5A is a cross-sectional illustration of the cleansing and conditioning article 20 prior to wetting of the first layer 100. As shown in Figure 5A, the wiping article is generally flat prior to wetting. Figure 5B is a cross-sectional illustration similar to that of Figure 5A, but showing the article 20 after wetting of the first layer 100. Figure 5B shows out of plane deformation of the first layer 100 upon wetting of the first layer 100. The Z-direction is indicated in Figures 5A and 5B. The deformation of the wetted first layer 100 provides the article 20 with elevated ridges 120 which increase the wet texture, wet caliper (thickness) and wet bulk of the article 20. The elevated ridges 120 also provide pockets 150 disposed between the unbonded portions of the first layer 100 and the underlying portions of the second layer. In particular, the article 20 has a wet caliper to dry caliper ratio which is greater than 1.0, preferably at least about 1.1, more preferably at least about 1.2, and most preferably at least about 1.4. The wet caliper to dry caliper ratio is a measure of the thickness of the article 20, when wetted, relative to the thickness of the dry article 20 prior to wetting. The wet caliper to dry caliper ratio is measured according to the procedure "Wet Caliper to Dry Caliper Ratio" provided below.

In a preferred embodiment, as shown in Figure 1, the first layer 100 is apertured, the first layer 100 comprising a plurality of apertures 102 which extend through the thickness of the first layer 100. Apertures, while not necessary to practice the present invention, add greatly to the desired texture and bulk of wiping article 20. In Figures. 1-3, apertures 102 are shown on only a portion of the first layer 100 for clarity. When an apertured first layer is used, the deformation of the wetted first layer 100 again provides the article 100 with elevated ridges 120 which increase the wet texture, wet caliper (thickness) and wet bulk of the article 20. However, in this embodiment, the elevated ridges 120 have apertures 102 which provide a flow path through which liquids and/or small particles can enter the pockets 150.

Additionally, since the article 20 is used with, or includes a lathering agent, such as a surfactant, the apertures 102 can aid in the incorporation of air during the lathering process, thereby improving lather generation. For instance, a portion of the article 20 can be coated with or otherwise treated with a surfactant composition, as described more fully below. The article 20 can be wetted with water to activate the surfactant, and the airflow generated through the apertures 102 during use of the article (e.g. washing or wiping) can help to generate lather.

The size and number of the apertures 102 can influence the speed of lather generation and the quality of lather produced. A relatively small number of relatively large apertures 102 will tend to reduce the time required to generate lather, but will yield relatively large lather bubbles with a translucent appearance. On the other hand, a relatively larger number of relatively smaller apertures 102 will tend to reduce bubble size, thereby increasing lather creaminess and opacity, but at the expense of increasing the time required to generate lather. Between about 4 and about 300 apertures per inch can provide suitable lather speed and quality.

Another advantage has been identified when first layer 100 is apertured. As shown in Figure 5B, in addition to the formation of elevated ridges 120, the wet extension of first layer 100 around apertures 102 forms what can best be described as cusps 106, or surface irregularities formed by the apertures 102. Cusps 106 give added texture to the surface on the side of apertured surface 22 of first layer 100. This added texture may be modified as needed by adjusting the size and spacing of apertures 102.

Also depicted in Figure 3, is another variation on the configuration of bonded and unbonded regions. In the embodiment shown, the bonded regions 110 are generally parallel, spaced apart regions which extend along substantially the full length of the article

20, and define generally parallel, spaced apart unbonded regions 114 of the first layer 100. In Figure 3, the unbonded regions 114 extend along substantially the full length of the article 20. An adhesive, designated by reference numeral 300 in Figures 1 and 2 and numerals 300, 310A-310D in Figure 3, can be used to join the first layer 100 to the second layer 200.

In a currently preferred embodiment, a wipe 20 of the present invention comprises an apertured cellulosic paper first layer bonded to a synthetic nonwoven in a continuous network of intersecting lines defining diamond-shaped unbonded regions. This combination of materials and bonding method and pattern provides for a preferred wipe that exhibits increased texture and bulk on one side upon wetting, while maintaining relatively smooth softness on the other side, and has a wet caliper greater than the dry caliper.

In addition to the above description, it has been found that an additional processing step involving heating the substrate after bonding further improves the texture and bulk, as well as the general aesthetic qualities of the wipe. Without being bound by theory, it is believed that the process of heating causes the thermoplastic adhesive to contract, thereby further causing out-of-plane (Z-direction) deformation of the first layer, as well as the second layer. By contracting in the plane of the wipe article, both layers experience a Z-direction increase in caliper, giving increased overall caliper with a pleasing quilted look.

For example, a wipe that has been adhesively bonded with an EVA hot melt adhesive (one suitable adhesive is a hot melt adhesive commercially available as H1382-01 from Ato-Findley Adhesives of Wauwatosa, Wisconsin), may increase in caliper between 10-20% after a post-lamination heat treatment. In this case, a suitable hot melt adhesive is applied and the resulting article is cooled to room temperature. Heat treatment may then be performed, for example, raising the temperature to 100 degrees Celsius for 20 seconds is sufficient to initiate contraction of the polymer network. While not being bound by theory, it is believed that for this process to be effective, the pattern of bonding must be a continuous or essentially continuous network. Discrete bond sites may not sufficiently contract to improve the appearance of the article.

30 First Layer:

Referring to the components of the article 20 in more detail, suitable materials from which the first layer 100 can be formed include foreshortened (such as by creping) wetlaid paper webs. Other suitable materials can include woven materials, nonwoven materials, foams, battings, and the like.

The first layer 100 should be constructed to have a wet extensibility of at least 4 percent, more preferably at least about 10 percent, and still more preferably at least about 20 percent. In one embodiment, the first layer has a wet extensibility of at least about 25 percent. Preferably, the difference between the wet extensibility of the first layer and the wet extensibility of the second layer (the wet extensibility of the second layer subtracted from the wet extensibility of the first layer) is at least about 4 percent, more preferably at least about 10 percent, and still more preferably at least about 25 percent.

The fibers or filaments of the first layer 100 can be natural (e.g. cellulosic fibers such as wood pulp fibers, cotton linters, and bagasse fibers) or synthetic (e.g. polyolefins, rayon, polyamides or polyesters), or combinations thereof.

In one preferred embodiment, the first layer 100 comprises a wetlaid paper web of cellulosic wood pulp fibers which is foreshortened at least about 4 percent, more preferably at least about 10 percent, and still more preferably at least about 20 percent, by dry creping. Referring to Figure 4, the first layer 100 is shown comprising crepe ridges 105 corresponding to the foreshortening of the first layer 100. The machine direction (MD) and cross machine direction (CD) are indicated in Figures 1-4. The machine direction corresponds to the direction of manufacture of the paper web of first layer 100. The crepe ridges 105 are generally perpendicular to the machine direction, and generally parallel to the cross machine direction of the paper web of first layer 100.

The paper web of the first layer 100 can have a basis weight of between about 15 to about 65 grams per square meter. In a preferred embodiment, the basis weight of the first layer is between about 25 to about 45 grams per square meter, and in a more preferred embodiment, the basis weight of the first layer 100 is about 35 grams per square meter.

While not wishing to be bound by theory, it is believed that the paper strength can significantly alter the overall appearance of the complete article. The amount of crepe input to the first layer is directly proportional to the amount of planar expansion and thereby the amount of caliper generated upon wetting. However, if the wet strength of the paper article is insufficient, the "buckles" may collapse to form a more "wrinkled" product having less caliper. Therefore both crepe and wet strength can be adjusted to provide an amount of texture based on the intended use of the article. Wet burst measurements were measured by a Thwing-Albert Burst Tester model number 1300-77, which tested peak load of a fully wetted substrate. The test utilized a 0.5 in ball diameter, a 5 in/min ball velocity, and clamps the test sample around a 3.5 in. diameter circle perpendicular to the motion of the ball. Peak load wet burst strengths are between 100 and 1200 grams per ply. More preferably between 400 and 700 grams per ply and most preferably between 500 and 600 grams per ply.

In a more preferred embodiment, the first layer 100 comprises an apertured wetlaid paper web of cellulosic wood pulp fibers. The apertures 102 can be formed in the first layer 100 in any suitable manner. For instance, the apertures 102 can be formed in the first layer 100 during formation of the paper web of the first layer 100, or alternatively, after the paper web of the first layer 100 is manufactured. In one embodiment, the paper web of the first layer 100 is produced according to the teachings of one or more of the following U.S. Patents, which Patents are incorporated herein by reference: U.S. Patent No. 5,245,025 issued Sept. 14, 1993 to Trokhan et al.; U.S. Patent No. 5,277,761 issued January 11, 1994 to Phan et al.; and U.S. Patent No. 5,654,076 issued August 5, 1997 to Trokhan et al. In particular, U.S. Patent No. 5,277,761 at Column 10 discloses formation of a paper web having a apertures.

Prior to wetting of the first layer, the creped first layer 100 can have between about 4 and about 300 apertures 102 per square inch, and more preferably between about 4 and about 100 apertures 102 per square inch. Wetting a creped paper web causes the web, if unrestrained, to expand in at least one direction, such as the machine direction, so that the number of apertures 102 per square inch after wetting can be smaller than the number of apertures per square inch prior to wetting. Similarly, when apertures are formed in a paper web, and the paper web is subsequently creped, the number of apertures per square inch prior to creping will be smaller than the number of apertures per square inch after creping. Accordingly references to paper web dimensions refer to dimensions after creping and prior to wetting.

The apertures 102 can comprise between about 15 and about 75 percent of the total surface of the first layer 100. The apertures 102 shown in Figure 2 are bilaterally staggered (staggered in both the machine and cross machine directions) in a repeating, nonrandom pattern. In one embodiment, the first layer 100 comprises a paper web which is dry creped 25 percent (25 percent foreshortening) with greater than about 25 percent wet extensibility, and has about 40 to about 50 apertures, 102, per square inch, the apertures 102 having a length 103 (Figure 4) of about 0.10 to about 0.18 inch and a width 104 of about 0.07 to about 0.15 inch, and a distance between apertures 106 of about 0.05 to about 0.08 inch.

The paper web is manufactured by first forming an aqueous papermaking furnish. The furnish comprises papermaking fibers, and can further comprise various additives. U.S. Patent 5,223, 096 issued June 29, 1993 to Phan et al. is incorporated herein by reference for the purpose of disclosing various wood pulps and papermaking additives.

A suitable paper web for making the first layer 100 can be manufactured according to the following description. A papermaking furnish is prepared from water and highly refined Kraft pulp derived from northern softwoods (NSK), the paper furnish having a fiber consistency of about 0.2 percent (dry fiber weight divided by the total weight of the furnish

application level of about 0.93 grams of adhesive per square inch. Immediately following application of the adhesive to the nonwoven second layer 200, the nonwoven second layer 200 and the paper first layer 100 can be bonded together by pressing the two layers 100 and 200 together with the adhesive disposed between the second layer 200 and the first layer 100. One suitable means for pressing the two layers 100 and 200 together is by passing the two layers through a nip formed between two rollers, with the rollers loaded to provide adequate nip pressure for bonding.

The resulting laminate of the first and second layers can have an average dry caliper of about 28.5 mils (0.0285 inch), an average wet caliper of about 32.1 mils (0.0321 inch), and a wet caliper to dry caliper ratio of about 1.1. The dry caliper, wet caliper, and wet caliper to dry caliper ratio are measured as described below under "Wet Caliper to Dry Caliper Ratio."

Wet Extensibility Test

The wet extensibility of a layer, such as the layer 100 or the layer 200, is determined using the following procedure. Samples are conditioned at 70 degrees Fahrenheit and 50 percent relative humidity for two hours prior to testing.

First, the direction of greatest wet extensibility in the plane of the layer is determined. For dry creped paper webs, this direction will be parallel to the machine direction, and generally perpendicular to the crepe ridges.

If the direction of greatest wet extensibility is not known, the direction can be determined by cutting seven samples from a sheet with sample lengths oriented between 0 degrees and 90 degrees, inclusive, with respect to a reference line drawn on the sheet. The samples are then measured as set forth below to determine the direction of greatest wet extensibility.

Once the direction of the greatest wet extensibility is determined, 8 samples are cut to have a length of about 7 inches measured parallel to the direction of greatest wet extensibility, and a width of at least 1 inch. The samples are cut from unbonded portions of the layers 100 and 200, or, if unbonded portions having the above dimensions cannot be cut from the article 20, then samples are cut from the layers 100 and 200 prior to bonding the layers together. Two marks are placed on each sample, such as with an ink pen. The marks are spaced apart 5 inches as measured parallel to the direction of greatest wet extensibility. This 5 inch length is the initial dry test length of the sample.

Each sample is thoroughly wetted by submerging the sample in distilled water for 30 seconds in a water bath. Each sample is removed from the water bath and immediately

supported to hang vertically so that a line through the two marks is generally vertical. The wet sample is supported such that the support does not interfere with extension between the two marks (e.g. with a clip which does not contact the sample between the two marks). The wet test length of the sample is the distance between the two marks. The distance is measured within 30 seconds of removing the sample from the water bath.

For each sample, the percent wet extension is calculated as

Sample Wet Extension = (wet test length - initial dry test length)/(initial dry test length) x 100

For example, for a measured wet test length of 6.5 inches and an initial dry test length of 5.0 inches, the wet extension is $((6.5-5)/5) \times 100 = 30$ percent.

The wet extensibility of the samples is the average of 8 calculated values of sample wet extension.

WET CALIPER TO DRY CALIPER RATIO

The wet caliper to dry caliper ratio is measured using a Thwing-Albert Instrument Co. Electronic Thickness Tester Model II, using the following procedure. Samples are conditioned at 70 degrees Fahrenheit and 50 percent relative humidity for two hours prior to testing.

The dry caliper of the article 20 is measured using a confining pressure of 95 grams per square inch and a load foot having a diameter of 2 inches. The dry caliper is measured for eight samples. For each sample, the caliper is measured with the load foot centered on an unbonded region of the first layer 100. The eight caliper measurements are averaged to provide an average dry caliper.

Each sample is then wetted by submerging the sample in a distilled water bath for 30 seconds. The sample is then removed from the water bath and drained by hanging vertically for about five seconds. The caliper of the wet sample is measured within 30 seconds of removing the sample from the bath. The wet caliper is measured in the same location in which the dry caliper was previously measured. The eight wet caliper measurements are averaged to provide an average wet caliper. The wet caliper to dry caliper ratio is the average wet caliper divided by the average dry caliper.

The wet caliper to dry caliper ratio is the average wet caliper divided by the average dry caliper.

329
302

329

LATHERING SURFACTANT

The articles of the present invention comprise one or more lathering surfactants which are added onto or impregnated into the substrate. Preferred articles of the present invention comprise a sufficient amount of one or more lathering surfactants such that the articles are capable of generating ≥ 30 ml of Lather Volume (medium hardness water at 95 °C) according to the Lather Volume Test described below. Preferably, the articles of the present invention comprise from about 0.5% to about 12.5%, more preferably from about 0.75% to about 11%, and most preferably from about 1% to about 10%, based on the weight of the water insoluble substrate, of a lathering surfactant.

By a lathering surfactant is meant a surfactant, which when combined with water and mechanically agitated generates a foam or lather sufficient to cause the article, as a whole, to lather. Preferably, these surfactants or combinations of surfactants should be mild, which means that these surfactants provide sufficient cleansing or deterative benefits but do not overly dry the skin or hair, and yet meet the lathering criteria described above.

A wide variety of lathering surfactants are useful herein and include those selected from the group consisting of anionic lathering surfactants, nonionic lather surfactants, amphoteric lathering surfactants, and mixtures thereof. Generally, the lathering surfactants do not strongly interfere with deposition of the conditioning agents, e.g., are fairly water soluble, and usually have an HLB value of above 10. Cationic surfactants can also be used as optional components, provided they do not negatively impact the overall lathering characteristics of the required, lathering surfactants.

Anionic Lathering Surfactants

Nonlimiting examples of anionic lathering surfactants useful in the compositions of the present invention are disclosed in McCutcheon's, Detergents and Emulsifiers, North American edition (1986), published by Allured Publishing Corporation; McCutcheon's, Functional Materials, North American Edition (1992); and U.S. Patent No. 3,929,678, to Laughlin et al., issued December 30, 1975 all of which are incorporated by reference herein in their entirety.

A wide variety of anionic lathering surfactants are useful herein. Nonlimiting examples of anionic lathering surfactants include those selected from the group consisting of sarcosinates, sulfates, isethionates, taurates, phosphates, lactylates, glutamates, and mixtures thereof. Amongst the isethionates, the alkoyl isethionates are preferred, and amongst the sulfates, the alkyl and alkyl ether sulfates are preferred. The alkoyl isethionates typically have the formula $ROO-CH_2CH_2SO_3M$ wherein R is alkyl or alkenyl of from about 10 to about 30 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium and triethanolamine. Nonlimiting examples of these

isethionates include those alkoyl isethionates selected from the group consisting of ammonium cocoyl isethionate, sodium cocoyl isethionate, sodium lauroyl isethionate, and mixtures thereof.

The alkyl and alkyl ether sulfates typically have the respective formulae $ROSO_3M$ and $RO(C_2H_4O)_xSO_3M$, wherein R is alkyl or alkenyl of from about 10 to about 30 carbon atoms, x is from about 1 to about 10, and M is a water-soluble cation such as ammonium, sodium, potassium and triethanolamine. Another suitable class of anionic surfactants are the water-soluble salts of the organic, sulfuric acid reaction products of the general formula:



wherein R1 is chosen from the group consisting of a straight or branched chain, saturated aliphatic hydrocarbon radical having from about 8 to about 24, preferably about 10 to about 16, carbon atoms; and M is a cation. Still other anionic synthetic surfactants include the class designated as succinamates, olefin sulfonates having about 12 to about 24 carbon atoms, and α -alkyloxy alkane sulfonates. Examples of these materials are sodium lauryl sulfate and ammonium lauryl sulfate.

Other anionic materials useful herein are soaps (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. 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 are described in more detail in U.S. Patent No. 4,557,853, cited above.

Other anionic materials include phosphates such as monoalkyl, dialkyl, and trialkylphosphate salts.

Other anionic materials include alkanoyl sarcosinates corresponding to the formula $RCON(CH_3)CH_2CH_2CO_2M$ wherein R is alkyl or alkenyl of about 10 to about 20 carbon atoms, and M is a water-soluble cation such as ammonium, sodium, potassium and triethanolamine (e.g., triethanolamine), a preferred examples of which are sodium lauroyl sarcosinate, sodium cocoyl sarcosinate, ammonium lauroyl sarcosinate, and sodium myristoyl sarcosinate. TEA salts of sarcosinates are also useful.

Also useful are taurates which are based on taurine, which is also known as 2-aminoethanesulfonic acid. Especially useful are taurates having carbon chains between C8 and C16. Examples of taurates include N-alkyltaurines such as the one prepared by reacting dodecylamine with sodium isethionate according to the teaching of U.S. Patent 2,658,072 which is incorporated herein by reference in its entirety. Further nonlimiting

330
323

330