

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

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 September 2010 (23.09.2010)

PCT

(10) International Publication Number
WO 2010/107635 A1

(51) International Patent Classification:
C11D 3/00 (2006.01) *C11D 3/37* (2006.01)
C11D 11/00 (2006.01)

(21) International Application Number:
PCT/US2010/026737

(22) International Filing Date:
10 March 2010 (10.03.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/160,426 16 March 2009 (16.03.2009) US

(71) Applicant (for all designated States except US): **THE PROCTER & GAMBLE COMPANY** [US/US]; One Procter & Gamble Plaza, Cincinnati, Ohio 45202 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DE BUZZAC-CARINI, Francesco** [IT/BE]; Koningin Astridlaan 5, B-2870 Breendonk (BE). **CEULEMANS, Raphael, Angeline Alfons** [BE/BE]; Lozenhoek 20, B-3220 Holsbeek (BE). **HEISEY, Matthew, Thomas** [US/US]; 1245 Forest Ct., Cincinnati, Ohio 45215 (US). **OFFSHACK, Edward, Robert** [US/US]; 411 Rawson Woods Lane, Cincinnati, Ohio 45220 (US).

(74) Common Representative: **THE PROCTER & GAMBLE COMPANY**; c/o HUGHETT, Eileen, L., Global Patent Services, 299 East Sixth Street, Sycamore Building, 4th Floor, Cincinnati, Ohio 45202 (US).

(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, 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, PE, PG, PH, PL, PT, RO, RS, RU, 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, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (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, 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))

(54) Title: METHOD OF INDUSTRIAL OR INSTITUTIONAL LAUNDRY FOR A POLYESTER LOAD

(57) Abstract: A method of cleaning a polyester load in a professional laundry machine the method comprises subjecting the load to main-wash, rinse and optionally pre-wash cycles and wherein the method comprises the step of contacting the load with an aqueous wash liquor containing a detergent composition comprising a silicone suds suppressor.



WO 2010/107635 A1

CM3373/SK

1

METHOD OF INDUSTRIAL OR INSTITUTIONAL LAUNDRY FOR A POLYESTER LOAD

TECHNICAL FIELD

The present invention is in the field of laundry. In particular, it relates to a method of industrial
5 or institutional laundry for a polyester load using a silicone suds suppressor during the wash
process.

BACKGROUND OF THE INVENTION

Even though the principles that determine the effectiveness of detergents for household (or
10 home) and professional (including institutional and industrial) laundries are similar, detergents
for large-scale institutional or industrial use generally differ insofar as they must be designed to
meet the special circumstances associated with laundry on an industrial scale and/or in an
institutional context. Contrary to home laundry, professional laundries have to deal with large
volumes of textile items and require therefore completely automatic processing with
15 microprocessor-controlled machines and dosing units. The length of the washing process differs
from that of home laundry and in some cases the washing is performed with soft water. Soil
levels can be significantly lower in certain types of loads of professional laundry (for example
towels and bed linen in a hotel which have minimal use and soiling before being re-washed) than
in household laundry and the loads and the machines are considerably bigger. The composition
20 of the loads is more uniform, in terms of both, types of fabrics and soils. For example a typical
commercial laundry load will consist of only towels, only bed linen or only table linen
(tablecloths and napkins).

Due to the size of the washing equipment, professional laundry involves higher mechanical
25 action than home laundry and this promotes foaming. Foaming is also promoted in the case of
laundry loads consisting mainly of synthetic fabrics, in particular polyester fabrics. Polyester
items are hydrophobic and they are not capable to absorb surfactants. During the washing
process, polyester items seem to be less densely packed than cotton items, being more prone to
sudsing. Suds negatively affect the laundry cleaning performance because contributes to the
30 suspension of items in the wash liquor precluding the free rise and fall of the items, leading to
reduction of mechanical action which is one of the major elements contributing to cleaning.

CM3373/SK

2

Low sudsing in washing polyester loads could be achieved through the selection of inherently low sudsing surfactants, primarily non-ionics, versus the use of anionics, for example. However this leads to poor performance on certain varieties of soils, because this limits the selection to potentially compromised-in-performance surfactants. An approach to overcome this lost of performance is the addition of high levels of alkalinity, as alkalinity itself can help drive soil removal. But alkalinity can drive (alkaline) hydrolysis of the polyester molecules that comprise the fibers, and thus damage the very fabrics intended for cleaning. The alkalinity can also drive mineral salt encrustation and many other issues.

Some of the professional laundry systems involve the use of soft water. Soft water also promotes sudsing. Under these circumstances, it is difficult to perform a good cleaning.

Fatty acids or fatty soaps are commonly used as suds suppressors in laundry. They rely on the presence of water hardness ions to work. When water hardness ions are present they can form salts which can disrupt the suds. If there are no water hardness ions, as the case is with soft water, then the soap might even cause additional suds. It has been found that if a load of polyester is washed in soft water, using a normal amount of detergent, the level of suds can be so high that it can overflow the machine, this seems to be worse when the level of soil is low.

SUMMARY OF THE INVENTION

According to a first aspect of the invention, there is provided a method of cleaning a polyester load in a professional laundry machine. The method comprises subjecting the load to main-wash, rinse and optionally pre-wash cycles and wherein the method comprises the step of contacting the load with an aqueous wash liquor containing a detergent composition comprising a silicone suds suppressor.

By polyester load is understood a load comprising at least about 50%, preferably at least about 60%, more preferably at least about 80% and more preferably at least 95% by weight of the load of polyester items.

It has been found that textile loads containing a high level of polyester items give rise to high suds that impact negatively in the cleaning process. The method of the invention provides improved cleaning.

CM3373/SK

3

In a preferred embodiment the level of anionic surfactant is greater than 10%, more preferably greater than 15% and especially greater than 20% by weight of the detergent composition. This provides an outstanding cleaning over a great range of soils. The detergent composition preferably comprises non-ionic surfactant and anionic surfactant. The level of anionic surfactant is higher than the level of non-ionic surfactant, by "higher" is herein meant that the level of anionic surfactant is at least 1% by weight more than the level of non-ionic surfactant, preferably at least 5%, more preferably at least 15% and especially at least 20%. Preferably the level of non-ionic surfactant is less than 10% by weight of the detergent composition. The method of the invention also allows for flexibility in terms of detergent formulation.

10

Polyester with low level of soil and new polyester items can be even more prone to sudsing than highly soiled items. The method of the invention performs very well even in the case of loads with low level of soil (typically towels or bed linen) or new items. By the term "low soiled items" is herein understood items free from visible stains. By the term "new items" is herein understood items that have not been subjected to a washing process.

15

As mentioned above, soft water further contributes to aggravate the suds problem. In preferred embodiments the liquor of the method of the invention, preferably the liquor of each cycle, has a hardness, i.e., Ca and Mg ions concentration, of less than about 1, preferably less than about 0.5 and especially less than about 0.2 mmol/L.

20

Another factor that further aggravates the suds problem is heating by steam means. In another embodiment the method of the invention involves the step of heating the cleaning water using steam, in particular steam injection.

25

Excellent cleaning is obtained with the method of the invention, even when using soft water and when the water is heated by steam means.

30

Good cleaning performance is obtained when the level of active suds suppressor in the wash liquor is from about 0.1 to about 10, more preferably from about 0.2 to about 5 and especially from about 0.8 to about 3 ppm. Preferred suds suppressor for use herein is a polydimethylsiloxane compounded with silica.

CM3373/SK

4

In preferred embodiments the wash liquor, preferably the wash liquor of the main wash, has a pH of from about 7 to about 10, preferably from about 8 to about 9, as measured at room temperature (20°C) this allows not only for good cleaning but also for good care of the washed articles.

- 5 In preferred embodiments the detergent composition comprises anionic surfactant, preferably in a level of at least 10%, more preferably at least 12% by weight of the detergent composition, and at least 50%, preferably at least 70% and more preferably at least 80% by weight of the anionic surfactant is an alkyl benzene sulfonated (LAS). Detergents rich in LAS, used according to the method of the invention, provide not only good cleaning but also have a low suds profile.

10

- In preferred embodiments the method of the invention comprises the step of contacting the load with a soil release polymer, in any of the wash cycles, preferably during the main-wash or a rinse cycle. Preferably the soil release polymer is added as part of an additive rather than as part of a detergent composition. This not only obviates the process challenges found to make the soil
15 release polymer part of a base detergent but also eliminates the interaction between some of the base detergent ingredients and the polymer and gives flexibility in terms of dosing.

DETAILED DESCRIPTION OF THE INVENTION

- The present invention envisages a method of professional laundry of a polyester load. The
20 method involves contacting the load with a detergent comprising a silicone suds suppressor. The method provides improved cleaning. It has been found that the problem of high suds is more acute in the case of a load with low level of soil, ie. a load with less than 10 g of soil per kilogram of load, preferably with less than 5 g of soil per kilogram of load. Preferably the polyester load used in the method of the present invention is a load with low level of soil.

25

- Professional laundry includes institutional and industrial (sometimes also referred to as commercial) laundry. Institutional laundry refers to textile washing operations usually run in business sites, normally referred to as On-Premise or In-House Laundry Operations. Typical businesses can be for instance hotels, restaurants, care homes, hospitals, spas, health or sport
30 clubs, schools, and similar institutions. Industrial laundry refers to textile washing operations carried out in dedicated places typically for the above businesses.

CM3373/SK

5

By “professional laundry machine” is herein meant a laundry machine which a capacity higher than 8 kg, preferably higher than 15 kg and more preferably higher than 25 kg of dry laundry.

There are two main types of professional laundry machines: front load which operate in a batch mode or tunnel washing machines that operate in continuous mode. The professional laundry machines for use herein, in the case of front load have a drum volume of at least about 0.15 m³, preferably at least 0.2 m³, more preferably at least 0.3 m³ and especially at least 0.5 m³. The professional laundry machines for use herein, in the case of front load have a drum diameter of at least about 0.5 m, preferably at least 0.8 m and more preferably at least 1 m. In the case of tunnel washing machines the tunnel has a diameter of at least about 1.5 m, preferably at least 3m and more preferably at least 5 m.

Silicone suds suppressor

Silicone suds suppressor is defined herein as any antifoam compound including a silicone component. Such silicone suds suppressor also typically contains a silica component. The term “silicone” as used herein, and in general throughout the industry, encompasses a variety of relatively high molecular weight polymers containing siloxane units and hydrocarbyl group of various types like the polyorganosiloxane oils, such as polydimethyl-siloxane, dispersions or emulsions of polyorganosiloxane oils or resins, and combinations of polyorganosiloxane with silica particles wherein the polyorganosiloxane is chemisorbed or fused onto the silica. Silicone suds suppressers are well known in the art and are, for example, disclosed in U.S. Pat. No. 4,265,779, and EP 354 016. Other silicone suds suppressers are disclosed in U.S. Pat. No. 3,455,839 which relates to compositions and processes for defoaming aqueous solutions by incorporating therein small amounts of polydimethylsiloxane fluids. Mixtures of silicone and silanated silica are described, for instance, in German Patent Application DOS 2,124,526. Silicone defoamers and suds controlling agents in granular detergent compositions are disclosed in U.S. Pat. No. 3,933,672 and in U.S. Pat. No. 4,652,392.

Examples of suitable silicone antifoam compounds are the combinations of polyorganosiloxane with silica particles commercially available from Dow Corning, Wacker Chemie and General Electric.

CM3373/SK

6

Silicone suds suppressors are typically utilized in amounts up to about 2% by weight of the detergent composition, although higher amounts may be used. This upper limit is practical in nature, due primarily to concern with keeping costs minimized and effectiveness of lower amounts for effectively controlling sudsing. Preferably from about 0.01 % to about 1 % of active silicone suds suppressor is used, more preferably from about 0.05% to about 0.5% by weight of the detergent composition. As used herein, the term "active" excludes water and inactive ingredients (in terms of suds suppression).

Detergent composition

10 Detergent Surfactant

Compositions suitable for use herein comprises from 5% to 70% by weight, preferably from 10% to 60% by weight, more preferably from 20% to 50% by weight, of a certain kind of detergent surfactant component. Such an essential detergent surfactant component must comprise anionic surfactants, nonionic surfactants, or combinations of these two surfactant types.

15

Suitable anionic surfactants useful herein can comprise any of the conventional anionic surfactant types typically used in liquid detergent products. These include the alkyl benzene sulfonic acids and their salts as well as alkoxylated or un-alkoxylated alkyl sulfate materials.

20 Preferred anionic surfactants are the alkali metal salts of C₁₀₋₁₆ alkyl benzene sulfonic acids, preferably C₁₁₋₁₄ alkyl benzene sulfonic acids. Preferably the alkyl group is linear and such linear alkyl benzene sulfonates are known as "LAS". Alkyl benzene sulfonates, and particularly LAS, are well known in the art. Such surfactants and their preparation are described for example in U.S. Patents 2,220,099 and 2,477,383. Especially preferred are the sodium and potassium
25 linear straight chain alkylbenzene sulfonates in which the average number of carbon atoms in the alkyl group is from about 11 to 14. Sodium C₁₁-C₁₄, e.g., C₁₂, LAS is especially preferred. Preferably the anionic surfactant comprises at least 50%, more preferably at least 60% and especially 70% by weight of the anionic surfactant of LAS.

30 Another preferred type of anionic surfactant comprises ethoxylated alkyl sulfate surfactants. Such materials, also known as alkyl ether sulfates or alkyl polyethoxylate sulfates, are those which correspond to the formula:

CM3373/SK

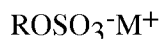
7



wherein R' is a C₈-C₂₀ alkyl group, n is from about 1 to 20, and M is a salt-forming cation. Preferably, R' is C₁₀-C₁₈ alkyl, n is from about 1 to 15, and M is sodium, potassium, ammonium, alkylammonium, or alkanolammonium. Most preferably, R' is a C₁₂-C₁₆, n is from
 5 about 1 to 6 and M is sodium.

The alkyl ether sulfates will generally be used in the form of mixtures comprising varying R' chain lengths and varying degrees of ethoxylation. Frequently such mixtures will inevitably also contain some unethoxylated alkyl sulfate materials, i.e., surfactants of the above ethoxylated
 10 alkyl sulfate formula wherein n=0. Unethoxylated alkyl sulfates may also be added separately to the compositions of this invention and used as or in any anionic surfactant component which may be present.

Preferred unalkoxyxylated, e.g., unethoxylated, alkyl ether sulfate surfactants are those produced
 15 by the sulfation of higher C₈-C₂₀ fatty alcohols. Conventional primary alkyl sulfate surfactants have the general formula:



wherein R is typically a linear C₈-C₂₀ hydrocarbyl group, which may be straight chain or branched chain, and M is a water-solubilizing cation. Preferably R is a C₁₀-C₁₅ alkyl, and M is
 20 alkali metal. Most preferably R is C₁₂-C₁₄ and M is sodium.

Suitable nonionic surfactants useful herein can comprise any of the conventional nonionic surfactant types typically used in liquid detergent products. These include alkoxyated fatty alcohols, ethylene oxide (EO)-propylene oxide (PO) block polymers, and amine oxide
 25 surfactants. Preferred for use in the liquid detergent products herein are those nonionic surfactants which are normally liquid.

Preferred nonionic surfactants for use herein include the alcohol alkoxyate nonionic surfactants. Alcohol alkoxyates are materials which correspond to the general formula:



CM3373/SK

8

wherein R^1 is a $C_8 - C_{16}$ alkyl group, m is from 2 to 4, and n ranges from about 2 to 12. Preferably R^1 is an alkyl group, which may be primary or secondary, that contains from about 9 to 15 carbon atoms, more preferably from about 10 to 14 carbon atoms. Preferably also the alkoxyated fatty alcohols will be ethoxylated materials that contain from about 2 to 12 ethylene oxide moieties per molecule, more preferably from about 3 to 10 ethylene oxide moieties per molecule.

The alkoxyated fatty alcohol materials useful in the liquid detergent compositions herein will frequently have a hydrophilic-lipophilic balance (HLB) which ranges from about 3 to 17. More preferably, the HLB of this material will range from about 6 to 15, most preferably from about 8 to 15. Alkoxyated fatty alcohol nonionic surfactants have been marketed under the tradenames Neodol and Dobanol by the Shell Chemical Company.

Another type of nonionic surfactant which is liquid and which may be utilized in the compositions of this invention comprises the ethylene oxide (EO) - propylene oxide (PO) block polymers. Materials of this type are well known nonionic surfactants which have been marketed under the tradename Pluronic. These materials are formed by adding blocks of ethylene oxide moieties to the ends of polypropylene glycol chains to adjust the surface active properties of the resulting block polymers. EO-PO block polymer nonionics of this type are described in greater detail in Davidsohn and Milwidsky; Synthetic Detergents, 7th Ed.; Longman Scientific and Technical (1987) at pp. 34-36 and pp. 189-191 and in U.S. Patents 2,674,619 and 2,677,700.

Yet another suitable type of nonionic surfactant useful herein comprises the amine oxide surfactants. Amine oxides are materials which are often referred to in the art as "semi-polar" nonionics. Amine oxides have the formula: $R(EO)_x(PO)_y(BO)_zN(O)(CH_2R')_{2.q}H_2O$. In this formula, R is a relatively long-chain hydrocarbyl moiety which can be saturated or unsaturated, linear or branched, and can contain from 8 to 20, preferably from 10 to 16 carbon atoms, and is more preferably $C_{12}-C_{16}$ primary alkyl. R' is a short-chain moiety preferably selected from hydrogen, methyl and $-CH_2OH$. When $x+y+z$ is different from 0, EO is ethyleneoxy, PO is propyleneoxy and BO is butyleneoxy. Amine oxide surfactants are illustrated by $C_{12}-14$ alkyldimethyl amine oxide.

CM3373/SK

9

In the liquid detergent compositions herein, the essential deterative surfactant component may comprise combinations of anionic and nonionic surfactant materials. When this is the case, the weight ratio of anionic to nonionic will typically range from 100:1 to 1:100, more typically from 20:1 to 1:20.

5

Laundry washing adjuncts

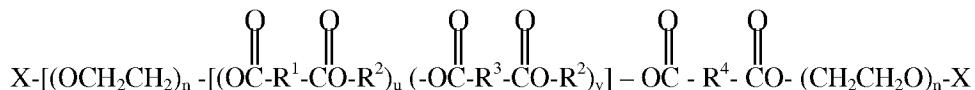
The detergent compositions herein, preferably in liquid form, comprise from 0.1% to 30% by weight, preferably from 0.5% to 20% by weight, more preferably from 1% to 10% by weight, of one or more of certain kinds of laundry washing adjuncts. Such laundry washing adjuncts can be selected from deterative enzymes, builders, chelants, soil release polymers, soil suspending polymers, optical brighteners, dye transfer inhibition agents, bleach, whitening agents, suds suppressors, fabric care benefit agents, solvents, stabilizers, buffers, structurants, dyes and perfumes and combinations of these adjunct types. All of these materials are of the type conventionally utilized in laundry detergent products.

15

Soil release polymer

Soil release polymers enhance the laundry cleaning efficacy by improving release of grease and oil during the laundry process. See soil release agents' definition, p.278-279, "Liquid Detergents" by Kuo-Yann Lai. For use herein, preferred level of soil release polymer per kilogram of load is from about 0.01 to about 0.8 grams, more preferably the level of polymer is less than 0.2 grams especially from about 0.05 to about 0.15 grams. Contrary to what one would expect higher levels of soil release polymer do not enhance removal. In some cases removal is worse than with lower levels.

Improved stain removal is achieved when the soil release polymer is a copolymer having the formula:



30

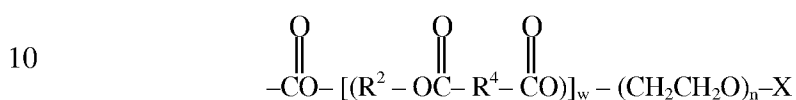
wherein :

- each R^1 moieties is a 1,4-phenylene moiety;

CM3373/SK

10

- the R^2 moieties are each selected from the group consisting of ethylene moieties, 1,2-propylene moieties, 1,2 butylene moieties, 1,2 hexylene moieties, 3-methoxy-1,2 propylene moieties or mixture thereof, provided that said R^2 are not exclusively 1,2 butylene moieties, 1,2 hexylene moieties, 3-methoxy-1,2 propylene moieties or mixture thereof; preferably R^2 is a 1,2-propylene moiety.
- the R^3 moieties are each selected from the group consisting of substituted 1,3-phenylene moieties having the substituent



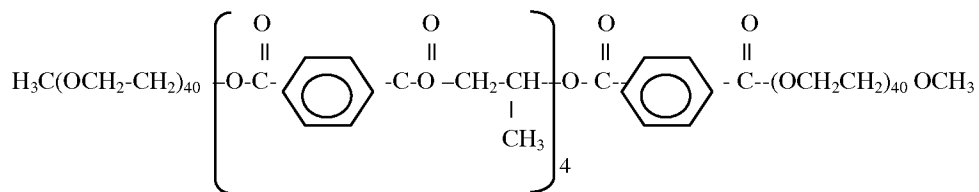
at the 5 position;

- the R^4 moieties are R^1 or R^3 moieties, or mixtures thereof;
- each X is C1-C4 alkyl; each n is from 12 to 43;
- when w is 0, u+v is from 3 to 10;
- when w is at least 1, u+v+w is from 3 to 10.

Preferably w is 0.

- Preferred soil release polymer for use herein is a copolymer comprising propylene glycol derived moieties, terephthalate moieties and capped polyethylene glycol derived moieties. Preferably the capped polyethylene glycol used is $CH_3O(CH_2CH_2O)_nOH$, wherein n is an integer from 12 to 44, preferably from 20 to 42 and more preferably from 25 to 41 and especially 40. Improved performance is obtained with this kind of copolymers.

The prefer copolymer for use herein has the following formula:



CM3373/SK

11

Preferably the soil release polymer has a molecular weight above about 2,000, more preferably above about 3,000 and more preferably above about 4,000. Methods in which soil release polymers having molecular weight above 4,000 have been used provide outstanding results in terms of stain removal. Preferably the molecular weight is below about 20,000. With reference
5 to the polymers described herein, the term "molecular weight" is the weight-average molecular weight as determined using gel permeation chromatography according to the protocol found in Colloids and Surfaces A. Physico Chemical & Engineering Aspects, Vol. 162, 2000, pg. 107-121. The units are Daltons.

10 Preferably the soil release polymer is added as part of an additive. The additive is in liquid form so it can be easily delivered by means of a displacement pump, for example a peristaltic pump. The additive is preferably an aqueous structured liquid, usually the soil release polymer is insoluble in aqueous solution and it is suspended by means of an external structurant. Structured
15 liquids can either be internally structured, whereby the structure is formed by primary ingredients (e.g. surfactant material) and/or externally structured by providing a three dimensional matrix structure using secondary ingredients (e.g. polymers, clay and/or silicate material). The additive comprises the soil release polymer, preferably in an amount of from about 1% to about 50%, more preferably from about 5% to about 20% by weight of the additive. The additive can further comprise an external structurant to keep the soil release polymer suspended. Levels of external
20 structurants of from about 0.05 to about 5%, more preferably from about 0.1 to about 2% and especially from about 0.1 to about 1% by weight of the additive have been found particularly suitable to keep the polymer suspended. Preferred external structurant for use herein is xanthan gum. Preferably the additive comprises a preservative, more preferred in a level of from about 0.05 to about 3% and especially from about 0.1 to about 1% by weight of the additive. A dye is
25 another preferred component of the additive of the invention. Preferably the additive is free of builders and/or surfactants.

Detersive Enzymes

Examples of suitable enzymes include, but are not limited to, hemicellulases, peroxidases,
30 proteases, cellulases, xylanases, lipases, phospholipases, esterases, cutinases, pectinases, keratanases, reductases, oxidases, phenoloxidases, lipxygenases, ligninases, pullulanases, tannases, mannanases?, pentosanases, malanases, β -glucanases, arabinosidases, hyaluronidase, chondroitinase, laccase, and known amylases, or combinations thereof. A preferred enzyme

CM3373/SK

12

combination comprises a cocktail of conventional deterative enzymes like protease, lipase, cutinase and/or cellulase in conjunction with amylase. Deterative enzymes are described in greater detail in U.S. Patent No. 6,579,839.

- 5 If employed, enzymes will normally be incorporated into the base detergent compositions herein at levels sufficient to provide up to 10 mg by weight, more typically from about 0.01 mg to about 5 mg, of active enzyme per gram of the composition. Stated otherwise, the aqueous liquid detergent compositions herein can typically comprise from 0.001% to 5%, preferably from 0.01% to 1% by weight, of a commercial enzyme preparation. Protease enzymes, for example, are
10 usually present in such commercial preparations at levels sufficient to provide from 0.005 to 0.1 Anson units (AU) of activity per gram of detergent composition.

The detergent may also include from about 0.05 to about 0.5% of preservatives non-limiting examples of which include didecyl dimethyl ammonium chloride which is available under the
15 tradeneme UNIQUAT (from Lonza of Basel Switzerland), 1,2-benzisothiazolin-3-one, which is available under the tradeneme PROPEL (from Arch Chemicals of Norwalk, Connecticut), dimethylol-5,5-dimethylhydantoin which is available under the tradeneme DANTOGUARD (from Lonza of Basel Switzerland), 5- Chloro-2- methyl-4- isothiazolin-3-one / 2-methyl-4- isothiazolin-3-one, which is available under the tradeneme KATHON (from Rohm and Haas of
20 Philadelphia, Pennsylvania), and mixtures thereof.

Other Fabric Care Benefit Agents

The detergent composition for use herein may also comprise additional fabric care or benefit agents which can be deposited onto fabrics being laundered and which thereupon provide one or
25 more types of fabric care or treatment benefits. Such benefits can include, for example, fabric softness, anti-static effects, ease-of-ironing benefits, anti-abrasion benefits, anti-pilling effects, color protection, wrinkle removal or improved resistance to wrinkling, fabric substantive perfume or odor benefits, malodor protection benefits, and the like.

- 30 A wide variety of materials which are suitable for providing such benefits and which can be deposited onto fabrics being laundered are known in the art. Such materials can include, for example, clays; starches; polyamines; un-functionalized and functionalized silicones such as aminosilicones and quaternary nitrogen-containing cationic silicones; cellulosic polymers, and

CM3373/SK

13

the like. Materials of these types are described in greater detail in one or more of the following publications: US 6,525,013; US 4,178,254; WO 02/40627; WO 02/18528; WO 00/71897; WO 00/71806; WO 98/39401; and WO 98/29528.

- 5 If employed, such additional fabric care benefit agents polymers can typically be incorporated into the liquid laundry detergent compositions herein in concentrations ranging from 0.05% to 20%, by weight, depending upon the nature of the materials to be deposited and the benefit(s) they are to provide. More preferably, such fabric care benefit agents can comprise from 0.1% to 10%, by weight of the composition.

10

Example:

45 pounds of a polyester load was washed in a Milnor commercial washing machine (model # 30022V6J (55-60 pound capacity)) at 60°C and using soft water (0 mmoles/liter).

- 15 The detergent used had the following composition and it was used at a dosage of 48 grams/machine (or 9.6 ml/kg fabric). The detergent was delivered into the main-wash cycle.

Table 1

Ingredient	% by weight
C12-alkylbenzene sulfonic acid	12.2
Non-ionic surfactant	8.75
C12-alkyl trimethyl amine N-oxide	1.5
C12-14 fatty acid	8.3
Citric acid	3.4
Triethyleneimine penta phosphonic acid	0.19
Ethoxylated polymine polymer	1.1
Enzyme	0.53
1,2 propandiol	4.9
Ethanol	2.8
Monethanolamine	0.83
Monoethanolamine borate	2.4
Cumene sulfonic acid	1.9
BF20 plus silicone suds suppressor Ex Dow Corning	0.13

CM3373/SK

14

Hydrogenated castor oil	0.10
Perfume and minors	0.5
Sodium hydroxide	to pH 8.0
water	Balance

A low suds profile was obtained using the exemplified detergent.

5 The dimensions and values disclosed herein are not to be understood as being strictly limited to the exact numerical values recited. Instead, unless otherwise specified, each such dimension is intended to mean both the recited value and a functionally equivalent range surrounding that value. For example, a dimension disclosed as “40 mm” is intended to mean “about 40 mm”

CM3373/SK

15

CLAIMS

What is claimed is:

1. A method of cleaning a polyester load in a professional laundry machine the method comprises
5 subjecting the load to main-wash, rinse and optionally pre-wash cycles and wherein the method
comprises the step of contacting the load with an aqueous wash liquor containing a detergent
composition comprising a silicone suds suppressor.
2. A method of cleaning according to claim 1 wherein the detergent composition comprises at
10 least 10% by weight of the composition of anionic surfactant.
3. A method of cleaning according to any of claims 1 or 2 wherein the water of the wash liquor,
preferably the water of the liquor of each cycle, has a hardness of less than about 1 mmole/litre.
- 15 4. A method of cleaning according any preceding claim wherein the method involves the step of
steam heating to heat the wash liquor.
5. A method of cleaning according to any preceding claim wherein the polyester load comprises
items with a low level of soils and/or new items.
- 20 6. A method of cleaning according to any preceding claim wherein the suds suppressor is a
polydimethylsiloxane compounded with silica.
7. A method of cleaning according to any preceding claim wherein the level of suds suppressor in
25 the wash liquor is from about 0.1 to about 10 ppm.
8. A method of cleaning according to any preceding claim wherein the wash liquor, preferably
the wash liquor of the main wash, has a pH of from about 7 to about 9.
- 30 9. A method of cleaning according to any preceding claim wherein the detergent composition
comprises anionic surfactant and at least 70% of the anionic surfactant is an alkyl benzene
sulfonate.

CM3373/SK

16

10. A method of cleaning according to any preceding claim comprising the step of contacting the load with a soil release polymer, preferably the soil release polymer is delivered into any of the main wash or rinse cycles.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/026737

A. CLASSIFICATION OF SUBJECT MATTER

INV. C11D3/00 C11D11/00 C11D3/37
ADD. C11D1/22

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

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, 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	WO 01/34747 A1 (COGNIS DEUTSCHLAND GMBH [DE]; SCHMID KARL HEINZ [DE]; FABRY BERND [DE]) 17 May 2001 (2001-05-17)	1,2,4-7, 9,10
Y	claims examples page 1, paragraph 1 - paragraph 2 page 13, last paragraph page 25, last paragraph	1,2,4-7, 9,10
X	FR 2 285 453 A1 (COLGATE PALMOLIVE CO [US]) 16 April 1976 (1976-04-16) claims examples page 8, line 12 - page 9, line 9 page 3, line 17 - line 23 page 4, line 8 - line 28 page 1, line 5 - line 40	1-3,5, 7-9
	----- -/--	

☒ 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 document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step 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

9 June 2010

Date of mailing of the international search report

15/06/2010

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

Neys, Patricia

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/026737

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 96/24657 A1 (HENKEL ECOLAB GMBH & CO OHG [DE]) 15 August 1996 (1996-08-15) claims 1,7,12 page 1, paragraph 1 page 3, paragraph 2 page 10, paragraph 3 examples	1,2,4-7, 9,10
A	WO 99/41346 A1 (RHONE POULENC CHIMIE [FR]; AUBAY ERIC [FR]; GRESSER ROBERT [FR]; JOUBE) 19 August 1999 (1999-08-19) claim 1 example page 10, line 33 - line 35 page 9, line 34 - page 10, line 8	1-10
A	EP 1 005 890 A1 (WACKER CHEMIE GMBH [DE]) 7 June 2000 (2000-06-07) claims examples page 2, paragraph 7 page 5, paragraph 43	1-10
A	EP 0 363 763 A1 (HENKEL KGAA [DE]) 18 April 1990 (1990-04-18) claims examples	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/026737

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 0134747	A1	17-05-2001	DE	19953796 A1	17-05-2001
			EP	1228178 A1	07-08-2002
FR 2285453	A1	16-04-1976	NONE		
WO 9624657	A1	15-08-1996	DE	19504006 A1	14-08-1996
			EP	0808357 A1	26-11-1997
WO 9941346	A1	19-08-1999	AU	2284699 A	30-08-1999
EP 1005890	A1	07-06-2000	DE	19855610 A1	08-06-2000
			JP	3112167 B2	27-11-2000
			JP	2000169707 A	20-06-2000
EP 0363763	A1	18-04-1990	DE	3834181 A1	12-04-1990
			DK	60991 A	05-04-1991
			WO	9004014 A1	19-04-1990
			EP	0437490 A1	24-07-1991
			ES	2036057 T3	01-05-1993