

(19)



(11)

EP 4 741 479 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

13.05.2026 Bulletin 2026/20

(21) Application number: **24212349.5**

(22) Date of filing: **12.11.2024**

(51) International Patent Classification (IPC):

C11D 1/83 (2006.01) **C11D 3/04** (2006.01)
C11D 3/08 (2006.01) **C11D 3/10** (2006.01)
C11D 3/34 (2006.01) **C11D 17/04** (2006.01)
C11D 17/06 (2006.01) **C11D 11/02** (2006.01)

(52) Cooperative Patent Classification (CPC):

**C11D 17/041; C11D 1/83; C11D 3/046; C11D 3/08;
C11D 3/10; C11D 3/3409; C11D 11/02; C11D 17/06**

(84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL
NO PL PT RO RS SE SI SK SM TR**

Designated Extension States:

BA

Designated Validation States:

GE KH MA MD TN

(71) Applicant: **The Procter & Gamble Company
Cincinnati, OH 45202 (US)**

(72) Inventors:

- **ATESS, Connor John
Newcastle upon Tyne, NE12 9TS (GB)**

- **DODDS, Alistair Patrick
Newcastle upon Tyne, NE12 9TS (GB)**
- **DOUGLASS, Sarah Jane
Newcastle upon Tyne, NE12 9TS (GB)**
- **HEATHCOTE, Lindsey
Newcastle upon Tyne, NE12 9TS (GB)**
- **SOLACHE LEON, Fernando
Newcastle upon Tyne, NE12 9 TS (GB)**
- **TRAWKA, Xavier
1853 Strombeek-Bever (BE)**

(74) Representative: **P&G Patent Belgium UK
N.V. Procter & Gamble Services Company S.A.
Temselaan 100
1853 Strombeek-Bever (BE)**

(54) **PACKAGED GRANULAR LAUNDRY DETERGENT COMPOSITION**

(57) A packaged granular laundry detergent composition, where the packaged product contains a package and a granular laundry detergent composition and the granular laundry detergent composition is contained

within the package. Also contemplated is a method of making the packaged product and a method of using the packaged product.

EP 4 741 479 A1

Description

FIELD OF THE INVENTION

[0001] A packaged granular laundry detergent composition, where the packaged product contains a package and a granular laundry detergent composition and the granular laundry detergent composition is contained within the package. Also contemplated is a method of making the packaged product and a method of using the packaged product.

BACKGROUND OF THE INVENTION

[0002] Granular laundry detergent compositions are well known. Without wishing to be bound by theory, the granular laundry detergent composition is mixed with water to create a wash liquor and fabrics to be washed are contacted with this. When the fabrics and wash liquor are in contact with one another, the fabrics are agitated in order to clean them and then they are dried.

[0003] The granular laundry detergent composition is housed in a package and a portion of the composition is used for each wash operation. Oftentimes, the portion is transferred using a suitable dosing device, however, some consumers prefer to transfer the portion via hand.

[0004] An issue with dosing via hand is that under low humidity conditions, the granular laundry detergent composition can be very free flowing, meaning a large proportion of the intended portion is lost from the hand as it 'slips away'. When the surrounding environmental conditions are such that the humidity is higher than the granular laundry detergent composition becomes 'stickier' and so easier to transfer by hand with less loss from the hand during the transfer. However, depending on the season and other influences, it may not be possible to adjust the relative humidity of the surrounding environment.

[0005] Therefore, there is a need for a granular laundry detergent composition and method of using it in a laundry operation, in which loss of composition from the hand can be reduced during transfer of the laundry detergent composition via hand under a range of humidities.

[0006] It was surprisingly found that the composition and process of washing according to the present invention achieved this. Without wishing to be bound by theory, the composition of the present invention showed reduced loss from the hand during hand transfer under low relative humidity but did not exhibit compromised transfer under higher relative humidity conditions. In other words, acceptable loss from hand during hand transfer under a range of relative humidities was achieved.

SUMMARY OF THE INVENTION

[0007] A first aspect of the present invention is a packaged product comprising a packaging and a granular laundry detergent composition, wherein, the package comprises an opening and at least one internal compartment in communication with the opening, and wherein the granular laundry detergent composition is housed within the internal compartment, and wherein, the granular laundry detergent composition comprises between 30% and 60% by weight of the granular laundry detergent composition of a first particle, wherein the first particle comprises between 20% and 97% by weight of the first particle of an anionic surfactant; and wherein the laundry detergent composition comprises between 55% and 85% by weight of the composition of a filler, wherein the filler comprises an alkali metal carbonate, an alkali metal sulphonate, an alkali metal chloride, an alkali metal silicate or a mixture thereof; and wherein, the laundry detergent composition comprises between 0.5% and 1.5% by weight of the laundry detergent composition of a non-ionic surfactant.

[0008] A second aspect of the present invention is a process of making a packaged laundry detergent composition according to any preceding claims, comprising the steps of;

- a. Preparing a first slurry, wherein the first slurry comprises the anionic surfactant and optionally the filler;
- b. Drying the first slurry to prepare the first particle;
- c. Optionally mixing the first particle with at least a second particle;
- d. Spraying the non-ionic surfactant onto the first and optionally at least second particle;
- e. Packing the particles into the package.

[0009] A third aspect of the present invention is a process of laundering fabrics comprising the steps of;

- a. mixing together a portion of the granular laundry detergent composition, water and fabrics to be washed to create a wash liquor containing the fabrics to be washed;
- b. agitating the fabrics to be washed within the wash liquor;
- c. removing the fabrics to be washed from the wash liquor and drying the fabrics. wherein, in step a, the portion of the granular laundry detergent composition is transferred from the packaging to the wash liquor by hand.

DETAILED DESCRIPTION OF THE INVENTION

Packaged product

[0010] The present invention is to a packaged product. The packaged product comprises a packaging and a granular laundry detergent composition.

[0011] The package comprises an opening and at least one internal compartment in communication with the opening. The granular laundry detergent composition is housed within the internal compartment. The packaging should be understood as any suitable means to house the granular laundry detergent composition. Those skilled in the art will be aware of suitable packages. The package is described in more detail below.

[0012] The granular laundry detergent composition should be understood to be a free-flowing particulate composition. Typically, the granular laundry detergent composition is a fully formulated laundry detergent composition, not a portion thereof such as a spray-dried, extruded or agglomerate particle that only forms part of the laundry detergent composition. Typically, the granular laundry detergent composition comprises a plurality of chemically different particles, such as spray-dried base detergent particles and/or agglomerated base detergent particles and/or extruded base detergent particles, in combination with one or more, typically two or more, or five or more, or even ten or more particles selected from: surfactant particles, including surfactant agglomerates, surfactant extrudates, surfactant needles, surfactant noodles, surfactant flakes; phosphate particles; zeolite particles; silicate salt particles, especially sodium silicate particles; carbonate salt particles, especially sodium carbonate particles; polymer particles such as carboxylate polymer particles, cellulosic polymer particles, starch particles, polyester particles, polyamine particles, terephthalate polymer particles, polyethylene glycol particles; aesthetic particles such as coloured noodles, needles, lamellae particles and ring particles; enzyme particles such as protease granulates, amylase granulates, lipase granulates, cellulase granulates, mannanase granulates, pectate lyase granulates, xyloglucanase granulates, bleaching enzyme granulates and co- granulates of any of these enzymes, preferably these enzyme granulates comprise sodium sulphate; bleach particles, such as percarbonate particles, especially coated percarbonate particles, such as percarbonate coated with carbonate salt, sulphate salt, silicate salt, borosilicate salt, or any combination thereof, perborate particles, bleach activator particles such as tetra acetyl ethylene diamine particles and/or alkyl oxybenzene sulphonate particles, bleach catalyst particles such as transition metal catalyst particles, and/or isoquinolinium bleach catalyst particles, pre-formed peracid particles, especially coated pre-formed peracid particles; filler particles such as sulphate salt particles and chloride particles; clay particles such as montmorillonite particles and particles of clay and silicone; flocculant particles such as polyethylene oxide particles; wax particles such as wax agglomerates; silicone particles, brightener particles; dye transfer inhibition particles; dye fixative particles; perfume particles such as perfume microcapsules and starch encapsulated perfume accord particles, or pro-perfume particles such as Schiff base reaction product particles; hueing dye particles; chelant particles such as chelant agglomerates; and any combination thereof.

[0013] Suitable laundry detergent compositions can comprise a detergent ingredient selected from: deterative surfactant, such as anionic deterative surfactants, non-ionic deterative surfactants, cationic deterative surfactants, zwitterionic deterative surfactants and amphoteric deterative surfactants; polymers, such as carboxylate polymers, soil release polymer, anti-redeposition polymers, cellulosic polymers and care polymers; bleach, such as sources of hydrogen peroxide, bleach activators, bleach catalysts and pre-formed peracids; photobleach, such as such as zinc and/or aluminium sulphonated phthalocyanine; enzymes, such as proteases, amylases, cellulases, lipases; zeolite builder; phosphate builder; co-builders, such as citric acid and citrate; carbonate, such as sodium carbonate and sodium bicarbonate; sulphate salt, such as sodium sulphate; silicate salt such as sodium silicate; chloride salt, such as sodium chloride; chelants; hueing agents; dye transfer inhibitors; dye fixative agents; perfume; silicone; fabric softening agents, such as clay; flocculants, such as polyethyleneoxide; suds suppressors; and any combination thereof.

[0014] Suitable laundry detergent compositions may have a low buffering capacity. Such laundry detergent compositions typically have a reserve alkalinity to pH 9.5 of less than 5.0gNaOH/100g.

[0015] The granular laundry detergent composition is described in more detail below.

The granular laundry detergent composition

[0016] The granular laundry detergent composition comprises between 30% and 60% by weight of the granular laundry detergent composition of a first particle, wherein the first particle comprises between 20% and 97% by weight of the first particle of an anionic surfactant.

[0017] By 'first particle', we herein mean a plurality of particles, each particle within said plurality having the characteristics and formulation described herein.

[0018] Suitable anionic surfactants include sulphonate and sulphate deterative surfactants.

[0019] Suitable sulphonate deterative surfactants include methyl ester sulphonates, alpha olefin sulphonates, alkyl benzene sulphonates, especially alkyl benzene sulphonates, preferably C₁₀₋₁₃ alkyl benzene sulphonate. Suitable alkyl

benzene sulphonate (LAS) is obtainable, preferably obtained, by sulphonating commercially available linear alkyl benzene (LAB); suitable LAB includes low 2-phenyl LAB, other suitable LAB include high 2-phenyl LAB, such as those supplied by Sasol under the tradename Hyblene®.

[0020] Suitable sulphate deterative surfactants include alkyl sulphate, preferably C₈₋₁₈ alkyl sulphate, or predominantly C₁₂ alkyl sulphate.

[0021] A preferred sulphate deterative surfactant is alkyl alkoxyated sulphate, preferably alkyl ethoxyated sulphate, preferably a C₈₋₁₈ alkyl alkoxyated sulphate, preferably a C₈₋₁₈ alkyl ethoxyated sulphate, preferably the alkyl alkoxyated sulphate has an average degree of alkoxylation of from 0.5 to 20, preferably from 0.5 to 10, preferably the alkyl alkoxyated sulphate is a C₈₋₁₈ alkyl ethoxyated sulphate having an average degree of ethoxylation of from 0.5 to 10, preferably from 0.5 to 5, more preferably from 0.5 to 3 and most preferably from 0.5 to 1.5.

[0022] The alkyl sulphate, alkyl alkoxyated sulphate and alkyl benzene sulphonates may be linear or branched, substituted or un-substituted, and may be derived from petrochemical material or biomaterial.

[0023] Other suitable anionic deterative surfactants include alkyl ether carboxylates.

[0024] Suitable anionic deterative surfactants may be in salt form, suitable counter-ions include sodium, calcium, magnesium, amino alcohols, and any combination thereof. A preferred counterion is sodium.

[0025] The anionic surfactant may be selected from linear alkylbenzene sulphonate, alky sulphate, ethoxyated alkyl sulphate or a mixture thereof.

[0026] The laundry detergent composition comprises between 55% and 85% by weight of the composition of a filler, wherein the filler comprises an alkali metal carbonate, an alkali metal sulphonate, an alkali metal chloride, an alkali metal silicate or a mixture thereof. Those skilled in the art will be aware of suitable alkali metals. Alkali metals could be sodium, magnesium, potassium or a mixture thereof.

[0027] The laundry detergent composition comprises between 0.5% and 1.5% by weight of the laundry detergent composition of a non-ionic surfactant. The non-ionic surfactant may be a fatty alcohol ethoxyated, preferably a fatty alcohol ethoxylate having an average degree of ethoxylation of from 1 and 12, or even between 2 and 9, or even between 3 and 7.

[0028] Suitable non-ionic surfactants are selected from the group consisting of: C₈-C₁₈ alkyl ethoxylates, such as, NEODOL® non-ionic surfactants from Shell; C₆-C₁₂ alkyl phenol alkoxyates wherein preferably the alkoxyate units are ethyleneoxy units, propyleneoxy units or a mixture thereof; C₁₂-C₁₈ alcohol and C₆-C₁₂ alkyl phenol condensates with ethylene oxide/propylene oxide block polymers such as Pluronic® from BASF; alkylpolysaccharides, preferably alkylpolyglycosides; methyl ester ethoxylates; polyhydroxy fatty acid amides; ether capped poly(oxyalkylated) alcohol surfactants; and mixtures thereof.

[0029] Suitable non-ionic surfactants are alkylpolyglucoside and/or an alkyl alkoxyated alcohol.

[0030] Suitable non-ionic surfactants include alkyl alkoxyated alcohols, preferably C₈₋₁₈ alkyl alkoxyated alcohol, preferably a C₈₋₁₈ alkyl ethoxyated alcohol, preferably the alkyl alkoxyated alcohol has an average degree of alkoxylation of from 1 to 50, preferably from 1 to 30, or from 1 to 20, or from 1 to 10, preferably the alkyl alkoxyated alcohol is a C₈₋₁₈ alkyl ethoxyated alcohol having an average degree of ethoxylation of from 1 to 10, preferably from 1 to 7, more preferably from 1 to 5 and most preferably from 3 to 7. The alkyl alkoxyated alcohol can be linear or branched, and substituted or un-substituted.

[0031] Suitable nonionic surfactants include secondary alcohol-based surfactants.

[0032] Without wishing to be bound by theory, the first particle comprises the non-ionic surfactant. Preferably, the non-ionic surfactant is sprayed onto the first particles. The process of making the packaged product is described below.

[0033] The first particle may comprise a filler. The filler is described as above. The first particle may comprises between 1% and 70%, or even between 40% and 70%, or even between 50% and 70% by weight of the first particle of the filler.

[0034] The first particle may be a blown powder particle, an agglomerate particle or a mixture thereof. Those skilled in the art will be aware of these different particles and will be aware of known methods to make them.

[0035] Typically, a suitable spray-drying process comprises the step of forming an aqueous slurry mixture, transferring it through at least one pump, preferably two pumps, to a pressure nozzle. Atomizing the aqueous slurry mixture into a spray-drying tower and drying the aqueous slurry mixture to form spray-dried particles. Preferably, the spray-drying tower is a counter-current spray-drying tower, although a co-current spray-drying tower may also be suitable.

[0036] Typically, the spray-dried powder is subjected to cooling, for example an air lift. Typically, the spray-drying powder is subjected to particle size classification, for example a sieve, to obtain the desired particle size distribution. Preferably, the spray-dried powder has a particle size distribution such that weight average particle size is in the range of from 300 micrometers to 500 micrometers, and less than 10wt% of the spray-dried particles have a particle size greater than 2360 micrometers.

[0037] It may be preferred to heat the aqueous slurry mixture to elevated temperatures prior to atomization into the spray-drying tower.

[0038] It may be preferred for a gas, such as air, to be introduced into the spray-drying process after the step of forming the aqueous slurry.

[0039] Typically, a suitable agglomeration process comprises the step of contacting a deterative ingredient, such as a deterative surfactant, e.g. linear alkyl benzene sulphonate (LAS) and/or alkyl alkoxyated sulphate, with an inorganic material, such as sodium carbonate and/or silica, in a mixer. The agglomeration process may also be an in-situ neutralization agglomeration process wherein an acid precursor of a deterative surfactant, such as LAS, is contacted

with an alkaline material, such as carbonate and/or sodium hydroxide, in a mixer, and wherein the acid precursor of a deterative surfactant is neutralized by the alkaline material to form a deterative surfactant during the agglomeration process.

[0040] Other suitable detergent ingredients that may be agglomerated include polymers, chelants, bleach activators, silicones and any combination thereof.

[0041] The agglomeration process may be a high, medium or low shear agglomeration process, wherein a high shear, medium shear or low shear mixer is used accordingly. The agglomeration process may be a multi-step agglomeration process wherein two or more mixers are used, such as a high shear mixer in combination with a medium or low shear mixer. The agglomeration process can be a continuous process or a batch process.

[0042] It may be preferred for the agglomerates to be subjected to a drying step, for example to a fluid bed drying step. It may also be preferred for the agglomerates to be subjected to a cooling step, for example a fluid bed cooling step.

[0043] Typically, the agglomerates are subjected to particle size classification, for example a fluid bed elutriation and/or a sieve, to obtain the desired particle size distribution. Preferably, the agglomerates have a particle size distribution such that weight average particle size is in the range of from 300 micrometers to 800 micrometers, and less than 10wt% of the agglomerates have a particle size less than 150 micrometers and less than 10wt% of the agglomerates have a particle size greater than 1200 micrometers.

[0044] It may be preferred for fines and over-sized agglomerates to be recycled back into the agglomeration process. Typically, over-sized particles are subjected to a size reduction step, such as grinding, and recycled back into an appropriate place in the agglomeration process, such as the mixer. Typically, fines are recycled back into an appropriate place in the agglomeration process, such as the mixer.

[0045] The first particle may comprise;

a. a first blown powder particle, wherein the first blown powder particle comprises between 15% and 30% by weight of the first blown powder particle of an anionic surfactant and between 40% and 70% by weight of the first blown powder particle of a filler; and

b. a first agglomerate particle, wherein the first agglomerate particle comprises between 25% and 40% by weight of the first agglomerate particle of an anionic surfactant and between 40% and 65% by weight of the first agglomerate particle of a filler; and

wherein the anionic surfactant is selected from linear alkylbenzene sulphonate, alky sulphate, ethoxylated alkyl sulphate or a mixture thereof, and wherein the filler is selected from an alkali metal carbonate, an alkali metal sulphonate, an alkali metal silicate, an alkali metal chloride, or a mixture thereof. The anionic surfactant and the filler are as described above.

[0046] The weight ratio of first blown powder particle to first agglomerate particle may be between 2:1 and 1:2, or even between 2:1 and 1:1. The granular laundry detergent composition may comprises between 15% and 30% by weight of the granular laundry detergent composition of the first blown powder particle and between 15% and 30% by weight of the granular laundry detergent composition of the first agglomerate particle.

[0047] The granular laundry detergent composition may comprise an adjunct ingredient. The adjunct ingredient may be selected from enzymes, bleach, bleach activator, hueing dye, aesthetic dye, brighteners, zeolite, dye transfer inhibitors, antiredeposition aids, soil release polymers or a mixture thereof. The first particle may comprise an adjunct ingredient. Alternatively, the adjunct ingredient may be comprised in at least a second particle. Alternatively, the adjunct ingredient may be comprised in the first particle and in at least a second particle.

The package

[0048] The packaged product comprises a package. The package comprises an opening and at least one internal compartment in communication with the opening. The granular laundry detergent composition is housed within the internal compartment. Preferably, the size of the opening is sufficient for the user to fit their hand through the opening and access the granular laundry detergent composition housed within via the hand.

[0049] The package may comprise cellulose-containing materials, plastic, or a mixture thereof, preferably wherein the package comprises at least 50% by weight of the package of recycled materials. Preferably, a cellulose-containing material includes cardboard, corrugated cardboard, paperboard or a mixture thereof.

[0050] The package can be of any suitable shape and dimension. Those skilled in the art will be aware of suitable package size and dimensions. The pack may comprise elements such as handles and closures. If the pack comprises a closure, it may be a recloseable lid such as a hinged lid, screw lid or removeable lid. The pack may comprise a child resistant or child impeding closure or other latching or locking means. Those skilled in the art will be aware of suitable

means.

Process of making

5 **[0051]** The present invention is also to a process of making a packaged laundry detergent composition according to the present invention. The process of making comprises the steps of;

- a. Preparing a first slurry, wherein the first slurry comprises the anionic surfactant and optionally the filler;
- b. Drying the first slurry to prepare the first particle;
- 10 c. Optionally mixing the first particle with at least a second particle;
- d. Spraying the non-ionic surfactant onto the first and optionally at least second particle;
- e. Packing the particles into the package.

[0052] Those skilled in the art will be aware of suitable slurries. Without wishing to be bound by theory, the slurry comprises the anionic surfactant together with any other ingredients to be incorporated into the first particle and a solvent, wherein the solvent can be an organic solvent, an inorganic solvent or a mixture thereof. The slurry is then dried to create the intermediate particle. The non-ionic surfactant is subsequently sprayed onto the dried particles.

[0053] The slurry may have a viscosity of between 2000 and 6000 Pa.s at a shear rate of 10s^{-1} . Those skilled in the art will be aware of appropriate means to measure the viscosity using known standard equipment.

20 **[0054]** Those skilled in the art will be aware if suitable means to dry the particles. The particles may be dried via the application of heat. Those skilled in the art will be aware of suitable temperatures to effect drying of the slurry.

[0055] The first particle may be a blown powder particle, an agglomerate particle or a mixture thereof. Those skilled in the art will be aware of these different particles and will be aware of known methods to make them.

[0056] Typically, a suitable spray-drying process comprises the step of forming an aqueous slurry mixture, transferring it through at least one pump, preferably two pumps, to a pressure nozzle. Atomizing the aqueous slurry mixture into a spray-drying tower and drying the aqueous slurry mixture to form spray-dried particles. Preferably, the spray-drying tower is a counter-current spray-drying tower, although a co-current spray-drying tower may also be suitable.

[0057] Typically, the spray-dried powder is subjected to cooling, for example an air lift. Typically, the spray-drying powder is subjected to particle size classification, for example a sieve, to obtain the desired particle size distribution. Preferably, the spray-dried powder has a particle size distribution such that weight average particle size is in the range of from 300 micrometers to 500 micrometers, and less than 10wt% of the spray-dried particles have a particle size greater than 2360 micrometers.

[0058] It may be preferred to heat the aqueous slurry mixture to elevated temperatures prior to atomization into the spray-drying tower.

35 **[0059]** It may be preferred for a gas, such as air, to be introduced into the spray-drying process after the step of forming the aqueous slurry.

[0060] Typically, a suitable agglomeration process comprises the step of contacting a deterative ingredient, such as a deterative surfactant, e.g. linear alkyl benzene sulphonate (LAS) and/or alkyl alkoxylated sulphate, with an inorganic material, such as sodium carbonate and/or silica, in a mixer. The agglomeration process may also be an in-situ neutralization agglomeration process wherein an acid precursor of a deterative surfactant, such as LAS, is contacted with an alkaline material, such as carbonate and/or sodium hydroxide, in a mixer, and wherein the acid precursor of a deterative surfactant is neutralized by the alkaline material to form a deterative surfactant during the agglomeration process.

[0061] In one example of the present invention, a first blown powder slurry is prepared and a first agglomerate slurry is prepared. The first blown powder slurry is dried in a blown powder process and the first agglomerate slurry is dried in an agglomeration process.

[0062] The first particle may be mixed with other adjunct ingredients to make the granular laundry detergent composition. The adjunct ingredient may be selected from enzymes, bleach, bleach activator, hueing dye, aesthetic dye, brighteners, zeolite, dye transfer inhibitors, antiredeposition aids, soil release polymers or a mixture thereof. The first particle may comprise an adjunct ingredient. Alternatively, the adjunct ingredient may be comprised in at least a second particle. Alternatively, the adjunct ingredient may be comprised in the first particle and in at least a second particle.

[0063] The non-ionic surfactant is described above. Those skilled in the art will be aware of appropriate means to spray the non-ionic surfactant onto the first particle. The non-ionic surfactant may be sprayed via a nozzle. The non-ionic surfactant may be sprayed via multiple nozzles. The non-ionic surfactant may be sprayed onto just the first particle. Alternatively, the granular laundry detergent composition may comprise the first particle and at least a second particle, and wherein the non-ionic surfactant is sprayed onto the first particle and at least the second particle.

[0064] The granular laundry detergent composition is then added to the package. The package is described above. Those skilled in the art will be aware of suitable means to fill the package with the granular laundry detergent composition. The laundry detergent composition may be added via a nozzle, a hopper, or a mixture thereof. The granular laundry

detergent composition may be measured out ahead of being added to the package, or the granular laundry detergent composition may be measured as it is being added to the package. Those skilled in the art will know suitable means to measure the granular laundry detergent composition. The granular laundry detergent composition may be measured via weight. The package may contain any suitable amount of the granular laundry detergent composition. The package may contain multiple doses of the granular laundry detergent composition. Without wishing to be bound by theory, a single dose is a portion of the granular laundry detergent composition used by the consumer in a single wash operation. Where the package contains multiple doses, each dose can be used in subsequent separate wash operations.

Process of laundering fabrics

[0065] The present invention is also to a process of laundering fabrics comprising the steps of;

- a. mixing together a portion of the granular laundry detergent composition, water and fabrics to be washed to create a wash liquor containing the fabrics to be washed;
- b. agitating the fabrics to be washed within the wash liquor;
- c. removing the fabrics to be washed from the wash liquor and drying the fabrics. wherein, in step a, the portion of the granular laundry detergent composition is transferred from the packaging to the wash liquor by hand.

[0066] The portion of the granular laundry detergent composition may weigh between 5g and 80g. The portion of the granular laundry detergent composition may weigh between 40g and 80g when dosing for an automatic or semi-automatic wash operation. The portion of the granular laundry detergent composition may weigh between 5g and 60g, or even between 15g and 45g when dosing for a hand wash operation. The portion of the granular laundry detergent composition may weigh between 40g and 80g when dosing for an automatic or semi-automatic wash operation. Those skilled in the art will be aware of the relevant volume of water to use. The wash liquor may comprise between 1 litre and 40 litres, or even between 2 litres and 20 litres. The wash liquor may comprise between 4 litre and 15 litres, for a hand wash operation. The wash liquor may comprise between 20 litres and 40 litres for an automatic or semi-automatic wash operation. The water may be at a temperature of between 10°C and 60°C, or even between 10°C and 50°C, or even between 10°C and 40°C, or even between 10°C and 30°C.

[0067] The fabrics to be washed may be any suitable fabrics. Those skilled in the art will be aware of suitable fabrics. Fabrics may be made of cotton, polycotton, synthetic materials or a mixture thereof. Those skilled in the art will be aware of the appropriate weight of fabrics to be washed.

[0068] When the portion of the granular laundry detergent composition is transferred, preferably the ambient relative humidity in the environment surrounding the portion during the transfer is between 30% and 90%. Without wishing to be bound by theory, during the dry season, the relative humidity may be between 30% and 65%. In the wet season, the humidity may be between 65% and 95%. Those skilled in the art will be aware of how to measure the relative humidity using standard equipment.

[0069] The process may be a hand wash process, an automatic wash process, a semi-automatic wash process or a mixture thereof.

[0070] The portion of the granular laundry detergent composition is transferred from the packaging to the wash liquor by hand. The user will be aware of how to do this.

[0071] 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".

EXAMPLES

[0072] The granular laundry detergent composition according to the present invention was tested versus a comparative composition with respect to the ability to transfer it by hand. Two powder detergent compositions (Compositions 1 & 2) were made and tested as detailed herein below.

Test Method

I. Preparation of Test Compositions

[0073] Tests were carried out using the following detergent compositions: Material additions shown at active material level in finished product (FP).

EP 4 741 479 A1

Ingredients	A (comparative)	B (according to the invention)
Linear alkylbenzene sulphonate	10.8000	10.8000
Sulfuric acid mono-C12-14-alkyl esters sodium salts	2.9450	2.9450
Fatty alcohol ethoxylate non-ionic surfactant with an average degree of ethoxylation of 7	0.0000	0.5000
Na ₂ CO ₃	19.0376	19.0376
Na ₂ SO ₄	4.7999	4.7999
NaCl	53.1091	52.6091
Sodium silicate	1.8136	1.8136
Zeolite	1.7855	1.7855
Kaolin	0.6041	0.6041
Caboxymethylcellulose	0.1279	0.1279
Percarbonate	1.6644	1.6644
TAED	0.3680	0.3680
Savinase	0.1605	0.1605
Amylase	0.0141	0.0141
Mannanase	0.0595	0.0595
Brightener 15	0.0570	0.0570
Brightener 49	0.0380	0.0380
Hueing dye	0.0190	0.0190
Bentonite clay	0.3192	0.3192
Perfume	0.3821	0.3821
Water	1.8956	1.8956
Total	100.0000	100.0000

II. Test procedure

[0074]

Detergent	1kg sample in open top container
Paper	A4
Plastic beaker	200g volume
Balance	2dp
Ovens	70C 25C/50% rH 25C/65% rH
eRH meter*	
* Rotronic Hygrolab Water Activity Meter	

Preparation of detergent samples.

[0075] 1Kg of each test detergent (A & B) were spread ~1cm thick on a tray and stored in the three following conditions for 1 hour.

EP 4 741 479 A1

1. 70C - to create a low humidity product.
2. 25C & 50% rh - to create a mid-humidity product.
3. 25C & 65 %rH - to create a high humidity product.

5 Measure of detergent retained in hand.

[0076] Determination of detergent retained in hand when dosed by a human hand was completed using the following procedure. Ten external replicates were completed for each test product, and each condition.

10 **[0077]** 1Kg detergent was presented in an open top container. Detergent was picked up by hand (thumb and fingers pointing towards the floor). As soon as hand was removed from detergent container it was held above a piece of paper to catch any falling detergent. The hand full of detergent was held in position over the paper for 30 seconds until all loose detergent had stopped falling. Detergent retained in the hand was then discharged into a plastic container. Detergent retained in hand that was transferred to the plastic beaker was weighed on the balance. Detergent dropped onto the paper was also transferred into another plastic beaker and weighed on the balance. Results below show the detergent retained in
15 hand and the detergent dropped.

Low eRH Results:

[0078]

20

25

30

35

40

45

Low eRH	A		B	
eRH	22.1		22.2	
Weight in g	Retained in hand	Fall Back	Retained in hand	Fall Back
1	2.8	6.3	4.9	2.3
2	3.1	5.9	3.4	3.2
3	4.1	3.1	4	2.4
4	2.8	3.7	3.6	4.2
5	4.5	2.2	4.3	2
6	4.2	3.2	4.5	3.5
7	3.5	3.6	4.3	3.4
8	3.5	4.6	4.2	3.1
9	4.6	4.6	3.9	4.4
10	3.9	4.5	4.3	2.6
	Retained in hand	Fall Back	Retained in hand	Fall Back
Average (g)	3.7	4.2	4.1	3.1
Average (%)	47.0	53.0	57.1	42.9
st dev	0.66	1.27	0.44	0.80

Mid eRH Results:

[0079]

50

55

Mid eRH	A		B	
eRH	42.2		45.4	
	Retained in hand	Fall Back	Retained in hand	Fall Back
1	6.6	2.7	8	3.1
2	5.3	3.7	8.8	1.8
3	6.2	1.8	8.1	2.5

EP 4 741 479 A1

(continued)

Mid eRH	A		B	
eRH	42.2		45.4	
	Retained in hand	Fall Back	Retained in hand	Fall Back
4	6.7	1.5	8.3	5
5	7.2	2.9	8.6	2
6	6.8	2.7	8.8	2.6
7	7.6	3.8	8.8	3.2
8	6.5	4	8.2	2.2
9	6.7	3.4	8.2	2.6
10	5.3	3.3	8.4	3.5
	Retained in hand	Fall Back	Retained in hand	Fall Back
Average (g)	6.5	3.0	8.4	2.9
Average (%)	68.5	31.5	74.7	25.3
st dev	0.73	0.83	0.31	0.93

High eRH Results:

[0080]

High eRH	A		B	
eRH	62		62	
	Retained in hand	Fall Back	Retained in hand	Fall Back
1	6.6	2.9	7.8	2.8
2	6.4	1.7	8	2.2
3	5.6	1.6	8.7	2.2
4	5.5	2.3	7.3	1.5
5	5.5	1.4	7.5	1.4
6	6.4	2.8	8.3	2.1
7	6.5	1.7	8.2	1.7
8	6	2.5	8.1	1.5
9	6.3	1.7	7.2	1.4
10	5.6	1.6	8.7	1.4
	Retained in hand	Fall Back	Retained in hand	Fall Back
Average	6.0	2.0	8.0	1.8
Average (%)	74.9	25.1	81.4	18.6
st dev	0.45	0.55	0.53	0.48

Summary:

[0081]

%	A Retained in hand	B retained in hand	Difference (B minus A)
22.1 erh	47.0	57.1	10.1
43 erh	68.5	74.7	6.2
62 erh	74.9	81.4	6.5

[0082] The summary shows that under low eRH conditions, there is a 10.1 difference between detergent retained in hand between compositions B and A. For mid and high eRH the difference is 6.2 and 6.5. This means that at low eRH composition A exhibits higher loss from hand than at mid and high eRH. The addition of non-ionic surfactant to composition B resulted in improved retention in hand at low eRH without any negative effect at mid and high eRH.

Claims

1. A packaged product comprising a packaging and a granular laundry detergent composition, wherein, the package comprises an opening and at least one internal compartment in communication with the opening, and

wherein the granular laundry detergent composition is housed within the internal compartment, and wherein, the granular laundry detergent composition comprises between 30% and 60% by weight of the granular laundry detergent composition of a first particle, wherein the first particle comprises between 20% and 97% by weight of the first particle of an anionic surfactant; and wherein the laundry detergent composition comprises between 55% and 85% by weight of the composition of a filler, wherein the filler comprises an alkali metal carbonate, an alkali metal sulphonate, an alkali metal chloride, an alkali metal silicate or a mixture thereof; and wherein, the laundry detergent composition comprises between 0.5% and 1.5% by weight of the laundry detergent composition of a non-ionic surfactant.

2. The packaged product according to claim 1, wherein the anionic surfactant is selected from linear alkylbenzene sulphonate, alkyl sulphate, ethoxylated alkyl sulphate or a mixture thereof.

3. The packaged product according to any preceding claims, wherein the non-ionic surfactant is a fatty alcohol ethoxylated, preferably a fatty alcohol ethoxylate having an average degree of ethoxylation of from 1 and 12, or even between 2 and 9, or even between 3 and 7.

4. The packaged product according to any preceding claims, wherein the first particle comprises a filler, wherein the filler is preferably selected from an alkali metal carbonate, an alkali metal sulphonate, an alkali metal silicate, an alkali metal chloride, or a mixture thereof.

5. The packaged product according to any preceding claim, wherein the first particle is a blown powder, an agglomerate or a mixture thereof.

6. The packaged product according to claim 5, wherein the first particle comprises;

a. a first blown powder particle, wherein the first blown powder particle comprises between 15% and 30% by weight of the first blown powder particle of an anionic surfactant and between 40% and 70% by weight of the first blown powder particle of a filler; and
b. a first agglomerate particle, wherein the first agglomerate particle comprises between 25% and 40% by weight of the first agglomerate particle of an anionic surfactant and between 40% and 65% by weight of the first agglomerate particle of a filler; and
wherein the anionic surfactant is selected from linear alkylbenzene sulphonate, alkyl sulphate, ethoxylated alkyl sulphate or a mixture thereof; and
wherein filler is selected from an alkali metal carbonate, an alkali metal sulphonate, an alkali metal silicate, an alkali metal chloride, or a mixture thereof.

7. The packaged product according to any preceding claims, wherein the granular laundry detergent composition comprises an adjunct ingredient, wherein the adjunct ingredient is selected from enzymes, bleach, bleach activator, hueing dye, aesthetic dye, brighteners, zeolite, dye transfer inhibitors, antiredeposition aids, soil release polymers or a mixture thereof.

8. The packaged product according to any preceding claims, wherein the package is constructed from cellulose-containing materials, plastic, or a mixture thereof, preferably a cellulose-containing material, more preferably cardboard, corrugated cardboard, paperboard or a mixture thereof.

9. A process of making a packaged laundry detergent composition according to any preceding claims, comprising the steps of;

- a. Preparing a first slurry, wherein the first slurry comprises the anionic surfactant and optionally the filler;
- b. Drying the first slurry to prepare the first particle;
- c. Optionally mixing the first particle with at least a second particle;
- d. Spraying the non-ionic surfactant onto the first and optionally at least second particle;
- e. Packing the particles into the package.

10. The process according to claim 9, wherein in step a, a first blown powder slurry is prepared, a first agglomerate slurry is prepared, and in step b, the first blown powder slurry is dried in a blown powder process and the first agglomerate slurry is dried in an agglomeration process.

11. The process according to claims 9-10, wherein the first particle is mixed with other adjunct ingredients to make the granular laundry detergent composition and the granular laundry detergent composition is added to the package.

12. A process of laundering fabrics comprising the steps of;

- a. mixing together a portion of the granular laundry detergent composition, water and fabrics to be washed to create a wash liquor containing the fabrics to be washed;
- b. agitating the fabrics to be washed within the wash liquor;
- c. removing the fabrics to be washed from the wash liquor and drying the fabrics.

wherein, in step a, the portion of the granular laundry detergent composition is transferred from the packaging to the wash liquor by hand.

13. The process according to claim 12, wherein the portion of the granular laundry detergent composition weights between 5g and 80g, or even between 40g and 80g, alternatively between 5g and 60g, or even between 15g and 45g.

14. The process according to claims 12-13, wherein the ambient relative humidity when the portion of the granular laundry detergent composition is transferred is between 30% and 90%.

15. The process according to claims 12-14, wherein the process is a hand wash process, an automatic wash process, a semi-automatic wash process or a mixture thereof.



EUROPEAN SEARCH REPORT

Application Number

EP 24 21 2349

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CA 2 247 499 A1 (PROCTER & GAMBLE [US]) 12 September 1997 (1997-09-12) * page 14, line 5 - page 15, line 17; examples III-X * * page 13, line 34 *	1-15	INV. C11D1/83 C11D3/04 C11D3/08 C11D3/10 C11D3/34 C11D17/04 C11D17/06 C11D11/02
A	EP 2 801 605 A1 (PROCTER & GAMBLE [US]) 12 November 2014 (2014-11-12) * claims 1-15 *	1-15	
A	EP 2 801 608 A1 (PROCTER & GAMBLE [US]) 12 November 2014 (2014-11-12) * claims 1-15; tables 1-3 *	1-15	
A	US 2013/324456 A1 (TANTAWY HOSSAM HASSAN [GB] ET AL) 5 December 2013 (2013-12-05) * claims 1-15 *	1-15	
A	US 2015/018264 A1 (SOMERVILLE ROBERTS NIGEL PATRICK [GB] ET AL) 15 January 2015 (2015-01-15) * claims 1-10 *	1-15	TECHNICAL FIELDS SEARCHED (IPC) C11D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		31 March 2025	Richards, Michael
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.82 (P34C01)

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

EP 24 21 2349

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

31-03-2025

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
CA 2247499 A1	12-09-1997	AR 006162 A1	11-08-1999
		CA 2247499 A1	12-09-1997
		CN 1218500 A	02-06-1999
		JP H11506162 A	02-06-1999
		JP 2000219893 A	08-08-2000
		WO 9732954 A1	12-09-1997

EP 2801605 A1	12-11-2014	BR 112015027036 A2	25-07-2017
		CN 105189723 A	23-12-2015
		EP 2801605 A1	12-11-2014
		WO 2014182415 A1	13-11-2014
		ZA 201507586 B	27-09-2017

EP 2801608 A1	12-11-2014	EP 2801608 A1	12-11-2014
		WO 2014182414 A1	13-11-2014

US 2013324456 A1	05-12-2013	BR 112014029636 A2	27-06-2017
		CN 104395452 A	04-03-2015
		EP 2669358 A1	04-12-2013
		EP 2669359 A1	04-12-2013
		JP 2015525256 A	03-09-2015
		RU 2014144341 A	27-05-2016
		US 2013324456 A1	05-12-2013
		WO 2013181304 A1	05-12-2013

US 2015018264 A1	15-01-2015	EP 3044299 A1	20-07-2016
		TR 201802644 T4	21-03-2018
		US 2015018264 A1	15-01-2015
		WO 2015003358 A1	15-01-2015
		WO 2015003639 A1	15-01-2015
