



(11) **EP 3 378 927 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
26.09.2018 Bulletin 2018/39

(51) Int Cl.:
C11D 1/83 (2006.01) **C11D 3/00** (2006.01)
C11D 3/37 (2006.01) **C11D 3/40** (2006.01)
C11D 3/50 (2006.01) **C11D 17/00** (2006.01)

(21) Application number: **18162991.6**

(22) Date of filing: **20.03.2018**

(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 MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **VILLA, Valentina**
24033 Calusco D'Adda (BG) (IT)
• **EGENOLF, Francesca**
48121 Ravenna (IT)
• **ORLANDINI, Francesco Maurizio**
26845 Codogno (LO) (IT)

(74) Representative: **De Gregori, Antonella et al**
Studio Legale Bird & Bird
Via Borgogna, 8
20122 Milano (IT)

(30) Priority: **21.03.2017 IT 201700030886**

(71) Applicant: **DECO INDUSTRIE S.COOP.P.A.**
48012 Bagnacavallo (RA) (IT)

(54) **DEODORANT AND/OR DETERGENT GEL FORMULATION, IN PARTICULAR FOR APPLICATION IN SANITARY APPLIANCES**

(57) The present invention relates to a deodorant and/or detergent gel formulation, for application in sanitary appliances as a tablet, comprising at least one polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer in a quantity ranging

from 20 to 90% by weight with respect to the total weight of the formulation, together with non-ionic surfactants, anionic surfactants, fragrance, colour and possible emulsifying agents.

EP 3 378 927 A1

Description

[0001] The present invention relates to a deodorant and/or detergent gel formulation, in particular for application in sanitary appliances.

[0002] There are currently various detergent and perfuming products on the market for WC hygiene, in gel form, both adhesive products and products in the form of tablets. So-called adhesive products are products which, thanks to the adhesion properties of the formulation, are used by direct application to the surface of the sanitary appliance of interest. In the case of tablets, the product is used by application to the sanitary appliance of interest through the aid of a container device, generally called a cage, containing the tablet.

[0003] These products exist both in gel form and in solid form and gel formulations have various performance limits with respect to solid physical forms. Gel formulations, in fact, if left exposed to the air (in storage and in application without a regular flushing) have the problem that the formulation dehydrates rather rapidly losing its aesthetic and functional characteristics.

[0004] In order to find a solution to this problem, in products currently on the market, resort has been made to the use of protective films to be removed before application or to plunger dispensing systems of the product with a cap closure, to avoid exposing the product to the air until the moment of use.

[0005] This solution however is clearly also not effective in the case of applications without regular flushings and in any case requires the use of mechanical means, external to the formulation of the product itself.

[0006] The objective of the present invention is therefore to identify a deodorant and/or detergent gel formulation for tablets that does not have the drawbacks described above of the gel formulations of the state of the art and, in particular, that is characterized by a greater stability with respect to dehydration phenomena, without the need for resorting to "mechanical means" and characterized by foam performances in line with what is required for this kind of product.

[0007] The objective of the present invention is therefore to identify an improved gel formulation for tablets that guarantees resistance to dehydration of the semi-solid deodorant and/or detergent gel formulation, if left exposed to the air without protection.

[0008] An object of the present invention relates to a deodorant and/or detergent gel formulation, for application in sanitary appliances, as a gel tablet, comprising at least one polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer in a quantity ranging from 20 to 90% by weight with respect to the total weight of the formulation, together with non-ionic surfactants, anionic surfactants, fragrance, colour and possible emulsifying agents.

[0009] A further object of the present invention relates to the use of the deodorant and/or detergent gel formulation, comprising a polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer in a quantity ranging from 20 to 90% by weight with respect to the total weight of the formulation, together with non-ionic surfactants, anionic surfactants, fragrance, colour and possible emulsifying agents, as a gel tablet for deodorizing and cleaning WCs, by application with a support.

[0010] The polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA) according to the present invention has a number molecular weight ranging from about 4,700 to about 20,000, a colour lower than 8 on the Gardner colorimetric scale (PAINT AND COATING TESTING MANUAL: GARDNER-WARD HANDBOOK (15th ed.)), an acidity number lower than 20, measured according to the internal method described herein, an amine number lower than 3, measured according to the method ASTM D2074-07(2013) (Standard Test Methods for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method) and a softening point ranging from 90°C to 115°C, measured according to the internal method described herein.

[0011] The acidity number is measured by means of an internal method which is based on the determination by titrimetry of the acidity of vegetable and animal oils and fats and derivatives. The acidity number corresponds to the milligrams of potassium hydroxide necessary for neutralizing the free fatty acids present in 1 g of sample and is expressed in mg KOH/g.

[0012] The sample, dissolved in a suitable solvent, is titrated directly with a standard solution of potassium hydroxide.

Specifications:

[0013]

Solvent: 50/50 mixture (v/v) of isopropanol/xylene

Alcohol solution of potassium hydroxide (0.1N or 0.5N)

Indicator: solution of phenolphthalein 1%

Results:

[0014] The value of the acidity number is calculated using the following formula:

5

$$AV = (MKOH \times Vc \times c)/m$$

wherein:

10

AV = acidity number of the sample, in mgKOH/g

MKOH = molecular mass of the potassium hydroxide, equal to 56.1 g/mole

Vc = volume of the potassium hydroxide used in the titration in ml

c = concentration of the solution of potassium hydroxide in mol/l

m = mass of the sample in grams.

15

[0015] The softening point is measured by means of an internal method which is based on a ball-ring system. A steel ball is centered on a ring previously filled with the sample. The system is housed in a heating apparatus which follows a programmed thermal ramp. The softening point is the temperature at which the sample begins to drip through the orifice located at the bottom of the ring, interrupting a light beam directed perpendicularly below the ball-ring system.

20

Specifications:

[0016]

25

Weight of sample: about 10g

Initial temperature: at least 20°C below the expected softening point

Thermal ramp: 1.8°C/min

Final temperature: at least 10°C above the expected softening point

Repeatability: 0.2-0.5°C

30

Reproducibility: 0.5-0.8°C

[0017] The product CrystaSense HP5, marketed by Croda Europe Ltd, falls within these specifications and is a preferred polyalkyleneoxy-polyamide polymer (PAOPA) in the deodorant and/or detergent gel formulation, for application in sanitary appliances as a gel tablet, according to the present invention.

35

[0018] Said polyalkyleneoxy-polyamide polymer (PAOPA) has a number molecular weight equal to about 19,000, a colour lower than 6 on the Gardner colorimetric scale, an acidity number lower than 15, measured according to the internal method described herein, and an amine number lower than 3, measured according to the method ASTM D2074-07(2013). It also has a softening point equal to about 93°C.

[0019] The product CrystaSense MP, marketed by Croda Europe Ltd, falls within these specifications and is a preferred polyalkyleneoxy-polyamide polymer (PAOPA) in the deodorant and/or detergent gel formulation, for application in sanitary appliances as a gel tablet, according to the present invention.

40

[0020] Said polyalkyleneoxy-polyamide polymer (PAOPA) has a number molecular weight equal to about 20,000, a colour lower than 4 on the Gardner colorimetric scale, an acidity number lower than 18, measured according to the internal method described herein, and an amine number lower than 3, measured according to the method ASTM D2074-07(2013). It also has a softening point equal to about 95°C The product CrystaSense HP4, marketed by Croda Europe Ltd, falls within these specifications and is the preferred polyether-polyamine polymer (PEPA) in the deodorant and/or detergent gel formulation, for application in sanitary appliances as a gel tablet, according to the present invention.

45

[0021] Said polyether-polyamine polymer has a number molecular weight equal to about 9,500, a colour lower than 6 on the Gardner colorimetric scale, an acidity number lower than 15, measured according to the internal method described herein, and an amine number lower than 3, measured according to the method ASTM D2074-07(2013) and a softening point equal to about 105°C, measured according to the internal method described herein.

50

[0022] The formulation according to the present invention is therefore characterized by a gel composition of a polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA) capable of blocking the exchange of water with the outside environment, thus preserving the appearance and functionality of the gel formulation.

55

[0023] Furthermore, the polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA) has a good hydrosolubility and can also be introduced into the formulation in high percentages, surprisingly preserving the functional characteristics of the gel in terms of consumption. The polymers according to the

present invention, in fact, allow a gel tablet to be obtained, which preserves the specific characteristics of the surfactants, maintaining the detergent and foaming characteristics of formulations that do not contain these types of polymer and that therefore have the problems of dehydration in the air, previously described.

[0024] The formulation of the gel tablet according to the present invention is preferably composed of a gel composition consisting of:

- water in a quantity ranging from 0 to 20% by weight;
- polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA), preferably a polyether-polyamine polymer, in a quantity ranging from 20 to 70% by weight;
- sodium laurylether sulfate in a quantity ranging from 0 to 25% by weight;
- monopropylene glycol in a quantity ranging from 2 to 20% by weight;
- glycerine in a quantity ranging from 0 to 5% by weight;
- coconut amides in a quantity ranging from 0 to 25% by weight;
- C₁₂-C₂₀ ethoxylated fatty alcohols EO 2-30 in a quantity ranging from 0 to 5% by weight;
- amine oxides in a quantity ranging from 0 to 9% by weight;
- fragrance in a quantity ranging from 0 to 10% by weight;

colour in a quantity of less than 0.005% by weight.

[0025] In a preferred embodiment, the deodorant and/or detergent gel formulation, for application in sanitary appliances, as a gel tablet, is composed of a two-layer structure, wherein the base layer A is a gel composition comprising surfactants and the coating layer B is a gel composition comprising at least one polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA).

[0026] This solution with a two-layer structure allows the quantity of polyether-polyamine polymer used in the production of the gel tablet to be limited, with a consequent cost saving: furthermore, the presence of these polymers even in layer B alone, surprisingly allows the maximum performance to be obtained in terms of detergency, foam and fragrance characteristic of layer A, ensuring however a greater stability and duration of the gel formulation according to the present invention both under storage conditions and in conditions of use with limited water flushing.

[0027] In the present description, the base layer A refers to the layer which, when the gel formulation is positioned in the container for final use, forms the lower layer, i.e. the layer in contact with the surface of the container/cage, whereas the coating layer B refers to the upper layer, i.e. the layer of the gel formulation directed towards the outside of the container/cage, i.e. exposed to the air and therefore to dehydration.

[0028] The base layer A is composed of a surfactant-based gel composition which comprises ethoxylated alcohol and water as main components. The composition of said layer A also comprises anionic surfactants, fragrance, colour and possible thickeners. It has excellent foaming properties, but shows all the air stability limits described above. A product composed of layer A alone, in fact, tends to dehydrate and the product loses its functional and aesthetic characteristics in a very short time.

[0029] In this embodiment of the gel tablet according to the present invention which provides a two-layer structure, the coating layer B is composed of a gel composition of a polyamide selected from polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA) capable of blocking the exchange of water with the outside environment, thus preserving the appearance and functionality of the gel formulation.

[0030] The gel formulation according to the present invention in the embodiment which provides two layers is produced by pouring the coating layer with a polymer-based gel composition on the base layer with a surfactant-based gel composition.

[0031] The base layer A preferably consists of a surfactant-based gel composition which comprises water in a quantity ranging from 20 to 60% by weight, preferably from 35 to 45%, with respect to the total weight of layer A, and one or more ethoxylated alcohols, selected from cetylstearyl alcohols with an ethoxylation degree ranging from 20 to 30, preferably equal to 25 or 30, in a quantity ranging from 25 to 50% by weight, preferably from 30 to 40%, with respect to the total weight of layer A, the complement to a hundred consisting of anionic surfactants, fragrance, colour and possible emulsifying agents.

[0032] The base layer A even more preferably consists of the following gel composition wherein the quantities indicated are weight quantities with respect to the total weight of layer A:

- water in a quantity ranging from 20 to 60% by weight;
- cetylstearyl alcohols with an ethoxylation degree equal to 25 or 30, in a quantity ranging from 25 to 50% by weight;
- sodium laurylether sulfate in a quantity ranging from 0 to 20% by weight;
- glycerine in a quantity ranging from 0 to 10% by weight;
- monopropylene glycol in a quantity ranging from 0 to 10% by weight;
- carbomer in a quantity ranging from 0 to 1% by weight;

- C₁₂-C₁₈ alcohols with 9 EO moles in a quantity ranging from 0 to 10% by weight;
- cationic hydroxyethylcellulose in a quantity ranging from 0 to 5% by weight;
- fragrance in a quantity ranging from 0 to 10% by weight;
- colour in a quantity of less than 0.5% by weight.

5

[0033] Layer B preferably comprises a quantity ranging from 50 to 98%, preferably from 80 to 90% by weight of polyamide selected from polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA), with respect to the total weight of layer B, the complement to a hundred consisting of surfactants and/or glycol, fragrance and colour.

10 **[0034]** The coating layer B even more preferably consists of the following gel composition wherein the quantities indicated are weight quantities with respect to the total weight of layer B:

- polyamide selected from polyether-polyamine polymer (PEPA) and a polyalkyleneoxy-polyamide polymer (PAOPA), preferably polyether-polyamine polymer, in a quantity ranging from 50 to 98% by weight;
- 15 - monopropylene glycol in a quantity ranging from 0 to 20% by weight;
- cocoamide DEA in a quantity ranging from 0 to 18% by weight;
- glycerine in a quantity ranging from 0 to 2% by weight;
- fragrance in a quantity ranging from 0 to 15% by weight;
- colour in a quantity ranging from 0 to 0.5% by weight.

20

[0035] The coating layer B has a thickness ranging from 0.5 mm to 5 mm, in any case up to full coverage of the underlying layer A.

Figures 1-4 attached herewith show:

25 Figure 1: plates immediately after pouring where, on the left, there is a formulation with layer A alone based on ethoxylated alcohol, and on the right the formulation according to the present invention with a double layer, with a coating layer B consisting of polyether-polyamine polymer.

Figure 2: the plates of Figure 1, 48 hours after pouring;

30 Figure 3, a side view of the plate of figure 1 with the double-layer formulation according to the present invention, showing said double layer;

Figure 4: the plate immediately after pouring with the formulation according to the present invention with a single layer.

[0036] The gel formulations according to the present invention therefore have the great advantage of a greater stability and duration over time of the aesthetic and functional structure of the gel, being characterized by a lesser tendency towards dehydration.

35 **[0037]** Furthermore, the gel formulation according to the present invention also has the undoubted advantage of allowing the manufacturing of products in cages that do not require particular packing precautions with sealing protective films which are therefore much less expensive.

[0038] Finally, the specific polyether-polyamine polymers surprisingly prevent or limit dehydration in contact with the air, but at the same time, as they are hydrosoluble, they can also be introduced into the formulation in high percentages, surprisingly preserving the functional characteristics of the gel in terms of consumption.

40 **[0039]** In the two-layer embodiment, the polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA) of layer B prevents or limits dehydration in contact with the air, but at the same time, as it is hydrosoluble, it allows layer A to exert its function of detergency and perfuming. The presence of these polymers in layer B alone therefore allows the maximum performance to be obtained in terms of detergency, foam and fragrance characteristic of layer A, ensuring however a greater stability and duration of the gel formulation according to the present invention both under storage conditions and in conditions of use with limited water flushing.

[0040] The following examples are provided for purely illustrative purposes of the present invention and should not be considered as limiting the protection scope, as defined by the enclosed claims.

50

Example 1

[0041] A first gel formulation according to the present invention was prepared as follows, with the compositions indicated in Table 1 and Table 2.

55

EP 3 378 927 A1

Table 1

GEL COMPOSITION	
<i>Raw material</i>	%
Polyether polyamine polymer (Crystasense®)	46
Monopropylene glycol	5.9995
Sodium laurylether sulfate (sles)	15.4
Cocamide DEA	18
Water	6.6
2-octadecoxyethanol (Steareth 21)	2
Glycerine	2
Fragrance	4
Colour	0.0005

Table 2

GEL COMPOSITION	
<i>Raw material</i>	%
Polyether polyamine polymer (Crystasense®)	62
Monopropylene glycol	6.9995
Sodium laurylether sulfate (sles)	14
Lauryldimethylamine N-oxide	2.25
Water	8.75
Fragrance	6
Colour	0.0005

[0042] The polyether polyamine polymer was inserted, together with the monopropylene glycol, into a fuser equipped with a mixing system and the whole mixture was heated to a temperature of 110°C, in order to obtain the perfect melting of the polymer. The product was then cooled, keeping the whole mixture under stirring, to a temperature of 90°C. The surfactants, the fragrance, the possible emulsifying agents and the colour were subsequently added. The whole mixture was mixed until the product was homogenized and was then poured into the cage.

[0043] Two gel tablets according to the present invention were thus produced, the first with the formulation of Table 1 and the second with the formulation of Table 2. The tablets thus formed were left with the surface in direct contact with the air and showed no dehydration for more than three months.

Example 2

[0044] A first gel formulation according to the present invention in the two-layer embodiment was prepared as follows with the compositions indicated in Table 3 and Table 4, for layer A and layer B, respectively.

Table 3

GEL COMPOSITION LAYER A	
<i>Raw material</i>	%
Water	37.499
Cetylstearyl alcohols with an ethoxylation degree equal to 25 (Cetareth 25)	45
Sodium laurylether sulfate (sles)	10.5

EP 3 378 927 A1

(continued)

GEL COMPOSITION LAYER A	
<i>Raw material</i>	%
Carbomer	0.3
C ₁₂ -C ₁₈ alcohol con 9 moles EO	2.7
Fragrance	4
Colour	0.001

Table 4

GEL COMPOSITION LAYER B	
<i>Raw material</i>	%
Polyether polyamine (Crystasense®)	91.9995
Monopropylene glycol	4
Fragrance	4
Colour	0.0005

Preparation of layer A with a surfactant-based gel composition

[0045] The water was charged into a main mixer together with the glycerine and the mixture was heated to a temperature ranging from 80°C to 90°C.

[0046] The ethoxylated alcohol and sodium lauryl ether sulfate (sles) were charged into a secondary mixer, heating under stirring until a temperature ranging from 80°C to 90°C had been reached.

[0047] A suspension of carbomer in the C₁₂-C₁₈ non-ionic surfactant was prepared, under forced stirring, in a third mixer.

[0048] Once the temperatures indicated had been reached in the main mixer and in the secondary mixer, the mixture of ethoxylated alcohol and sles was poured under forced stirring into the main mixer, always keeping the temperature at a value ranging from 80 to 90°C.

[0049] As soon as the mixture had become fully homogeneous, the fragrance and colour (previously dispersed in water) were added. The carbomer suspension was finally added slowly and under stirring.

Preparation of layer B with a polymer-based gel composition

[0050] The polyether polyamine polymer and glycol were charged into a fuser, heating to a temperature of about 110°C (this temperature ensures the perfect melting of the polymer grains).

[0051] The whole mixture was then cooled to 90°C, and, after adding the fragrance, was poured onto the surfactant-based layer A (previously cooled to a temperature lower than 40°C and arranged in the container/cage), until the same had been completely covered. The thickness of layer B was approximately equal to 3 mm.

[0052] A gel tablet according to the present invention was thus produced in the embodiment providing a layer A and a layer B.

[0053] The tablet thus formed was left with the surface of layer B in direct contact with the air and showed no dehydration for over 45 days.

Example 3

[0054] A gel formulation according to the present invention was prepared as described in the previous Example 2, using the compositions indicated in Table 5 and Table 6, for layer A and layer B, respectively.

[0055] In the preparation of layer A, cationic hydroxyethylcellulose was added instead of the carbomer of Example 1 under the same conditions.

[0056] In the preparation of layer B, the surfactant (cocoamide DEA) was added together with the fragrance.

Table 5

GEL COMPOSITION LAYER A	
<i>Raw material</i>	%
Water	44.999
Cetylstearyl alcohols with an ethoxylation degree equal to 25	35
Sodium laurylether sulfate (sles)	14
Cationic hydroxyethylcellulose (Ucare® polimer)	2
Fragrance	4
Colour	0.001

Table 6

GEL COMPOSITION LAYER B	
<i>Raw material</i>	%
Polyether polyamine (Crystasense®)	85.9995
Monopropylene glycol	5
Cocamide DEA	4.5
Fragrance	4
Glycerine	0.5
Colour	0.0005

[0057] The gel formulation according to the present invention of Example 2 was also characterized by an improved stability.

[0058] A gel tablet according to the present invention was in fact produced, in the embodiment providing a layer A and a layer B.

[0059] The tablet thus formed was left with the surface of layer B in direct contact with the air and showed no dehydration for over 45 days.

Claims

1. A deodorant and/or detergent gel formulation, for application in sanitary appliances as a tablet, comprising at least one polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer in a quantity ranging from 20 to 90% by weight with respect to the total weight of the formulation, together with non-ionic surfactants, anionic surfactants, fragrance, colour and possible emulsifying agents.
2. The gel formulation according to claim 1, composed of a two-layer structure, wherein the base layer A is a gel composition comprising surfactants and the coating layer B is a gel composition comprising at least one polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer.
3. The gel formulation according to any of the previous claims, wherein the polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA) according to the present invention has a number molecular weight ranging from about 4,700 to about 20,000, a colour lower than 8 on the Gardner colorimetric scale, an acidity number lower than 20, measured according to the internal method, an amine number lower than 3, measured according to the method ASTM D2074-07(2013) and a softening point ranging from 90°C to 115°C, measured according to the internal method.
4. The gel formulation according to any of the previous claims, wherein the polyamide is a polyether-polyamine polymer (PEPA) having a number molecular weight equal to about 9,500, a colour lower than 6 on the Gardner colorimetric scale, an acidity number lower than 15, measured according to the internal method, an amine number lower than

3, measured according to the method ASTM D2074-07(2013) and a softening point equal to about 105°C, measured according to the internal method, and/or a polyalkyleneoxy-polyamide polymer (PAOPA) having a number molecular weight equal to about 19,000, a colour lower than 6 on the Gardner colorimetric scale, an acidity number lower than 15, measured according to the internal method, an amine number lower than 3, measured according to the method
 5 ASTM D2074-07(2013) and a softening point equal to about 93°C, measured according to the internal method and/or a polyalkyleneoxy-polyamide polymer (PAOPA) having a number molecular weight equal to about 20,000, a colour lower than 4 on the Gardner colorimetric scale, an acidity number lower than 18, measured according to the internal method described herein, and an amine number lower than 3, measured according to the method ASTM
 10 D2074-07(2013). It also has a softening point equal to about 95°C.

5. The gel formulation according to claim 1, consisting of a gel composition composed of:

- water in a quantity ranging from 0 to 20% by weight;
- polyamide selected from a polyether-polyamine polymer (PEPA) or a polyalkyleneoxy-polyamide polymer (PAOPA), preferably a polyether-polyamine polymer, in a quantity ranging from 20 to 70% by weight;
- sodium lauryl ether sulfate in a quantity ranging from 0 to 25% by weight;
- monopropylene glycol in a quantity ranging from 2 to 20% by weight;
- glycerine in a quantity ranging from 0 to 5% by weight;
- coconut amides in a quantity ranging from 0 to 25% by weight;
- C₁₂-C₂₀ ethoxylated fatty alcohols EO 2-30 in a quantity ranging from 0 to 5% by weight;
- amine oxides in a quantity ranging from 0 to 9% by weight;
- fragrance in a quantity ranging from 0 to 10% by weight;
- colour in a quantity of less than 0.005% by weight.

6. The gel formulation according to claim 2, wherein

- the base layer A is a gel composition based on surfactants comprising water and one or more ethoxylated alcohols, selected from cetylstearyl alcohols with an ethoxylation degree ranging from 20 to 30; and
- the coating layer B is a gel composition with a polymeric base comprising at least one polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer.

7. The gel formulation according to claim 2, wherein the base layer A consists of a gel composition based on surfactants comprising water in a quantity ranging from 20 to 60% by weight, preferably from 35 to 45%, with respect to the total weight of layer A, and one or more ethoxylated alcohols, selected from cetylstearyl alcohols with an ethoxylation degree ranging from 20 to 30, preferably equal to 25 or 30, in a quantity ranging from 25 to 50% by weight, preferably from 30 to 40%, with respect to the total weight of layer A, the complement to a hundred consisting of anionic surfactants, fragrance, colour and possible emulsifying agents and layer B) comprises a quantity ranging from 50 to 98%, preferably from 80 to 90% by weight, of polyamide selected from polyether-polyamine polymer (PEPA) or polyalkyleneoxy-polyamide polymer (PAOPA), with respect to the total weight of layer B, the complement to a hundred consisting of surfactants and/or glycol, fragrance and colour.

8. The gel formulation according to claim 2, wherein the base layer A consists of the following gel composition wherein the quantities indicated are weight quantities with respect to the total weight of layer A:

- water in a quantity ranging from 20 to 60% by weight;
- cetylstearyl alcohols with an ethoxylation degree equal to 25 or 30, in a quantity ranging from 25 to 50% by weight;
- sodium lauryl ether sulfate in a quantity ranging from 0 to 20% by weight;
- glycerine in a quantity ranging from 0 to 10% by weight;
- monopropylene glycol in a quantity ranging from 0 to 10% by weight;
- carbomer in a quantity ranging from 0 to 1% by weight;
- C₁₂-C₁₈ alcohols with 9 moles EO in a quantity ranging from 0 to 10% by weight;
- cationic hydroxyethylcellulose in a quantity ranging from 0 to 5% by weight;
- fragrance in a quantity ranging from 0 to 10% by weight;
- colour in a quantity of less than 0.5% by weight and the coating layer B consists of the following gel composition wherein the quantities indicated are weight quantities with respect to the total weight of layer B:
- polyamide selected from polyether-polyamine polymer (PEPA) and polyalkyleneoxy-polyamide polymer (PAOPA), preferably polyether-polyamine polymer, in a quantity ranging from 50 to 98% by weight;

EP 3 378 927 A1

- monopropylene glycol in a quantity ranging from 0 to 20% by weight;
- cocoamide DEA in a quantity ranging from 0 to 18% by weight;
- glycerine in a quantity ranging from 0 to 2% by weight;
- fragrance in a quantity ranging from 0 to 15% by weight;
- colour in a quantity ranging from 0 to 0.5% by weight.

5

9. The gel formulation according to any of the claims 2, 6-8, wherein the coating layer B has a thickness ranging from 0.5 mm to 5 mm.

10

10. Use of the deodorant/detergent gel formulation, comprising at least one polyamide selected from a polyether-polyamine polymer or a polyalkyleneoxy-polyamide polymer in a quantity ranging from 20 to 90% by weight with respect to the total weight of the formulation, together with non-ionic surfactants, anionic surfactants, fragrance, colour and possible emulsifying agents, as a gel tablet for deodorizing and cleaning WCs, by application with a support.

15

11. Use of the formulation according to any of the claims from 2 to 9 as a gel tablet for deodorizing and cleaning WCs, by application with a support.

20

25

30

35

40

45

50

55

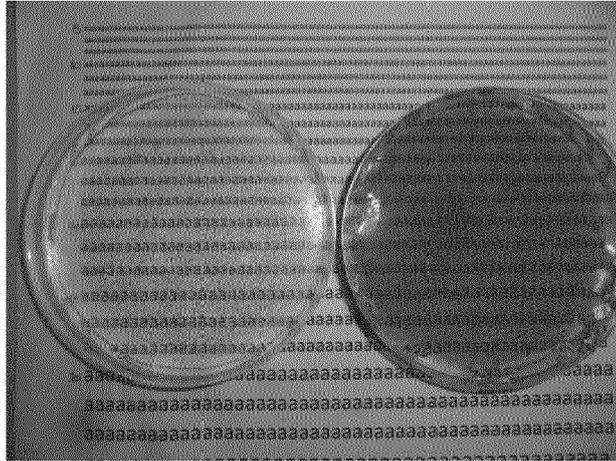


Fig.1

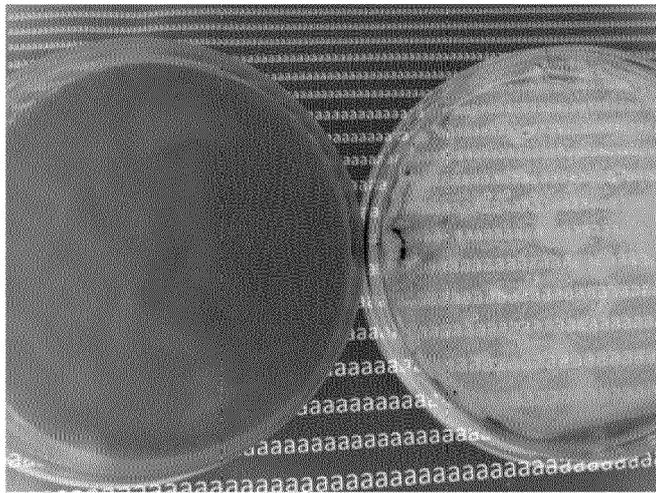


Fig.2

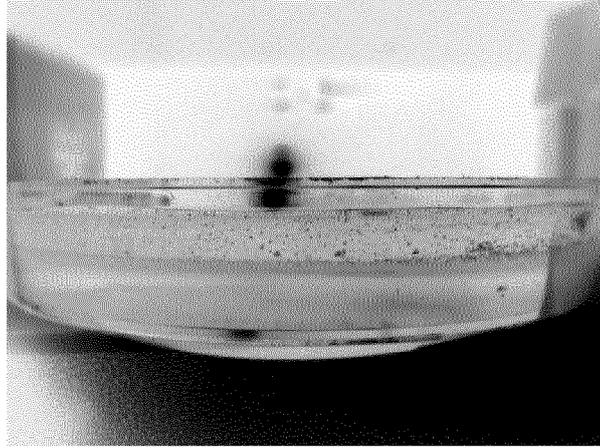


Fig.3

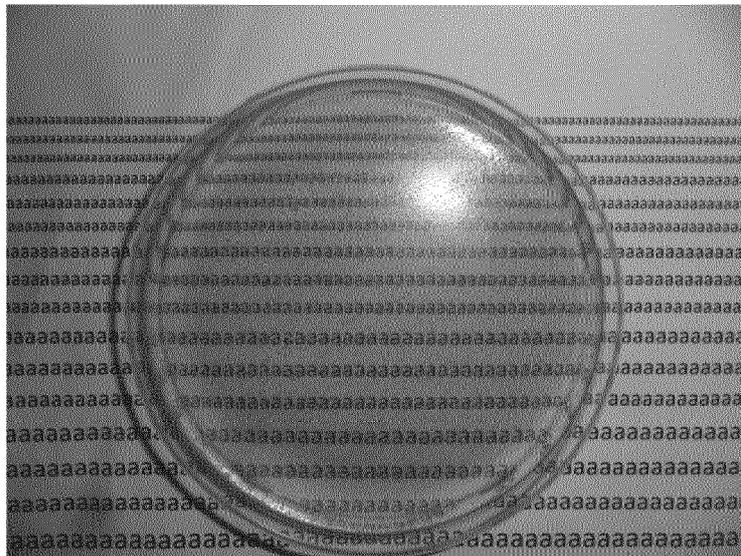


Fig.4



EUROPEAN SEARCH REPORT

Application Number
EP 18 16 2991

5

10

15

20

25

30

35

40

45

50

55

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	EP 2 316 914 A1 (BOLTON MANITOBA SPA [IT]) 4 May 2011 (2011-05-04) * example 5; table 1 * * paragraphs [0080] - [0082] * -----	1,3-5, 10,11	INV. C11D1/83 C11D3/00 C11D3/37 C11D3/40 C11D3/50 C11D17/00
A	EP 3 138 898 A1 (PROCTER & GAMBLE [US]) 8 March 2017 (2017-03-08) * example 2.1; table 2 * * paragraphs [0051], [0071], [0110] - [0111] * -----	1-11	
A	US 2016/310623 A1 (KELLY CHRISTOPHER [US] ET AL) 27 October 2016 (2016-10-27) * paragraphs [0010], [0021] * -----	1-11	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
			C11D
Place of search		Date of completion of the search	Examiner
The Hague		10 July 2018	Agra-Gutierrez, C
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 (P04C01)

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

EP 18 16 2991

5

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.

10-07-2018

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2316914 A1	04-05-2011	EP 2316914 A1	04-05-2011
		ES 2631513 T3	31-08-2017
		HR P20170993 T1	22-09-2017
		IT 1396369 B1	19-11-2012
		PL 2316914 T3	29-09-2017
		SI 2316914 T1	30-10-2017

EP 3138898 A1	08-03-2017	EP 3138898 A1	08-03-2017
		US 2017067003 A1	09-03-2017
		WO 2017040560 A1	09-03-2017

US 2016310623 A1	27-10-2016	NONE	

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Non-patent literature cited in the description

- PAINT AND COATING TESTING MANUAL: GARDNER-WARD HANDBOOK [0010]