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(54) Title: FABRIC TREATMENT ARTICLE AND COMPOSITION

(57) Abstract: The invention provides an article for fabric treatment comprising a substrate releasably impregnated with a fluid treatment composition adapted for fabric cleaning and freshening by contact of the fluid composition with the fabric to be treated during a tumble drying process, the fluid treatment composition comprising: a glycol ether solvent; water; a non-ionic surfactant; and a perfume characterised in that the glycol ether solvent is present in the composition in an amount which is miscible with the water present in the composition.

WO 01/79415 A1

FABRIC TREATMENT ARTICLE AND COMPOSITION**FIELD OF THE INVENTION**

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The present invention relates to a fabric treatment article and composition, more particularly to a tumble dryer sheet carrying a composition for treating fabrics in a tumble dryer and for pre-treating such fabrics to remove stains.

10

BACKGROUND TO THE INVENTION

Tumble dryer sheets adapted for domestic dry cleaning purposes are a relatively recent addition to the range of fabric treatment products currently known. There are currently at least two commercial embodiments of such materials, namely the Dryel™ product of The Procter & Gamble Company and the Custom Cleaner™ product of Creative Products Resource, Inc. Both commercial products comprise hydroentangled sheets impregnated with a fabric treatment composition. The Dryel™ product is sold with a separate pre-treater for stain removal and the Custom Cleaner™ product is sold as a combined stain removal and fabric treatment product. Both commercial products instruct the consumer to use the fabric treatment sheet inside a bag, into which the fabrics to be treated are placed before sealing the bag and placing it in the tumble dryer.

WO-A-99/10586 (The Procter & Gamble Company) relates to a bagless dry cleaning kit having one or more carrier sheets and from 200 grams to 1,000 grams of a liquid cleaning/refreshment composition. The "cleaning/refreshment

- 2 -

composition" is primarily water and perfume with an emulsifier and optional solvents such as ethanol and isopropanol. The kit includes a separate pre-treating composition which is delivered to the fabric by means of an
5 absorbent stain removal article impregnated with the pre-treating composition. WO-A-97/07278 (The Procter & Gamble Company) relates to a dry cleaning process using a bag. WO-A-97/29178 (The Procter & Gamble Company) relates to a dry cleaning sheet which is oleophilic and can acquire a
10 strong electrostatically positive charge when passed across the surface being cleaned. WO-A-97/32004 (The Procter & Gamble Company) relates to a dry cleaning sheet which has a permeable coversheet which it is said provides a more uniform distribution within the tumble dryer of the cleaning
15 composition on the dry cleaning sheet. WO-A-97/45516 (The Procter & Gamble Company) discloses a phase stable liquid refreshment and cleaning composition comprising butoxy propoxy propanol, water, optional nonionic and a phase stabilising amount of an alkyl sulphate and/or alkyl ethoxy
20 sulphate surfactant. WO-A-96/30471 (The Procter & Gamble Company) discloses a cleaning composition comprising at least 4% butoxy propoxy propanol and other ingredients, including an emulsifier. WO-A-93/23603 (Creative Products Resource, Inc.) discloses a fabric cleaning kit comprising a
25 bag and a cleaning sheet impregnated with a composition comprising a gelling agent, surfactant and a solvent.

It is an object of the present invention to provide an improved form of fabric treatment article.

30

BRIEF SUMMARY OF THE INVENTION

Accordingly, the present invention provides an article for fabric treatment comprising a substrate releasably
5 impregnated with a fluid treatment composition adapted for fabric cleaning and freshening by contact of the fluid composition with the fabric to be treated during a tumble drying process, the fluid treatment composition comprising:

a glycol ether solvent;

10 water;

a non-ionic surfactant; and

a perfume

characterised in that the glycol ether solvent is present in the composition in an amount which is
15 miscible with the water present in the composition and the total surfactant content is not more than 2% by weight of the fluid treatment composition.

The provision of a fabric treatment article impregnated with
20 a fluid composition comprising no more glycol ether solvent than is miscible with the water present in the composition removes the need to include any polymeric emulsification aid in the composition. This is desirable both to reduce the expense of the composition and to avoid the deposition of
25 residues on the treated fabric left by the emulsifier. The fluid treatment composition of the invention is free from polymeric emulsification aids.

The fluid treatment composition used in the invention is
30 non-gelled having a viscosity comparable to water. The composition is free from gelling agent. The composition may

- 4 -

be readily applied to an absorbent carrier sheet and may be released from the carrier sheet to treat a stain on a fabric by wiping, rubbing or pressing the impregnated carrier sheet against the fabric. Surprisingly, it is found that the amount of glycol ether in the fabric treatment articles according to the invention provides an effective cleaning performance even at the relatively low levels of glycol ether needed to maintain water miscibility. The cost of the composition is further reduced by maintaining the amount of glycol ether solvent therein at a relatively low level and the avoidance of phase separation in the composition by maintaining water miscibility further reduces the risk of staining during the treatment process.

15

DESCRIPTION OF PREFERRED EMBODIMENTS

Preferably, the glycol ether solvent is present in the composition in an amount of from about 1.0% to about 4.5%, more preferably from 1.5 to 3.5%, and most preferably from 2.0 to 3.0% by weight of the composition. A particularly preferred fabric treatment article according to the invention is impregnated with a fluid composition which comprises about 2.5% glycol ether solvent.

25 The glycol ether solvent for use in the fabric treatment articles of the invention preferably has a volatility of less than that of butyl acetate. Glycol ether solvents are lower-(alkoxy)- or lower(alkoxy)lower(alkoxy)-ethers of ethanol or isopropanol. The lower alkoxy groups generally contain from 1 to 6 carbon atoms. Preferred solvents include dipropylene glycol n-propyl ether, dipropylene

- 5 -

glycol t-butyl ether, dipropylene glycol n-butyl ether and dipropylene glycol methyl ethanoate, tripropylene glycol methyl ether, tripropylene glycol n-butyl ether or mixtures of one or more thereof. Preferably the glycol ether solvent
5 has a flash point of above 90°C. Preferably the glycol ether has a lower odour.

The fabric treatment article according to the invention additionally includes a perfume and a non-ionic surfactant
10 as essential components and it is preferred that the non-ionic surfactant is present in an amount sufficient to solubilised the perfume in the composition.

The perfume is preferably present in an amount of from about
15 0.1% to 1%, more preferably from about 0.25% to 0.75% and most preferably from about 0.5% to about 0.75% by weight of the composition.

Preferably, the non-ionic surfactant is present in the fluid
20 composition in an amount of from about 0.1% to about 2%, more preferably from about 0.5% to about 2% by weight, most preferably from about 1.1% to about 2% by weight of the composition. Non-ionic surfactants that may be used include the primary and secondary alcohol ethoxylates, especially
25 the C₈₋₂₀ aliphatic alcohols ethoxylated with an average of from 1 to 20 moles of ethylene oxide per mole of alcohol, and more especially the C₁₀₋₁₅ primary and secondary aliphatic alcohols ethoxylated with an average of from 1 to 10 moles of ethylene oxide per mole of alcohol. A preferred non-
30 ionic surfactants are commercially available from Shell Chemicals under the trade name NEODOL 25-9 and NEODOL 25-7

- 6 -

which are C₁₂-C₁₅ primary alcohol ethoxylates having 9 and 7 moles of ethylene oxide respectively. Non-ethoxylated non-ionic surfactants suitable for use in the invention include alkylpolyglycosides, glycerol monoethers and
5 polyhydroxyamides (glucamide).

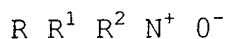
The composition may comprise other surfactants provided the total surfactant content does not exceed 2% by weight. Preferably the total surfactant content is not more than
10 1.5% by weight. Higher surfactant contents may lead to staining during the treatment process.

The fluid composition may further comprise an anionic surfactant. In this case, the amount of anionic surfactant
15 present in the fluid composition is less than the amount of non-ionic surfactant present therein. Anionic surfactants are well known to those skilled in the art. Examples suitable for use in a fabric treatment article according to the invention include alkylbenzene sulphonates, particularly
20 C₈₋₁₅ linear alkylbenzene sulphonates, alkyl ether sulphates and alkyl ether carboxylates. A preferred anionic surfactant is sodium lauryl ether sulphate ethoxylated with 2 ethylene oxide molecules.

25
The composition may further comprise an amphoteric surfactant. The amphoteric surfactant may be present in an amount not more than the amount of non-ionic surfactant present therein. Amphoteric surfactants are well known to
30 those skilled in the art and include sultaines, belaines, alkyl amine oxides, zwitterions, amphopropionates and

- 7 -

carboxylates. Preferred amphoteric surfactants are alkyl amine oxides of the formula:



5 in which:

R is selected from the group alkyl, alkylarylalkyl, arylalkyl, alkylaminoalkyl, and the sulfonated derivatives thereof, alkylamidoalkyl, or alkoxyalkyl wherein the total carbon atom content of the R group is no more than about 22
10 carbon atoms, and

R¹ and R² independently represent alkyl of from 1 to about 6 carbon atoms and the hydroxy-substituted derivatives thereof.

Preferably R is alkyl of 10 to 20 carbon atoms and R¹
15 and R² are methyl.

Exemplary formulations for use in the invention comprise a balance of non-ionic, anionic and amphoteric surfactants. The anionic surfactant is present in an amount less than the
20 non-ionic surfactant e.g. up to 50% by weight of the non-ionic surfactant. The amphoteric surfactant may be present in an amount no more than the non-ionic surfactant. A suitable weight ratio is about 40 : 20 : 40 non-ionic : anionic : amphoteric surfactants. It has been found that
25 such a surfactant mixture allows phase stable formulations to be produced with low surfactant content, below 2%, by weight surfactant mixture. Such formulations offer minimum levels of water marking and good perfume delivery.

30 The fluid composition may further comprise fatty acids, for example C₈₋₂₄ alkyl or alkenyl monocarboxylic acids.

- 8 -

Preferably saturated fatty acids are used, in particular hardened tallow C₁₆₋₁₈ fatty acids. Examples of preferred fatty acids include oleic acid, lauric acid or tallow fatty acid. Other optional ingredients include builders,
5 preservatives and sequestrants.

Water is the predominant component of the formulation and generally comprises at least 90% by weight, preferably at least 94% by weight of the formulation.

10

The substrate may comprise any materials which will absorb the fluid treatment composition and withstand the tumble drying process without disintegrating. Suitable materials include woven and non-woven fabrics. A preferred substrate
15 is a 50/50 rayon/polyester hydroentangled material commercially available from PGI.

The substrate is generally impregnated with from 20 to 40g, preferably 25 to 35g of the fluid composition which is
20 sufficient to treat up to four garments in a tumble drying cycle.

The invention further provides a process for treating a fabric comprising the step of contacting the fabric with a
25 fabric treatment article according to the invention in a tumble dryer and conducting a tumble drying process. Preferably, the fabric to be treated and the fabric treatment article are placed directly in the tumble dryer without any other form of containment. The invention
30 provides a further process according to the above comprising the preliminary step of treating a stain on the fabric by

- 9 -

direct application, with a wiping, rubbing or pressing action, of the article to the fabric.

In another of its aspects, the invention provides a fluid composition for use in the manufacture of an article according to the invention. Also according to the invention is the use of an article according to the invention in a domestic dry cleaning process.

The invention will now be more particularly described with reference to the following Examples.

EXAMPLES

In the Examples the following components were used:

Perfume

Galaxy 80 commercially available from IFF.

Preservatives

A mixture of the following components:

Component	Parts by weight
1,2 benzisothiazolin-3-one	160
sodium hypochlorite	2
3-iodo-2-propynyl butyl carbamate	200

Fluid compositions for impregnation onto the carrier substrate were prepared by the following generic method:

About 5-10% of the total water was added to a vessel and heated to about 40°C.

- 10 -

The non-ionic surfactant and the glycol ether solvent were added to the heated water and mixed for 10 to 15 minutes.

5 The mixture was allowed to cool to below 30°C and the perfume was added with mixing for about 10 to 15 minutes. Alternatively or also a milling step could be employed here.

10 The remaining water, in combination with the preservative, was added and mixed for about 10 to 15 minutes.

The resulting fluid composition was then dosed onto an absorbent carrier sheet comprising a 50/50 rayon/polyester hydroentangled material available commercially from PGI.

15

An alternative formulation procedure is as follows:

About 40-50% of the total water was added to a vessel together with the preservative and heated to around 40-60°C.

20 The non-ionic surfactant and the glycol ether solvent were added and mixed.

The remaining water at ambient temperature was added and mixed.

25 After confirming that the temperature of the mixture had fallen below 30°C, the perfume was added and mixed.

The resulting fluid composition was then dosed onto an absorbent carrier sheet comprising a 50/50 rayon/polyester hydroentangled material available commercially from PGI.

30

- 11 -

Three example fluid compositions were prepared using the first of the above methods:

	Example 1	Example 2	Example 3
Neodol 25-9	2.0%	1.5%	1.1%
DPnB	2.5%	2.5%	2.5%
Perfume	0.55%	0.55%	0.55%
Preservative	0.04%	0.04%	0.04%
Water	To 100%	To 100%	To 100%

5 DPnB dipropylene glycol n-butyl ether.

These compositions, pre-dosed onto non-woven sheets, were tested for cleaning performance on a range of:

10 Stain types (eg make-up, tomato juice, coffee, redwine, lipstick)
 Fabrics (eg cotton, Tencel™, wool, polyesters, "polycotton" blend)
 Fabric colours (eg red, green, navy, cream, pink, purple, brown).

15

The fabric treatment procedure was as follows:

Pre-treatment method:

20 A folded paper, cotton or other absorbent towel was placed on a hard surface underneath the stained area of fabric.

The stain was contacted firmly with the impregnated carrier substrate and a gentle rubbing was employed until the stained area was visibly wet and the stain was transferred onto the paper towel.

25

- 12 -

The treated area was dampened with water to flush out any remaining stain and the treated area was then dried using a hair dryer or an iron.

5 Tumble drying method:

Up to four fabrics were placed in a domestic tumble dryer.

A single carrier substrate dosed with (xg) of the fluid composition was placed in the dryer on top of the
10 fabrics.

A tumble drying process was conducted at low temperature for about 30 minutes.

Each of Examples 1, 2 and 3 were found to give good cleaning
15 and freshening performance.

Example 4

The following formulation was prepared:

20

Component	weight %
Neodol 25-9	1.5
DPnB	3.33
Perfume	0.75
Preservative(s)	0.04
Water	to 100

The formulation had a higher perfume content than Examples 1 to 3 and required a higher solvent level. The formulation gave good cleaning and freshening performance.

25

Examples 5 to 7

These Examples demonstrate a mixed surfactant system with different glycol ether solvents. The following formulations were prepared:

Component	Example 5 % by weight	Example 6 % by weight	Example 7 % by weight
DPnB	3.33	-	-
BDGE	-	3.33	-
TPM	-	-	3.33
Surfactant	1.4	1.4	1.4
Perfume	0.67	0.67	0.67
Preservative	0.04	0.04	0.04
Water	to 100	to 100	to 100

The surfactant comprised an anionic surfactant primary alkyl sulphate (PAS) Hostapur SAS 30; a non-ionic surfactant Neodol 25-7 and an amphoteric surfactant amine oxide, Aromox C/12W. The surfactants were in the weight ratio PAS : Neodol 25-7 : Aromox C/12W of 20 : 40 : 40.
BDGE : butyldiglycol ether
TPM : tripopylene glycol mono-methyl ether

15

The formulations were prepared by making a premix of the solvent, Neodol 25-7 and perfume under stirring. A main batch of PAS, amine oxide, preservative and water was prepared and the premix added under stirring. Stirring was continued until a closer solution was produced.

20

- 14 -

Examples 8 to 10

The following formulations were prepared:

Component	Example 8 % by weight	Example 9 % by weight	Example 10 % by weight
TPM	3.33	3.33	3.33
Neodol 25-9	1.0	0.9	0.85
Perfume	0.67	0.67	0.67
Preservative	0.04	0.04	0.04
Water	to 100	to 100	to 100

5

The samples were stored at 0, 20 and 37°C and observed. Examples 8 and 9 were more stable than Example 10 with no separation of components after eight weeks.

10 Examples 11 to 14

The following formulations were prepared:

Component	Example 11 % by weight	Example 12 % by weight	Example 13 % by weight	Example 14 % by weight
TPM	3.0	2.5	2	1.5
Neodol 25-9	1.0	1.0	1.0	1.0
Perfume	0.67	0.67	0.67	0.67
Preservative	0.04	0.04	0.04	0.04
Water	to 100	to 100	to 100	to 100

15 No separation was observed after storing for eight weeks as in Examples 8 to 10.

CLAIMS

1. An article for fabric treatment comprising a substrate
5 releasably impregnated with a fluid treatment
composition adapted for fabric cleaning and freshening
by contact of the fluid composition with the fabric to
be treated during a tumble drying process, the fluid
treatment composition comprising:
- 10 a glycol ether solvent;
water;
a non-ionic surfactant; and
a perfume
- characterised in that the glycol ether solvent is
15 present in the composition in an amount which is
miscible with the water present in the composition and
the total surfactant content is not more than 2% by
weight of the fluid treatment composition.
- 20 2. An article according to claim 1, wherein the non-ionic
surfactant is present in an amount sufficient to
solubilised the perfume in the composition.
3. An article according to claim 1 to claim 2, wherein the
25 glycol ether solvent is present in the composition in
an amount of from 1.5 to 3.5% by weight of the
composition.
4. An article according to any one of claims 1 to 3,
30 wherein the glycol ether solvent is selected from

- 16 -

dipropylene glycol n-butyl ether and tripropylene glycol mono methyl ether.

5. An article according to any one of claims 1 to 4,
5 wherein the non-ionic surfactant is the only surfactant and is present in an amount of from 1.1 to 2% by weight of the composition.
6. An article according to any one of claims 1 to 5,
10 wherein the fluid composition comprises a mixture of non-ionic, anionic and amphoteric surfactant wherein the amount of anionic surfactant is less than the amount of non-ionic surfactant and the amount of amphoteric surfactant is not more than the amount of
15 non-ionic surfactant.
7. An article according to any one of claims 1 to 6,
20 wherein the perfume is present in an amount of from 0.5 to 0.75% by weight of the composition.
8. An article according to any one of claims 1 to 7,
25 wherein the fluid treatment composition is free from polymeric emulsification aids and gelling agents.
9. An article according to any one of Claims 1 to 8
wherein the fluid treatment composition comprises at least 94% by weight water.

- 17 -

10. An article according to any one of claims 1 to 9,
wherein the fluid treatment composition further
comprises one or more preservatives.
- 5 11. An article according to any one of claims 1 to 10
wherein the fluid treatment composition is present in
an amount of from 20 to 40g.
- 10 12. A process for treating a fabric comprising the step of
contacting the fabric with an article according to any
one of claims 1 to 11 in a tumble dryer and conducting
a tumble drying process.
- 15 13. A process according to claim 12 wherein the fabric to
be treated and the fabric treatment article are placed
directly in the tumble dryer without any other form of
containment.
- 20 14. A process according to claim 12 or claim 13 comprising
the preliminary step of treating a stain on the fabric
by direct application, with a wiping, rubbing or
pressing action, of the article to the fabric.
- 25 15. Use of an article according to any one of claims 1 to
11 in a domestic dry cleaning process, using a tumble
drier.

INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C11D17/04 C11D3/20 C11D3/50 D06L1/04

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)
 IPC 7 C11D D06L

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 865 851 A (LUCIA III FRANK ANTHONY ET AL) 2 February 1999 (1999-02-02)	1-4, 8-12,14, 15
A	claims 1-20,22,23,25-28,33-35 examples 14,15 cleaning examples 4,5 column 3, line 55 - line 61 column 7, line 40 -column 8, line 44 column 14, line 30 -column 15, line 9 column 15, line 57 -column 16, line 60 ---	5-7
A	US 5 997 586 A (SMITH JAMES A ET AL) 7 December 1999 (1999-12-07) claims 1,6,7,10-12,20,24,29 example 1 column 2, line 49 - line 60 column 5, line 31 - line 48 column 6, line 7 - line 24 --- -/--	1-12,14, 15



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the international search

6 August 2001

Date of mailing of the international search report

16/08/2001

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 01/03452

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 630 848 A (ROETKER TIMOTHY C ET AL) 20 May 1997 (1997-05-20) claims examples -----	1-12,14, 15
A	WO 99 10586 A (PROCTER & GAMBLE ;YEAZELL BRUCE ALBERT (US)) 4 March 1999 (1999-03-04) cited in the application claim 8 examples II,III,V page 15, paragraph 1 - paragraph 2 -----	13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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