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(54) Title
PHOSPHATE-FREE LIQUID WASHING AGENT WITH HIGH ALKALINITY

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(71) Applicant(s)
HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN

(72) Inventor(s)
UWE TRABITZSCH

(74) Attorney or Agent
SPRUSON & FERGUSON , GPO Box 3898, SYDNEY NSW 2001

(56) Prior Art Documents
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(57) Claim

1. A liquid, aqueous, non-phosphate detergent concentrate containing 5 to 20% by weight of a nonionic surfactant component (A), 15 to 40% by weight of a builder component (B), up to 3% by weight of other non-surfactant and non-builder detergent constituents and water (balance to 100% by weight), characterized in that the components have the following composition, based on the detergent:

A1) 4 to 20% by weight of an alkyl glucoside corresponding to formula I



where R = a C₈₋₁₄ alkyl radical, G = a glucose residue and

x = a number of 1.2 to 5,

A2) 0 to 2% by weight of at least one nonionic surfactant from the class of alkyl polyglycol ethers containing C₁₂₋₁₈ alkyl groups and 5 to ¹⁰~~8~~ ethylene glycol ether groups,

B1) 4 to 20% by weight sodium hydroxide,

B2) 0.5 to 12% by weight sodium silicate having the composition Na₂O : SiO₂ = 1:1 to 1:3.4,

B3) 2 to 12% by weight sodium nitrilotriacetate,

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B4) 0 to ^{3.5%}~~3%~~ by weight of the sodium salt of at least one phosphonic acid, with the proviso that the content of constituents (B3 + B4) is from 3 to 12% by weight.

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PCT

INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)

<p>(51) Internationale Patentklassifikation ⁵ : C11D 1/66, 1/825, 3/08 C11D 3/33</p>	<p>A1</p>	<p>(11) Internationale Veröffentlichungsnummer: WO 90/06353 Internationale Veröffentlichungsdatum: 14. Juni 1990 (14.06.90)</p>
<p>(21) Internationales Aktenzeichen: PCT/EP89/01370 (22) Internationales Anmeldedatum: 15. November 1989 (15.11.89) (30) Prioritätsdaten: P 38 41 129.6 7. Dezember 1988 (07.12.88) DE P 39 06 766.1 3. März 1989 (03.03.89) DE (71) Anmelder (für alle Bestimmungsstaaten ausser US): HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN [DE/DE]; Henkelstraße 67, D-4000 Düsseldorf-Holthausen (DE). (72) Erfinder; und (75) Erfinder/Anmelder (nur für US) : TRABITZSCH, Uwe [DE/DE]; Rosendalstraße 79, D-4030 Ratingen 8 (DE). (81) Bestimmungsstaaten: AT (europäisches Patent), AU, BE (europäisches Patent), BR, CH (europäisches Patent), DE (europäisches Patent), DK, FI, FR (europäisches Patent), GB (europäisches Patent), IT (europäisches Patent), JP, LU (europäisches Patent), NL (europäisches Patent), SE (europäisches Patent), US.</p>		<p>Veröffentlicht Mit internationalem Recherchenbericht. Vor Ablauf der für Änderungen der Ansprüche zugelassenen Frist. Veröffentlichung wird wiederholt falls Änderungen eintreffen.</p>
<p>(54) Title: PHOSPHATE-FREE LIQUID WASHING AGENT WITH HIGH ALKALINITY</p>		
<p>(54) Bezeichnung: PHOSPHATFREIES, FLÜSSIGES WASCHMITTEL MIT HOHER ALKALITÄT</p>		
<p>(57) Abstract</p>		
<p>A washing agent concentrate suitable for preparing liquid concentrated stock solutions contains (A) 5 to 20 wt. % of non-ionic tensides, including (A1) 4 to 20 wt.-% of alkylglucosides of formula R-O-G_x and (A2) 0 to 2 wt.-% of C₁₂₋₁₈ alkyl polyglycol ether with 5 to 9 ethylene glycol ether groups, (B1) 4 to 20 wt. % of sodium hydroxyde, (B2) 0.5 to 12 wt. % of sodium silicate Na₂O:SiO₂ = 1:1 to 1:3.4, (B3) 2 to 12 wt. % of sodium nitrilotriacetate and 0 to 3 wt. % of at least one phosphonic acid in the form of the sodium salt. In the formula R-O-G_x, R denotes a C₈₋₁₄ alkyl residue, G a glucose residue and the index x numbers between 1.2 and 5. The sum of the constituents (B3) and (B4) is between 3 and 12 wt. %.</p>		
<p>(57) Zusammenfassung</p>		
<p>Ein zur Herstellung von flüssigen, konzentrierten Vorratslösungen geeignetes Waschmittelkonzentrat enthält (A) 5 bis 20 Gew.-% an nichtionischen Tensiden, wovon (A1) 4 bis 20 auf Alkylglucoside der Formel R-O-G_x und (A2) 0 bis 2 Gew.-% auf C₁₂₋₁₈-Alkylpolyglykolether mit 5 bis 9 Ethylenglykolether-Gruppen entfallen, (B1) 4 bis 20 Gew.-% Natriumhydroxid, (B2) 0,5 bis 12 Gew.-% Natriumsilikat Na₂O:SiO₂ = 1:1 bis 1:3,4, (B3) 2 bis 12 Gew.-% Natriumnitrilotriacetat und 0 bis 3 Gew.-% mindestens einer Phosphonsäure in Form des Natriumsalzes. In der Formel R-O-G_x bedeutet R einen C₈₋₁₄-Alkylrest, G einen Glucoserest und der Index x Zahlen von 1,2 bis 5. Die Summe der Bestandteile (B3) und (B4) beträgt 3 bis 12 Gew.-%.</p>		

HENKEL KGaA
Dr. Wa/Sk
07.07.1989

Patent Application

D 7813-1 EP

A liquid non-phosphate detergent of high alkalinity

Laundry detergents for institutional laundries differ considerably in their composition from those typically used in the home. On the one hand, softened water, i.e. Ca- and Mg-free water, is generally used in institutional laundries. On the other hand, institutional laundry detergents often contain highly alkaline builder salts and alkalis, such as sodium metasilicate and sodium hydroxide, which - although they can be safely handled by the expert - are unadvisable in the home for safety reasons. These highly alkaline constituents can in turn interact with the surfactants typically present, particularly nonionics of the alkyl polyglycol ether type, and can decompose them to a greater or lesser extent in the event of prolonged storage together. These problems exist in particular in the case of liquid concentrates and products which are intended for the preparation of concentrated stock solutions and in whose case the decomposing effect is particularly intensive through lack of spatial separation between surfactant and alkali component. Highly alkaline liquid products and stock solutions have the advantage over powder-form preparations of the same composition that they are dust free and, in particular, can be automatically dispensed and hence pose no operating problems.

Another aspect is the almost exclusive use of surfactants which can be obtained from natural, i.e. renewable,



raw materials and which are distinguished by complete and rapid biodegradability in the wastewater.

In addition, detergents of the type in question should not produce troublesome quantities of foam either in the main wash cycle or in the final rinse cycle. Since standard foam inhibitors, such as polysiloxanes and paraffin hydrocarbons, undergo losses of effect when dispersed in liquid detergents or, in the case of polysiloxanes, are decomposed by alkali, the surfactant component must itself be low-foaming.

The present invention, by which these problems are solved, relates to a liquid, aqueous, non-phosphate detergent concentrate containing 5 to 20% by weight of a non-ionic surfactant component (A), 15 to 40% by weight of a builder component (B), up to 3% by weight of other non-surfactant and non-builder detergent constituents and water (balance to 100% by weight), characterized in that the components have the following composition, based on the detergent:

A1) 4 to 20% by weight of an alkyl glucoside corresponding to formula I



where R = a C₈₋₁₄ alkyl radical, G = a glucose residue and

x = a number of 1.2 to 5,

A2) 0 to 2% by weight of at least one nonionic surfactant from the class of alkyl polyglycol ethers containing C₁₂₋₁₈ alkyl groups and 5 to ¹⁰~~9~~ ethylene glycol ether groups,

B1) 4 to 20% by weight sodium hydroxide,

B2) 0.5 to 12% by weight sodium silicate having the composition Na₂O : SiO₂ = 1:1 to 1:3.4,

B3) 2 to 12% by weight sodium nitrilotriacetate,

B4) 0 to ^{3.5%}~~3%~~ by weight of the sodium salt of at least one phosphonic acid, with the proviso that the content of



constituents (B3 + B4) is from 3 to 12% by weight.

The detergent preferably contains the individual components in the following quantities:

- 5
- A1) 5 to 12 % by weight
 - A2) 0.5 to 1.5 % by weight
 - B1) 6 to 15 % by weight
 - B2) 0.5 to 3 % by weight
 - B3) 3 to 10 % by weight
 - B4) 0.2 to 2 % by weight

10 Component (A1) consists of alkyl glucosides or alkyl oligoglucosides of the type described, for example, in US-PSS 3,547,828, 3,772,269 and 3,839,318. They are obtainable by reaction of glucose or depolymerized starch and alcohols containing C₈₋₁₄ alkyl groups in the presence or
15 absence of lower alcohols or glycols, such as butanol or propylene glycol, and acidic acetalization catalysts. Alcohols or mixtures of alcohols obtained from native fats, such as coconut oil or palm kernel oil, are preferably used as the fatty alcohols. Examples are octyl, decyl, lauryl
20 and myristyl alcohol and also mixtures thereof. Alternatively, it is also possible to use alkyl glucosides which are derived from oxoalcohols and which, in addition to linear alcohols, also contain alcohols methyl-branched in the 2-position in admixture or an even and/or odd number of
25 C atoms in the alkyl chain.

 Examples are octyl, nonyl, decyl, undecyl, dodecyl and tridecyl alcohol and also mixtures thereof. R is preferably a C₈₋₁₂ alkyl group and more especially a C₈₋₁₀ alkyl group. In the reaction of the glucose or glucose-containing starch degradation products with the alcohols, the
30 glucose is partly oligomerized in the presence of acidic acetalization catalysts, resulting in the formation of mixtures of alkyl monoglucosides and alkylol oligoglucosides. The parameter x in formula I thus represents an
35 average degree of oligomerization and is preferably from



1.3 to 3. Mixtures such as these are meant where alkyl glucosides are mentioned generally in the context of the invention.

5 From their production, the alkyl glucosides still contain small quantities of free fatty alcohol and glucose. Alkyl glucosides containing less than 5% by weight and, more especially, less than 2% by weight fatty alcohols (based on alkyl glucoside) are preferably used.

10 In addition to the alkyl glucosides, the detergents may optionally contain nonionic surfactants of the ethoxylated fatty alcohol and oxoalcohol type containing 12 to 18 C atoms and 5 to 10 ethylene polyglycol ether groups (EO) as component (A2). Suitable nonionic surfactants of this type are, for example, ethoxylates derived from coconut
15 oil, tallow or palm kernel oil fatty alcohols having an HLB value of ~~more than~~ ^{or more} 12, for example from 13 to 18, and corresponding ethoxylates of oxoalcohols containing 12 to 16 C atoms and 6 to 8 EO groups.

20 The builder component consists of sodium hydroxide (constituent B1), sodium silicate (constituent B2) and sequestering polyanionic salts derived from nitrilotriacetic acid (NTA) and, optionally, phosphonic acids (constituent B3 and B4).

25 In the sodium silicate, the ratio of Na_2O to SiO_2 ^{is} ~~may~~ be from 1:1 (metasilicate) to 1:3.4 (waterglass). In detergents containing relatively small amounts of sodium hydroxide, metasilicate is preferably used in the interests of high alkalinity whereas, in detergents having relatively high contents of sodium hydroxide, the sodium silicate may
30 consist predominantly or completely of waterglass.

The NTA is present in the form of the trisodium salt, the quantitative calculation also being based on this form. The NTA content is preferably from 5 to 10% by weight.

35 The phosphonate is primarily the sodium salt of 1-hydroxyethane-1,1-diphosphonic acid (HEDP). The quantita-

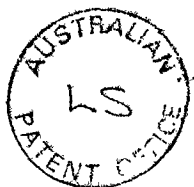


5 tive calculation is based on the tetrasodium salt. It is also possible to use the sodium salts of aminotrimethylene phosphonic acid (ATMP), ethylenediamine tetramethylene phosphonic acid (EDTMP), diethylenetriamine pentamethylene phosphonic acid (DTPMP) and higher homologs thereof, although EDTMP is less preferred on account of its as yet unclear function in the wastewater. Their quantitative calculation is based on neutrally reacting sodium salts (Na₃ salt in the case of ATMP, Na₅ salt in the case of EDTMP, Na₆ salt in the case of DTPMP). The sum of components B3 + B4 is from 3 to 12% by weight and preferably from 6 to 11% by weight.

15 In addition to the constituents mentioned above, the detergents may contain other non-surfactant and non-builder constituents, including optical brighteners in quantities of up to 1% by weight and preferably from 0.05 to 0.3% by weight. Examples of optical brighteners are derivatives of bis-(triazinylamino)-stilbene disulfonic acid, for example the sodium salt of 4,4'-bis-(2-anilino-4-morpholino-1,3,5-triazin-6-ylamino)-stilbene-2,2'-disulfonic acid and of the chlorinated diphenyl distyryl sulfonic acids.

20 Other optional constituents are enzymes, fragrances, dyes, hydrotropes and water-miscible solvents. Suitable hydrotropes are, for example, toluenesulfonate, xylenesulfonate and cumenesulfonate, in each case in the form of the sodium salts. Suitable solvents are, for example, ethanol, propanol, isopropanol and also ether alcohols, such as diglycol, and C₁₋₃ monoalkyl ethers of C₂₋₄ diols. The hydrotropes may be present in quantities of up to 6% by weight while the alcohols or ether alcohols may be present in quantities of up to 10% by weight. The detergents may also contain neutral salts, such as sodium sulfate and sodium chloride, in small quantities as impurities of the raw materials used. The balance to 100% by weight consists essentially of water.

35



The detergents are storable, pourable liquids which are suitable both for automatic dispensing and also for the preparation of stock solutions. The concentrates remain liquid and stable to separation at temperatures of down to -10°C. Their in-use concentration is generally from 2 to 10 g/l and preferably from 3 to 7 g/l.

EXAMPLES

Detergents were prepared from the following constituents. In the alkyl glucoside, R was a mixture of C₈₋₁₀ groups and X = 1.8, prepared by the direct synthesis method.

Table 1

Constituent	Example				
	1	2	3	4	5
	(quantities in % by weight)				
Alkyl glucoside	6	6	8	6	7
C ₁₂₋₁₅ alcohol + 7 EO	1	1	-	1	1
NaOH	10	12.5	15	6	13
Na ₂ -SiO ₃ 1:3.3	2	2	2	0.7	2.5
NTA (Na ₃ salt)	8	8	8	6	5
HEDP (Na salt)	2	-	1	1	2.5
EDTMP (Na salt)	-	1	-	-	-
DTPMP (Na salt)	-	-	1	-	1
Optical brightener	0.1	0.1	0.1	0.1	0.1
Na cumenesulfonate	-	-	-	4	-
Isopropanol	-	-	-	5	-
Water	bal- ance	bal- ance	bal- ance	bal- ance	bal- ance

A washing machine (of the Frista^(R) type) was loaded with lightly soiled washing (bed and table linen which had



been used once) and test cloths soiled as follows:

- A1 dust-wool grease on cotton
- A2 blood-milk-indian ink on cotton
- A3 blood on cotton
- 5 A4 milk cocoa on cotton
- A5 dust-sebum on crease-resistant cotton
- A6 dust-sebum on crease-resistant cotton/polyester blend
- A7 dust-wool grease on blended fabric (as A6).

10 The quantity of washing amounted to 7.5 kg, the water hardness was 0°Gh, normal program (no prewash), detergent concentration 4 g/l, 5 minutes at 40°C and 15 minutes at 90°C, three rinses, low foaming.

15 The percentage remission (against a white standard) was photometrically evaluated. The figures represent averages of three parallel determinations (scattering 2%). The results are shown in Table 2 below. A commercially available detergent of similar composition (without gluco-
 20 side) was used for comparison (C). Equally good washing results were also obtained when alkyl glucosides in which $x = 1.4$ and $x = 2.2$ were used instead of the alkyl gluco-
 side with $x = 1.8$.

Table 2

25	Soil	% Remission				
		1	2	3	5	C
	A1	75.9	73.2	73.1	73.8	71.5
	A2	40.2	37.8	37.6	39.2	35.2
	A3	83.5	82.4	82.6	82.7	78.2
30	A4	75.7	72.5	77.9	78.1	74.4
	A5	58.6	54.6	52.0	53.8	48.1
	A6	72.0	69.1	69.7	71.0	64.5
	A7	58.9	56.0	53.6	58.1	49.3

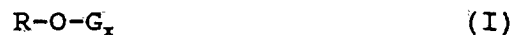
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CLAIMS

1. A liquid, aqueous, non-phosphate detergent concentrate containing 5 to 20% by weight of a nonionic surfactant component (A), 15 to 40% by weight of a builder component (B), up to 3% by weight of other non-surfactant and non-builder detergent constituents and water (balance to 100% by weight), characterized in that the components have the following composition, based on the detergent:

A1) 4 to 20% by weight of an alkyl glucoside corresponding to formula I



where R = a C₈₋₁₄ alkyl radical, G = a glucose residue and

x = a number of 1.2 to 5,

A2) 0 to 2% by weight of at least one nonionic surfactant from the class of alkyl polyglycol ethers containing C₁₂₋₁₈ alkyl groups and 5 to ¹⁰~~18~~ ethylene glycol ether groups,

B1) 4 to 20% by weight sodium hydroxide,

B2) 0.5 to 12% by weight sodium silicate having the composition Na₂O : SiO₂ = 1:1 to 1:3.4,

B3) 2 to ~~12~~ % by weight sodium nitrilotriacetate,

B4) 0 to ^{3.5}~~12~~ % by weight of the sodium salt of at least one phosphonic acid, with the proviso that the content of constituents (B3 + B4) is from 3 to 12% by weight.

2. A detergent as claimed in claim 1, characterized in that the individual components are present in the following quantities:

A1) 5 to 12 % by weight

A2) 0.5 to 1.5 % by weight

B1) 6 to 15 % by weight

B2) 0.5 to 3 % by weight

B3) 3 to 10 % by weight

B4) 0.2 to 2 % by weight

3. A detergent as claimed in claim 1 or 2, characterized



in that, in formula (I), $R = C_{8-12}$ alkyl radicals and $x =$ a number of 1.3. to 3.

4. A detergent as claimed in any one of claims 1 to 3, characterized in that the nonionic surfactant of component (A2) has an HLB value of 12 or more.

5. A detergent as claimed in any one of claims 1 to 4, characterized in that component (B4) consists of the sodium salt of 1-hydroxyethane-1,1-diphosphonic acid.

6. A detergent as claimed in claim 5, characterized in that component (B4) additionally contains the sodium salt of diethylenetriamine pentamethylene phosphonic acid.

7. A detergent as claimed in any one of claims 1 to 6, characterized in that the content of component (B3) is from 5 to 10% by weight.

8. A detergent as claimed in any one of claims 5 to 7, characterized in that the sum of components (B3 + B4) is from 6 to 11% by weight.

9. A liquid, aqueous, non-phosphate detergent concentrate substantially as hereinbefore described with reference to any one of Examples 1 to 5.

10. A method for preparing a liquid, aqueous, non-phosphate detergent concentrate, substantially as hereinbefore described with reference to the Examples.

11. A method of washing textiles or fabrics substantially as hereinbefore described with reference to any one of Examples 1 to 5 but excluding the Comparative Example.

DATED this TWENTY-EIGHTH day of MAY 1992

Henkel Kommanditgesellschaft auf Aktien

Patent Attorneys for the Applicant
SPRUSON & FERGUSON



D 7813-1 EP

A B S T R A C T

A liquid non-phosphate detergent of high alkalinity

A detergent concentrate suitable for the preparation of liquid, concentrated stock solutions contains (A) 5 to 20% by weight nonionic surfactants, of which (A1) 4 to 20% by weight consist of alkyl glucosides corresponding to the formula $R-O-G_x$ and (A2) 0 to 2% by weight C_{12-18} alkyl polyglycol ethers containing 5 to 9 ethylene glycol ether groups, (B1) 4 to 20% by weight sodium hydroxide, (B2) 0.5 to 12% by weight sodium silicate $Na_2O : SiO_2 = 1:1$ to $1:3.4$, (B3) 2 to 12% by weight sodium nitrilotriacetate and 0 to 3% by weight of at least one phosphonic acid in the form of the sodium salt, in the formula $R-O-G_x$, R is a C_{8-14} alkyl radical, G is a glucose residue and the index x is a number of 1.2 to 5. The sum of the constituents (B3) and (B4) is 3 to 12% by weight.



INTERNATIONAL SEARCH REPORT

International Application No PCT/EP 89/01370

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int. Cl. ⁵ C 11 D 1/66; C 11 D 1/825; C 11 D 3/08; C 11 D 3/33		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
Int. Cl. ⁵	C 11 D	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	WO, A, 8706949 (A.E. STALEY) 19 November 1987 see the whole document	1
Y	EP, A, 0075995 (PROCTER & GAMBLE) 6 April 1983 see claims 1-10	1
Y	FR, A, 2540511 (HENKEL) 10 August 1984 see claims; examples	1
Y	US, A, 3721633 (H.J. RANAUTO) 20 March 1973 see column 6, lines 68 - 75; claims	1

<p>* Special categories of cited documents: ¹⁴</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
10 April 1990 (10.04.90)	22 May 1990 (22.05.90)	
International Searching Authority	Signature of Authorized Officer	
European Patent Office		

**ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.**

EP 8901370
SA 32402

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international 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. 16/05/90

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		US-A- 4483780	20-11-84
FR-A-2540511	10-08-84	None	
US-A-3721633	20-03-73	None	

EP 8901370

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

INTERNATIONALER RECHERCHENBERICHT¹

Internationales Aktenzeichen

PCT/EP 89/01370

I. KLASSIFIKATION DES ANMELDUNGSGEGENSTANDS (bei mehreren Klassifikationssymbolen sind alle anzugeben) ⁶		
Nach der Internationalen Patentklassifikation (IPC) oder nach der nationalen Klassifikation und der IPC		
Int. Kl. 5	C11D1/66 ; C11D1/825 ; C11D3/08 ;	C11D3/33
II. RECHERCHIERTE SACHGEBIETE		
Recherchiertes Mindestprüfstoff ⁷		
Klassifikationssystem	Klassifikationssymbole	
Int. Kl. 5	C11D	
Recherchierte nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Sachgebiete fallen ⁸		
III. EINSCHLAGIGE VERÖFFENTLICHUNGEN⁹		
Art. ⁹	Kennzeichnung der Veröffentlichung ¹¹ , soweit erforderlich unter Angabe der maßgeblichen Teile ¹²	Betr. Anspruch Nr. ¹³
Y	WO,A,8706949 (A.E. STALEY) 19 November 1987 siehe das ganze Dokument ---	1
Y	EP,A,0075995 (PROCTER & GAMBLE) 06 April 1983 siehe Ansprüche 1-10 ---	1
Y	FR,A,2540511 (HENKEL) 10 August 1984 siehe Ansprüche; Beispiele ---	1
Y	US,A,3721633 (H.J. RANAUTO) 20 März 1973 siehe Spalte 6, Zeilen 68 - 75; Ansprüche ---	1
<p>¹⁰ Besondere Kategorien von angezeigten Veröffentlichungen:</p> <p>"A" Veröffentlichung, die den allgemeinen Stand der Technik definiert, aber nicht als besonders bedeutsam anzusehen ist</p> <p>"E" älteres Dokument, das jedoch erst am oder nach dem internationalen Anmeldedatum veröffentlicht worden ist</p> <p>"I" Veröffentlichung, die geeignet ist, einen Prioritätsanspruch zweifelhaft erscheinen zu lassen, oder durch die das Veröffentlichungsdatum einer anderen im Recherchenbericht genannten Veröffentlichung belegt werden soll oder die aus einem anderen besonderen Grund angegeben ist (wie ausgeführt)</p> <p>"O" Veröffentlichung, die sich auf eine mündliche Offenbarung, eine Benutzung, eine Ausstellung oder andere Maßnahmen bezieht</p> <p>"P" Veröffentlichung, die vor dem internationalen Anmeldedatum, aber nach dem beanspruchten Prioritätsdatum veröffentlicht worden ist</p> <p>"T" Spätere Veröffentlichung, die nach dem internationalen Anmeldedatum oder dem Prioritätsdatum veröffentlicht worden ist und mit der Anmeldung nicht kollidiert, sondern nur zum Verständnis des der Erfindung zugrundeliegenden Prinzips oder der ihr zugrundeliegenden Theorie angegeben ist</p> <p>"X" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als neu oder auf erfinderischer Tätigkeit beruhend betrachtet werden</p> <p>"Y" Veröffentlichung von besonderer Bedeutung; die beanspruchte Erfindung kann nicht als auf erfinderischer Tätigkeit beruhend betrachtet werden, wenn die Veröffentlichung mit einer oder mehreren anderen Veröffentlichungen dieser Kategorie in Verbindung gebracht wird und diese Verbindung für einen Fachmann naheliegend ist</p> <p>"A" Veröffentlichung, die Mitglied derselben Patentfamilie ist</p>		
IV. BESCHEINIGUNG		
Datum des Abschlusses der internationalen Recherche	Abschließdatum des internationalen Recherchenberichts	
10. APRIL 1990	22. 05. 90	
Internationale Recherchenbehörde	Unterschrift des bevollmächtigten Bediensteten	
EUROPAISCHES PATENTAMT	<div style="border: 1px solid black; display: inline-block; padding: 2px;">M. PERZ</div>	

**ANHANG ZUM INTERNATIONALEN RECHERCHENBERICHT
 ÜBER DIE INTERNATIONALE PATENTANMELDUNG NR.**

EP 8901370

SA 32402

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten internationalen Recherchenbericht angeführten Patentdokumente angegeben.

Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am
 Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

16/05/90

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
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Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82