

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
13 April 2006 (13.04.2006)

PCT

(10) International Publication Number
WO 2006/037512 A1

(51) International Patent Classification:
B65D 75/58 (2006.01) **B65D 75/46** (2006.01)

TJ, TM, TN, TR, UA, UZ, VN, YU only): **UNILEVER NV**
[NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).

(21) International Application Number:
PCT/EP2005/010399

(71) Applicant (*for IN only*): **HINDUSTAN LEVER LIMITED** [IN/IN]; Hindustan Lever House, 165/166 Backbay Reclamation, Maharashtra, Mumbai 400 020 (IN).

(22) International Filing Date:
22 September 2005 (22.09.2005)

(72) Inventor; and

(25) Filing Language: English

(75) Inventor/Applicant (*for US only*): **ROBERTS, Kevin, Alan** [GB/NL]; Unilever R & D Vlaardingen, Olivier van Noortlaan 120, 3133 AT Vlaardingen (NL).

(26) Publication Language: English

(30) Priority Data:
0422197.4 7 October 2004 (07.10.2004) GB

(74) Agents: **HARDY, Susan, Margaret** et al.; Unilever Patent Group, Colworth House, Sharnbrook, Bedford Bedfordshire MK44 1LQ (GB).

(71) Applicant (*for AE, AG, AU, BB, BW, BZ, CA, CY, EG, GB, GD, GH, GM, IE, IL, KE, LC, LK, LS, MN, MW, NA, NG, NZ, OM, PG, SC, SD, SG, SL, SZ, TT, TZ, UG, VC, ZA, ZM, ZW only*): **UNILEVER PLC** [GB/GB]; Unilever House, Blackfriars, London Greater London EC4P 4BQ (GB).

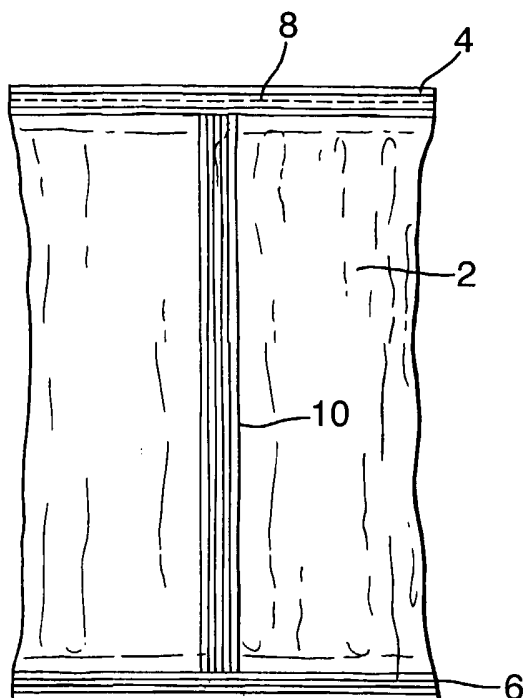
(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (*for AL, AM, AT, AZ, BA, BE, BF, BG, BI, BR, BY, CF, CG, CH, CI, CM, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, FR, GA, GE, GN, GQ, GR, GW, HR, HU, ID, IS, IT, JP, KG, KM, KP, KR, KZ, LR, LT, LU, LV, MA, MC, MD, MG, MK, ML, MR, MX, MZ, NE, NI, NL, NO, PH, PL, PT, RO, RU, SE, SI, SK, SM, SN, SY, TD, TG,*

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH,

[Continued on next page]

(54) Title: PACKAGE FOR A WATER-SOLUBLE CAPSULE



(57) Abstract: One or more water-soluble capsules containing a detergent composition in combination with a flexible package comprising: a. front wall b. a rear wall (2), c. two end seals (4,6) interconnecting and sealing respective opposed end regions of the front wall and rear wall which together define a chamber for containing the one or more water-soluble capsules, the package incorporating a zone of weakness (8) for opening the package, said zone of weakness being located within one end seal.



GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

- 1 -

PACKAGE FOR A WATER-SOLUBLE CAPSULE

The present invention relates to a package or container for one or more water-soluble capsules containing a laundry or machine dishwashing composition.

It is an object of the present invention to provide a improved package for containing water-soluble capsules of detergent.

In one aspect the invention provides one or more water-soluble capsules containing a detergent composition in combination with a flexible package comprising

a. a front wall

b. a rear wall,

c. two end seals interconnecting and sealing respective opposed end regions of the front wall and rear wall which together define a chamber for containing the one or more water-soluble capsules,

the package incorporating a zone of weakness for opening the package, said zone of weakness being located within one end seal.

In a further aspect the invention provides one or more

water-soluble capsules containing a detergent composition in combination with a flexible package comprising

a. a dual-walled chamber with opposing flexible walls

b. said flexible walls being are interconnected by

respective seals at respective opposed end regions of the

two walls,

- 2 -

- c. the chamber containing the one or more water-soluble capsules, and
- d. the package incorporates a zone of weakness located within one end seal.

5

In a further aspect the invention provides a method of opening a package according to the first invention, wherein the method comprises the step of separately grasping the front wall and the rear wall followed by the step of
10 pulling the walls away from each other so as to tear open the one end seal and tearing along the zone of weakness.

By incorporating the zone of weakness within the seal
15 region, the integrity of the bag is not compromised by the weakness, and the water soluble film material of the packaged capsules is protected from increased levels of ambient humidity during storage which could otherwise lead to premature dissolution of the film and as a result the
20 capsule may rupture and release its contents. Package integrity is necessary during the pre-purchase/use period during which the package may be handled, transported etc. However, at the same time, when the pack does need to be opened, excessive force is not required to open the package,
25 because the zone of weakness assists opening reducing the force required. A package which has requires excessive force can actually be damaged during opening, or even worse the contents can be spilt, so that capsules could be thrown, dropped out of the package and rupture on landing.

30

Protection of capsules from ambient humidity is important because premature dissolution of a single capsule (by

- 3 -

exposure to increased levels of ambient humidity) could have a knock on effect whereby the fluid released dissolves some or all or other capsules.

- 5 Protection of capsules from ambient humidity during storage, means that they are drier on use. If the water soluble capsule material becomes damp, it may then increase the possibility of in-wash lodging as a tacky film is more likely to stick to the washing machine door before it has
10 chance to be caught up in the main wash.

Preferably the seals are effected by heating the regions to be sealed.

- 15 The zone of weakness may comprise a series e.g. line of perforations. Each of the perforations is preferably less than 1 mm in length and may be 0.5 mm in length. The gap between each perforation is preferably less than 1mm in length and may be 0.5 mm in length.

- 20 The perforations may be made by e.g. a blade or laser. Each perforation may be a small hole or slot.

- Preferably the package is a non-peelable, flexible material such as polyethylene, polypropylene and may be an oriented
25 materials, laminates, coextrusions etc.

The package may be of thickness 25-100 μ m.

- Preferably the package is aged for at least 24 hours and
30 more preferably at least 1 week before opening, even more preferably at least 2 weeks before opening and further

- 4 -

preferably 4 weeks before opening. Without being bound by theory it is thought that ageing allows recrystallisation of the seal occurs making it more brittle, allowing easier opening. Thus the package is stored without

5

Preferably, there are one or more longitudinal seals within one of the walls, e.g. the rear wall and/or the front wall. The package may be manufactured by vertical form fill and seal techniques.

10

To protect the capsules from ambient humidity, the package material preferably has a Moisture Vapour Transfer Rate (M.V.T.R) of between $0.25 \text{ g/m}^2/\text{day}$ to $20 \text{ g/m}^2/\text{day}$ at 38°C and 90% relative humidity, and preferably between $5 \text{ g/m}^2/\text{day}$ to $15 \text{ g/m}^2/\text{day}$ at 38°C and 90% relative humidity.

15

The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only, with reference to the accompanying drawings in which:-

20

Figure 1 is a perspective view of a sealed package containing a round-shaped water-soluble capsule of liquid detergent according to the invention.

25

Referring to the drawing, one combination of the invention is shown, comprising a flexible plastic bag 1 which contains one or more water soluble capsules (not shown) of laundry detergent liquid.

30

- 5 -

The flexible bag has two flexible rectangular walls, a front wall (not shown) and a rear wall 2 which are joined together along respective end portions by heat seals 4,6. The co-joined walls define a dual walled chamber for containing the one or more water-soluble capsules, and the package incorporates a zone of weakness 8 for opening the package. The zone 8 of is located within one end seal 4.

The seals 4,6 are effected by heating the regions to be sealed.

The zone of weakness 8 comprises a series i.e. a line of perforations. Each of the perforations is 0.5 mm in length. The gap between each perforation is 0.5 mm in length. The perforations are made by e.g. a blade and each perforation comprises a small hole or slot.

The package is a non-peelable, flexible material, in this case polyethylene, and has a thickness 25-100 μ m.

The package is made by vertical form fill and seal techniques and therefore includes a longitudinal seal 10. The perforations are made following sealing. The package is then aged for at least 24 hours and more preferably at least 1 week before opening can take place, even more preferably at least 2 weeks before opening and further preferably 4 weeks before opening. Without being bound by theory it is thought that aging allows recrystallisation of the seal occurs making it more brittle, allowing easier opening. Thus the package is stored for a predetermined period as above, e.g. in a storage area e.g. warehouse, before being

- 6 -

offered for sale to prevent premature opening and allow aging.

To protect the capsules from ambient humidity, the package material preferably has a Moisture Vapour Transfer Rate (M.V.T.R) of between $0.25 \text{ g/m}^2/\text{day}$ to $20 \text{ g/m}^2/\text{day}$ at 38°C and 90% relative humidity, and preferably between $5 \text{ g/m}^2/\text{day}$ to $15 \text{ g/m}^2/\text{day}$ at 38°C and 90% relative humidity.

10 The package is opened by separately grasping the front wall and the rear wall followed by the step of pulling the walls away from each other so as to tear open the one end seal and tearing along the zone of weakness.

15 By incorporating the zone of weakness within the seal region, the integrity of the bag is not compromised by the weakness, and the water soluble film material of the packaged capsules is protected from increased levels of ambient humidity during storage which could otherwise lead to premature dissolution of the film and as a result the capsule may rupture and release its contents. Package integrity is necessary during the pre-purchase/use period during which the package may be handled, transported etc. However, at the same time, when the pack does need to be
20 opened, excessive force is not required to open the package, because the zone of weakness assists opening reducing the force required. A package which has requires excessive force can actually be damaged during opening, or even worse the contents can be spilt, so that capsules could be thrown,
25 dropped out of the package and rupture on landing.
30

- 7 -

The detergent liquid contained in the water soluble capsules exemplified here comprises:

Raw material	Level (weight percent of total)
Nonionic Surfactant (alcohol ethoxylate)	20.00
Linear Dodecylbenzene Sulphonic Acid	20.00
Fatty acid	17.00
Monopropylene glycol	22.35
Monoethanolamine	9.65
Water, perfume, minor ingredients	11.00

5. It is of course to be understood that the invention is not intended to be restricted to the details of the above embodiments which are described by way of example only.

- 8 -

CLAIMS

1. One or more water-soluble capsules containing a detergent composition in combination with a flexible package comprising:

- a. front wall
 - b. a rear wall,
 - c. two end seals interconnecting and sealing respective opposed end regions of the front wall and rear wall which together define a chamber for containing the one or more water-soluble capsules,
- the package incorporating a zone of weakness for opening the package, said zone of weakness being located within one end seal.

2. One or more water-soluble capsules containing a detergent composition in combination with a flexible package comprising:

- a. a dual-walled chamber with opposing flexible walls
- b. said flexible walls being are interconnected by respective seals at respective opposed end regions of the two walls,
- c. the chamber containing the one or more water-soluble capsules, and
- d. the package incorporates a zone of weakness located within one end seal.

3. The combination according to claim 1 or claim 2 wherein the zone of weakness comprise a series of perforations.

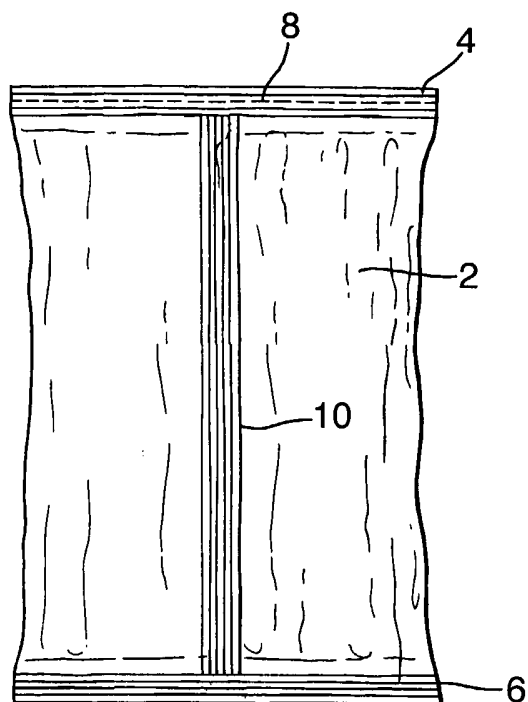
4. The combination according to claim 3 wherein each of the perforations is preferably less than 1 mm.

- 9 -

5. The combination according to claim 4 or 5 wherein the gap between each perforation is less than 1mm in length.
6. The combination of any preceding claim wherein the package is a non-peelable, flexible material such as polyethylene, polypropylene.
7. The combination according to any preceding claim wherein the package includes one or more longitudinal seals within one of the walls, e.g. the rear wall and/or the front wall.
8. The combination according to any preceding claim wherein the package material preferably has a Moisture Vapour Transfer Rate (M.V.T.R) of between $0.25 \text{ g/m}^2/\text{day}$ to $20 \text{ g/m}^2/\text{day}$ at 38°C and 90% relative humidity, and preferably between $5 \text{ g/m}^2/\text{day}$ to $15 \text{ g/m}^2/\text{day}$ at 38°C and 90% relative humidity.
9. A method of opening a package according to any of the preceding claims, wherein the method comprises the step of separately grasping the front wall and the rear wall followed by the step of pulling the walls away from each other so as to tear open the one end seal and tearing along the zone of weakness.
10. A method of making a package according to any of the preceding claims, wherein the package is aged for at least 24 hours.

1/1

Fig.1.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2005/010399

A. CLASSIFICATION OF SUBJECT MATTER

B65D75/58 B65D75/46

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)

B65D

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)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 321 377 A (UNILEVER PLC; UNILEVER N.V) 25 June 2003 (2003-06-25) the whole document	1-10
Y	US 4 919 272 A (KAI ET AL) 24 April 1990 (1990-04-24) column 2, line 58 - column 3, line 11; figures 4-6 column 6, line 49 - line 68 column 7, line 62 - column 8, line 12	1-10
Y	US 3 388 836 A (OTTO ROBERT E ET AL) 18 June 1968 (1968-06-18) column 2, line 66 - column 3, line 10; figures 1-6	5
	----- -/--	

☒ 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

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

14 December 2005

Date of mailing of the international search report

29/12/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Pernice, C

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP2005/010399

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 4 787 517 A (MARTIN ET AL) 29 November 1988 (1988-11-29) the whole document -----	1-10
A	GB 2 150 908 A (ALLEN * DAVIES & COMPANY LIMITED) 10 July 1985 (1985-07-10) the whole document -----	1,9,10
A	DE 200 08 953 U1 (THIELE, MATTHIAS) 7 September 2000 (2000-09-07) the whole document -----	1,9,10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP2005/010399

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 1321377	A	25-06-2003	NONE	
US 4919272	A	24-04-1990	DE 3542565 A1	05-06-1986
			FR 2574051 A1	06-06-1986
			FR 2628710 A1	22-09-1989
			GB 2169874 A	23-07-1986
			HK 92993 A	17-09-1993
			HK 93093 A	17-09-1993
			US 4977807 A	18-12-1990
			US 5038547 A	13-08-1991
			US 5141795 A	25-08-1992
US 3388836	A	18-06-1968	NONE	
US 4787517	A	29-11-1988	NONE	
GB 2150908	A	10-07-1985	NONE	
DE 20008953	U1	07-09-2000	NONE	