(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 375 377 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
02.01.2004 Bulletin 2004/01

(51) Int Cl.[7]: **B65D 65/46**, C11D 17/04

(21) Application number: **03076745.3**

(22) Date of filing: **04.06.2003**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR
Designated Extension States:
AL LT LV MK

(30) Priority: **19.06.2002 EP 02077433**

(71) Applicants:
- **UNILEVER N.V.**
  3013 AL Rotterdam (NL)
  Designated Contracting States:
  AT BE BG CH CZ DE DK EE ES FI FR GR HU IT LI LU MC NL PT SE SK TR
- **UNILEVER PLC**
  London EC4P 4BQ (GB)
  Designated Contracting States:
  GB IE

(72) Inventors:
- **Van Gink, Johan Augustus Theodorus**
  3133 AT Vlaardingen (NL)
- **Ranade, Vidyadhar Sudhir**
  3133 AT Vlaardingen (NL)
- **Verschelling, Gilbert Martin**
  3133 AT Vlaardingen (NL)

(74) Representative: **Joppe, Hermina L. P. et al**
Unilever N.V.
Patent Division
P.O. Box 137
3130 AC Vlaardingen (NL)

(54) Detergent sachets

(57) Sachet comprising at least one compartment enclosing a detergent composition, wherein said compartment is formed by at least two different sheets sealed to each other and wherein the first sheet is of a water soluble film material and the second sheet is a woven or non-woven material.

EP 1 375 377 A1

Description

[0001] This invention relates to water soluble detergent sachets comprising a detergent composition, in particular a laundry detergent or machine dishwashing composition.

[0002] For many years detergent compositions, especially laundry detergent compositions, have been provided commercially in forms such as free-flowing powders and liquids. For these products the consumer is required to determine and provide the correct dosage of the product at the point of use. This may lead to over dosing of the product and/or to an increased risk of spillage or wastage.

[0003] More recently, detergent products have been commercially available in a form which provide a single dose of the detergent product for the consumer to add directly to the cleaning operation. Two examples of these single-dose products are laundry detergent tablets of compressed powder and water-soluble sachets of detergent composition which may contain the detergent product in liquid, paste or particulate form.

[0004] These single-dosage products are advantageous in that they obviate the need for the consumer to determine and measure the correct dosage and allow for more accurate dosing of the detergent product. They are also easier to handle and dispense, for example into the wash load, so reducing the risk of spillage and/or wastage.

[0005] Water-soluble sachets generally comprise a detergent composition encapsulated with water-soluble film, such as polyvinyl alcohol. Encapsulation allows for handling of the product without direct contact with the detergent composition. This is especially advantageous when the detergent composition comprises aggressive cleaning components which could irritate the skin on direct contact.

[0006] EP-A-479 404 (Unilever) describes a sachet or bag containing a cleaning composition wherein the sachet or bag is made of a continuous base film soluble in water with a second plastics material present as a discontinuous layer and which is less soluble than the base film material.

[0007] EP-A-253 566 (Procter & Gamble) describes a laundry product which comprises a particulate laundry composition releasably contained within a sachet formed of a film of water-soluble material, said film having an outer covering of a flexible, apertured, water-insoluble but water permeable non-woven, textile or paper sheet material.

[0008] US 4 410 441 (Lever Brothers) discloses detergent sachets for particulate material where the sachets have pores and the particle size of the particulate material is chosen so that the amount of material which can escape through the pores is minimised.

[0009] However,a problem encountered with water soluble sachets containing a detergent composition is that the dissolution properties of the composition are sometimes hindered, especially the speed of dissolution, compared to the same detergent composition used without the sachet. This effect of reduced dissolution has been found to be less apparent in conventional methods of introducing a particulate detergent composition into a cleaning operation. For example, particulate detergent compositions used with a conventional dispensing device, such as a detergent ball allow a good flow of water to pass through the dispensing device directly to the particulate detergent composition.

[0010] Another problem encountered with water-soluble sachets containing a detergent composition is that the use of films generally prevents migration of the perfume of the detergent composition. Therefore these water-soluble sachets do often less appeal to the customer because they are not characterised by a typical detergent smell. One solution to this problem could be to use porous materials for the preparation of the sachets, for example woven polymer materials. However it has been found difficult to produce sealed sachets from these materials because they have a tendency to have weak seals.

[0011] Another problem encountered with water-soluble sachets made of films is that often the ingredients in the sachet, for example the bleach, may release gases during storage. To prevent unwanted expansion or even bursting of such sacjets it is often necessary to make a small hole in the sachet. This is less efficient because it requires an extra production step and incurs the risk that the sachet is damaged during this step.

[0012] The present invention provides a water-soluble sachet containing a detergent composition which has adequate dissolution properties, adequate seal strength and allows the migration of perfume smells and other gaseous substances to the outside of the sachet without a need to puncture the sachet.

[0013] Accordingly in a first aspect the invention relates to a sachet comprising at least one compartment enclosing a detergent composition, wherein said compartment is formed by at least two different sheets sealed to each other and wherein the first sheet is of a water soluble film material and the second sheet is a woven or non-woven material.

[0014] Preferably the woven or non-woven material is a woven or non-woven polymer material also preferably thematerial is a water-soluble material.

detergent composition

[0015] The detergent composition may be any type of detergent composition for which it is desirable to provide a single dose thereof in a water soluble sachet. For example the detergent composition may be in the form of tablets or briquets. Preferably the detergent composition is a particulate detergent composition for example having an average

mean particle size of from 400 to 4000 micron.

[0016] For example, the detergent composition may be a laundry (fabric cleaning, softening and/or treatment) composition or a machine dishwashing detergent composition.

[0017] Thus the detergent sachets are suitable for use in (fabric) washing machines and in dishwashing machines amongst other applications. They can also be used in the manual laundry and dishwashing operations.

[0018] The detergent composition may contain particles which have been prepared by spray-drying or granulation and which contain a mixture of ingredients. Such particles may contain organic detergent surfactant and some, or all, of any water-softening agent (detergency builder) present in the composition.

Suitable granulation and spray drying methods are well known in the art. The spray dried or granulated particles may be optionally mixed with other materials to form the particulate detergent composition.

[0019] Preferably the particulate detergent composition may have a bulk density of at least 400 g/litre, preferably at least 500 g/litre, and most preferably at least 600 g/litre.

a) Surfactant Compounds

[0020] The detergent compositions typically comprise one or more organic surfactants. Many suitable detergent-active compounds are available and are fully described in the literature, for example, in "Surface-Active Agents and Detergents", Volumes I and II, by Schwartz, Perry and Berch.

[0021] The surfactant may be anionic (soap or non-soap), cationic, zwitterionic, amphoteric, nonionic or a combination of these. The preferred detergent-active compounds that can be used are soaps and synthetic non-soap anionic and nonionic compounds.

[0022] Anionic surfactant may be present in an amount from 0.5 to 50% by weight, preferably from 2% or 4% up to 30% or 40% by weight of the composition. Suitable examples include alkyl benzene sulphonates, particularly sodium linear alkyl benzene sulphonates having an alkyl chain length of C_8-C_{15}; olefin sulphonates; alkane sulphonates; dialkyl sulphosuccinates; and fatty acid ester sulphonates.

[0023] Suitable nonionic surfactant compounds include in particular the reaction products of compounds having a hydrophobic group and a reactive hydrogen atom, for example, aliphatic alcohols, acids, amides or alkyl phenols with alkylene oxides, especially ethylene oxide.

[0024] Specific nonionic surfactant compounds are alkyl (C_{8-22}) phenol-ethylene oxide condensates, the condensation products of linear or branched aliphatic C_{8-20} primary or secondary alcohols with ethylene oxide, and products made by condensation of ethylene oxide with the reaction products of propylene oxide and ethylene-diamine.

[0025] In a fabric washing composition, these organic surfactants preferably provide from 5 to 50% by weight of the overall composition. In a machine dishwashing composition, organic surfactant is likely to constitute from 0.5 to 8% by weight of the overall composition and is likely to consist of nonionic surfactant, either alone or in a mixture with anionic surfactant.

b) Water-softening agent

[0026] The detergent compositions may contain a so-called water-softening agent, which serves to remove or sequester calcium and/or magnesium ions in the water. In the context of a detergent composition containing organic surfactant, a water-softening agent is more usually referred to as a detergency builder.

[0027] When a water-softening agent (detergency builder) is present, the amount of it is likely to lie in a broad range from 5%, preferably 15 wt% up to 98% by weight of the composition. The amount is likely to be from 15 to 80% by weight, more usually 15 to 60% of the composition.

[0028] Water-softening agents may be provided wholly by water soluble materials, or may be provided in large part or even entirely by water-insoluble material with water-softening properties.

[0029] Alkali metal aluminosilicates are strongly favoured as environmentally acceptable detergency builders for fabric washing. Suitable crystalline sodium aluminosilicate ionexchange materials are described, for example, in GB 1 429 143 (Procter & Gamble). The preferred sodium aluminosilicates of this type are the well known commercially available zeolites A and X, the newer zeolite P described and claimed in EP 384 070 (Unilever) and mixtures thereof. This form of zeolite P is also referred to as "zeolite MAP". One commercial form of it is denoted "zeolite A24" (ex Ineos Silicas, UK).

[0030] The builder may also be a water-soluble phosphorus-containing inorganic softener for example alkali-metal orthophosphates, metaphosphates, pyrophosphates and polyphosphates. Specific examples of inorganic phosphate detergency builders include sodium and potassium tripolyphosphates, orthophosphates and hexametaphosphates.

[0031] Non-phosphorus water-soluble detergency builders may be organic or inorganic. Inorganics that may be present include alkali metal (generally sodium) carbonate; while organics include polycarboxylate polymers, such as polyacrylates, acrylic/maleic copolymers, and acrylic phosphonates, monomeric polycarboxylates such as citrates,

gluconates, oxydisuccinates, glycerol mono- di- and trisuccinates, carboxymethyloxysuccinates, carboxymethyloxymalonates, dipicolinates and hydroxyethyliminodiacetates.

c) Bleach System

[0032] The detergent compositions according to the invention may contain a bleach system. This preferably comprises one or more peroxy bleach compounds, for example, inorganic persalts or organic peroxyacids, which may be employed in conjunction with activators to improve bleaching action at low wash temperatures. If any peroxygen compound is present, the amount is likely to lie in a range from 10 to 85% by weight of the composition. If the composition contains surfactant and detergency builder, the amount of peroxygen compound bleach is unlikely to exceed 25%wt of the composition.

[0033] Preferred inorganic persalts are sodium perborate monohydrate and tetrahydrate, and sodium percarbonate, advantageously employed together with an activator. Bleach activators, also referred to as bleach precursors, have been widely disclosed in the art.

d) Further optional ingredients

[0034] Detergency enzymes may be employed in the compositions and are commonly employed in the form of granules or marumes, optionally with a protective coating, in amount of from about 0.1% to about 3.0% by weight of the composition.

[0035] The compositions may also contain a fluorescer (optical brightener), for example, Tinopal (Trade Mark) DMS or Tinopal CBS available from Ciba-Geigy AG, Basel, Switzerland. Tinopal DMS is disodium 4,4'bis-(2-morpholino-4-anilino-s-triazin-6-ylamino) stilbene disulphonate; and Tinopal CBS is disodium 2,2'-bis-(phenyl-styryl) disulphonate.

[0036] An antifoam material is advantageously included if organic surfactant is present; especially if the detergent composition is primarily intended for use in front-loading drum-type automatic washing machines.

[0037] It may also be desirable that the composition comprises an amount of an alkali metal silicate. A composition for machine dishwashing will frequently contain at least 20 wt% silicate.

[0038] Further ingredients which can optionally be employed in laundry detergent compositions of the invention include antiredeposition agents such as sodium carboxymethylcellulose, straight-chain polyvinyl pyrrolidone and the cellulose ethers such as methyl cellulose and ethyl hydroxyethyl cellulose, fabric-softening agents; heavy metal sequestrants such as EDTA; perfumes; and colorants or coloured speckles.

Sachet material

[0039] The sachet may is produced from at least two different sheets of materials.

[0040] The first of these sheets is made of a water-soluble film material, i.e. a substantially uniform material. Such film materials can for example be produced by a process of blowing or casting.

[0041] Water soluble materials which may be used to form the water soluble films are widely disclosed in the literature and include, for example, water-soluble polyester&polyamides, polyvinyl alcohol, co-polymers of vinyl alcohol, polyvinyl pyrrolidone, polyethylene oxide, alginates, cellulose ethers such as carboxymethyl cellulose and methylcellulose, gums, starches and starch derivatives, gelatin and any combination of these. Especially preferred is the use of polyvinyl alcohol

[0042] The desired degree of solubilisation and sachet strength can be achieved by matching the type of packaging material and its thickness such that the desired solubilisation time is achieved while still maintaining the desired strength. Preferably the thickness of the water-soluble film is from 10 to 400 micron, more preferred 20 to 300 micron, most preferred 25 to 100 micron.

[0043] The second of the sheet is a woven or non-woven material. This material can be water soluble or water insoluble, but it is preferred to use a water-soluble woven or non-woven material.

[0044] Water-soluble woven or non-woven materials may be formed from for example, water-soluble polyester&polyamides, polyvinyl alcohol, co-polymers of vinyl alcohol, polyethylene oxide, polyvinyl pyrrolidone and any combination of these. Especially preferred is the use of polyvinyl alcohol. Also preferred is the use of water-solube paper. Water-insoluble materials can for example be paper, nylon etc.

[0045] The desired degree of porosity, sachet strength and if desired the desired degree of solubilisation can be achieved by matching the type of packaging material and its porosity and weight per square meter such that the desired properties are obtained.

[0046] Preferably the degree of porosity is such that a perfum component which is contained in a sachet of the woven or non-woven will after 6 weeks storage at 20 C still retain more than 80% of its perfume, more preferably more than 90%. On the other hand the porosity is preferably chosen such that a minor amound of the perfume migrates through

the sachet. Preferably the porosity is chosen such that a perfum component which is contained in a sachet of the woven or non-woven will after 6 weeks storage at 20 C have lost at least 0.1 % of its activity, more preferably from 0.5 to 10%, most preferably from 1 to 5.

[0047] Preferably the woven or non-woven material has a density of of 2 to 200 g/m2, more preferred 10 to 150 g/m2, most preferred 20 to 100 g/m2.

[0048] Preferably the non-woven material has an average thickness of from 10 to 400 micron, more preferred 20 to 300 micron, most preferred 25 to 100 micron. Preferably the woven material has an average thickness of from 20 to 2000 micron, more preferred 30 to 1000 micron, most preferred 40 to 400 micron.

[0049] Typically the filaments for use in the woven or non-woven materials can be chosen of a variety of thicknesses although generally a thickness of from 3 to 1000 micrometer is used.

[0050] The water soluble sachet is preferably mainly composed of poly vinyl alcohol (PVA). The term poly vinyl alcohol as used herein also includes partially hydrolysed poly vinyl acetates and copolymers of vinyl alcohol and vinyl acetate. The water soluble film can also contain minor quantities of plasticizers, antifoams, anti-oxidants, surfactants, perfumes and the like.

[0051] The exterior surface of the film may be treated with BITREX™ or similar material to discourage ingestion of the package of the invention by children. Similarly if desired the outside of the sachet may be (partially) coated or printed.

Sachet construction and use

[0052] The water soluble sachet may be of any suitable shape and construction and is preferably a flexible sachet.

[0053] The most convenient shapes from the viewpoints of both manufacture and packing are square and rectangular, but any other desired shape is also within the scope of the invention.

[0054] An example of a preferred process for producting a sachet according to the invention includes the steps of:

- ✓ Thermoforming the first sheet of a water-soluble film to form a domed body wall;
- ✓ Placing the detergent composition into the domed body wall;
- ✓ Superposing the second sheet of woven or non-woven material over the first sheet; and
- ✓ Sealing the first and second sheets along a continuous region of the superposed sheets surrounding the detergent composition to a fomr a base wall of the body portion.

[0055] In one preferred process the first sheet of water-soluble film is thermoformed by means of a heating plate. Preferably the sheet of water-soluble film intimately contacts the heating plate, typically by applying a vacuum between the heating plate and the sheet of water-soluble material. Generally the vacuum applied will be of less than 0.6 bar. Alternatively the sheet may be blown into contact with the heating plate and into a suitable dome shaped mould.

[0056] The general conditions suitable for using this process are for example described in WO 00/55415. A similar preferred process for preparing sachets is described in WO 01/83668.

[0057] The sealing of the sachets may be done by any suitable method for example heat-sealing, solvent-sealing or ultrasound sealing. Particularly preferred is water-sealing.

[0058] After sealing it may further be desired to separate the sachets from each other by cutting. Again any suitable method for cutting can be used.

[0059] In use the sachets according to the invention are preferably, and conveniently, placed directly into the liquid which will form the wash liquor or into the area where this liquid will be introduced. The sachet dissolves on contact with the liquid, thereby releasing the particulate detergent composition.

EXAMPLES

[0060] The invention will be further described by reference to the following example. Further examples within the scope of the invention will be apparent to the Skilled Person.

[0061] A particulate laundry detergent composition having the composition set out in the table below was made by granulating the first eight ingredients together under high shear followed by densification under reduced shear to produce a base powder. To 61.05 grams of this base powder the other ingredients were added to produce a particulate detergent composition having the overall composition given below.

Ingredient	wt parts
Sodium linear alkylbenzene sulphonate	8.80
C_{13-15} fatty alcohol 7EO, branched.	7.00

(continued)

Ingredient	wt parts
Fatty Acid (sprayed on)	1.03
Zeolite A24*1 anhydrous	29.63
Sodium carbonate (light)	7.11
Sodium carbonate (dense)	3.35
Sodium CMC (69%wt active)	0.54
Salts, moisture and NDOM*2	3.58
BASE POWDER	61.05
Anti-foam granules	1.70
Fluorescer adjunct	1.30
Soil release polymer*3	0.22
Sodium citrate dihydrate	2.00
TAED granules, (83% active)	5.50
Sodium carbonate (dense)	0.35
Sodium Percarbonate (coated)*4	18.00
Sodium silicate granules (80% active)	5.50
EDTMP granulate (Dequest 2047)*5	0.90
Protease, lipase, cellulase; carbonate speckles and perfume	2.98
EHDP granulate (Dequest 2016D)*6	0.50
TOTAL	100%

*1 Zeolite A24 is maximum aluminium zeolite P ex Ineos Silicas, UK.

*2 NDOM is non detergent organic matter

*3 Gerol™ soil release polymer

*4 coated percarbonate available from Interox

*5 Dequest 2047 is ethylene diamine tetra methylene phosphonate available from Monsanto

*6 Dequest 2016 is ethylene hydroxy diphosphonate available from Monsanto

[0062] The particulate composition had the following particle size distribution;

Particle size (um)	% by weight of the composition
<180 um	5.19 +/- 0.91 %
>1400 um	5.56 =/- 0.86%

[0063] The mean particle size was 772 um +/- 34.5 um.

[0064] The particulate composition was encapsulated in sachet made of a single sheet of a 60 micron polyvinyl alcohol film (M8630 ex Monosol) and one sheet of water-soluble non-woven material (Solufab ex BBF water-soluble non-woven having a degree of thermal bonding of 17% and density of 30 grammes per square metre). The PVA film was thermoformed into a rectangular dome shaped compartment of 65 by 48 mm and 22 mm depth. The dome shaped compartment was filled with the detergent powder and the second non-woven sheet was sealed on top by water sealing.

Example II

[0065] The previous example was repeated by replacing the non-woven material by Dissolvo water -soluble paper DP30B ex Gilbreth Packaging Systems (50 grammes /square metre).

[0066] The PVA file was thermoformed into a spherical dome shaped compartment (radius 28 mm, depth 20 mm), filled with the detergent powder. The paper sheet was sealed on top by heat sealing at 165 C.

Claims

1. Sachet comprising at least one compartment enclosing a detergent composition, wherein said compartment is formed by at least two different sheets sealed to each other and wherein the first sheet is of a water soluble film material and the second sheet is a woven or non-woven material.

2. Sachet according to claim 1, wherein the sachet is formed by sealing two sheets to each other and whereby the detergent composition is enclosed in the compartment between the two sheets.

3. Sachet according to claim 1, wherein the water soluble film material is selected from the group of water-soluble polyester&polyamides, polyvinyl alcohol, copolymers of vinyl alcohol and vinyl acetate, polyethylene oxide, polyvinyl pyrrolidone, gums, alginates, cellulose ethers such as carboxymethyl cellulose and methylcellulose, starches and starch derivatives, gelatin and any combination of these.

4. Sachet according to claim 1, wherein the water-soluble film material has a thickness of 10 to 400 micron.

5. Sachet according to claim 1, wherein the woven or non-woven material is a water-soluble material.

6. Sachet accrording to claim 1, wherein the woven or non-woven material is selected from the group of water-soluble polyester&polyamides, polyvinyl alcohol, co-polymers of vinyl alcohol and vinyl acetate, polyethylene oxide, polyvinyl pyrrolidone, water soluble paper and any combination of these.

7. Sachet according to claim 1, wherein the woven or non-woven material has a density of of 2 to 200 g/m2.

8. Sachet according to claim 1 comprising a a non-woven material having an average thickness of from 10 to 400 micron.

9. Sachet according to claim 1, comprising a woven material having an average thickness of 20 to 2000 micron

10. Sachet according to claim 1, wherein the detergent composition comprises a particulate detergent composition.

11. Method for the washing of fabrics using a sachet in accordance to one or more of claims 1-9.

12. Method to prepare a sachet comprising a detergent composition according to claim 1, wherein a sheet of water soluble film is sealed to a sheet of woven or non-woven polymer material to form a compartment and before of after sealing introducing a detergent composition such that after sealing this composition is enclosed in the compartment

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 07 6745

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 253 566 A (PROCTER & GAMBLE LTD ;PROCTER & GAMBLE (US)) 20 January 1988 (1988-01-20) * page 2, line 47 - page 3, line 20 * * page 4, line 1 - line 16 * ---	1-4,7-12	B65D65/46 C11D17/04
A	US 4 259 373 A (DEMESSEMAEKERS EMIEL M ET AL) 31 March 1981 (1981-03-31) * column 2, line 60 - column 3, line 35 * ---	1-12	
A	US 4 886 615 A (DEHAN LOUIS) 12 December 1989 (1989-12-12) * column 4, line 15 - column 5, line 36 * -----	1-12	

TECHNICAL FIELDS SEARCHED (Int.Cl.7)

B65D
C11D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	3 September 2003	Bevilacqua, V

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 03 07 6745

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.

03-09-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0253566 A	20-01-1988	DE 3784975 D1	29-04-1993
		DE 3784975 T2	22-07-1993
		EP 0253566 A2	20-01-1988
US 4259373 A	31-03-1981	CA 1112004 A1	10-11-1981
		DE 2731080 A1	19-01-1978
		FR 2358499 A1	10-02-1978
		GB 1578951 A	12-11-1980
		IT 1079275 B	08-05-1985
		JP 53038796 A	10-04-1978
US 4886615 A	12-12-1989	US 4846992 A	11-07-1989
		US 4767558 A	30-08-1988
		AU 623593 B2	21-05-1992
		AU 1750288 A	22-12-1988
		AU 624282 B2	04-06-1992
		AU 6819290 A	07-03-1991
		BE 1004194 A3	13-10-1992
		BR 8802948 A	03-01-1989
		CH 677675 A5	14-06-1991
		DE 3820631 A1	19-01-1989
		DK 334988 A	18-12-1988
		FR 2616796 A1	23-12-1988
		FR 2621596 A1	14-04-1989
		GB 2208168 A ,B	08-03-1989
		GB 2239657 A ,B	10-07-1991
		IL 86659 A	25-05-1992
		IT 1219648 B	24-05-1990
		JP 1065198 A	10-03-1989
		LU 87250 A1	08-03-1989
		MX 163858 B	26-06-1992
		NL 8801547 A	16-01-1989
		NZ 224926 A	29-01-1992
		NZ 237517 A	29-01-1992
		SE 8802236 A	18-12-1988
		SE 9103452 A	22-05-1993
		US 5004556 A	02-04-1991
		ZA 8804057 A	28-02-1990
		AT 395168 B	12-10-1992
		AT 205586 A	15-02-1992
		AU 590893 B2	23-11-1989
		AU 6073686 A	12-02-1987
		BE 905218 A1	04-02-1987
		BR 8603677 A	10-03-1987
		CA 1280663 C	26-02-1991
		CH 671027 A5	31-07-1989

EPO FORM P0459

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

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 03 07 6745

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.

03-09-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4886615 A		DE 3625268 A1	05-02-1987
		DK 373386 A	06-02-1987
		EG 17940 A	30-03-1991
		ES 2000832 A6	16-03-1988
		FR 2585720 A1	06-02-1987
		GB 2180551 A ,B	01-04-1987
		GR 862053 A1	06-03-1987
		HK 2393 A	21-01-1993
		IT 1196563 B	16-11-1988
		KR 9410116 B1	21-10-1994
		LU 86543 A1	06-03-1987
		MX 163788 B	22-06-1992
		NL 8601997 A	02-03-1987
		NO 863144 A ,B,	06-02-1987
		NZ 216985 A	27-09-1989

EPO FORM P0459

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