(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 May 2010 (14.05.2010)

PCT

(10) International Publication Number
WO 2010/051918 A3

(51) International Patent Classification:
A61K 9/51 (2006.01) *A61K 8/19* (2006.01)

(21) International Application Number:
PCT/EP2009/007645

(22) International Filing Date:
26 October 2009 (26.10.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
08019306.3 4 November 2008 (04.11.2008) EP

(71) Applicant *(for all designated States except US)*: **PHARMASOL GMBH** [DE/DE]; Blohmstrasse 66a, 12307 Berlin (DE).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **KECK, Cornelia** [DE/DE]; Stubenrauchstrasse 66, 12161 Berlin (DE).

(74) Agents: **HEESCH, Helmut van** et al.; Uexküll & Stolberg, Beselerstraße 4, 22607 Hamburg (DE).

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

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: COMPOSITIONS CONTAINING LIPID MICRO- OR NANOPARTICLES FOR THE ENHANCEMENT OF THE DERMAL ACTION OF SOLID PARTICLES

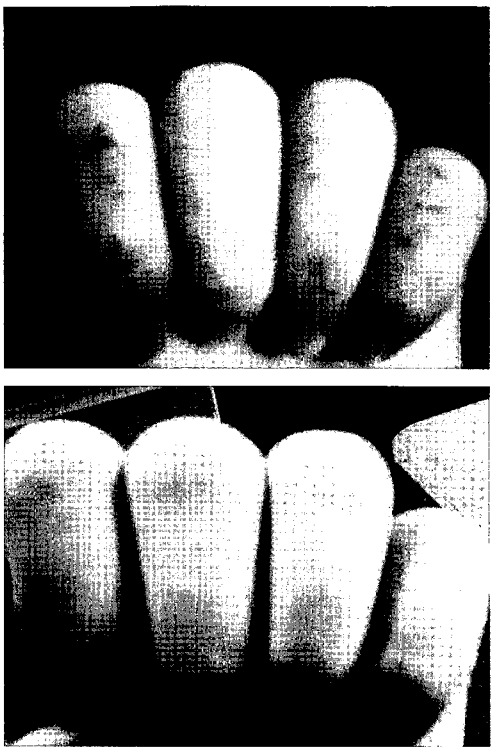

Figure 1

(57) Abstract: The invention is related to compositions which can be used as dermal formulations for supporting the skin to restore normal conditions in case of e.g. irritated skin, or to support medical therapy of skin with atopic dermatitis symptoms, atopic dermatitis, psoriasis or related diseases (e.g. accompanied by distorted barrier function of the skin and microbial load). The compositions of the invention can be used for dermo-cosmetic products but also for pharmaceutical/ - medical products, depending on the composition and the additional actives incorporated (cosmetic actives or drugs). The invention is based on the synergistic effect of metallic particles, in particular silver particles (such as microsilver, nanosilver) and lipid particles (lipid nanoparticles or lipid microparticles). As alternatives to silver particles, other metallic particles (e.g. zinc, copper) or nanocrystalline actives can be incorporated (e.g. replacing the anti -oxidative silver by anti -oxidative nanocrystals of plant molecules such as hesperitin). This leads to combinations of lipid particles with nanocrystals for dermal use.

WO 2010/051918 A3

WO 2010/051918 A3

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:
19 August 2010

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/007645

A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K9/51 A61K8/19
ADD.

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)
A61K

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, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 814 959 B1 (MUELLER RAINER H [DE] ET AL) 9 November 2004 (2004-11-09) claims 1-6 column 4, line 54 - column 5, line 11	1-20, 24-34
X	CENGIZ E ET AL: "Sunblocking efficiency of various TiO(2)-loaded solid lipid nanoparticle formulations(1)." INTERNATIONAL JOURNAL OF COSMETIC SCIENCE OCT 2006, vol. 28, no. 5, October 2006 (2006-10), pages 371-378, XP002550167 ISSN: 1468-2494 page 372, right-hand column - page 373, left-hand column page 376, right-hand column	1-20, 24-34

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family 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	Date of mailing of the international search report
23 June 2010	01/07/2010

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Vázquez Lantes, M

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MULLER R H ET AL: "Solid lipid nanoparticles (SLN) for controlled drug delivery - a review of the state of the art" EUROPEAN JOURNAL OF PHARMACEUTICS AND BIOPHARMACEUTICS, ELSEVIER SCIENCE PUBLISHERS B.V., AMSTERDAM, NL, vol. 50, no. 1, 3 July 2000 (2000-07-03), pages 161-177, XP004257186 ISSN: 0939-6411 page 171, right-hand column, paragraph first page 166, right-hand column - page 167, left-hand column, paragraph first * abstract	1-22, 24-34
X	US 5 188 837 A (DOMB ABRAHAM J [US]) 23 February 1993 (1993-02-23) claims 1,3,7 column 2, lines 19-21	21,22, 24-34
X	WO 2008/013785 A2 (SINGH BROEMER AND COMPANY INC [US]; SINGH CHANDRA ULAGARAJ [US]) 31 January 2008 (2008-01-31) pages 30,35 page 1, last paragraph	23-34

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2009/007645

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-20(completely); 24-34(partially)

   A composition containing a combination of solid lipid particles with metallic particles.

   ---

2. claims: 21, 22(completely); 24-34(partially)

   A composition containing a combination of solid lipid particles with "other particulate, poorly water soluble particles".

   ---

3. claims: 23(completely); 24-34(partially)

   A composition containing a combination of solid lipid particles with "poorly water soluble antioxidants".

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2009/007645

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6814959 B1	09-11-2004	AT 338527 T	15-09-2006
		AU 6433400 A	30-01-2001
		BR 0012445 A	02-04-2002
		CA 2375556 A1	18-01-2001
		CN 1372452 A	02-10-2002
		WO 0103652 A2	18-01-2001
		EP 1194111 A2	10-04-2002
		ES 2269166 T3	01-04-2007
		HU 0201958 A2	28-09-2002
		JP 2003504318 T	04-02-2003
		KR 20070099703 A	09-10-2007
		PL 353643 A1	01-12-2003
US 5188837 A	23-02-1993	NONE	
WO 2008013785 A2	31-01-2008	EP 2054036 A2	06-05-2009
		JP 2010505748 T	25-02-2010
		US 2009238878 A1	24-09-2009