



(43) International Publication Date
26 September 2013 (26.09.2013)

(10) International Publication Number
WO 2013/142534 A3

- (51) International Patent Classification:
C08K 5/10 (2006.01) *C08L 27/06* (2006.01)
- (21) International Application Number:
PCT/US2013/033027
- (22) International Filing Date:
19 March 2013 (19.03.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
13/423,358 19 March 2012 (19.03.2012) US
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- (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, BN, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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:
20 February 2014



WO 2013/142534 A3

(54) Title: BIOBASED PLASTICIZER AND SURFACE COVERING EMPLOYING SAME

(57) Abstract: A biobased plasticizer and a surface covering are disclosed. The biobased plasticizer includes an ester formed as a reaction product of a furan derivative selected from the group consisting of furoic acid, furfural and furfuryl alcohol reacted with a carboxylic acid or an alcohol, or includes an ester formed as a reaction product of a biobased aromatic compound and a biobased aliphatic compound. The surface covering is plasticized with a composition comprising an ester formed as a reaction product of a functionalized aromatic heterocyclic compound reacted with a carboxylic acid or an alcohol.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2013/033027

A. CLASSIFICATION OF SUBJECT MATTER INV. C08K5/10 C08L27/06 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) C08K C08L		
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 practicable, 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	SANDERSON R D ET AL: "SYNTHESIS OF DIFURAN DIESTERS FROM FURFURAL, ANT THEIR EVALUATION AS PLASTICIZERS FOR POLYVINYL CHLORIDE", JOURNAL OF APPLIED POLYMER SCIENCE, JOHN WILEY & SONS, INC, US, vol. 55, no. 13, 28 March 1995 (1995-03-28), pages 1837-1846, XP000516797, ISSN: 0021-8995, DOI: 10.1002/APP.1995.070551314 the whole document ----- -/--	1-12, 14-20
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> 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		"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
"E" earlier application or patent but published on or after the international filing date		"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
"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)		"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
"O" document referring to an oral disclosure, use, exhibition or other means		"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 27 May 2013		Date of mailing of the international search report 03/01/2014
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016		Authorized officer Jansen, Reinier

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2013/033027

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE REGISTRY [Online] CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; 16 November 1984 (1984-11-16), XP002696204, Database accession no. 39251-88-2 abstract -----	1,2, 9-11,15, 17
X,P	CN 102 757 552 A (SUZHOU UHNHI CHEMICAL CO LTD) 31 October 2012 (2012-10-31) the whole document -----	4,8,12, 14
X	WO 2011/124833 A1 (ARKEMA FRANCE [FR]; MALET FREDERIC [FR]; LE GUILLAUME [FR]; JOUANNEAU) 13 October 2011 (2011-10-13) claims 1,12,17,21,33 -----	1,3,4, 7-12,14, 16
X	WO 2009/135921 A1 (NOVAMONT SPA [IT]; BASTIOLI CATIA [IT]; BORSOTTI GIAMPIETRO [IT]; CAPU) 12 November 2009 (2009-11-12) example 1 -----	1,4, 7-12, 14-17
X	US 3 738 973 A (KALLENBACH S ET AL) 12 June 1973 (1973-06-12) example II -----	1,2,4,8, 10,11,14

INTERNATIONAL SEARCH REPORT

International application No.
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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.:

1-9, 11, 12, 19, 20(completely); 10, 14-18(partially)

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.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2013/033027

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
CN 102757552	A	31-10-2012	NONE	

WO 2011124833	A1	13-10-2011	CN 102918082 A	06-02-2013
			EP 2556102 A1	13-02-2013
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			WO 2009135921 A1	12-11-2009

US 3738973	A	12-06-1973	NONE	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-9, 11, 12, 19, 20(completely); 10, 14-18(partially)

esters comprising a furanyl group, plasticiser compositions therewith and surface coverings plasticised therewith

2. claims: 10, 13-18(all partially)

esters comprising lignin, plasticiser compositions therewith and surface coverings plasticised therewith

3. claims: 10, 13-18(all partially)

esters comprising porphyrin, plasticiser compositions therewith and surface coverings plasticised therewith

4. claims: 10, 13-18(all partially)

esters comprising an aromatic amino acid, plasticiser compositions therewith and surface coverings plasticised therewith
