



(43) International Publication Date
26 June 2014 (26.06.2014)

(10) International Publication Number
WO 2014/100258 A3

(51) International Patent Classification:

C08G 63/189 (2006.01) *C08G 63/672* (2006.01)
C08J 5/18 (2006.01) *C08L 67/02* (2006.01)

(21) International Application Number:

PCT/US2013/076265

(22) International Filing Date:

18 December 2013 (18.12.2013)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/740,109 20 December 2012 (20.12.2012) US

(71) Applicant: **DOW GLOBAL TECHNOLOGIES LLC**
[US/US]; 2040 Dow Center, Midland, MI 48674 (US).

(72) Inventors: **BHATTACHARJEE, Debkumar**; 170 Birkdale Drive, Blue Bell, PA 19422 (US). **SEHANOBISH, Kalyan**; 3182 North Lakeside Drive, Sanford, MI 48657-9446 (US).

(74) Agent: **COTHORN, Judith A.**; The Dow Chemical Company, Intellectual Property, PO Box 1967, Midland, Michigan 48641-1967 (US).

(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, IR, IS, JP, KE, KG, 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, SA, 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, KM, 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:

7 August 2014

(54) Title: NDCA-BASED POLYESTERS MADE WITH ISOSORBIDE

(57) Abstract: A polymer comprising reaction product of (a) one or more diacid, diester thereof, glycolide, and (b) one or more polyol, wherein component (a) consists essentially of 2,6-naphthalene dicarboxylic acid (NDCA), C₁ to C₁₀ alkyl diester thereof, or combinations thereof, and component (b) comprises isosorbide.



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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2013/076265

A. CLASSIFICATION OF SUBJECT MATTER

INV. C08G63/189 C08J5/18 C08G63/672 C08L67/02
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)

C08G C08J 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.
A	EP 0 620 245 A1 (ICI PLC [GB]) 19 October 1994 (1994-10-19) claims 1, 10	1-14
X	WO 99/54119 A1 (HNA HOLDINGS INC [US]; KHANARIAN GARO [US]; CHARBONNEAU LARRY F [US];) 28 October 1999 (1999-10-28)	1-6,11, 12
A	page 7, line 8; claims 17, 23, 32; example 11; table 5	7-10,13, 14
X	US 2002/115817 A1 (HAYES RICHARD A [US] HAYES RICHARD ALLEN [US]) 22 August 2002 (2002-08-22)	1,2,5-8, 10-14
A	paragraph [0029] - paragraph [0053]; claims 1, 2, 7, 15; examples 14, 17	3,4,9
	----- -/-	



Further documents are listed in the continuation of Box C.



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 application or patent but published on or after the international filing date

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"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

3 April 2014

Date of mailing of the international search report

17/06/2014

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

Enescu, Cristina

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2013/076265

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.:

1-14

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/US2013/076265

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/264047 A1 (FARRUGIA VALERIE M [CA] ET AL FARRUGIA VALERIE [CA] ET AL) 18 October 2012 (2012-10-18)	1,2,5-8, 10,11
A	paragraph [0029] - paragraph [0041]; claims 1, 6, 8; example 1; table 1 -----	3,4,9, 12-14
X	JP 2006 028324 A (NIPPON OIL CORP) 2 February 2006 (2006-02-02)	1,2,5,6, 10-12
A	paragraph [0022] - paragraph [0043]; claims 1, 2, 3, 6; examples 1, 2, 5; compounds 1, 2, 3 -----	3,4,7-9, 13,14

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2013/076265

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		JP 2006028324 A 02-02-2006	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-14

A polymer comprising the reaction product of (a) one or more diacid or diester thereof, and (b) one or more polyol, wherein: component (a) consists essentially of 2,6-napthalene dicarboxylic acid (NDCA), C1 to C10 alkyl diester thereof, or combinations thereof, and component (b) comprises isosorbide.

2. claims: 15, 16

A barrier film comprising a polyester-based polymer with (a) an O₂ gas permeability of 0.4 cc-mil/100 in² 24 hrs atm (8 cc 20 Vlm 24 hrs atm) at 50% relative humidity (ASTM D-3985) or less, (b) a moisture permeability of 0.5 g. mil/100 in.² 24 hrs atm (9.8 g 20 [micro]/m² 24 hrs atm) at 38[deg.]C (ASTM F-1249) or less, and (c) a glass transition temperature (T_g) of 100[deg.]C or higher.
