

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 December 2006 (14.12.2006)

PCT

(10) International Publication Number
WO 2006/133369 A3

(51) International Patent Classification:
C08G 69/28 (2006.01)

[US/US]; 5116 New Kent Road, Wilmington, Delaware 19808 (US). **WAGGONER, Marion, Glen** [US/US]; 304 Buttonwood Road, Landenberg, Pennsylvania 19350 (US).

(21) International Application Number:
PCT/US2006/022343

(74) Agent: **HAMBY, William, H.**; E. I. du Pont de Nemours and Company, Legal Patent Records Center, 4417 Lancaster Pike, Wilmington, Delaware 19805 (US).

(22) International Filing Date: 8 June 2006 (08.06.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/688,749 8 June 2005 (08.06.2005) US

(71) Applicant (for all designated States except US): **E. I. DU PONT DE NEMOURS AND COMPANY** [US/US]; 1007 Market Street, Wilmington, Delaware 19898 (US).

(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, KN, 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.

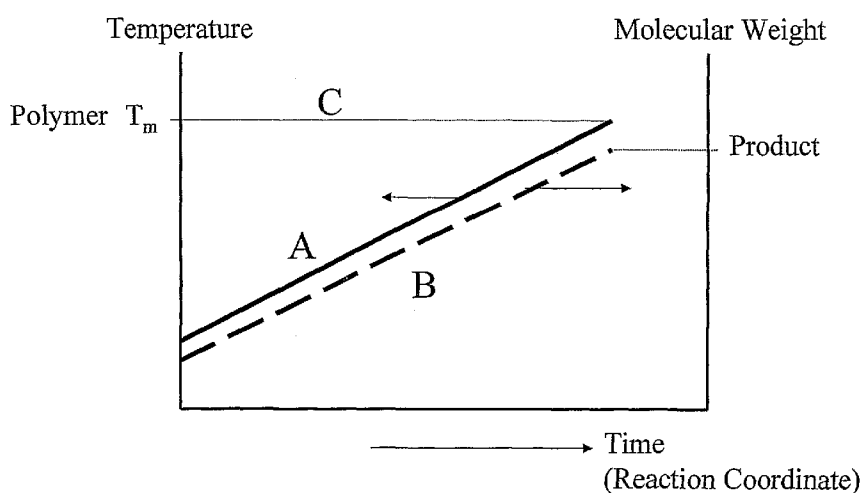
(72) Inventors; and

(75) Inventors/Applicants (for US only): **ALMS, Gregory, R.** [US/US]; 1 Ashleaf Court, Hockessin, Delaware 19707 (US). **BRUGEL, Edward, G.** [US/US]; 16 Country Gates Drive, Wilmington, Delaware 19810 (US). **JACKSON, Richard, Alan** [US/US]; 102 Bellfield Court, Hockessin, Delaware 19707 (US). **SAMUELS, Michael, Robert**

(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, 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).

[Continued on next page]

(54) Title: POLYMERIZATION PROCESS



(57) Abstract: A process for the production of polymers in which an oligomeric precursor is formed first in a melt phase. A phase transition is then induced in the polymerizing reaction medium under the action of shear in such a way that the simultaneous action of the shear, and the ongoing polymerization through the phase transition produces a product that is in a powdered form.

WO 2006/133369 A3



Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.

(88) Date of publication of the international search report:

29 March 2007

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/022343

A. CLASSIFICATION OF SUBJECT MATTER
INV. C08G69/28

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 854 372 A (HENZE ET AL) 29 December 1998 (1998-12-29) column 1, line 66 - column 2, line 65 column 4, lines 39-60 examples 1,3,4	1-7
X	----- US 5 703 199 A (HENZE ET AL) 30 December 1997 (1997-12-30) column 2, line 30 - column 3, line 35 examples 1,2,4	1-7
X	----- GB 2 006 239 A (SUMITOMO CHEMICAL CO LTD) 2 May 1979 (1979-05-02) claims 1,2,14 *page 2, line 110 - page 3, line 4* *page 5, lines 20-45* ----- -/--	1-7

☒ 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 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.

"G" document member of the same patent family

Date of the actual completion of the international search

4 October 2006

Date of mailing of the international search report

05. 02. 2007

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

Gerber, Myriam

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/022343

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 15 70 844 A1 (KALLE AG) 19 March 1970 (1970-03-19) page 2, line 8 - page 6, line 26 -----	1-7
A	US 4 831 108 A (RICHARDSON ET AL) 16 May 1989 (1989-05-16) claim 1 example 1 column 5, line 33 - column 6, line 7 column 12, lines 20-34 -----	1-7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/022343

✓ Box 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 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 fee, this Authority did not invite payment of any additional fee.
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.:

see annex

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ 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: 1-4 (part), 5-7

Process according to claims 1 and 4 for the production of a polyamide based on the combination of a melt condensation and a dispersion condensation

2. claims: 1-4 (part), 8, 9

Process according to claims 1 and 4, based on the combination of a melt condensation and a dispersion condensation, for the production of a polymer containing bisphenols

3. claims: 1-4 (part), 10, 11

Process according to claims 1 and 4, based on the combination of a melt condensation and a dispersion condensation, for the production of a polymer containing diesters of dicarboxylic acids (PE/PC)

4. claims: 1-4 (part), 12, 13

Process according to claims 1 and 4, based on the combination of a melt condensation and a dispersion condensation, for the production of a polymer containing aliphatic and/or aromatic dihydroxy compounds (PE)

5. claims: 1-4 (part), 14-16

Process according to claims 1 and 4, based on the combination of a melt condensation and a dispersion condensation, for the production of a polymer containing aromatic dicarboxylic acids or carboxylic acid derivatives and diols (PE)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/022343

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5854372	A	29-12-1998	DE 4435874 A1 EP 0705867 A2 JP 8113642 A	11-04-1996 10-04-1996 07-05-1996
US 5703199	A	30-12-1997	DE 4435873 A1 EP 0705860 A2 JP 8113643 A	11-04-1996 10-04-1996 07-05-1996
GB 2006239	A	02-05-1979	DE 2840301 A1 FR 2404020 A1 IT 1106637 B NL 7809585 A US 4313870 A	29-03-1979 20-04-1979 11-11-1985 23-03-1979 02-02-1982
DE 1570844	A1	19-03-1970	NONE	
US 4831108	A	16-05-1989	NONE	