

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
27 May 2004 (27.05.2004)

PCT

(10) International Publication Number
WO 2004/044014 A3

- (51) International Patent Classification⁷: **C08F 8/00**, 6/00
- (21) International Application Number:
PCT/US2003/035836
- (22) International Filing Date:
7 November 2003 (07.11.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10/290,642 8 November 2002 (08.11.2002) US
10/691,182 22 October 2003 (22.10.2003) US
- (71) Applicant: **E.I. DU PONT DE NEMOURS AND COMPANY** [US/US]; 1007 Market Street, Wilmington, DE 19898 (US).
- (72) Inventors: **CHAPMAN, Gregory, Allen**; Route 2, Box 224, Washington, WV 26181 (US). **BIDSTRUP, David, E.**; 102 Briarwood Place, Parkerburg, WV 26101 (US).
- (74) Agent: **TOCKER, Edwin**; E.I. Du Pont de Nemours and Company, Legal Patent Records Center, 4417 Lancaster Pike, Wilmington, DE 19805 (US).
- (81) Designated State (*national*): JP.
- (84) Designated States (*regional*): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).
- 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
- (88) Date of publication of the international search report:
8 July 2004



WO 2004/044014 A3

(54) Title: REACTION OF FLUOROPOLYMER MELTS

(57) Abstract: Chemical reactions are carried out with molten fluoropolymer, most conveniently in an extruder, wherein the reaction zone in the extruder is isolated from the melting zone, and the molten fluoropolymer is subdivided in the reaction zone sufficiently that contact and reaction between the reactant and the molten fluoropolymer in the reaction zone is essentially free of mass transfer limitation, followed by devolatilization in isolation from the reaction zone, and cooling the devolatilized fluoropolymer.

INTERNATIONAL SEARCH REPORT

PCT/US 03/35836

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C08F8/00 C08F6/00

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)

IPC 7 C08F

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, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category ^o	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 150 953 A (DU PONT DE NEMOURS AND COMPANY) 7 August 1985 (1985-08-07) cited in the application page 3, line 24 - page 6, line 8 page 8, line 1 - line 15 page 11, line 7 - page 13, line 25; claims 1-7	1,3,4, 11,12, 16-18
X	EP 0 780 403 A (DYNEON GMBH) 25 June 1997 (1997-06-25) the whole document	1,7,8
X	EP 1 070 728 A (DYNEON GMBH) 24 January 2001 (2001-01-24) the whole document	1,7,8
	----- -/-- -----	

 Further documents are listed in the continuation of box C. Patent family members are listed in annex.^o 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.

"Z" document member of the same patent family

Date of the actual completion of the international search

7 May 2004

Date of mailing of the international search report

18/05/2004

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

Permentier, W

INTERNATIONAL SEARCH REPORT

PCT/US 03/35836

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/44797 A (DYNEON GMBH) 3 August 2000 (2000-08-03) the whole document -----	1
A	EP 0 457 255 A (DAIKIN INDUSTRIES, LTD.) 21 November 1991 (1991-11-21) claims 1,2 -----	1,7,8
A	EP 0 178 935 A (DU PONT DE NEMOURS AND COMPANY) 23 April 1986 (1986-04-23) claims 1-10 -----	1,7,8
A	GB 766 840 A (THE M. W. KELLOG COMPANY) 23 January 1957 (1957-01-23) claims 1-4 -----	1
A	US 5 391 709 A (R. G. EGRES, JR.) 21 February 1995 (1995-02-21) the whole document -----	1

INTERNATIONAL SEARCH REPORT

PCT/US 03/35836

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0150953	A	07-08-1985	CA 1240119 A1	09-08-1988
			DE 3577094 D1	17-05-1990
			EP 0150953 A2	07-08-1985
			JP 1809787 C	10-12-1993
			JP 5010204 B	09-02-1993
			JP 60171110 A	04-09-1985
			US 4626587 A	02-12-1986
EP 0780403	A	25-06-1997	DE 19547909 A1	26-06-1997
			CA 2193606 A1	22-06-1997
			DE 59607675 D1	18-10-2001
			EP 1070728 A2	24-01-2001
			EP 0780403 A2	25-06-1997
			JP 9183812 A	15-07-1997
			US 5861464 A	19-01-1999
EP 1070728	A	24-01-2001	DE 19547909 A1	26-06-1997
			CA 2193606 A1	22-06-1997
			DE 59607675 D1	18-10-2001
			EP 1070728 A2	24-01-2001
			EP 0780403 A2	25-06-1997
			JP 9183812 A	15-07-1997
			US 5861464 A	19-01-1999
WO 0044797	A	03-08-2000	DE 19903657 A1	03-08-2000
			AT 253086 T	15-11-2003
			AU 2293200 A	18-08-2000
			BR 0007853 A	23-10-2001
			CA 2360025 A1	03-08-2000
			CN 1337970 T	27-02-2002
			CZ 20012751 A3	13-02-2002
			DE 50004254 D1	04-12-2003
			WO 0044797 A1	03-08-2000
			EP 1165632 A1	02-01-2002
			HU 0105071 A2	29-04-2002
			JP 2002535456 T	22-10-2002
			NO 20013696 A	28-09-2001
			PL 349004 A1	17-06-2002
			TR 200102130 T2	21-12-2001
			US 2003130459 A1	10-07-2003
			US 6541588 B1	01-04-2003
EP 0457255	A	21-11-1991	JP 2921026 B2	19-07-1999
			JP 4020507 A	24-01-1992
			DE 69105236 D1	05-01-1995
			DE 69105236 T2	13-04-1995
			EP 0457255 A2	21-11-1991
			US 5115038 A	19-05-1992
EP 0178935	A	23-04-1986	US 4599386 A	08-07-1986
			EP 0178935 A1	23-04-1986
			JP 61098709 A	17-05-1986
			JP 63025004 B	24-05-1988
GB 766840	A	23-01-1957	NONE	
US 5391709	A	21-02-1995	DE 69407818 D1	12-02-1998
			DE 69407818 T2	13-08-1998

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5391709	A	EP 0729479 A1 JP 9505343 T WO 9514047 A1	04-09-1996 27-05-1997 26-05-1995
