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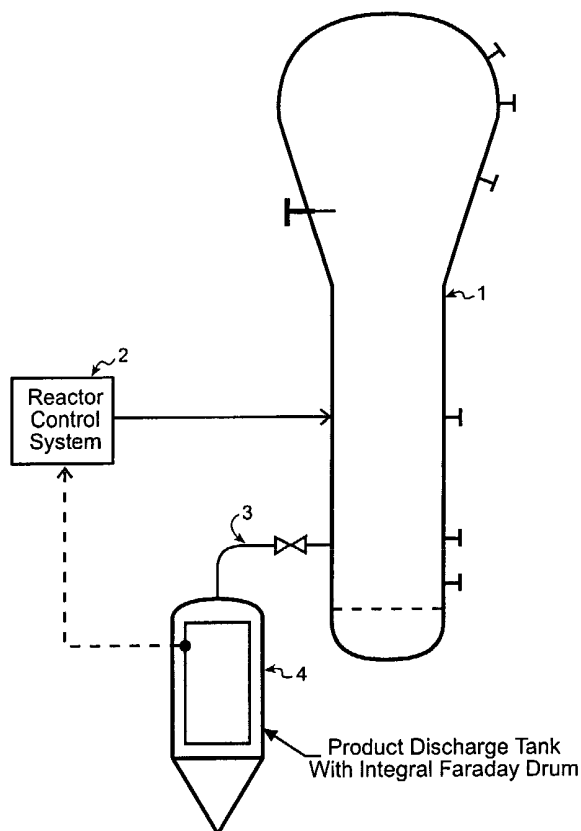
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(54) Title: METHOD AND APPARATUS FOR REDUCING STATIC CHARGES DURING POLYMERIZATION OF OLEFINS IN A FLUIDIZED BED REACTOR



(57) Abstract: The present invention relates to a method and apparatus for controlling static charges in a fluidized bed olefin polymerization reactor. Static charges that develop in the polymer products are measured and, if they fall outside a predetermined range, static charge control agents are introduced into the reactor. By controlling the static charges in the reactor, sheeting and drooling can be controlled.

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INTERNATIONAL SEARCH REPORT

International Application No
PCI/US 01/30459

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C08F2/34 B01J8/24 B01J8/00

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 B01J G01R

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 803 251 A (GOODE MARK G ET AL) 7 February 1989 (1989-02-07) cited in the application	1,5
Y	the whole document	1-19
Y	DE 28 00 157 A (NAT RES DEV) 20 July 1978 (1978-07-20) claims; tables -& GB 1 587 908 A 15 April 1981 (1981-04-15)	1-19
A	US 6 008 662 A (DAY DAVID R ET AL) 28 December 1999 (1999-12-28) cited in the application claims	1-19
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Further documents are listed in the continuation of box C. Patent family members are listed in annex.

° Special categories of cited documents :

<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*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)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p>	<p>*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</p> <p>*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</p> <p>*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.</p> <p>*&* document member of the same patent family</p>
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Date of the actual completion of the international search	Date of mailing of the international search report
1 March 2002	11/03/2002

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 Kaumann, E
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/30459

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 635 724 A (PETERSON THOMAS F) 25 January 1995 (1995-01-25) claims; examples ---	1-19
A	EP 0 326 430 A (MITSUBISHI ELECTRIC CORP) 2 August 1989 (1989-08-02) claims -----	1-19

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/30459

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4803251	A	07-02-1989	AT 63926 T 15-06-1991
		AU 2465688 A 04-05-1989	
		BR 8805758 A 25-07-1989	
		CA 1311876 A1 22-12-1992	
		CN 1035296 A ,B 06-09-1989	
		CZ 8807286 A3 12-03-1997	
		DE 3863054 D1 04-07-1991	
		DK 617188 A 05-05-1989	
		EG 19873 A 31-05-1999	
		EP 0315192 A1 10-05-1989	
		FI 885104 A ,B, 05-05-1989	
		GR 3002568 T3 25-01-1993	
		HU 48651 A2 28-06-1989	
		IE 61052 B 21-09-1994	
		JP 1230607 A 14-09-1989	
		JP 1984927 C 25-10-1995	
		JP 7005666 B 25-01-1995	
		KR 9307503 B1 12-08-1993	
		MX 166036 B 16-12-1992	
		NO 884926 A ,B, 05-05-1989	
		NZ 226841 A 27-11-1990	
		PT 88936 A ,B 30-11-1989	
		RO 102338 B1 20-08-1991	
		SG 2792 G 20-03-1992	
TR 23624 A 07-05-1990			
YU 205188 A1 31-12-1989			
ZA 8808288 A 30-08-1989			
<hr/>			
DE 2800157	A	20-07-1978	GB 1587908 A 15-04-1981
		CA 1087247 A1 07-10-1980	
		DE 2800157 A1 20-07-1978	
<hr/>			
US 6008662	A	28-12-1999	NONE
<hr/>			
EP 0635724	A	25-01-1995	US 5450005 A 12-09-1995
		DE 69428311 D1 25-10-2001	
		EP 0635724 A2 25-01-1995	
		JP 7077550 A 20-03-1995	
<hr/>			
EP 0326430	A	02-08-1989	JP 1191406 A 01-08-1989
		EP 0326430 A1 02-08-1989	
		US 5055794 A 08-10-1991	
<hr/>			