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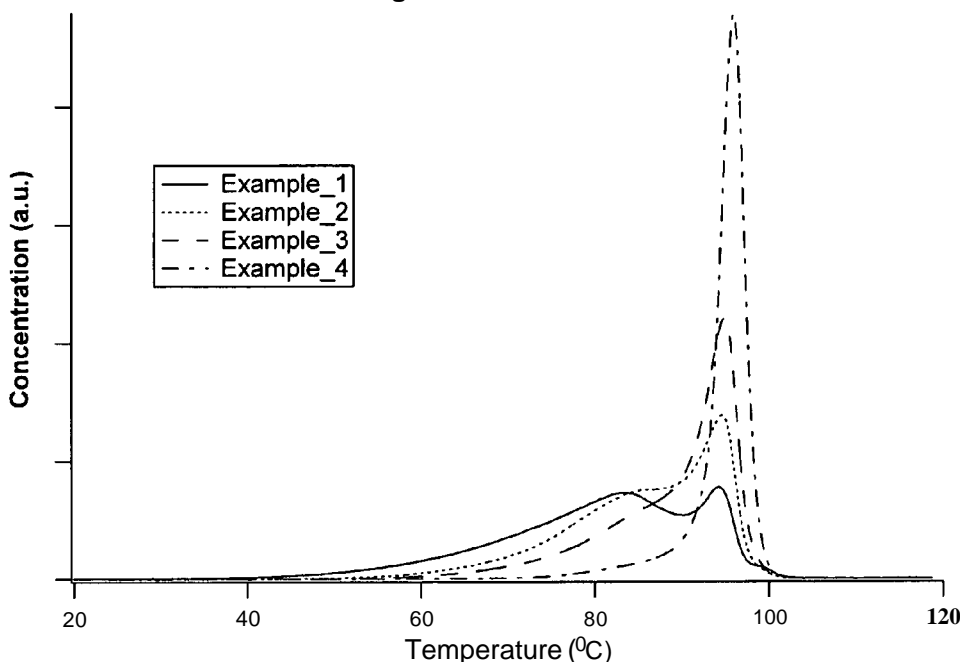
- (51) **International Patent Classification:**
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FT, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
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[Continued on next page]

(54) **Title:** METHODS OF CONTROLLING POLYMER PROPERTIES

Figure 1



(57) **Abstract:** The invention generally provides for methods for controlling polymer properties. In particular, invention provides for methods for controlling the comonomer composition distribution of polyolefins such as ethylene alpha-olefin copolymers by altering at least one or more of the following parameters: the molar ratio of hydrogen to ethylene, the molar ratio of comonomer to ethylene, the partial pressure of ethylene, and the reactor temperature without substantially changing the density and/or the melt index of the copolymer.

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Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(U))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(Ui))*

Published:

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(88) Date of publication of the international search report:
25 September 2008

INTERNATIONAL SEARCH REPORT

International application No

PCT/US 08/00731

A CLASSIFICATION OF SUBJECT MATTER IPC(8) - C08F 4/44, C08F 210/16; C08F 4/00 (2008 04) USPC - 526/72 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) USPC 526/72 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched USPC - all classes Google patent, Google Scholar Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Electronic Databases Searched USPTO WEST (PGPUB, EPAB, JPAB, USPT) Google patent, Google Scholar Search Terms Used ateri composition distribution, reduce or increase, molar ratio, TREF, hydrogen and ethylene, hydrogen and ethylene, metallocene or supported, ethylene or copolymer or comonomer, partial pressure, and hafnium													
C DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No</th> </tr> </thead> <tbody> <tr> <td>X -- Y</td> <td>US 7,151,145 B1 (Reinking) 19 December 2006 (19 12 2006), entire document especially abstract, col 4, ln 07-46, col 7, ln 18-57, col 3, ln 65-67, col 3, ln 52-53</td> <td>1-3, 11-12 and 21 ----- 4, 13-14, 22-26, 31-36 and 41-45</td> </tr> <tr> <td>Y</td> <td>US 2006/0281878 A1 (Kolb et al) 14 December 2006 (14 12 2006), entire document especially para [0012], [0022]-[0023], [0025]</td> <td>4, 13-14, 22-26, 32-36 and 43-45</td> </tr> <tr> <td>Y</td> <td>US 6,072,007 A (Abrigo et al) 06 June 2000 (06 06 2000), entire document, especially table 1</td> <td>31-36 and 41-45</td> </tr> </tbody> </table>		Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No	X -- Y	US 7,151,145 B1 (Reinking) 19 December 2006 (19 12 2006), entire document especially abstract, col 4, ln 07-46, col 7, ln 18-57, col 3, ln 65-67, col 3, ln 52-53	1-3, 11-12 and 21 ----- 4, 13-14, 22-26, 31-36 and 41-45	Y	US 2006/0281878 A1 (Kolb et al) 14 December 2006 (14 12 2006), entire document especially para [0012], [0022]-[0023], [0025]	4, 13-14, 22-26, 32-36 and 43-45	Y	US 6,072,007 A (Abrigo et al) 06 June 2000 (06 06 2000), entire document, especially table 1	31-36 and 41-45
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D Further documents are listed in the continuation of Box C													
* 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 "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 "&" document member of the same patent family												
Date of the actual completion of the international search 23 April 2008 (23 04 2008)	Date of mailing of the international search report 20 MAY 2008												
Name and mailing address of the ISA/US Mail Stop PCT, Attn ISWUS, Commissioner for Patents P O Box 1450, Alexandria, Virginia 22313-1450 Facsimile No 571-273-3201	Authorized officer Lee W Young PCT Helpdesk 571-272-4300 PCT OSP 571 272-7774												

INTERNATIONAL SEARCH REPORT

International application No
PCT/US 08/00731

Box INo. 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 **D** 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 5-10, 15-20, 27-30, 37-40, 46-53
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

- 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 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

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