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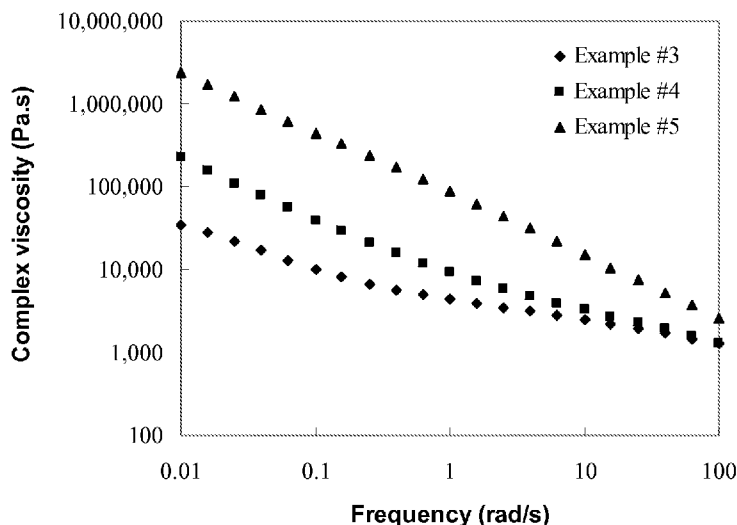
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[Continued on next page]

(54) Title: THERMOPLASTIC ELASTOMER POLYOLEFIN IN-REACTOR BLENDS AND MOLDED ARTICLES THEREFROM

Figure 1.



(57) Abstract: This invention relates to an in-reactor polymer blend comprising: (a) a first ethylene-containing polymer having a density of greater than 0.90 g/cm³ and a Mw of more than 20,000 g/mol and (b) a second ethylene-containing polymer having a density of less than 0.90 g/cm³, wherein the polymer blend has a Tm of at least 90 OC (DSC second melt), a density of less than 0.92 g/cm³, and the densities of the first and second polymers differ by at least 1%. Specifically this invention relates to an in-reactor polymer blend comprising: (a) a first ethylene polymer comprising 90 to 100 wt% ethylene and from 0 to less than 10 wt% comonomer, said first ethylene polymer component having density of greater than 0.920 g/cm³, an Mw of 20,000 g/mol or more; and (b) a second ethylene polymer comprising from 70 to 90 wt% ethylene and 30 to 10 wt% comonomer, said second ethylene polymer having a density of 0.910 g/cm³ or less, wherein the polymer blend has: (a) a Tm of at least 100 OC over a density ranging from 0.84 to 0.92

g/cm³; (b) an elongation at break of 300% or more; (c) a strain hardening index M300/M100 of at least 1.2; (d) a ratio of complex viscosity at 0.01 rad/s to the viscosity at 100 rad/s is of at least 30; and (e) a shear thinning slope of the plot of log(dynamic viscosity) versus log(frequency) less than -0.2.

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- *with international search report (Art. 21(3))*
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A. CLASSIFICATION OF SUBJECT MATTER*C08L 23/04(2006.01)i, C08F 10/02(2006.01)i*

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)

C08L 23/04; B29C 43/24; C08F 4/642; C08J 5/18; C08L 23/06; C08L 23/08

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords:ethylene, blend, density, molecular weight

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 10-110068 A (MITSUI PETROCHEM IND LTD) 28 April 1998 See claims 1-6, paragraphs [0013]-[0016], [0038]-[0054], examples	1-4
A	JP 08-041253 A (TOSOH CORP) 13 February 1996 See claim 1, paragraphs [0007]-[0022], examples	1-4
A	JP 2004-231844 A (JAPAN POLYOLEFINS CO LTD) 19 August 2004 See claims 1-6, paragraphs [0014]-[0024], [0036]-[0037], examples	1-4
A	JP 2004-359911 A (MITSUI CHEMICALS INC) 24 December 2004 See claims 1-6, paragraphs [0007]-[0025], examples	1-4

 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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of 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

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/068123

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.: 18-19, 22
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:
They are dependent on claims which do not comply with PCT Rule 6.4(a), and thus these claims are not searchable.

3. Claims Nos.: 5-17, 20-21, 23-24
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 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.:

- 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

Information on patent family members

International application No.

PCT/US2009/068123

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 10-110068 A	28.04.1998	None	
JP 08-041253 A	13.02.1996	JP 3460314 B2	27.10.2003
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JP 2004-359911 A	24.12.2004	JP 4248939 B2	02.04.2009