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(54) Title: INTERNAL AND EXTERNAL DONOR COMPOUNDS FOR OLEFIN POLYMERIZATION CATALYSTS II

(57) Abstract: The present invention relates to catalyst systems containing solid catalyst components comprising titanium, magnesium, halogen and an internal electron donor compound having at least one ether group and at least one ketone group; organoaluminum compounds and alkyl benzoate derivatives as external electron donors. The present invention also relates to methods of making the catalyst systems, and methods of polymerizing or copolymerizing alpha-olefins using the catalyst systems.

## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2011/025997****A. CLASSIFICATION OF SUBJECT MATTER***C08F 4/654(2006.01)i, C08F 4/642(2006.01)i, C08F 210/00(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)

C08F 4/654; C08F 4/02; B01J 31/02; B01J 31/00; B01J 31/14; C08F 10/00; C08F 10/02

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) &amp; Keywords: catalyst, titanium, magnesium, halogen, internal electron donor, organoaluminum, alkyl benzoate

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009-0286672 A1 (CHANG MAIN) 19 November 2009 See paragraphs [0014-0017, 0020-0024, 0051, 0054-0056, 0074], claim 17	1,2,4-18,20,21
A	US 04952649 A (KIOKA MAMORU et al.) 28 August 1990 See the whole document	1-21
A	US 6887817 B2 (BING LU et al.) 03 May 2005 See the whole document	1-21
A	US 04530983 A (MATSUURA MITSUYUKI et al.) 23 July 1985 See the whole document	1-21

 Further documents are listed in the continuation of Box C. See patent family annex.

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"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

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Date of the actual completion of the international search

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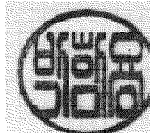
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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