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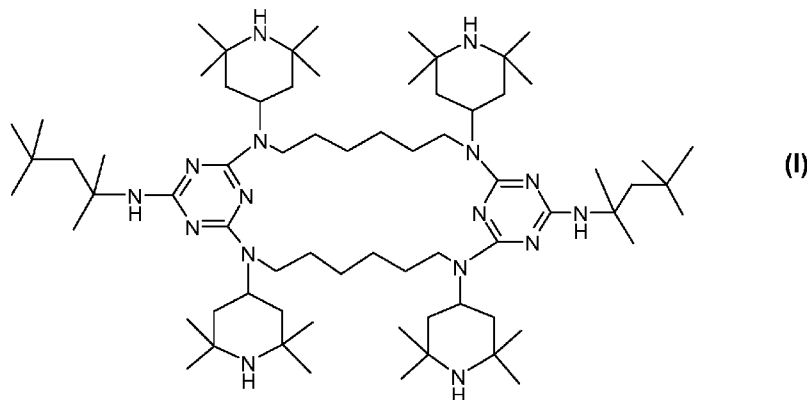
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(54) Title: METHODS OF FLAME RETARDING POLYETHYLENE PROCESSED AT HIGH TEMPERATURES



(57) Abstract: Disclosed is a process for the preparation of a stabilized and flame retardant polyethylene article, which process comprises adding an effective stabilizing amount of one or more macrocyclic hindered amine light stabilizers and an effective flame retarding amount of one or more brominated flame retardants to a polyethylene substrate and subjecting the resultant polyethylene mixture to a high temperature of 250°C or above, for instance to a temperature of 280°C or above. The polyethylene articles are for example prepared by a high temperature rotomolding process or a high temperature film or laminate film extrusion process. The articles are white in color, have a smooth surface and produce little or no odor. The macrocyclic hindered amine is for example



A. CLASSIFICATION OF SUBJECT MATTER*C08J 5/00(2006.01)i, C08K 5/17(2006.01)i, C08K 5/3477(2006.01)i, C08L 23/06(2006.01)i, C08J 5/18(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)

C08J 5/00; C08K 5/3435; C08K 3/32; C08K 5/06; C08K 5/3495; C09K 21/00; C08K 5/3415; C08K 5/34

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: polyethylene, HALS, flame, retardant

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 7138448 B2 (N. KAPRINIDIS et al.) 21 November 2006 See the abstract and columns 4, 7, 16, 20.	1-3,7-9
A	WO 03-087211 A2 (CIBA SPECIALTY CHEMICALS HOLDING INC.) 23 October 2003 See pages 1-3, 27-35, 41, 48, and 51.	1-3,7-9
A	US 6472456 B1 (D.W. HORSEY et al.) 29 October 2002 See columns 1-4.	1-3,7-9
A	US 2006-0197069 A1 (G. CAPOCCI et al.) 07 September 2006 See pages 2-4 and 17.	1-3,7-9



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

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"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

22 AUGUST 2012 (22.08.2012)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/020766

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7138448 B2	21.11.2006	US 2004-138351 A1	15.07.2004
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International application No.
PCT/US2012/020766

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.: 10
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:

Claim 10 is related to the use of a macrocyclic amine light stabilizer of formula I and a brominated flame retardant in the preparation of a polyethylene article. However, claim 10 does not contain any features which define formula I. Consequently, the subject matter of claim 10 is so unclear that no meaningful international search can be carried out.
3. ☒ Claims Nos.: 4-6
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

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.:

☐ 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.