Stabilizers for Flame Retardant Polymers Containing Aliphatically-Bound Bromine

Abstract: Aliphatic bromine-containing polymers are stabilized using a mixture of an alkyl phosphite and an epoxy compound. This stabilizer package is very effective at preventing cross-linking reactions from occurring when the aliphatic bromine-containing polymer is subjected to high temperatures as are seen in melt processing operations. The stabilized aliphatic bromine-containing polymer is useful as a flame retardant for other polymers, notably polystyrene foam.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

A. CLASSIFICATION OF SUBJECT MATTER

INV. C08K5/00 C08K5/1515 C08K5/524 C08L9/06 C08L25/04 C09K21/14

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C08K C08L C09K

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

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>GB 1 444 440 A (BASF AG) 28 July 1976 (1976-07-28) the whole document</td>
<td>1, 3-4, 6, 8-12, 14-15</td>
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Further documents are listed in the continuation of Box C

See patent family annex

Date of the actual completion of the international search

9 February 2010

Date of mailing of the international search report

03/08/2010

Name and mailing address of the ISA/

European Patent Office, P B 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel (+31-70) 340-2040, Fax (+31-70) 340-3018

Authorized officer

Jansen, Reiner
### 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. Yes [ ] Claims Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. Yes [ ] 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. Yes [ ] Claims Nos.:
   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:

> see additional sheet

1. Yes [ ] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. No [ ] As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. Yes [ ] 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. Yes [ ] 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.:

   1-4, 6-15 (partially)

**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.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-4, 6-15 (partially)

   The composition comprising an aliphatic bromine containing polymer and an alkyl phosphite, and the bulk polymer composition therewith and the method thereto.

   The composition comprising an aliphatic bromine containing polymer and an epoxy compound, and the bulk polymer composition therewith and the method thereto.

   The alkyl phosphites.

2. claim: 5 (partially)

   The polymer composition comprising a bulk polymer, an aliphatic bromine containing copolymer of styrene and allyl maleimide and an epoxy compound.

3. claim: 5 (partially)

   The polymer composition comprising a bulk polymer, an aliphatic bromine containing aliphatically unsaturated polyester and an epoxy compound.

4. claim: 5 (partially)

   The polymer composition comprising a bulk polymer, an aliphatic bromine containing allyl ether of a novolac novolac resin and an epoxy compound.

5. claim: 5 (partially)

   The polymer composition comprising a bulk polymer, an aliphatic bromine containing ring-opening methathesis polymer (ROMP) and an epoxy compound.

6. claims: 1-4, 6-15 (partially)

   The composition comprising an aliphatic bromine containing polymer and a mixture of an alkyl phosphite and an epoxy compound, and the bulk polymer composition therewith and the method thereto.
<table>
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<th>Patent document cited in search report</th>
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