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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(ii))
— as to the applicant’s entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:
— with international search report (Art. 21(3))

(88) Date of publication of the international search report: 19 July 2012

(54) Title: REINFORCED THERMOPLASTIC ARTICLES, COMPOSITIONS FOR THE MANUFACTURE OF THE ARTICLES, METHODS OF MANUFACTURE, AND ARTICLES FORMED THEREFROM

(57) Abstract: A composition for the manufacture of a porous, compressible article, the composition comprising a combination of: a plurality of reinforcing fibers; a plurality of polyamide fibers; and a plurality of polymeric binder fibers; wherein the polymeric binder fibers have a melting point lower than the polyamide fibers; methods for forming the porous, compressible article; and articles containing the porous, compressible article. An article comprising a thermoformed dual matrix composite is also disclosed, wherein the composite exhibits a time to peak release, as measured by FAR 25.853 (OSU test), a 2 minute total heat release, as measured by FAR 25.853 (OSU test), and an NBS optical smoke density of less than 200 at 4 minutes, determined in accordance with ASTM E662 (FAR/JAR 25.853).
A. CLASSIFICATION OF SUBJECT MATTER

INV.  D04H1/541
ADD.

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)
D04H

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 No.</th>
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<td>X</td>
<td>WO 96/11293 A1 (BRITISH UNITED SHOE MACHINERY [GB]; USM ESPANA SA [ES]; GREATOREX ANTH) 18 April 1996 (1996-04-18) abstract page 3, paragraph 4</td>
<td>1-13, 26-34</td>
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<td>X</td>
<td>US 2006/141880 A1 (BASCOM LAURENCE N [US] ET AL) 29 June 2006 (2006-06-29) paragraphs [0028], [0034], [0035], [0037]; claim 1; example 2</td>
<td>14-37</td>
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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 document 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

*"X"* 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

*"A"* document member of the same patent family

Date of the actual completion of the international search

20 March 2012

Date of mailing of the international search report

05/04/2012

Name and mailing address of the ISA/
European Patent Office, P.B. 5818 Patentlaan 2
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Authorized officer

Mirza, Anita
**INTERNATIONAL SEARCH REPORT**

**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.:  
   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.:  
   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. [X] 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 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.
- [X] No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet (2)) (April 2005)
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13(completely); 26-34(partially)
   A composition comprising reinforcing fibers;
   a plurality of polyimide fibers; and
   a plurality of polymeric binder fibers;
   wherein the polymeric binder fibers have a melting point lower than the polyimide fibers.
   and further comprising an aqueous solvent.
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2. claims: 14-25, 35-37(completely); 26-34(partially)
   A dual matrix, thermoformable composite, comprising:
   a network comprising a plurality of reinforcing fibers; and
   a matrix comprising melted and cooled polyimide fibers and melted and cooled polymeric binder fibers, wherein the polymeric binder has a melt temperature lower than the polyimide, and
   wherein the dual matrix composite has a minimum degree of loft of greater than or equal to three.
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<table>
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<th>Patent document cited in search report</th>
<th>Publication date</th>
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<td>WO 9611293</td>
<td>18-04-1996</td>
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