(54) Title: SURFACTANT-FREE SYNTHESIS AND FOAMING OF LIQUID BLOWING AGENT-CONTAINING ACTIVATED CARBON-NANO/MICROPARTICULATE POLYMER COMPOSITES

(57) Abstract: Exemplary embodiments of the present invention relate to polystyrene and/or thermoplastic polymer or polymer blend composite foam or a foammable polymeric material precursor, which contains activated carbon and/or at least one of 1-dimensional, 2-dimensional, and 3-dimensional nano/micro-materials in polystyrene and/or thermoplastic polymer and/or polymer blend matrix to carry a co-blowing agent such as water without using any surfactant-like molecules and/or polymers, having or adapted to have the properties of low density, high-R value, good mechanical properties, and fire retardance thereof. Exemplary embodiments of the present invention include various manufacturing methods that may be employed including, but not limited to, extrusion, batch molding, and injection molding. One example includes synthesis and CO₂ water-based extruded foaming of such a material.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

C08J 9/35(2006.01)i, C08J 9/00(2006.01)i, C08J 9/22(2006.01)i, C08J 9/04(2006.01)i, C08K 7/22(2006.01)i, C08L 25/04(2006.01)i, C08K 3/22(2006.01)i, C08K 3/36(2006.01)i, C08J 9/12(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)
IPC C08J, C08F 47/10

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 practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords : activated carbon, foam, blowing agent

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<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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<tr>
<td>X</td>
<td>GB 1138473 A(AQUITAINE PETROLE), 01. January. 1969 See page1-3, Example 1.</td>
<td>1-20</td>
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<td>A</td>
<td>US 5847017 A1 (BRANDT, M. KARL), 08. December. 1998 See the whole document.</td>
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☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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<tbody>
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