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18 March 2010

(54) Title: METHOD FOR SELECTIVELY ANCHORING LARGE NUMBERS OF NANOSCALE STRUCTURES

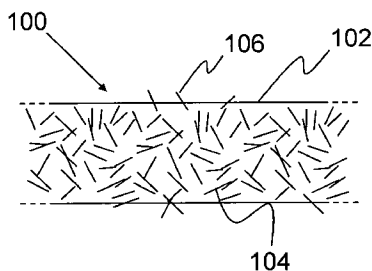


FIG. 1A

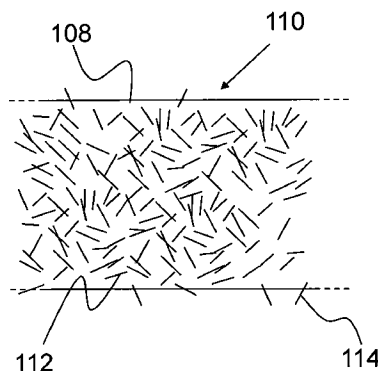


FIG. 1B

(57) Abstract: A method is provided for creating composites by combining pre-fabricated nanoscale structures (nanoscale structures) and other materials in which the nanoscale structures are anchored. This method results in anchored nanoscale structures with their base held and encased within the anchoring material to a specified depth and with a specified length of protrusion of the nanoscale structures from the anchoring material. This represents a major advance over previous methods of creating composites containing nanoscale structures which were limited to fully embedded nanoscale structures or, at best, very limited and uncontrolled protrusion of nanoscale structures. In summary, the current method involves bringing nanoscale structures and anchoring materials into physical contact in a controlled fashion and optionally conducting a treatment step to complete the anchoring process.



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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/015754

A. CLASSIFICATION OF SUBJECT MATTER
INV. C01B31/02

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)
C01B B29C

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, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	YUNG JOON JUNG ET AL: "Aligned carbon Nanotube-Polymer Hybrid Architectures for diverse Flexible Electronic Applications" NANO LETTERS, ACS, WASHINGTON, DC, US, vol. 6, no. 3, 31 March 2006 (2006-03-31), pages 413-418, XP008115112 ISSN: 1530-6984 [retrieved on 2006-02-01]	1-3,5-9, 20-24
Y A	the whole document	4 10-19
X	----- TW 256 877 B (HON HAI PREC IND CO LTD [TW]) 11 June 2006 (2006-06-11) abstract	20,24
X	----- TW 253 898 B (HON HAI PREC IND CO LTD [TW]) 21 April 2006 (2006-04-21) abstract	20,24
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> See patent family annex.
<p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"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</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p>	
Date of the actual completion of the international search 15 January 2010	Date of mailing of the international search report 25/01/2010
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) 340-3016	Authorized officer Corrias, M

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2007/015754

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	E. LAHIFF ET AL.: "Selective positioning and density control of nanotubes within a polymer" NANO LETTERS, vol. 3, no. 10, 13 September 2003 (2003-09-13), pages 1333-1337, XP002563383 page 1334, column 2 - page 1335, column 1 -----	4
A	N.R. RARRAVIKAR ET AL.: "Embedded carbon-nanotube stiffened polymer surfaces" SMALL, vol. 1, no. 3, 2005, pages 317-320, XP002563384 the whole document -----	1-24
A	WO 2006/041535 A2 (CALIFORNIA INST OF TECHN [US]; NOCA FLAVIO [US]; SANSOM ELIJAH B [US];) 20 April 2006 (2006-04-20) page 3, line 35 - page 11, line 8; claims 1-34; table 1 -----	1-24

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.2

Claims Nos.: 1-24(all partially)

Present independent claims 1, 9, 13, and their dependent claims relate to processes using an extremely large number of possible compounds: namely the use of any fluid layer. Support and disclosure in the sense of Article 6 and 5 PCT is to be found however for only a very small proportion of the compounds claimed, see paragraphs 87 to 89 and 127 to . The non-compliance with the substantive provisions is to such an extent, that the search was performed taking into consideration the non-compliance in determining the extent of the search of claims 1,9 and 13 (PCT Guidelines 9.19 and 9.23). The search of claims 1, 9, 13 and their dependent claims was therefore restricted processes using the type of fluids specified in paragraphs 87 to 89. The same argument applies, mutatis mutandis, for the subject-matter of claim 20, which refers to an unspecified anchoring material. Support and disclosure in the sense of Article 6 and 5 PCT can however only be found for the anchoring layers specified in paragraphs 87 to 89 of the present application. The search of claim 20 and its dependent claims was therefore restricted to products having the anchoring materials specified in paragraphs 87 to 89.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.2), should the problems which led to the Article 17(2) declaration be overcome.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/015754

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.: 1-24(all partially)
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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:

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 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.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/015754

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
TW 256877	B	11-06-2006	NONE
TW 253898	B	21-04-2006	NONE
WO 2006041535	A2	20-04-2006	EP 1747576 A2 31-01-2007 JP 2007536101 T 13-12-2007