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GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
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ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted
a patent (Rule 4.17(ii)) for the following designations AE,
AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ,
CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE,
EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS,
JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA,
MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM,
PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ,
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ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD,
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KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG,
CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT,
LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF,
BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN,
TD, TG)

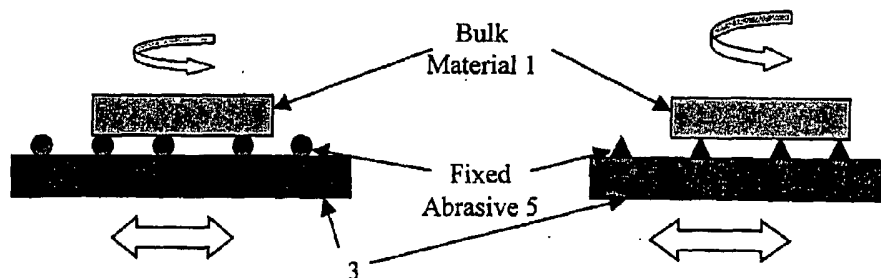
— as to the applicant's entitlement to claim the priority of the
earlier application (Rule 4.17(iii)) for all designations

Published:

— with international search report

[Continued on next page]

(54) Title: RAPID GENERATION OF NANOPARTICLES FROM BULK SOLIDS AT ROOM TEMPERATURE



(57) Abstract: A plurality of nanoparticles are provided. The nanoparticles may have a metal oxide or a semiconductor oxide surface region and a metal or semiconductor core region and/or the nanoparticles may be uniformly doped. The nanoparticles are formed by grinding a bulk material to a powder and then etching the powder in a solution to a desired nanoparticle size.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/06350

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : B32B 5/16; B02C 17/00, 19/20, 23/20; C23C 14/06, 14/14

US CL : 204/192.35, 192.37; 241/24.25, 27; 428/403

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)

U.S. : 204/192.35, 192.37; 241/24.25, 27; 428/403

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)

WEST; nanoapex.com nanomagazine.com; google.com

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,514,767 B1 (NATAN) 4 February 2003, col. 3, lines 20-44; examples 1, 4; and claims 1-20 and 16.	1-26 and 43-52
X	US 6,136,156 A (EL-SHALL et al) 24 October 2000, col. 2, lines 10-21; col. 3, line 24 to col. 4, line 3; and claims.	1-26
X	US 6,649,138 B2 (ADAMS et al) 18 November 2003, col. 12, lines 13-42.	1-26
X, T	US 6,815,064 B2 (TREADWAY et al) 9 November 2004; col. 2, line 54 to col. 3, line 5; and col. 7, line 17 to 8, line 65 and col. 11, lines 22-32.	1-26 and 43-47.
A, T	The Royal Society & The Royal Academy of Engineering, "Nanomanufacturing and the industrial application of nanotechnologies", Nanoscience and nanotechnologies, July 2004, pp. 25-34.	29-42

☐ 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 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

"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

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/06350

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.: 27 and 28
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:
It's unclear what is being claimed in claims 27 and 28. There are 17 totally different subject matters in this claim. It's impossible to conduct a meaningful search with many diverse subject matters in one claim.
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 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.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.