(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
7 June 2007 (07.06.2007)

PCT

(10) International Publication Number
WO 2007/064390 A1

(51) International Patent Classification:
B82B 3/00 (2006.01) *G01N 21/65* (2006.01)

(21) International Application Number:
PCT/US2006/037503

(22) International Filing Date:
27 September 2006 (27.09.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/741,692 2 December 2005 (02.12.2005) US

(71) Applicant *(for all designated States except US)*: **NORTHWESTERN UNIVERSITY** [US/US]; 1880 Oak Street, Suite 100, Evanston, IL 60201 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **MIRKIN, Chad, A.** [US/US]; 111, 16th Street, Wilmette, IL 60091 (US). **QIN, Lidong** [CN/US]; 2219 Ridge Avenue, Apt. 2B, Evanston, IL 60201 (US). **XUE, Can** [CN/US]; 818 Noyes St., Apt. 2A, Evanston, IL 60201 (US).

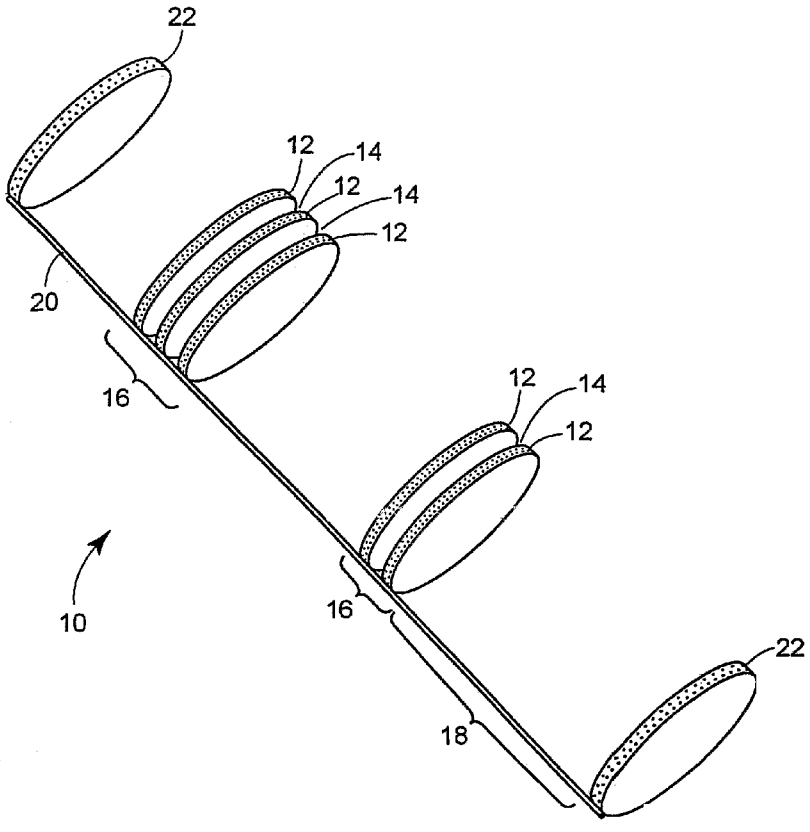
(74) Agent: **NAPOLI, James, J.**; MARSHALL, GERSTEIN & BORUN LLP, 233 S. Wacker Drive, Suite 6300, Sears Tower, Chicago, IL 60606-6357 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: 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, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,

[Continued on next page]

(54) Title: ANALYTE DETECTION USING NANOWIRES PRODUCED BY ON-WIRE LITHOGRAPHY



(57) Abstract: The present invention relates to methods of detecting analytes using nanowires (10) having nanodisk arrays (16). In particular, the present invention discloses methods of detecting analytes via surface enhanced Raman scattering (SERS) and employing nanowires (10) prepared using on-wire lithography (OWL). The nanowire (10) comprises at least one nanodisk array (16) comprising at least two nanodisks (12), and at least one gap (14). The nanodisk array (16) characteristics can be tuned to provide means for detecting analytes using spectroscopic means.

WO 2007/064390 A1

RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *with international search report*

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.