

(43) International Publication Date
22 December 2011 (22.12.2011)(10) International Publication Number
WO 2011/159889 A3

(51) International Patent Classification:

D04H 3/16 (2006.01) **A61L 15/42** (2006.01)
A61F 13/00 (2006.01) **D01D 5/00** (2006.01)
A61L 15/22 (2006.01)

(21) International Application Number:

PCT/US2011/040691

(22) International Filing Date:

16 June 2011 (16.06.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/355,712 17 June 2010 (17.06.2010) US

(71) Applicant (for all designated States except US): **WASHINGTON UNIVERSITY** [US/US]; One Brookings Drive, St. Louis, MO 63130 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **MACEWAN, Matthew, R.** [US/US]; c/o Washington University in St. Louis, 660 South Euclid, St. Louis, MS 63110 (US). **XIE, Jingwei** [CN/US]; c/o Washington University in St. Louis, 660 South Euclid, St. Louis, MS 63110 (US). **RAY, Zack** [US/US]; c/o Washington University in St. Louis, 660 South Euclid, St. Louis, MS 63110 (US).

XIA, Younan [US/US]; c/o Washington University in St. Louis, 660 South Euclid, St. Louis, MS 63110 (US).

(74) Agents: **HOLDENER, Steven G.** et al.; Armstrong Teasdale, LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, MO 63105 (US).

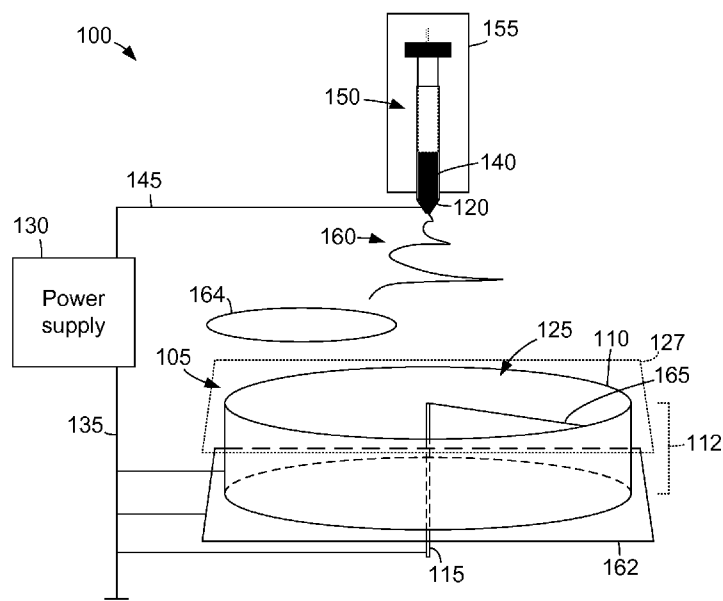
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: BIOMEDICAL PATCHES WITH ALIGNED FIBERS

FIG. 1



(57) Abstract: A structure of aligned (e.g., radially and/or polygonally aligned) fibers, and systems and methods for producing and using the same. One or more structures provided may be created using an apparatus that includes one or more first electrodes that define an area and/or partially circumscribe an area. For example, a single first electrode may enclose the area, or a plurality of first electrode(s) may be positioned on at least a portion of the perimeter of the area. A second electrode is positioned within the area. Electrodes with rounded (e.g., convex) surfaces may be arranged in an array, and a fibrous structure created using such electrodes may include an array of wells at positions corresponding to the positions of the electrodes.

**Published:****(88) Date of publication of the international search report:**

26 April 2012

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*