

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
13 March 2008 (13.03.2008)

PCT

(10) International Publication Number  
**WO 2008/030960 A3**

(51) International Patent Classification:

**H01B 7/06** (2006.01) **H01R 35/00** (2006.01)

(21) International Application Number:

PCT/US2007/077759

(22) International Filing Date:

6 September 2007 (06.09.2007)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/824,683 6 September 2006 (06.09.2006) US  
60/944,626 18 June 2007 (18.06.2007) US

(71) Applicant (for all designated States except US): **THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ILLINOIS** [US/US]; 352 Henry Administration Bldg., 506 South Wright Street, Urbana, IL 61801 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ROGERS, John A.** [US/US]; 2803 Valleybrook, Champaign, IL 61822 (US). **MEITL, Matthew** [US/US]; 8100 L-4 Stonebrook Terrace, Raleigh, NC 27617 (US). **SUN, Yugang** [CN/US]; 2021 Vanderbilt Court, Naperville, IL 60565 (US). **KO, Heung Cho** [KR/US]; 300 S. Goodwin Ave., #515,

Urbana, IL 61801 (US). **CARLSON, Andrew** [US/US]; 1901 North Lincoln Avenue #115, Urbana, IL 61801 (US). **CHOI, Won Mook** [KR/US]; 2403 Heathrow Dr. #8, Champaign, IL 61820 (US). **STOYKOVICH, Mark** [US/US]; 35 Westwood Circle, Dover, NH 03820-4321 (US). **JIANG, Hanqing** [CN/US]; 1306 Lancaster Drive, Urbana, IL (US). **HUANG, Yonggang** [US/US]; 758, Strawberry Hill Drive, Glencoe, IL 60022 (US).

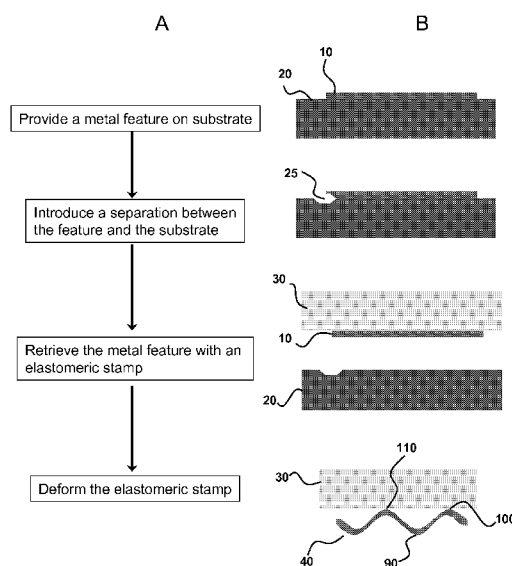
(74) Agents: **CHAPMAN, Gary, B.** et al.; Greenlee, Winner And Sullivan, P.C., 4875 Pearl East Circle, Suite 200, Boulder, CO 80301 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, 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, 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),

[Continued on next page]

(54) Title: CONTROLLED BUCKLING STRUCTURES IN SEMICONDUCTOR INTERCONNECTS AND NANOMEMBRANES FOR STRETCHABLE ELECTRONICS



(57) Abstract: In an aspect, the present invention provides stretchable, and optionally printable, components such as semiconductors and electronic circuits capable of providing good performance when stretched, compressed, flexed or otherwise deformed, and related methods of making or tuning such stretchable components. Stretchable semiconductors and electronic circuits preferred for some applications are flexible, in addition to being stretchable, and thus are capable of significant elongation, flexing, bending or other deformation along one or more axes. Further, stretchable semiconductors and electronic circuits of the present invention are adapted to a wide range of device configurations to provide fully flexible electronic and optoelectronic devices.

WO 2008/030960 A3



European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,  
PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,  
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(88) Date of publication of the international search report:  
24 July 2008

**Published:**

— *with international search report*