



(51) International Patent Classification:
G11C 11/16 (2006.01)

(21) International Application Number:

PCT/US2011/001573

(22) International Filing Date:

13 September 2011 (13.09.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/885,012 17 September 2010 (17.09.2010) US

(71) Applicant (for all designated States except US): **MICRON TECHNOLOGY INC.** [US/US]; 8000 S. Federal Way, Boise, ID 83716-9632 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KRAMER, Stephen, J.** [US/US]; 1311 N 14th Street, Boise, ID 83702 (US). **SANDHU, Gurtej, S.** [US/US]; 2964 E Parkriver Drive, Boise, ID 83706 (US).

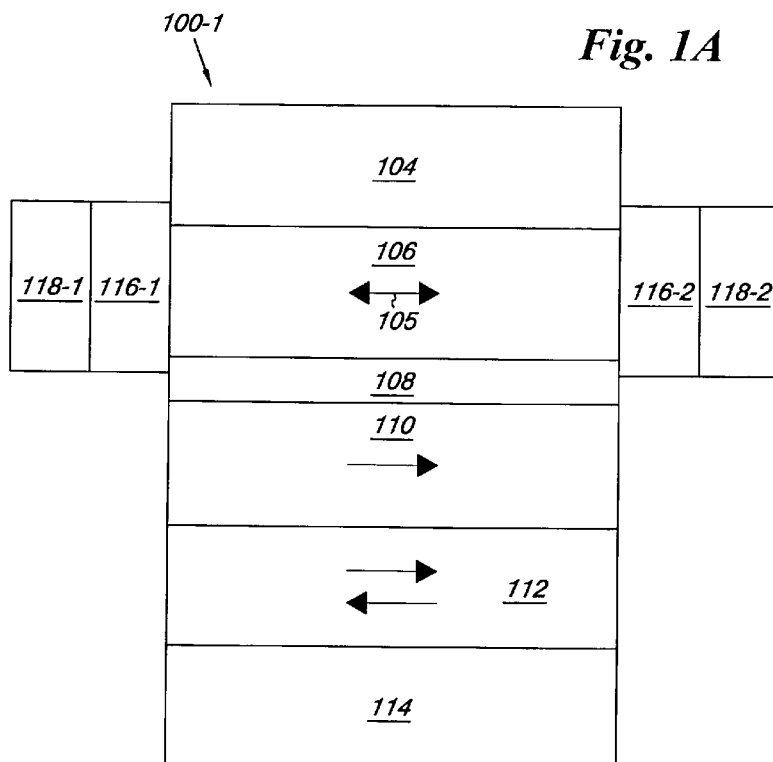
(74) Agent: **KERN, Jacob, T.**; Brooks, Cameron & Huebsch, PLLC, 1221 Nicollet Avenue, Suite 500, Minneapolis, MN 55403 (US).

(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, QA, RO, RS, RU, RW, 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,

[Continued on next page]

(54) Title: SPIN TORQUE TRANSFER MEMORY CELL STRUCTURES AND METHODS



(57) Abstract: Spin Torque Transfer (STT) memory cell structures and methods are described herein. One or more STT memory cell structures include a tunneling barrier material positioned between a ferromagnetic storage material and a pinned ferromagnetic material in contact with an antiferromagnetic material and a multiferroic material in contact with the ferromagnetic storage material, wherein the antiferromagnetic material, the ferromagnetic storage material, and the pinned ferromagnetic material are located between a first electrode and a second electrode.



LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, **Published:**

SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,

GW, ML, MR, NE, SN, TD, TG).

— *without international search report and to be republished
upon receipt of that report (Rule 48.2(g))*