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(71) Applicant (for all designated States except US): **INTERNATIONAL BUSINESS MACHINES CORPORATION** [US/US]; New Orchard Road, Armonk, NY 10504 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ANDO, Takashi** [JP/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **CHARNS, Leslie** [US/US]; 1280 North Mathilda Avenue, Sunnyvale, CA 94089 (US). **CUMMINGS, Jason** [US/US]; 488 Carolina Oaks Avenue, Smithfield (US). **HUPKA, Jukasz, J.** [PL/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **KOLI, Dinesh, R.** [IN/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **KONNO, Tomohisa** [JP/JP]; 1-

9-2 Higashi-Shinbashi, Minato-ku, Tokyo (JP). **KRISHNAN, Mahadevaiyer** [US/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **LOFARO, Michael, F.** [US/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **NALASKOWSKI, Jakub** [PL/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **NODA, Masahiro** [JP/JP]; 1-9-2 Higashi-Shinbashi, Minato-ku, Tokyo (JP). **PENIGALAPATI, Dinesh, K.** [IN/US]; 1101 Kitchawan Road, Yorktown Heights, NY 10598 (US). **YAMANAKA, Tatsuya** [JP/JP]; 1-9-2 Higashi-Shinbashi, Minato-ku, Tokyo (JP).

(74) Agent: **DAVIS, Jennifer R.**; International Business Machines Corporation, 2070 Route 52, Bldg. 321 / Zip 481, Hopewell Junction, New York 12533 (US).

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[Continued on next page]

(54) Title: FABRICATION OF REPLACEMENT METAL GATE DEVICES

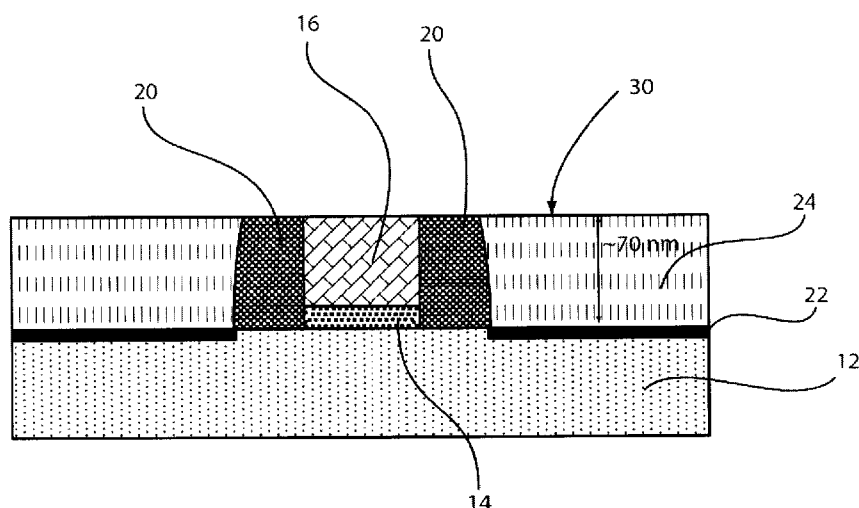


FIG. 1F

(57) Abstract: Methods for polishing multiple dielectric layers to form replacement metal gate structures include a first chemical mechanical polish step to remove overburden and planarize a top layer to leave a planarized thickness over a gate structure. A second chemical mechanical polish step includes removal of the thickness to expose an underlying covered surface of a dielectric of the gate structure with a slurry configured to polish the top layer and the underlying covered surface substantially equally to accomplish a planar topography. A third chemical mechanical polish step is employed to remove the dielectric of the gate structure and expose a gate conductor.



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).

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/054545**A. CLASSIFICATION OF SUBJECT MATTER****H01L 21/336(2006.01)i, H01L 29/78(2006.01)i, H01L 21/304(2006.01)i**

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)

H01L 21/336; H01L 21/306; H01L 21/28; H01L 21/8242

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: CMP, gate, polish, metal, nitride, silicide, junction, poly-silicon, oxide, dielectric, selectivity, slurry.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0048007 A1 (SHEN-NAN LEE et al.) 25 February 2010 See abstract, paragraphs [0017]-[0028], claims 1,2,5,7,8,10 and figures 3A-3D	1-24
A	US 6855607 B2 (KRISHNASHREE ACHUTHAN et al.) 15 February 2005 See abstract, claims 1,3-5,7,8 and figures 3,4A,4B.	1-24
A	US 6743683 B2 (CHRIS E. BARNS et al.) 01 June 2004 See abstract, column 2, line 31 - column 3, line 13, claims 1,2,5,7 and figures 10-12.	1-24
A	US 7166506 B2 (MATTHEW J. PRINCE et al.) 23 January 2007 See abstract, column 4, line 37 - column 5, line 16, claims 1,6,10 and figures 10-13.	1-24



Further documents are listed in the continuation of Box C.



See patent family annex.

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Authorized officer

KIM, Jung Jin

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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