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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
14 December 2006 (14.12.2006)

PCT

(10) International Publication Number
WO 2006/132789 A3

(51) International Patent Classification:
H01L 21/3213 (2006.01)

(21) International Application Number:
PCT/US2006/019693

(22) International Filing Date: 19 May 2006 (19.05.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/146,648 7 June 2005 (07.06.2005) US

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

(72) Inventor: **RAGHU, Prashant**; 2640 East Red Cedar Lane, Apt. F-302, Boise, ID 83716 (US).

(74) Agents: **MATKIN, Mark, S.** et al.; Wells St. John P.S., 601 West First Avenue, Suite 1300, Spokane, WA 99201-3828 (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, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

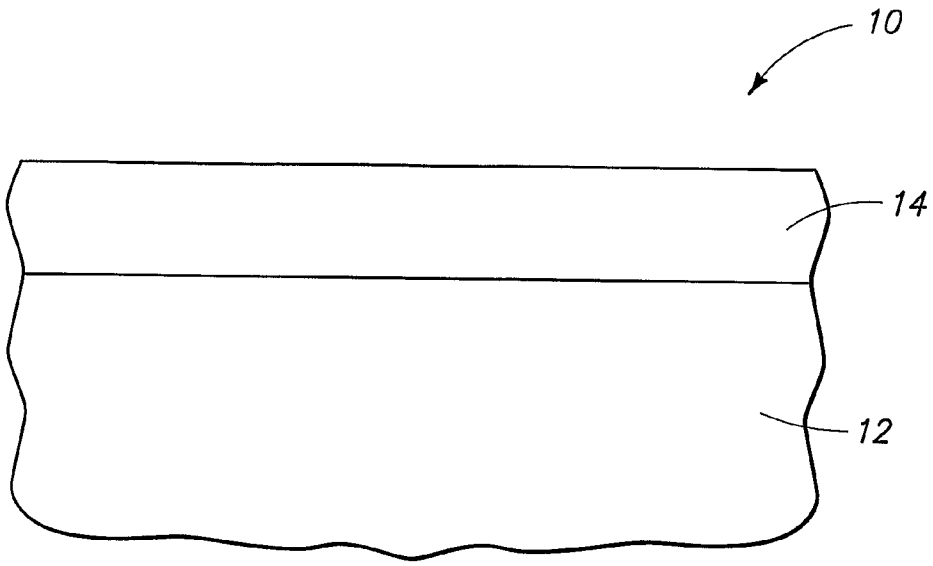
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT,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

(88) Date of publication of the international search report:
8 March 2007

[Continued on next page]

(54) Title: METHODS OF ETCHING NICKEL SILICIDE AND COBALT SILICIDE AND METHODS OF FORMING CONDUCTIVE LINES



(57) Abstract: The invention includes methods of etching nickel suicide and cobalt suicide, and methods of forming conductive lines. In one implementation, a substrate comprising nickel suicide is exposed to a fluid comprising H_3PO_4 and H_2O at a temperature of at least 50°C and at a pressure from 350 Torr to 1100 Torr effective to etch nickel suicide from the substrate. In one implementation, at least one of nickel suicide or cobalt suicide is exposed to a fluid comprising H_2SO_4, H_2O_2, H_2O, and HF at a temperature of at least 50 °C and at a pressure from 350 Torr to 1100 Torr effective to etch the at least one of nickel suicide or cobalt suicide from the substrate.

WO 2006/132789 A3

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.