



(51) International Patent Classification:
H01L 21/67 (2006.01) *H01L 21/3065* (2006.01)

(21) International Application Number: PCT/US2017/056786

(22) **International Filing Date:** 16 October 2017 (16.10.2017)

(25) Filing Language: English

(26) **Publication Language:** English

(30) Priority Data:
15/351,437 14 November 2016 (14.11.2016) US

(71) Applicant: APPLIED MATERIALS, INC. [US/US];
3050 Bowers Avenue, Santa Clara, California 95054 (US).

(72) Inventors: **KRAUS, Philip Allan**; 1006 Broadway Avenue, San Jose, California 95125 (US). **FRANKLIN, Timothy J.**; 671 Regas Drive, Campbell, California 95008 (US).

(74) **Agent:** BERNADICOU, Michael A. et al.; Schwabe, Williamson & Wyatt, P.C., 1211 SW 5th, Ste 1900, Portland, Oregon 97204 (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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,

HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, 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, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: SELECTIVE ETCH RATE MONITOR

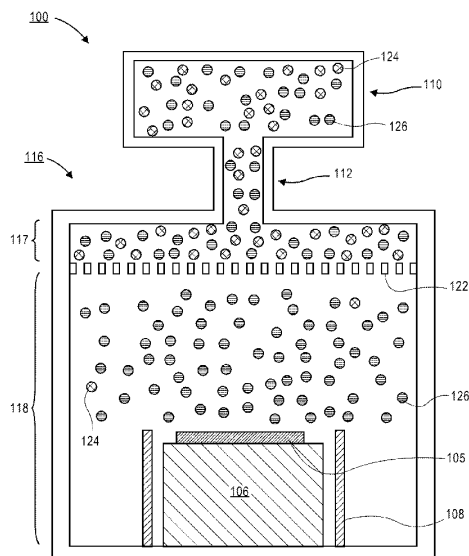


FIG. 1

(57) Abstract: Embodiments include a real time etch rate sensor and methods of for using a real time etch rate sensor. In an embodiment, the real time etch rate sensor includes a resonant system and a conductive housing. The resonant system may include a resonating body, a first electrode formed over a first surface of the resonating body, a second electrode formed over a second surface of the resonating body, and a sacrificial layer formed over the first electrode. In an embodiment, at least a portion of the first electrode is not covered by the sacrificial layer. In an embodiment, the conductive housing may secure the resonant system. Additionally, the conductive housing contacts the first electrode, and at least a portion of an interior edge of the conductive housing may be spaced away from the sacrificial layer.