



- (51) **International Patent Classification:**
C23C 16/455 (2006.01) C23C 16/54 (2006.01)
C23C 16/44 (2006.01)
- (21) **International Application Number:**
PCT/US2021/025033
- (22) **International Filing Date:**
31 March 2021 (31.03.2021)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
63/012,646 20 April 2020 (20.04.2020) US
- (71) **Applicant:** APPLIED MATERIALS, INC. [US/US];
3050 Bowers Avenue, Santa Clara, California 95054 (US).
- (72) **Inventors:** YE, Zhiyuan; c/o Applied Materials, Inc., Law
Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, Cali-
fornia 95054 (US). LAU, Shu-Kwan Danny; c/o Applied
Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Av-

enue, Santa Clara, California 95054 (US). **BURROWS, Brian H.**; c/o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, California 95054 (US). **WASHINGTON, Lori**; c/o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, California 95054 (US). **DINIZ, Herman**; c/o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, California 95054 (US). **HILKENE, Martin A.**; c/o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, California 95054 (US). **COLLINS, Richard O.**; c/o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, California 95054 (US). **MYO, Nyi O.**; 6547 Timberview Drive, San Jose, California 95120 (US). **HEMKAR, Manish**; c/o Applied Materials, Inc., Law Dept., M/S 1269, 3050 Bowers Avenue, Santa Clara, California 95054 (US). **CHU, Schubert S.**; 38 Sequoia Way, San Francisco, California 94127 (US).

- (54) **Title:** MULTI-THERMAL CVD CHAMBERS WITH SHARED GAS DELIVERY AND EXHAUST SYSTEM

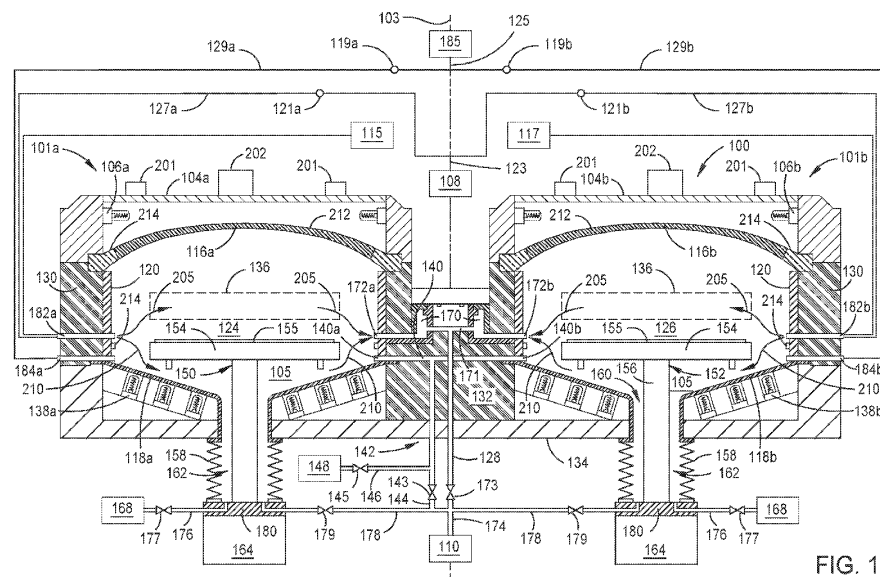


FIG. 1

- (57) **Abstract:** A method and apparatus for a process chamber for thermal processing is described herein. The process chamber is a dual process chamber and shares a chamber body. The chamber body includes a first and a second set of gas inject passages. The chamber body may also include a first and a second set of exhaust ports. The process chamber may have a shared gas panel and/or a shared exhaust conduit. The process chamber described herein enables for the processing of multiple substrates simultaneously with improved process gas flow and heat distribution.

(74) **Agent: DOUGHERTY, Chad M.** et al.; PATTERSON + SHERIDAN LLP, 24 Greenway Plaza, Suite 1600, Houston, Texas 77046 (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, IT, 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, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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))