

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
03 February 2022 (03.02.2022)



(10) International Publication Number
WO 2022/025950 A1

(51) International Patent Classification:

H01L 21/67 (2006.01) *H05B 3/06* (2006.01)
H05B 1/02 (2006.01) *F16K 27/00* (2006.01)

(21) International Application Number:

PCT/US2020/053069

(22) International Filing Date:

28 September 2020 (28.09.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/057,872 28 July 2020 (28.07.2020) US

(71) Applicant: **VERSUM MATERIALS US, LLC** [US/US];
8555 South River Parkway, Tempe, Arizona 85284 (US).

(72) Inventors: **FONTANA, Christopher David**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **ESHELMAN, David Carl**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **FATIMA, Yusra**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **PILTZ, Thomas William**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US). **SEIDEL, Mason**; c/o Versum Materials US, LLC, 8555 South River Parkway, Tempe, Arizona 85284 (US).

(74) Agent: **KIERNAN, Anne B.**; Versum Materials US, LLC, 7350 Tilghman Street, Suite 104, Allentown, Pennsylvania 18106 (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,

(54) Title: SYSTEMS HAVING HEATED VALVE MANIFOLD ASSEMBLIES, METHODS OF MANUFACTURE OF SAME

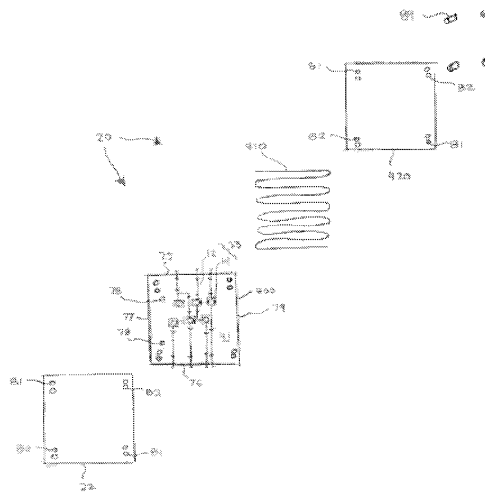


FIG. 5

(57) Abstract: A system for semiconductor fabrication having at least one heated valve manifold assembly comprising a heat-conductive plate having a total surface area, said conductive plate having a first side and a second side; at least one heater contacting said at least one heat-conductive plate; a valve manifold comprising a plurality of valves and pipes; said plurality of said valves and pipes having a total surface area wherein a portion of the surface area of said plurality of valves and pipes contacts said at least one heat-conductive plate; and one or more layers of insulation covering: (i) a majority of the surface area of said plurality of said valves and pipes where said portion contacts said at least one heat-conductive plate, (ii) said at least one heater in contact with said at least one heat-conductive plate, and (iii) the majority of the surface area of said at least one heat-conductive plate.

[Continued on next page]

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))