

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
13 January 2022 (13.01.2022)



(10) International Publication Number
WO 2022/010497 A1

(51) International Patent Classification:
H01L 21/18 (2006.01) *H01L 21/67* (2006.01)
H01L 21/324 (2006.01)

(21) International Application Number:
PCT/US2020/042286

(22) International Filing Date:
16 July 2020 (16.07.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
16/924,847 09 July 2020 (09.07.2020) US

(71) Applicant: **TOKYO ELECTRON LIMITED** [JP/JP];
Akasaka Biz Tower, 3-1 Akasaka 5-chome, Minato-ku,
Tokyo 107-6325 (JP).

(71) Applicant (for JP only): **TOKYO ELECTRON U.S.
HOLDINGS, INC.** [US/US]; 2400 Grove Boulevard,
Austin, Texas 78741 (US).

(72) Inventor: **IP, Nathan**; 2400 Grove Blvd., Austin, Texas
78741 (US).

(74) Agent: **MEHIGAN, Jason D.**; Tokyo Electron U.S. Hold-
ings, Inc., 2400 Grove Boulevard, Austin, Texas 78741
(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).

(54) Title: APPARATUS AND METHODS FOR WAFER TO WAFER BONDING

(57) Abstract: A method includes having a first wafer bonding recipe and a model of a wafer bonding process, the model comprising an input indicative of a physical parameter of a first wafer to be bonded to a second wafer and configured to output a wafer bonding recipe based on the physical parameter of the first wafer; obtaining measurements of the first wafer to obtain the physical parameter of the first wafer; generating, by the model, the first wafer bonding recipe based on the physical parameter of the first wafer; and bonding the first wafer to the second wafer in accordance with the first wafer bonding recipe to produce a first post-bond wafer.

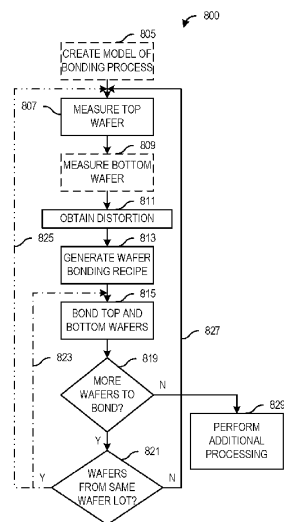


Fig. 8

WO 2022/010497 A1

[Continued on next page]

Published:

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