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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
4 January 2001 (04.01.2001)

PCT

(10) International Publication Number
WO 01/01454 A3

(51) International Patent Classification[7]: H01L 21/00

(21) International Application Number: PCT/US00/40191

(22) International Filing Date: 8 June 2000 (08.06.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/342,669 29 June 1999 (29.06.1999) US

(71) Applicant: LAM RESEARCH CORPORATION [US/US]; 4650 Cushing Parkway, Fremont, CA 94538-6516 (US).

(72) Inventors: KROEKER, Tony, R.; 439 Patricia Road, Georgetown, TX 78628 (US). COOK, Larry; 3506 Palomar Lane, Austin, TX 78727 (US).

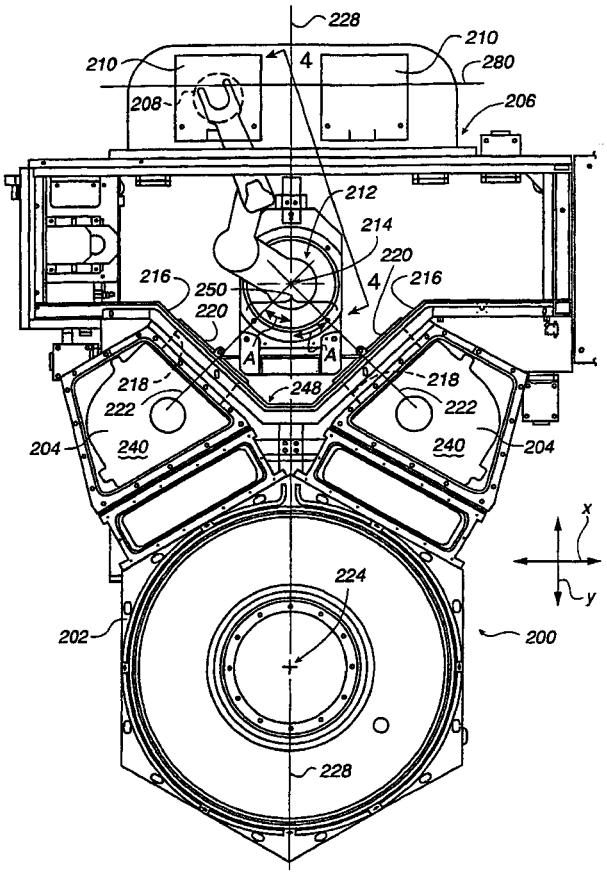
(74) Agent: PENILLA, Albert, S.; Martine Penilla & Kim, LLP, Suite 170, 710 Lakeway Drive, Sunnyvale, CA 94086 (US).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: ATMOSPHERIC WAFER TRANSFER MODULE WITH NEST FOR WAFER TRANSPORT ROBOT AND METHOD OF IMPLEMENTING SAME



(57) Abstract: A load lock wafer transfer face is provided at an acute angle with respect to a footprint dimension line, so the length of the footprint dimension line does not include the entire minimum length of the wafer transfer distance that must separate a robot from the wafer transfer face of a load lock. Two adjacent load locks provided for use with a robot have two load lock wafer transfer faces defining a nest, in that each such face is at an acute angle with respect to the footprint dimension line. A robot is mounted for rotation at a fixed location relative to wafer cassettes and to the nested load lock wafer transfer faces, avoiding use of a robot track to move transversely. Because the faces are at the acute angle, there is only a component of, and not the entire, minimum wafer transfer distance extending in the direction of the footprint dimension line. The robot is positioned at least partly in the nest formed by the adjacent load lock faces without requiring rotation of the base of the robot on a vertical axis at the same time as the arms of the robot are moved in an extend motion during wafer transfer into the load lock. The footprint of the modules may be substantially reduced, in that at least one dimension of the footprint is minimized, yet the robot may operate with only relatively simple extend motion to transfer the wafers into the load locks, avoiding more complex motions that include both transverse motion (i.e., on a linear track), and rotate motion.

WO 01/01454 A3

Published:
— *With international search report.*

(88) Date of publication of the international search report:
12 July 2001

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.