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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 April 2004 (15.04.2004)

PCT

(10) International Publication Number
WO 2004/031859 A3

(51) International Patent Classification[7]: H01L 21/66

(21) International Application Number:
PCT/US2003/028682

(22) International Filing Date:
12 September 2003 (12.09.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/261,569 30 September 2002 (30.09.2002) US

(71) Applicant: **ADVANCED MICRO DEVICES, INC.** [US/US]; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (US).

(72) Inventors: **PHAN, Khoi, A.**; 5796 Trowbridge Way, San Jose, CA 95138 (US). **SINGH, Bhanwar**; 17122 Heatherwood Way, Morgan Hill, CA 95037 (US). **RANGARAJAN, Bharath**; 2295 Dolores Avenue, Santa Clara, CA 95050 (US). **SUBRAMANIAN, Ramkumar**; 1155-D La Rochelle Terrace, Sunnyvale, CA 94089 (US).

(74) Agent: **WRIGHT, Hugh, R.**; Brookes Batchellor LLP, 102-108 Clerkenwell Road, London EC1M 5SA (GB).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, 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, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW.

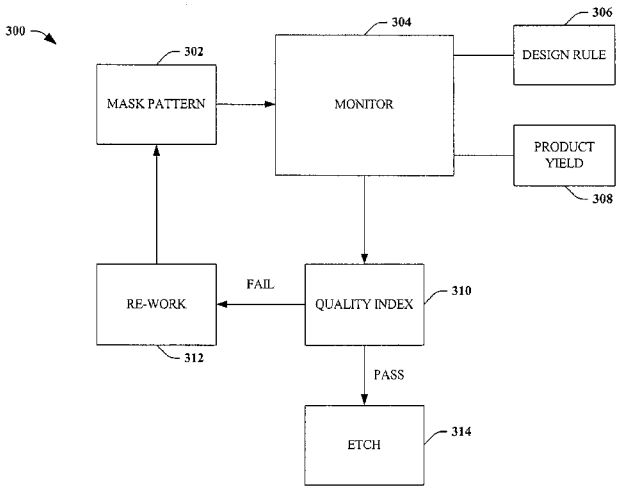
(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ,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

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
17 June 2004

[Continued on next page]

(54) Title: COMPREHENSIVE INTEGRATED LITHOGRAPHIC PROCESS CONTROL SYSTEM BASED ON PRODUCT DESIGN AND YIELD FEEDBACK SYSTEM



(57) Abstract: The present invention provides systems and methods that facilitate performing fabrication process. Critical parameters are valued collectively as a quality matrix, which weights respective parameters according to their importance to one or more design goals. The critical parameters are weighted by coefficients according to information such as, product design, simulation, test results, yield data, electrical data and the like. The invention then can develop a quality index which is a composite "score" of the current fabrication process. A control system can then do comparisons of the quality index with design specifications in order to determine if the current fabrication process is acceptable. If the process is unacceptable, test parameters can be modified for ongoing processes and the process can be re- worked and re-performed for completed processes. As such, respective layers of a device can be customized for different specifications and quality index depending on product designs and yields.

WO 2004/031859 A3

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.