

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
4 September 2003 (04.09.2003)

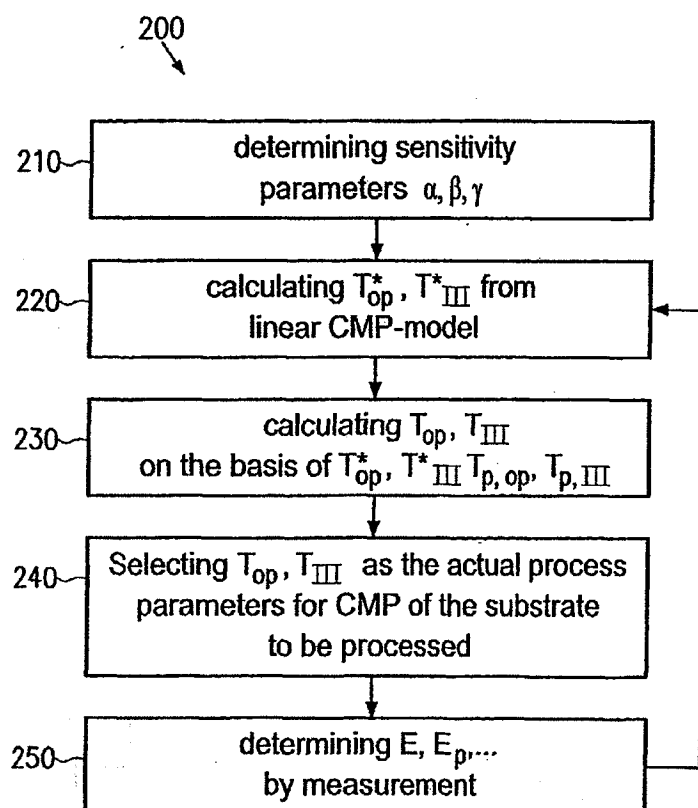
PCT

(10) International Publication Number
WO 03/072305 A1

- (51) International Patent Classification⁷: **B24B 49/03, 37/04**
- (21) International Application Number: **PCT/US02/41668**
- (22) International Filing Date:
20 December 2002 (20.12.2002)
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (30) Priority Data:
102 08 165.4 26 February 2002 (26.02.2002) **DE**
10/261,612 30 September 2002 (30.09.2002) **US**
- (72) Inventors: **WOLLSTEIN, Dirk**; Hertelstr. 34, 01307 Dresden (DE). **RAEBIGER, Jan**; Am Knie 4, 01277 Dresden (DE). **MARXSEN, Gerd**; Wettinstr. 10, 01445 Radebeul (DE).
- (74) Agent: **DRAKE, Paul, S.**; Advanced Micro Devices, Inc., 5204 East Ben White Boulevard, Mail Stop 562, Austin, TX 78741 (US).
- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, 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, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.
- (71) Applicant: **ADVANCED MICRO DEVICES, INC.** [US/US]; One AMD Place, Mail Stop 68, P.O. Box 3453, Sunnyvale, CA 94088-3453 (US).
- (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),

[Continued on next page]

(54) Title: METHOD AND SYSTEM FOR CONTROLLING THE CHEMICAL MECHANICAL POLISHING OF SUBSTRATES BY CALCULATING AN OVERPOLISHING TIME AND/OR A POLISHING TIME OF A FINAL POLISHING STEP



(57) Abstract: A method and a controller 150 for the chemical mechanical polishing (CMP) of substrates 121 and, in particular, for the chemical mechanical polishing of metallization layers is disclosed. In a linear model of the CMP process, the erosion of the metallization layer to be treated is determined by the overpolish time and possibly by an extra polish time on a separate polishing platen for polishing the dielectric layer, wherein the CMP inherent characteristics are represented by sensitivity parameters derived empirically. Moreover, the control operation is designed so that even with a certain inaccuracy of the sensitivity parameters due to subtle process variations, a reasonable controller response is obtained.



European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

Published:

— *with international search report*

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.