

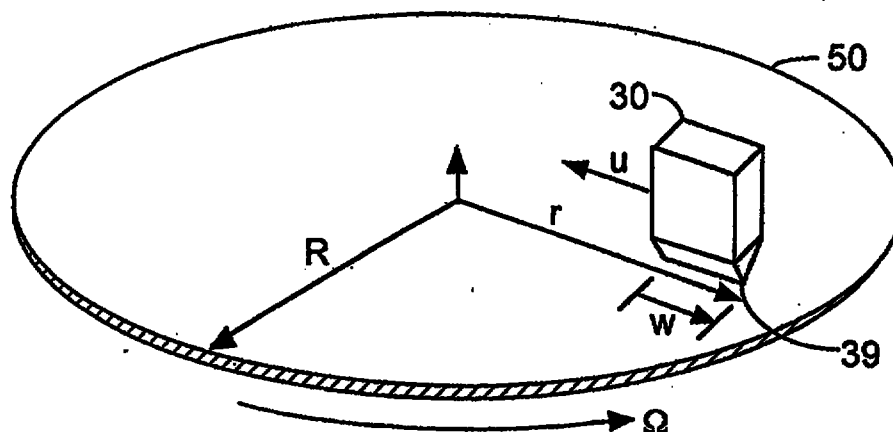
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(21) International Application Number: PCT/US98/11988 (22) International Filing Date: 10 June 1998 (10.06.98) (30) Priority Data: <table border="0"> <tr> <td>60/050,017</td> <td>16 June 1997 (16.06.97)</td> <td>US</td> </tr> <tr> <td>60/050,159</td> <td>19 June 1997 (19.06.97)</td> <td>US</td> </tr> <tr> <td>60/055,789</td> <td>14 August 1997 (14.08.97)</td> <td>US</td> </tr> </table> (71) Applicant (for all designated States except US): MASSACHUSETTS INSTITUTE OF TECHNOLOGY [US/US]; 77 Massachusetts Avenue, Cambridge, MA 02142 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): CHUN, Jung-Hoon [KR/US]; 40 Millpond Road, Sudbury, MA 01776 (US). DERKSEN, James [US/US]; 240 Chicago Street, West Chicago, IL 60185 (US). HAN, Sangjun [KR/US]; 129 Franklin Street #128, Cambridge, MA 02139 (US). (74) Agent: WALKER, William, B.; Enterprise Law Group, Inc., Suite 280, 4400 Bohannon Drive, Menlo Park, CA 94025 (US).		60/050,017	16 June 1997 (16.06.97)	US	60/050,159	19 June 1997 (19.06.97)	US	60/055,789	14 August 1997 (14.08.97)	US	(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, 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, ML, MR, NE, SN, TD, TG). Published With international search report.
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(54) Title: HIGH EFFICIENCY PHOTORESIST COATING



(57) Abstract

An improved method and apparatus for coating semiconductor substrates (50) with organic photoresist polymers by extruding a ribbon of photoresist in a spiral pattern (202) which covers the entire top surface of the wafer (50). The invention provides a more uniform photoresist layer and is much more efficient than are current methods in the use of expensive photoresist solutions. A wafer (50) is mounted on a chuck (114), aligned horizontally and oriented upward. An extrusion head (30) is positioned adjacent to the outer edge of the wafer (50) and above the top surface of the wafer (50) with an extrusion slot (39) aligned radially toward the center of the wafer (50) while photoresist is extruded out the extrusion slot (39). The rotation rate of the wafer (50) and the radial speed of the extrusion head (30) are controlled so that the tangential velocity of the extrusion head (30) with respect to the rotating wafer (50) is a constant.