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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
24 November 2005 (24.11.2005)

PCT

(10) International Publication Number
WO 2005/112093 A2

(51) International Patent Classification[7]: H01L 21/306

(21) International Application Number:
PCT/US2005/013582

(22) International Filing Date: 22 April 2005 (22.04.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/835,175 30 April 2004 (30.04.2004) US

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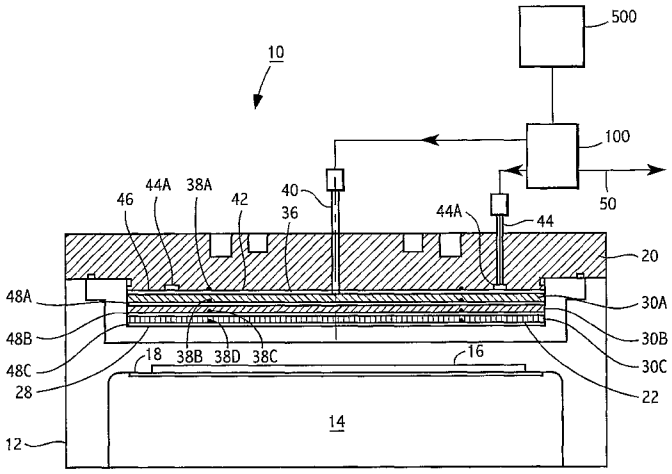
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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,

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(54) Title: GAS DISTRIBUTION SYSTEM HAVING FAST GAS SWITCHING CAPABILITIES



(57) Abstract: A gas distribution system for supplying different gas compositions to a chamber, such as a plasma processing chamber of a plasma processing apparatus is provided. The gas distribution system can include a gas supply section, a flow control section and a switching section. The gas supply section provides first and second gases, typically gas mixtures, to the flow control section, which controls the flows of the first and second gases to the chamber. The chamber can include multiple zones, and the flow control section can supply the first and second gases to the multiple zones at desired flow ratios of the gases. The gas distribution system can continuously supply the first and second gases to the switching section and the switching section is operable to switch the flows of the first and second gases, such that one of the first and second process gases is supplied to the chamber while the other of the first and second gases is supplied to a by-pass line, and then to switch the gas flows. The switching section preferably includes fast switching valves operable to quickly open and close to allow fast switching of the first and second gases, preferably without the occurrence of undesirable pressure surges or flow instabilities in the flow of either gas.

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SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

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