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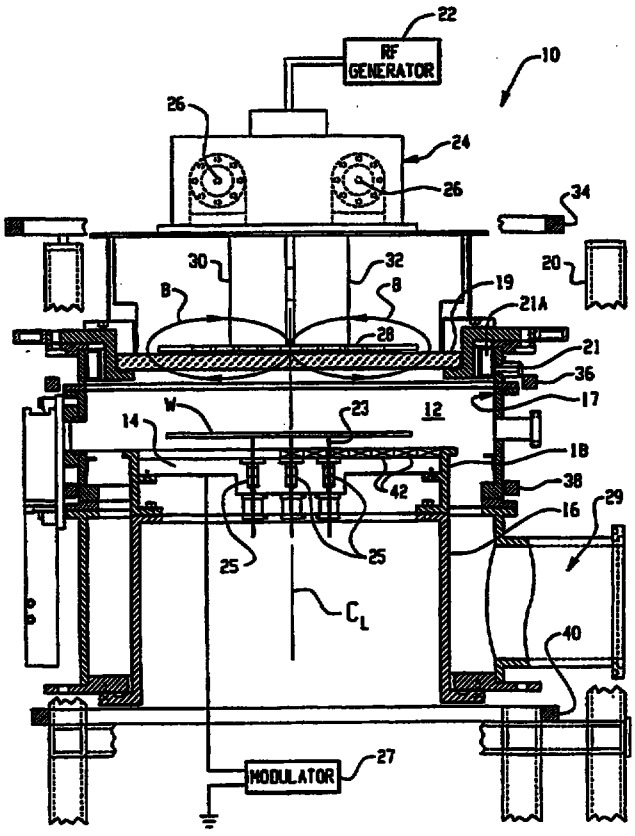
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(54) Title: IMPLANTING SYSTEM AND METHOD



(57) Abstract: A plasma immersion ion implantation method and system is provided for maintaining uniformity in implant energy distribution and for minimizing charge accumulation of an implanted substrate such as a wafer. A voltage modulator (27) applies a pulsed voltage signal ($-V_p$) to a platen (14) in a process chamber (17) containing a plasma, so that ions in the plasma are attracted by and implanted into a wafer residing on the platen. The voltage modulator (27) comprises: (i) a first switch (50) disposed between a power supply (48) and the platen for momentarily establishing a connection therebetween and supplying the pulsed voltage signal to the platen; (ii) a second switch (54) disposed between the platen (14) and ground for at least momentarily closing to discharge residual voltage ($-V_r$) from the platen after the first switch (50) opens and the connection between the power supply and the platen is broken; and (iii) a controller (56) for controlling sequential operation of the switches (50, 54). By closing second switch (54) and grounding the platen, (a) only ions within a certain energy level range are implanted into the wafer, improving the implant energy distribution, and (b) wafer charging due to implantation of positive ions is neutralized by allowing electrons in the plasma to flow toward the wafer between implant pulses. Upon opening, second switch (54) permits the platen to float to achieve the floating potential of the plasma thus minimizing voltage stresses on devices in the wafer. Alternatively, the platen may be positively biased to the plasma floating potential.

WO 01/15200 A1