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(54) Title: HYBRID RF CAPACITIVELY AND INDUCTIVELY COUPLED PLASMA SOURCE USING MULTIFREQUENCY RF POWERS AND METHODS OF USE THEREOF

(57) Abstract: A device for inductively confining capacitively coupled RF plasma formed in a plasma processing apparatus. The apparatus includes an upper electrode and a lower electrode that is adapted to support a substrate and to generate the plasma between the substrate and the upper electrode. The device includes a dielectric support ring that concentrically surrounds the upper electrode and a plurality of coil units mounted on the dielectric support ring. Each coil unit includes a ferromagnetic core positioned along a radial direction of the dielectric support ring and at least one coil wound around each ferromagnetic core. The coil units generate, upon receiving RF power from an RF power source, electric and magnetic fields that reduce the number of charged particles of the plasma diffusing away from the plasma.

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