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(54) **Title:** EDGE ELECTRODES WITH VARIABLE POWER

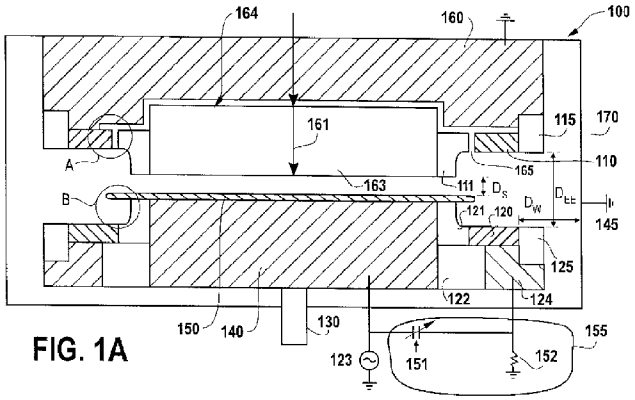


FIG. 1A

(57) **Abstract:** The embodiments provide structures and mechanisms for removal of etch byproducts, dielectric films and metal films on and near the substrate bevel edge, and chamber interior to avoid the accumulation of polymer byproduct and deposited films and to improve process yield. In an exemplary embodiment, a plasma processing chamber configured to clean a bevel edge of a substrate is provided. The plasma processing chamber includes a bottom electrode configured to receive the substrate, wherein the bottom electrode is coupled to a radio frequency (RF) power supply. The plasma processing chamber also includes a top edge electrode surrounding an insulating plate opposing the bottom electrode. The top edge electrode is electrically grounded. The plasma processing chamber further includes a bottom edge electrode surrounding the bottom electrode. The bottom edge electrode opposes the top edge electrode. The top edge electrode, the substrate disposed on the bottom electrode, and the bottom edge electrode are configured to generate a cleaning plasma to clean the bevel edge of the substrate. The bottom edge electrode and the bottom electrode are electrically coupled to one another through an RF circuit tunable to adjust the amount of RF current going between the substrate disposed on the bottom electrode, the bottom edge electrode and the top edge electrode.

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