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(54) Title: SEMICONDUCTOR PROCESSING SYSTEM WITH SOURCE FOR DECOUPLED ION AND RADICAL CONTROL

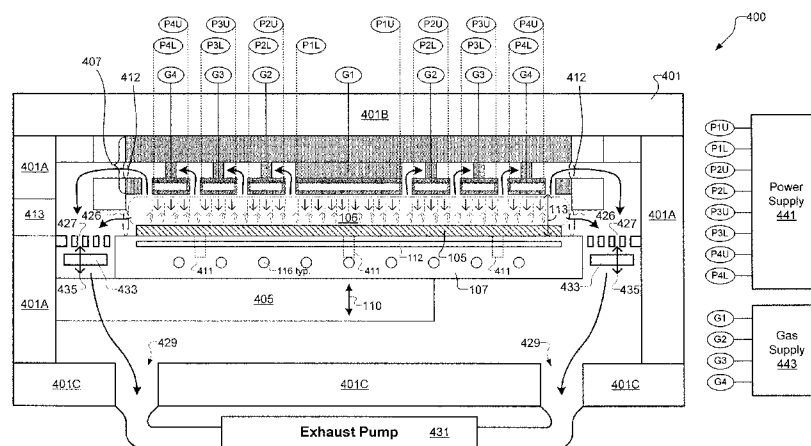


Fig. 1A

(57) Abstract: A top plate assembly is positioned above and spaced apart from the substrate support, such that a processing region exists between the top plate assembly and the substrate support. The top plate assembly includes a central plasma generation microchamber and a plurality of annular-shaped plasma generation microchambers positioned in a concentric manner about the central plasma generation microchamber. Adjacently positioned ones of the central and annular-shaped plasma generation microchambers are spaced apart from each other so as to form a number of axial exhaust vents therebetween. Each of the central and annular-shaped plasma generation microchambers is defined to generate a corresponding plasma therein and supply reactive constituents of its plasma to the processing region between the top plate assembly and the substrate support.