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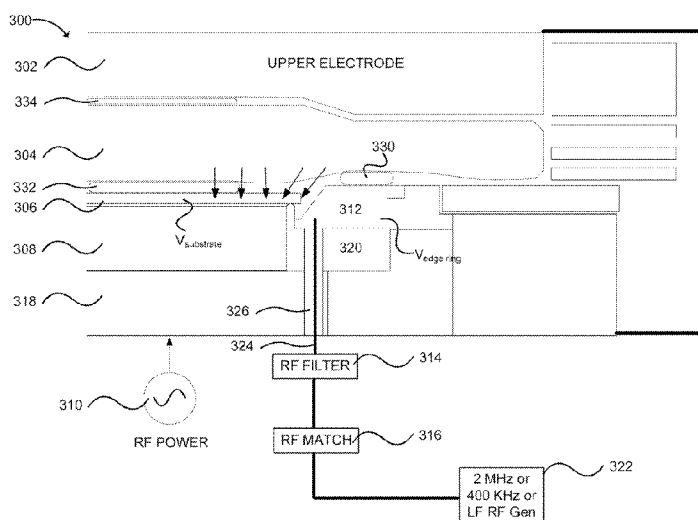


FIG. 3

(57) Abstract: A method for processing a substrate in a plasma processing chamber is provided. The substrate is disposed above a chuck and surrounded by an edge ring. The edge ring is electrically isolated from the chuck. The method includes providing first RF power to the chuck. The method also includes providing an edge ring RF voltage control arrangement. The edge ring RF voltage control arrangement is coupled to the edge ring to provide second RF power to the edge ring resulting in the edge ring having an edge ring potential. The method further includes generating a plasma within the plasma processing chamber to process the substrate. The substrate is being processed while the edge ring RF voltage control arrangement is configured to cause the edge ring potential to be substantially equal to a DC potential of the substrate while processing the substrate.

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