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(54) **Title**: ATOMIC LAYER ETCHING USING METASTABLES FORMED FROM AN INERT GAS

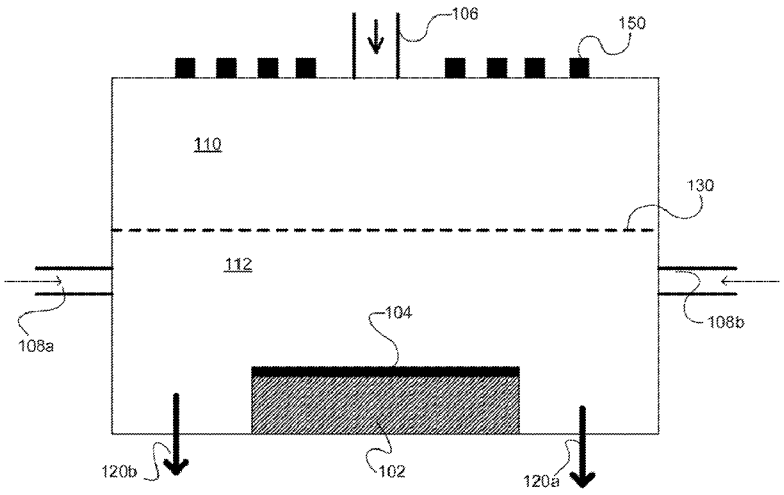


FIG. 1

(57) **Abstract**: Substrate processing systems and methods for etching an atomic layer are disclosed. The methods and systems are configured to introducing a first gas into the chamber, the gas being an etchant gas suitable for etching the layer and allowing the first gas to be present in the chamber for a period of time sufficient to cause adsorption of at least some of the first gas into the layer. The first gas is substantially replaced in the chamber with an inert gas, and metastables are then generated from the inert gas to etch the layer with the metastables while substantially preventing the plasma charged species from etching the layer.

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