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- (54) **Title:** NOVEL MASK REMOVAL PROCESS STRATEGY FOR VERTICAL NAND DEVICE

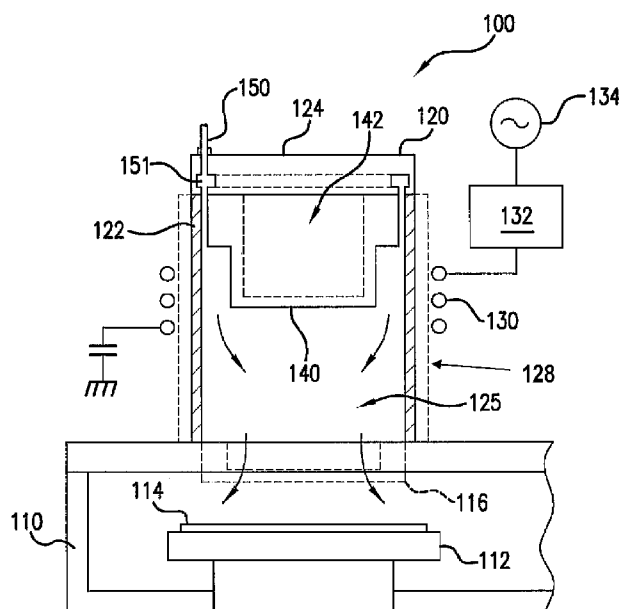


Fig. 1

(57) **Abstract:** A method for removing a doped amorphous carbon mask from a semiconductor substrate is disclosed. The method comprises generating a plasma to be used in treating the substrate, wherein the plasma comprises an oxygen containing gas, a halogen containing gas, and a hydrogen containing gas; and treating the substrate by exposing the substrate to the plasma. The doped amorphous carbon mask can be a boron doped amorphous carbon mask or a nitrogen doped amorphous carbon mask. The method can result in a mask removal rate ranging from about 1,000 ngstrms/minute to about 12,000 ngstrms/minute. Further, gases can be applied to the substrate before plasma treatment, after plasma treatment, or both to reduce the amount of defects or pinholes found in the substrate film.

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