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(54) Title: HIGH MODULUS BORON-BASED CERAMICS FOR SEMICONDUCTOR APPLICATIONS

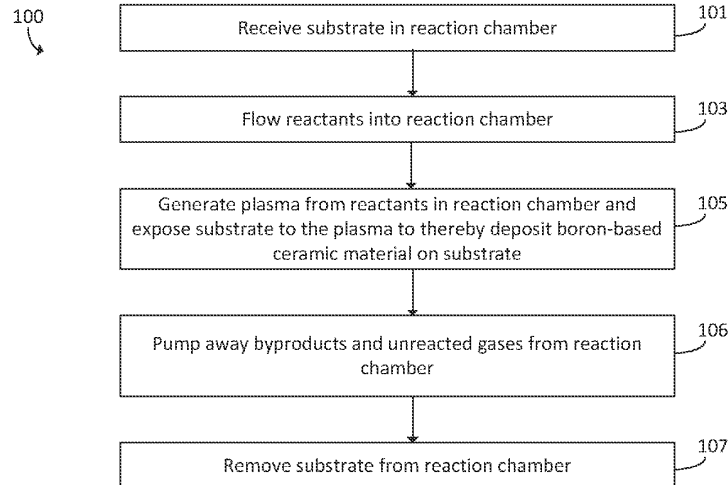


FIG. 1

(57) Abstract: Various embodiments herein relate to methods, apparatus, and systems for depositing a boron-based ceramic film on a substrate. Advantageously, the boron-based ceramic films described herein can be formed at relatively low temperatures (e.g., about 600C or less), while still achieving very high quality materials that exhibit good mechanical strength (e.g., high hardness and Young's modulus), good etch selectivity, amorphous morphology, etc. The films herein also have low hydrogen content, low oxygen content, and low halide content. In many cases, the films may be formed through a reaction between a boron halide and a saturated or unsaturated hydrocarbon, in the presence of plasma.

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WO 2021/173553 A1

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