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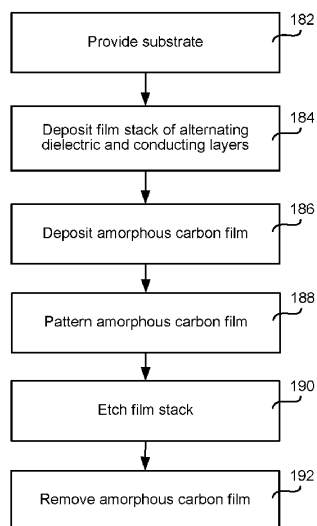


FIG. 1

(57) Abstract: Provided herein are examples of methods and related apparatus for depositing an ashable hardmask (AHM) on a substrate using a process gas including hydrocarbons and halide-containing species and pulsed low frequency (LF) power. Halide-containing species may decrease the hydrogen content of the AHM, and a plasma using pulsed LF power may improve mechanical properties of the AHM. Also provided herein are examples of annealed hardmasks and examples of processes for annealing hardmasks.

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