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(54) Title: METHOD OF PROCESSING A SUBSTRATE

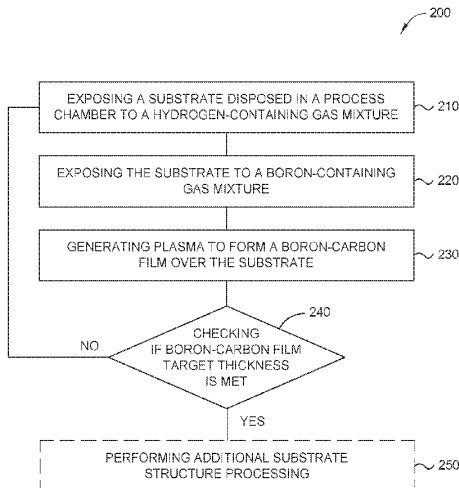


FIG. 2

(57) Abstract: Embodiments of the present disclosure generally relate to a method of processing a substrate. The method includes exposing the substrate positioned in a processing volume of a processing chamber to a hydrocarbon-containing gas mixture, exposing the substrate to a boron-containing gas mixture, and generating a radio frequency (RF) plasma in the processing volume to deposit a boron-carbon film on the substrate. The hydrocarbon-containing gas mixture and the boron-containing gas mixture are flowed into the processing volume at a precursor ratio of (boron-containing gas mixture/((boron-containing gas mixture)+hydrocarbon-containing gas mixture) of about 0.38 to about 0.85. The boron-carbon hard-mask film provides high modulus, etch selectivity, and stress for high aspect-ratio features (e.g., 10:1 or above) and smaller dimension devices (e.g., 7 nm node or below).

[Continued on next page]

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