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(54) Title: METHOD OF FORMING CARBON-BASED SPACER FOR EUV PHOTORESIST PATTERNS

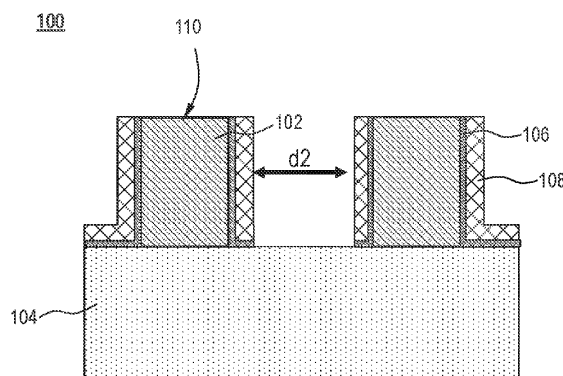


FIG. 1D

(57) **Abstract:** Methods of depositing a conformal carbon-containing spacer layer are described. Exemplary processing methods may include flowing a first precursor over a patterned surface and a substrate to form a first portion of an initial carbon-containing film on the structure. The methods may include removing a first precursor effluent from the substrate. A second precursor may then be flowed over the substrate to react with the first portion of the initial carbon-containing film. The methods may include removing a second precursor effluent from the substrate. The methods may include etching the substrate to remove a portion of the carbon-containing film and expose a top surface of the patterned surface and expose the substrate between the patterned surfaces. The patterned surface may be an EUV photoresist pattern, and the carbon-containing film may be formed on the sidewall and act as a spacer to reduce the critical dimension (CD). The carbon-containing film may act as an etch protection layer or an etch resistance layer for the sidewall of the nanostructures. When no etch is performed, the carbon-containing film may act as a liner material.

[Continued on next page]

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