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(54) **Title**: SMOOTH SICONI ETCH FOR SILICON-CONTAINING FILMS

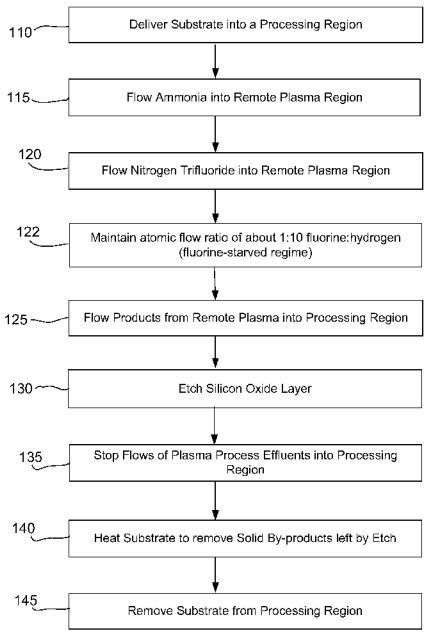


FIG. 1

(57) **Abstract**: A method of etching silicon-containing material is described and includes a SiConi™ etch having a greater or lesser flow ratio of hydrogen compared to fluorine than that found in the prior art. Modifying the flow rate ratios in this way has been found to reduce roughness of the post-etch surface and to reduce the difference in etch-rate between densely and sparsely patterned areas. Alternative means of reducing post-etch surface roughness include pulsing the flows of the precursors and/or the plasma power, maintaining a relatively high substrate temperature and performing the SiConi™ in multiple steps. Each of these approaches, either alone or in combination, serve to reduce the roughness of the etched surface by limiting solid residue grain size.

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