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Basceri

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(54) **METHOD FOR IMPROVING THE SIDEWALL STOICHIOMETRY OF THIN FILM CAPACITORS**

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(52) **U.S. Cl.** **438/3**; 438/240
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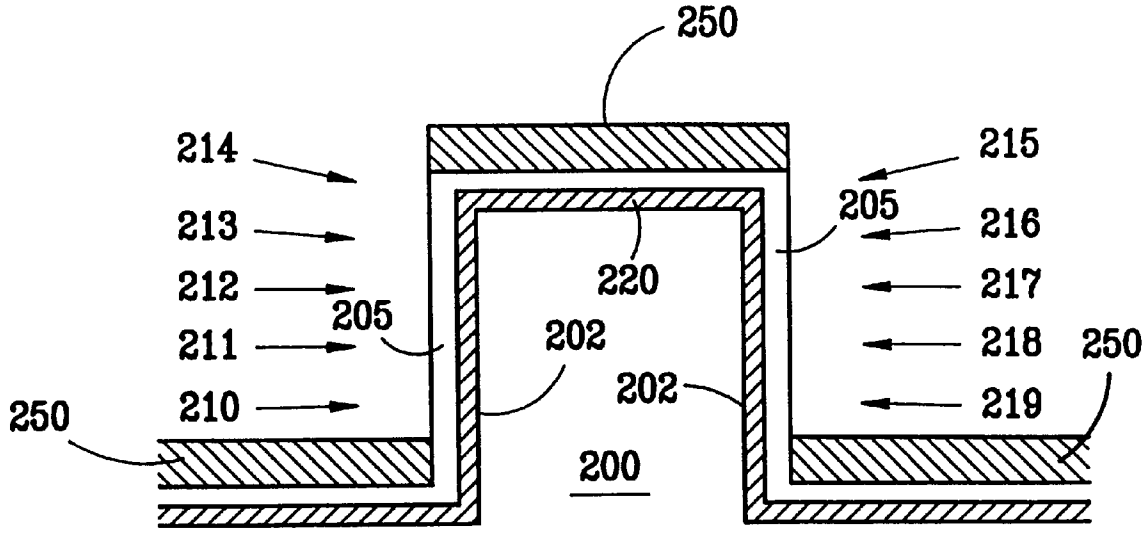
(57) **ABSTRACT**

A method for ion implantation of high dielectric constant materials with dopants to improve sidewall stoichiometry is disclosed. Particularly, the invention relates to ion implantation of $(Ba,Sr)TiO_3$ (BST) with Ti dopants. The invention also relates to varying the ion implantation angle of the dopant to uniformly dope the high dielectric constant materials when they have been fabricated over a stepped structure. Additionally, the invention relates to forming a capping layer over a horizontal portion of the BST film to reduce excess dopant from being implanted into the horizontal section of the BST film. The invention also relates to integrated circuits having a thin film high dielectric material with improved sidewall stoichiometry used as an insulating layer in a capacitor structure.

38 Claims, 3 Drawing Sheets