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(54) Title: METHODS FOR IMPROVING THE QUALITY OF STRUCTURES COMPRISING SEMICONDUCTOR MATERIALS

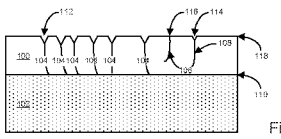


Fig. 1A

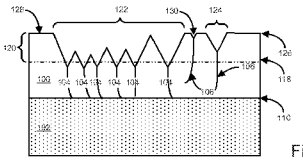


Fig. 1B

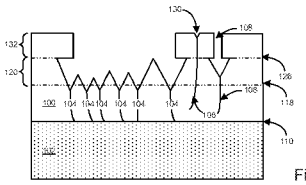


Fig. 1C

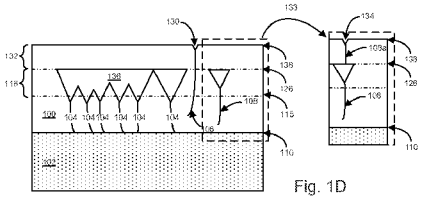


Fig. 1D

(57) Abstract: Methods which can be applied during the epitaxial growth of semiconductor structures and layers of III-nitride materials so that the qualities of successive layers are successively improved. An intermediate epitaxial layer is grown on an initial surface so that growth pits form at surface dislocations present in the initial surface. A following layer is then grown on the intermediate layer according to the known phenomena of epitaxial lateral overgrowth so it extends laterally and encloses at least the agglomerations of intersecting growth pits. Preferably, prior to growing the following layer, a discontinuous film of a dielectric material is deposited so that the dielectric material deposits discontinuously so as to reduce the number of dislocations in the laterally growing material. The methods of the invention can be performed multiple times to the same structure. Also, semiconductor structures fabricated by these methods.

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