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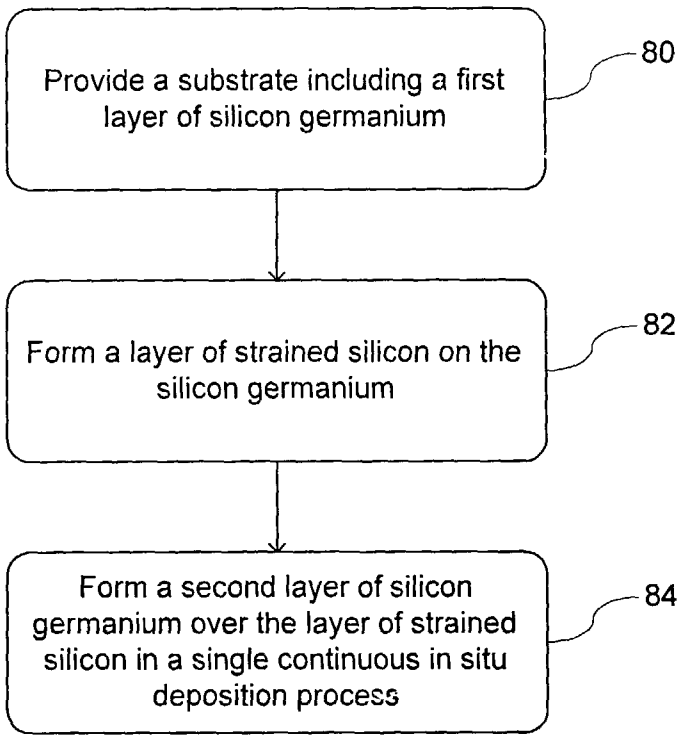
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(54) Title: METHOD OF FORMING A THICK STRAINED SILICON LAYER AND SEMICONDUCTOR STRUCTURES INCORPORATING A THICK STRAINED SILICON LAYER



(57) Abstract: A strained silicon layer (50) s grown on a layer of silicon germanium (40) and a layer of silicon germanium (52) is grown on the strained silicon (50) in a single continuous in situ deposition process with the strained silicon (50). Shallow trench isolations (48) are formed in the lower layer of silicon germanium (40) prior to formation of the strained silicon layer (50). The two silicon germanium layers (40, 52) effectively provide dual substrates at both surfaces of the strained silicon layer (50) that serve to maintain the tensile strain of the strained silicon layer (50) and resist the formation of misfit dislocations that might otherwise result from temperature changes during processing. Consequently the critical thickness of strained silicon (50) that can be grown without significant misfit dislocations during later processing is effectively doubled for a given germanium content of the silicon germanium layers (40, 52). The formation of shallow trench isolations (48) prior to formation of the strained silicon layer (50) avoids subjecting the strained silicon (50) layer to extreme thermal stresses and further reduces the formation of misfit dislocations.

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