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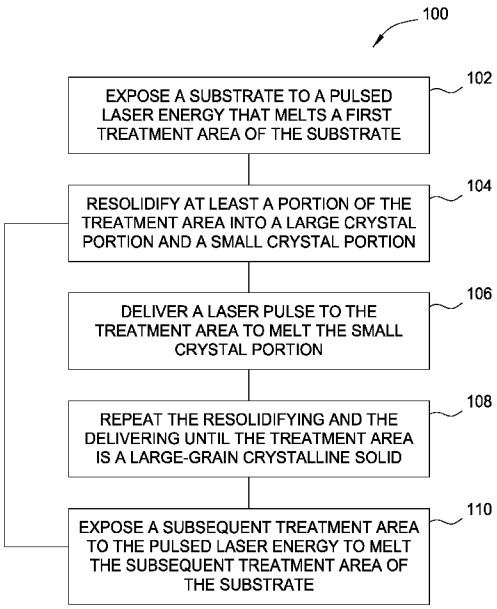


FIG. 1

(57) Abstract: Apparatus and methods of treating a substrate with an amorphous semiconductor layer, or a semiconductor layer having small crystals, to form large crystals in the substrate are described. A treatment area of the substrate is identified and melted using a progressive melting process of delivering pulsed energy to the treatment area. The treatment area is then recrystallized using a progressive crystallization process of delivering pulsed energy to the area. The pulsed energy delivered during the progressive crystallization process is selected to convert the small crystals into large crystals as the melted material freezes.

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