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(54) Title: ESTABLISHING A HIGH PHOSPHORUS CONCENTRATION IN SOLAR CELLS

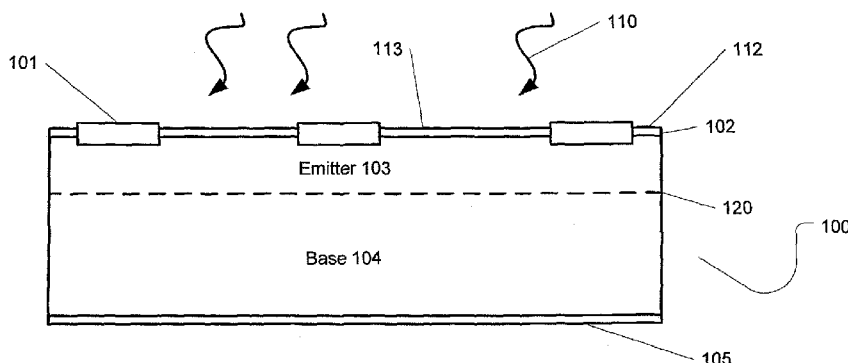


FIG. 1

(57) Abstract: Methods of controlling the diffusion of a dopant in a solar cell are disclosed. A second species is used in conjunction with the dopant to modify the diffusion region. For example, phosphorus and boron both diffuse by pairing with interstitial silicon atoms. Thus, by controlling the creation and location of these interstitials, the diffusion rate of the dopant can be controlled. In one embodiment, a heavier element, such as germanium, argon or silicon, is used to create interstitials. Because of the presence of these heavier elements, the dopant diffuses deeper into the substrate. In another embodiment, carbon is implanted. Carbon reduces the number of interstitials, and thus can be used to limit the diffusion of the dopant. In another embodiment, a lighter element, such as helium is used to amorphize the substrate. The crystalline-amorphous interface created limits diffusion of the dopant into the substrate.

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