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(54) Title: PASSIVATION STACK ON A CRYSTALLINE SILICON SOLAR CELL

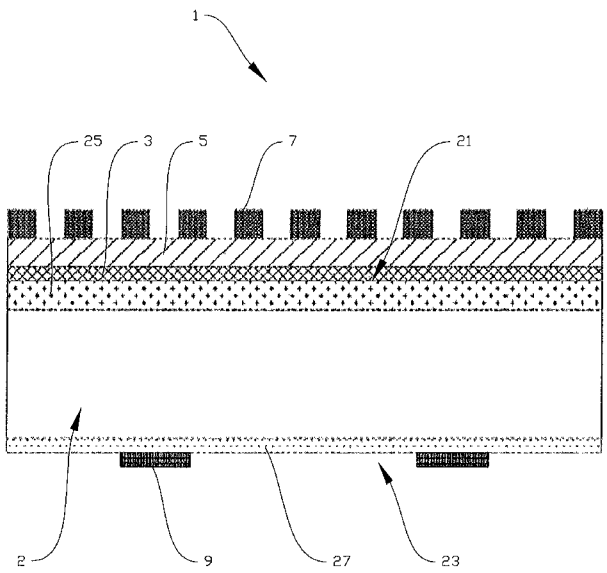


Fig. 6a

(57) Abstract: There is described a method for manufacturing a passivation stack on a crystalline silicon solar cell (1) device, the method comprising the steps of: - providing a substrate comprising a crystalline silicone layer (2), such as a crystalline silicon wafer or chip; - cleaning a surface (21, 23) of the crystalline silicon layer (2) by removing an oxide layer at least from a portion of one side of the crystalline silicon layer (2); - depositing, on at least a part of the cleaned surface (21, 23), a layer of silicon oxynitride (3); and - depositing a capping layer (5) comprising a hydrogenated dielectric material on top of the layer of silicon oxynitride (3), wherein the layer of silicon oxynitride (3) is deposited at a temperature between 100 °C and 200 °C, preferably between 100 °C and 150 °C, and even more preferably between 100 °C and 130 °C, wherein the step of depositing the layer of silicon oxynitride (3) includes the sub-steps of: - using $N_2O$ and $SiH_4$ as precursor gasses in an $N_2$ ambient atmosphere; and - depositing silicon oxynitride with a gas flow ratio of $N_2O$ to $SiH_4$ below 2, preferably below 1, and even more preferably around 0,5. There is also described a crystalline silicon solar cell device obtainable by means of a method according to the invention.

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