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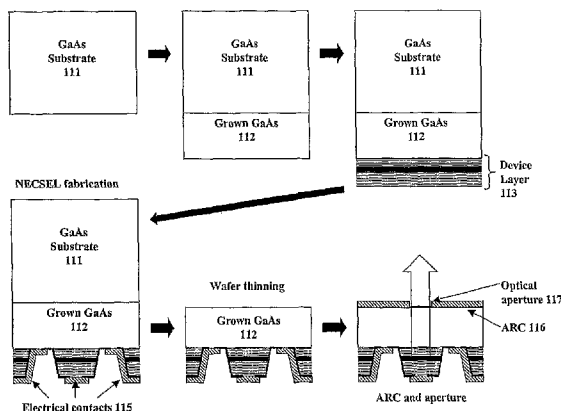
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(54) Title: METHOD OF FABRICATION OF A SUPPORT STRUCTURE FOR A SEMICONDUCTOR DEVICE



(57) Abstract: A method of fabricating a semiconductor device is described. In this method, a starting substrate of sufficient thick-
ness is selected that has the required defect density levels, which may result in an undesirable doping level. Then a semiconductor
layer having a desired doping level is formed on the starting substrate. The resulting semiconductor layer has the required defect
density and doping levels for the final product application. After active components, electrical conductors, and any other needed
structures are formed on the semiconductor layer, the starting substrate is removed leaving a desired thickness of the semiconductor
layer. In a VECSEL application, the active components can be a gain cavity, where the semiconductor layer has the necessary defect
density and doping levels to maximize wall plug efficiency (WPE). In one embodiment, the doping of the semiconductor layer is not
uniform. For example, a majority of the layer is doped at a low level and the remainder is doped at a much higher level. This can
result in improved WPE at particular thicknesses for the higher doped material.

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