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[54] STACKED QUANTUM WELL ALUMINUM INDIUM GALLIUM NITRIDE LIGHT EMITTING DIODES

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[58] **Field of Search** 257/13, 191, 12, 257/14, 79, 94, 95, 96, 97, 101, 103

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[57] **ABSTRACT**

Stacked quantum well light emitting diodes include a plurality of stacked active layers of indium gallium nitride, separated by barrier layers of aluminum gallium nitride or aluminum indium gallium nitride, wherein the ratios of indium to gallium differ in at least two of the stacked active layers. Preferably, the differing ratios of indium to gallium are selected to produce emission wavelengths from the stacked active layers, such that the emission wavelengths are combined to produce white light. Controlled amounts of hydrogen gas are introduced into a reaction chamber during formation of indium gallium nitride or aluminum indium gallium nitride to produce high quality indium gallium nitride or aluminum indium gallium nitride which incorporate large percentages of indium and possesses excellent optical and surface properties.

26 Claims, 8 Drawing Sheets