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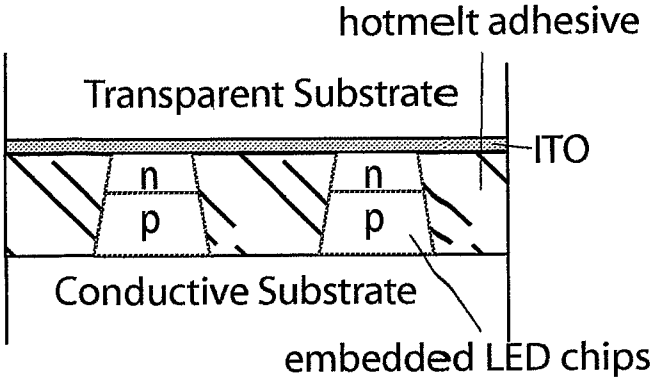
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(54) Title: ROLL-TO-ROLL FABRICATED LIGHT SHEET AND ENCAPSULATED SEMICONDUCTOR CIRCUIT DEVICES



(57) Abstract: A method of making a light active sheet. A bottom substrate having an electrically conductive surface is provided. A hotmelt adhesive sheet is provided. Light active semiconductor elements, such as LED die, are embedded in the hotmelt adhesive sheet. The LED die each have a top electrode and a bottom electrode. A top transparent substrate is provided having a transparent conductive layer. The hotmelt adhesive sheet with the embedded LED die is inserted between the electrically conductive surface and the transparent conductive layer to form a lamination. The lamination is run through a heated pressure roller system to melt the hotmelt adhesive sheet and electrically insulate and bind the top substrate to the bottom substrate. As the hotmelt sheet is softened, the LED die breakthrough so that the top electrode comes into electrical contact with the transparent conductive layer of the top substrate and the bottom electrode comes into electrical contact with the electrically conductive surface of the bottom substrate. Thus, the p and n sides of each LED die are automatically connected to the top conductive layer and the bottom conductive surface. Each LED die is encapsulated and secured between the substrates in the flexible, hotmelt adhesive sheet layer. The bottom substrate, the hotmelt adhesive (with the embedded LED die) and the top substrate can be provided as rolls of material. The rolls are brought together in a continuous roll fabrication process, resulting in a flexible sheet of lighting material.

WO 2005/099310 A2

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