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(12) **United States Patent**  
**Loh et al.**

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(54) **LIGHT EMITTING DEVICE PACKAGES, LIGHT EMITTING DIODE (LED) PACKAGES AND RELATED METHODS**

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This patent is subject to a terminal disclaimer.

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(51) **Int. Cl.**

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**H01L 21/00** (2006.01)  
**F21V 9/16** (2006.01)  
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(52) **U.S. Cl.** ..... **257/98**; 257/81; 257/82; 257/91; 257/99; 257/E33.056; 257/E33.058; 257/E33.059; 438/27; 438/29; 362/84; 362/27; 313/318.11

(58) **Field of Classification Search** ..... 257/98, 257/81, 82, 91, 99, 436; 438/26, 27; 362/84, 362/267; 313/318.11

See application file for complete search history.

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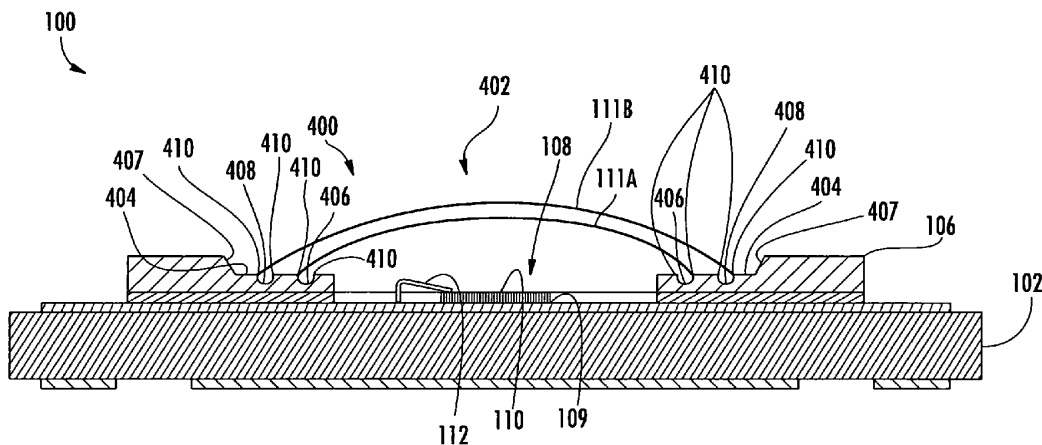
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(57) **ABSTRACT**

Light emitting device packages, light emitting diode (LED) packages and related methods are disclosed. According to one aspect, a light emitting device package is provided. The package includes a mounting pad adapted for attachment of a light emitting device. A lens coupler is attached to the mounting pad and defines an opening for containing the light emitting device and a quantity of encapsulant. The lens coupler includes a surface defining a depression which comprises at least one edge that shapes an outer surface of the encapsulant.

**25 Claims, 16 Drawing Sheets**



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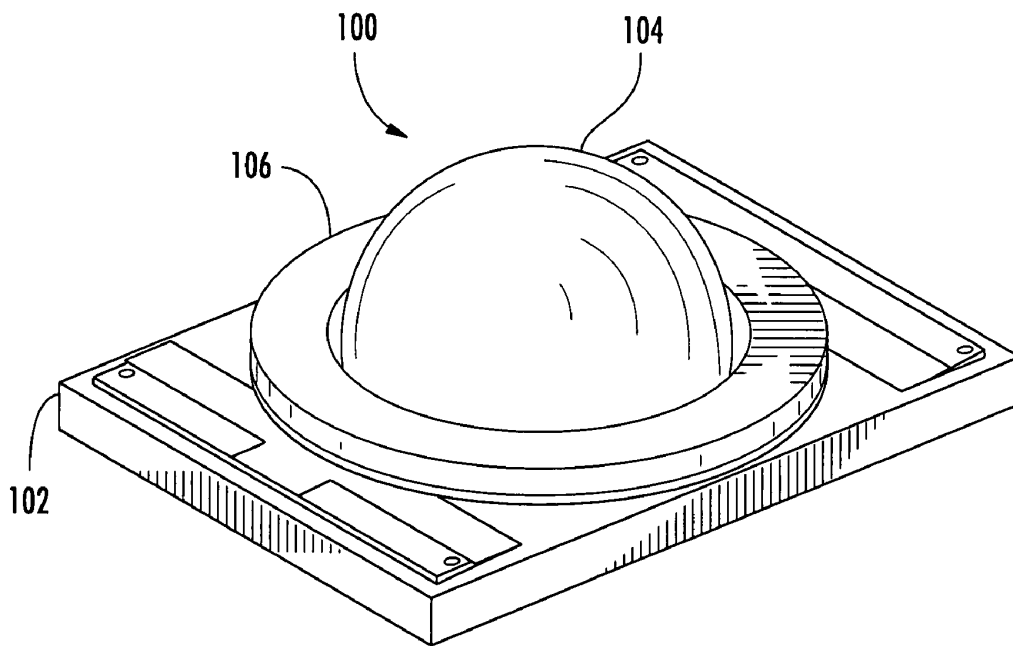


FIG. 1

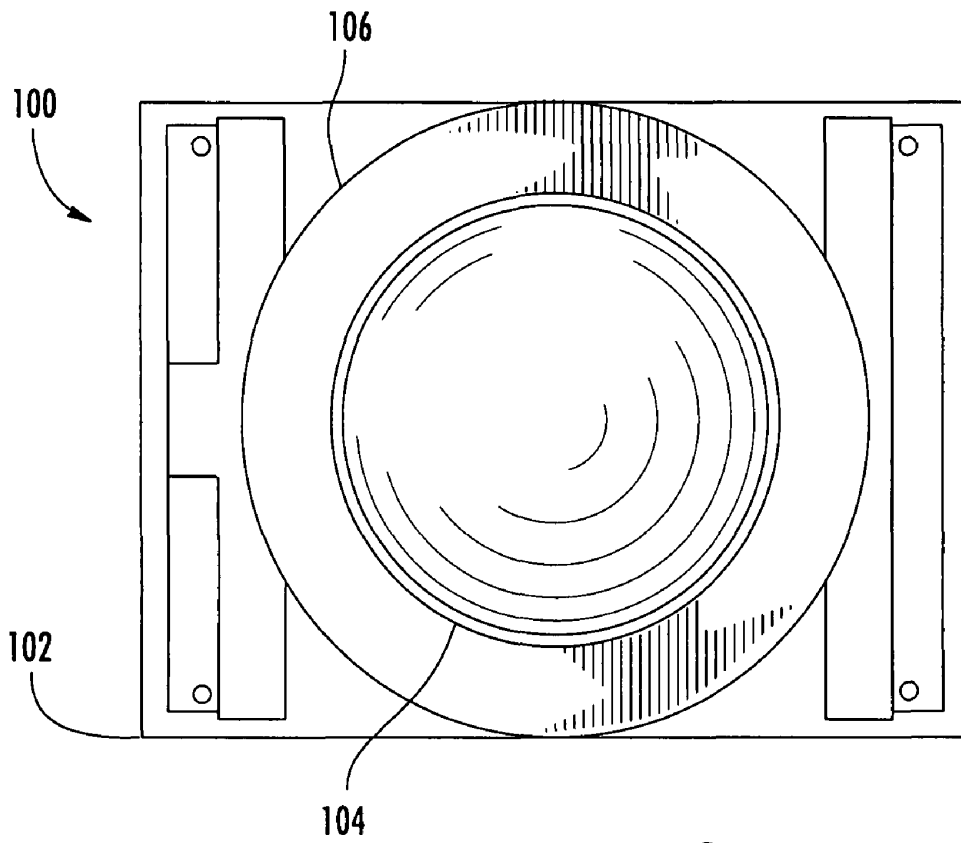
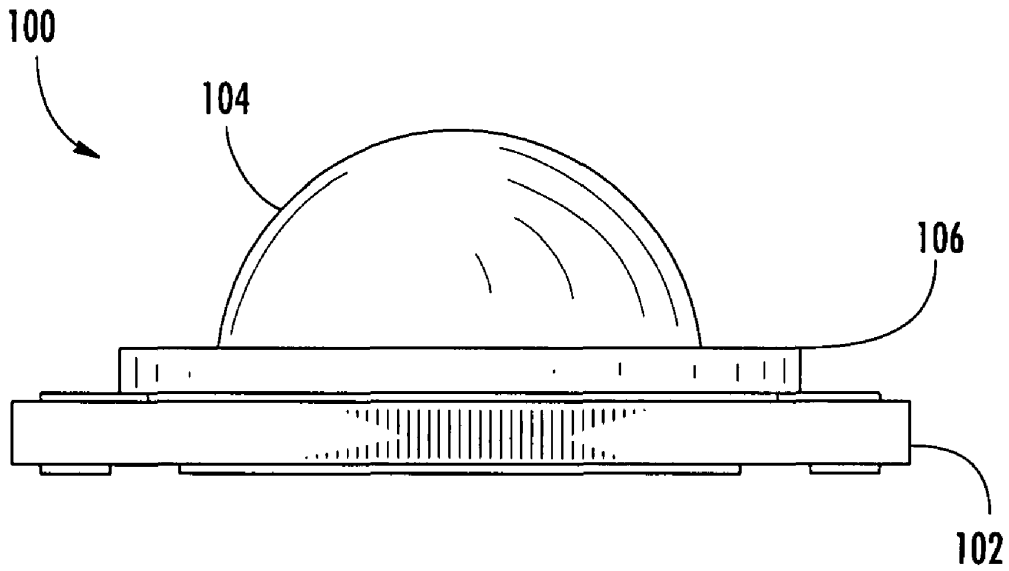


FIG. 2



**FIG. 3**

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