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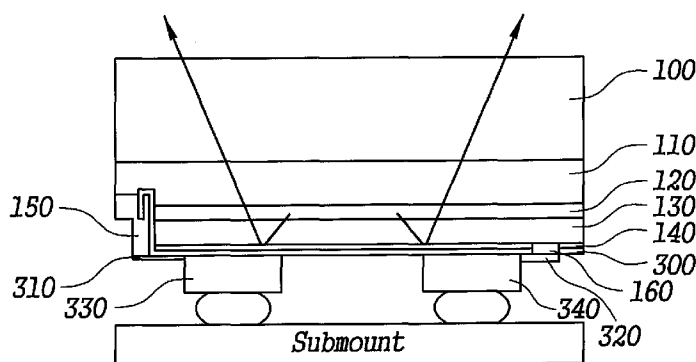
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[Continued on next page]

(54) Title: LIGHT EMITTING DIODE WITH METAL PILES AND MULTI-PASSIVATION LAYERS AND ITS MANUFACTURING METHOD

[Figure 9]



(57) Abstract: The present invention relates to a light emitting diode with metal piles and one or more passivation layers and a method for making the diode including a first steps of performing mesa etching respectively on a first semiconductor layer and a second semiconductor layer belonging to stacked layers formed on a substrate in sequence! a second step of forming a reflector layer on the mesa-etched upper and side face! a third step of contacting one or more first electrodes with the first semiconductor layer and one or more second electrodes through the reflector layer with the second semiconductor layer; a fourth step of forming a first passivation layer on the reflector layer and the contacted electrodes; and a fifth step of connecting the first electrodes to a first bonding pad through one or more first electrode lines, bring one ends of vertical extensions having the shape of a metal pile into contact with one or more second electrodes, and connecting the other ends of the vertical extensions to a second bonding pad through one or more second electrode lines. As effects of the present invention, the loss of light emitting area decreases and current diffusion efficiency increases.



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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 H01L 33/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

e-KIPASS(KIPO internal) : "Light emitting diode", "chip-scale", "bonding pad", "metal pile"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| P, X | KR 10-2007-0079956 A (KOREA PHOTONICS TECHNOLOGY INS.) 08 AUGUST 2007 See the abstract, page 3 line 13 - page 5 line 44, Figures 2a-5 | 1-24 |
| A | KR 10-2003-0073054 A (EPIVALLEY CO.,LTD) 19 SEPTEMBER 2003 See the abstract, claims 1-18, Figures 2-9 | 1-24 |
| A | WO 2005/101598 A1 (HAMAMATSU PHOTONICS KK.) 27 OCTOBER 2005 See the abstract, Figure 2 | 1-24 |
| A | JP 2006-147629 A (MATSUSHITA ELECTRIC WORKS LTD) 08 JUNE 2006 See the abstract, Figures 3-9 | 1-24 |

 Further documents are listed in the continuation of Box C. See patent family annex.

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| JP 2006-147629 A | 08.06.2006 | NONE | |