



US 20080157110A1

(19) **United States**

(12) **Patent Application Publication**
Huang et al.

(10) **Pub. No.: US 2008/0157110 A1**
(43) **Pub. Date: Jul. 3, 2008**

(54) **LED CHIP HAVING MICRO-LENS STRUCTURE**

Publication Classification

(75) Inventors: **Tien-Fu Huang**, Hsinchu (TW);
Shih-Hao Hua, Hsinchu (TW);
Kuo-Chang Hu, Hsinchu (TW)

(51) **Int. Cl.**
H01L 33/00 (2006.01)
(52) **U.S. Cl.** **257/98; 257/E33.068**

Correspondence Address:
RABIN & Berdo, PC
1101 14TH STREET, NW, SUITE 500
WASHINGTON, DC 20005

(57) **ABSTRACT**

A light-emitting diode (LED) chip having a micro-lens structure includes a light-emitting structure and a light guide lens. The light-emitting structure emits a light from a light-emitting surface upon being applied with a current, and the light guide lens is stacked on the light-emitting surface and used for emitting the light from a light guide surface of the light guide lens. The light guide surface has an annular ridge portion and a scatter region, such that the lights close to the central optical axis of the light-emitting surface (the region having the maximum light-emitting intensity) are deflected in a direction away from the central optical axis, and the lights far away from the central optical axis are deflected towards the central optical axis, so as to obtain a light with a uniform overall optical intensity.

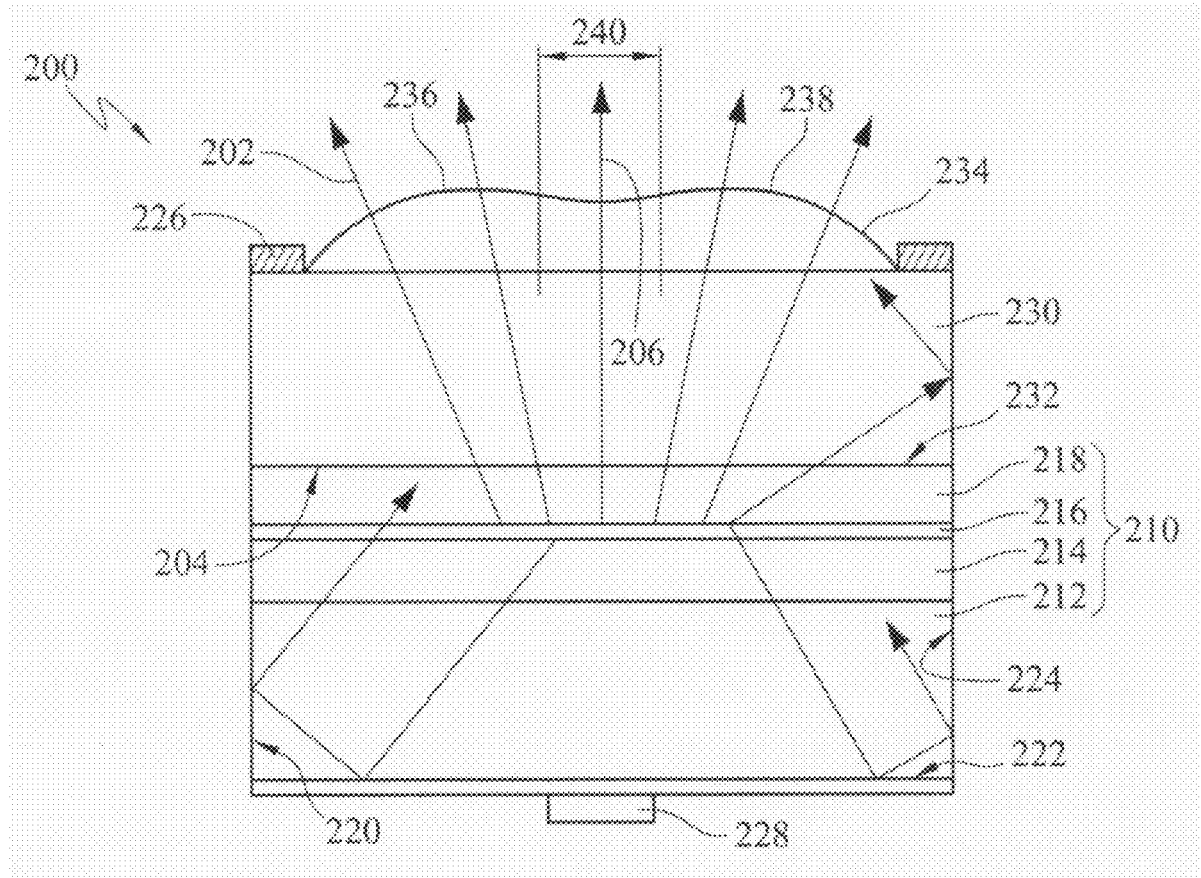
(73) Assignee: **Industrial Technology Research Institute**, Hsinchu (TW)

(21) Appl. No.: **11/826,469**

(22) Filed: **Jul. 16, 2007**

(30) **Foreign Application Priority Data**

Dec. 29, 2006 (TW) 095150067



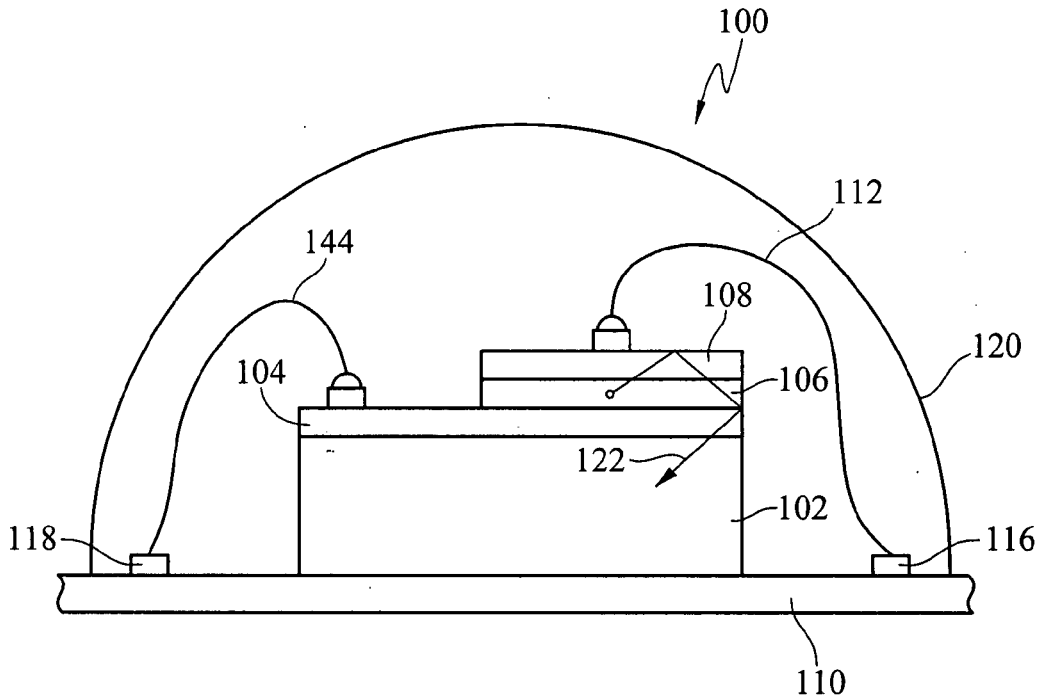


FIG. 1 (PRIOR ART)

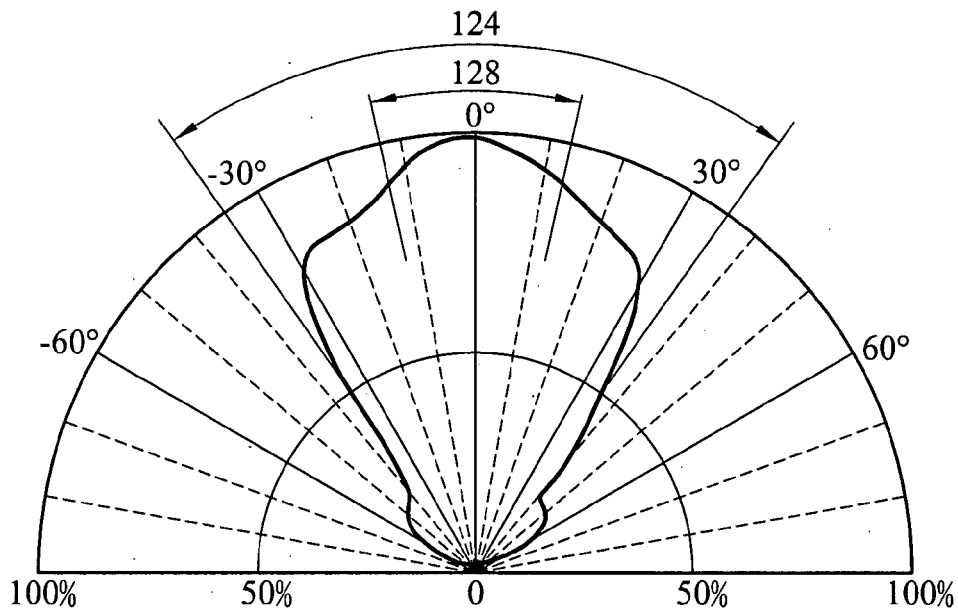


FIG. 2 (PRIOR ART)

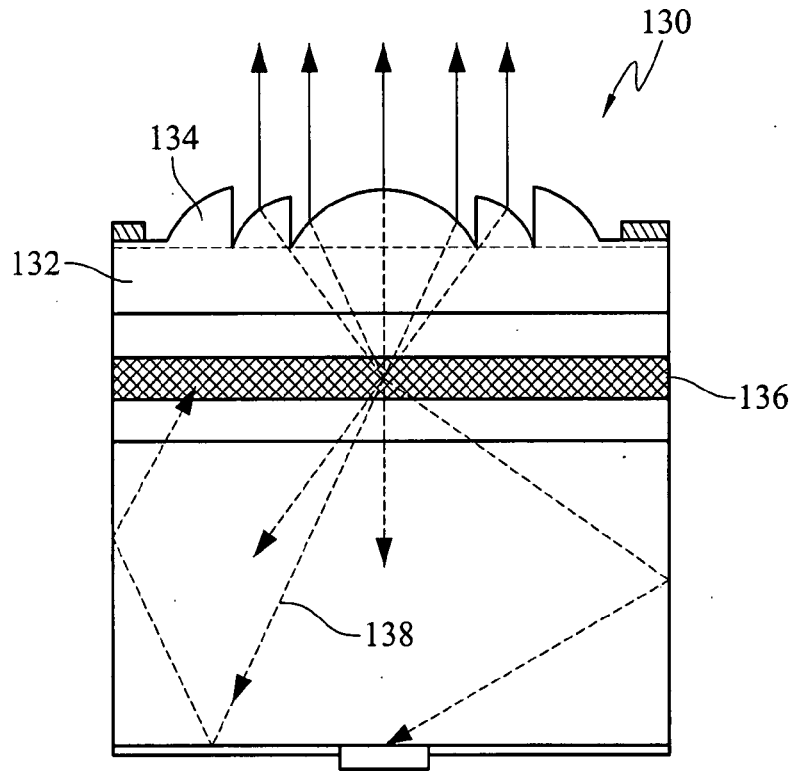


FIG. 3 (PRIOR ART)

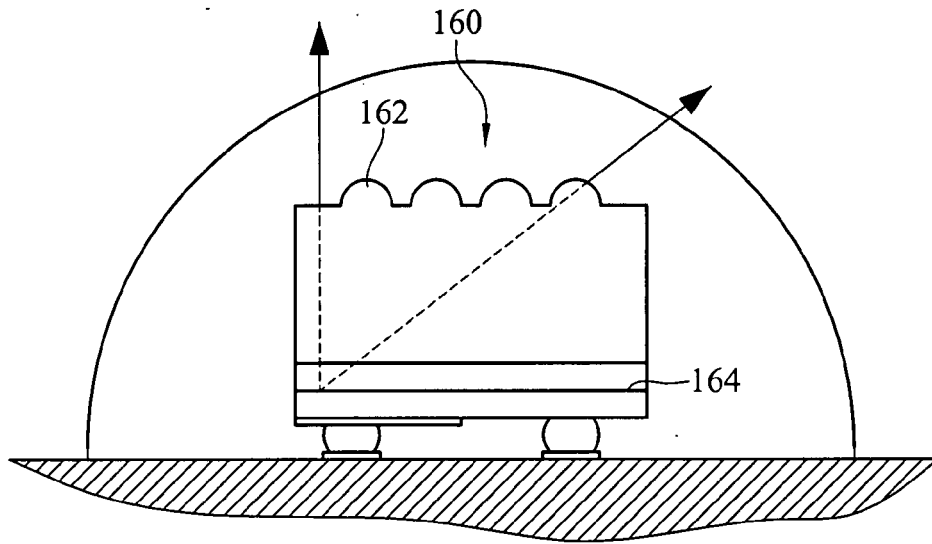


FIG. 4 (PRIOR ART)

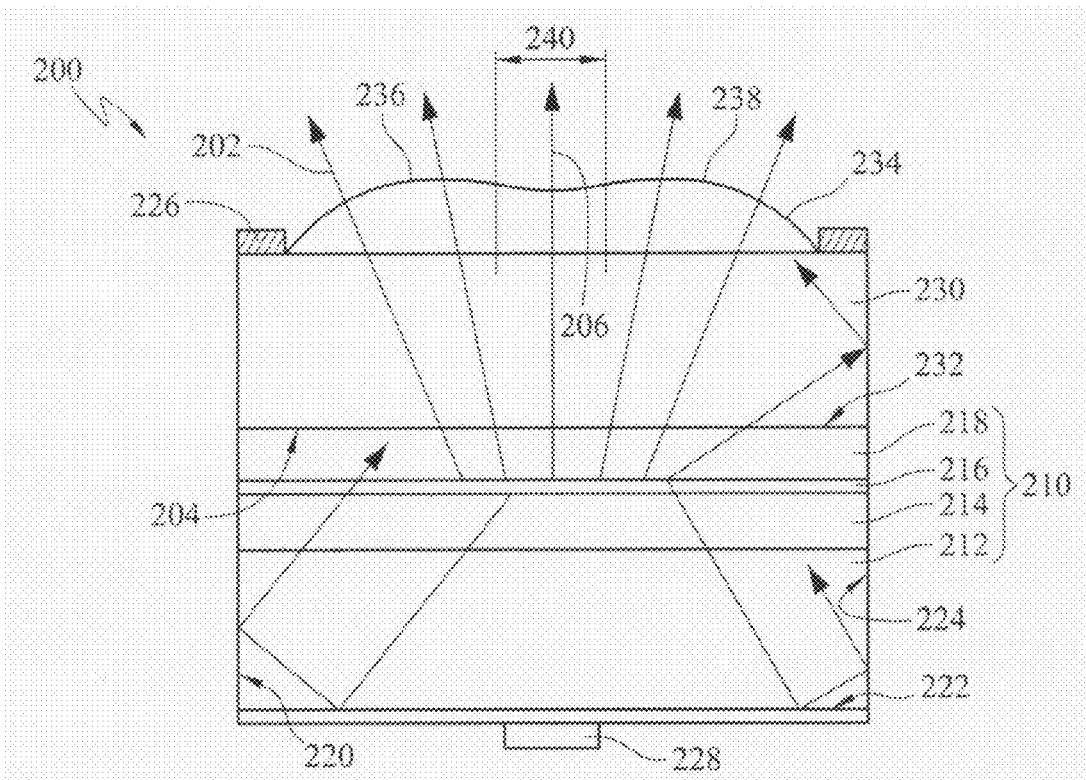


FIG.5

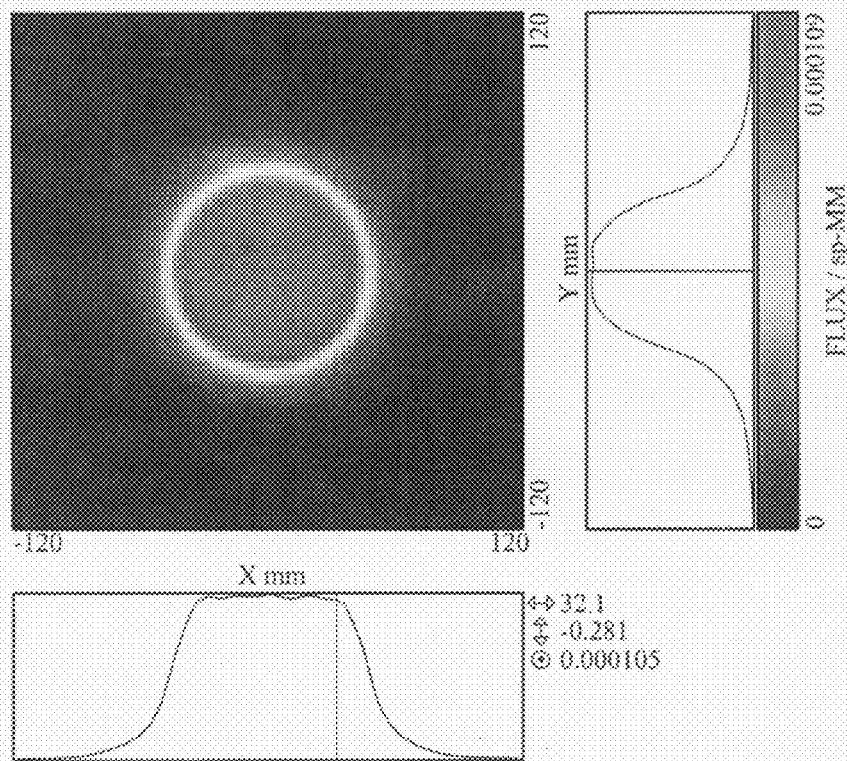


FIG.6

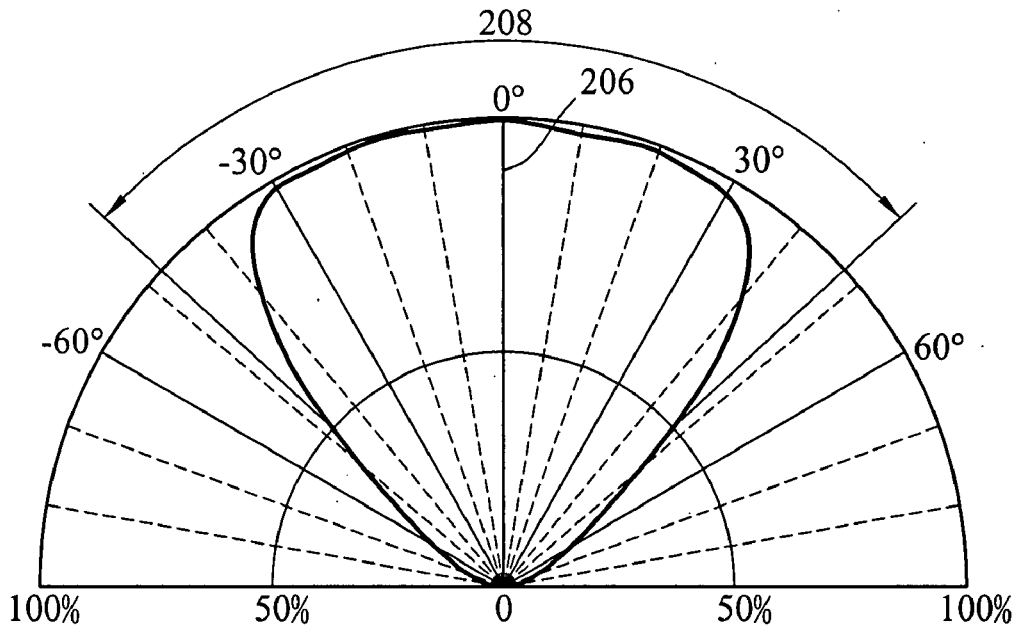


FIG. 7

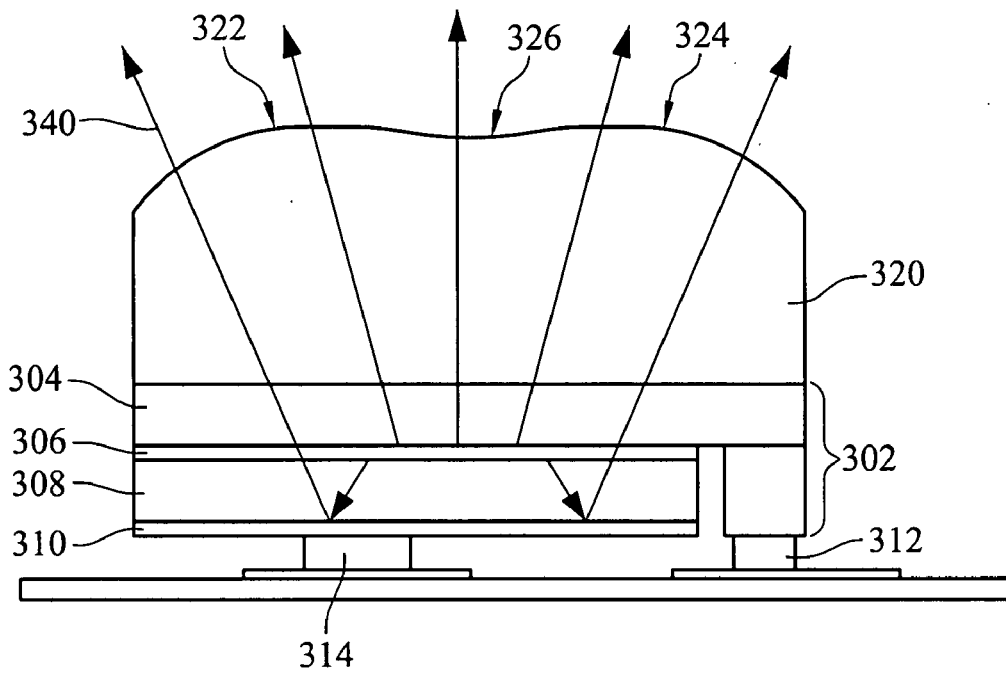


FIG. 8

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.