

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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NICHIA CORPORATION,

Petitioner,

v.

DOCUMENT SECURITY SYSTEMS, INC.,

Patent Owner.

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Case IPR2018-00966  
Patent 7,652,297

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**PATENT OWNER'S DEMONSTRATIVE EXHIBITS**



Nichia Corporation  
v.  
Document Security Systems, Inc.

IPR2018-00966 (USP 7,652,297)

Oral Hearing Date: July 30, 2019

*Before Hon. Sally C. Medley, Scott C. Moore, and Brent M. Dougal,  
Administrative Patent Judges*

## Summary of Asserted Grounds and Prior Art

Reference(s)	Basis	Challenged Claims
Loh '842 <sup>2</sup>	§ 102(e)	1–6
Loh '842	§ 103(a)	1–6 and 9
Loh '842 and Fujiwara <sup>3</sup>	§ 103(a)	7, 8, and 10–17
Loh '842 and Uraya <sup>4</sup>	§ 103(a)	7, 8, and 10–17
Loh '819 <sup>5</sup>	§ 102(e)	1–6
Loh '819	§ 103(a)	1–6 and 9
Loh '819 and Andrews <sup>6</sup>	§ 103(a)	1–6 and 9
Loh '819 and Fujiwara	§ 103(a)	7, 8, and 10–17
Loh '819, Fujiwara, and Andrews	§ 103(a)	7, 8, and 10–17
Loh '819 and Uraya	§ 103(a)	7, 8, and 10–17
Loh '819, Uraya, and Andrews	§ 103(a)	7, 8, and 10–17

<sup>2</sup> U.S. Patent No. 7,939,842 B2, filed Aug. 27, 2007, issued May 10, 2011 (Ex. 1004, “Loh '842”).

<sup>3</sup> U.S. Patent No. 6,680,568 B2, issued Jan. 20, 2004 (Ex. 1005, “Fujiwara”).

<sup>4</sup> Japanese Patent Application No. 2005-174998, published June 30, 2005 (Ex. 1011, “Uraya”).

<sup>5</sup> U.S. Patent No. 7,960,819 B2, filed July 13, 2006, issued June 14, 2011 (Ex. 1006, “Loh '819”).

<sup>6</sup> U.S. Patent Application Publication No. 2005/0218421 A1, filed Jan. 27,

# Overview of Oral Hearing Issues

Issue	Pet. Ground(s)	DI Ground(s)	Claim(s)
Did Petitioner Demonstrate a Reflector “Extending From” a Substrate in Loh ’842 or a Reflector Forming A Cavity “In Conjunction With” The Substrate as Recited In Independent Claims 1, 10, And 15?	1-4	1-4	1-17
Did Petitioner Establish Loh ’819 as Satisfying “A Reflector Extending From Said Substrate” as Recited in Independent Claims 1, 10, And 15	5-8	5-11	1-17
Did Petitioner Satisfy the Requirements of Claims 3, 4, 13, and 14?	1, 2, and 5, 6	1, 2, and 5-7	3, 4, 13, and 14
Did Petitioner Satisfy the Requirements of Claims 6, 9, 15-17?	1-8	1-11	7, 8, 10, 17
Did Petitioner Satisfy the Requirements of Claims 9 and 15?	2-4, 6-8	2-4, 6-11	9, 15
Did Petitioner Show Loh ’842 Has a Light Emitter Electrically Connected to the Substrate as Recited in Claim 5?	1, 2	1, 2	5
Did Petitioner Show That Loh ’819 in View of	5-6	5-7	5

# U.S. Patent No. 7,652,297 B2

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

(10) **Patent No.:** US 7,652,297 B2  
(45) **Date of Patent:** Jan. 26, 2010

(54) **LIGHT EMITTING DEVICE**

(75) **Inventors:** **Lee Kee Hon**, Penang (MY); **Tan Kheng Leng**, Fort Collins, CO (US); **Lee Chiau Jin**, Fort Collins, CO (US); **Ng Keat Chuan**, Fort Collins, CO (US); **Oon Slang Ling**, Fort Collins, CO (US); **Ong Klam Soon**, Fort Collins, CO (US)

(73) **Assignee:** **Avago Technologies ECBU IP (Singapore) Pte. Ltd.**, Singapore (SG)

(\* ) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 103 days.

(21) **Appl. No.:** 11/853,179

(22) **Filed:** Sep. 11, 2007

(65) **Prior Publication Data**  
US 2009/0065793 A1 Mar. 12, 2009

(51) **Int. Cl.**  
**H01L 27/15** (2006.01)

(52) **U.S. Cl.** ..... 257/81; 257/99; 257/100; 257/E33.056; 257/E25.032; 257/98

(58) **Field of Classification Search** ..... 257/98, 257/82, 91, 99, 100, 116, 117, 432-437, 257/749, E33.056-E33.059, E25.032  
See application file for complete search history.

(56) **References Cited**  
U.S. PATENT DOCUMENTS

2003/0020077 A1\* 1/2003 Horiuchi et al. .... 257/81  
2006/0278882 A1\* 12/2006 Leung et al. .... 257/98  
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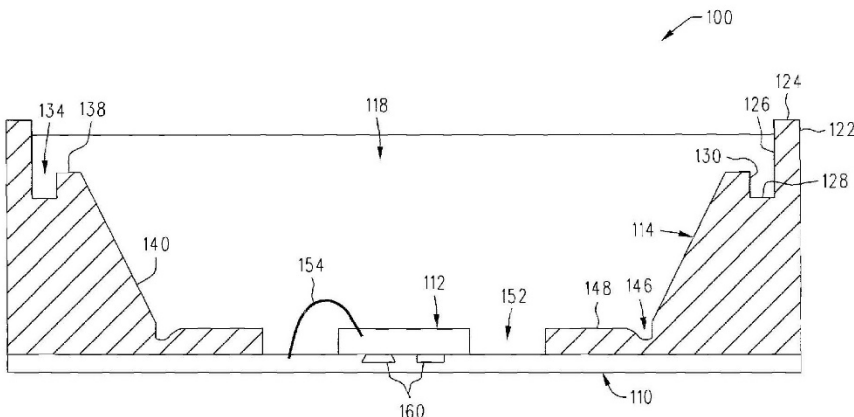
*Primary Examiner*—Fernando L Toledo  
*Assistant Examiner*—Mamadou Diallo

(57) **ABSTRACT**

A light emitting device is disclosed herein. An embodiment of the light emitting device comprises a substrate and a reflector extending from the substrate. The reflector forms a cavity in conjunction with the substrate. A light emitter is located in the cavity. At least one first recessed portion is located in the reflector, the at least one first recessed portion extends substantially axially around the reflector.

17 Claims, 2 Drawing Sheets

1. A light emitting device comprising:  
a substrate;  
a reflector extending from said substrate, said reflector forming a cavity in conjunction with said substrate;  
a light emitter located in said cavity; and  
at least one first notch located in said reflector, said notch extending substantially axially around said reflector, said at least one first notch being formed by a first wall and a second wall wherein said first wall and said second wall extend substantially perpendicular to said substrate.



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