

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NICHIA CORPORATION,

Petitioner,

v.

DOCUMENT SECURITY SYSTEMS, INC.,

Patent Owner.

CASE NO. IPR2018-00966

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

PETITIONER'S DEMONSTRATIVE EXHIBITS

SHEARMAN & STERLING

Nichia Corporation

v.

Document Security Systems, Inc.

IPR2018-00966 (U.S. Patent No. 7,652,29

ORAL ARGUMENT – JULY 30, 2019

SHEARMAN & STERLING

U.S. PATENT NO. 7,652,297



US007652297B2

(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** (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.

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

(*) **cited by examiner**
Primary Examiner—Fernando L Toledo
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(21) **Appl. No.:** **11/853,179** (57) **ABSTRACT**

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

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US 2009/0065793 A1 Mar. 12, 2009

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

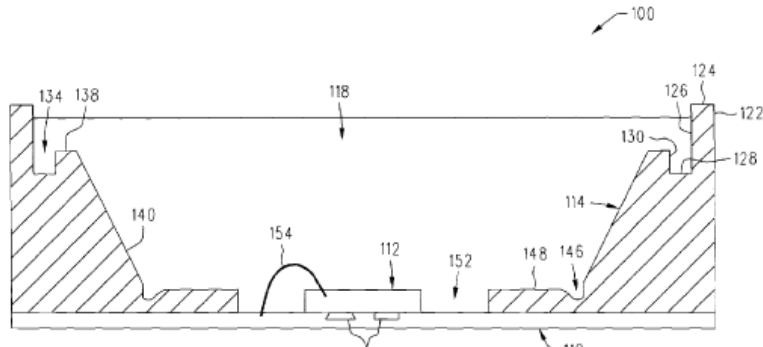
(52) **U.S. Cl.** **257/81; 257/99; 257/100; 257/E33.056; 257/E25.032; 257/98**

17 Claims, 2 Drawing Sheets

(10) **Patent No.:** **US 7,652,297 B2**
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LIGHT EMITTING DEVICE

Filed: Sep. 11, 2007



SHEARMAN & STERLING

CLAIMS 1-17 ARE UNPATENTABLE

Claims	Prior Art Grounds
1-6	<ul style="list-style-type: none">• Anticipated by Loh '842• Obvious over Loh '842• Anticipated by Loh '819• Obvious over Loh '819 alone, or alternatively, with Andrews, if not considered incorporated by reference
9	<ul style="list-style-type: none">• Obvious over Loh '842• Obvious over Loh '819 alone, or alternatively, with Andrews, if not considered incorporated by reference
7-8, 10-17*	<ul style="list-style-type: none">• Obvious over Loh '842 and Fujiwara or Uraya• Obvious over Loh '819 and Fujiwara or Uraya, or alternatively, with Andrews, if not considered incorporated by reference

*It is not disputed that claims 10-17 rise and fall with claims 1-9

CLAIMS 1-9

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 at least one first 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.

2. The light emitting device of claim 1 and further comprising an encapsulant located in said cavity, wherein said encapsulant is also located in said at least one first notch.

3. The light emitting device of claim 1, wherein said reflector has an upper portion and a lower portion, said lower portion being located proximate said substrate, said at least one first notch being located proximate said upper portion.

4. The light emitting device of claim 1, wherein said reflector has an upper portion and a lower portion, said lower portion being located proximate said substrate, said at least one first notch being located proximate said lower portion.

5. The light emitting device of claim 1, wherein said light emitter is electrically connected to said substrate.

6. The light emitting device of claim 1, wherein said reflector comprises a slanted portion that intersects said substrate, wherein said platform is located proximate said slanted portion, wherein said at least one notch is located at the intersection of said slanted portion and said platform.

7. The light emitting device of claim 1, wherein said substrate comprises at least one recessed portion and said light emitter is located on said at least one recessed portion.

8. The light emitting device of claim 7 and further comprising an adhesive located in said at least one recessed portion, said adhesive serving to bond said light emitter to said substrate.

9. The light emitting device of claim 1, wherein said reflector comprises:

a first wall extending substantially perpendicular to said substrate;

a first platform extending from said first wall;

a second wall extending from said first platform and said first wall, the space between said first wall and said second wall constituting one of said at least one notches;

a second platform extending from said second wall and located at the center of said light emitting device;

a slanted portion extending from said second wall and toward said substrate; and

a third platform located on said substrate and extending from said slanted portion;

wherein a second of said at least one notches is located at the intersection of said third platform and said first wall.

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