

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SATCO PRODUCTS, INC.,
Petitioner,

v.

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA,
Patent Owner.

IPR2020-00813
Patent 9,859,464 B2

Before JENNIFER S. BISK, CHRISTOPHER L. CRUMBLEY, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

BISK, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Satco Products, Inc., filed a Petition requesting an *inter partes* review of claims 1, 2, 8–12, and 18–20 (“the challenged claims”) of U.S. Patent No. 9,859,464 B2 (Ex. 1001, “the ’464 patent”). Paper 2 (“Pet”). The owner of the ’464 patent, The Regents of the University of California, filed a Preliminary Response. Paper 9 (“Prelim. Resp.”).

We instituted review on October 22, 2020. Paper 10 (“Institution Dec.”). Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 19 (“PO Resp.”)), Petitioner filed a Reply (Paper 27 (“Reply”)), and Patent Owner filed a Sur-Reply (Paper 28 (“Sur-Reply”)). A transcript of the oral hearing held on September 8, 2021, has been entered into the record as Paper 40 (“Tr.”).

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons that follow, Petitioner has demonstrated by a preponderance of the evidence that the challenged claims are unpatentable.

II. BACKGROUND

A. Related Matters

The parties identify several related district court cases, including *Satco Products, Inc. v. The Regents of the University of California*, 2:19-cv-06444, in the Eastern District of New York (“the Satco Litigation”). Pet. 1–2; Paper 3, 2–3. In the Satco Litigation, Petitioner filed a complaint seeking a declaratory judgment of non-infringement. Pet. 4. In addition, there are several other pending petitions for IPRs challenging patents related to the ’464 patent, including IPR2020-00579, IPR2020-00695, IPR2020-00780, IPR2021-00661, IPR2021-00662, and IPR2021-00794. Petitioner also identifies a related proceeding before the International Trade Commission

(ITC), *In the Matter of Certain Filament Light-Emitting Diodes and Products Containing Same (II)*, Inv. No. 337-TA-1172. Pet. 1.

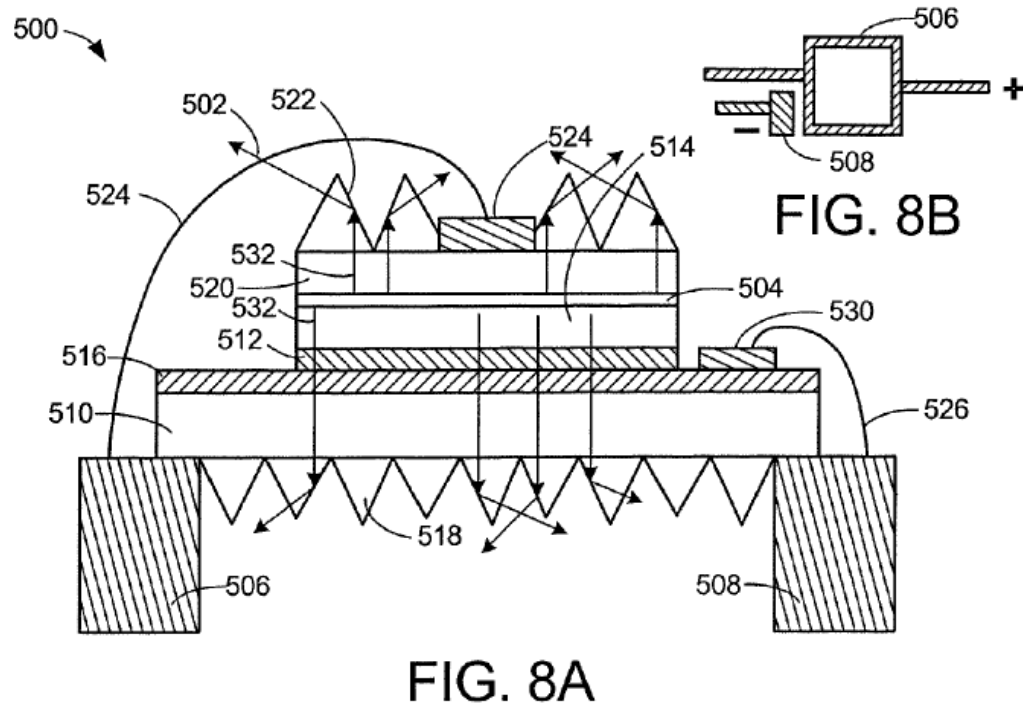
B. The '464 Patent

The '464 patent relates to “LED Light Extraction and white LED with high luminous efficacy for optoelectronic applications, and, more specifically, relates to a textured phosphor conversion layer LED.”

Ex. 1001, 5:20–23. In particular, the '464 patent discloses that “[i]n conventional white LEDs, the phosphor conversion layer is typically placed directly on top of the blue GaN chip.” *Id.* at 5:30–31. Because photons are converted to lower energy photons in that phosphor layer, a large fraction of them are internally reflected and reabsorbed by the chip. *Id.* at 5:35–39.

This is inefficient. *Id.* To increase efficiency of the LED, the '464 patent “minimizes the internal reflection of the phosphor layer by preferential patterning the emitting surface to direct more light away from the absorbing chip structure.” *Id.* at 5:58–61.

Figures 8A and 8B of the '464 patent are reproduced below.



Figures 8A and 8B of the '464 patent "illustrate the dual-sided roughened phosphor layer of the present invention." *Id.* at 7:37–39. LED chip 500 contains glass plate 510, which is coated with Indium Tin Oxide (ITO) layer 516, which, in turn, is attached to deposited ITO layer 512 using epoxy as a glue. *Id.* at 10:34–39. "LED chip 500 is put on a lead frame 506," and wire bonding 524 and 526 connect bonding pads 528 and 530 of LED chip 500 with lead frame 506 and electrode 508 "to allow an electric current to flow through the lead frame 506." *Id.* at 10:46–51. Lead frame 506 "acts as a support around the edges of LED chip 500." *Id.* at 10:52–56.

C. The Challenged Claims

Petitioner challenges claims 1, 2, 8–12, and 18–20 of the '464 patent. Claims 1 and 11 are independent. Claim 1 is reproduced below:

1. A light emitting device, comprising:
a lead frame including a transparent plate; and

an LED chip, attached to the lead frame, for emitting light;

wherein the LED chip resides on or above the transparent plate and at least some of the light emitted by the LED chip is transmitted through the transparent plate; and

wherein at least a portion of the light emitted by the LED chip is extracted from a front side of the lead frame and another portion of the light emitted by the LED chip is extracted from a back side of the lead frame.

Ex. 1001, 15:23–33.

Claim 11 is substantively similar to claim 1, but claims a method. To the extent our analysis herein focuses on claim 1, it should be understood to apply equally to claim 11.

Claims 2 and 8–10 depend from claim 1, and claims 12 and 18–20 depend from claim 11.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability:

Claims Challenged	35 U.S.C. § ¹	Basis
1, 9, 11, 19	102(b)	Okamoto ²

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), included revisions to 35 U.S.C. § 102 and § 103 that became effective on March 16, 2013. Because the ’464 patent issued from an application that was a continuation of an application filed before March 16, 2013, we apply the pre-AIA version of the statutory bases for unpatentability.

² Japan Patent App. Pub. No. 2000/277808A (published Oct. 6, 2000). Ex. 1008 (certified English translation).

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