

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.

IPR2021-00662
Patent 10,644,213 B1

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
Denying Petitioner's Motion to Exclude
Denying Patent Owner's Motion to Exclude
35 U.S.C. § 318(a)

I. INTRODUCTION

Satco Products, Inc., filed a Petition requesting an *inter partes* review of claims 1 and 2 (“the challenged claims”) of U.S. Patent No. 10,644,213 B1 (Ex. 1003, “the ’213 patent”). Paper 2 (“Pet.”). The owner of the ’213 patent, Regents of the University of California, filed a Preliminary Response. Paper 9 (“Prelim. Resp.”).

We instituted review on November 8, 2021. Paper 13 (“Inst. Dec.”). Subsequent to institution, Patent Owner filed a Request for Rehearing (Paper 17), which we denied (Paper 18). Patent Owner then filed a Patent Owner Response (Paper 28¹, “PO Resp.”), Petitioner filed a Reply (Paper 33, “Reply”), and Patent Owner filed a Sur-Reply (Paper 43, “Sur-Reply”). A transcript of the oral hearing held on September 16, 2022, has been entered into the record as Paper 49 (“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. Real Parties in Interest

Petitioner identifies itself as the real party in interest. Pet. 2. Patent Owner identifies itself as the real party in interest. Paper 4, 2. The parties do not raise any issue about real parties in interest.

¹ Patent Owner filed both confidential (Paper 27) and public, redacted (Paper 28) versions of the Patent Owner Response as well as certain exhibits, pursuant to the protective order entered by the Board (Paper 56). This Decision does not refer to any confidential information filed under seal.

B. Related Matters

The parties identify several related district court cases, including *Satco Products, Inc. v. The Regents of the University of California*, No. 2:19-cv-06444 in the Eastern District of New York (“the Satco Litigation”). Pet. 2–3; Paper 4, 2–3. Several other pending or terminated IPR proceedings challenge patents related to the ’213 patent, including IPR2020-00579, IPR2020-00695, IPR2020-00780, IPR2021-00661, and IPR2021-00794.

In addition, several of the patents related to the ’213 patent are involved in several investigations at the ITC. *Certain Filament Light-Emitting Diodes and Products Containing Same*, No. 337-TA-1172 (ITC) (“the 1172 Investigation”); *Certain Filament Light-Emitting Diodes and Products Containing Same (II)*, No. 337-TA-1220 (ITC) (“the 1220 Investigation”) (collectively “the ITC Investigations”). The ALJ in the 1220 Investigation has issued a Markman Order (Ex. 1038) and an Initial Determination (Ex. 2009).

C. The ’213 Patent

The ’213 patent, titled “Filament LED Light Bulb,” issued on May 5, 2020, from an application filed on September 11, 2019. Ex. 1003, codes (22), (45), (54). The patent identifies that application as the last in a series of continuation applications that started with application no. 11/954,154 (“the ’154 application”), filed on December 11, 2007. *Id.* at 1:7–42, code (63). Further, the patent claims priority to provisional application no. 60/869,447 (“the ’447 provisional”), filed on December 11, 2006. *Id.* at 1:43–46, code (60). The ’213 patent incorporates by reference several patent applications (*see id.* at 1:43–7:66), including provisional application

no. 60/869,454 (“the ’454 provisional”), filed on December 11, 2006. *Id.* at 7:16–23.

The ’213 patent explains that “[i]n conventional LEDs, in order to increase the light output power from the front side of the LED, the emitt[ed] light is reflected by the mirror on the backside of the sapphire substrate or the mirror coating on the lead frame.” Ex. 1003, 10:49–52; *see id.* at 8:16–21. But an LED’s emitting layer (active region) may reabsorb reflected light because the photon energy in the light “is almost [the] same as the band-gap energy” of the LED’s emitting layer. *Id.* at 10:55–57; *see id.* at 8:22–25. Reabsorption by the LED’s emitting layer decreases the LED’s “efficiency or output power.” *Id.* at 10:58–60; *see id.* at 8:25–28.

To address that deficiency, the ’213 patent discloses minimizing internal reflections within an LED by eliminating mirrors and/or mirrored surfaces, and minimizing reabsorption of light by the active region. Ex. 1003, 8:67–9:3. The patent explains that the invention concerns “a light emitting device comprised of a plurality of III-nitride layers” with “an active region that emits light, wherein all of the layers except for the active region are transparent for an emission wavelength of the light, such that the light is extracted effectively through all of the layers and in multiple directions through the layers.” *Id.* at 8:39–45, 11:35–42, code (57). The patent discloses a lead frame supporting a transparent plate and the III-nitride layers residing on the transparent plate, such that “the light emitted from the III-nitride layers is transmitted through the transparent plate in the lead frame.” *Id.* at 8:59–61. The patent also discloses several LED structures “according to the preferred embodiment of the present invention.” *See, e.g., id.* at 9:32–10:21, Figs. 4–22.

Figures 8A and 8B in the '213 patent (reproduced below) depict an LED structure “according to the preferred embodiment of the present invention”:

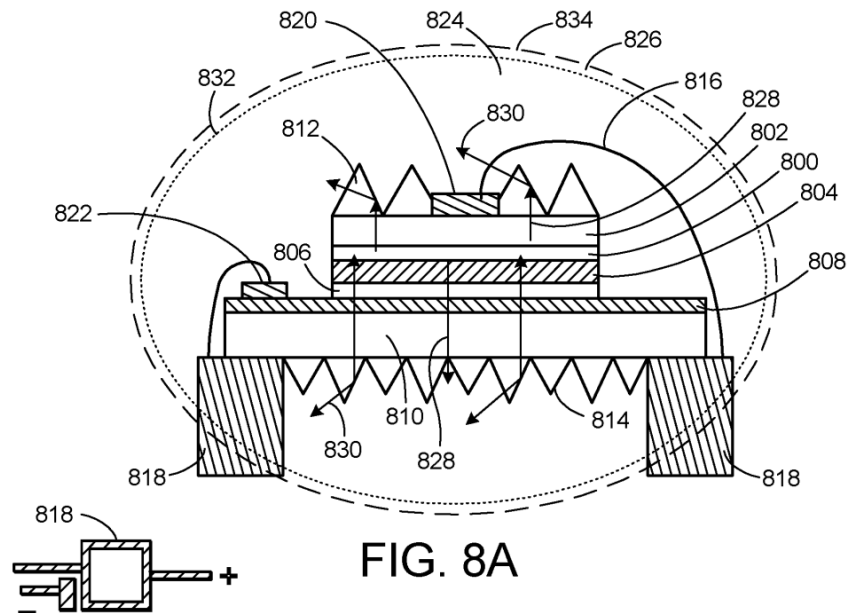


FIG. 8B

Figures 8A and 8B illustrate an LED including “an emitting layer 800, an n-type GaN [gallium nitride] layer 802, a p-type GaN layer 804, a first ITO [indium tin oxide] layer 806, a second ITO layer 808, and a glass layer 810.” Ex. 1003, 13:50–55, Figs. 8A–8B; *see id.* at 9:44–46. The LED “is wire bonded 816 to a lead frame or sub-mount 818 using the bonding pads 820, 822.” *Id.* at 13:59–61, Fig. 8A. Figure 8B shows a top view of “the lead frame 818.” *Id.* at 14:19–20, Fig. 8B.

“The n-type GaN layer 802 has a surface 812 that is roughened, textured, patterned or shaped (e.g., a cone shape surface), and the glass layer 810 has a surface 814 that is roughened, textured, patterned or shaped (e.g., a cone shape surface).” Ex. 1003, 13:55–57, Fig. 8A. A roughened,

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