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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ANDREW J. OUDERKIRK,
CATHERINE A. LEATHERDALE,
and ARLIE R. CONNOR

Appeal 2015-003846
Application 11/973,481
Technology Center 2800

Before TERRY J. OWENS, WESLEY B. DERRICK, and
DEBRA L. DENNETT, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1–5, 19 and 20. We have jurisdiction under 35 U.S.C. § 6(b).

The Invention

The Appellants claim a light source. Claim 1 is illustrative:

1. A light source, comprising:
an LED die having side surfaces and a primary emitting surface disposed between the side surfaces;
a patterned low index layer in optical contact with a first portion of the primary emitting surface, the patterned low index layer having a first refractive index; and

> an optical element having an input surface in optical contact with a second portion of the primary emitting surface, the optical element having a second refractive index higher than the first refractive index.

The References

Lee	US 6,717,362 B1	Apr. 6, 2004
Zou	US 7,740,375 B2	June 22, 2010
	(§ 371 (c)(1), (2), (4) date: Sep. 14, 2006)	

The Rejections

The claims stand rejected as follows: claims 1, 2 and 19 under 35 U.S.C. § 103 over Zou in view of Lee and claims 3–5 and 20 under 35 U.S.C. § 102(e) over Zou.

OPINION

We reverse the rejections.

Rejection under 35 U.S.C. § 102(e)

"Anticipation requires that every limitation of the claim in issue be disclosed, either expressly or under principles of inherency, in a single prior art reference." *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1255–56 (Fed. Cir. 1989).

We need address only the independent claims (3 and 20). Claim 3 requires 1) an LED die having a primary emitting surface between side surfaces, 2) means, in optical contact with a first portion of the primary emitting surface, for totally internally reflecting at least some of the light generated by the LED die back into the LED die, and 3) an optical element having an input surface in optical contact with a second portion of the

primary emitting surface different from the first portion.[1] Claim 20 requires 1) an LED die having a primary emitting surface, 2) a patterned low index layer in optical contact with at least a portion of the primary emitting surface exclusive of at least one aperture, and 3) an optical element having an input surface in optical contact with at least a portion of the primary emitting surface including at least a portion of the at least one aperture, wherein at least a portion of the patterned low index layer is between the primary emitting surface and the optical element.

Zou discloses an illumination device (200) comprising 1) an LED incoherent solid state light source (210) having a light emission surface (212), 2) a light guide (220) having a) a light receiving surface (222) which receives light from the light emission surface (212), and b) a light extraction area (224), and 3) a light extraction device (230) optically coupled to the light guide (220) via its light extraction area (224) (col. 3, ll. 39–53; Fig. 2). "Beneficially, the light guide **220** is fabricated of a low-loss, solid, transparent material with a refractive index N>1. Optionally, the light guide **220** may be hollow" (col. 3, ll. 63–66). "On exterior surfaces of the light guide **220** where total internal reflection (TIR) is not supported, a highly reflective material **229** is provided. The highly reflective material **229** may be Spectralon, Teflon, or another suitable material" (col. 3, l. 66 – col. 4, l. 3; Fig. 2). "Significantly, the surface area S_1 of the light extraction area **224** of the light guide **220** is substantially smaller than the

[1] The Appellants'' Specification indicates that the reflecting means is a layer having an index of refraction substantially lower than the refractive indexes of the LED die and the optical element (Spec. 5:17–19; 6:1–6; 6:29 – 7:4).

total surface area S_0 of the light emission surface(s) **212** of the incoherent solid state light source(s) **210**" (col. 4, ll. 12–15).

> The illumination device **200** operates as follows. Light emitted by the incoherent solid state light source **210**, at the light emission surface(s) **212**, enters the light guide **220** at one or more corresponding light receiving surface(s) **222**. Some of the light will initially be coupled out of the light guide **220** through the light extraction area **224** and emerge as a collimated light beam at the light extraction device **230**. The remainder of the light emitted by the incoherent solid state light source **210** will be confined within the light guide **220** by TIR and by the highly reflective material **229** provided on surfaces of the light guide **220** that do not support TIR. The light will bounce around within the light guide **220** until it is finally coupled out of the light guide **220** through the light extraction area **224** and emerges as a collimated beam at the light extraction device **230**. Hence, light exiting through light extraction device **230** includes contributions from the light from the total area of the light emission surface(s) **212** of the incoherent solid state light source **210**. [col. 4, ll. 16–33]

Regarding claim 3 the Examiner relies upon Zou's light emission surface (212) as corresponding to the Appellants' primary emitting surface and Zou's highly reflective material (229) as corresponding to the Appellants' reflecting means (Non-final Act. 2).[2] The Examiner asserts that "[o]ptical contact is not accorded a special definition in the specification. Optical contact as generally used in the art refers to multiple objects that are separated within the visible range of frequencies/wavelength such that interference of light is not observable" (Ans. 4).

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[2] "Non-final Act." herein refers to the non-final action mailed March 13, 2014.

"'[D]uring examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification.'" *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1256 (Fed. Cir. 2007) (quoting *In re Hyatt*, 211 F.3d 1367, 1372 (Fed. Cir. 2000)). The Appellants' Specification states that "'optical contact' refers to the surfaces or media being spaced close enough together, including but not limited to being in direct physical contact, that the refractive index properties of the low index layer or transparent element, for example, control or substantially influence total internal reflection of at least some light propagating within the LED die" (Spec. 5:13–17). The Examiner does not establish that even if Zou's light guide (220) is part the structure corresponding to the Appellants' LED die, Zou's highly reflective material (229), which is on the external surface of the light guide (220) (col. 3, l. 66 – col. 4, l. 1) and, therefore, reflects light from a surface external to the light guide (220), controls or substantially influences total internal reflection of at least some light propagating within the LED die as required by the Appellants' meaning of "optical contact."

With respect to claim 20 the Examiner relies upon Zou's light extraction device (230) as corresponding to the Appellants' optical element, Zou's light guide (220) as corresponding to the Appellants' patterned low index layer, and Zou's entrance aperture (122; Fig. 1) as corresponding to the Appellants' aperture, and asserts that according to the meaning given to "optical contact" by the Examiner (Ans. 4), 1) the light extraction device (230) is in optical contact with the light emission surface (212), and 2) the light guide (220) is in optical contact with at least a portion of the light emission surface (212) exclusive of the entrance aperture (122).

The Examiner does not establish that the broadest reasonable interpretation of the Appellants' claim term "patterned low index layer" consistent with the Appellants' Specification includes Zou's light guide (220). Nor does the Examiner establish that Zou's light extraction device (230), which is spaced from the light emission surface (212) (Fig. 2), is in optical contact with the light emission surface (212) according to the broadest reasonable interpretation of "optical contact" consistent with the meaning of that term indicated by the Appellants' Specification. Also, even if Zou's disclosure of an entrance aperture (122) covering a light emission surface (112) in embodiment 1 (col. 2, ll. 52–53) is considered to be a disclosure of an entrance aperture covering the light emission surface (212) in embodiment 2, the entrance aperture covers the entire light emission surface (212) such that no portion of the light emission surface (212) exclusive of the entrance aperture exists. Thus, if even Zou's light guide (220) is considered to be a patterned low index layer in optical contact with the light emission surface (212), there is no portion of the light emission surface (212) exclusive of the entrance aperture which could be optically coupled with the light guide (220).

Thus, the Examiner has not established a prima facie case of anticipation of the light sources claimed in the Appellants' claims 3–5 and 20.

Rejection under 35 U.S.C. § 103

We need address only the independent claims (1 and 19). Claim 1 requires a patterned low index layer in optical contact with a first portion of a primary emitting surface, and an optical element having an input surface in optical contact with a second portion of the primary emitting surface.

Claim 19 requires 1) an LED die having a primary emitting surface between side surfaces, 2) a patterned low index layer in optical contact with side surfaces of a first portion of the primary emitting surface, thereby defining at least one aperture at the primary emitting surface, and 3) an optical element having an input surface in optical contact with the at least one aperture.

Regarding claim 1 the Examiner relies upon Zou's light guide (220) as corresponding to the Appellants' patterned low index layer, Zou's light emission surface (212) as corresponding to the Appellants' primary emitting surface, and Zou's light extraction device (230) as corresponding to the Appellants' optical element (Non-final Act. 4–5). The Examiner asserts that Zou's light extraction device (230) has an input surface (224) in optical contact with a portion of the light emission surface (212) (*id.*).

The Examiner does not establish that Zou's light extraction device (230), which is separated from the light emission surface (212), is in optical contact with the light emission surface (212) according to the broadest reasonable interpretation of "optical contact" consistent with the meaning of that term indicated by the Appellants' Specification.

As for claim 19 the Examiner relies upon Zou's entrance aperture (122) as corresponding to the Appellants' aperture (Non-final Act. 5–6). The Examiner asserts that Zou's light extraction device (230) has an input surface (light extraction aperture 224) in optical contact with the entrance aperture (*id.*).

The Examiner does not establish that even if Zou's disclosure of an entrance aperture (122) covering a light emission surface (112) in embodiment 1 (col. 2, ll. 52–53) would have led one of ordinary skill in the art to cover the light emission surface (212) in embodiment 2 with an

entrance aperture, the light extraction device (230)'s light extraction aperture (224), which is separated from the light emission surface (212) (Fig. 2), would be in optical contact with the light emission surface (212) according to the broadest reasonable interpretation of "optical contact" consistent with the meaning of that term indicated by the Appellants' Specification.

The Examiner, therefore, has not established a prima facie case of obviousness of the light sources claimed in the Appellants' claims 1, 2 and 19.

DECISION/ORDER

The rejections of claims 1, 2 and 19 under 35 U.S.C. § 103 over Zou in view of Lee and claims 3–5 and 20 under 35 U.S.C. § 102(e) over Zou are reversed.

It is ordered that the Examiner's decision is reversed.

REVERSED