

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CURRENT LIGHTING SOLUTIONS, LLC, and HLI SOLUTIONS, INC.,
Petitioner,

v.

ALSI HOLDINGS, LLC,
Patent Owner.

IPR2023-00198
Patent 8,721,114 B2

Before HUBERT C. LORIN, GRACE KARAFFA OBERMANN, and
DONNA M. PRAISS, *Administrative Patent Judges*.

LORIN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

Current Lighting Solutions, LLC and HLI Solutions, Inc. (collectively “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–19 of U.S. Patent No. 8,721,114 B2 (Ex. 1001, “the ’114 patent”). ALSI Holdings, LLC (“Patent Owner”) filed a Preliminary Response (Paper 7, “Prelim. Resp.”). Petitioner also filed a Preliminary Reply (Paper 9, “Prelim. Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 10, “Prelim. Sur-reply”).¹

We have jurisdiction under 35 U.S.C. § 6.

Upon consideration of the arguments and evidence presented by Petitioner, we are persuaded that Petitioner has demonstrated, under 35 U.S.C. § 314(a), a reasonable likelihood that it would prevail in showing the unpatentability of at least one challenged claim.

For the reasons stated below, we institute *inter partes* review as to challenged claims 1–19 of the ’114 patent.

B. Related Proceedings

Petitioner indicates, and Patent Owner agrees, that the ’114 patent is being asserted in *ALSI Holdings, LLC v. Current Lighting Solutions, LLC, d/b/a GE Current, a Daintree Company, and HLI Solutions, Inc., f/k/a Hubbell Lighting, Inc., both d/b/a Hubbell Control Solutions and/or*

¹ The Board authorized the filing of these papers. *See* Ex. 1057. The Board also authorized Petitioner to file a *Sotera* stipulation. *Id.* at 16:24–25; Ex. 1056.

Current, Case No. 6:21-cv-01187-ADA, (W.D. Tex. 2021) (“District Court Action”). Pet. vii; Paper 4, 1.

Petitioner indicates that related U.S. Patent Nos. 9,699,854; 8,186,855; 8,322,881; and 9,049,753; as well as U.S. Design Patent Nos. D650,508 and D612,088 are also being asserted in the District Court Action. Pet. vii. Petitioner also indicates that it has “filed petitions regarding U.S. Patent Nos. 9,699,854 and 8,322,881.” *Id.*

C. The '114 patent (Ex. 1001)

1. Disclosure

The '114 patent, titled “LED Lamp Apparatus and Method of Making an LED Lamp Apparatus,” relates to “a light emitting diode (LED) or other solid state light emitter light device.” Ex. 1001, code (54), 1:17–18.

The '114 patent explains that lighting devices that use incandescent and halogen bulbs suffer from various problems including being energy inefficient, having short lifetimes, producing unwanted heat, and having problematic housing designs that causes electrical shorts, or other problems. Ex. 1001, 1:20–51.

According to the '114 patent, although LEDs are known in general, “LEDs have not been considered an option in the past for providing quality light in many applications because they do not provide enough useful light at a distance.” Ex. 1001, 1:57–61. Accordingly, the '114 patent considers that “there is a need in the art for methods and [] apparatuses that can be used with LEDs or other solid state emitters to provide quality light from a distance.” *Id.* at 1:63–65.

To that end, the '114 patent discloses “an ‘LED device’ that directs enough light from a plurality of LEDs to a distant area in a form that provides an acceptable amount of light.” Ex. 1001, 2:9–11. This is depicted in Fig. 1 of the '114 patent, reproduced below.

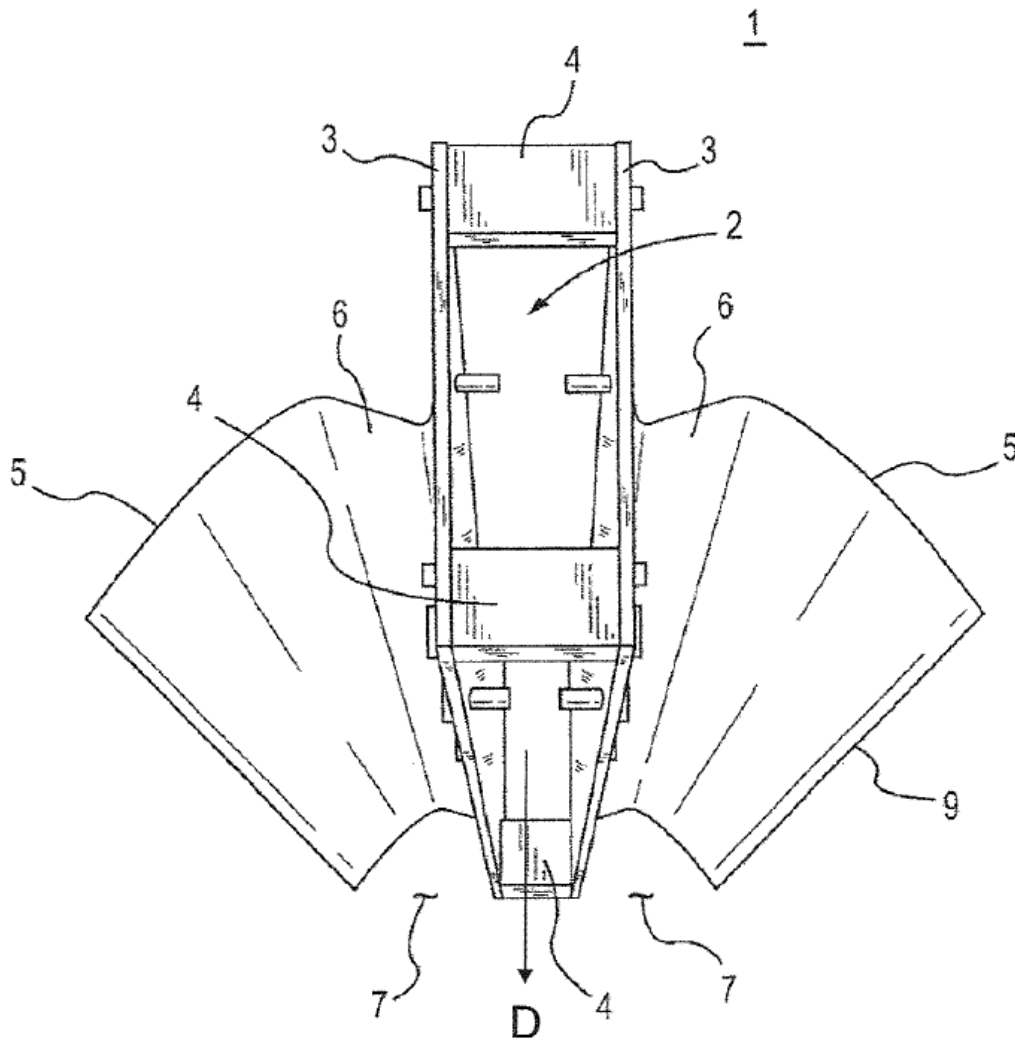


FIG.1

Fig. 1 of the '114 patent (Ex. 1001) shows lighting device 1 having rolled reflector 5.

Lighting device 1 depicted in Fig. 1 comprises “central chimney portion 2 formed by two chimney side plates 3” that are “connected together via at least two spacers 4.” Ex. 1001, 3:35–37. “A plurality of LEDs 8 are mounted through each chimney side plate 3,” as depicted in Fig. 5, reproduced below.

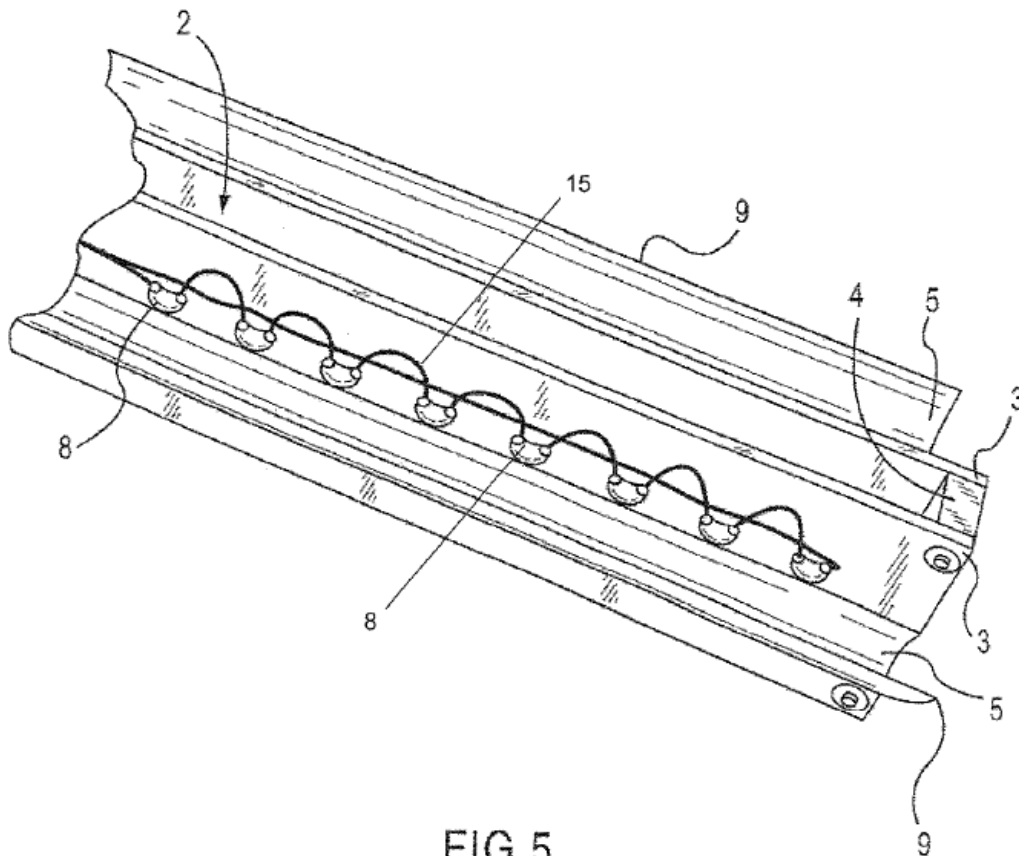


Fig. 5 depicts the lighting device of Fig. 1 from a different view. Ex. 1001, 3:33–34.

LEDs 8 include a light emitting portion that “faces a reflector 5, such that the direction of maximum intensity light emitted by the LEDs is substantially anti-parallel with the [illumination] direction, D.” *Id.* at

3:37–38, 3:43–48. Each reflector 5 includes flat portion 6 adjacent to chimney side plate 3. *Id.* at 5:6–7. “Light from the LEDs is directed toward the bottom of the device by the reflector, so that light is directed toward the opening 7 between the bottom of the chimney side piece 3 and the far edge 9 of the reflector 5.” *Id.* at 4:18–22. According to the ’114 patent, variations of reflector 5 may be used, including embodiments where the reflector is rolled, as in Fig. 1, with the roll including a continuous curve. *Id.* at 4:32–35.

The ’114 patent explains that LED lifetime may be increased by reducing the amount of heat around the LEDs by using “a central chimney or heat sink that circulates air and removes heat from the area around the LEDs,” and which includes “a central open portion between the two chimney sides pieces of the unit.” Ex. 1001, 7:15–22. “In addition, each chimney side piece may include openings above each LED” that “increase air flow to and from the device as well as circulation around the LEDs.” *Id.* at 7:29–32. According to the ’114 patent, the device may be configured so that “the chimney is spaced away from a ceiling or wall, and both ends of the device are open,” which also “increase[s] the amount of air circulation and effectively lower[s] the temperature around the LEDs.” *Id.* at 7:33–37.

2. Claims 1–19

Petitioner challenges claims 1–19. Pet. 1.

Claim 1 is the sole independent claim and is reproduced below.

Consistent with the Petition, bracketing is added to assist in referring to the claim elements. Pet. 12–13.

1. [1.0] An illumination device for providing light in an illumination direction, the illumination device comprising:

[1.1] a central body having a surface facing the illumination direction and including a first heat dissipating mechanism for allowing heat to dissipate through a central portion of the central body;

[1.2] first and second groups of Light Emitting Diodes (LEDs) connected to the central body directly or via an attachment feature, the first and second group of LEDs being spaced apart from each other;

[1.3] a second heat dissipating mechanism including one or more openings formed in the central body or in the attachment feature;

[1.4] a first reflector extending from the central body adjacent to the first group of LEDs for directing light from the first group of LEDs in the illumination direction; and

[1.5] a second reflector extending from the central body adjacent to the second group of LEDs for directing light from the second group of LEDs in the illumination direction,

[1.6] wherein heat generated by the first and second groups of LEDs is dissipated through the central body via the first heat dissipating mechanism,

[1.7] wherein the one or more openings of the second heat dissipating mechanism provide fluid flow cooling of the first and second groups of LEDs, and

[1.8] wherein one of the first and second heat dissipating mechanisms allows heat to dissipate between the first and second reflectors.

Ex. 1001, 11:58–12:18.

D. Asserted References

Petitioner relies on the following references:

Name	Reference	Ex. No.
Burton	U.S. Patent Application Publication No. 2008/0002410 A1, published Jan. 3, 2008	1049
Schuknecht	U.S. Patent Application Publication No. 2006/0232984 A1, published Oct. 19, 2006	1041
Hsu	U.S. Patent Application Publication No. 2005/0116597 A1, published June 2, 2005	1024
Leong	U.S. Patent No. 6,853,151 B2, issued Feb. 8, 2005	1051
Hashimoto	U.S. Patent No. 7,959,330 B2, issued June 14, 2011	1052
Baek	U.S. Patent Application Publication No. 2007/0075325 A1, published Apr. 5, 2007	1053

Petitioner also relies on the Declaration of Dr. Jack Josefowicz, Ph.D. (Ex. 1003, “Josefowicz Decl.”) and the prosecution file for the ’114 patent (Ex. 1002) as support for the various contentions.

E. Asserted Grounds

Petitioner contends that claims 1–19 of the ’114 patent are unpatentable under the following grounds:

Ground	Claims Challenged	35 U.S.C. §	Reference(s)/Basis
I	1–17, 19	§ 103 ²	Burton, POSITA ³
II	1–14, 16, 18, 19	§ 103	Schuknecht, Hsu, Leong, POSITA
III	1, 3–12, 14, 17–19	§ 103	Hashimoto, Baek, POSITA

Pet. 1–2.

II. ANALYSIS

A. Discretionary Denial Under 35 U.S.C. § 314(a)

Patent Owner requested that we exercise our discretion to deny institution under § 314(a) due, *inter alia*, to the advanced state of the District Court Action. *See* Prelim. Resp. 48–54.

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Because the challenged claims of the ’114 patent have an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. § 103 throughout this Decision.

³ Person of ordinary skill in the art. Petitioner attributes certain knowledge to a POSITA by asserting that “a POSITA would understand” *See, e.g.*, Pet. 22.

However, if Petitioner has provided a *Sotera*⁴ stipulation, we will not discretionarily deny institution under § 314(a) in view of a District Court Action. *See* Director Memorandum, *Interim Procedure for Discretionary Denials in AIA-Post Grant Proceedings With Parallel District Court Litigation*, U.S. PATENT AND TRADEMARK OFFICE (June 21, 2022) (“Director Memo”), at 3, 7, 9. Petitioner argues:

the PTAB will not discretionarily deny institution of an IPR or PGR in view of parallel district court litigation where a petitioner stipulates not to pursue in a parallel district court proceeding the same grounds as in the petition or any grounds that could have reasonably been raised in the petition (*i.e.*, a “Sotera stipulation”).

In that regard, the Petition provided this stipulation:

Petitioner[] want to make clear they are consenting to a *full Sotera* stipulation and ***Petitioner will not pursue in the parallel district court litigation or other parallel proceedings the same grounds as raised in this Petition or any grounds that Petitioners could have reasonably raised before the PTAB.*** Petitioners agree to not pursue any of the grounds raised in this Petition, any grounds raised within Petitioners’ invalidity contentions, or any grounds Petitioners could have reasonably raised before the PTAB in the parallel district court litigation or any parallel proceeding.

Pet. 88.

In making its request, Patent Owner responded to Petitioner’s stipulation by arguing that the stipulation set forth in the Petition is not in full accordance with *Sotera*:

⁴ *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential, designated Dec. 17, 2020).

Unlike *Sotera*, the clear language of this stipulation does not include any conditions, particularly the condition of “if IPR is instituted”. . . . Furthermore, the clear language does state “any grounds raised within Petitioners’ invalidity contentions,” in reference to Petitioners’ final invalidity contentions filed in the district court litigation.

Prelim. Resp. 52.

The Board authorized Petitioner to make modifications to its stipulation to accord with the language of *Sotera*.⁵

Petitioner subsequently filed a modified *Sotera* stipulation, which now states, in part, that:

Defendants [i.e., Petitioner] hereby stipulate that, if the U.S. Patent and Trial Appeal Board (“PTAB”) institutes the pending *inter partes* reviews in IPR2023-00145, IPR2023-00198 and IPR2023-00125 (“the IPRs”), . . . Defendants agree to not pursue any grounds raised in the IPRs, any grounds raised within Defendants’ invalidity contentions that were raised or could have been raised in the IPRs, or any grounds Defendants could have reasonably raised before the PTAB, in this district court litigation or any parallel proceeding.

Ex. 1056, 1–2.

The modified *Sotera* stipulation accords with the language of *Sotera* and is thus a *Sotera* stipulation. Accordingly, we will not discretionarily deny institution of the IPR. Ex. 1056; *see* Director Memo.

Patent Owner raises a concern about the phrase “[d]efendants [i.e., Petitioner] hereby stipulate that, if the U.S. Patent and Trial Appeal Board (‘PTAB’) institutes the pending *inter partes* reviews in IPR2023-00145, IPR2023-00198 and IPR2023-00125.” Prelim. Sur-reply 4; Ex. 1056, 1.

⁵ *See supra* n.1; Ex. 1056.

Patent Owner interprets this to mean the modified stipulation is “condition[ed] on institution of all three of the following IPRs: ‘IPR2023-00145, IPR2023-00198, **and** IPR2023-00125.’ EX1056 (emphasis added).” *Id.*

We do not read it that way. The Petition clearly indicates that Petitioner intended to attach a “*full Sotera* stipulation” to this proceeding. Pet. 88 (emphasis original). The modified stipulation merely perfects the “*full Sotera* stipulation” Petitioner initially intended to provide with its Petition. We read said phrase simply as Petitioner’s way of expressing that the modified stipulation attaches to all three IPRs if any of the proceedings are instituted.

For the foregoing reasons, we determine that the circumstances of this case do not warrant discretionary denial of the Petition under 35 U.S.C. § 314(a).

B. Discretionary Denial Under 35 U.S.C. § 325(d)

Patent Owner requests that the Board exercise its discretion to deny institution is under § 325(d). Prelim. Resp. 54–57.

Section 325(d) provides that the Director may elect not to institute a proceeding if the challenge to the patent is based on matters previously presented to the Office. 35 U.S.C. § 325(d) states, in pertinent part, that “[i]n determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.”

The Board uses a two-part framework for evaluating arguments under § 325(d):

(1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and

(2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”). “[T]he *Becton, Dickinson* factors provide useful insight into how to apply the framework under 35 U.S.C. § 325(d).” *Id.* at 9 (footnote omitted). The non-exclusive *Becton, Dickinson* factors are:

(a) the similarities and material differences between the asserted art and the prior art involved during examination;

(b) the cumulative nature of the asserted art and the prior art evaluated during examination;

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

(d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;

(e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first

paragraph) (“*Becton, Dickinson*”). *Becton, Dickinson* factors (a), (b), and (d) relate to the first part of the *Advanced Bionics* framework (whether the same or substantially the same art or arguments previously were presented to the Office), and *Becton, Dickinson* factors (c), (e), and (f) relate to the second part of that framework (previous Office error). *Advanced Bionics*, Paper 6 at 9–11. Only if the same or substantially the same art or arguments were previously presented to the Office do we then consider whether the petitioner has demonstrated a material error by the Office. *Id.*

Under § 325(d), the art or arguments must have been previously presented to the Office during proceedings, such as examination of the underlying patent application, pertaining to the challenged patent. *Advanced Bionics*, Paper 6 at 7. Previously presented art includes art made of record by the Examiner, and art provided to the Office by an applicant, such as on an Information Disclosure Statement (“IDS”), in the prosecution history of the challenged patent. *Id.* at 7–8.

1. First step of the framework

Patent Owner contends that, “[a]s clearly shown here, substantially the same art and arguments were presented during examination, considered by the Examiner, and ultimately found not to render the claims unpatentable.” Prelim. Resp. 56 (emphasis added). Patent Owner provides one example:

during prosecution the Examiner relied on Kaszuba⁶ [Ex. 1009] as disclosing “a reflector 36 extending from the central body (see paragraph number 62, reflective panels 36 extend from central

⁶ U.S. Patent Application Publication No. 2007/0228289 A1, published Oct. 4, 2007; Application 11/686,897, filed Mar. 15, 2007. Ex. 1009.

body 32. . . .) adjacent to the (elongated light source or group of LEDs)”. EX1002, 173. In the same fashion, Petitioners rely on Burton in Ground 1 as disclosing reflectors. *See* Petition, 22 (“A POSITA would understand each support plate forming the central body includes a parabolic shaped first and second reflector (shaded red) adjacent a given LED array (first/second group of LEDs) for directing light in the illumination direction.”).

Id. at 55. Patent Owner adds that Petitioner “rel[ies] on Schuknecht in Ground 2 and Baek in Ground 3 as disclosing first and second reflectors in this same fashion.” *Id.* (citing Pet. 45, 74).

As a preliminary matter, the Examiner did not apply Burton, Schuknecht, and Baek and Patent Owner does not indicate, nor does there appear to be any indication in the record, that the Examiner considered these references. *See generally* Prelim. Resp. 54–57; Ex. 1002.

As far as Burton, Schuknecht, and Baek being cumulative of Kaszuba is concerned (i.e., *Becton, Dickinson* factor (b)), the record strongly suggests otherwise.

Burton, Schuknecht, and Baek are directed to devices for illuminating a space, similar to the ’114 patent. *Compare* Ex. 1001, 2:6–16, *with* Ex. 1049 ¶ 2 (“LED light unit”), Ex. 1041 ¶ 2 (“fluorescent lamp”), *and* Ex. 1053 ¶ 3 (“Light Emitting Diode (LED) package”).

Kaszuba on the other hand, and unlike the ’114 patent, is directed to “an ultraviolet (UV) cure chamber for curing a dielectric material disposed on a substrate and to methods of curing dielectric materials using UV.” Ex. 1009 ¶ 8.

The devices of Burton, Schuknecht, and Baek (and the ’114 patent) are constructed so as to solve very different problems than the problem

Kaszuba is concerned about (illumination versus curing). Under the circumstances, we are persuaded that this indicates a material difference between the asserted art (Burton, Schuknecht, and Baek) and the prior art that was involved during examination (Kaszuba), and supports a finding that the references are not cumulative to what was considered during prosecution.

Cf. Becton, Dickinson factors (a), (b).

Burton, Schuknecht, and Baek (and the '114 patent) are directed to illumination lamps using conventional illuminating bulbs, fluorescent in the case of Schuknecht and LEDs in the cases of Burton and Baek. Ex. 1041 ¶ 2; Ex. 1049 ¶ 2; Ex. 1053 ¶ 28. Such bulbs output light within the visible spectrum.

Kaszuba's device is not for illumination but to concentrate UV radiation in such a way that it improves curing a dielectric material disposed on a substrate. Ex. 1009 ¶¶ 9–19. The Examiner relied on Kaszuba as disclosing LEDs, pointing to one recitation of UV LEDs in Kaszuba. Ex. 1002, 172; Ex. 1009 ¶ 83 (“In general, embodiments of the invention contemplate any UV source such as mercury microwave arc lamps, pulsed xenon flash lamps or high-efficiency UV light emitting diode arrays.”) Kaszuba's LEDs bulbs output light within the UV spectrum.

While LEDs may be used in Kaszuba's device, which makes Kaszuba somewhat similar to the asserted art, especially Burton and Baek but also Schuknecht, there is a substantial structural difference between the UV LEDs Kaszuba uses for UV curing and conventional illumination LEDs Burton and Baek (and the '114 patent) use to light a space. In our view, this structural difference coupled with their very different objectives makes the

difference between the asserted art (Burton, Schuknecht, and Baek) and the prior art that was involved during examination (Kaszuba) a material one.

And then there is the matter of the claims.

In arguing that Petitioner presents the same arguments as presented by the Examiner, Patent Owner recognizes that the Examiner relied on Kaszuba as disclosing “a reflector” but Petitioner relies on Burton, Schuknecht, and Baek as disclosing “first and second reflectors.” Prelim. Resp. 55.

This is so because the claim the Examiner addressed only called for a single reflector. *Cf.* Ex. 1002, 156 (claim 35: “a reflector”), 172–173 (Final Action: Kaszuba “discloses . . . a reflector 36”). The Examiner did not address whether Kaszuba disclosed “first and second reflectors” because that limitation was added later to the claims, after which the claims were allowed without further examination. *Id.* at 183–187.

The “reflector” limitation before the Examiner read “a reflector extending from the central body adjacent to the group of LEDs for directing light from the group of LEDs in the illumination direction.” Ex. 1002, 156 (claim 35).

Contrast that with the patent claims, which call for:

a first reflector extending from the central body adjacent to the first group of LEDs for directing light from the first group of LEDs in the illumination direction; and

a second reflector extending from the central body adjacent to the second group of LEDs for directing light from the second group of LEDs in the illumination direction.

Ex. 1001, 12:4–9 (claim 1, limitations [1.4], [1.5]); *see also id.* at 12:16–18 (claim 1, limitation [1.8] (“one of the first and second heat dissipating

mechanisms allows heat to dissipate between the first and second reflectors’’)).

Petitioner’s arguments are new ones because no arguments during prosecution were presented for a first and second reflector. Therefore, there is no overlap between the arguments made during examination and the manner in which Petitioner relies on Burton, Schuknecht, and Baek. *Cf. Becton, Dickinson* factor (d).

Relying on materially-different references not before the Examiner, that is, Burton, Schuknecht, and Baek, Petitioner presents arguments addressing the now-claimed first and second reflector limitations that the Examiner did not examine. *See* Pet. 21–23 (Burton); 45–48 (Schuknecht); and, 73–75 (Baek).

For the reasons discussed related to *Becton, Dickinson* factors (a), (b), and (d), we find the art and arguments are not the same or substantially the same as was previously presented to the Office.

2. Second step of the framework

Because the same or substantially the same art or arguments were not previously presented to the Office, we do not consider whether Petitioner has demonstrated a material error by the Office. *See Advanced Bionics*, Paper 6 at 9–11.

3. Conclusion Regarding § 325(d)

Under the circumstances of this case, we determine that exercising discretion to deny the Petition under § 325(d) is unwarranted.

C. Principles of Law for Patentability

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, “would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective evidence of nonobviousness.⁷ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016), 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

⁷ Patent Owner does not present objective evidence of nonobviousness.

D. Level of Ordinary Skill in the Art

Petitioner contends:

A person of ordinary skill in the art of the '114 Patent (POSITA) would have at least a bachelor's degree in a relevant scientific field, e.g., physics, materials science or engineering, or electrical engineering, and two or more years of experience in lighting design with LED fixtures for lighting applications. This description is approximate and additional development experience could make up for less education and vice versa.

Pet. 2 (citing Ex. 1003 ¶¶ 37–40). Patent Owner states, “[f]or the purpose of this Preliminary Response, applying this level of skill is sufficient for the Board to evaluate the Petition Grounds.” Prelim. Resp. 11.

Petitioner’s proposed definition of a person of ordinary skill in the art appears reasonable, and we adopt that definition for our analysis in this decision.

That being said, we see no reason why the level of ordinary skill in the art is not adequately reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

E. Claim Construction

For petitions filed on or after November 13, 2018, “[claims] of a patent . . . shall be construed using the same claim construction standard that would be used to construe the [claims] in a civil action under 35 U.S.C. § 282(b), including construing the [claims] in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.”

37 C.F.R. § 42.100 (2019); *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005).

Petitioner proposes constructions for two claim limitations. Pet. 9–12.

1. Limitations [1.4] (“first reflector . . . adjacent to the first group of LEDs”) and [1.5] (“second reflector . . . adjacent to the second group of reflectors for directing light from the second group of LEDs”).

Petitioner proposes that the two reflector terms in [1.4] and [1.5] be construed as “first/second reflector... for directing light **only** from the first/second group of LEDs.” Pet. 11 (emphasis original).

Patent Owner responds, *inter alia*, that “[n]othing in the ’114 Patent’s specification or prosecution history suggests these terms should be given anything other than their plain and ordinary meaning.” Prelim. Resp. 11.

2. Limitation [1.1] (“a first heat dissipating mechanism for allowing heat to dissipate through a central portion of the central body”).

According to Petitioner, “[c]laim 1 uses the generic term ‘mechanism’ which Petitioner[] contends invokes a §112, ¶6 construction.” Pet. 11. If §112, ¶ 6 were to be invoked, Petitioner proposes construing “a first heat dissipating mechanism” as limited to the corresponding structure disclosed in the Specification; that is, “***a central chimney having a walled, open-ended channel defining the central portion of the central body***.” Pet. 12 (citing Ex. 1001, 7:19–21; Ex. 1055 ¶¶ 4–10; Ex. 1003 ¶ 88).

Patent Owner disputes the way Petitioner has framed the inquiry. “[T]he correct inquiry is whether the term ‘heat dissipating mechanism’ is subject to §112, ¶6,” not just the term “mechanism.” Prelim. Resp. 14. “Petitioners’ proposed term, plucked out of context from the surrounding claim language, has no application here.” *Id.*

At this stage of the proceeding, it is unnecessary for us to address Petitioner's proposed constructions for the two limitations in order to resolve any of the patentability disputes. Only those terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

F. Overview of the Prior Art References

1. Burton (Ex. 1049)

Burton is titled "Apparatus for Using Heat Pipes in Controlling Temperature of an LED Light Unit," and relates to "removing heat from an LED light unit." Ex. 1049, code (54), ¶ 2. Burton's Fig. 5 is reproduced below.

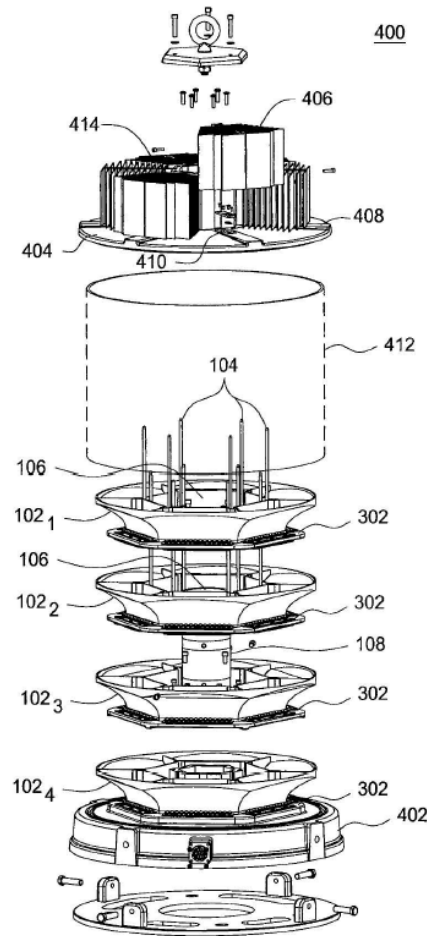


FIG. 5

Fig. 5 illustrates an exploded view of an exemplary LED light unit 400. Ex. 1049 ¶ 45.

LED light unit 400 includes a plurality of support plates with each support plate 102 having at least one array of LEDs 302 formed from a plurality of individual LEDs placed adjacently to one another generally in a line. *Id.* ¶ 32. Support plates 102 are constructed from a thermally conductive material such as copper or aluminum, are stacked vertically above one another, and are coupled to a center column 108. *Id.* ¶¶ 20, 24. Burton explains that air intake 202 at the bottom of center column 108 (*see*

Fig. 2) provides an air flow through inner opening 106 of center column 108 to create an “updraft” to help facilitate heat transfer. *Id.* ¶ 31. In addition, inner openings 106 allow heat pipes 104 to extend vertically up through each support plate 102 for sufficiently removing heat away from the LED arrays. *Id.* ¶ 22. In the depicted embodiment, lens cover 412 may be used to seal LED light unit 400 and a plate 404 supporting at least one heat sink 406. *Id.* ¶ 50. “[L]ens cover 412 may be constructed from a transparent material such as, for example, glass or plastic in order to allow the light generated by the LEDs to exit the unit.” *Id.*

2. *Schuknecht (Ex. 1041)*

Schuknecht is titled “Compact Fluorescent Lamp Fixture Ventilation Method and Apparatus.” Ex. 1049, code (54). Schuknecht’s Fig. 22 is exemplary and is reproduced below.

FIG. 22

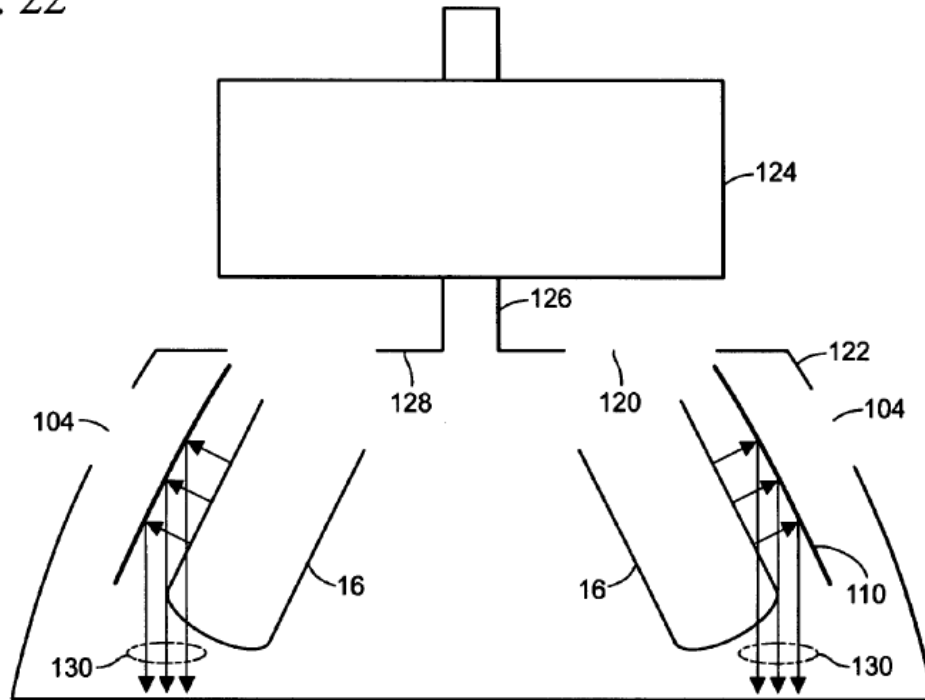


Fig. 22 is a representational line drawing simulating a sectioned view of a CFL fixture showing a reflected light path. Ex. 1049 ¶ 48.

Schuknecht's fixture includes a lamp chamber 122, also known as a reflector or dome, which surrounds a set of compact fluorescent lamps 16. Ex. 1049 ¶ 52. The fixture also includes vertical vents 104, outboard of reflective piece 110, which can be a ring of material as shown in Fig. 22, or individual reflective pieces. *Id.* ¶ 86. The light path, as shown by lines 130, is emitted from lamps 16 and reflected off reflective piece 110. *Id.* ¶ 87. "A portion of the reflected light is reflected downwardly as shown by the light path indicator lines." *Id.* Since reflective piece 110 is mounted inboard from the interior surface of the lamp chamber, it provides a channel for air flow to be directed out from the vents. *Id.* ¶ 86. In particular, there may be

an opening, such as large aperture 120, or small apertures, that will allow heated air to exit the top of the lamp chamber. *Id.* Lamp chamber 122 is mounted to housing 124 through stand-off 126, which provides a connection between housing 124 and lamp chamber 122. *Id.* Lamp chamber 122 also includes structural element, such as attachment plate 128, that is attached to housing 124 through a connection such as stand-off 126. “In this configuration the lamp chamber 122 has air flow management that is independent of any airflow management in the housing 124.” *Id.*

3. *Hsu (Ex. 1024)*

Hsu relates to a light bulb having a light reflecting plate and a light-emitting repository on a circuit board that achieves uniform distribution of the rays of light, to enhance brightness and uniformity. Ex. 1024, code (57).

Fig. 1 of Hsu, reproduced below, depicts light emitting device B. Ex. 1024 ¶ 18.

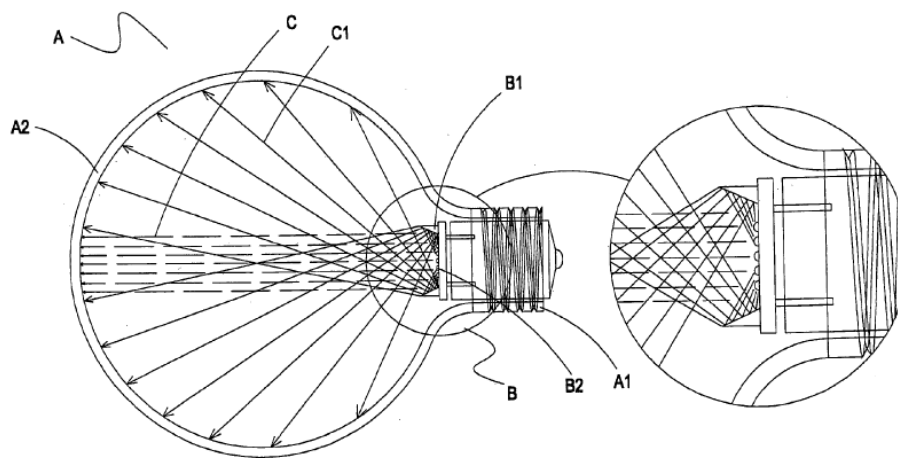


FIG. 4

Fig. 4 of Hsu (Ex. 1024) depicts a cross sectional schematic view of light emitting device B emitting rays of light.

In Fig. 4 of Hsu, light-emitting device B is within base A1 of light bulb A. Ex. 1024 ¶ 17. “Upon electricity being supplied to the lightbulb A, rays of light C emit from the light-emitting repository B2, and, after undergoing rectification of light path through deflection from the inclined surface of the light reflecting plate B1, the rays of light C uniformly project on to a bulb A2.” *Id.* Hsu explains, rays of light C emitting from lightbulb A provide excellent brightness and degree of uniformity. *Id.* In this embodiment, a plurality of light-emitting elements may be adapted to enhance brightness of illumination, to enable light-emitting repository B2 to achieve a uniform equivalent light source. *Id.* ¶ 18. Light-emitting repository B2 includes “a light-emitting diode, an incandescent diode, a small-scale light bulb, and other related light source elements applied in illumination components.” *Id.* ¶ 19.

4. *Leong (Ex. 1051)*

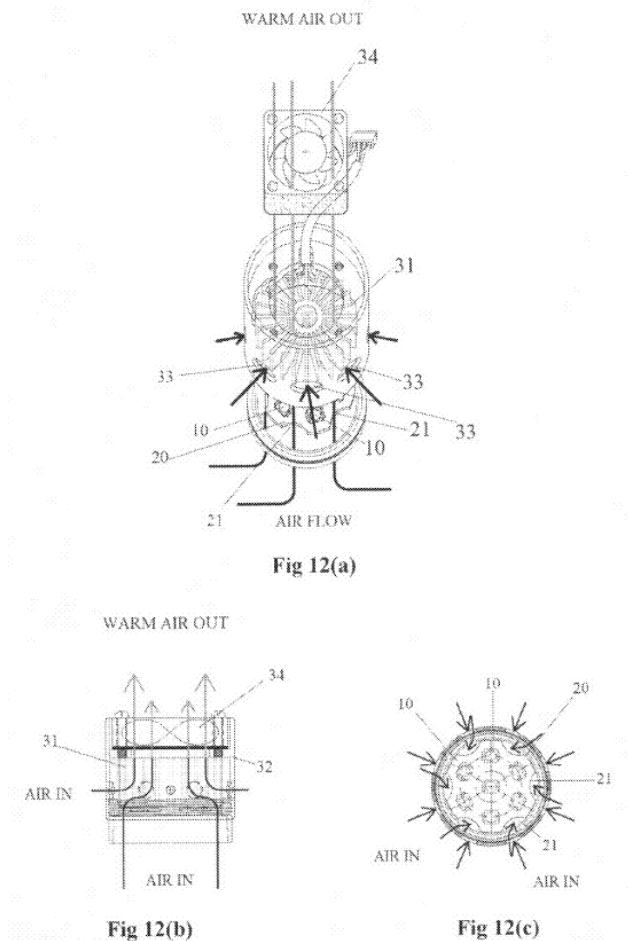
Leong relates to an “LED lamp for mounting to an existing fluorescent lamp fixture.” Ex. 1051, code (57). Leong notes that existing fluorescent lamps have various disadvantages, and discloses light emitting diode (LED) lamps that retrofit fluorescent lighting fixtures using existing ballasts address some of these disadvantages. *Id.* at 4:39–41. According to Leong, these “LED lamps can be used with magnetic, hybrid, and electronic instant and rapid start ballasts, and will plug directly into the present sockets thereby replacing the fluorescent lamps in existing lighting fixtures.” *Id.* at 4:42–45. In particular, the “LED retrofit lamps are adapted to be inserted into the housing of existing fluorescent lighting fixtures acting as a direct replacement light unit for the fluorescent lamps of the original equipment,” and because they have integral electronic circuitry, they “are able to replace

existing fluorescent lamps without any need to remove the installed ballasts or make modifications to the internal wiring of the already installed fluorescent lighting fixtures.” *Id.* at 3:45–54.

5. *Hashimoto (Ex. 1052)*

Hashimoto relates to a power LED (Light Emitting Diode) lighting assembly with a forced air cooling device. Ex. 1052, 1:5–7.

Hashimoto’s Figs. 12a, 12b, and 12c are reproduced below.



Hashimoto Figs. 12(a), 12(b) and 12(c) are a perspective view, a side view and a front view of the fan ventilation system that show air flows.

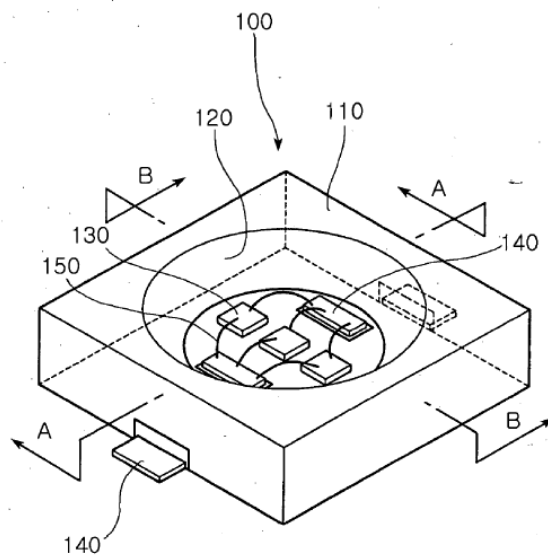
Fig. 12(a) shows individual components of a power LED lighting assembly including LEDs 10, LED PC board 20, and heat sink 31 with a plurality of heat radiating fins housed within heat sink enclosure 32.

Ex. 1052, 3:4–9. “The heat sink enclosure 32 is formed with a plurality of air openings 33 at its periphery for air communication between the surrounding atmosphere and the heat sink 31.” *Id.* at 3:9–12. “The heat sink 31 and the LED PC board 20 are accommodated between the heat sink enclosure 32 and the heat sink cover 30 so that the LED PC board is positioned in close proximity to the heat sink 31 for efficient heat release and cooling effects with help of the air openings 33 in the heat sink enclosure 32.” *Id.* at 3:12–17. A micro fan 34 is placed at a rear side of heat sink enclosure 32 “for forced air circulation and ventilation within the heat sink enclosure 32.” *Id.* at 3:17–20. Hashimoto explains that “micro fan 34, the heat sink 31 and the LED PC board 20 are accommodated within the heat sink enclosure 32 to complete a fan ventilation system (FVS) or forced air ventilation system for the power LED lighting assembly.” *Id.* at 3:60–63. As depicted by arrows in Figs. 12(a) to 12(c), “cool air is drawn from the surrounding atmosphere through the air openings 21 in the LED PC board 20 to travel around the power LEDs 10 on the LED PC board 20 while cooling down the power LEDs.” *Id.* at 4:1–4. By this configuration, “heat generated from the power LEDs 10 is transferred through the heat sink 31 having an extended cross-sectional area for efficient heat release,” and heated “air is dispelled outside to the surrounding atmosphere through the forced air ventilation action of the micro fan 34.” *Id.* at 4:5–9. Thus, the “FVS system of the power LED lighting assembly employs not only the micro fan 34 but also the air openings 21 in the LED PC board 20 and the air

openings 33 in the heat sink enclosure 32 to maximize forced air ventilation.” *Id.* at 4:9–13.

6. *Baek (Ex. 1053)*

Baek “relates to a high power LED package having excellent light efficiency and heat dissipating characteristics.” Ex. 1053, code (57). Fig. 1 of Baek is reproduced below.



Prior art

FIG. 1

Fig. 1 depicts “a conventional high power LED package.” Ex. 1053 ¶ 22.

As shown in Fig. 1, “a sloped annular reflector 120 is formed in a lead frame 110, and a plurality of LED chips 130 are mounted inside the reflector 120, electrically connected to leads 140 of the lead frame 110 via wires 150 (i.e., wire bonding).” Ex. 1053 ¶ 23.

G. Ground I: Burton in view of general knowledge/skill of a POSITA

1. Prior Art Status

In the Preliminary Response, Patent Owner states:

Petitioners have the burden of proof to establish that a reference that serves as the basis of a ground of unpatentability asserted in an *inter partes* review qualifies as prior art.

Prelim. Resp. 22 (citing 37 C.F.R. § 42.20(c)). Patent Owner contends that “Petitioners have not met this burden. . . . Petitioners have not established that Burton is prior art under 35 U.S.C. § 102(e).” *Id.* at 23.

Petitioner disagrees.

First, Petitioner points out that it “identified Burton as prior art under 35 U.S.C. § 102” in the Petition. Prelim. Reply 1 (citing Pet. 2).

Next, Petitioner points out that the ’114 patent claims priority to two provisional applications, the earliest of which has an October 1, 2007 filing date. Prelim. Reply 1. According to Petitioner, “Patent Owner has identified October 1, 2007 as the earliest priority date for the challenged claims.” *Id.* (citing Ex. 1035, E1). Petitioner states that it does not contest this. *Id.* (citing Ex. 1003 ¶ 37). Petitioner contends that:

Since Petitioners are not disputing the October 1, 2007 priority date in this proceeding, they were relying on Burton’s June 28, 2007 filing date to qualify the reference as prior art under 35 U.S.C. § 102. Burton is therefore § 102(e) prior art as it is “an application for patent [11/770,538], published under section 122(b) [US 2008/0002410 A1], by another [Thomas R. Burton] filed in the United States [June 28, 2007] before the invention [October 1, 2007] by the applicant for patent [James J. Wassel].” 35 U.S.C. § 102(e).

Id. at 1–2.

Finally, Petitioner states that “Petitioners’ Declarant expressly relied on Burton’s June 28, 2007 filing date to determine Burton was prior art under 35 U.S.C. § 102.” Prelim. Reply 2 (citing Ex. 1003 ¶ 90).

Patent Owner responds by reiterating that “Petitioners have the burden to establish that a reference that serves as the basis of a ground of unpatentability asserted in an *inter partes* review qualifies as prior art” and, here, “under 35 U.S.C. §103, or for any other use in this IPR.” Prelim. Sur-reply 2.

We agree with Patent Owner that Petitioner has the burden of proof to establish that the challenged claims are unpatentable. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”). And part of that burden of proof entails explaining why a reference qualifies as prior art so as to serve as a basis of an asserted ground of unpatentability. That being said, Petitioner identified Burton as prior art under 35 U.S.C. § 102 in the Petition (Pet. 2) and the record is sufficiently clear that Burton qualifies as prior art under 35 U.S.C. § 102(e). Importantly, Patent Owner identified October 1, 2007, as the earliest priority date for the challenged claims, which is not being contested. Based on that uncontested date, Burton would qualify as prior art under 35 U.S.C. § 102(e). *See* Ex. 1035, E1. Given this, and based on the current record, the Petition provides an adequate explanation as to why Burton qualifies as prior art so as to serve as a basis for Ground I.

Patent Owner further contends that Petitioner has also not met its burden of proof by insufficiently explaining the relevance of Burton. Prelim. Resp. 23. We consider that and other similar contentions about the

prior art references (*see id.* at 23–28) in our subsequent analyses of Grounds I–III.

2. Independent claim 1

Petitioner contends that Burton teaches or renders obvious in view of the knowledge of a POSITA all that is claimed. *See* Pet. 16–27.

We observe that Patent Owner has not responded to Petitioner’s challenge as to limitations [1.2], [1.3], and [1.6]–[1.8] with any particularity at this stage of the proceeding. *See generally* Prelim. Resp. 28–32. As to these limitations, we have reviewed the evidence Petitioner has presented, briefly discussed below, and based on our evaluation of that evidence, we determine that at this stage Petitioner sufficiently shows on this record that Burton teaches limitations [1.2], [1.3], and [1.6]–[1.8] as claimed. Our discussion below of limitations [1.0 pre], [1.1], [1.4], and [1.5] addresses Patent Owner’s specific arguments.

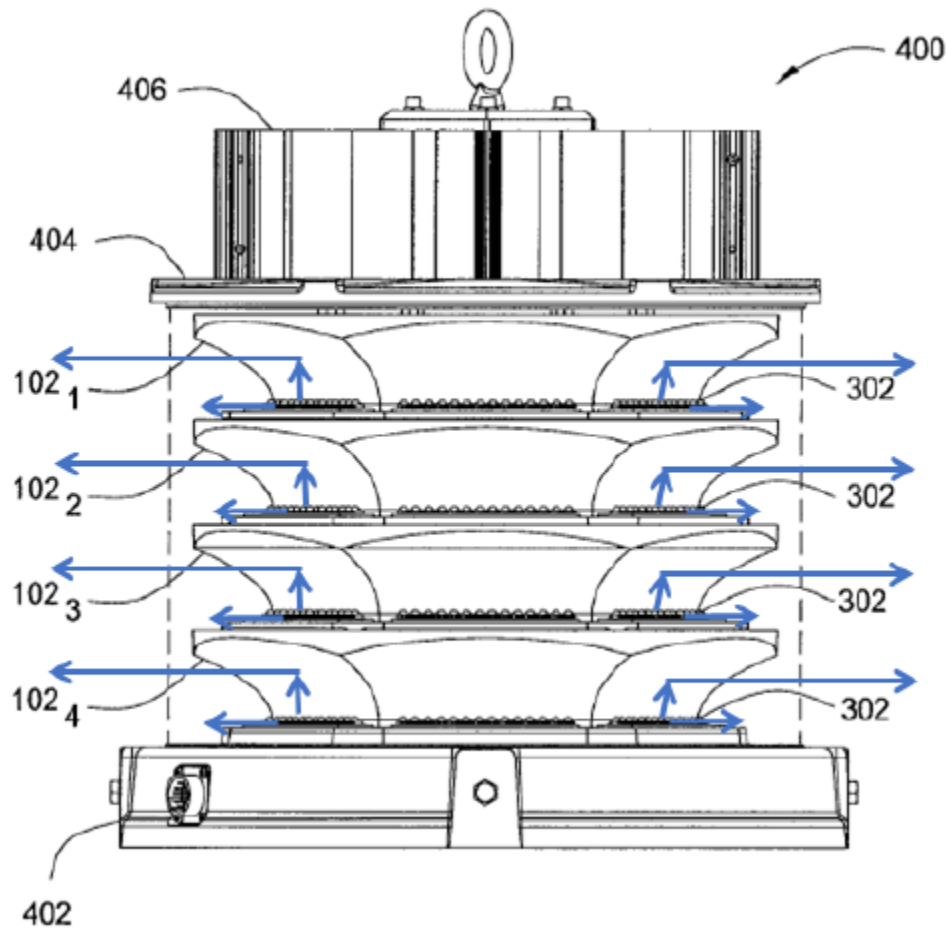
[1.0] An illumination device for providing light in an illumination direction, the illumination device comprising:

Petitioner contends that Burton teaches an illumination device for providing light in an illumination direction as the preamble requires.

Pet. 16.

Petitioner explains, *inter alia*, that Burton discloses an “LED light unit 400,” which Petitioner characterizes as an “illumination device.” Pet. 16 (citing Ex. 1049, ¶ 60.) According to Petitioner, Burton’s light unit is intended to be a beacon providing “light outward.” *Id.* (citing Ex. 1049 ¶ 20; Ex. 1003 ¶¶ 116–118). In support, Petitioner provides a first annotated

version of Burton's Fig. 8, reproduced below, showing "light outward" from Burton's LED unit (400) with blue arrows. *Id.* at 17;
Ex. 1049, Fig. 8.



Petitioner's first annotated version of Burton's Fig. 8 depicting a fully assembled LED light unit 400 with blue arrows to indicate "light outward." Pet. 17; Ex. 1049, Fig. 8.

According to Petitioner, in providing "light outward," Burton's light unit, i.e., "illumination device," "provid[es] light in an illumination direction" as the preamble requires. Pet. 17.

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches the preamble.

Patent Owner argues that “Burton’s light unit is not intended for illumination or as an illumination device.” Prelim. Resp. 28. Patent Owner acknowledges that Burton discloses “‘the use of LEDs for warning devices such as beacon lights,’ ‘LEDs can be used in strobing beacon applications,’ and ‘warning devices which produce a flash.’” *Id.* at 28–29 (quoting Ex. 1049 ¶ 3). But, Patent Owner argues, “[s]uch strobing or flashing beacons are not intended to illuminate or light an area located at a distance from the beacon.” *Id.* at 29. According to Patent Owner, “[s]ince Burton’s warning beacon cannot light an area located at a distance from the beacon, Burton’s ‘LED light unit’ cannot be an ‘illumination device for providing light in an illumination direction.’” *Id.*

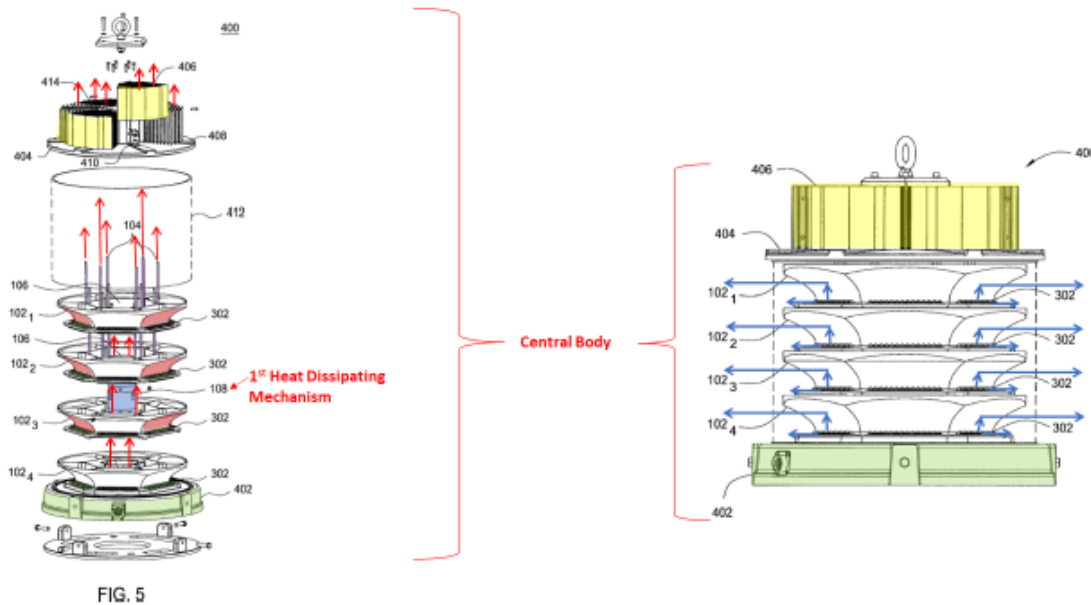
At this stage of the proceeding Patent Owner’s argument is unavailing on this record because the preamble contains no language precluding the “illumination device” from being a beacon or requiring the illuminating or lighting to be of an area located at a distance. The preamble calls only for an “illumination device” “providing light in an illumination direction.”

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches this.

[1.1] a central body having a surface facing the illumination direction and including a first heat dissipating mechanism for allowing heat to dissipate through a central portion of the central body;

Petitioner contends that Burton teaches a central body that includes a first heat dissipating mechanism for allowing heat to dissipate through a central portion of the central body. Pet. 17.

To show this, Petitioner provides an annotated version of Burton Figs. 5 and 8, reproduced below.



Petitioner’s annotated version of Burton Fig. 5 (on the left) showing an exploded view of LED light unit 400 and Burton Fig. 8 (on the right) depicting a fully assembled LED light unit 400 with blue arrows to indicate “light outward.” Shaded in green is “base 402” and shaded in yellow is “heat sink 406.” Pet. 17; Ex. 1049, Figs. 5, 8, ¶¶ 46, 50.

According to Petitioner, Burton depicts, *inter alia*, a “center column 108 ... constructed from a thermally conductive material such as, for example, copper, aluminum and the like.” Pet. 18 (citing Ex. 1049, ¶¶ 24, 49). This “center column,” according to Petitioner, “dissipates heat (represented by the red directional arrows) through a central portion of the central body. The ‘center column’ is a first heat dissipating mechanism.” Pet. 18 (emphasis omitted) (citing Ex. 1003 ¶¶ 120–122).

Patent Owner has not responded to Petitioner's challenge as to the "first heat dissipating" limitation of [1.1]. *See generally* Prelim. Resp. 28–32.

Regarding the "central body having a surface facing the illumination direction" limitation of [1.1], Petitioner contends that, as shown in its annotated version of Fig. 5 of Burton reproduced above, "the central body includes a 'base 402' (shaded green) or 'heat sink 406' (shaded yellow) which has a surface facing an illumination direction." Pet. 17 (citing Ex. 1003 ¶ 121).

Patent Owner disagrees, arguing, *inter alia*, that "'base 402' and 'heat sink 406' are not required by nor central to any portion of Burton's light unit." Prelim. Resp. 30. Because they "are not central to Burton's light unit and [they] cannot form part of a central body as recited in Claim 1." *Id.* at 31.

At this stage of the proceeding, Patent Owner's argument is unavailing.

If the central body is designated as that portion of Burton's lighting unit as depicted in Petitioner's annotated version of Burton Fig. 5 (reproduced above), then it would include "base 402" and "heat sink 406" which, as Petitioner depicts it, have surfaces in the illumination direction (the blue arrows).

To the extent Patent Owner is arguing that "base 402" and "heat sink 406" are not in a central location of the "central body," in the sense that these elements are not inside the "central body," this is not something the claim requires.

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches [1.1].

[1.2] first and second groups of Light Emitting Diodes (LEDs) connected to the central body directly or via an attachment feature, the first and second group of LEDs being spaced apart from each other;

Petitioner contends that Burton teaches [1.2] by disclosing “one or more ‘LED arrays 302’ assembled on an ‘LED board 304’ (attachment feature) which is then positioned on ‘each support plate’ (labeled 102₁₋₄) – i.e. central body.” Pet. 19; *see* Petitioner’s annotated version of Burton Fig. 5 reproduced above. “Multiple support plates are shown (i.e., 102₁, 102₂, 102₃, etc.) with each including additional ‘LED arrays’ [302].” *Id.* at 19–20 (citing Ex. 1049 ¶¶ 39–40). According to Petitioner, a given support plate may therefore include two separate “LED arrays.” Thus, “a first support plate (e.g., 102₄) may include a first ‘LED array’ – i.e., a first LED group – and a second support plate (e.g., 102₃) may each include a second LED array – a second LED group.” *Id.* at 20 (citing Ex. 1003 ¶¶ 124–126).

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches [1.2].

[1.3] a second heat dissipating mechanism including one or more openings formed in the central body or in the attachment feature;

Petitioner contends that Burton teaches a second heat dissipating mechanism as claimed via the combination of “support plate 102” and “heat pipe 104” of Burton’s central body. Pet. 20; *see also* Petitioner’s annotated version of Burton Fig. 5 reproduced above. Petitioner provides an annotated

version of Burton Fig. 3 showing the combination of these elements in more detail. *Id.* at 21.

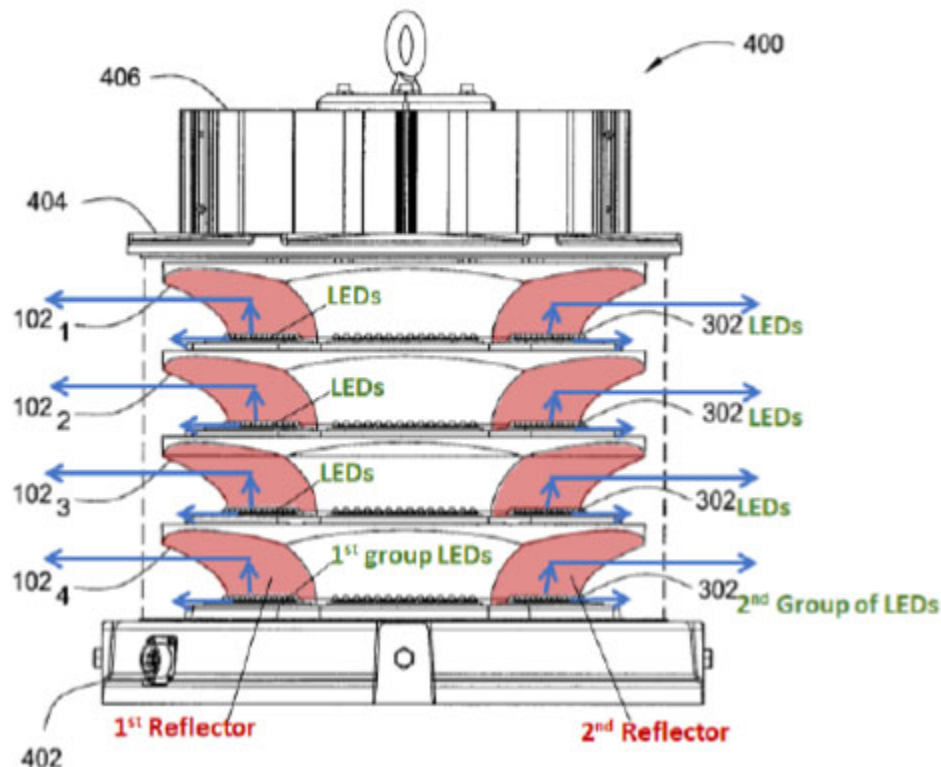
Petitioner explains that “support plate 102” has openings and is constructed from a thermally conductive material. Pet. 20 (citing Ex. 1049 ¶ 20). According to Petitioner, this can operate to dissipate heat generated by the LED arrays. *Id.* “Additionally, the ‘support plate 102’ includes a ‘heat pipe 104’ which also cooperates to dissipate heat away from the LEDs and out to the ambient environment.” *Id.* at 20–21 (citing Ex. 1049 ¶¶ 42–44). “The support plate in combination with the heat pipes, is *a second heat dissipating mechanism.*” *Id.* at 21 (emphasis original).

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches [1.3].

[1.4] a first reflector extending from the central body adjacent to the first group of LEDs in the illumination direction; and

[1.5] a second reflector extending from the central body adjacent to the second group of LEDs for directing light from the second group of LEDs in the illumination direction,

Petitioner contends that Burton teaches first and second reflectors as claimed. Pet. 21–23. In support, Petitioner provides a second annotated version of Burton Fig. 8 depicting said reflectors with red shading, reproduced below.



Petitioner’s second annotated version of Fig. 8 of Burton depicting a fully assembled LED light unit 400 with blue arrows to indicate “light outward” and first and second reflectors shaded in red. Pet. 22; Ex. 1049, Fig. 8.

According to Petitioner, a “POSITA would understand each support plate forming the central body includes a parabolic shaped first and second reflector (shaded red) adjacent a given LED array (first/second group of LEDs) for directing the light in the illumination direction (as represented by the directional arrow).” Pet. 22 (citing Ex. 1003 ¶¶ 131–133).

Patent Owner argues, *inter alia*, that “the words ‘reflect’, ‘reflector’ or ‘reflective’ do not appear anywhere in Burton.” Prelim. Resp. 32.

Patent Owner’s argument at this stage of the proceeding is unavailing on this record. Burton discloses that plates 102 may be constructed of “copper, aluminum and the like.” Ex. 1049 ¶ 20; Pet. 20. A POSITA would

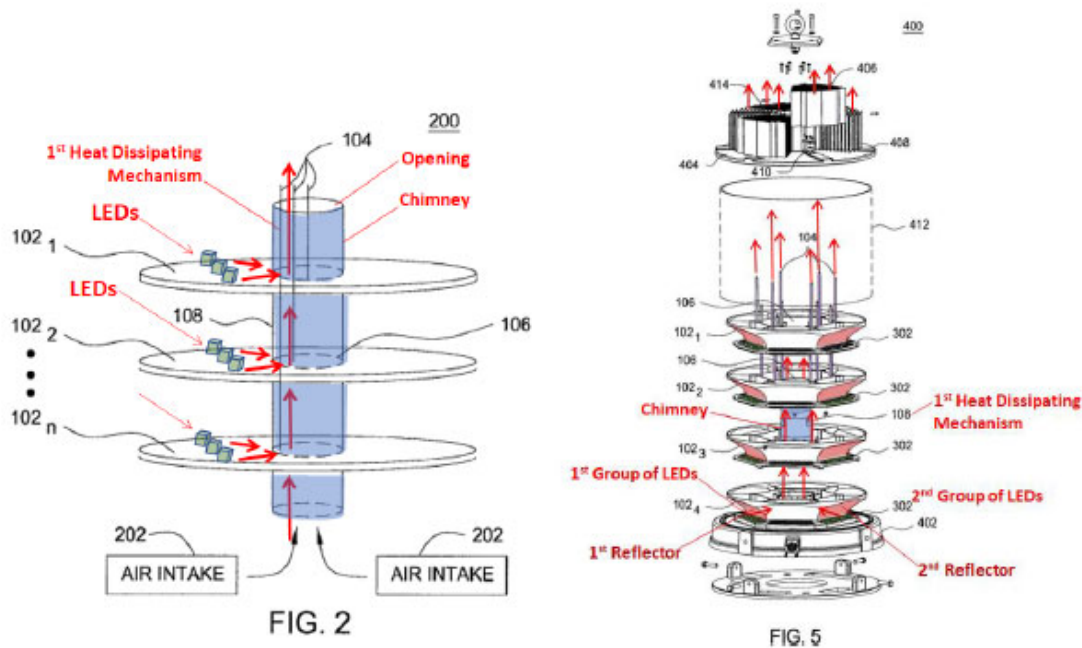
understand that plates made of such materials would reflect light. This would appear to meet what [1.4] and [1.5] call for; that is, reflectors for directing light in the illumination direction.

In our view, at this stage, Petitioner sufficiently shows on this record that Burton in combination with the knowledge of a POSITA teaches [1.4] and [1.5].

[1.6] wherein heat generated by the first and second groups of LEDs is dissipated through the central body via the first heat dissipating mechanism,

Petitioner contends that Burton teaches [1.6]. Pet. 23–24.

To demonstrate, Petitioner provides annotated versions of Burton Figs. 2 and 5, reproduced below.



Petitioner’s annotated version of Burton Fig. 2 (on the left) showing LED light unit 200 and “at least one air intake 202 to provide greater transfer of heat away from the heat pipes and, therefore, away from the LEDs” and Burton Fig. 5 (on the right) showing an exploded view of Burton’s LED light unit 400. Pet. 24; Ex. 1049, Figs. 2, 5, ¶¶ 32, 50.

According to Petitioner, the red arrows in its annotated version of Burton Fig. 2 reproduced above show heat “dissipated inward from LEDs arrays 302 from the ‘support plate 102’ and ‘heat tubes 104’ to the ‘center column 108’ – i.e., first heat dissipating mechanism.” Pet. 23. Petitioner explains that the heat generated by the groups of LEDs (302) that is dissipated through the center column 106 is transferred to a series of finned heat sink units (labeled “414”) for dissipation to the ambient environment. Pet. 23–24 (citing Ex. 1003 ¶ 136).

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches [1.6].

[1.7] wherein the one or more openings of the second heat dissipating mechanism provide fluid flow cooling of the first and second groups of LEDs, and

Petitioner contends that Burton teaches [1.7]. Pet. 24–26.

To support its contention, Petitioner provides an annotated version of Burton Fig. 3, reproduced below. Petitioner explains that the second heat dissipating mechanism (i.e., the combination of support plate 102 and heat pipe 104 of Burton’s central body) provides fluid flow cooling (as shown by the red directional arrows) of the first and second groups of LEDs (302) via openings 310 and 106 and heat pipes 104. Pet. 24 (citing Ex. 1003 ¶ 138).

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches [1.7].

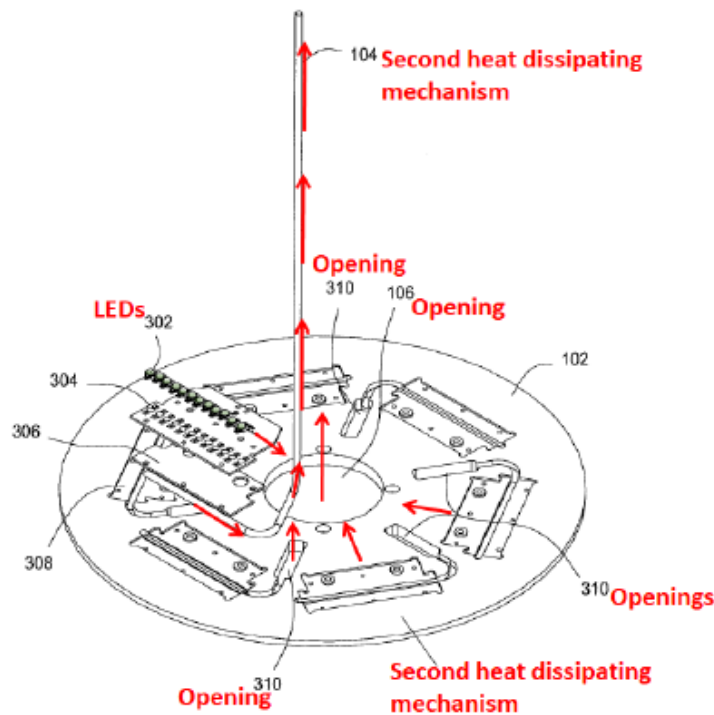


FIG. 3

Petitioner's annotated version of Burton Fig. 3 showing support plate 102 and heart pipe 104. Pet. 25; Ex. 1049, Fig. 3, ¶ 32.

[1.8] wherein one of the first and second heat dissipating mechanisms allows heat to dissipate between the first and second reflectors.

Petitioner contends that Burton teaches [1.8.] Pet. 26.

Relying on the annotated version of Burton Fig. 5, reproduced above, Petitioner explains that “[t]he heat generated by the first/second LEDs (red directional arrows) is dissipated by the ‘updraft’ of cooling air through the first mechanism (‘center column 108’) which is located between the first/second reflectors.” Pet. 26 (citing Ex.1049 ¶¶ 27–28). “[T]he second mechanism (‘support plate 102’ and ‘heat pipe 104’) likewise operate[s] to dissipate heat through the center column and [is] therefore also disposed between the first/second reflectors.” Pet. 26 (citing Ex. 1003 ¶¶ 140–141).

In our view, at this stage, Petitioner sufficiently shows on this record that Burton teaches [1.8].

3. Conclusion as to claim 1

On this record, Petitioner has demonstrated a reasonable likelihood of prevailing in demonstrating that claim 1 of the '114 patent is taught or rendered obvious over Burton and the knowledge of a POSITA.

4. Dependent claims 2–17 and 19

Petitioner argues that dependent claims 2–17 and 19 are also taught or rendered obvious over Burton and the knowledge of a POSITA. Pet. 27–35.

Along with our reasons discussed with respect to the challenge of claim 1, we are persuaded that the evidence relied upon by Petitioner sufficiently supports Petitioner's contentions regarding claims 2–17 and 19.

Patent Owner does not provide any specific arguments challenging Petitioner's patentability position as to these claims. *See* Prelim. Resp. 28–32.

At this stage, on this record, Petitioner has demonstrated a reasonable likelihood of prevailing in demonstrating that dependent claims 2–17 and 19 of the '114 patent are taught or rendered obvious over Burton and the knowledge of a POSITA.

H. Ground II: Schuknecht, Hsu, Leong, and the knowledge/skill of a POSITA

Petitioner challenges claims 1–14, 16, 18, and 19 as unpatentable under 35 U.S.C. § 103(a) over the combination of Schuknecht, Hsu, Leong, and a POSITA. Pet. 35–65.

At this stage of the proceeding, it is unnecessary for us to provide an assessment of claims 1–14, 16, and 19 under this ground because Petitioner has demonstrated a reasonable likelihood of success in demonstrating that at least one of the challenged claims 1–17, and 19 of the ’114 patent is unpatentable under Ground I. *See* 37 C.F.R. § 42.108(a).

However, this ground includes claim 18, which is not included in Ground I. Since claim 18 depends from claim 1, we will analyze Petitioner’s position as to claim 1 in order to determine whether Petitioner has demonstrated a reasonable likelihood of prevailing in demonstrating that dependent claim 18 is taught or rendered obvious over Schuknecht, Hsu, Leong, and the knowledge/skill of a POSITA.

1. Independent claim 1 and dependent claim 18

Petitioner’s basic position is that Schuknecht teaches the device of claim 1 but for LEDs, for which Hsu, Leong, and the knowledge of a POSITA are relied upon. Pet. 35–51.

Petitioner acknowledges that “Schuknecht’s light fixture is designed to receive and use ‘compact fluorescent bulbs’ or CFLs.” Pet. 38 (citing Ex. 1041 ¶ 2), emphasis added. This differs from the claimed illumination device which uses LEDs. *See* [1.2]. To fill the missing disclosure of LEDs, Petitioner relies on Hsu’s disclosure of LEDs (Pet. 40–41 (citing Ex. 1024 ¶¶ 18–19)), Leong’s disclosure of circuitry for mounting an LED lamp to a

fluorescent lamp fixture (*id.* at 39–40 (citing Ex. 1051, 4:51–54; Ex. 1003 ¶ 179)), and the knowledge of a POSITA of, for example, improved energy efficiency and longer life expectancy of LED lamps over fluorescent lamps (*id.* (citing Ex. 1003 ¶ 181)).

Petitioner argues, *inter alia*, that it would have been obvious to a POSITA to replace Schuknecht’s fluorescent light with an LED lamp bulb like that taught in Hsu “as this would provide a lighting source that is energy efficient, has a longer life expectancy, would have zero disposal costs, and be constructed using no hazardous chemicals.” Pet. 63–64 (citing Ex. 1003 ¶ 225).

To illustrate, Petitioner provides a figure, reproduced below, that combines annotated versions of Schuknecht Fig. 22 (top) showing a lamp chamber 122 housing fluorescent bulbs 16 (shaded in purple and light blue) and Hsu Fig. 5 (bottom, shown twice) showing two LED bulbs with red arrows extending from Hsu’s LED bulbs to Schuknecht’s fluorescent bulbs to indicate replacing Schuknecht’s fluorescent bulbs with Hsu’s LEDs. Ex. 1041, Fig. 22, ¶ 86; Ex. 1024, Fig. 5, ¶ 22.

Schuknecht's device with a reasonable expectation of success at arriving at the claimed device, Petitioner explains why a POSITA could have generally substituted fluorescent bulbs for LEDs.

Schuknecht is directed to an air flow management specifically designed for vent chambers containing high wattage lamps such as fluorescent lamps. *See* Ex. 1041 ¶¶ 2 (“The devices presented here are directed to a compact fluorescent lamp (‘CFL’) type lighting fixture that has improved cooling capability.”), 7 (The invention “is primarily, but not exclusively, directed at CFL fixtures where the sum of wattage of all of the lamps in the fixture exceeds 200 watts.”). We agree with Patent Owner that

Petitioners do not provide any argument that an optimal temperature of an LED bulb matches that of a CFL fixture. Nor do Petitioners provide any argument that an LED bulb, as disclosed by Hsu, might generate output in excess of 200 watts/fixture, as required by Schuknecht.

Prelim. Resp. 38 (citing Ex. 1041 ¶¶ 4–7). Petitioner does not address why a POSITA would have modified Schuknecht's vent chamber that is specifically designed for managing heat associated with using fluorescent bulbs to manage heat from LEDs, if any, with a reasonable expectation of success in arriving at the claimed illumination device.

For that reason, a reasonable likelihood of prevailing in demonstrating that claim 1 is unpatentable under 35 U.S.C. § 103(a) over the combination of Schuknecht, Hsu, Leong, and the knowledge of a POSITA on this record has not been demonstrated.

2. Conclusion

For the foregoing reasons, we determine that on this record Petitioner has not demonstrated a reasonable likelihood of prevailing in demonstrating

that claim 1 is unpatentable under 35 U.S.C. § 103(a) over the combination of Schuknecht, Hsu, Leong, and the knowledge of a POSITA.

Because claim 18 depends from claim 1 and Petitioner's discussion of claim 18 does not include reasoning for why a POSITA would replace or include LEDs in Schuknecht's lamp fixture specifically designed to vent high wattage fluorescent lamps and reasonably expect to successfully arrive at the claimed illumination device, we reach the same determination as to claim 18. Pet. 61–62.

I. Ground III: Hashimoto, Baek and the knowledge of a POSITA

Petitioner challenges claims 1, 3–12, 14, and 17–19 as unpatentable under 35 U.S.C. § 103(a) over the combination of Hashimoto, Baek, and the knowledge of a POSITA. Pet. 66–86.

At this stage of the proceeding, it is unnecessary for us to provide an assessment of claims 1, 3–12, 14, 17, and 19 under this ground because Petitioner has demonstrated a reasonable likelihood of success in demonstrating that at least one of the challenged claims 1–17, and 19 of the '114 patent is unpatentable under Ground I. *See* 37 C.F.R. § 42.108(a).

However, this ground includes claim 18 which is not included in Ground I. Since claim 18 depends from claim 1, we will analyze Petitioner's position as to claim 1 in order to determine whether Petitioner has demonstrated a reasonable likelihood of prevailing in demonstrating that dependent claim 18 is taught or rendered obvious over Hashimoto, Baek and the knowledge of a POSITA.

1. Independent claim 1 and dependent claim 18

Petitioner’s basic position is that Hashimoto teaches the device of claim 1 but for the “first and second groups of Light Emitting Diodes (LEDs) connected to the central body directly or via an attachment feature, the first and second group of LEDs being spaced apart from each other” [1.2], for which Baek and the knowledge of a POSITA are relied upon. Pet. 35–51.

Petitioner acknowledges that “Hashimoto discloses a plurality of ‘six power LEDs 10’ mounted to a ‘PC [Power Circuit] board 20.’” Pet. 68 (citing Ex. 1052, 2:62–64). This is depicted in Hashimoto Fig. 1, reproduced in the Petition and below. Ex. 1052, Fig. 1; Pet. 68.

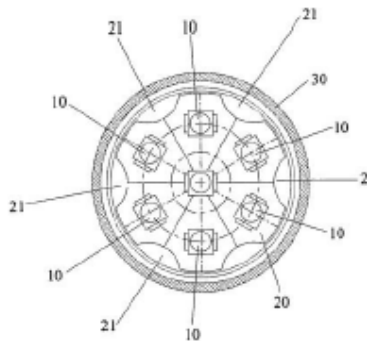
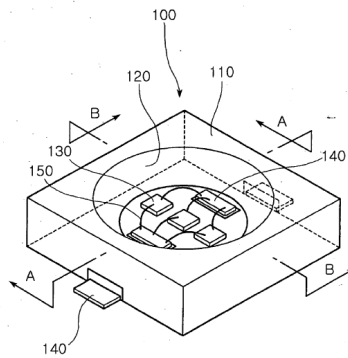


Fig 1

Hashimoto Fig. 1 showing six power LEDs mounted on an LED Power Circuit (PC) board.

As depicted in Hashimoto Fig. 1 reproduced above, Hashimoto’s six LEDs are spaced equidistant from each other. This differs from the claimed illumination device which requires two groups of LEDs spaced apart from each other.

To modify Hashimoto to satisfy the claim, Petitioner relies on Baek's disclosure; that is, "Baek describes a generic 'Prior Art' LED package that includes three 'LEDs 130' (a plurality of LEDs) located and surrounded by a conical 'reflector 120.'" Pet. 68 (quoting Ex. 1053 ¶ 23, citing Ex. 1003 ¶¶ 231–233). This is depicted in Baek Fig. 1, reproduced in the Petition and below. Ex. 1053, Fig. 1; Pet. 69.



Prior art
FIG. 1

Baek Fig. 1 showing a conventional high power LED package with LED chips 130 are mounted inside reflector 120.

According to Petitioner, "[o]nce modified, Hashimoto would include six LED packages each having 3 LEDs apiece," thereby meeting the claimed LED arrangement. Pet. 71.

Petitioner reasons that a "POSITA would have understood Baek's [prior art] LED package would provide a greater lumen output (i.e., more light) due to the plurality of LEDs included." Pet. 69 (citing Ex. 1003 ¶ 235). "A POSITA would have understood it to be desirable to have a brighter and more directed lighting when used in applications like that disclosed by Hashimoto – e.g., illuminating merchandise in jewelry stores." *Id.* at 70 (citing Ex. 1003 ¶ 235).

However, Petitioner does not explain why a POSITA would have modified Hashimoto to include the prior art package described in Baek so as to position LEDs in Hashimoto's device in the arrangement claimed (i.e., "the first and second group of LEDs being spaced apart from each other" [1.2]) with a reasonable expectation of success.

Hashimoto is directed to illuminating with LEDs. An object is "to provide to a power LED lighting assembly which provides high brightness illumination without changes in the expected color temperature and color performance of its power LEDs." Ex. 1052, 1:43–46.

Baek discloses that the prior art LED package (illustrated in Fig. 1, reproduced above) includes "lights emitted from adjacent ones of the LED chips 130, 230 [which] *interfere with each other, thereby degrading light efficiency*." Ex. 1053 ¶ 28 (emphasis added).

In addition, the high power LED package 100, 200 where several LED chips are mounted have some elements resistant against the LED chips 130, 230, which cause *power loss while hindering heat dissipation*. The conventional LED package 100, 200 has poor heat dissipating efficiency since the LED chips are mounted inside the reflector of the lead frame.

That is, in a case where several LED chips are mounted inside one molding, a larger amount of heat is emitted but *heat dissipation efficiency is rather low*.

Id. at ¶¶ 30–31 (emphasis added).

Petitioner does not explain why a POSITA would arrange LEDs in Hashimoto consistent with the prior art package discussed in Baek when, according to Baek, they would "interfere with each other," "degrad[e] light efficiency," and "hinder[] heat dissipation." Ex. 1053 ¶¶ 28, 30–31.

Petitioner's reasoning for combining Hashimoto and Baek in arriving at the

claimed device with a reasonable expectation of success is substantially undermined by Baek's criticism of the prior art LED arrangement. We agree with Patent Owner that "Petitioners fail to note Baek's explicit criticism of such 'prior art' LED package." Prelim. Resp. 43.

Because Petitioner does not address Baek's criticism, a reasonable likelihood of prevailing in demonstrating that claim 1 is unpatentable under 35 U.S.C. § 103(a) over the combination of Hashimoto, Baek, and the knowledge of a POSITA on this record has not been demonstrated.

2. Conclusion

For the foregoing reasons, we determine that on this record Petitioner has not demonstrated a reasonable likelihood of prevailing in demonstrating that claim 1 is unpatentable under 35 U.S.C. § 103(a) over the combination of Hashimoto, Baek, and the knowledge of a POSITA.

Because claim 18 depends from claim 1 and Petitioner's discussion of claim 18 does not include reasoning for why a POSITA would arrange LEDs in Hashimoto consistent with a prior art package described in Baek, notwithstanding Baek's criticism, and reasonably expect to successfully arrive at the claimed illumination device, we reach the same determination as to claim 18. Pet. 85–86.

III. NOTICES

The Board shall deem waived any issue not raised in a timely response to the Petition, or as permitted in another manner during trial, even if asserted in the Preliminary Response or discussed in this Decision.

Nothing in this Decision authorizes Petitioner, in a manner not otherwise permitted by the Board's rules, to supplement the information supporting any ground advanced in the Petition.

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of at least one of claims 1–19 of the '114 patent. Accordingly, we grant the Petition and institute an *inter partes* review of the '114 patent.

Because a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition,” *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 & n.2 (Fed. Cir. 2018) (citing *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018) and corresponding USPTO Guidance, <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial> (Apr. 26, 2018)), and because we have determined that at least one ground set forth in the Petition satisfies the threshold for institution, trial is instituted on the proposed grounds based on Burton, Schuknecht, Hsu, Leong, Hashimoto, Baek, and knowledge of a POSITA.

IV. ORDER

It is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of claims 1–19 of the '114 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of claims 1–19 of the '114 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of *inter partes* review.

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