

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG DISPLAY CO., LTD.,
LG ELECTRONICS, INC.
Petitioners

v.

INNOVATIVE DISPLAY TECHNOLOGIES L.L.C.
Patent Owner

Case No.: IPR2015-00487¹

U.S. Patent No. 7,404,660

PETITIONERS' NOTICE OF APPEAL

Director
U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

¹ Case IPR2015-01717 has been joined with this proceeding.

Pursuant to 37 C.F.R. § 90.2(a), Petitioners LG Display Co., Ltd. and LG Electronics, Inc. provide notice of their appeal to the United States Court of Appeals for the Federal Circuit of the Final Written Decision of the Patent Trial and Appeal Board entered on July 15, 2016, in case IPR2015-00487 (Paper 36), and from all underlying findings, orders, decisions, rulings, and opinions. Petitioners have attached a copy of the Final Written Decision to this Notice. The Patent Trial and Appeal Board denied Petitioners' request for rehearing on November 28, 2016.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), the issues on appeal include, but are not limited to, the Board's determination of patentability of claims 1, 3, 5, 10, 13, 16, 17, 25-29, and 33-35 of U.S. Patent No. 7,404,660 ("the '660 patent"), as well as the findings that support that ruling, including, for example:

1. whether the Board erred in finding that Petitioners had not demonstrated that claims 1, 3, 5, 10, 13, 16, 17, 25-29, and 33-35 of the '660 patent are unpatentable by a preponderance of the evidence under 35 U.S.C. § 103 based on the combination of U.S. Patent No. 5,711,589 ("Oe") and JP 07-064078 ("Etsuo"), and any finding or determination that supports or relates to this issue;
2. whether the Board applied the wrong legal standard for obviousness;
3. whether the Board correctly interpreted the claim language, the law of

- obviousness, and the prior art references (such as Oe and Etsuo); and
4. any other issues decided adversely to Petitioners in any orders, decisions, rulings, or opinions issued in these proceedings.

Petitioners are simultaneously electronically filing copies of this Notice with the Board and the Federal Circuit. The requisite fee is being remitted to the Clerk of Court for the Federal Circuit.

Dated: December 23, 2016

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on this 23rd day of December, 2016, a copy of the attached PETITIONERS' NOTICE OF APPEAL, was served by e-mail pursuant to Patent Owner's consent in its Mandatory Notices Pursuant to 37 C.F.R. §§ 42.8(a)(2) and 42.8(b): jkimble@bcpc-law.com, jbragalone@bcpc-law.com, tsaad@bpcp-law.com, nkliewer@bpcp-law.com, and bkennedy@bpcp-law.com.

I also certify that a correct copy of this Notice of Appeal and the required fee were filed electronically via CM/ECF on December 23, 2016, with the Clerk of Court for the United States Court of Appeals for the Federal Circuit.

I further certify that, in addition to being filed electronically through the Patent Trial and Appeal Board End to End (PTAB E2E) System, this Notice of Appeal was filed with the Director of the United States Patent and Trademark Office at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
Madison Building East, 10B20
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Alexandria, VA 22313-5793

Dated: December 23, 2016

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG DISPLAY CO, LTD.,
Petitioner,

v.

INNOVATIVE DISPLAY TECHNOLOGIES LLC,
Patent Owner.

Case IPR2015-00487¹
Patent 7,404,660 B2

Before LORA M. GREEN, THOMAS L. GIANNETTI, and
BEVERLY M. BUNTING, *Administrative Patent Judges*.

BUNTING, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

¹ Case IPR2015-01717 has been joined with this proceeding.

I. INTRODUCTION

LG Display Co, Ltd. (“Petitioner”), filed a Petition requesting an *inter partes* review of claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 of U.S. Patent No. 7,404,660 B2 (Ex. 1001, “the ’660 patent”) pursuant to 35 U.S.C. §§ 311–319. Paper 2 (“Pet.”). Innovative Display Technologies LLC (“Patent Owner”) filed timely a Preliminary Response to the Petition. Paper 6 (“Prelim. Resp.”). Taking into account the arguments presented in the Preliminary Response, we determined that the information presented in the Petition establishes a reasonable likelihood that Petitioner would prevail on its challenge of claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 (“the challenged claims”) of the ’660 patent under 35 U.S.C. § 103(a).² Pursuant to 35 U.S.C. § 314, we instituted this trial on July 16, 2015, based on the following asserted ground of unpatentability (“ground”): Claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 as unpatentable under 35 U.S.C. § 103(a) over Oe and Etsuo. Paper 8 (“Decision on Institution” or “Dec. on Inst.”).

During the course of trial, Patent Owner timely filed a Patent Owner Response (Paper 14 (“PO Resp.”)), and Petitioner timely filed a Reply thereto (Paper 20 (“Pet. Reply”)). Petitioner filed Objections to Patent Owner’s Evidence (Paper 16). Patent Owner filed a Motion for Observation of Cross-Examination of Dr. Escuti (Paper 26) and a Motion for Observation of Cross-Examination of Vincent Thomas (Paper 27). In turn, Petitioner

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, took effect on March 18, 2013. Because the application from which the ’660 patent issued was filed before that date, our citations to 35 U.S.C. § 103 are to the pre-AIA version.

filed a Response to Patent Owner’s Motion for Observation of Cross-Examination of Dr. Escuti (Paper 31) and a Response to Patent Owner’s Motion for Observation of Cross-Examination of Vincent Thomas (Paper 32).

An oral hearing was conducted on March 16, 2016, and a transcript of the hearing is entered in the record. Paper 35 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to the patentability of the challenged claims of the ’660 patent. For the reasons that follow, we determine that Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 of the ’660 patent are unpatentable.

II. BACKGROUND

A. *Related Proceedings*

The parties indicate that Patent Owner has asserted infringement of the ’660 patent in the following proceeding: *Delaware Display Group LLC v. LG Electronics Inc.*, No. 1:13-cv-02109 (D. Del., filed Dec. 31, 2013). Pet. 1; Paper 4, 2. In addition, Patent Owner lists other proceedings in which it has alleged infringement of the ’660 patent. Paper 4, 2–6. Other petitions challenging the ’660 patent include IPR2014-01094 (not instituted), IPR2015-00363 (terminated); and IPR2015-00495 (not instituted). *Id.* at 6. Finally, Patent Owner names pending requests for *inter partes* review of patents related to the ’660 patent. *Id.* at 6–7.

B. The '660 Patent (Ex. 1001)

The '660 patent is directed to a light emitting panel assembly 60 having a transparent light emitting panel 62 with a “greater cross-sectional width than thickness” (Ex. 1001, Abstract) as illustrated in Fig. 10, reproduced below.

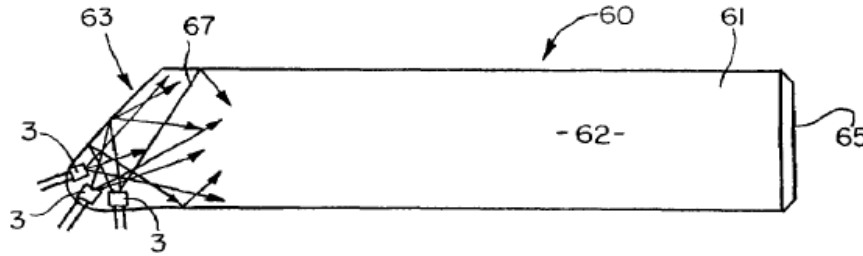


Fig. 10 is a schematic top view of a light emitting panel assembly. The light emitting panel assembly includes one or more light sources 3, a transition area 63 and a light emitting panel 62. *Id.* at 7:55–8:5. The light sources emit light in a predetermined pattern in light transition member 63, such that the light source has “a light output distribution with a greater width component than height component positioned adjacent to the input edge for directing light into the optical conductor and emission of the light from at least one output region of the optical conductor.” *Id.* at Abstract. The '660 patent describes the light sources as “any suitable type” (*Id.* at 4:12), including “an arc lamp, an incandescent bulb which also may be colored, filtered or painted, a lens end bulb, a line light, a halogen lamp, a light emitting diode (LED), a chip from an LED, a neon bulb, a fluorescent tube, a fiber optic light pipe transmitting from a remote source, a laser or laser diode, or any other suitable light source” (*Id.* at 4:17–22).

The '660 patent discloses that light extracting deformities “may be provided on one or both sides of the panel members or on one or more selected areas on one or both sides of the panel members.” *Id.* at 4:31–34.

The transition area is depicted generally as “an integral extension of one end of the light emitting panel [2] and as being generally rectangular in shape.” *Id.* at 3:5–7. The transition area is configured to spread and transmit the light by the light source to the output region. *Id.* at Abstract. The ’660 patent contemplates that the transition area “may be a separate piece suitably attached to the light input surface [13] of the panel member.” *Id.* at 3:11–13.

C. Illustrative Claim

Of the challenged claims, claims 1 and 33 are independent. Claims 3, 5, 10, 13, 16, 17, and 25–29 depend directly or indirectly from claim 1. Claims 34 and 35 depend directly from claim 33. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A light emitting panel assembly comprising:
 - a generally planar optical conductor having at least one input edge with a greater cross-sectional width than thickness; and
 - a plurality of light sources configured to generate light having an output distribution defined by a greater width component than height component, the light sources positioned adjacent to the input edge, thereby directing light into the optical conductor;
 - the optical conductor having at least one output region and a predetermined pattern of deformities configured to cause light to be emitted from the output region,
 - the optical conductor having a transition region disposed between the light source and the output region.

Ex. 1001, 9:10–24.

D. Evidence of Record

Petitioner relies on the following references (Pet. 8–10), the Admitted Prior Art (“APA”) discussed in the ’660 patent (Pet. 8), and the Declaration of Dr. Michael J. Escuti (Ex. 1004):

References	Patents/Printed Publications	Date ³	Exhibit
Oe	US 5,711,589	Jan. 27, 1998	1024
Etsuo	JP 07-064078	March 10, 1995	1025

E. Instituted Ground

As explained in the Introduction section above, we instituted trial based on the following asserted ground of unpatentability: claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 as unpatentable under 35 U.S.C. § 103(a) based on Oe and Etsuo. Dec. on Inst. 20.

III. ANALYSIS

A. Claim Construction

Patent Owner informed us during trial that the ’660 patent expired June 27, 2015, subsequent to filing of this Petition, but prior to institution of trial on July 16, 2015. PO Resp. 39. The Board interprets claims of an expired patent using the claim construction standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See 37 C.F.R. § 42.5(b); see also *In re Rambus Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012) (“While claims are generally given their broadest possible scope during

³ Petitioner relies on the June 22, 1993, filing date of the parent application of Oe. *Id.*

prosecution, the Board’s review of the claims of an expired patent is similar to that of a district court’s review.”) (internal citation omitted) (“*Phillips*” standard).

“In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). The words of a claim generally are given their ordinary and customary meaning, which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *See Phillips*, 415 F.3d at 1312–13. Although it is improper to read a limitation from the specification into the claims, the claims still must be read in view of the specification of which they are a part. *See Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1347 (Fed. Cir. 2004). In certain circumstances, however, a claim term may not be given its ordinary and customary meaning. “[A] claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). A claim term also will not receive its ordinary meaning where the intrinsic record contains “an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Phillips*, 415 F.3d at 1316.

Because the ’660 patent had not yet expired when the Petition was filed, Petitioner and its Declarant, Dr. Escuti properly applied the broadest reasonable construction in light of the specification of the patent in which it

appears. 37 C.F.R. § 42.100(b); *see also* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012). For an unexpired patent, claims are interpreted using the broadest reasonable interpretation in light of the specification of the patent in which it appears. *See* 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278 (Fed. Cir. 2015) (“We conclude that Congress implicitly approved the broadest reasonable interpretation standard in enacting the AIA.”), *aff’d sub nom. Cuozzo Speed Techs., LLC v. Lee*, No. 15–446, 2016 WL 3369425 (U.S. June 20, 2016).

Petitioner proposed only one construction in the Petition, for the claim term “deformities” appearing in claims 1 and 33, in view of the broadest reasonable interpretation standard applicable at that time. Pet. 7–8. Specifically, Petitioner proposed that we construe “deformities” to mean: “any change in the shape or geometry of the panel surface and/or coating or surface treatment that causes a portion of the light to be omitted.” *Id.* This language came directly from the specification of the ’660 patent. *Id.* at 8 (citing Ex. 1001, 4:36–40). Patent Owner’s Preliminary Response took no position on claim construction. Prelim. Resp. 4. For purposes of the Decision on Institution only, we determined that construction of the term “deformities” or any other term was unnecessary. Dec. on Inst. 5.

Now, in consideration of the Parties’ arguments and evidence developed during trial, we are not persuaded that our decision is affected in any way by the expiration of the ’660 patent. Nor do we agree with Patent Owner’s argument that the broadest reasonable interpretation claim construction standard used by Petitioner is “fatal” to the Petition or the Escuti declaration. PO Resp. 29. As noted by Petitioner in its Reply, Patent

Owner does not proffer examples of how Petitioner’s interpretation of any disputed term “is materially affected by a change in the claim construction standard. Reply 17.

As to the claim term “deformities,” despite the fact that the claims are being interpreted using the *Phillips* standard, Patent Owner still did not challenge expressly Petitioner’s proposed construction of “deformities.” See PO Resp. 49–50. Indeed, Patent Owner acknowledges that Petitioner’s proposed construction was agreed to by the parties in district court proceedings concerning related patents. PO Resp. 49–50 (citing Ex. 2007, 58; Ex. 2008, 9). Moreover, in its Reply, Petitioner agrees that the change in the claim construction standard “does not change the parties’ agreed to construction.” Reply 18. Having considered the arguments and evidence presented during trial, we determine that the parties agreed to construction for the claim term “deformities,” namely “any change in the shape or geometry of the panel surface and/or coating or surface treatment that causes a portion of the light to be omitted” is the correct construction under the *Phillips* standard.

Additionally, Patent Owner proffered constructions for the terms “height” and width” in its Patent Owner Response. *Id.* at 41–49. Specifically, Patent Owner contends that the term “height” be construed to mean “the dimension that correlates to the smallest dimension of the light input edge.” *Id.* at 41. Patent Owner contends the term “width” be construed to mean “the dimension that correlates to the largest dimension of the light input edge.” *Id.* Patent Owner supports its contentions with the testimony of its declarant, Mr. Werner (*id.* at 41–42 (citing Ex. 2021 ¶ 40)); the specification of the ’660 patent (*id.* at 42–47 (citing Ex. 1001, Figures

10, 11; Ex. 2021 ¶ 41–49)); and the testimony of Dr. Escuti with regards to Oe (*id.* at 42 (citing Ex. 1004 ¶ 160; Ex. 2021 ¶ 51)).

Patent Owner does not direct us to, nor can we find, an explicit disclosure in the specification of the '600 patent to support Patent Owner's proposed claim construction of "height" and "width." Indeed, our review of the specification of the '660 patent reveals that these terms are not defined explicitly or implicitly. For example, the specification states that "the deformities may vary in shape and/or size along the length and/or *width* of the panel members." Ex. 1001, 5:43–44 (emphasis added). With respect to the planar optical conductor, claims 1 and 33 each recite, in relevant part, that the input edge has "at least one input edge with a greater cross-sectional *width* than thickness." Ex. 1001, 9:11–12, 10:65–67 (emphasis added). Both claims 1 and 33 recite that the output distribution generated by the plurality of light sources is "defined by a greater *width* component than *height* component."⁴ *Id.* at 9:15–16, 11:5–6 (emphasis added). Claim 33 recites that the plurality of LED light sources each have "a greater *width* than *height*." *Id.* at 11:1–2 (emphasis added).

Because the terms "width" and "height" are commonly understood, we also consult a general purpose dictionary. "Width" is defined as "the horizontal measurement taken at right angles to the length." *See* Merriam-Webster.com, <http://www.merriam-webster.com/dictionary/width>, (last viewed July 10, 2015). The dictionary definition of height is "the distance from the bottom to the top of something standing upright." *See* Merriam-

⁴ In a related district court proceeding, the claim term "output distribution defined by a greater width component than height component" was determined to have its plain meaning. Ex. 2008, 47. *See* TR. 21:24–22:8.

Webster.com, <http://www.merriam-webster.com/dictionary/height>, (last viewed July 10, 2015).

Within the context of the claims, we are not persuaded by Patent Owner's contentions that the term "width" is used other than according to its ordinary and customary meaning with respect to the shape of the input edge of the optical conductor, the output distribution of the light source, and the shape of the LED light source. Along this vein, we are not persuaded by Patent Owner's contentions that the term "height" is used other than according to its ordinary and customary meaning with respect to the light output distribution. Based on this usage in the claims, no express construction is necessary.

B. Obviousness Based on Oe and Etsuo

Petitioner contends that claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 are unpatentable under 35 U.S.C. § 103(a) based on Oe and Etsuo. Pet. 33–38. In its Petition, Petitioner explains how the proposed combination of Oe and Etsuo describes the claimed subject matter of each challenged claim (*id.*) and relies on the Declaration of Dr. Escuti (Ex. 1004) in support of the analysis advocated in the Petition. Patent Owner disagrees, and focuses its arguments on challenging the teachings of Oe and Etsuo and Petitioner's articulated reason to combine these references.

For the reasons given below, after consideration of the Petition, the arguments in the Patent Owner Response, Petitioner's Reply, and the evidence of record, we conclude that Petitioner has not demonstrated, by a preponderance of the evidence, that 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 are unpatentable under 35 U.S.C. § 103(a) based on Oe and Etsuo. We

begin our analysis with the principles of law that generally apply to a ground based on obviousness, and then analyze the evidence presented in accordance with those principles.

1. Principles of Law

A claim is unpatentable under § 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 skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

2. Level of Skill in the Art

The relatively high level of skill in the art is a consideration we have taken into account. In making this determination, we were aided by expert testimony. According to Dr. Escuti, “a person of ordinary skill in the art relevant to the ’660 Patent would have at least an undergraduate degree in physics, optics, engineering, or applied mathematics AND 3 years of work experience (or a graduate degree) in a field related to optical technology.” Ex. 1004 ¶ 23. Mr. Werner does not take issue with this testimony, and in fact proposes a similar standard:

a person of ordinary skill in the art of the ’660 patent would hold an undergraduate degree in physics, material science, electrical engineering, or mathematics and have one or both of the following: (1) three or more years of work experience in a

field related to optical technology; or (2) a graduate degree in a field related to optical technology.

Ex. 2021 ¶ 76. We find that Mr. Werner’s definition is too limited in that it does not include a person with an undergraduate degree in optics. We, therefore, do not accept his standard and adopt instead Dr. Escuti’s more complete definition.

Additionally, we note that the prior art of record in this proceeding—namely, Oe and Etsuo—is indicative of the level of ordinary skill in the art. *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).

3. *Declaration of Dr. Escuti (Ex. 1004 and Ex. 1027)*

We consider initially Patent Owner’s contention that we accord the testimony of Petitioner’s expert witness, Dr. Escuti, “no weight.” PO Resp. 31–36. Specifically, Patent Owner characterizes Dr. Escuti’s declaration as “simply attorney argument ‘sanctified as the opinion of an expert.’” *Id.* at 35. To support this position, Patent Owner cites various statements made by Dr. Escuti during the deposition regarding the content of his declaration. *Id.* at 31–33 (citing Ex. 2006, 77:12–112:8).

We have reviewed the testimony from both Dr. Escuti, and Patent Owner’s expert, Mr. Werner (Ex. 2021). We find that both experts have, at times, taken liberties in proffering conclusory statements without real analysis.⁵ However, it is within our discretion to assign the appropriate weight to the testimony of both Dr. Escuti, and Mr. Werner. *See, e.g.*,

⁵ Under our rules, expert testimony that does not have a proper basis is entitled to little or no weight. 37 C.F.R. § 42.65(a).

Yorkey v. Diab, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (holding the Board has discretion to give more weight to one item of evidence over another “unless no reasonable trier of fact could have done so”); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004). We, therefore, are not persuaded by Patent Owner’s contention that Dr. Escuti’s testimony be disregarded in its entirety. Instead, we have accorded the testimony of both Dr. Escuti and Mr. Werner the weight that is appropriate in view of the arguments and evidence of record in this trial.

4. Overview of Oe (Ex. 1024)

The Oe patent, titled “Plane Light Source Unit,” issued January 27, 1998, from U.S. Patent Application No. 630,467, filed on April 10, 1996. Ex. 1024, at [54], [45], [21], and [22]. Oe is a continuation of U.S. Patent Application Serial No. 79,820, filed on June 22, 1993, now abandoned. *Id.* at [63]; 1:3–4. Petitioner asserts that Oe’s effective filing date is June 22, 1993, and therefore it qualifies as prior art to the ’660 patent under 35 U.S.C. § 102(e). Pet. 10. Patent Owner challenged this assertion in its Preliminary Response but did not dispute Petitioner’s assertion in its Patent Owner Response filed after institution. *See* Prelim. Resp. 17. *See also* Paper 9, 3 (The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.).

Oe relates generally to a plane light source used as a backlighting means for a liquid crystal display. Ex. 1024, 1:8–11. Referring to Figure 4, reproduced below, the backlighting device includes a light guide 1, an element 3 with prism units located on light emitting surface 6, a light reflecting layer 2 opposite the light emitting surface, and a light source 4 positioned on the side end surface of the light guide. *Id.* at 6:5–13.

FIG. 4

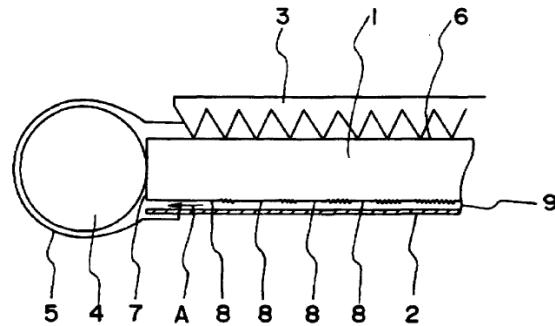


Figure 4 is a partial sectional view of the backlighting device. In another embodiment shown in Figure 10, Oe describes the use of light sources on both ends of the light guide. *Id.* at 8:19–21. By way of example, Oe describes the light source as “a fluorescent lamp” (*id.* at 6:7–8), but acknowledges that the light source type is not limited, and could be:

[a] fluorescent lamp or a filament lamp which is a continuous linear light source, a plurality of point-like sources of light arranged along the incident surface, or a light source device comprising a combination of a light transmissive member which can receive light through a side surface and a light source provided near the end portion incident surface of the light transmissive member

Id. at 7:29–35.

5. Overview of Etsuo (Ex. 1025)

The Etsuo reference is an Unexamined Japanese Patent Application Publication, JP H07-64078 A, titled “LCD Backlight Device,” published on March 10, 1995. Ex. 1025 at [12], [11], [54], and [43]. Petitioner asserts that Etsuo qualifies as prior art under 35 U.S.C. § 102(a). Pet. 10. Patent Owner does not dispute this assertion. *See* Paper 9, 3 (The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.).

Etsuo relates generally to “an LCD backlight device that allows for a light-emitting surface free of brightness irregularities, a stable supply of light, prevention of degradation in properties, a slimmer profile, and modular design.” Ex. 1025 at [57]. The backlight device includes lamp unit L having two light-emitting elements, e.g., LED elements 20, 21. *Id.* at [19]. Figure 8 of Etsuo, reproduced below, is a cross-sectional view illustrating light distribution in the backlight device. *Id.* at [27].

[Fig. 8]

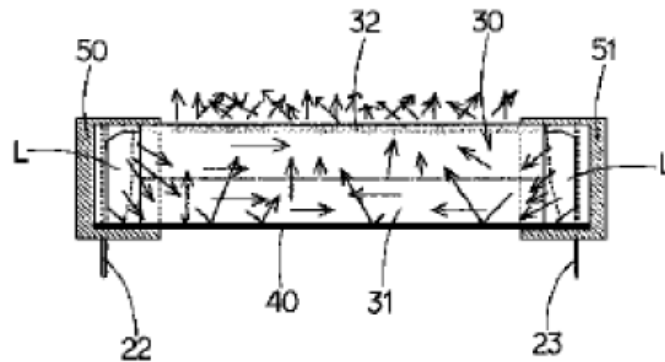


Figure 8 is a cross-sectional view illustrating operation of the backlight device.

Figure 11, reproduced below, illustrates Lamp Units L that form part of the light source. *Id.* at [29].

[Fig. 11]

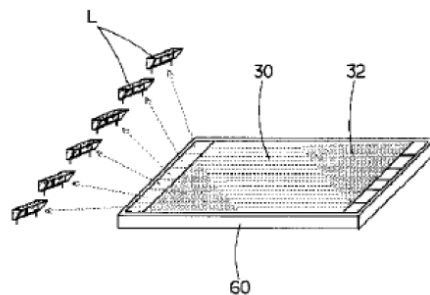


Figure 11 is Partially Exploded Perspective View of the Lamp Unit.

6. Discussion

Independent claim 1 recites, in relevant part, “a plurality of light sources configured to generate light having an output distribution defined by a greater width component than height component, the light sources positioned adjacent to the input edge, thereby directing light into the optical conductor.” Ex. 1001, 9:14–18. Independent claim 33 is similar, and recites in relevant part, “a plurality of LED light sources each having a greater width than height positioned adjacent to the input edge, thereby directing light into the optical conductor, each light source being configured to generate light having an output distribution defined by a greater width component than height component.” *Id.* at 11:1–6. We refer to these limitations, collectively, as the “light output distribution” limitation.

Petitioner contends Oe discloses a plurality of light sources 4 positioned adjacent the input edges. Pet. 35 (citing Ex. 1024, 6:15–13; Ex. 1004 ¶ 161). As to the position of the plurality of light sources adjacent to a single input edge, Petitioner relies on the disclosure in Etsuo. *Id.* at 36. Specifically, Petitioner cites Figure 6 of Etsuo for the plurality of light sources positioned adjacent to a single input edge and having an output distribution having a greater width component than height component. *Id.* at 36 (citing Ex. 1025 ¶¶ 19, 22, and 24; Ex. 1004 ¶¶ 163, 164). Also, relying on the testimony of Dr. Escuti, Petitioner asserts that

[a] person of ordinary in the art would understand that the light source constituted by the six lamp units of Etsuo has ‘a greater width than height positioned adjacent to the input edge, thereby directing light into the optical conductor, each light source being configured to generate light having an output distribution defined by a greater width component than height component.’

Id. (citing Ex. 1004 ¶ 164).

Patent Owner disputes these contentions. PO Resp. 24–28. Specifically, Patent Owner contends Etsuo does not disclose the “light output distribution” limitation for two reasons:“(1) its individual light sources do not have the required distribution and (2) when the six individual light sources are combined into a single light source, the requirement of having a plurality of light sources adjacent to the input edge or the requirement of the light output distribution” is not met. *Id.* at 24. According to Patent Owner instead of having a light output distribution with greater width than height, due to light reflecting plates 11–15, the individual LEDs disclosed by Etsuo emit light in two directions: forward, and obliquely downward and forward. *Id.* at 25 (citing Ex. 1025 ¶ 23, Figures 3, 4; Ex. 2021 ¶ 93). Patent Owner maintains, therefore, that the light exiting the LEDs in Etsuo “has a negligible distribution in its width direction as compared to its height direction,” and that after the light enters the optical conductor and progresses inward, the light spreads in the width direction. *Id.* at 25–26 (citing Ex. 1025 ¶ 27; Ex. 2021 ¶ 93).

In its Reply, Petitioner directs our attention to the disclosure in Etsuo of light-reflecting rear plate 11, upper plate 12, lower plate 13, and side plates 14, 15, and argues that the position of these light-reflecting plates with respect to LED light sources 20, 21 “confirms that light exiting each of the LEDs 20 and 21 will spread in all directions to subsequently be reflected toward the edge of the light conductor by those light-reflecting plates.” Reply 12 (citing Ex. 1025 ¶¶ 13, 23; Ex. 1026, 105:10–106:14; Ex. 1027 ¶¶ 21–22). Petitioner argues that the disclosure in Etsuo regarding shielding plate 16 positioned between adjacent LED elements 20, 21 to prevent

interference between the light from adjacent LED elements “confirms that a significant portion of the light from each LED element 20 or 21 spreads in the width direction toward the shielding plate 16 at the center.” *Id.* at 13 (citing Ex. 1027 ¶ 22). Additionally, Petitioner argues that the rectangular shape of the individual LEDs themselves as disclosed in Etsuo likewise satisfies the light “output distribution” limitation. *Id.* at 13–15 (citing Ex. 1004 ¶ 237).

Additionally, Patent Owner contends Figure 6 of Etsuo discloses that the six-lamp units positioned along one side of the conductor form one light source positioned adjacent the input edge, and not “a plurality of light sources ... the light sources positioned adjacent to the input edge.” PO Resp. 26–27 (citing Ex. 2021 ¶ 95). Patent Owner argues that providing one full set of six-light sources on each side of the light conductor does not meet the “light output distribution” limitation because one light source set adjacent to one input edge and another light source set adjacent the opposite side’s input edge “cannot be a plurality of light sources adjacent to the input edge.” *Id.* at 27. Petitioner replies to this argument, by reiterating its position that “Etsuo discloses that each lamp L incorporates two LEDs connected in series.” Reply 15 (citing Pet. 41–42) (internal citations omitted). Petitioner maintains “when electrically connected in series to form a single light source, the resulting structure in Etsuo still contains six individual lamp units (each lamp unit being a light source), each lamp unit having two individual LEDs (each LED also being a light source).” *Id.* at 16.

For claims 1, 3, 10, 13, 16, 26, 27, and 29, Petitioner asserts that one of skill in the art would have combined Oe and Etsuo because both are in the

same field of backlighting and because both use light sources located at edges of a light guide. Pet. at 36 (citing Ex. 1024 1:9–12; Ex. 1025 ¶ 1; Ex. 1004 ¶ 165). Patent Owner proffers arguments challenging Petitioner’s assertions, including characterizing Petitioner’s analysis as “conclusory.” PO Resp. 14–22. Patent Owner also presents evidence of secondary considerations to refute the obviousness of making Petitioner’s proposed combination (PO Resp. 36–38), which evidence Petitioner in turn challenges (Reply 19–25).

Petitioner, in its Reply, addresses Patent Owner’s arguments concerning the combination of Oe and Etsuo. Reply 5–11. Specifically, Petitioner argues: (1) Oe and Etsuo use similar reflectors on the lamp case to direct light from the light source toward the edge of the light conductor (*id.* at 6); (2) the light guide of Oe was designed to use light sources that transmit light in all directions, including obliquely downward (*id.* at 7–8); (3) Etsuo does not teach away because the recessed light paths 31 of Etsuo transmit light away from the light source, similar to the deformities in Oe (*id.* at 9); (4) Etsuo is analogous art to the ’660 patent (*id.* at 9–11).

Having considered the arguments and evidence of record, we are not persuaded Petitioner has provided sufficient articulated reasoning with rational underpinning explaining why one with ordinary skill in the art would have modified the teachings of the applied references to address the noted differences. *See KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”)).

We consider Petitioner’s first reason to combine Oe and Etsuo “because they are in the same field of backlighting for liquid crystal display devices.” Pet. 36. The mere fact that both Oe and Etsuo are in the same field of endeavor falls short of an adequate rationale. The same field of endeavor analysis is merely the jumping-off point in reaching the determination of whether a claimed invention is obvious. *See K-TEC, Inc. v. Vita-Mix Corp.*, 696 F.3d 1364, 1375 (Fed. Cir. 2012) (to qualify as prior art in an obviousness analysis, references must be analogous art—either from the same field of endeavor, or reasonably pertinent to the problem with which the inventor is involved).

Next, we consider Petitioner’s second reason to combine because “both Oe and Etsuo relate to backlight devices that use light sources located at edges of a light guide.” Pet. 36 (citing Ex. 1004 ¶ 165). Although Petitioner relies on the testimony of Dr. Escuti, he does not proffer any persuasive facts, data, or analysis to support his opinion. *See* Ex. 1004 ¶ 165 (“Also, both Oe and Etsuo relate to backlight devices that use light sources located at edges of a light guide.”). Merely repeating an argument from the Petition in the declaration of a proposed expert does not give that argument probative value. Dr. Escuti’s opinion lacks sufficient support. For this reason, we do not credit the testimony of Dr. Escuti on this issue. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Petitioner’s second reason is also unavailing because it does not address the entirety of Petitioner’s proposed modification. As discussed above, Petitioner relies on the disclosure in Etsuo for both the position of the

plurality of light sources adjacent a single input edge claim element, as well as the output distribution having a greater width component than height component claim element. Petitioner's reasoning, directed only to the use of light sources at the edge of the light guide, does not explain sufficiently why one of skill in the art would have replaced a single light source positioned adjacent one input edge of Oe, with the plurality of light sources disclosed by Etsuo that have an output distribution defined by a greater width component than height component.

We also consider Petitioner's argument in the Reply that, in addition to Etsuo, Petitioner also relies on Oe's explicit disclosure of "a plurality of point-like sources of light." Reply 16–17. Petitioner directs us to the passage of Oe cited in its claim chart (Pet. 40), describing how the light source could be "a plurality of point-like sources of light arranged along the incident surface" (Ex. 1024, 7:30–31). *Id.* at 16. But Petitioner's arguments in this regard do not address specifically its proffered reason to combine Oe and Etsuo. Indeed, Petitioner does not explain the *relevance* of the point-like sources of light to the claim element in question. *See* 37 C.F.R. § 42.22(a)(2) (requiring a full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence including material facts, and the governing law, rules, and precedent).

Patent Owner contends that "Petitioner never argues that 'point-like sources' are equivalent to LEDs." PO Resp. 10. We agree. Petitioner's argument that "Oe discloses a plurality of light sources 4 adjacent to the input edges" (Pet. 35 (citing Ex. 1024, 6:5–13; Ex. 1004 ¶ 161)) makes no

mention of the specific passage in Oe concerning the point-like sources of light. Indeed, the cited passage states that:

[t]he unit comprises a light guide 1 with a rectangular plate shape, an element 3 having the prism units provided on the light emitting surface 6, a light source 4 such as a fluorescent lamp provided on the side end surface (a light incident surface 7) of the light guide 1, and a reflector 5 for holding the light source 4 and reflecting the light to the incident surface by the reflective surface provided on the inner surface thereof. The opposite side of the light emitting surface 6 of the light guide 1 has a light reflective layer 2.

(Ex. 1024, 6:5–13), and does not mention a “point-like” light source.

In the Reply, Petitioner for the first time cites a *different* passage from Oe (Reply 16), which specifically describes the sources of light as “point-like,” e.g., “a plurality of point-like sources of light 30 arranged along the incident surface” (Ex. 1024, 7:29–31)). That argument should not have been made for the first time in a reply, but should have been made in the Petition, in order to provide Patent Owner an opportunity to address it. Moreover, Petitioner cites the point-like light sources only in argument, and not within the context of how Oe satisfies the requirements of the challenged claims.

Having considered the arguments and evidence, neither Petitioner, nor Dr. Escuti, provides persuasive analysis to support Petitioner’s contention that a skilled artisan would have modified Oe in the manner it suggests. As explained in *KSR*, “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418.

Petitioner’s conclusory arguments regarding the general feasibility of incorporating the features of Etsuo into Oe do not explain adequately how or

why a person of ordinary skill in the art would have attempted to modify Oe by looking to Etsuo. Nor has Petitioner, or its expert, Dr. Escuti, established an advantage for the proposed combination. Thus, we are not persuaded Petitioner has provided a sufficient articulated reasoning with rational underpinning to support the legal conclusion of obviousness with respect to claims 1, 3, 10, 13, 16, 26, 27, and 29.

In addition, Patent Owner argues that “secondary indicia of non-obviousness show that this patent is not obvious” (PO Resp. 36–38) and supports its arguments with the declaration of the inventor of the ’660 patent, Mr. Parker. Ex. 2013. Petitioner challenges whether Patent Owner has shown a nexus between the evidence and the merits of the claimed invention. Reply 19–25. Because we are not persuaded Petitioner has provided a sufficient articulated reasoning with rational underpinning to support the legal conclusion of obviousness as discussed above, we need not reach Patent Owner’s further assertions regarding secondary indicia.

Based on further review of the record, and for the reasons discussed above, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1, 3, 10, 13, 16, 26, 27, and 29 of the ’660 patent would be obvious based on the combination of Oe and Etsuo.

Claims 5, 17, and 33–35 each require a plurality of LED light sources. Ex. 1001, 9:34–35, 10:7–8, 11:1. As to claims 5, 17, and 33, Petitioner asserts that Etsuo discloses the use of a plurality of LEDs. Pet. 37 (citing Ex. 1025, ¶ 22). Petitioner reasons that “[a] person of ordinary skill in the art would have been motivated to combine the assembly of Oe with the LED light sources of Etsuo because *more* stable light can be obtained from the LED elements, that is, the lamp unit L of Etsuo.” *Id.* (citing Ex. 1025 ¶ 22;

Ex. 1004 ¶¶ 177–182, 199–207, and 236–241) (emphasis added). Further along this vein, Petitioner’s reasons that, based on the desire of a person of skill in the art to have such stable control over the light in the light assemblies of Oe and Etsuo, “one would have been motivated to replace the light sources of Oe with the LED light sources of Etsuo.” Pet. 37 (citing Ex. 1004 ¶¶ 180, 205, and 240). Patent Owner characterizes this reason to combine Oe and Etsuo as “flawed,” because Etsuo does not state that its light sources would be more stable than the fluorescent lamp of Oe. PO Resp. 22 (citing Ex. 2021 ¶ 91). According to Patent Owner, one of skill in the art would recognize “the fluorescent tube of Oe as a similarly stable source of light to the light sources in Etsuo.” *Id.* at 22–23 (citing Ex. 2021 ¶ 91).

We have reviewed the testimony of both witnesses. Dr. Escuti provides several reasons why one of skill would combine the assembly of OE with the LED light sources of Etsuo. Ex. 1004 ¶¶ 177–182. For example, Dr. Escuti testifies that as a result of connecting two LED elements in series “a more stable light can be obtained from the LED elements.” Ex. 1004 ¶ 177. Dr. Escuti also testifies that “[a] person of ordinary skill in the art would have been motivated to use the LEDs of Etsuo as light sources for the backlighting means of Oe because LEDs were known to reduce power consumption.” *Id.* Dr. Escuti concludes that a person of ordinary skill “would have been motivated to replace the fluorescent light source 4 of Oe with the light source constituted by the six lamps L of Etsuo.” *Id.* at ¶ 180.

Mr. Werner counters that one of skill in the art would have recognized that LED light sources at the time, even those connected in series, were no more stable than the single fluorescent lamp of Oe. Etsuo only states that wiring its two LED light sources in

series draws a more stable current than a single LED light source . . . [b]ut Oe never mentions using a single LED light source, so there would have been no motivation to use the dual LEDs suggested by Etsuo that purportedly provide a more stable current than one LED.

Ex. 2021 ¶ 91.

We are not persuaded that Petitioner's arguments and evidence demonstrate sufficiently that one of ordinary skill would have concluded that more stable light would be obtained by using LED elements in the light assembly of Oe. Dr. Escuti provides no factual support for his statement above concerning improved stability in using two LEDs. Thus, on this issue, we credit the testimony of Mr. Werner that one of skill in the art would not use dual LEDs in series to provide a more stable current than one LED in isolation. PO Resp. 23. Nor are we persuaded by Petitioner's other arguments regarding replacing the fluorescent light source of Oe with the LEDs of Etsuo. Petitioner has not established why one of skill in the art would replace the light source of Oe with the LEDs of Etsuo, nor what advantage or equivalence would be gained by such combination for the reasons stated by Patent Owner and Dr. Werner. Thus, having considered Petitioner's arguments, we are not persuaded that Petitioner has provided articulated reasoning for modifying Oe that has a sufficient rational underpinning to support the legal conclusion of obviousness with respect to claims 5, 17, and 33–35. Because we are not persuaded Petitioner has provided a sufficient articulated reasoning with rational underpinning to support the legal conclusion of obviousness, we need not reach Patent Owner's further assertions regarding secondary indicia as to these claims.

Based on further review of the record, and for the reasons discussed above, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 5, 17, and 33–35 of the '660 patent would be obvious based on the combination of Oe and Etsuo.

Claim 25 depends from claim 1 and recites, in relevant part, “a tray in which the optical conductor is received.” Ex. 1001, 10:37–38. Petitioner asserts that Etsuo discloses a tray having a reflector associated with the bottom of the optical conductor. Pet. 37 (citing Ex. 1025 ¶ 30; Ex. 1004 ¶ 212). Petitioner reasons that it would have been obvious to enclose Oe’s assembly in the tray of Etsuo because (1) such trays were well known; (2) Oh discloses using its backlighting assembly with backlighting LCD devices, which would include a tray; and (3) the tray of Etsuo would be enclosing a similar structure to than of Etsuo. *Id.* (citing Ex. 1004 ¶¶ 210, 214, and 232–241). Patent Owner does not challenge the sufficiency of Petitioner’s proofs regarding these teachings of Etsuo regarding the tray, nor Petitioner’s articulated reason to combine the tray of Etsuo with the light assembly of Oe.

Nonetheless, because claim 25 includes all the features of claim 1, for the reasons set forth with respect to claim 1, we conclude that Petitioner has not provided an articulated reasoning with rational underpinning to support the legal conclusion of obviousness as to claim 25.

Based on further review of the record, and for the reasons discussed above, Petitioner has not demonstrated, by a preponderance of the evidence, that claim 25 of the '660 patent would be obvious based on the combination of Oe and Etsuo.

Claim 28 depends from claim 25, and further recites that the tray includes a “reflector associated with a bottom surface of the optical conductor.” Ex. 1001, 10:45–47. Petitioner explains how the reflector 60 of Etsuo also serves to contain the light conductor, and reasons that it would have been obvious to a person of skill in the art “to include the reflector 60 of Etsuo in combination with Oe because of the benefit of the reflector 60 in a light-reflecting function and also a function of containing the light conductor 30 returning light in the optical conductor.” Pet. 38 (citing Ex. 1025 ¶ 30; Ex. 1004 ¶ 227). Patent Owner does not challenge the sufficiency of Petitioner’s proofs regarding the teachings of Etsuo regarding the tray having a reflector, nor Petitioner’s articulated reason to combine the tray of Etsuo with the light assembly of Oe.

Nonetheless, because claim 28 includes all the features of claim 1, for the reasons set forth with respect to claim 1, Petitioner has not provided an articulated reasoning with rational underpinning to support the legal conclusion of obviousness as to claim 28.

Based on further review of the record, and for the reasons discussed above, Petitioner has not demonstrated, by a preponderance of the evidence, that claim 28 of the ’660 patent would be obvious based on the combination of Oe and Etsuo.

IV. MOTION FOR OBSERVATION

Patent Owner filed a Motion for Observation on the cross-examination testimony of Petitioner’s rebuttal witness, Dr. Escuti. Paper 26. In turn, Petitioner filed a reply. Paper 31. To the extent Patent Owner’s motion pertains to testimony purportedly impacting Dr. Escuti’s credibility

or his opinion, we have considered Patent Owner's observations and Petitioner's responses in rendering this Final Written Decision, and accorded Dr. Escuti's rebuttal testimony appropriate weight as explained above. Moreover, as we determined that Petitioner had not provided a sufficient reason to combine Oe and Etsuo, we did not need to reach Patent Owner's arguments regarding secondary considerations in this Final Written Decision. For these reasons, Patent Owner's motion is moot.

Patent Owner also filed a Motion for Observation on the cross-examination testimony of its witness, Mr. Thomas. Paper 27. In turn, Petitioner filed a reply. Paper 32. Because we did not need to reach Patent Owner's arguments regarding secondary considerations in this Final Written Decision, Patent Owner's motion is moot.

V. CONCLUSION

Thus, based on our further review of the record, and for the reasons discussed above, Petitioner has not demonstrated, by a preponderance of the evidence, that claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 of the '660 patent are unpatentable under 35 U.S.C. § 103(a) as obvious based on Oe and Etsuo.

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 3, 5, 10, 13, 16, 17, 25–29, and 33–35 are held not to be unpatentable over Oe and Etsuo; and

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FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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