

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD.,  
SAMSUNG ELECTRONICS AMERICA, INC., and  
SAMSUNG SEMICONDUCTOR, INC.  
Petitioner,

v.

IMPERIUM (IP) HOLDINGS,  
Patent Owner.

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Case IPR2015-01232  
Patent 7,092,029 B1

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Before JAMES B. ARPIN, BART A. GERSTENBLITH, and  
CHARLES J. BOUDREAU, *Administrative Patent Judges*.

ARPIN, *Administrative Patent Judge*.

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

## I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Semiconductor, Inc. (collectively, “Petitioner”) challenge the patentability of claims 1, 6, 7, 14, and 16 (“the challenged claims”) of U.S. Patent No. 7,092,029 B1 (Ex. 1001, “the ’029 patent”), owned by Imperium (IP) Holdings (“Patent Owner”). Paper 4 (“Pet.”), 1. The Petition identifies Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Semiconductor, Inc. as real parties-in-interest. *Id.* at 4. We have jurisdiction under 35 U.S.C. § 6, and this Final Written Decision, issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73, addresses issues and arguments raised during the review. For the reasons discussed below, we determine that Petitioner has met its burden to prove, by a preponderance of the evidence, that claims 1, 6, 7, 14, and 16 of the ’029 patent are unpatentable on the ground upon which we instituted *inter partes* review.

### A. *Procedural History*

On May 21, 2015, Petitioner filed a Petition to institute an *inter partes* review of claims 1, 6, 7, 14, and 16 of the ’029 patent. Pet. 1. Petitioner asserted a ground for unpatentability based on the following reference and declaration:

Exhibit	Reference and Declaration
1005	Patent Application Publication No. JP H11-119288 (“Shimada”) <sup>1</sup>
1033	Declaration of Kenneth Parulski (“the Parulski Declaration”)

Patent Owner filed a Preliminary Response (Paper 14). On December 2, 2015, we issued an Institution Decision (Paper 15, “Inst. Dec.”), instituting *inter partes* review on the following ground:

Claims	Basis	Reference
1, 6, 7, 14, and 16	35 U.S.C. § 103(a)	Shimada “in further view of the knowledge of a [person of ordinary skill in the art (POSITA)]” <sup>2</sup>

After institution, Patent Owner filed a Patent Owner Response to the Petition (Paper 26, “PO Resp.”), and Petitioner replied (Paper 33, “Pet. Reply”). A hearing for the instant proceeding and related case IPR2015-01233 was held on September 1, 2016. A transcript (Paper 50, “Tr.”) of that hearing is included in the record.

*B. Related Proceedings*

The ’029 patent is the subject of a patent infringement lawsuit brought by Patent Owner, asserting claims 1, 6, 7, 14, and 16 of the ’029 patent

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<sup>1</sup> Exhibit 1005 consists of the Japanese-language version of Shimada, a Translation Declaration, and a certified English-language translation. Citations to Shimada are to the certified English-language translation included as pages 10–28 of Exhibit 1005.

<sup>2</sup> We understand Petitioner’s reference to “the knowledge of a POSITA” here to refer to a person of ordinary skill in the art’s understanding of the applied reference and not to supply missing limitations or as shorthand to incorporate an unspecified disclosure by reference to supply missing claim limitations. 37 C.F.R. § 42.6(a)(3); *see* 35 U.S.C. § 311(b).

against Petitioner in *Imperium IP Holdings (Cayman) v. Samsung Electronics Co., et al.*, No. 4:14-cv-00371 (ALM) (E.D. Tex. 2014). Pet. 4–5; Paper 8, 2. The '029 patent also is the subject of *Imperium IP Holdings (Cayman), Ltd. v. Samsung Techwin Co., Ltd. et al.*, No. 4:15-cv-00026 (ALM) (E.D. Tex. 2015). Paper 8, 2.<sup>3</sup>

## II. THE '029 PATENT (EX. 1001)

### A. *Subject Matter*

The '029 patent is titled “STROBE LIGHTING SYSTEM FOR DIGITAL IMAGES,” and teaches methods and systems for strobe lighting and memories having machine readable instructions for strobe lighting for use in the capturing of digital images. Ex. 1001, col. 1, ll. 14–15. The '029 patent was filed as U.S. Patent Application No. 09/816,038 on March 22, 2001, and claims priority to and the benefit of U.S. Provisional Patent Application No. 60/192,008, filed on March 24, 2000.<sup>4</sup> *Id.* at [22], [60].

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<sup>3</sup> Petitioner notes that Samsung Techwin Co., Ltd. and Samsung Opto-Electronics America, Inc. (together “Techwin”) were identified as separate parties and that the U.S. District Court for the Eastern District of Texas severed those parties from Patent Owner’s litigation against Petitioner. *See infra* Section I.B. Petitioner asserts that Techwin is neither a privy of Petitioner nor a real party-in-interest in this proceeding. Pet. 5 n.5; *see* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,759 (Aug. 14, 2012). Patent Owner has not contested Petitioner’s identification of the real parties-in-interest.

<sup>4</sup> Petitioner does not contest the '029 patent’s claim to priority from March 24, 2000. Pet. 1; *but see Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375 (Fed. Cir. 2015).

A digital camera, such as that described in the '029 patent, uses a flash or strobe to provide supplemental light. The duration of the supplemental light (i.e., the main flash or strobe) in the '029 patent is determined based on the processing of preparatory image data obtained through the use of a preparatory light or strobe. When setting the duration of the supplemental light, the '029 patent may give greater weight to an area of interest of the preparatory image, rather than performing a uniform evaluation of the entire preparatory image including the background of the preparatory image. *Id.* at col. 2, ll. 4–17; *see id.* at Fig. 9.

To increase the accuracy of the photographic image, the '029 patent employs a look-up table that stores main flash or strobe durations and associated power values. Figure 6 of the '029 patent, depicting an embodiment of such a look-up table, is reproduced below.

50 us	1000
25 us	349
50 us	981
75 us	1453
100 us	2075
400 us	4217
800 us	5387

Look-up Table  
**FIG. 6**

In the look-up table of the embodiment of Figure 6, which we annotated to include language from challenged claim 1, the first entry pair provides values relating to capture of a preparatory image, including the preparatory image strobe duration and associated preparatory power value. The remaining entry pairs relate to supplemental light (i.e., main strobe) durations and associated supplemental light (i.e., main power) values, used when capturing the final photographic image. *Id.* at col. 7, ll. 30–45.

The preparatory strobe duration depicted in Figure 6 is 50 microseconds ( $\mu\text{s}$ ) with an associated power value of 1000, i.e., 100.0%, which represents a nominal power value for a nominal average luminance at

the preparatory strobe duration. *Id.* The subsequent durations from 25  $\mu\text{s}$  to 800  $\mu\text{s}$  have power values that are determined relative to the preparatory strobe duration (50  $\mu\text{s}$ ) table entry.

The '029 patent describes a method of generating a look-up table having a preparatory strobe duration and an associated preparatory power value, as well as main strobe durations and associated power values. The generated look-up table presents associated main strobe power values as a percentage of a luminance at the specified strobe duration divided by a luminance at the preparatory strobe duration. *Id.* at Fig. 10; *see also id.* at col. 7, ll. 35–40, col. 9, l. 45–col. 11, l. 24. For example, for a main strobe duration of 25  $\mu\text{s}$  in Figure 6, the associated power value is 349, i.e., 34.9%, of the preparatory power value at the nominal 50  $\mu\text{s}$  preparatory strobe duration. The difference between the associated power value for a main strobe duration of 50  $\mu\text{s}$ , i.e., 98.1%, of the preparatory power value and the preparatory power value, i.e., 100%, for the nominal 50  $\mu\text{s}$  preparatory strobe duration is the “charge loss” (e.g., 1.9%) caused by generation of the preparatory strobe. *Id.* at col. 9, ll. 40–44.

In an embodiment, the nominal average luminance at the preparatory strobe duration is determined through an initial measurement. *Id.* at col. 9, ll. 58–60. For various calibration durations of the strobe, an average calibration luminance then is determined through measurement. This embodiment stores a relationship between the nominal average luminance of the preparatory strobe and the measured average calibration luminance of the main flash or strobe in the look-up table for the respective calibration durations. *Id.* at col. 10, ll. 15–18.

*B. Illustrative Claims*

As noted above, Petitioner challenges claims 1, 6, 7, 14, and 16 of the '029 patent. Claims 1, 7, and 14 are independent claims, directed to a method for adjusting image lighting, a memory having machine readable instructions for execution by a processor to adjust image lighting, and a digital imaging system, respectively. Claim 6 depends from claim 1, and claim 16 depends from claim 14. Claim 1 is illustrative and is reproduced below, with disputed limitations emphasized:

1. A method of adjusting image lighting, the method comprising:  
generating a preparatory light for a predetermined preparatory duration;  
capturing a preparatory image while generating the preparatory light, wherein the preparatory image is represented by preparatory image data;  
determining an average preparatory image luminance of the preparatory image based on the preparatory image data *and weighting at least a subset of the preparatory image data*;  
generating a supplemental strobe duration based on the average preparatory image luminance and luminance weightings; and  
*generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value.*

Ex. 1001, col. 11, ll. 40–58 (emphases added).

### III. CLAIM CONSTRUCTION

In an *inter partes* review, claim terms in an unexpired patent are construed according to their broadest reasonable interpretation in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). There is a presumption that claim terms are given their ordinary and customary



meaning, as would be understood by a person of ordinary skill in the art in the context of the specification. *See In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An applicant may rebut that presumption by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner notes that the parties proposed constructions for disputed terms in the related litigation in the U.S. District Court for the Eastern District of Texas (*see supra* Section I.B.), and Petitioner adopts its proposed constructions, but “does not believe that any of these constructions has any impact or bearing on the analysis set forth in this Petition.” Pet. 13–14 (citing Ex. 1033 ¶ 60); *see* PO Resp. 15–16 (providing the district court constructions). We did not construe any terms in the Decision on Institution. Inst. Dec. 7–9.

Petitioner stated at the hearing that no claim terms require construction. Tr. 8:4–15; *see also id.* at 14:16–15:2 (no need to construe “preparatory power value”). Patent Owner agreed, also stating at the hearing that no claim constructions are necessary. *Id.* at 19:11–25; *see* PO Resp. 12 (relating to the claim term “interface”); Tr. 50:19–55:4. Nevertheless, Petitioner notes that the parties appear to disagree regarding the plain and ordinary meaning of the term “weighting.” PO Resp. 16–18; *see* Pet. Reply 15; Tr. 8:9–15. Petitioner argues that “weighting” means “‘according more weight,’ emphasizing, ‘an area of interest of the image,’ or even emphasizing the *entire* image.” Pet. Reply 16 (citing Ex. 1001, col. 2, ll.

15–17, col. 9, ll. 1–3; Ex. 2003, 62:10–13); *see* Tr. 8:24–25 (“according more weight or emphasizing a portion or all of an image”). Patent Owner does not propose expressly an alternative construction, but, in attempting to distinguish the teachings of Shimada, contends implicitly that Petitioner’s construction is overly broad. PO Resp. 18; *see* Pet. Reply 15 (“Though PO never actually proposes an actual construction for ‘weighting,’ it argues Shimada uses a ‘selection process’ and suggests that, in contrast, the claimed ‘weighting’ must be performed numerically.” (citations omitted)). We find Petitioner’s proposed construction to be consistent with the Specification of the ’029 patent, and we construe “weighting” to mean “according more weight or emphasizing a portion or all of an image.”

Nevertheless, *only* terms that are in controversy in *this* proceeding need to be construed, and then 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). Because the resolution of this controversy does not depend upon the construction of any other claim term, no other claim terms are construed expressly.

#### IV. ANALYSIS

Petitioner asserts that claims 1, 6, 7, 14, and 16 of the ’029 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Shimada. *See supra* Section I.A. Petitioner also relies upon the Parulski Declaration.

##### A. *Obviousness Over Shimada*

###### 1. *Overview*

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 skill in the art;<sup>5</sup> and (4) objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).<sup>6</sup> For the reasons set forth below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 6, 7, 14, and 16 of the ’029 patent are rendered obvious over Shimada.

## 2. *Shimada (Ex. 1005)*

Shimada teaches a camera system that creates a preliminary exposure of a photographic subject using a pre-flash of a strobe device prior to the main photographic exposure. Ex. 1005 ¶ 12. Shimada’s system performs photometry, i.e., measurement of the image luminance value, on the

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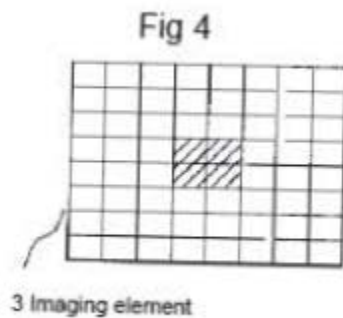
<sup>5</sup> Petitioner proposes an assessment of the level of skill for a person of ordinary skill in the art. Pet. 15–16 (citing Ex. 1033 ¶ 20). Patent Owner’s declarant proposes a slightly different and somewhat lower (e.g., two years, instead of four years, of industry experience) assessment of the level of skill for a person of ordinary skill in the art. Ex. 2004 ¶ 26. To the extent necessary and for purposes of this Final Written Decision, we adopt Patent Owner’s declarant’s assessment, which each party’s declarant meets or exceeds. See Ex. 1033 ¶ 21; Ex. 2004 ¶ 27.

<sup>6</sup> There is no requirement to enumerate each *Graham* factor and to include findings specifically in terms of the factors as long as “the required factual determinations were actually made and it is clear that they were considered while applying the proper legal standard of obviousness.” *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 990 (Fed. Cir. 1988).

preliminary image data in order to determine an average image data value, which may be used to compute the necessary amount of emitted light of a main flash or strobe for proper exposure of the subject. *Id.* ¶¶ 20, 25–27, 31.

In Shimada, photometry of the pre-flash image may be performed by dividing the imaging element into sixty-four (64) areas. *Id.* ¶¶ 30, 49.

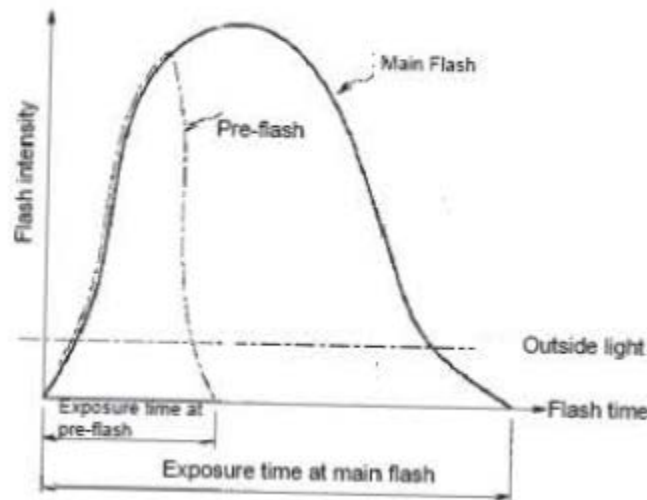
Shimada's Figure 4 is reproduced below:



In Figure 4, Shimada depicts detecting the presence of backlighting in the image by comparing the average luminance value of four (4) center areas of the image detected by imaging element 3 and the average luminance value of the outside areas. *Id.* ¶ 49. Shimada teaches performing photometry for only the central areas if a backlit state is detected; in a non-backlit state, however, a wider area may be subject to photometry to determine the average image data value. *Id.* ¶ 50.

In addition, Shimada teaches calculating a relative amount of light,  $S$ , needed for the main flash for proper image exposure based on the pre-flash image data value. *Id.* ¶¶ 37–45. Shimada's Figure 5 is reproduced below:

Fig 5



In Figure 5, Shimada depicts “a line graph illustrating the relationship between the exposure times at pre-flash and at main flash relative to the intensity characteristics of the light emitted at pre-flash and at main flash in the strobe device of the third embodiment.” *Id.* ¶ 62.

As illustrated in the drawing, in the strobe device of the third embodiment, the exposure time at pre-flash is set shorter than the exposure time at main flash. In accordance with this, the amount of emitted light of the pre-flash becomes relatively greater than the outside light, thereby enhancing detection accuracy.

*Id.* ¶ 63. Shimada then teaches the use of a look-up table comprised of empirically determined, relative light values associated with flash time durations in order to identify the main flash duration, i.e., exposure time, corresponding to the desired amount of relative light. *Id.* ¶¶ 7, 31–36, Table 1.

Shimada's Table 1 is reproduced below:

Relative Amount of Emitted Light	Flash Time
1.409	22.7
1.507	23
1.613	23.6
1.726	24.5
1.847	25.23267
1.976	25.87895
2.114	26.57048
2.262	27.31041
2.420	28.22237
2.590	29.23915
2.771	30.32689
2.965	31.49077
3.173	32.73613
3.395	34.06866
3.632	35.49446
3.887	37.02007
4.159	39.64042
4.450	42.49861
4.761	45.55688
5.095	48.27519
5.451	49.68896
5.833	51.20168
6.241	52.8203
6.678	54.55222
7.146	56.40538
7.646	58.38825
8.181	61.25068
8.754	64.63439
9.366	68.25537
10.022	72.09688
10.723	75.19533
11.474	78.51066
12.277	82.05808
13.137	85.85381
14.056	89.91524
15.040	94.26098
16.093	98.97294
17.220	104.6994
18.425	110.8267
19.715	117.3829
21.095	124.398
22.571	131.8947
24.151	139.9
25.842	148.4656
27.651	157.6309
29.586	167.4377
31.657	177.931
33.873	189.1589
36.245	201.1726
38.782	218.3629
41.496	238.7233
44.401	260.509
47.509	283.8196
50.835	308.762
54.393	360
58.201	408
62.275	467
66.634	525
71.299	622
76.290	710
81.630	871
87.344	1161
93.458	1878
100.000	4050

Shimada's Table 1 depicts the relationship between the relative amount of emitted light and the associated flash duration, i.e., "Flash Time." *Id.* ¶ 32.

### 3. Analysis

#### a. Petitioner's Arguments

Petitioner argues that Shimada teaches or suggests all of the limitations of claims 1, 6, 7, 14, and 16 of the '029 patent. Pet. 25–42. Referring to challenged claim 1, Petitioner argues that Shimada teaches or

suggests “[a] method of adjusting image lighting.” *Id.* at 25 (citing Ex. 1005 ¶ 31, Fig. 2); *see* Ex. 1033 ¶ 101. Further, Petitioner argues that Shimada teaches the step of “generating a preparatory light for a predetermined preparatory duration,” as recited in claim 1. Pet. 25–26 (citing Ex. 1005 ¶¶ 2, 7, Fig. 5 (reproduced above)); *see* Ex. 1033 ¶ 101. Petitioner argues that Shimada also teaches the step of “capturing a preparatory image while generating the preparatory light, wherein the preparatory image is represented by preparatory image data,” as recited in claim 1. Pet. 26–27 (citing Ex. 1005 ¶¶ 12, 24, 27, Fig. 2); *see* Ex. 1033 ¶ 103.

Petitioner argues that the corresponding limitations of independent claims 7 and 14 also are taught or suggested by Shimada. Pet. 34–37 (claim 7), 38–39 (claim 14). Further, Petitioner argues that the additional limitations of claims 6 also are taught or suggested by Shimada. Pet. 34 (citing Ex. 1005 ¶¶ 6–7, Table 1); *see* Ex. 1033 ¶ 109.

Petitioner provides a detailed and persuasive mapping of Shimada’s teachings onto the limitations of each of the challenged claims. Pet. 25–42. Nevertheless, Patent Owner disputes Petitioner’s mapping of the following limitations of the challenged claims onto Shimada. We discuss each in turn. To the extent Patent Owner has not challenged the mappings of the remaining limitations in the Patent Owner Response, such challenges are deemed waived, and we adopt Petitioner’s mappings, which we determine to be persuasive by a preponderance of the evidence, in this Final Written Decision. *See* Paper 16, 6 (“Patent Owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.”).

*i. “Weighting” Limitations (Claims 1, 6, and 7) and the “Weighting Table” Limitation of (Claim 16)*

Petitioner argues that Shimada teaches the step of “determining an average preparatory image luminance of the preparatory image based on the preparatory image data and *weighting at least a subset of the preparatory image data,*” as recited in claim 1. Pet. 27–28 (emphasis added) (citing Ex. 1005 ¶¶ 9, 50, Fig. 4 (reproduced above)); *see* Ex. 1033 ¶ 104. In addition, Petitioner argues that Shimada teaches the step of “generating a supplemental strobe duration based on the average preparatory image luminance and luminance *weightings*” as recited in claim 1. Pet. 30–31 (emphasis added) (citing Ex. 1005 ¶¶ 31, 49, 50, 55, Table 1, Fig. 4 (reproduced above)); *see* Ex. 1033 ¶ 106. In particular, Petitioner argues that, referring to Shimada’s Figure 4, Shimada teaches that photometry of the pre-flash image may be performed by dividing the imaging element into sixty-four (64) areas. Pet. 16 (citing Ex. 1005 ¶¶ 30, 49). With respect to claim 16, Petitioner argues that Shimada’s Figure 4 teaches or suggests a “weighting table.” Pet. 41 (citing Ex. 1005 ¶ 34; Ex. 1033 ¶ 115); *see* Pet. Reply 19.

In Shimada, the average luminance value of four (4) center areas of the pre-flash image is compared to the average luminance value of the outside areas. Pet. 41 (citing Ex. 1005 ¶ 49). According to Petitioner, “[a]n average value of the preparatory image luminance data is determined based on weightings of subsets of preparatory image luminance data. *See, e.g.,* Ex. 1005 ¶¶ 30, 49-50 (when backlight is detected, weighting only the 4 center areas and discounting the outer 60; when no backlight, weighting more than these 4 regions).” Pet. 28 n.13; *see* Ex. 1033 ¶ 104. Petitioner’s



declarant, Mr. Parulski, explains that “Shimada takes a binary approach (either counting an area or discounting an area), utilizing the central four areas of the image in the calculation and ignoring the remainder.” Ex. 1033 ¶ 92 (citing Ex. 1005 ¶ 50). Thus, for example, the four (4) center areas may be weighted one (1), and the sixty (60) surrounding areas may be weighted zero (0). *See* Ex. 2003, 62:18–63:4. In support of this argument, Petitioner notes that

the ’029 [patent] itself discloses “*uniform*” *weighting*. Ex. 1001 8:60-9:3; Ex. 1033 ¶ 53. And, as Mr. Parulski explains, uniform weighting equally weights all areas—*i.e.*, applies a weighting of “1” in every one of the 64 blocks into which the image is divided. *See, e.g.*, Ex. 2003 171:13-20. And that is exactly what Shimada does when performing photometry on all 64 areas. *See, e.g.*, Ex. 2003 69:10-70:22.

Pet. Reply 18. Therefore, Petitioner argues persuasively that Shimada teaches the “weighting” limitations, as recited in claims 1, 6, and 7 and the “weighting table” limitation, as recited in claim 16.

*ii. “Preparatory Image Strobe Duration” and  
“Associated Preparatory Power Value” Limitations  
(Claims 1, 6, 7, 14, and 16)*

As noted above, claim 1 of the ’029 patent further recites “generating a look-up table storing associated image strobe durations and power values *including a preparatory image strobe duration and associated preparatory power value.*” Ex. 1001, col. 11, ll. 55–58 (emphasis added). This limitation appears in each of the other independent claims (Ex. 1001, col. 12, ll. 57–61 (claim 7), col. 14, ll. 9–12 (claim 14)), and our analysis here applies equally to those corresponding limitations. Initially, Petitioner argues that Shimada teaches the look-up table recited in claim 1. Pet. 32–34 (claim limitation 1-5). However, Petitioner fails to demonstrate in its claim

charts or the accompanying argument that Shimada's Table 1 includes the relative amount of emitted light and associated flash duration values for the pre-flash, corresponding to the preparatory image strobe duration and associated preparatory power value, recited in the challenged claims of the '029 patent.

Recognizing this deficiency in its claim charts and argument, Petitioner argues in the alternative that:

To the extent it is argued that Shimada does not disclose a [look-up table] containing a preparatory image strobe duration and associated preparatory power value, *it would at minimum have been obvious to a [person of ordinary skill in the art] in light of Shimada's disclosure of fixed factor K and a [look-up table] storing paired values for amount of emitted light and flash time, both stored in memory, and a "set" amount of light at pre-flash, to include the preparatory power value and preparatory duration in the [look-up table]. See Ex.1033 ¶ 108, p. 161; Ex. 1005 ¶¶ 32–35 42–45.*

Pet. 33 n.20 (emphasis added); *see* Ex. 1033 ¶ 30. Moreover, the K factor may be calculated from pre-flash and main flash values, such as those taught by Shimada's Figure 5. *See* Ex. 1033 ¶ 70.

Mr. Parulski testifies that:

A POSITA would have understood that the preparatory image strobe duration (*e.g.*, the duration of the pre-flash) would be set by using the look-up table to retrieve the flash time which is associated with the relative amount of light in the look-up table having a value equal to 100% divided by the fixed factor K. Accordingly, a POSITA would have found it obvious to include the preparatory power value (*i.e.* relative amount of light with value equal to 100% divided by K) and associated preparatory image strobe duration (*i.e.* flash time) in the look-up table. *Alternatively, a POSITA would also have found it obvious and advantageous to include the predetermined duration and corresponding relative amount of emitted light S for the*

*preliminary emission in the look-up table, because it would eliminate the need for a separate data structure or memory location for storing the preliminary strobe duration and relative amount of emitted light S.*

Ex. 1033 ¶ 108 (emphasis added); *see id.* ¶¶ 110 (Claim 7), 114 (Claim 14).

Shimada's Paragraph 34 teaches that

*the flash time of the strobe is controlled by storing beforehand as a file in storage means a [look-up table (LUT)] which represents the relationship between a relative amount of emitted light, which is the ratio between a prescribed amount of emitted light and the amount of light emitted by a flash when, out of the total charge stored in a main capacitor for causing the strobe to flash, the total charge remaining in the main capacitor after a pre-flash has been discharged (hereinafter this flash will be referred to as a full flash), and a flash time required for obtaining the prescribed amount of emitted light, and referring to the LUT for a flash time that corresponds to the relative amount of emitted light required to obtain the proper exposure computed on the basis of a pre-flash. Actually, the amount of emitted light in a full flash at main flash time is regarded as 100%, and the relative amount of emitted light is expressed as a percentage thereof.*

Ex. 1005 ¶ 34 (emphasis added). Thus, as with Figure 6 of the '029 patent, the power value in the look-up table may be expressed as a percentage of a full flash value. Ex. 1033 ¶ 69; *see supra* Section II.A.

Petitioner argues that the values in the “relative amount of emitted light” column of Shimada's Table 1 correspond to the power values of the look-up table of the '029 patent. Pet. 17; *see supra* Section II.A.

(reproducing an annotated version of Figure 6 of the '029 patent). Petitioner further argues that the paired values in Table 1 of Shimada describe a non-linear relationship between flash duration and power. Pet. 17 (citing Ex. 1001, col. 11, ll. 1–19). Moreover, Shimada's Paragraphs 42–45 teach how the relative amount of emitted light S in Table 1 is calculated based on

“the image data average value obtained as a result of a full flash pre-flash.” *Id.* ¶ 42; *see* Ex. 1005 ¶ 7, Pet. 17; Pet. Reply 2–3, 6–9 & n.5; Ex. 1033, App. C. Consequently, because the calculated values in Shimada’s Table 1 are based on pre-flash data, we are persuaded that the pre-flash data must be stored within—or at least accessible to—Shimada’s system. Pet. Reply 11 n.7 (“PO’s argument is misguided, however, because it incorrectly presupposes that Shimada has no need for storing pre-flash data. However, as explained above, Shimada in fact uses pre-flash data (just like the ’029 [patent]).”); *see* Tr. 11:23–12:19.

Shimada teaches a single memory, e.g., ROM 16 of Figure 1. Ex. 1005 ¶¶ 19, 20 (“a ROM 16 for storing a prescribed value related to a flash”); *see* Tr. 14:8–15. Shimada states that “[d]ata related to the [look-up table] is stored in the ROM 16.” Ex. 1005 ¶ 32; *see id.* ¶ 20. Further, Shimada teaches that “K ( $K > 1$ ) is a fixed value regardless of the subject, *and this value can be stored in the ROM 16 beforehand.*” *Id.* ¶ 42 (emphasis added); *see* PO Resp. 23, 29 (quoting Ex. 1005 ¶ 42); Ex. 1033 ¶ 70. Consistent with Mr. Parulski’s testimony, Shimada also explains that:

Conventionally, the [look-up table] has been such that an array of relative amounts of emitted light were set in arithmetic sequence fashion, but this posed a problem in that as the relative amount of emitted light became larger, the precision for controlling the amount of emitted light became unnecessarily high, *causing the storage capacity for storing the [look-up table] to become exceedingly large.*

Ex. 1005 ¶ 35 (emphasis added). Shimada goes on to suggest that the storage capacity can be reduced by increasing the array intervals, thus, reducing the number of values stored in the table. *Id.*; *see* Ex. 2004, 38:2–41:7. In this regard, Patent Owner acknowledges that each of Shimada

and the '029 patent teaches a degree of “balancing” between table size, e.g., storage space, and interval precision in the setting of table size. Tr. 31:22–32:22.

Petitioner argues that Shimada uses preparatory flash duration and power values to determine the main flash values presented in Table 1, that such values must be stored within and/or accessible to Shimada’s system, and that Shimada teaches that storage capacity was a concern in the art. Ex. 1005 ¶ 34; *see* Ex. 2003, 33:7–34:11, 40:9–15. Shimada expressly teaches that two of the pieces of data used to accomplish Shimada’s purpose may be stored in a single memory, ROM 16 of Shimada’s Figure 1. Ex. 1005 ¶¶ 20, 32, 42. Based on the art and arguments presented here, the record suggests a finite number of ways in which distinct pieces of data (e.g., the main flash duration and power values, the preparatory flash duration, and the preparatory flash power values) may be stored and that these would be within the technical grasp of a person of ordinary skill in the art. Ex. 2003, 44:7–45:17, 46:5–47:6; *see* Tr. 37:3–38:6. On this record, we are persuaded that a person of ordinary skill in the art would have understood that saving information in one file, instead of two or more files, has the ability to conserve storage space. *KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”), 421 (“When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue

the known options within his or her technical grasp.”); *see* Ex. 1005 ¶¶ 34, 35 (describing known problem of, and solutions for, storage capacity).

As noted above, each of independent claims 1, 7, and 14 includes a substantially similar limitation reciting a look-up table storing associated image strobe durations and power values, including a “preparatory image strobe duration” and an “associated preparatory power value.” For the reasons stated above, Petitioner argues persuasively that Shimada teaches these limitations and that a person of ordinary skill in the art would have had reason to modify the teachings of Shimada to achieve these limitations of claims 1, 7, and 14, namely to store the various pieces of data in a single look-up table.

*iii. “Machine Readable Instructions” Limitation  
(Claim 7)*

Claim 7 recites “[a] memory having machine readable instructions for execution by a processor to adjust image lighting.” Ex. 1001, col. 12, ll. 41–42. Referring to Shimada’s Figure 1, Shimada depicts a block diagram illustrating the configuration of a strobe device, including “a central processing unit (CPU) 8 for calculating an amount of emitted light of a strobe flash tube 13 on the basis of an output signal from either the A/D circuit 3 or memory 7, and for driving and controlling the component parts of the strobe device.” Ex. 1005 ¶¶ 19, 20; *see also id.* ¶¶ 21 (“The size of the photometric area of the CCD 3 is switched on the basis of a control signal from the CPU 8.”), 24 (“Also, when the strobe flash mode switch 14 is ON, the CPU 8 causes the strobe to flash, and when the release switch 15 is ON, a photographic operation is started under the control of the CPU 8.”).

Petitioner argues that:

As Shimada teaches use of a processor to calculate the main flash using the preparatory image captured after pre-flash, Shimada necessarily, *and thus inherently discloses machine readable instructions* (including instructions for performing the task of adjusting image lighting, as well as all other elements of Claim 7) for execution by the processor. See, e.g., element 1, above; see also Ex.1005 Fig. 1. Indeed, the only way for a processor to perform the claimed functionality would be using such instructions (code). *Alternatively, using such instructions would at minimum have been obvious to a POSITA.* See Ex.1033 ¶ 110, pp. 166-67.

Pet. 34 n.23 (emphases added). In order for Shimada to disclose machine readable instructions “inherently,” Shimada’s CPU 8 must *necessarily* employ machine readable instructions. “Under the principles of inherency, if the prior art necessarily functions in accordance with, or includes, the claimed limitations, it anticipates.” *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1349 (Fed. Cir. 2002) (citations and internal quotation marks omitted). “Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations and internal quotation marks omitted).

Here, we need not determine whether Shimada inherently teaches “machine readable instructions.” In view of the teachings of Shimada discussed above and Mr. Parulski’s testimony, Petitioner argues that a person of ordinary skill in the art would have been obvious to use such instructions in Shimada’s CPU 8. *See* Ex. 1033 ¶ 110. Therefore, Petitioner argues persuasively that a person of ordinary skill in the art would have had reason to use machine readable instructions in Shimada to achieve this limitation of claim 7.

Consequently, Petitioner argues persuasively that Shimada teaches or suggests all of the limitations of claims 1, 6, 7, 14, and 16.

*b. Patent Owner's Contentions*

Patent Owner contends that Shimada fails to render claims 1, 6, 7, 14, and 16 obvious for five reasons. First, Patent Owner contends that Shimada's look-up table does not store a preparatory image strobe duration and associated preparatory power value. PO Resp. 18–19. Second, Patent Owner contends that Petitioner fails to provide any reason to modify Shimada's look-up table to include a preparatory image strobe duration and associated preparatory power value. *Id.* at 20–22. Third, Patent Owner contends that Shimada uses the K value, rather than a “preparatory power value,” to convert the measured image data from pre-flash to the full flash baseline. *Id.* at 22–32. Fourth, with respect to claim 7, Patent Owner contends that Shimada teaches hard-wired averaging and fails to teach or suggest corresponding “machine readable instructions.” *Id.* at 32–33. Fifth, with respect to claims 1, 7, and 16, Patent Owner contends that Shimada's selection of four central areas for photometry does not teach “weighting” or a “weighting table.” *Id.* at 34–37.

First, Patent Owner contends that Shimada's Table 1 does not disclose a look-up table “having a preparatory image strobe duration and preparatory power value, as required by each of the challenged claims.” PO Resp. 18–19. Instead, Patent Owner contends that “Shimada's Table 1 is directed to a main flash and contains values for a main flash.” *Id.* at 19. Further, Patent Owner contends that “Shimada [does not] disclose the look-up table including a preparatory image strobe duration and preparatory power value,



as required by each of the challenged claims.” *Id.* According to Patent Owner,

Analysis of Petitioners’ claim chart attempting to show support for this element confirms that Shimada lacks this disclosure and therefore is not an *anticipatory reference*. Pet. at 32-33. The Board also confirmed that Shimada fails to disclose the recited “preparatory” entries in Shimada’s look-up table. Inst. Dec. at 14.

*Id.* (emphasis added). Nevertheless, Petitioner does not argue, and we did not institute review based on, Shimada as an “anticipatory reference.” See Pet. 6 (“Ground 1: Claims 1, 6, 7, 14, and 16 are obvious under § 103 over Shimada in view of the knowledge of a POSITA.”); Inst. Dec. 23 (“*inter partes* review is instituted as to claims 1, 6, 7, 14, and 16 of the ’029 patent under 35 U.S.C. § 103(a) as allegedly rendered obvious over Shimada”). Thus, although we agree that Shimada’s Table 1 does not *disclose* “a preparatory image strobe duration and preparatory power value,” that does not alter our analysis.

Second, Patent Owner contends that Petitioner fails to provide any reason to modify Shimada’s look-up table to include a preparatory image strobe duration and associated preparatory power value. PO Resp. 20–22. We disagree.

Patent Owner notes that, in the Institution Decision, we gave “some credit to Petitioners’ argument that, ‘because the calculated values in Shimada’s Table 1 are based on pre-flash data, the pre-flash data must be stored by Shimada’s system.’” PO Resp. 21 (quoting Inst. Dec. 16). Patent Owner contends that “the Institution Decision presumes that a) Shimada must store a pre-flash ‘preparatory power value,’ and b) storage in one table rather than two may conserve storage space.” *Id.* Patent Owner does not

contest the first alleged presumption, but contends that storing more data would create a larger table, rather than a smaller table, and would not conserve storage space. *Id.* at 21 n.3. Moreover, because Shimada expresses concern over memory capacity (Ex. 1005 ¶¶ 34, 35), and because Patent Owner asserts that Shimada does not teach using “a ‘preparatory power value’ for the pre-flash . . . in any computation required to determine either S for the main flash, or a corresponding flash time to achieve S” (Ex. 2004 ¶ 55; *see* PO Resp. 21–22), Patent Owner contends that a person of ordinary skill in the art would not have had reason to store data associated with a pre-flash, especially Shimada’s K value, in a main flash table. PO Resp. 21. Specifically, Patent Owner contends that “Shimada has disclosed a scheme in which no pre-flash preparatory power value is used to determine a main flash duration.” *Id.* Thus, Patent Owner contends that “[t]here simply would have been no reason for a POSITA to modify Shimada to waste storage capacity on extraneous data.” *Id.* at 21–22.

We find Patent Owner’s contention unpersuasive for at least two reasons. First, as noted above, Shimada’s K value already is stored separately in Shimada’s system or is stored elsewhere, such that it is accessible by Shimada’s system. In particular, Shimada teaches that both the look-up table and the K value may be stored separately in ROM 16 of Shimada’s Figure 1. Ex. 1005 ¶¶ 20, 32, 42. We are not persuaded that storing the data together in a single table in ROM 16, rather than separately in ROM 16, is likely to increase greatly the memory capacity in use. Further, Mr. Parulski explains that data intervals may be increased to store more types of data without increasing the overall table size. *See* Ex. 2004, 38:2–41:7. Second, Patent Owner is incorrect in its assertion that “Shimada

has disclosed a scheme in which no pre-flash preparatory power value is used to determine a main flash duration.” PO Resp. 21. As explained in detail below, Petitioner has demonstrated that Shimada’s K value “is a ‘preparatory power value’ within the meaning of the ’029 [patent]. And Shimada uses K, which comprises pre-flash data and correlates to a pre-flash duration, in determining the main flash duration.” Pet. Reply 2–3. Thus, we are not persuaded that a person of ordinary skill in the art would not have had reason to combine Shimada’s K values and the main flash values in a single table. *See supra* Section IV.A.3.a.ii.

Third, Patent Owner contends that Shimada uses the K value, rather than a “preparatory power value,” to convert the measured image data from pre-flash to the full flash baseline. PO Resp. 22–32. Although Patent Owner acknowledges that Shimada uses its K value to calculate the main flash values included in Shimada’s Table 1 (*id.* at 23), Patent Owner contends that:

Shimada describes K as “VF/VP” and a value stored “beforehand” in [Ex. 1005] ¶ 42. A POSITA would understand that the VP used to determine K represents a calibration value, which is different from the VP actually measured and used to calculate VF in ¶ 43. [Ex. 2004] ¶ 50; p. 29 n. 21.

PO Resp. 23 n.5. Consequently, Patent Owner contends that:

A POSITA would understand that the VP used to determine K represents a calibration value, the pre-flash does not actually emit at the full flash level, and VF is not actually measured due to a full flash. Rather, the actual pre-flash value image data VP is converted to a corresponding full flash level VP based on the conversion factor K.

*Id.* at 23–24. Thus, Patent Owner contends that, in Shimada,

the “relative amount of emitted light S” is calculated from the ratio of VM, which is the “image data average value

corresponding to the proper exposure” for the main flash (*id.* at ¶ 37), divided by the hypothetical value VF. [Ex. 1005] ¶ 44. Both this numerator and denominator must be measured relative to the full flash level, because the “relative amount of emitted light S” logged in Shimada’s look-up table is relative to the full flash data. *Id.* at ¶ 32; Table 1. As discussed above, the baseline for Shimada’s Table 1 is the full flash amount of emitted light, which is represented as 100.000. *Id.* *Main flash durations are measured relative to this full flash value.*

PO Resp. 24 (emphasis added). Patent Owner contends that, unlike Shimada’s “fixed” K values, the preparatory image strobe duration and associated preparatory power value are predetermined values.

Referring to Figure 6 of the ’029 patent, the first look-up table entry, the preparatory strobe (i.e., pre-flash) duration is 50  $\mu$ s and has an associated power value of 1000 (i.e., 100%), which represents a nominal power value for a nominal average luminance at a preparatory strobe duration. *See supra* Section II.A. Thus, the remaining entries in the look-up table depicted in Figure 6 are main strobe power values represented as *a percentage* of a luminance at the specified strobe duration divided by a luminance at the preparatory strobe duration. PO Resp. 5.

Although the pre-flash duration in Figure 6 of the ’029 patent corresponds to a flash duration of 50  $\mu$ s, the pre-flash power value, i.e., the preparatory power value, is not suitable for a main flash power value for main flash duration of 50  $\mu$ s. *Id.* The power values differ due to the

“*charge lost* in the high voltage supply of the strobe circuit from activating the strobe for preparatory duration to acquire the preparatory image.” [Ex. 1001, col. 9, ll. 36–44.] In other words, due to charge that is lost during the pre-flash, a successive main flash having the same duration as the pre-flash will yield a lower power value.

PO Resp. 6 (emphasis added).

Patent Owner contends that, because Shimada's K values are "fixed," they do not take charge loss into account. *Id.* at 28. Moreover, the preparatory image strobe duration and associated preparatory power value are stored in the recited, look-up table as a baseline for determining the main flash power value and associated duration. *Id.* at 27. Shimada uses its K value "to first scale up to a baseline associated with a full flash value." *Id.* Thus, Patent Owner contends that the preparatory image strobe duration and associated preparatory power value are used to calculate the actual main strobe duration and power values, but Shimada's K value already has been utilized to calculate the values in Shimada's Table 1. *Id.* at 26–27. Therefore, Patent Owner contends, because Shimada's K value already is incorporated into the calculated main flash values in its Table 1, there would be no reason to include the K value or an associated pre-flash duration in Table 1. *Id.*

We are not persuaded by Patent Owner's contention. Petitioner argues that "[Patent Owner's] argument . . . is premised on improperly limiting the claim term 'preparatory power value' to the preferred embodiment," as depicted in Figure 6 of the '029 patent. Pet. Reply 3. Although Patent Owner correctly notes that Figure 6 of the '029 patent teaches a specific methodology for calculating the main flash duration, Petitioner argues that the language of the challenged claims do not mention a specific methodology for calculating the main flash duration. Pet. Reply 4 n.2; see *Van Geuns*, 988 F.2d at 1184 (explaining that although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims). Moreover, as noted above, the embodiment of

Figure 6 is intended to take into account charge loss resulting from the pre-flash. *See* PO Resp. 6. Nevertheless, “charge loss” is mentioned nowhere in the challenged claims (Tr. 27:5–17), and Patent Owner acknowledges that it is not aware of a claim, challenged or unchallenged, that is directed specifically to charge loss (*id.* at 28:18–29:2).

The prosecution history of the '029 patent reveals that the Examiner indicated that the limitation “generating a look-up table storing associated image strobe durations and power values including a preparatory image strobe duration and associated preparatory power value” distinguished claim 1 over the art of record. *See* Ex. 1002, 11. In particular, the Examiner noted in regard to this limitation that

the prior art does not teach or fairly suggest a method of adjusting image lighting on a preparatory image comprising generating preparatory light, determining an average preparatory image luminance and generating a supplemental strobe duration, wherein the system is capable of generating a look-up table that stores image strobe durations and power values including a preparatory image strobe duration and an associated preparatory power value.

*Id.* at 153. Nevertheless, the Examiner did not limit the reasons for determining the allowability of these claims to the methodology taught by Figure 6.

The Specification of the '029 patent states that, “[w]hile various embodiments of the invention have been described, it will be apparent to those of ordinary skill in the art *that many more embodiments and implementations are possible that are within the scope of this invention.*” Ex. 1001, col. 11, ll. 34–37 (emphasis added). For the foregoing reasons, we do not read limitations from the embodiment of the invention depicted in

Figure 6 of the '029 patent into the challenged claims, and Patent Owner cannot rely on the methodology of Figure 6 to distinguish the challenged claims over Shimada.

Turning now to the relationship between Shimada's K value and the recited "preparatory power value," Petitioner argues that they are substantially the same. Pet. Reply 3–6. In particular, Petitioner argues that:

Shimada's K is simply a ratio representing the '029 [patent's] preparatory power value (the ratio of the *preflash luminance* to the *nominal luminance*) with numerator and denominator reversed:

$'029\ PPV = \frac{PreFlash\ Luminance}{Nominal\ Luminance}$	$Shimada's\ K = \frac{Nominal\ Luminance}{PreFlash\ Luminance}$
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*See* Ex. 1038 ¶¶12-14; *see also* Ex. 1033 ¶108, App'x C at 42 (describing "preparatory power value" as the "relative amount of light with value equal to 100% divided by K"); Ex. 2003 127:12-128:11, 130:19-131:13. *K thus contains all of the information of the '029 [patent]'s preparatory power value.*

Pet. Reply 5–6 (emphasis added).

Patent Owner contends, however, that Shimada does not teach using the K value "in any computation required to determine either the relative amount of emitted light S for the main flash, or the associated duration." *Id.* at 6 (quoting PO Resp. 24). Consequently, Patent Owner contends that a person of ordinary skill in the art would have no reason to modify Shimada's teachings regarding Table 1 to store a pre-flash preparatory power value and preparatory duration in Shimada's look-up table. *Id.* (citing PO Resp. 24–31). However, Shimada teaches that the relative amount of emitted light S for the main flash in Table 1 is calculated by the following equation:

$$S = \frac{VM}{K * VP}$$

Ex. 1005 ¶ 44. Petitioner explains that VM represents the target luminance, VP represents the measured average pre-flash luminance, and 1/K is the preparatory power value. Pet. Reply 7. Thus, the equation may be rewritten as follows:

$$S = \frac{\textit{Target Luminance}}{\textit{Measured Avg. PreFlash Luminance}} * \frac{1}{K}$$

*Id.*; see Ex. 1038 ¶ 14. Therefore, we disagree with Patent Owner that Shimada does not use a “preparatory power value” to convert the measured image data from pre-flash to the full flash baseline. For the reasons set forth here and in Appendix C to Mr. Parulski’s declaration, we are persuaded that Shimada’s K value is or is equivalent to a preparatory power value, *as recited in the challenged claims*. Moreover, in addition to the reasons provided above (*see supra* Section IV.A.3.a.ii.), we are persuaded that, because Shimada’s K value is used to calculate “the relative amount of emitted light S for the main flash,” which is reproduced in Shimada’s Table 1, a person of ordinary skill in the art would have had reason to incorporate the preparatory power value K and the preparatory flash duration, i.e., the “exposure time at pre-flash” from Shimada’s Figure 5, into a single table.

Patent Owner’s fourth contention is directed to challenged claim 7, which recites a “memory having machine readable instructions for execution by a processor.” Ex. 1001, col. 12, ll. 41–42. Patent Owner notes that Shimada teaches “photometry for natural light alone and for the pre-flash may be performed by dividing the entire screen into 64 areas, and using the



imaging element to determine data for which the respective pixel data has been averaged *in a hard-wired manner* for each area.” PO Resp. 28 (emphasis added). Because Shimada praises the faster processing achieved by operation in a “hard-wired manner” (*id.*), and because Shimada does not disclose expressly software embodiments, Patent Owner contends that Shimada is limited *only* to hardware embodiments. *Id.* at 33.

Petitioner argues against this limited interpretation of Shimada for at least three reasons. First, as noted above (*see supra* Section IV.A.3.a.iii.), Petitioner asserts that Shimada teaches that its system, as depicted in its Figure 1, operates “under the control of the CPU 8.” Pet. Reply 20 (citing Ex. 1005 ¶ 27). Mr. Parulski testifies that using machine readable instructions to exert control by means of a central processing unit would have been obvious to a person of ordinary skill in the art. Ex. 1033, App. C (pg. 56). Therefore, we are not persuaded that Shimada’s central processing unit operates without machine readable instructions.

Second, Petitioner argues that Patent Owner has misunderstood Shimada’s reference to operation in a “hard-wired manner.” Pet. Reply 20. In particular, Shimada’s states that “photometry for natural light alone and for the pre-flash may be performed by *dividing the entire screen into 64 areas*, and using the imaging element to determine data for which the respective pixel data has been averaged in a hard-wired manner *for each area.*” *Id.* (quoting Ex. 1005 ¶ 30 (emphases added by Petitioner)); *see* PO Resp. 32. Thus, Petitioner argues that Shimada’s discussion of a “hard-wired manner” of operation refers only to the screen areas, and not to the determination of the average luminance for the entire image. Pet. Reply 20. We agree with Petitioner that the reference to operation in a “hard-wired

manner” is not limiting. Therefore, we do not find that Shimada’s discussion of photometry limits Shimada operations to a “hard-wired manner.”

Third, Petitioner notes that Shimada states that photometry “*may be performed . . . using the imaging element to determine data for which the respective pixel data has been averaged in a hard-wired manner for each area.*” Ex. 1005 ¶ 30 (emphasis added). Thus, Shimada does not proscribe operation using software in favor of hardware. Pet. Reply 21. Again, we agree with Petitioner that the reference to operation in a “hard-wired manner” is not limiting. Therefore, we do not find that Shimada’s discussion of photometry limits Shimada operations to a hard-wired manner.

Patent Owner’s fifth contention is directed to Shimada’s selection of four central areas for photometry and Patent Owner’s contention that this selection does not teach “weighting” or a “weighting table.” PO Resp. 34–37. In particular, Patent Owner contends that “Shimada’s selection of four areas for photometry, *and the exclusion of the remaining sixty areas*, is not tantamount to either the step of ‘weighting’ or a ‘weighting table’ as required by the challenged claims.” *Id.* at 34–35 (emphasis added, citing Ex. 2004 ¶¶ 42–46). Patent Owner contends that

in arguing that Shimada’s selection of four certain areas is “equivalent” to the claimed features, Petitioners are suggesting that Shimada uses a different process (without weighting) that yields an equivalent result that could be achieved using weighting. In other words, Petitioners are arguing that Shimada could apply a weight of 0 to the outer sixty areas, and a weight of 1 to the central four areas, and yield an equivalent result. But this is not how Shimada operates.

*Id.* at 35–36. Thus, Patent Owner concludes that “Shimada performs a

*selection* of areas for photometry, but Shimada does not perform any weighting and does not use any ‘weighting table’ in this selection process.” *Id.* at 35. We disagree.

As discussed above (*see supra* Section IV.A.3.a.i.), Mr. Parulski explains that “Shimada takes a binary approach (either counting an area or discounting an area), utilizing the central four areas of the image in the calculation and ignoring the remainder.” Ex. 1033 ¶ 92 (citing Ex. 1005 ¶ 50). Thus, for example, the four (4) center areas may be weighted one (1), and the sixty (60) surrounding areas may be weighted zero (0). *See* Ex. 2003, 62:18–63:4, 78:19–84:1; *see* Pet. Reply 17–18. Shimada discloses “uniform” weighting (Ex. 1001, col. 8, l. 60–col. 9, l. 3), and Mr. Parulski explains that uniform weighting equally weights all areas (*see, e.g.*, Ex. 2003, 171:13–20). *See* Pet. Reply 18–19. Mr. Parulski testifies that this is how Shimada operates when performing photometry uniformly on all 64 areas of Figure 4. *See, e.g.*, Ex. 2003, 69:10–70:22; *see also* Ex. 1005 ¶ 50 (“[W]hen the photographic subject is in a normal state other than a backlit state, photometry is performed for a wider area.”); *but see* Ex. 2004 ¶¶ 42–47. We credit Mr. Parulski’s testimony here. Thus, we are persuaded that Shimada teaches “weighting” as that term is here construed.

In its Figure 4, reproduced above (*see supra* Section IV.A.2.), Shimada further depicts a square imaging element measuring eight “areas” on a side and totaling sixty-four (64) areas. As noted above, Petitioner argues persuasively that Shimada teaches assigning numerical values to each of these areas. Pet. Reply 19 (citing Ex. 2003, 69:10–70:22). Further, Mr. Parulski testifies that:

Shimada further describes that “the size of the photometric area substantially may be selected by processing only the signals of the required photometric area.” [Ex. 1005 ¶ 50.] It would have been obvious to a POSITA that Shimada’s disclosure of “processing only the signals of the required photometric area” could advantageously be accomplished by using a memory having “luminance weighting tables” with binary values (e.g., “0” or “1”), which enable the CPU to identify the photometric areas to be included in the processing.

Ex. 1033 ¶ 115; *see* Ex. 2003, 84:11–94:11; *see also* *KSR*, 550 U.S. at 417 (“If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.”). Again, we credit Mr. Parulski’s testimony. Thus, we are persuaded that such an assignment of numerical values discloses a “weighting table,” such as that recited in challenged claim 16, and that a person of ordinary skill in the art would understand, in view of Shimada’s teachings, that such numerical values might be stored in a memory in the form of a table. Pet. 41 n.36; *see* Pet. Reply 19 (“Claim 16 differs from claims 1, 6 and 7 in that it requires a memory storing a “weighting table.”).

On this record, we are persuaded that Petitioner has shown that the first three *Graham* factors weigh in favor of finding that Shimada would have rendered the subject matter of claims 1, 6, 7, 14, and 16 of the ’029 patent obvious to one of ordinary skill in the art at the time of the invention.

*c. Secondary Considerations*

Patent Owner contends that evidence of secondary considerations of non-obviousness weighs against Petitioner’s challenges to claims 1, 6, 7, 14, and 16. PO Resp. 37. In particular, Patent Owner asserts that it has “achieved commercial success from licensing its patents to many of [Petitioner’s] competitors” and that “[Petitioner] admitted during litigation

that Patent Owner has collected more than \$22 million in licenses from [Petitioner's] competitors on [Patent Owner's] patents including the '029 patent.” *Id.* at 38 (citing Ex. 2005, 7:3–10, 58:12–60:8).<sup>7</sup>

Patent Owner contends that each of its licensees “was and is a large and sophisticated technology company.” *Id.* Citing the testimony of Patent Owner’s declarant, Dr. Wright, Patent Owner further contends that “[s]ophisticated corporations such as those that took licenses to [Patent Owner’s] patents would have necessarily considered the validity of the patent claims to which they took licenses.” *Id.* (emphasis omitted) (citing Ex. 2004 ¶ 66). Patent Owner additionally alleges that Petitioner “knew about and attempted to buy Patent Owner’s patents – including the ’029 patent – in 2011,” which, Patent Owner argues, “further demonstrates a long-felt need and praise by the accused infringer ([Petitioner]).” *Id.* Again citing Dr. Wright’s testimony, Patent Owner asserts that “[Patent Owner] did not file suit against [Petitioner] until 2014, and so Petitioner’s pursuit of the patents in 2011 must have been based on the merits of the patents themselves, including the ’029 patent.” *Id.* at 39 (citing Ex. 2004 ¶ 68).

In its Reply, Petitioner argues that Patent Owner’s “commercial success arguments are legally deficient and unsupported by evidence, and should be disregarded,” and,

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<sup>7</sup> Patent Owner also cites to Exhibit 2006. Because we exclude Exhibit 2006, we do not consider it further in the analysis of Patent Owner’s contentions concerning secondary considerations. *See infra* Section V. Nevertheless, because Patent Owner alleges that Exhibit 2006 includes “similar statements” to those contained in Exhibit 2005, we are persuaded that the deficiencies noted here with respect to Exhibit 2005 would apply equally to Exhibit 2006, and that our consideration of Exhibit 2006 would not alter the result we reach here.

in addition to entirely failing to show the required nexus between licensing fees and the claimed invention, [Patent Owner] omits key facts, including that: (1) [Patent Owner] *never* licensed the '029 [patent] individually, but rather only as part of its entire 100-patent portfolio; (2) *no* licensing revenue is specifically attributable to the '029 [patent]; and (3) the licenses were entered to settle litigation that ***did not concern the '029*** [patent].

Pet. Reply 21–22. Petitioner further argues that Patent Owner's "long-felt need and praise" argument is "similarly baseless." *Id.* at 23. Petitioner argues, for example, that Patent Owner cites in support of that contention only attorney argument from parallel litigation (*id.* (citing PO Resp. 38–39; Ex. 2005, 7:11–8:12)), and even then, the citation indicates only that Petitioner *explored* a potential purchase of [Patent Owner's] patents *as a group* (*id.* (citing Ex. 2005, 7:20–23)). Petitioner further argues that, in fact, it never made any *offer* for Patent Owner's patents, and there is no evidence that it ever investigated the '029 patent. *Id.*

Regarding Dr. Wright's testimony, we note that Dr. Wright does not claim to have any direct knowledge of the licensing agreements between Patent Owner and its competitors. Ex. 2004 ¶ 65 ("Here, I *understand* that Imperium has achieved commercial success from licensing its patents to many of Samsung's competitors, including Apple, Sony, and LG." (emphasis added)); Ex. 1037, 18:2–12. Dr. Wright explains that his understanding is based on his review of Exhibits 2005 and 2006. Ex. 2004 ¶ 65; Ex. 1037, 19:4–27:20. Further, with regard to Dr. Wright's testimony concerning the licensing practices of sophisticated, technology companies, Dr. Wright speculates as to what the practices of such companies might be and why, and Dr. Wright then applies those speculations to the companies at issue here. Ex. 2004 ¶ 66; Ex. 1037, 26:25–27:14. Dr. Wright does not

claim to have any direct knowledge of the licensing practices of sophisticated, technology companies, in general, or of the alleged licensors of Patent Owner's patents, in particular. Ex. 2004 ¶¶ 66; Ex. 1037, 15:6–20, 26:25–27:20. Consequently, we do not credit Dr. Wright's testimony concerning Patent Owner's license agreements or the licensing practices of the licensors.

Although Patent Owner advances attorney argument that its success in licensing its portfolio “must have been based on the merits of the patents themselves, including the '029 patent” (PO Resp. 39), Patent Owner cites no evidence in support of that argument. *See In re Geisler*, 116 F.3d 1465, 1471 (Fed. Cir. 1997) (attorney argument cannot take the place of evidence). The evidence that Patent Owner does cite, namely Dr. Wright's opinions that corporations, such as Patent Owner's licensees, “would have necessarily considered the validity of the patents to which they took licenses” and that Petitioner's alleged pursuit of Patent Owner's patents “was based on the merits of the patents themselves, including the '029 patent” (Ex. 2004 ¶¶ 66, 68; *see id.* ¶¶ 64, 65, 67), do not appear to be based on any actual knowledge regarding licensing negotiations. *See* Ex. 1036, 10:5–7 (“Q. Have you ever been involved with patent licensing negotiations? A. No, I have not.”). Moreover, Dr. Wright's testimony does not appear to be based on any actual knowledge regarding whether Petitioner or any of Patent Owner's licensees concluded that the '029 patent *in particular*, among all of the patents in Patent Owner's licensing portfolio, was likely valid or meritorious in any regard, or whether Petitioner ever had any interest in purchasing the '029 patent. *See* PO Resp. 38–39; *see also* Ex. 1036, 9:10–10:10 (Dr. Wright testifying that he is not an expert in, and has

had no personal experience with, patent licensing); Ex. 1037, 15:6–20 (accord). As such, we agree with Petitioner that such opinions amount to “pure conjecture and speculation” (Pet. Reply 23), and, together with Patent Owner’s contentions, are unpersuasive.

Having reviewed the parties’ contentions, we conclude that Patent Owner’s evidence of secondary considerations is weak and does not outweigh Petitioner’s strong evidence of obviousness in this case. Patent Owner, in particular, provides no persuasive evidence of any nexus between the alleged success of its licensing program and the merits of the ’029 patent. *See In re Huai-Hung Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (explaining that for “objective evidence of secondary considerations to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the claimed invention”); *CBS Interactive Inc. v. Helferich Patent Licensing, LLC*, IPR2013-00033, slip op. at 22 (PTAB Mar. 25, 2013) (Paper 21) (concluding that alleged secondary considerations were insufficient to defeat obviousness in light of failure to provide evidence of a nexus between the success of licensing program and merits of claimed invention rather than avoidance of litigation). Accordingly, we conclude that Petitioner has shown by a preponderance of the evidence that the challenged claims would have been obvious over Shimada.



*B. Lack of Sufficient Particularity in Petition*

In its Preliminary Response, Patent Owner contended that the Petition fails to comply with the Board's Rules for particularity. Prelim Resp. 14–19. In the Institution Decision, we determined that

*Although we agree with Patent Owner that Petitioner's arguments are not presented as clearly as we would desire, we are able to determine the grounds that Petitioner asserts against the challenged claims and the support for those grounds, upon which the Petitioner relies. Therefore, given our understanding of Petitioner's arguments and supporting evidence, we do not deny review based solely on the Petition's shortcomings.*

Inst. Dec. 11 (emphasis added). In its Patent Owner Response, Patent Owner asserts substantially identical complaints against the particularity of the Petition. PO Resp. 39–44; *see* Pet. Reply 24–25 (noting that “PO's previously unsuccessful but repeated argument that the Petition obfuscates the challenges being presented is baseless”). After again considering Patent Owner's contentions, we remain persuaded that the Petition meets the required level of particularity with regard to the instituted ground.

*C. Motion for Observations*

Patent Owner filed a Motion for Observations regarding Mr. Parulski's cross-examination. Paper 37 (“Obs.”). Petitioner, in turn, filed a Response. Paper 44 (“Obs. Resp.”). To the extent Patent Owner's Motion for Observations pertains to testimony purportedly impacting Mr. Parulski's credibility, we have considered Patent Owner's observations and Petitioner's responses in rendering this Final Written Decision, and accorded Mr. Parulski's testimony appropriate weight in view of Patent Owner's observations. *See* Obs. 1–8; Obs. Resp. 1–15.

*D. Constitutionality of Inter Partes Review Process*

In the Patent Owner Response, Patent Owner contends that the *inter partes* review process “violates the Separation of Powers doctrine of the United States Constitution.” PO Resp. 44. In particular, Patent Owner contends that:

Supreme Court authority dating back more than a century holds that a patent, upon issuance becomes the property of the patentee, is no longer within the control and jurisdiction of the Patent Office, and thus, is not subject to revocation or cancellation by any executive agent, including by any part of the USPTO. *McCormick Harvesting Mach. Co. v. Aultman*, 169 U.S. 606, 609 (1898).

*Id.* at 44–45. Petitioner responds that the Federal Circuit has rejected Patent Owner’s argument. Pet. Reply 25; *see MCM Portfolio LLC v. Hewlett-Packard Co.*, 812 F.3d 1284, 1288–92 (Fed. Cir. 2015), *cert. denied*, 2016 WL 1724103 (U.S. Oct. 11, 2016); *Cooper v. Square, Inc.*, 645 F. App’x 1014 (Fed. Cir. 2016), *cert. denied*, 2016 WL 3856113, (U.S. Nov. 14, 2016). Although “administrative agencies do not have jurisdiction to decide the constitutionality of congressional enactments,” we are bound by the precedential decision by our reviewing court. *See Riffin v. Office of Senate Fair Employment Practices*, 61 F.3d 1563, 1569 (Fed. Cir. 1995); *Apple Inc. v. Smartflash LLC*, Case CBM2015-00028, slip op. at 23–24 (PTAB May 26, 2016) (Paper 44); *see also Harjo v. Pro-Football, Inc.*, 50 USPQ2d 1705, 1710 (TTAB 1999) (“[T]he Board has no authority . . . to declare provisions of the Trademark Act unconstitutional.”); *Amanda Blackhorse v. Pro-Football, Inc.*, 111 USPQ2d 1080, 1082 n.1 (TTAB 2014); *but see Am. Express Co. v. Lunenfeld*, Case CBM2014-00050, slip op. at 10 (PTAB May 22, 2015) (Paper 51) (explaining that “for the reasons articulated in *Patlex*

[*Corp. v. Mossinghoff*, 758 F.2d 594 (Fed. Cir. 1985)], we conclude that covered business method patent reviews, like reexamination proceedings, comply with the Seventh Amendment”). Thus, because the Federal Circuit previously has rejected substantially similar constitutional challenges, Patent Owner’s challenge to the constitutionality of the *inter partes* review process is *denied*.

## V. MOTION TO EXCLUDE

Petitioner filed a Motion to Exclude Evidence, seeking to exclude Exhibits 2005 and 2006. Paper 40 (“Mot.”). Patent Owner filed an Opposition (Paper 43, “Opp.”) to Petitioner’s Motion to Exclude Evidence, and Petitioner filed a Reply to Patent Owner’s Opposition (Paper 45, “Opp. Reply”).

In its motion, Petitioner characterizes its challenge to Exhibits 2005 and 2006, stating “[t]hese exhibits appear to be incomplete snippets of opening and closing arguments from a trial earlier this year, with no indication of who is arguing or which party they represent; they are not evidence.” Mot. 1; *see id.* at 5–6. Further, to the extent that these “snippets” are evidence, Petitioner argues that they are inadmissible hearsay. *Id.* at 6–7.

With respect to Exhibit 2005, Patent Owner disagrees with Petitioner’s assertion that there is no indication of who made the purported statements. *Id.* at 4. Patent Owner contends, instead, that, regarding Exhibit 2005, “[i]t is clear from the surrounding context that the statements on pages 58-60 were all delivered by *an attorney* for Petitioner.” *Id.* (emphasis added). Moreover, with respect to Exhibit 2006, Patent Owner acknowledges that, not only does the exhibit present attorney argument, but

it presents the argument of Patent Owner's attorneys. Opp. 5 ("While Patent Owner acknowledges that the statements in Exhibit 2006 regarding the licensing agreements, *see, e.g.*, Exhibit 2006 at 16:23-17:2, were delivered by its attorneys, not Petitioners' attorneys, that fact does not alter the conclusion.").

With respect to Exhibits 2005 and 2006, Patent Owner contends that party admissions in opening and closing statements are admissible as exceptions to the rule against hearsay. Opp. 1-3 ("These statements thus qualify as relevant admissions of a party, and fall under that exception to the hearsay rule."). Federal Rules of Evidence 801(d)(2)(C) and (D) provide that a hearsay exception exists when "[t]he statement is offered against an opposing party and . . . was made by a person whom the party authorized to make a statement on the subject [or] was made by the party's agent or employee on a matter within the scope of that relationship and while it existed." *See* Opp. 3 (citing 37 C.F.R. § 42.62 for applicability of Federal Rules of Evidence to *inter partes* review proceedings). If, as Patent Owner asserts, Exhibit 2005 includes the statements against Petitioner's interest by Petitioner's counsel, those statements appear to fall within the hearsay exception. What is less clear is the scope of those statements upon which Patent Owner is relying. The statements, allegedly delivered by Petitioner's counsel, go to the contention that Patent Owner licensed several of Patent Owner's patents for \$22 million dollars. *Id.* ("Here, statements in Exhibit 2005 that Patent Owner had entered into above-mentioned agreements totaling more than \$22 million were offered by Petitioners' counsel, in support of Petitioners' defense, and are thus admissible against

Petitioners.”). Such statements arguably fall within the hearsay exception.<sup>8</sup>

Federal Rule of Evidence 801(d)(2)(B) provides that a hearsay exception exists when “[t]he statement is offered against an opposing party and . . . is one the party manifested that it adopted or believed to be true.” Patent Owner overstretches this hearsay exception when it attempts to apply it to its own counsel’s “similar statements” to those allegedly made by Petitioner’s counsel. Opp. 3; Opp. Reply 3 (“Even assuming, *arguendo*, PO had somehow shown that the statements on pages 58–60 of Exhibit 2005 were attributable to Petitioners—a fact PO has not established—PO neglects to explain how they manifest, even circumstantially, assent to the truth of PO’s *non-identical statements* in Exhibit 2006.” (emphasis added)). We are not persuaded that such “similar statements” fall within this hearsay exception.

Regarding Petitioner’s argument that the speakers in Exhibits 2005 and 2006 are not identified, we agree that Patent Owner, the proponent of these exhibits, does not identify *expressly* the person or persons presenting the testimony reproduced in the exhibits either in the exhibits or in its Opposition to Petitioner’s Motion to Exclude Evidence. Opp. 2–3. This is especially remarkable with respect to Exhibit 2006, the statements in which Patent Owner acknowledges were made by its own attorney. Petitioner argues that

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<sup>8</sup> With regard to Petitioner’s arguments that Exhibit 2005 is not relevant to the Patent Owner’s contentions regarding secondary considerations of non-obviousness (Mot. 7 (citing Federal Rule of Evidence 401 and 402)), the bar for relevancy here is relatively low. Although we find Exhibit 2005 relevant, as noted above, we do not find Exhibit 2005 persuasive. *See* Opp. Reply 5 (conflating relevancy with weight).

while Patent Owner relies on certain portions of the Exhibits to show what Petitioners “admitted” (*see* [PO Resp.] 38), the Exhibits fail to identify the individuals who made the purported admissions, or which side they were on. *Without such information, Patent Owner cannot possibly establish that the statements contained within the Exhibits are non-hearsay. See* [Federal Rule of Evidence] 801(d)(2)(A)–(D) (party admissions must be “made by the party” or the party’s agent, employee or authorized representative).

Mot. 6–7 (emphasis added). We note, however, that Petitioner does not dispute that the statements in Exhibit 2005 were made by its attorney, that its attorney was authorized to make those statements, or that the statements in Exhibit 2006 were made by Patent Owner’s attorney. Generally, we would find it insufficient that the parties may be able to determine the identity of the person or persons presenting the testimony reproduced in Exhibit 2005 or 2006, by other means. *See* Opp. 4 n.1. Although we do not know the names of the speakers, there appears to be no dispute that the speaker in Exhibit 2005 is an attorney for Petitioner and the speaker in Exhibit 2006 is an attorney for Patent Owner. For purposes of ruling on Petitioner’s Motion, that is enough.

Accordingly, we are not persuaded that Petitioner has shown that Exhibit 2005 should be excluded as inadmissible hearsay or as irrelevant, and we *deny* Petitioner’s Motion to Exclude Evidence with respect to Exhibit 2005. Nevertheless, we are persuaded that Exhibit 2006 does not fall within the hearsay exceptions, and we *grant* Petitioner’s Motion to Exclude Evidence with respect to Exhibit 2006. Therefore, we exclude Exhibit 2006, and we do not consider that exhibit, or credit the arguments in Patent Owner’s Response relying solely on that exhibit for support, in this proceeding. *See supra* Section IV.A.3.c.

## VI. CONCLUSION

For reasons stated above, we conclude that Petitioner has established by a preponderance of the evidence that Shimada would have rendered obvious claims 1, 6, 7, 14, and 16 of the '029 patent to one of ordinary skill in the art at the time of the invention.

## VII. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 6, 7, 14, and 16 of the '029 patent are held unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude Evidence is *granted-in-part and denied-in-part*; the motion is *granted* with respect to Exhibit 2006 and *denied* with respect to Exhibit 2005;

FURTHER ORDERED that Exhibit 2006 is excluded; and

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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