

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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VIZIO, INC.,  
Petitioner,

v.

MAXELL, LTD.,  
Patent Owner.

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IPR2022-01463  
Patent 7,760,213 B2

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Before KEVIN C. TROCK, JOHN A. HUDALLA, and  
JASON W. MELVIN, *Administrative Patent Judges*.

*Per curiam.*

Opinion Concurring filed by MELVIN, *Administrative Patent Judge*.

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

## I. INTRODUCTION

Vizio, Inc., (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–5 and 9 (the “challenged claims”) of U.S. Patent No. 7,760,213 B2 (Ex. 1001, “the ’213 patent”). Maxell, Ltd., (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Pursuant to 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review.

An *inter partes* review may not be instituted unless “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). For the reasons set forth below, we conclude that Petitioner has shown a reasonable likelihood it will prevail in establishing the unpatentability of at least one challenged claim, and we institute *inter partes* review.

### A. REAL PARTIES IN INTEREST

Petitioner identifies itself as the real party in interest. Pet. 1. Patent Owner also identifies itself as the real party in interest. Paper 3, 1 (Patent Owner’s Mandatory Notices).

### B. RELATED MATTERS

The parties identify the following related litigation: *Maxell, Ltd. v. Vizio, Inc.*, No. 2:21-cv-06758 (C.D. Cal.). Pet. 1; Paper 3, 1.

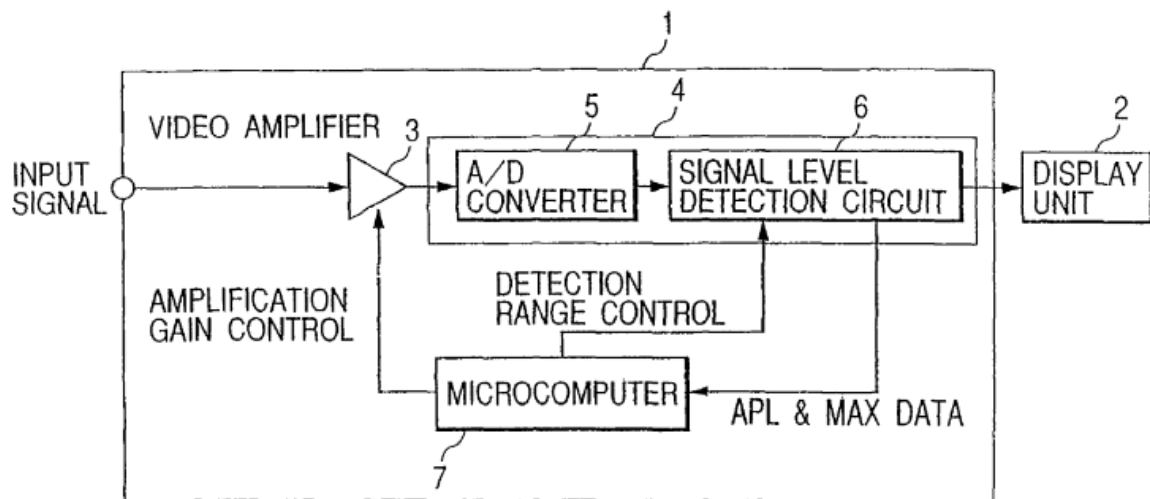
### C. THE ’213 PATENT

The ’213 patent is titled “Contrast Adjusting Circuitry and Video Display Apparatus Using Same.” Ex. 1001, code (54). It issued from an

application filed April 22, 2009, and claims priority to an application filed November 15, 2002. *Id.*, codes (22), (63).

The '213 patent relates to circuitry that adjusts video-signals “to offer stable and high contrast video images.” *Id.* at 1:44–45. It does so “by changing the gain made by the amplifying means, based on maximum picture level data and average picture level data for analog-to-digital converted luminance signals.” *Id.* at 1:55–59. The '213 patent's Figure 1 is reproduced below:

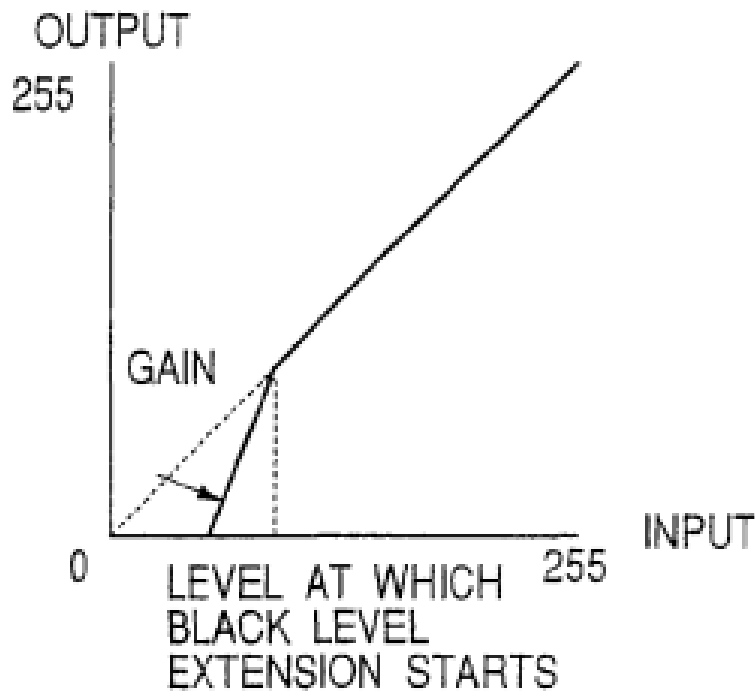
**FIG. 1**



*Id.*, Fig. 1. Figure 1 depicts contrast adjusting circuitry 1 including an input signal going to video amplifier 3, which outputs to circuit block 4, “in which digital signals are obtained and their picture levels are detected” and provided to microcomputer 7. *Id.* at 2:61–3:3. Microcomputer 7 “determines one of the predefined luminance regions within which the detected maximum picture level falls and one of the predefined luminance regions within which the detected average picture level falls and generates and

outputs a control signal, according to the thus determined luminance regions of the maximum and average picture levels.” *Id.* at 3:3–10.

The ’213 patent describes “a black level extension function used to render video images with a sharper black.” *Id.* at 5:27–29. It illustrates the effect with Figure 5a reproduced below:



*Id.*, Fig. 5(a). Figure 5(a) “shows a relationship between the input level and the output level of luminance signals when black level extension is performed,” in which the input signal, for luminance values below a certain threshold, have a higher gain applied, resulting in depressing the output level for luminance values below the threshold. *Id.* at 5:27–35. The ’213 patent states that “the output level depression is controlled by gain and the gain is controlled, based on the average picture level (APL).” *Id.* at 5:35–38.

#### D. CHALLENGED CLAIMS

Challenged claim 1 is independent and is reproduced below:<sup>1</sup>

1. A video display apparatus which displays a video image based on a video signal using a fixed-pixel type device, comprising
  - [1a] a contrast adjusting unit to adjust the contrast of the video image by controlling the gain of the video signal based on a maximum luminance level information and an average luminance level information of the video signal; and
  - [1b] a black level extension unit to perform black level extension processing for the video signal,
  - [1c] wherein the black level extension unit is configured to decrease an output luminance level corresponding to an input luminance level which is equal to or lower than a starting level set for the video signal in the case where the contrast is adjusted to increase by the contrast adjusting unit input luminance level which is equal to or lower than a starting level set for the video signal in the case where the contrast is adjusted to increase by the contrast adjusting unit.

Ex. 1001, 13:39–14:4. Claims 2–5 and 9 depend directly from claim 1. *Id.* at 14:5–19, 14:44–47.

#### E. PRIOR ART AND ASSERTED GROUNDS

Petitioner asserts the following grounds of unpatentability:

| Claim(s) Challenged | 35 U.S.C. § | Reference(s)/Basis   |
|---------------------|-------------|----------------------|
| 1–5                 | 102(a)/(b)  | Akbayir <sup>2</sup> |

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<sup>1</sup> We include bracketed limitation designations, consistent with Petitioner. Ex. 1004.

<sup>2</sup> European Patent Application No. 98109976.5 (Ex. 1006).

| Claim(s) Challenged | 35 U.S.C. § | Reference(s)/Basis           |
|---------------------|-------------|------------------------------|
| 1–5, 9              | 103         | Akbayir, Kakuya <sup>3</sup> |
| 1–5                 | 102(a)/(b)  | Funamoto <sup>4</sup>        |
| 1–5, 9              | 103         | Funamoto, Kakuya             |

Pet. 4. Petitioner also relies on the Declaration of Dr. Robert Stevenson.  
Ex. 1003.

## II. ANALYSIS

### A. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner asserts that ordinarily skilled artisans “would have held a bachelor’s or master’s degree in the field of electrical engineering, computer science, or physics, or a bachelor’s or master’s degree in a related field and at least one year of experience in designing or developing hardware or software for televisions.” Pet. 15–16 (citing Ex. 1003 ¶ 35). Patent Owner does not dispute that definition. *See generally* Prelim. Resp. We adopt Petitioner’s definition as supported by expert testimony.

### B. CLAIM CONSTRUCTION

Petitioner proposes that two claim terms should be construed as means-plus-function recitations under 35 U.S.C. § 112 ¶ 6, and that all other terms should be applied without construction using their plain and ordinary meaning. Pet. 16–19. The two terms Petitioner identifies are “contrast adjusting unit” and “black level extension unit.” *Id.* Although Patent Owner

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<sup>3</sup> WO 01/39495 (Ex. 1007 (certified translation); Ex. 1008 (original Japanese)).

<sup>4</sup> Canadian Patent Application No. 2,336,803 (Ex. 1010).

appears to have asserted in the district court that § 112 ¶ 6 does not apply to either term (*see* Ex. 1025, 21–26), both parties proposed constructions to the district court under § 112 ¶ 6 (Ex. 2001, 27 (“The parties agree that ‘a contrast adjusting unit’ is a means-plus-function claim term”), 28 (same, as to “black level extension unit”).

In its claim-construction order, the district court did not discuss whether § 112 ¶ 6 applies. Ex. 2001, 27–29. The parties have not analyzed the issue here. Nor have they analyzed the proper scope for corresponding structure if § 112 ¶ 6 does apply. Rather, they simply assert differing constructions without further explanation. *See* Pet. 16–19; Prelim. Resp. 21–23. The district court did not discuss how it reached its constructions, and construed the structure corresponding to the “contrast adjusting unit” as “contrast adjusting circuitry” with additional functional restriction. Ex. 2001, 28. The court construed the structure corresponding to the “black level extension unit” as “a circuit configured to” perform functions beyond those recited in the claims. *Id.* at 29.

The record does not resolve whether skilled artisans at the time understood “contrast adjusting unit” or “black level extension unit” to connote structure. Petitioner’s expert opines that both terms “are means-plus-function terms” but offers no explanation for that conclusion. Ex. 1003 ¶ 40. Patent Owner has not offered expert testimony at this stage. Because there is a presumption that § 112 ¶ 6 does not apply in the absence of the word “means,” we feel the better approach is for the parties to brief claim construction before adopting an approach that departs from the presumption. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (“When a claim term lacks the word ‘means,’ the presumption can be

overcome and § 112, para. 6 will apply if the challenger demonstrates that the claim term fails to ‘recite sufficiently definite structure’ or else recites ‘function without reciting sufficient structure for performing that function.’” (quoting *Watts v. XL Sys., Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000))).

Moreover, even if § 112 ¶ 6 applies, the parties have not supported their competing views regarding the structure that corresponds to the claimed functions. Thus, we conclude that claim construction is best performed during the instituted trial. During trial, the parties should first support their contentions that the two terms require construction in means-plus-function format. Further, they should support their contentions regarding the proper scope for corresponding structure. In particular, it appears that the district court adopted corresponding structures purportedly defined by various functions, rather than structures known to skilled artisans that the specification links to the claimed functions. *See* Ex. 2001, 26–29.

Although the specification describes elements that perform the claimed functions, that does not mean those elements identify structures that would have been known to skilled artisans. *See Diebold Nixdorf, Inc. v. Int’l Trade Comm’n*, 899 F.3d 1291, 1300 (Fed. Cir. 2018) (holding that it was error to define a structure in purely functional terms, without the specification’s guidance regarding “what structure or class of structures” ). The key is whether the specification describes at least a class of structures identifiable by skilled artisans. *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1322 (Fed. Cir. 2004) (“That the disputed term is not limited to a single structure does not disqualify it as a corresponding structure, as long as the class of structures is identifiable by a person of ordinary skill in the art.”).

For example, while a skilled artisan might have understood “contrast adjusting circuitry” generally, the record does not reflect whether artisans would have understood that term as circuitry that “adjust[s] the contrast of the video image by controlling the gain of the video signal based on a maximum luminance level information and an average luminance level information of the video signal” as claimed. Therefore, it is not apparent that the specification’s description of “contrast adjusting circuitry” would itself provide adequate corresponding structure. *See, e.g.*, Ex. 1001, 2:49–58, 2:61–62. The specification describes additional detail regarding the “contrast adjusting circuitry,” and that detail may be part of the corresponding structure. For example, the specification describes using an A/D converter to convert analog signals to digital and a “signal level detection circuit that detects maximum and average pictures levels” of the digital signal. *Id.* at 2:67–3:3.

The specification describes that “microcomputer 7” generates and outputs a control signal based on the detected maximum and average picture levels. *Id.* at 3:17–25. Identifying computer-implemented corresponding structure requires further identifying the algorithm used by the computer. *Aristocrat Techs. Austl. Pty Ltd. v. Int’l Game Tech.*, 521 F.3d 1328, 1333 (Fed. Cir. 2008) (citing *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339 (Fed. Cir. 1999)). The specification describes also that “the APL region determiner 18, MPL region determiner 19, and gain controller 20 may be integrated into a single entity of hardware, for example a microcomputer.” Ex. 1001, 6:38–40. Although that description uses optional language—“may be” and “for example”—the specification does not appear to describe structures other than a microcomputer for performing those

functions. Thus, the parties should address whether the specification describes known structures that perform the claimed functions or whether the corresponding structure includes an algorithm described in the specification.

An algorithm that is part of the corresponding structure must include the particular steps used to produce the claimed function. *Ergo Licensing LLC v. CareFusion 303, Inc.*, 673 F.3d 1361, 1363 (Fed. Cir. 2012) (“Even described in prose, an algorithm is still a step-by-step procedure for accomplishing a given result.”) (quotations omitted); *Triton Tech of Texas, LLC v. Nintendo of Am., Inc.*, 753 F.3d 1375, 1378–79 (Fed. Cir. 2014) (“However, merely using the term ‘numerical integration’ does not disclose an algorithm—i.e., a step-by-step procedure—for performing the claimed function.”). Here, we leave to the parties to support their respective views regarding what steps are disclosed for performing the claimed functions. We note that an algorithm must be sufficiently specific to describe how the claimed function is performed, not simply a repetition of claimed function. *See Blackboard, Inc. v. Desire2Learn, Inc.*, 574 F.3d 1371, 1384 (Fed. Cir. 2009) (“Like the specification in *Aristocrat*, that language ‘simply describes the function to be performed.’ It says nothing about how the access control manager ensures that those functions are performed. As such, the language ‘describes an outcome, not a means for achieving that outcome.’” (quoting *Aristocrat*, 521 F.3d at 1334)).

Given the complex nature of construction under § 112 ¶ 6, and the lack of briefing from the parties, we determine that the best course here is to apply the claims’ plain language without construction for purposes of institution. We note that Petitioner’s proposed constructions appear to follow

the claim language, in that they require the claimed functions be performed by circuit components, without the addition of additional functions reflected in the asserted structures of Patent Owner’s proposed constructions.

*Compare* Pet. 17–19, *with* Prelim. Resp. 22–23. We discern little, if any, difference in our analysis that would result from applying Petitioner’s proposed constructions.

To the extent that the scope of a particular claim term impacts a party’s argument during trial, the party should propose an express construction and show how the record supports it. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

### C. ANTICIPATION BY AKBAYIR

Petitioner asserts that Akbayir anticipates claims 1–5. Pet. 32–51.

Akbayir discloses a method and apparatus for dynamic contrast improvement in video. Ex. 1006, code (57). In Akbayir’s method, “picture contrast is optimised by analyzing the picture contents of the displayed video pictures and adjusting the contrast dependent on the results of the picture content analysis step.” *Id.* ¶ 3. Akbayir preferentially uses a “dual segment transfer function,” which “consists of two segments with an adaptive pivot point” at the transition between the two. *Id.* ¶ 4. The transfer function characteristics depend on image average brightness, dark sample distribution, and frame peak value. *Id.* ¶ 5. Akbayir’s Figure 1 shows an exemplary dual segment transfer function and is reproduced below:

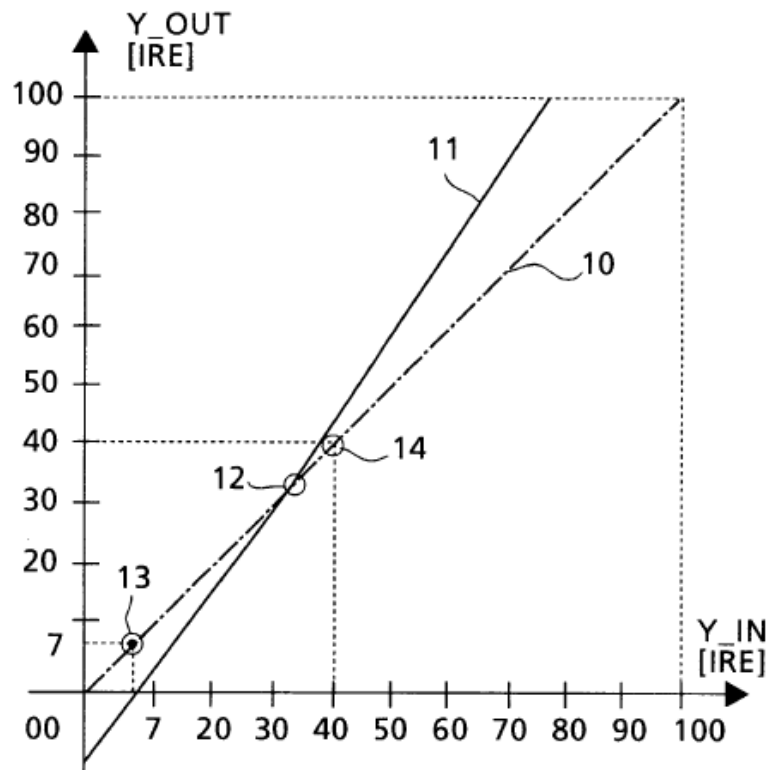


**Fig.1**

*Id.* at 12 (Fig. 1). Figure 1 shows input luminance values on its x-axis and output luminance values on its y-axis, where 0 IRE<sup>5</sup> represents black and 100 IRE represents white, such that an unmodified signal has a straight-line transfer function with slope of 1 (shown as reference number 10) and a modified signal has dual segment transfer function 11 with one gain for input values above adaptive pivot point 12 (the upper segment) and another gain for input values below adaptive pivot point 12 (the lower segment). *Id.* ¶¶ 18–20. The upper segment gain is computed based on the detected peak value and the pivot point location is adaptive to the average image brightness. *Id.* ¶¶ 23–25.

<sup>5</sup> IRE (Institute of Radio Engineers) units are used for luminance. Ex. 1006 ¶ 18.

Akbayir discloses exemplary hardware implementing its methods. Figure 6 depicts an image analysis unit 40, which includes average brightness analysis unit 410, frame peak analysis unit 430, and parameter computation unit 450. *Id.* ¶ 31, Fig. 6. Image analysis unit 40 outputs: TF\_DPP, the transfer function pivot point value; GAIN\_SEG1\_FRC, the fraction part of first segment (lower segment) gain; and GAIN\_SEG2\_FRC, the fraction part of second segment (upper segment) gain. *Id.* ¶¶ 41–48, 50, Fig. 10.

1. “contrast adjusting unit”

Petitioner maps the claim language to Akbayir’s disclosures, asserting for the contrast adjusting unit that Akbayir’s image analysis unit 40 determines the frame peak value and average brightness, and generates a control signal for the upper segment gain, which transfer function unit 30 applies to the video signal. Pet. 33–38. In our view, Petitioner’s assertions support that Akbayir’s image analysis unit adjusts contrast by controlling video-signal gain based on maximum and average luminance levels. *See* Ex. 1006 ¶¶ 4 (“[The] dual segment transfer function . . . consists of two segments with an adaptive pivot point which separates the two segments.”), 6 (“The gain of the upper segment is adaptive to the frame peak value . . . .”), 7 (“[T]he pivot point . . . is adaptive to the average image brightness . . . .”).

Patent Owner argues that Akbayir does not teach contrast adjusting circuitry that sets gain based on determining which predefined luminance region the maximum luminance level falls in. Prelim. Resp. 31–33. That argument is based on Patent Owner’s proposed claim construction, which we do not adopt at this stage. *See supra* at 6. The claim language does not

require “determining a predefined luminance region within which the maximum luminance level falls” and Patent Owner has not explained why we should construe the claims to require that.

Accordingly, we conclude that the present record supports Petitioner’s contentions regarding the claimed contrast adjusting unit.

2. “black level extension unit”

Petitioner identifies Akbayir’s dual segment transfer function unit as the structure that performs black level extension processing (in addition to acting as the contrast adjusting unit as described above) by adjusting gain for the video signal below the pivot point. Pet. 39–43. Petitioner relies on Akbayir’s description that TF\_DPP represents the “Transfer function dynamic pivot point” and “GAIN\_SEG1\_FRC” represents the gain for the first (lower) segment of the intended transfer function. Ex. 1006 ¶ 50.

Patent Owner argues that Akbayir does not disclose a “black level extension unit” because it discloses TF\_DPP and GAIN\_SEG1\_FRC are “each a value of a mathematical equation” rather than a “control signal” as required by the claim. Prelim. Resp. 34. We do not agree. Akbayir discloses that the parameters calculated by image analysis unit 40 are “supplied to the dual segment transfer function unit.” Ex. 1006 ¶ 48. And it is clear from Akbayir’s disclosures, including Figures 6, 10, and 11, that the pivot point and gain parameters are represented by register values or circuit signals. Those figures label signals with the asserted parameters and are consistent with Akbayir’s textual description. *Id.*, Figs. 6, 10, 11.

Accordingly, we conclude that the present record supports Petitioner’s contentions regarding the claimed black level extension unit.

3. Black level extension unit “configured to decrease an output luminance level corresponding to an input luminance level which is equal to or lower than a starting level set for the video signal in the case where the contrast is adjusted to increase by the contrast adjusting unit”

Petitioner asserts that Akbayir’s approach, using its lower transfer-function segment to decrease luminance of dark samples, is consistent with the claim language. Pet. 44–48. Petitioner maps the “starting level set for the video signal” as the luminance level immediately below Akbayir’s pivot point. *Id.* at 44. Petitioner reasons that an input video signal (Y\_CORED) lower than the pivot point (TF\_DPP) is “an input luminance level which is equal to or lower than a starting level set for the video signal,” and Akbayir discloses applying the lower segment of its transfer function to darken the video signal. *Id.* at 44–45. Because that portion of the input signal is below the pivot point, Akbayir’s equation for the output signal produces a result less than the input signal. *Id.* (citing Ex. 1006 ¶ 50). That effect is seen in Akbayir’s Figure 1, which shows that dual segment transfer function 11 below pivot point 12 produces an output level lower than the input level. Ex. 1006, Fig. 1; *see* Pet. 46 (annotating Akbayir’s Figure 1). Akbayir’s Figure 1 shows the effect of Akbayir’s dual-segment transfer function on “dark samples,” i.e., those below pivot point 12, such that transfer function 11 results in dark samples having reduced luminance compared to the input signal. Ex. 1006 ¶¶ 18–21, Fig. 1. Further, Petitioner explains, Akbayir’s asserted contrast adjusting unit increases the contrast in Figure 1’s example, as shown by the upper segment of the dual segment transfer function 11 having a steeper slope than the unadjusted transfer function 10. Pet. 46–48.

Patent Owner argues that Akbayir's dual segment transfer function applies only one of its two segments, not both, to the video signal. Prelim. Resp. 35–40. According to Patent Owner, because the gain is defined for the two segments separately, the transfer function cannot apply both gains. *Id.* at 38 (citing Ex. 1006 ¶ 50). We do not agree. Akbayir does not describe the upper and lower segments as mutually exclusive alternatives, but as different operations to apply to different parts of a video signal. Ex. 1006 ¶ 50; *accord id.* ¶¶ 4 (“A lower segment for dark samples and an upper segment for light samples.”), 17 (“[T]he new dynamic contrast improvement method applies only the luminance signal to the transfer function which assigns to each luminance signal point (pixel of the video picture) an output value thus resulting in improved picture contrast and quality.”), 18 (noting that Figure 1 shows “the effect of the transfer function”).

Patent Owner asserts that Petitioner misreads Akbayir's equations and that Akbayir's transfer function would result in reduced contrast, not increased contrast as the claims require. Prelim. Resp. 38–39. This again misunderstands Akbayir. Akbayir computes the parameters for its dual segment transfer function for each video frame and applies the transfer function to each pixel. Ex. 1006 ¶ 17 (“The basic function of the dynamic contrast improvement method DCI according to the invention is to analyze the picture framewise in real time and adjust the parameters of a transfer function . . . which assigns to each luminance signal point (pixel of the video picture) an output value thus resulting in improved picture contrast and quality.”). Thus, it makes sense that a particular pixel may fall on either side of the pivot point and thus will be adjusted according to one of the two segments.

Patent Owner does not otherwise contest Petitioner's contentions for anticipation of claim 1 by Akbayir. We have reviewed Petitioner's contentions and conclude that Petitioner has shown a reasonable likelihood of prevailing with respect to anticipation of claim 1 by Akbayir.

4. Claim 2

Claim 2 depends from claim 1 and further requires "the contrast adjusting unit is configured to adjust the contrast of the video image by controlling the gain of an analog video signal or the gain of a digital video signal." Petitioner asserts that "[a]ll video signals are either analog or digital" and that claim 2 therefore has the same scope as claim 1. Pet. 48.

Patent Owner takes issue with that position and asserts that the '213 patent discloses an A/D converter for processing analog signals. Prelim. Resp. 41. To the extent that Patent Owner asserts that claim 2 requires the ability to process both types of signals, Patent Owner should support that contention with a claim-construction argument. The plain language of claim 2, however, requires only one or the other, and we agree with Petitioner that claim 2 has the same scope as claim 1. Accordingly, Petitioner's contentions for claim 2 support institution.

5. Additional claims

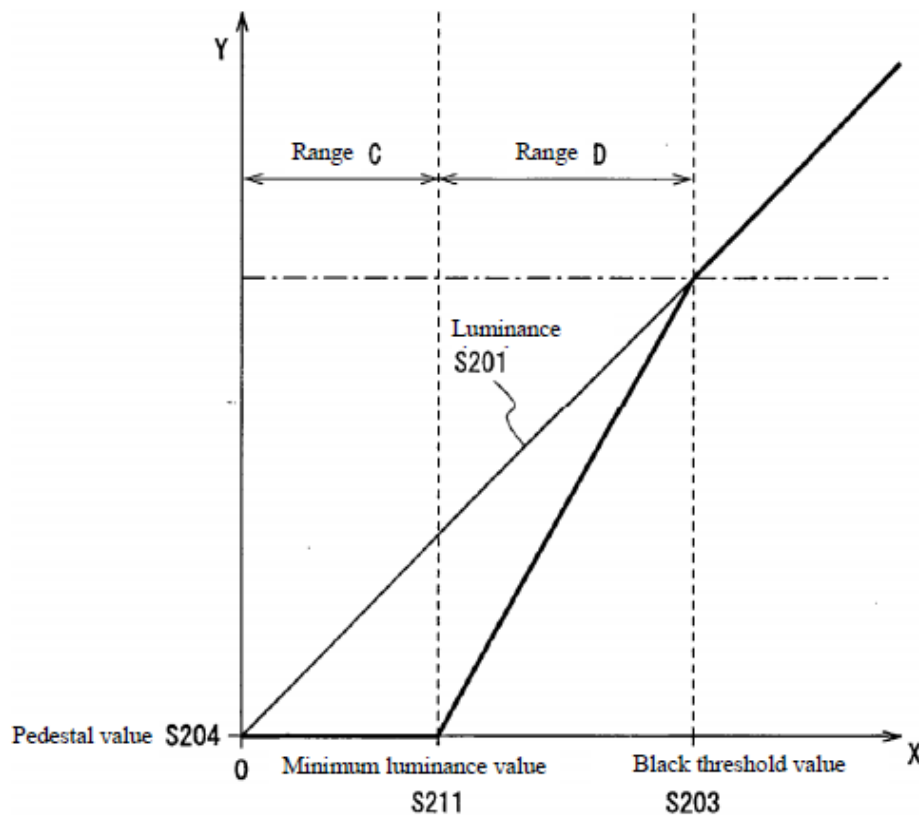
For the additional dependent claims (3–5), Patent Owner challenges Petitioner's showing only to the extent discussed above regarding claim 1. Prelim. Resp. 42. We have reviewed Petitioner's contentions for those claims and determine they support institution. *See* Pet. 49–51.

D. OBVIOUSNESS OVER AKBAYIR AND KAKUYA

Petitioner relies on Kakuya's teachings regarding black level extension, and that combining those teachings with Akbayir's teachings discussed above would have rendered obvious claims 1–5 and 9. Pet. 51–63.

Petitioner asserts that Kakuya discloses black level extension processing that reduces output luminance for signal values below a black threshold value. Kakuya's Figure 14 is reproduced below:

**FIG. 14**

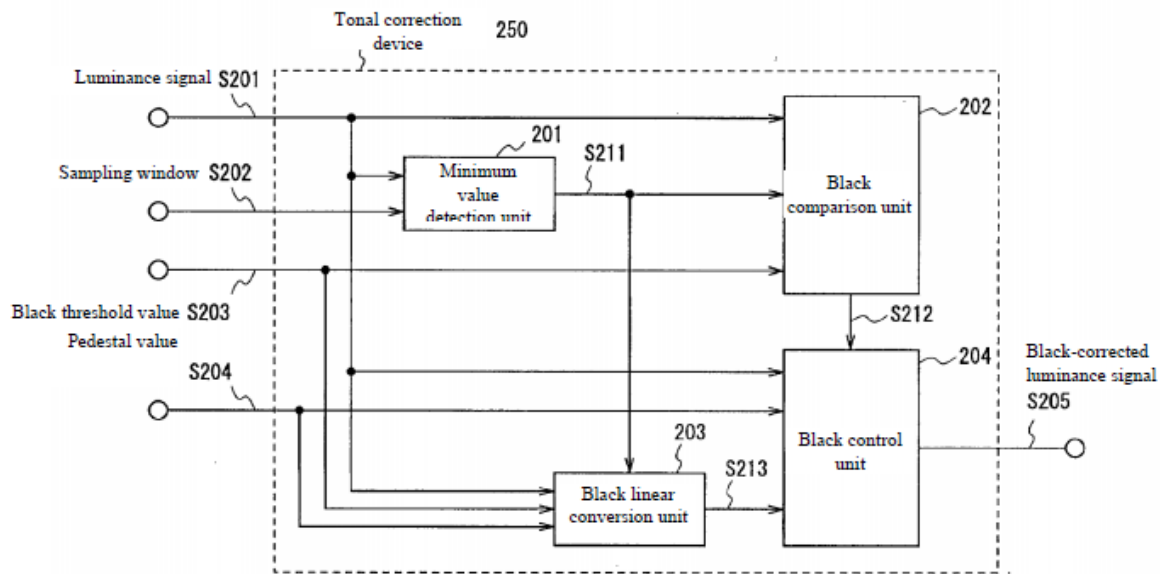


Ex. 1007, 62<sup>6</sup> (Fig. 14). Figure 14 illustrates the relationship between luminance signal S201 and the black-corrected luminance signal S205 such

<sup>6</sup> Our citations use the exhibit's pagination rather than the original document's pagination.

that, when luminance signal S201 is below black threshold value S203, its value is reduced to zero for values of luminance signal S201 at or below minimum luminance value S211. *Id.* at 30–31. Kakuya illustrates one embodiment of its “tonal correction device” in Figure 12, reproduced below:

FIG. 12



*Id.* at 60 (Fig. 12). Figure 12 illustrates a block diagram of tonal correction device 250 including black control unit 204 and accepting luminance signal S201 and outputting black-corrected luminance signal S205. *Id.* at 28.

Petitioner reasons that Akbayir discloses the possibility of using alternative transfer functions. Pet. 58 (citing Ex. 1006 ¶ 61). And Akbayir notes the “strong demand for picture contrast.” *See id.* (quoting Ex. 1006 ¶ 2). Thus, Petitioner asserts that Akbayir itself motivated skilled artisans “to include additional luminance signal processing to further enhance the contrast.” *Id.* Petitioner’s proposed combination uses Kakuya’s “black control unit 204” to modify a video signal and produce “sharper black portions.” *Id.* at 54.

Petitioner reasons that modifying Akbayir to use Kakuya's black-correction approach would have been a "straightforward use of a known technique (i.e., decreasing the luminance of those portions of the video signal falling below a particular threshold) to improve a similar device (i.e., Akbayir and Kakuya are both concerned with enhancing contrast in video displays) in a similar way." *Id.* at 59. Petitioner further relies on similarity between Akbayir's and Kakuya's approaches to adjusting contrast for dark portions of the video signal. *Id.* at 59–60.

Thus, Petitioner relies on Kakuya's black controller 204 as the claimed black level extension unit, and submits that it would facilitate a straightforward combination with Akbayir's circuit because "the components are effectively discrete and modular and adding the components necessary to apply Kakuya's black-correction approach would be a simple application of basic engineering principles." Pet. 61 (citing Ex. 1003 ¶ 122; Ex. 1007, 50). We understand the physical combination as portions of Akbayir's "transfer function adaptation unit" having been replaced with Kakuya's black control unit 204.

*1. "black level extension unit"*

Petitioner asserts that Kakuya's black controller 204 receives a control signal (black linear-converted luminance signal S213) and outputs black-corrected luminance signal S205. Pet. 54. Kakuya describes that "black linear-converted luminance signal S213" is the adjusted luminance signal shown in Figure 14's "Range D" as having a higher slope than luminance signal S201. Ex. 1007, 28.

Patent Owner contends that Petitioner fails to show "how this 'black linear-converted luminance signal S213' is the 'control signal' that controls

black level extension processing on the luminance signal.” Prelim. Resp. 43. But that argument relies on a “control signal” that does not appear in the claim language. Patent Owner has not supported a construction including that limitation. Based on our understanding of Kakuya and the plain claim language, we conclude that Petitioner’s contentions support institution.

2. Black level extension unit “configured to decrease an output luminance level corresponding to an input luminance level which is equal to or lower than a starting level set for the video signal in the case where the contrast is adjusted to increase by the contrast adjusting unit”

Petitioner contends that Kakuya’s processing would apply to luminance values below Akbayir’s pivot point, and that Kakuya discloses the same approach of using a determined point below which to apply adjustment (“black threshold value S203” in Kakuya). Pet. 52, 56–57 (“[T]he black threshold value ‘is a starting point for tonal correction of the luminance signal S201.’” (quoting Ex. 1007, 28)), 59–61.

Patent Owner challenges whether Kakuya’s black controller 204 would operate in conjunction with Akbayir’s or Kakuya’s contrast adjustment. Prelim. Resp. 44. The combination, however, does not include Kakuya’s white tonal correction and Petitioner need not explain any relationship with that. As to Akbayir, Petitioner asserts that Kakuya’s black-level processing would be used in place of Akbayir’s. Pet. 58–61. Patent Owner’s argument appears to depend on the idea that Akbayir’s approach applies only one of its lower or upper transfer-function segments (Prelim. Resp. 44–45) but as discussed above, the present record supports that Akbayir applies both segments to a video signal. *See supra* at 15 (§ II.C.3). Thus, we agree with Petitioner that the combination of Kakuya and Akbayir would operate as claimed. Petitioner’s contentions support institution.

3. Reason to combine Kakuya with Akbayir

Patent Owner challenges Petitioner's proposed reasons that skilled artisans would have combined Kakuya's black-level processing with Akbayir's system. Prelim. Resp. 46–48. Patent Owner admits that there may have been reason to modify the equation used to determine Akbayir's transfer function lower segment, but disputes whether skilled artisans would replace the entire transfer function with Kakuya's approach. *Id.* at 47. We conclude that Petitioner's asserted reasoning relies on substantial similarity in the two approaches and offers a plausible reason for the combination. Patent Owner's argument establishes, at most, a factual dispute best resolved through trial.

Patent Owner argues also that because Akbayir's transfer function adaption unit 30 is the structure that applies both contrast adjustments and also black level extension, making the asserted combination with Kakuya's black controller would be impossible. *Id.* at 48–50. Petitioner supports its contentions with expert testimony that the combination was straightforward because the substitution involves components performing the same functions as they did in the uncombined references. Pet. 61 (citing Ex. 1003 ¶¶ 122–123). According to Patent Owner, the asserted combination would require sub-component combinations that the Petition does not explain. Prelim. Resp. 49–50.

At this juncture, we are persuaded preliminarily by Petitioner's contentions, which are supported by uncontested expert testimony. We conclude that Petitioner's assertions support institution and that Patent Owner's argument raises a factual issue best resolved through trial.

4. Claim 9

Claim 9 depends from claim 1 and further recites that “the black level extension processing is performed by the black level extension unit after the contrast is adjusted by the contrast adjusting unit.” Petitioner asserts that Akbayir does not disclose a particular order for applying the two adjustments (its two transfer-function segments) but that only three options are possible: applying the adjustments simultaneously; adjusting contrast first; or adjusting black level extension first. Pet. 62. Petitioner contends that skilled artisans would find the options interchangeable, rendering claim 9’s limitation obvious. *Id.* at 62–63.

Patent Owner disputes that reasoning as inadequate. It relies, as before, on the assertion that Akbayir discloses applying only one of its two transfer-function segments. Prelim. Resp. 50. As discussed above, that view is not consistent with Akbayir’s disclosures. *See supra* at 15 (§ II.C.3). We determine that Petitioner’s contentions support institution.

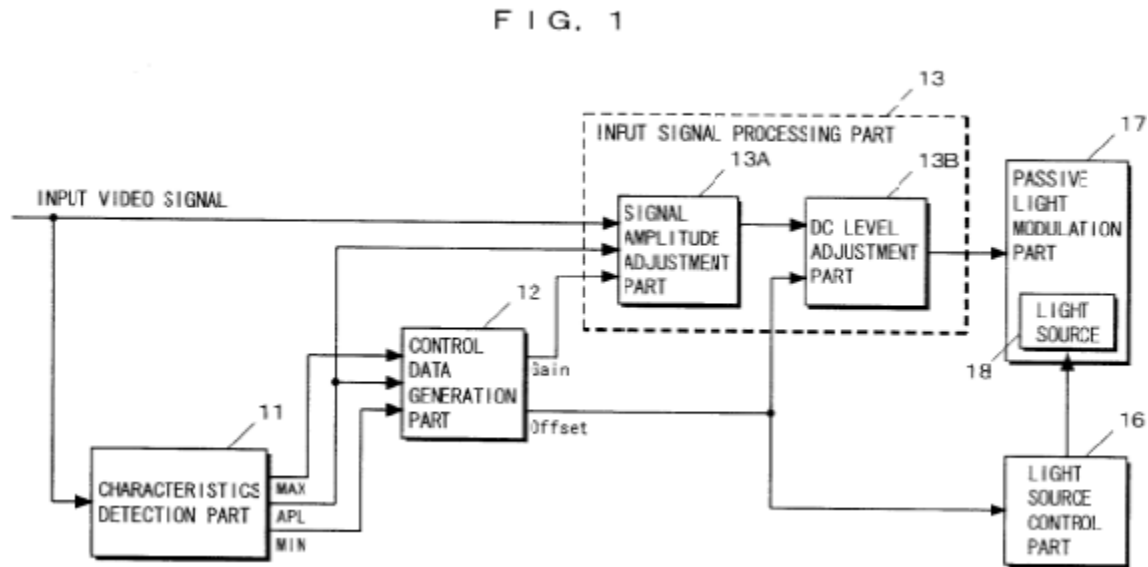
5. Additional claims

For the additional dependent claims (2–5), Patent Owner challenges Petitioner’s showing only to the extent discussed above regarding claim 1. Prelim. Resp. 51. Petitioner’s contentions for obviousness of claims 2–5 rely on Kakuya only for claim 1’s incorporated limitations. *See* Pet. 51. We have reviewed Petitioner’s contentions for those claims and determine they support institution. *See id.* at 49–51.

E. ANTICIPATION BY FUNAMOTO

Petitioner asserts that Funamoto anticipates claims 1–5. Pet. 63–77.

Funamoto discloses a method and system for adjusting image-display contrast. Ex. 1010, 3:3–5.<sup>7</sup> Funamoto discloses a block diagram of its system in Figure 1, reproduced below:



*Id.* at 114 (Fig. 1). Figure 1 depicts an input video signal provided to both characteristics detection part 11 and input signal processing part 13. *Id.* at 25:9–15. Funamoto’s characteristics detection part 11 determines the maximum brightness level (MAX), minimum brightness level (MIN), and average brightness level (APL). *Id.* at 26:6–10. Those detected characteristics are provided to Funamoto’s control data generation part 12, which “calculates a gain for signal amplitude adjustment . . . and a shift amount of DC level of the video signal.” *Id.* at 26:13–17. Funamoto refers to its signal amplitude control as “contrast adjustment.” *Id.* at 8:7.

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<sup>7</sup> Our citations use the exhibit’s pagination rather than the original document’s pagination.

1. “contrast adjusting unit”

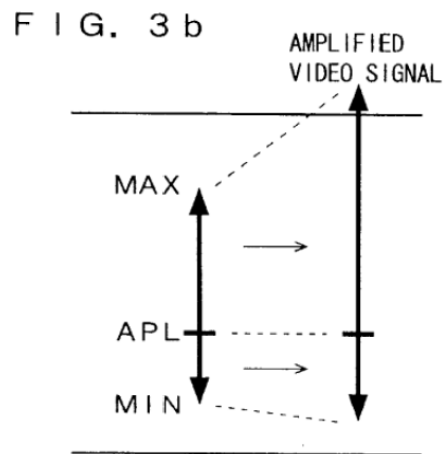
Petitioner relies on Funamoto’s control data generation part 12 and signal amplitude adjustment part 13A as the claimed contrast adjusting unit. Pet. 64–68. Petitioner reasons that those elements receive determined picture characteristics including average and maximum brightness, generate a gain based on those characteristics, and then apply that gain to the video signal. *Id.* at 64–67.

Patent Owner challenges Petitioner’s assertions as not identifying how Funamoto’s system adjusts contrast based on which predefined regions for average and maximum luminance the signal falls. Prelim. Resp. 51–53. As discussed above, however, we do not construe the claims to require that. *See supra* at 6. Accordingly, Patent Owner has not shown a flaw in Petitioner’s contentions.

Patent Owner offers no other argument against Petitioner’s contentions regarding Funamoto’s contrast adjusting unit. We have reviewed Petitioner’s contentions and determine they support institution. *See* Pet. 64–68.

2. “black level extension unit”

Petitioner relies on Funamoto’s signal amplitude adjustment part 13A, which receives a gain control signal and outputs a video signal with sharper black portions. Pet. 70–72. In Petitioner’s view, when Funamoto’s system applies gain to the video signal, it extends the dark parts of the signal into lower luminance levels. Petitioner points to Funamoto’s Figure 3b, reproduced below:



Ex. 1010, 115 (Fig. 3b). Figure 3b depicts the luminance ranges of an input video signal and an amplified video signal, showing the portion of the signal below the average luminance (APL) extends to a lower luminance in the amplified signal compared to the input signal. *See id.* at 28:4–6. Petitioner identifies the lower luminance of Funamoto’s amplified signal as resulting from the claimed black level extension processing, i.e., black level extension. Pet. 69–70; *id.* at 70 (“[T]he signal is extended so that the darker part of the signal moves closer to the black level at the bottom end of the dynamic range, resulting in sharper black colors.”).

Patent Owner contends that Funamoto’s Figure 3b depicts a “change in amplification” such that the input video signal increases in amplitude. Prelim. Resp. 54. According to Patent Owner, Figure 3b’s amplitude change does not result in decreased output luminance. *Id.* at 54–55. While we agree that Funamoto’s Figure 3b shows amplification creating increased amplitude, Petitioner relies on the average luminance remaining fixed in Funamoto’s processing. Pet. 69–70. The result of maintaining a fixed APL luminance is reduced output luminance of values below APL, as shown in Funamoto’s Figure 3b. In particular, Funamoto’s Figure 3b depicts an

amplified video signal that has a reduced minimum luminance compared to the input signal. Ex. 1010, 115 (Fig. 3b). Thus, it supports Petitioner's contentions.

3. Black level extension unit “configured to decrease an output luminance level corresponding to an input luminance level which is equal to or lower than a starting level set for the video signal in the case where the contrast is adjusted to increase by the contrast adjusting unit”

Petitioner asserts that Funamoto's black level processing discussed above is configured as claimed because portions of the video signal with a lower luminance than the average (those with an input luminance level equal to or lower than a starting level) decrease in luminance, whereas portions of the video signal with a luminance higher than the average increase (the contrast is adjusted to increase). Pet. 72–74.

Patent Owner challenges Petitioner's contentions, arguing that Funamoto only mentions black level in reference to its light source 18. Prelim. Resp. 56. But whether Funamoto uses the same terms as the disputed claim language is not determinative of whether Funamoto discloses the claimed structure.

Patent Owner argues that Funamoto discloses only a single gain applied to the signal, and that its gain cannot be used in both the alleged “contrast adjusting unit” and “black level extension unit.” *Id.* That, however, assumes that the claim construction requires different structures, and we decline to adopt a particular claim construction at this stage. Patent Owner may propose claim constructions or better explain its position in the instituted trial. It is possible, for example, that the two claimed units require construction as means-plus-function limitations and, if so, applying gain may address both claimed functions. *See Ironworks Pats. LLC v. Samsung*

*Elecs. Co.*, 798 F. App’x 621, 628 (Fed. Cir. 2020) (nonprecedential) (“an algorithm can support more than one function”); *HTC Corp. v. Cellular Commc’ns Equip., LLC*, 701 F. App’x 978, 983 (Fed. Cir. 2017) (nonprecedential) (“[T]he claims of any given patent must be evaluated in light of the specification to determine whether their scope requires more than one structure.”). It is also possible that a single physical structure could be mapped to more than one claim limitation. *See Powell v. Home Depot USA, Inc.*, 663 F.3d 1221, 1231–32 (Fed. Cir. 2011); *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1303 (Fed. Cir. 2011).

Based on the plain claim language, Petitioner’s showing supports institution.

#### 4. Claim 2

For claim 2, Patent Owner contends that Petitioner has not shown how Funamoto could operate on a digital video signal. Prelim. Resp. 57–58. As discussed above, Petitioner takes the position that claim 2 does not have a narrower scope compared with claim 1. Pet. 74; *see supra* at 17 (§ II.C.4). As above, we agree with Petitioner’s view of claim scope at this stage.

#### 5. Additional claims

For the additional dependent claims (3–5), Patent Owner challenges Petitioner’s showing only to the extent discussed above regarding claim 1. Prelim. Resp. 58. We have reviewed Petitioner’s contentions for those claims and determine they support institution. *See* Pet. 75–77.

#### F. OBVIOUSNESS OVER FUNAMOTO AND KAKUYA

Petitioner relies on Kakuya’s teachings regarding black level extension, and that combining those teachings with Funamoto’s teachings

discussed above would have rendered obvious claims 1–5 and 9. Pet. 77–85. Petitioner relies on Kakuya combined with Funamoto much in the same way as it does regarding Kakuya combined with Akbayir, discussed above. *Id.*; *see supra* at 18 (§ II.D).

Petitioner explains that Funamoto expressly desires to use the available dynamic range, including the darkest portion, and that its amplification approach (described above in the anticipation ground) does so. Pet. 80–81. Petitioner contends that Kakuya’s processing provides an alternative to Funamoto’s approach and that Kakuya presents its device as modular components that could be easily adapted to Funamoto’s system. *Id.* at 81–82, 84–85. Petitioner reasons that Funamoto and Kakuya “disclose similar devices aimed at solving similar problems using similar approaches.” *Id.* at 82. Finally, Petitioner submits that “modifying Funamoto to include Kakuya’s black-correction approach is simply the straightforward use of a known technique (i.e., decreasing the luminance of those portions of the video signal falling below a particular threshold) to improve a similar device (i.e., Funamoto and Kakuya are both concerned with enhancing contrast in video displays) in a similar way.” *Id.* at 83.

Patent Owner challenges Petitioner’s assertions for the same reasons discussed regarding the Akbayir combination (Prelim. Resp. 59), and we need not revisit them. We conclude that Petitioner’s contentions support institution.

Patent Owner additionally challenges the reasons Petitioner gives for the proposed combination, arguing that it would not serve Funamoto’s primary goal. *Id.* at 60. But the law does not require a combination be made to further a reference’s primary goal. *See KSR Int’l v. Teleflex, Inc.*, 550 U.S.

398, 420 (2007). We conclude that Petitioner's stated reasons for the combination support institution.

G. DISCRETIONARY DENIAL UNDER § 314(a)

Patent Owner argues we should exercise our discretion to decline institution under § 314(a) according to the framework in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB March 20, 2020) (precedential). Prelim. Resp. 26–30. We do not agree.

*Fintiv* instructs us to consider whether to deny institution in certain circumstances when there is parallel district court litigation, upon consideration of six factors:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

*Fintiv*, Paper 11 at 6. Our analysis of *Fintiv* is guided by the USPTO Director's Memorandum issued on June 21, 2022, titled "Interim Procedure

for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation” (“Director’s Memo”).<sup>8</sup>

As to the first factor, we have no indication the litigation is or will be stayed pending an *inter partes* review, and we decline to speculate as to the possibility of a stay. That factor is neutral as to discretionary denial.

As to the second factor, Patent Owner asserts that the litigation will be complete three months before a final written decision in this proceeding. Prelim. Resp. 27 (citing Ex. 2002, which indicates a January 23, 2024, trial). But Patent Owner admits that cases in the Central District of California take, on average, fifteen months from a *Markman* order to trial. *Id.* at 28; *See* Ex. 1024. According to Patent Owner, that timing means we should expect a trial to occur by about “February/March 2024.” Prelim. Resp. 28. The district court issued a claim-construction order on December 21, 2022. Ex. 2001. Using the district court’s average time to trial statistics provides a trial date around the end of March 2024. Considering the presently scheduled trial date of January 23, 2024, and the projected trial date of March 2024, we find that this factor weighs marginally in favor of discretionary denial.

As to the third factor, the litigation has involved some discovery and the court has issued a claim-construction order (Ex. 2001). The district court and the parties have not substantively addressed invalidity. *See* Ex. 2002 (setting a June 20, 2023, date for exchanging expert reports). Thus, we conclude that parties’ and court’s minimal investment in the litigation

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<sup>8</sup> Available at [https://www.uspto.gov/sites/default/files/documents/interim\\_proc\\_discretionary\\_denials\\_aia\\_parallel\\_district\\_court\\_litigation\\_memo\\_20220621\\_.pdf](https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf)

weighs slightly against discretionary denial. *See Sand Revolution II LLC v. Continental Intermodel Group – Trucking LLC*, IPR2019-01393, Paper 24, 10–11 (informative).

As to the fourth factor, Petitioner points out that claim 9, challenged here, has not been asserted in litigation. Pet. 87. Patent Owner points out that Petitioner has asserted the same prior art in litigation as asserted here. Prelim. Resp. 29. We note that Petitioner has not provided a stipulation that would avoid any overlap with the district court. *See Director’s Memo* 7–8. We conclude that the additional claim at issue here does not overcome the fact that the same art is asserted. Thus, the overlap supports discretionary denial.

Because Petitioner is the litigation defendant, factor 5 weighs in favor of discretionary denial.

Considering factors one through five together arguably supports discretionary denial. We therefore consider whether the Petition presents a compelling unpatentability challenge. Director’s Memo 4–5. That is, we consider whether the “evidence, if unrebutted in trial, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.” *Id.* at 4. The “compelling merits” standard is a standard higher than that required for institution. *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23, 3 (Feb. 27, 2023) (precedential).

We have discussed the challenges and Patent Owner’s arguments against them above. The asserted references and combination appear to teach the limitations of each challenged claim, based on the references’ plain disclosures. Nearly all of Patent Owner’s arguments at this stage rely on

unsupported, implicit claim constructions or assertions contrary to the references' plain disclosures.

Patent Owner does not present expert testimony at this stage supporting its positions on either the references' disclosures or claim interpretation. For example, Patent Owner relies heavily on arguments that would require certain limitations to be construed as means-plus-function limitations, but provides no analysis or testimony supporting such a construction. *See* Prelim. Resp. 31–33 (asserting Akbayir lacks the claimed “contrast adjusting unit” because it does not disclose contrast adjustment based on a “predefined luminance region within which the maximum luminance level falls” and “a predefined luminance region within which the average luminance level falls”), 22–23 (adopting, without support, a construction for “contrast adjusting unit” that requires gain control based on the two determined luminance regions).

Patent Owner raises arguments that contradict a reference's plain disclosures, without explaining why a skilled artisan would have understood the reference as Patent Owner asserts. *See* Prelim. Resp. 34 (asserting that Akbayir's TF\_DPP and GAIN\_SEG1\_FRC are “each a value of a mathematical equation” and not a “control signal”); Pet. 42–43 (relying on Akbayir's disclosure of circuitry labeling inputs as those parameters) (citing Ex. 1006 ¶¶ 42–51, Fig. 11; Ex. 1003 ¶¶ 84–86). The present record could not support a conclusion that Petitioner fails to show the asserted parameters are a “control signal.”

Similarly, Patent Owner's argument that Akbayir's “dual segment transfer function” operates to apply only one of its two segments is an illogical and unsupported assertion. *See* Prelim. Resp. 34–40. Patent Owner

relies on Akbayir’s stepwise definition for the transfer function. *Id.* at 35 (citing Ex. 1006 ¶ 50). But nothing about a stepwise function inherently requires that the function apply to only one of multiple defined domains. Moreover, Akbayir’s plain disclosures contradict Patent Owner, stating that the transfer function is used to “assign[] each luminance signal point (pixel of the video picture) and output value.” Ex. 1006 ¶ 17. The present record could not support a conclusion that Petitioner fails to show that Akbayir’s asserted “black level extension unit” operates on the same video signal as its asserted “contrast adjusting unit.”

Additionally, the challenged claims fall within multiple grounds, including two different primary references, Akbayir and Funamoto. Both of those primary references appear to plainly teach the limitations of the challenged claims as mapped by Petitioner.

Considering the strength and nature of Patent Owner’s arguments, as opposed to Petitioner’s well-supported contentions, we conclude that the Petition presents compelling merits.

We decline to exercise our discretion as Patent Owner seeks.

### III. CONCLUSION

For the reasons discussed above, we conclude Petitioner has shown a reasonable likelihood of prevailing with respect to at least one claim. We have evaluated all of the parties’ submissions and determine that the record supports institution.

Our determination at this stage of the proceeding is based on the evidentiary record currently before us. This decision to institute trial is not a final decision as to patentability of any claim for which *inter partes* review

has been instituted. Our final decision will be based on the full record developed during trial.

#### IV. ORDER

Accordingly, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review of claims 1–5 and 9 of the '213 patent is instituted on the grounds set forth in the Petition;

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial commencing on the entry date of this decision.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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VIZIO, INC.,  
Petitioner,

v.

MAXELL, LTD.,  
Patent Owner.

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IPR2022-01463  
Patent 7,760,213 B2

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Before KEVIN C. TROCK, JOHN A. HUDALLA, and  
JASON W. MELVIN, *Administrative Patent Judges*.

MELVIN, *Administrative Patent Judge, concurring*.

I concur with the conclusion that we should not deny institution under *Fintiv*. I would, however, reach that conclusion through a different path. As to factor 2 (the district court's schedule), I view the record as showing the expected trial is "around the same time" as our April 2024 statutory deadline, supporting no discretionary denial. *See* Director's Memo 9 ("The PTAB will weigh this factor against exercising discretion to deny institution under *Fintiv* if the median time-to-trial is around the same time or after the projected statutory deadline for the PTAB's final written decision."). Further, I view factors one through five together as weighing against discretionary denial, largely because of the expected trial date. I therefore do not believe

IPR2022-01463  
Patent 7,760,213 B2

we should address the Petition's compelling merits. In all other regards, I agree with my colleagues.

IPR2022-01463  
Patent 7,760,213 B2

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