

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

**SAMSUNG ELECTRONICS CO., LTD. AND
SAMSUNG ELECTRONICS AMERICA, INC.,**
Petitioners,

v.

MAXELL, LTD.,
Patent Owner

Case: IPR2025-01312

U.S. Patent No. 7,952,645

**PATENT OWNER'S RESPONSE TO PETITION FOR *INTER PARTES*
REVIEW OF U.S. PATENT NO. 7,952,645**

Mail Stop Patent Board
Patent Trial and Appeal Board
U.S. Patent and Trademark Office
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TABLE OF EXHIBITS

Exhibit	Description
2001	Notice Letter to Samsung (July 7, 2021)
2002	Follow-up Notice Letter to Samsung (December 29, 2021)
2003	Docket Navigator Time to Trial Statistics for the Eastern District of Texas
2004	Docket Control Order, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00052-RWS (E.D. Tex.)
2005	Jury Trial Transcript, Vol. 4, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:23-cv-00092-RWS (E.D. Tex.)
2006	Complaint, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00052-RWS (E.D. Tex.)
2007	Follow-up Notice Letter to Samsung (April 21, 2025)
2008	Law360 Article, "Maxell Settles Patent Suit Against Apple Over Mobile Tech"
2009	Law360 Article, "Maxell Scores \$43M EDTX Jury Win In ZTE Patent Trial"
2010	Law360 Article, "Maxell, Huawei Reach Terms To End Smartphone Patent Suit"
2011	Hudson Institute Article, "Google's Loss to Sonos Settles It, Big Tech Has an IP Piracy Problem"
2012	PatentRenewal.com Article, "which-companies-hold-the-most-patents-in-the-world"
2013	Motion for Partial Summary Judgment of Validity Based on <i>Sotera</i> Stipulations, <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:23-cv-00092-RWS (E.D. Tex.)
2014	Follow-up Notice Letter to Samsung (November 28, 2024)
2015	Petitioner's Invalidation Contentions (November 28, 2025)

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2016	Microcontrollers: Fundamentals and Applications with PIC
2017	Declaration of Matthew Turk, Ph.D.
2018	Transcript – Deposition of Dan Schonfeld (May 7, 2026)

LISTING OF CHALLENGED CLAIMS¹

Claim	Claim Text
[1.pre]	A video processing apparatus comprising:
[1.a]	an input unit to which a video signal containing contents is input;
[1.b]	a detector which detects whether pattern portions other than contents are contained in the video signal input to the input unit;
[1.c]	a corrector which corrects the video signal input to the input unit; and
[1.d]	a controller which controls the corrector to cause the corrector to correct the video signal input to the input unit when the pattern portions are not contained, and which controls the corrector to cause the corrector not to correct the video signal when the pattern portions are contained.
[2.pre]	2. The video processing apparatus according to claim 1, comprising:
[2.a]	a characteristic point detector which detects a level or distribution of at least one of luminance, hue and saturation of the video signal,
[2.b]	wherein the corrector corrects the video signal according to the level or distribution detected by the characteristic point detector.
[3.pre]	A video processing apparatus comprising:
[3.a]	an input unit to which a video signal containing contents is input;

¹ For convenience purposes only, Patent Owner adopts for this Response the numbering of claim elements advanced by Petitioner in the Petition (Paper 2) on page vii-xi. Patent Owner does not concede the appropriateness of such grouping and numbering of claim elements.

[3.b]	a detector which detects whether pattern portions other than contents are contained in the video signal input to the input unit;
[3.c]	a characteristic point detector which detects a level or distribution of at least one of luminance, hue and saturation of the video signal input to the input unit;
[3.d]	a corrector which changes correction characteristics according to a result of detection output from the characteristic point detector, and corrects the video signal input to the input unit; and
[3.e]	a controller which controls the corrector to cause the corrector not to change the correction characteristics in the corrector when the pattern portions are contained.
[4]	The video processing apparatus according to claim 1, wherein the pattern portions are wallpaper areas or no-picture areas having a single color added to left and right of the contents or above and below the contents and displayed.
[5.pre]	A video processing apparatus comprising:
[5.a]	an input unit to which a video signal containing contents is input;
[5.b]	a pattern portion detector which detects whether a pattern portion other than contents is contained in the video signal input to the input unit;
[5.c]	a no-picture area detector which detects whether the pattern portions are no-picture areas having a single color;
[5.d]	a corrector which corrects the video signal input to the input unit; and
[5.e]	a controller which controls the corrector to cause the corrector to correct the video signal input to the input unit when the pattern

	portions are not contained and when the pattern portions are the no-picture areas, and which controls the corrector to cause the corrector not to correct the video signal when the pattern portions are not the no-picture areas.
[6.pre]	The video processing apparatus according to claim 5, comprising:
[6.a]	a characteristic point detector which detects a level or distribution of at least one of luminance, hue and saturation of the video signal,
[6.b]	wherein when the no-picture area detector has detected that the pattern portions are no-picture areas, the characteristic point detector detects a level or distribution of at least one of luminance, hue and saturation of the video signal other than the no-picture areas.
[7]	The video processing apparatus according to claim 5, wherein the pattern portions are portions added to left and right of the contents or above and below the contents and displayed.
[8]	The video processing apparatus according to claim 5, wherein the no-picture areas have a black color or a white color.

I. INTRODUCTION

Patent Owner Maxell, Ltd. (“Patent Owner”) respectfully requests that the Board confirm the patentability of claims 1-8 (“challenged claims”) of U.S. Patent No. 7,952,645 (the “’645 Patent”) (EX1001). Petitioner fails to show that the challenged claims are unpatentable. None of the cited references, alone or in combination, disclose or suggest the arrangement of each limitation of the challenged claims. Accordingly, the Board should confirm the patentability of the challenged claims.

II. BACKGROUND

A. Overview of the ’645 Patent

At the time of the invention of the ’645 Patent, visual display signal processing posed unique problems in the field of mobile apparatuses, which were limited in both processing power and battery life. EX1001, 1:31-37; EX2017, ¶¶50-54. Images viewed on mobile apparatuses were difficult to view if the images were not color-corrected in accordance with optimal viewing conditions to account for, for example, focusing on surrounding areas added to the images and/or sunny conditions. EX1001, 1:37-56. The ’645 Patent discloses techniques of image enhancement by processing a video using a detector and controller to distinguish between pattern portions and picture areas (contents) in a video image signal. *Id.*, 1:60-63. When pattern portions are detected in a frame (the relevant “video signal” being analyzed),

the '645 Patent discloses a controller that stops a corrector from performing visual enhancement on the video signal containing the pattern portions, which limits the use of processing power and improves battery performance. *Id.*, 1:64-67, 19:52-57, 19:58-63, 15:57-16:3. Some embodiments in the '645 Patent further improve on this, by providing additional techniques that allow the device to limit visual corrections to just the picture area when a pattern portion is detected. *Id.*, 20:17-25; 20:56-64.

In particular, the '645 Patent describes as a “third embodiment” an approach to “detect whether there is a pattern portion” in a video signal, and then “stopping picture quality correction when a pattern portion is detected.” *Id.*, 16:21-25; EX2017, ¶¶55-63. The details described with the third embodiment provide an exemplary technique for detecting the presence of a pattern portion by measuring luminance at a series of different points in an analyzed frame and a preceding frame. *Id.*, 18:14-49. Based on differences between luminances, the device in the '645 Patent can determine that pattern portions are present, for example when measured points on an outside edge of the image do not change in luminance but measured points further in towards a picture area do change. *Id.* When there is no pattern portion detected in a frame of the video, the device proceeds with picture correction as normal. *Id.*, 18:52-58. When a pattern portion is detected in the frame, the device sets a value to disable the relevant picture correction in the frame. *Id.*, 18:58-61;

19:52-57. This has the benefits of reducing flicker when a pattern portion is detected, and of lowering power consumption while still offering picture quality. *Id.*, 19:58-63; 15:57-67. The '645 Patent recognizes that this is especially important in the context of a portable terminal that operates with a battery, as also described in the related second embodiment which disables picture correction based on ambient light. *Id.*

The '645 Patent describes a further “fourth embodiment,” which details two further improvements beyond the third embodiment. EX2017, ¶61. First, the fourth embodiment expands the detection of the pattern areas to distinguish between black “no-picture areas” and wallpapers added to the image. *Id.*, 20:14-25; 22:63-23:12. Second, the fourth embodiment describes a further improvement to selectively limit where a picture correction technique is applied in a frame such that the device can apply the correction to the picture area while leaving the no-picture areas uncorrected. *Id.*, 20:56-64; 22:13-22; 24:12-17. Applying this second part of the fourth embodiment, “it becomes possible to conduct the characteristic point detection only in the contents display area with the black no-picture area excluded,” (*Id.*, 20:61-64) whereas in the previous description of the third embodiment the device would stop the relevant picture correction as applied to the entire frame. *Id.*, 19:52-66; EX2017, ¶¶60-61.

B. Patent Prosecution History

U.S. Patent Application No. 11/602,956, which would ultimately issue as the '645 Patent, was filed on November 22, 2006, and claimed priority to Japanese Application 2005-338000, which was filed on November 24, 2005.

The Examiner allowed the claims on January 13, 2011. EX1002, 17. In the Notice of Allowability, the Examiner stated that: "the prior art does not disclose or suggest applying correction processing to a video signal when non-content pattern data is not detected/contained, and not applying the correction when the pattern data is detected/contained, as is claimed." EX1002, 21. The prosecution history therefore demonstrates that the USPTO recognized that the detection of pattern data other than contents and controlling a device to not perform correction processing based on the detection of a pattern portion in the '645 Patent as patentably distinct over the relevant art.

As shown below, Petitioner's cited references fail to disclose at least the same limitations the Examiner noted as the reasons for allowance in the Notice of Allowance.

C. Summary of Petitioner's Proposed Grounds for Unpatentability

Petitioner alleges that claims 1-8 of the '645 Patent would have been obvious under pre-AIA 35 U.S.C. § 103 and raises three grounds of alleged unpatentability.

Pet. 1. The alleged invalidity grounds are summarized as follows:

Ground	'645 Claims	Type of Challenge	References
1	1-3	§ 103	Kim
2	1-4	§ 103	Fujimura
3	5-8	§ 103	Fujimura and Kim

The references relied upon by Petitioner are summarized below.

1. Kim (EX1004)

U.S. Patent Publication No. 2004/0156545 (“Kim”) is entitled “Method for Detecting Pattern-Like Images and Method for Enhancing Images While Suppressing Undesirable Artifacts Caused by Pattern-Like Images.” Kim is directed to using histograms to determine whether an input image is pattern-like by calculating a parameter r . EX1004, Abstract; EX2017, ¶¶112-19. Based on the calculated parameter, Kim states that the input image is classified as a pattern-like image. EX1004, ¶[0039].

2. Fujimura (EX1005)

U.S. Patent No. 5,808,697, is entitled “Video Contrast Enhancer.” Fujimura addresses a video contrast enhancer that determines whether a luminance signal is a letterbox signal, which consists of a picture area with black non-picture areas above and below the picture area. EX1005, 13:42-44, 13:50-54; EX2017, ¶¶120-28. Fujimura describes determining where a picture area starts by counting the number

of bright pixels in each horizontal scanning line. EX1005, 14:12-24.

III. LEVEL OF ORDINARY SKILL

Petitioner alleges that a person of ordinary skill in the art (“POSITA”) “would have had a bachelor’s degree in computer science, electrical or computer engineering, or a comparable field of study, plus approximately two to three years of professional experience with image processing, video processing, or other relevant industry experience.” Pet. 4.

Patent Owner contends that a POSITA at the time of the ’645 Patent would have a working knowledge of image and/or video processing systems gained through a degree in electrical/computer engineering, computer science, or an equivalent degree, and two years of experience in the field of image and/or video processing. EX2017, ¶¶67-72.

For purposes of this response only, Patent Owner submits that the level of ordinary skill does not need to be resolved, and that Patent Owner’s remarks would hold under either definition.

IV. CLAIM CONSTRUCTION

Petitioner contends that no less than nine terms need construction. Pet. 6-13. However, “[t]he Board is required to construe ‘only those terms’” that “‘are in controversy, and only to the extent necessary to resolve the controversy.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs.*,

Inc. v. Am. Sci. & Eng’g, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner’s numerous terms are interrelated: many of these terms implicate each other and need to be construed within the context of the claim rather than divorced from surrounding context.

A. “*video signal*” (claims 1-3, 5-6)

Patent Owner’s Construction	Petitioner’s Construction
A frame or series of related frames, such as a scene.	“a logical unit of video” ... “such as a ‘frame’ and a ‘scene’” or “a series of frames.” Pet. at 6.

Petitioner relies on an overbroad construction of “*video signal*”: while the ’645 Patent only describes frames and series of frames as the logical unit acted on by the pattern detection methods, Petitioner argues that the term should mean an entire video and individual scanning lines or even individual pixels of the video. Pet., 36-38; EX2017, ¶¶75-80. Petitioner’s arguments are also inconsistent: they change their definition of “*video signal*” from element to element, arguing that “*the video signal*” is sometimes a frame, sometimes a horizontal scanning line, and sometimes the totality of a video content item. Pet. 39-40 (scanning lines), 47-48 (same), 60 (entire frame); EX2017, 32:14-33:5, 19:12-20:7 (Petitioner’s expert

interpreting correction in the context of the entire video as the video signal); EX2017, ¶¶75-80. Petitioner even switches its interpretation between claims (*e.g.*, claim 5, discussed below, where Petitioner and Petitioner's expert expressly swap to a different interpretation of "video signal" without explanation in applying a whole new theory). EX2017, ¶¶75-80.

The "*video signal*" referred to in the claims is the logical unit of the video that is being analyzed to detect the pattern portion. Throughout, the '645 Patent is clear that detection is performed on a frame or a series of frames. See EX1001, 16:16-21 ("If the video signal with the pattern portions added is subjected to picture quality correction by taking a frame as the unit or a scene as the unit..."); EX2017, ¶¶75-80. No part of the '645 Patent describes that the logical unit for analysis and detection of pattern portions is an entire video, nor does it describe that single scanning lines are analyzed in isolation in the detailed descriptions regarding the third embodiment in the '645 Patent. *Id.*, 16:7-20:10; EX2017, ¶77. And, the '645 Patent's fourth embodiment does not support such an overbroad understanding of the "logical unit" for analysis and detection of pattern portions. *Id.*, 20:14-24:42; EX2017, ¶77.

Petitioner's overbroad construction of "*video signal*" nullifies the improvements and benefits of the '645 Patent. EX2017, ¶¶75-80. This infects the

construction of other terms in the '645 Patent claims. The Petition itself proves this. One of Petitioner's arguments is that the cited art corrects some frames in a video but doesn't correct others. Petitioner argues that this amounts to both (1) correcting a "*video signal*" as well as (2) not correcting that same video signal, since "*video signal*" could be the entire video, or sometimes a frame, or sometimes an individual scanning line. Pet., 39-40 (scanning lines), 47-48 (same), 60 (entire frame); *cf.* EX2017, 32:14-33:5 (Dr. Schonfeld explaining correcting / not correcting at the level of an entire video), 19:12-20:7 (again, explaining that the video signal is the entire video, so of course the claims allow for some portions of the video to be corrected while other portions are not corrected); EX2017, ¶¶75-80. Petitioner also argues that some scanning lines in a picture area are corrected, while scanning lines having a letterbox pattern are not corrected. But here, the "*correct*" or "*not ... correct*" decision is not made at a frame level.

As discussed below, Petitioner's entire argument fails unless the Board adopts both (1) their overbroad construction of "*video signal*" as including both a full video as well as individual scanning lines, and (2) their construction of "*correct[ing] the video signal*" where correcting a part of a video, or some scanning lines and not others, is somehow both "*correct[ing] the video signal*" and not "*correct[ing] the [same] video signal.*" These constructions strip the claims of all meaning, and the

Board should rightly reject them.

Accordingly, Patent Owner asks that the Board construe “*video signal*” in the context of claims 1-8 to be “a frame or series of related frames, such as a scene.” EX2017, ¶¶75-80. The series of frames must include some form of a relationship, as the '645 Patent only discusses such units comprising a “frame” or “scene,” not disconnected/unrelated frames. EX1001 16:16-21; EX2017, ¶¶75-80.

B. “a corrector which corrects the video signal input to the input unit” (claims 1 and 5) and “a corrector which changes correction characteristics according to a result of detection output from the characteristic point detector” (claim 3)

Petitioner does not provide a clear construction for these terms, only obliquely citing to Patent Owner's arguments in a separate litigation. The Petition thus fails to explain how the challenged claims should be construed. EX2017, ¶¶81.

For purposes of this proceeding, Patent Owner adopts the noted position that the claimed “*corrector*” language includes “means-plus-function limitations and that the corresponding structure is “[Central Processing Unit (“CPU”)] 7 or equivalents thereof.” Pet. 7.

C. “correct[s] the video signal” (claims 1-3, 5-6)

Patent Owner's Construction	Petitioner's Construction
Applying a correction to a logical unit	“[t]he Board should construe this

<p>(frame, or series of frames). “not ... correcting” means not applying the correction to the logical unit (frame, or series of frames).</p>	<p>limitation to include correcting part of the video signal” (Pet. 7-8)</p>
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Petitioner’s proposed construction hides a key distinction: “*not ... correct[ing]*” the video signal is, in the ’645 Patent, very different from “*correct[ing]*” that video signal. EX2017, ¶¶82-85. The arguments in the Petition reveal this distinction, as Petitioner argues that applying a correction to just a portion of a full video (taken as the “video signal”) is somehow both correcting the video content and also not correcting the same video content. *Id.* Similarly, Petitioner argues that correcting one scanning line that doesn’t have pattern portions, and not correcting another scanning line that does have pattern portions, satisfies both correcting and not correcting the video signal. *Id.*

As discussed above, the innovations described in the third embodiment of the ’645 Patent (and recited in the claims) relate to not applying a correction to a video signal when pattern portions are detected. EX2017, ¶¶82-85. This avoids improper influence on the corrections by the pattern portions (*e.g.*, black bars) and reduces power consumption from ineffective picture correction. *Id.*, 19:58-63; 15:57-67; EX2017, ¶¶82-85. When a “*pattern portion*” is detected in the frame, the device sets

a value to disable the relevant picture correction in the frame. *Id.*, 18:58-61; 19:52-57. The effect of this is that the picture correction processes (described with reference to the first and second embodiments) are not applied to the frame or related frames when a pattern portion is detected in the frame. EX2017, ¶¶82-85.

Patent Owner agrees that applying a correction to a frame may result in only a portion of the frame changing. For example, the correction data calculated for different pixels in the image could result in some pixels staying unchanged. EX2017, ¶¶86-87. But the portions of the '645 Patent cited by Petitioner allegedly showing that some portions of a video signal are always corrected, *e.g.*, in FIGs. 21 and 23A-D, still show how correction might be performed on the totality of a frame (“*video signal*”). EX2017, ¶¶86-87. That is, some pixels of a frame may not be changed based on a set of rules defining how that “*video signal*” should be changed (*e.g.*, to modify certain luminance values in certain ways, such as brighter/darker). *Id.* In turn, the '645 Patent's discussion that certain luminance and/or chrominance values might or might not be corrected based on a particular curve (as depicted in FIGs. 21 and 23A-D) does not mean that the '645 Patent does not contemplate enabling/disabling application of a relevant picture correction for an entire frame. *Cf.* EX2017, 19:12-20:7 (Petitioner's expert explaining that the video signal is the entire video and that it is nonsense to read the '645 Patent claims as requiring that the video signal not be

subjected to the correction); EX2017, ¶¶86-89. Rather, it merely indicates that rules for the “*corrector*” might be implemented to only correct certain ranges of chrominance/luminance values regardless of their location in a frame. EX2017, ¶¶86-89. While the fourth embodiment in the '645 Patent further adds the capability to limit corrections to the picture area, the third embodiment is clear that one aspect of the disclosed innovations is to simply disable the relevant picture correction at a frame level when pattern portions are detected.

More important than “*correct[ing] the video signal*” is the meaning of the claims when they recite not correcting the video signal. As explained above, the “*video signal*” that the claimed methods in the '645 Patent operate on is a frame, or a series of related frames such as a scene. EX2017, ¶¶75-80. The innovations recited in the claimed methods, and described in the third embodiment portion of the specification, expressly do not correct the video signal (*i.e.*, the frame(s)) using the relevant picture correction techniques when pattern portions are detected. In this circumstance, the picture correction processes are not applied to the frame or related frames when a pattern portion is detected in the frame. *Id.*

The '645 Patent also describes other approaches to video correction, but those do not change how these terms should be construed. EX2017, ¶¶87-90. The disclosure of the '645 Patent's fourth embodiment recognizes that it may be

desirable to “conduct correction only in the contents display area.” *Id.*, 24:14-16; see *also* 20:56-64; 22:13-22; 24:12-17; EX2017, ¶¶87-90. Critically, the '645 Patent is clear: this is an additional improvement beyond the already innovative techniques of not applying the relevant correction at all. EX2017, ¶¶82-90. The inventors and Applicant in the '645 Patent knew how to describe when a correction is applied only to a portion of a frame, versus when it is applied (or not applied) to a frame overall. They did not make this distinction in the claims, and intentionally so. *Id.* It is clear that the claims of the '645 Patent recite the scenario described with respect to the third embodiment, where a decision to not apply the described picture corrections applies to the analyzed frame (or series of frames), rather than some unrelated frame or mere portion of a frame. EX2017, ¶85.

D. “the pattern portions are contained” (claims 1 and 3); “the pattern portions are not contained” (claims 1 and 5)

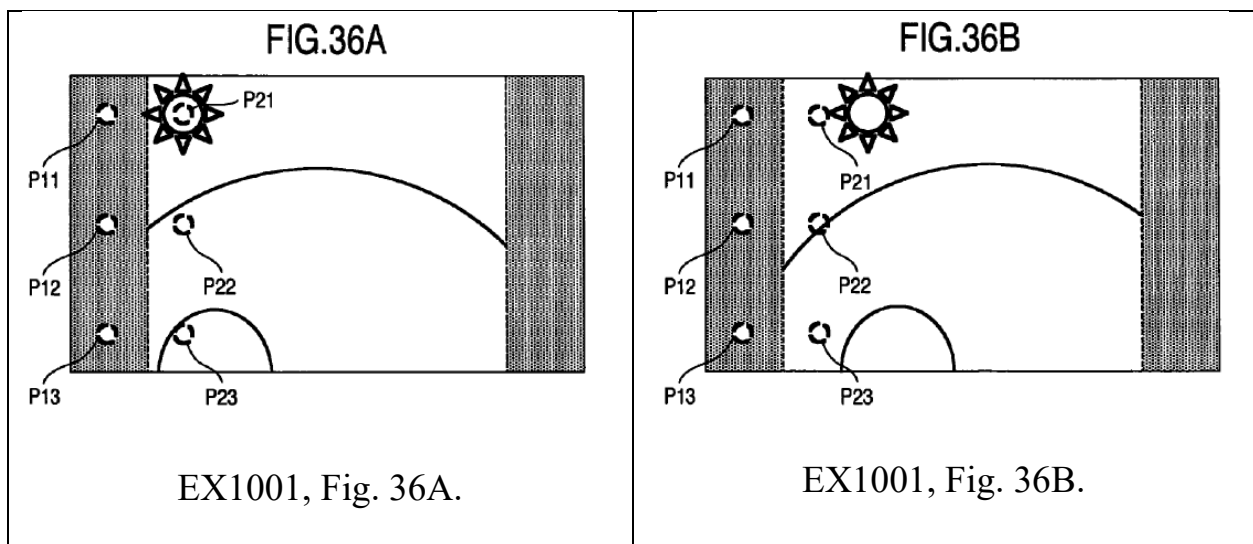
Patent Owner's Construction	Petitioner's Construction
frame always contains “contents,” inquiry is to whether “pattern portions” are contained in that same frame or not	“the plain meaning of these claim limitations means the pattern portions are included in the video signal and the pattern portions are not included in the

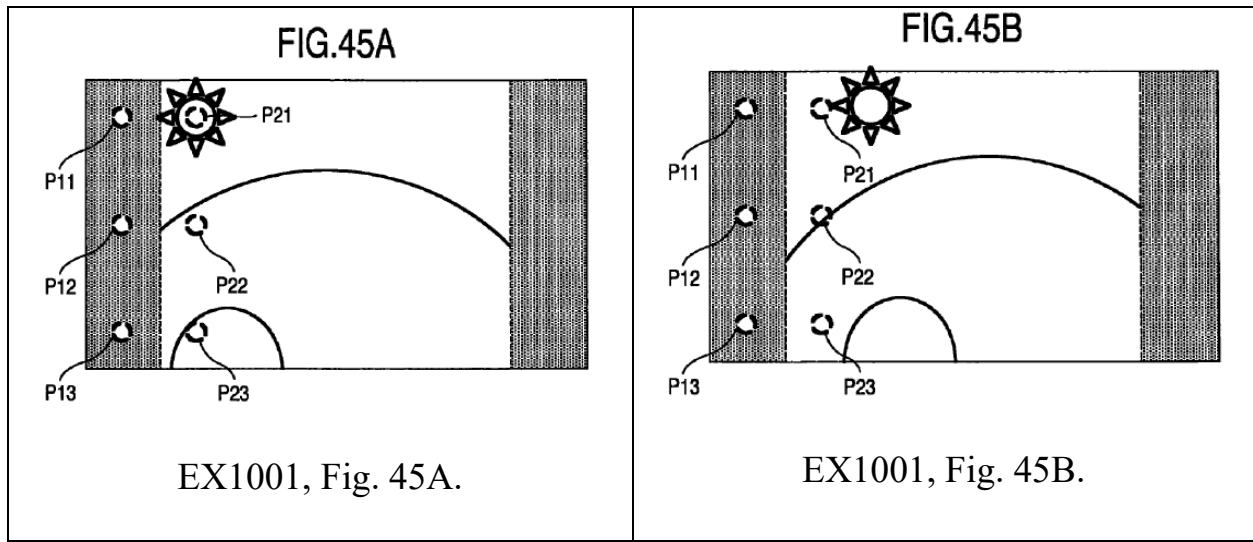
	video signal, respectively” (Pet. 8)
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Patent Owner disagrees with Petitioner's construction (*see* Pet. 8-9) at least because, particularly as it used by Petitioner, the construction uses a broad interpretation of “*video signal*” to suggest that inclusion of the “*pattern portions*” anywhere in the signal (*e.g.*, a whole frame containing nothing but a “*pattern*”) would suffice. EX2017, ¶¶91-97. This contradicts the express disclosure and purpose of the '645 Patent, which clearly depicts that the relevant inquiry is whether a frame contains “*pattern portions*” along with “*contents.*” EX2017, ¶91. Accordingly, Patent Owner contends that the plain language of the claim language inquires whether “*the pattern portions are [not] contained*” in a frame that already contains “*contents,*” noting that the '645 Patent indicates that detection of “*pattern portions*” in a particular frame with “*contents*” might be based on comparing that particular frame to immediately preceding frames. EX2017, ¶¶91-97.

As a threshold matter, the '645 Patent is clear that the “*pattern portions*” are always in the same frame as the “*contents.*” EX2017, ¶92. The Federal Circuit has held that “when a patent ‘repeatedly and consistently’ characterizes a claim term in a particular way, it is proper to interpret the claim term in accordance with that characterization.” *See GPNE Corp. v. Apple Inc.*, 830 F.3d 1365, 1370 (Fed. Cir.

2016); *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1318 (Fed. Cir. 2014); *Aortic Innovations LLC v. Edwards Lifesciences Corp.*, No. 2024-1145, 2025 WL 2999367 at *6 (Fed. Cir. Oct. 27, 2025); *Ebates Performance Marketing, Inc., D/B/A Rakuten Rewards v. International Business Machines Corp.*, IPR-2022-00133, Paper 35, at 15-17 (P.T.A.B. May 24, 2023). That is precisely the case here: the '645 Patent never indicates that “*pattern portions*” somehow could comprise an entire frame of their own. EX2017, ¶92. For example, the '645 Patent describes how “*pattern portions*” may be added to the same frame as the “*contents*” to pad out a particular aspect ratio (EX1001, 16:7-15; EX2017, ¶92) and describes that a detector is added to “detect pattern portion inserted on the left and right of an image.” *See, e.g.*, EX1001, 16:28-31, 17:11-16, 19:28-30, 20:17-22. Further examples are shown in the '645 Patent figures below, where “*pattern portions*” (leftward/rightward black bars) are always shown along with “*contents*” (e.g., a sun) in the same frame:





See also EX2017, ¶92. At no point does the '645 Patent suggest that (for example) “*pattern portions*” are one frame, then “*contents*” are another frame. *Id.* Thus, “*are [not] contained*” necessarily implies that the inquiry is whether a particular frame contains the “*pattern portions*” in addition to existing “*content,*” not (for example) whether one frame is a “*pattern portion*” and an entirely different frame is a “*pattern portion.*” *Id.* There are no figures in the '645 Patent showing, for example, a frame with “*pattern portions*” and no “*contents.*” *Id.* Stated somewhat differently, there is a reason why the claims recite “*pattern portions*”: the other “*portions*” of a frame comprise “*contents*” besides the pattern portions. *Id.*

The '645 Patent also repeatedly clarifies that detecting “*whether pattern portions other than contents are contained in the video signal input to the input unit*” involves detecting whether “*pattern portions*” are in a frame (per the above, a frame

that also contains “*contents*”) by comparing that frame with a previous frame or frames. EX2017, ¶93. For example, the ’645 Patent refers to: (1) “one frame” multiple times when describing detector functions (*see, e.g.*, EX1001, 6:44-45, 8:11-12); (2) “taking a frame as the unit” multiple times when describing the detector functions (*see, e.g.*, EX1001, 6:67-7:3); (3) “preceding frame” multiple times when describing detector functions (*see, e.g.*, EX1001, 9:35-37, 18:20-22); and (4) “consecutive frames” multiple times when describing detector functions (*see, e.g.*, EX1001, 20:5-9). In turn, while other frames might be involved in detecting the presence of “*pattern portions other than contents*,” the frame in inquiry always has “*contents*.” EX2017, ¶93.

Petitioner’s construction thus has no basis in the ’645 Patent: no portion of the ’645 Patent suggests that, for example, “*pattern portions*” in one frame could cause (or not cause) correction in an entirely different and unrelated frame that exclusively has “*contents*.” EX2017, ¶¶94-96. For example, Petitioner’s proposed construction puts no bounds as to the time period when these frames are input. *Id.* By Petitioner’s logic, a frame occurring hours before a subsequent frame could somehow cause the subsequent frame to be corrected. *Id.* In fact, to make its invalidity arguments using Kim, Petitioner has to actively avoid using the term “*portions*” because (as will be detailed below in more detail) Kim has no such “*portions*”: an entire frame of Kim

is the purported “*pattern[]*” without any “*contents.*” *Id.*

Petitioner's characterizations of the third embodiment of the '645 Patent (Pet. 8-9) do not remedy the flaws in its proposed construction. It is true that the “third embodiment” of the '645 Patent involves stopping “enhancement processing” at “the time of display of [the] pattern portions.” EX1001, 19:52-57; *see also id.* 19:59-61, 19:67-20:1. But such “stopping” merely means that, for frames that contain both “*pattern portions*” and “*content,*” enhancement is not applied. EX2017, ¶95. It does not suggest that some frames contain pattern portions only and that others do not, and/or that one frame might cause enhancement of an entirely unrelated frame. *Id.* In fact, Petitioner's own construction of “*video signal*” admits a relationship needs to exist with the frames being processed because it discusses “scenes,” not disparate frames. *See* Pet. 6.

Adopting Petitioner's construction would defeat the express purpose of the '645 Patent's improvements as well as the claims' explicit selection of one of the variety of ways that the '645 Patent effectuates those improvements. EX2017, ¶96. The background section of the '645 Patent specifically addresses issues when color-correcting videos with different aspect ratios and the “wallpapers [that] are added to the left and right of the contents sometimes.” EX1001, 1:41-56. The “object of the present invention” is therefore to address video signal correction in such a scenario:

pattern portions within the same frame. *See id.*, 1:57-59. Even if the '645 Patent did describe other ways of correcting a video signal, the claims are focused on the third embodiment, where (*e.g.*, in claim 1) the relevant correction is not performed if “*pattern portions*” are detected. EX2017, ¶95.

In view of the foregoing, the Board should reject Petitioner's overly broad interpretation of the claimed term that finds no support in the intrinsic record.

E. “*when the pattern portions are contained*” (claims 1 and 3); “*when the pattern portions are not contained*” (claims 1 and 5); “*when the pattern portions are not the no-picture areas*” (claim 5)

The Petition is fundamentally deficient in that, while it vaguely hand-waves towards “apparent” and “different” constructions of “*when*” as used in the claims, it fails to articulate any construction for this term. EX2017, ¶¶98-100.

The Petition concedes the need for a construction of “*when*” as used in the claims but fails to specifically identify one. Pet. 9-10. At the outset, the Petition argues that Patent Owner has construed “*when*” to be broader than “whenever,” citing to infringement contentions of the parties relating to whether camera modes satisfy this limitation. Pet. 9-10. But Patent Owner does not contend that, standing alone, selecting a “Food” or “Portrait” mode alone satisfies the “*when*” limitations or results in the presence of pattern portions. Rather, in the context of that litigation, the “*when*” condition is met when the system detects food or detects a face in those

modes. Regardless, it is not remotely clear how Petitioner views those litigation-related arguments as broader, much less how such breadth would be defined. Stated differently, Patent Owner does not agree that its litigation arguments imply that “*when*” is to be construed as broader than “*whenever*,” and in any event Petitioner has failed to explain how this purported breadth is to be applied (or not applied) in this proceeding.

Tellingly, Petitioner's inconsistent use of the claimed “*when*” language in its invalidity contentions suggest that even Petitioner is not sure how “*when*” should be construed. EX2017, ¶100. For example, in Ground 2, Petitioner states that Fujimura's disclosure of a vertical limiter causes correctors “not to enhance (correct) the luminance of the pixels of a scanning line (video signal) when the scanning line contains pattern portions.” Pet. 48. But, in Ground 3, Petitioner states that, in the case “when the pattern portions are the no-picture areas,” Fujimura's “corrector enhances the picture area portion of the image (*i.e.*, the picture area part of the video signal) and therefore still corrects the image (video signal).” Pet. 67. In this manner, Petitioner states that the same scenario (enhancing a “picture area” and not enhancing the “non-picture bands above and below” the picture area) is both: (1) “*caus[ing] the corrector not to correct the video signal when the pattern portions are not the no-picture areas*” (limitation [1.d]); and (2) “*caus[ing] the corrector to*

correct the video signal input to the input unit ... when the pattern portions are the no-picture areas” (limitation [5.e.i]). Petitioner thereby alleges that the same scenario of not correcting the black-picture band areas can be construed to mean that (1) the corrector does not correct the video signal because the black-picture bands are not corrected; and (2) the corrector does correct the video signal because at least a portion of the video signal is being corrected. These positions offer no coherent construction of the disputed term and render Petitioner's mapping of the limitations irreconcilable and unclear.

Thus, the Board should find that the Petition fails to establish how the claim terms are to be construed, and that Petitioner's amorphous meaning ascribed to these terms in applying the cited art to the claims fails to clearly show how the features of the claims are disclosed or rendered obvious.

F. “a characteristic point detector” (claims 2-3, 6)

Petitioner states that the Board should construe “characteristic point detector” to “include a component that determines a histogram of luminance from an input video signal.” Pet. 11. For the purposes of this dispute, Patent Owner's position is that this term does not need to be construed, but the arguments herein apply equally under Petitioner's construction. EX2017, ¶101.

**G. “a result of detection output from the characteristic point detector”
(claim 3)**

Patent Owner disagrees with Petitioner's assertion that the “plain meaning of this limitation includes a ‘result’ that is not ‘from the characteristic point detector’ but still is a result of ‘detection output’ that is from the characteristic point detector.” Pet. 11; EX2017, ¶¶102-106. The claim recites a “*a corrector which changes correction characteristics according to a result of detection output from the characteristic point detector.*” Here, “*output*” is not a noun but a past tense verb form that describes that the result of detection was output from the characteristic point detector. EX2017, ¶103. That is, the phrasing is similar to a sentence like “Bob drank the wine of Italy poured from the bottle”: the correct reading is that “poured” modifies “wine of Italy,” whereas Petitioner's construction would assert that the sentence would be read as suggesting that the country of Italy was poured from the bottle, and that the wine is generated based on Italy but not necessarily from the bottle. *Id.* This is a style of language used in other claims in the '645 Patent, such as “*a detector which detects whether pattern portions other than contents are contained in the video signal input to the input unit*” in claim 3. EX2017, ¶¶103-105. This reading is also consistent with intrinsic evidence in the '645 Patent. EX2017, ¶104. The '645 Patent is clear that the characteristic point detector outputs characteristic data (a “*result of detection*”) of an image. EX1001, 5:41-54. Later, the '645 Patent

details that the CPU 7 “reads out the characteristic data” and determines correction data based on the characteristic data (“*a corrector which changes correction characteristics according to a result of detection*”). *Id.* Therefore, the '645 Patent details that a characteristic point detector performs detection and outputs characteristic data (a “*result of detection*”). *Id.*

Applicant also notes that it is not particularly clear how Petitioner's construction would operate in practice. EX2017, ¶105. Petitioner only states that the “*result*” does not have to be “*from the characteristic point detector.*” Pet. 11-12. But Petitioner fails to identify which other element(s) the result might originate from, much less where the '645 Patent would support such an idea. EX2017, ¶105. Petitioner thus fails to define the metes and bounds of how the term should be construed.

Thus, the Board should reject Petitioner's overly broad interpretation that finds no support in the intrinsic record.

H. “*a corrector which changes correction characteristics according to a result of detection output from the characteristic point detector*” (claim 3, also claim 2)

Petitioner states that the Board should construe “*according to*” such that the claimed corrector can change “‘correction characteristics’ *based in part on* ‘a result of the [the] detection output’ rather than accordingly *only* to the result of the

detection output.” Pet. 12. For the purposes of this dispute, Patent Owner's contends that this term should be given its plain and ordinary meaning and does not need to be construed.

Petitioner's apparent construction, per its arguments in the Petition, confuses or equates the pattern detector with the characteristic point detector in a manner that renders this claim language regarding the characteristic point detector superfluous. EX2017, ¶¶107-08. In particular, Petitioner's overbroad application of “based in part on” leads to them arguing that the same pattern detection, which controls whether or not the image is corrected, somehow also is effectively the same as changing correction characteristics according to the output of the characteristic point detector. *Id.*; compare Pet. 31 (citing Kim's use of parameter r as correction according to level from characteristic point detector) with Pet. 27 (citing Kim's use of parameter r in the mixer as the decision whether to correct or not). Using this same exact decision to meet both elements improperly makes this separate feature recited in claims 2 and 3 redundant of other elements and features already recited. Further examples are discussed *infra* regarding each ground as applied to claim element [2.b].

I. “cause the corrector not to change the correction characteristics in the corrector when the pattern portions are contained” (claim 3)

Petitioner states that the Board should construe the claimed language “not to change the correction characteristics ... when the pattern portions are contained” to

include setting the correction characteristic to a value that is constant (*i.e.*, does not change) every time ‘the pattern portions are contained.’” Pet. 13. For the purposes of this dispute, Patent Owner’s contends that this term should be given its plain and ordinary meaning and does not need to be construed. EX2017, ¶109.

V. LEGAL STANDARD

A claim is not patentable if the differences between the claim and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time of the invention. 35 U.S.C. § 103(a). Obviousness requires assessing (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of non-obviousness such as “commercial success, long felt but unsolved needs, failure of others, etc.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)).

It is a petitioner’s burden “to demonstrate both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367-68 (Fed. Cir. 2016) (quotations and citations

omitted). However, a petitioner must first show that all of the claimed elements are disclosed in the prior art. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (considering motivation to combine and reasonable expectation of success only “if all the elements of an invention are found in a combination of prior art references”).

VI. PETITIONER’S EXPERT DECLARATION IS ATTORNEY ARGUMENT PRESENTED IN THE CLOTH OF EXPERT TESTIMONY

Little to no weight should be given to Petitioner’s expert’s testimony because it copies verbatim Petitioner’s arguments and lacks sufficient facts and data to support his positions. *See* EX1003. For example:

Petition	Dr. Schonfeld’s Declaration (EX1003)
If PO argues that Fujimura does not disclose any limitation of the challenged claims, such limitation would have nonetheless been obvious to a POSITA in light of Fujimura. Practicing any limitation of the challenged claims in light of Fujimura would have been within the knowledge and skill of a POSITA, would have required minimal effort, would have yielded predictable results, would have been fully compatible with Fujimura, and would have been a mere design choice. Motivation to do so arises from at least common sense and the disclosures of Fujimura set forth above.	If Patent Owner argues that Fujimura does not disclose any element of the challenged claims, such element would have nonetheless been obvious to a POSITA in light of Fujimura. Practicing any element of the challenged claims in light of Fujimura would have been within the knowledge and skill of a POSITA, would have required minimal effort, would have yielded predictable results, would have been fully compatible with Fujimura, and would have been a mere design choice. Motivation to do so arises from at least common sense and the disclosures of Fujimura set forth above.

Petition	Dr. Schonfeld's Declaration (EX1003)
EX1003, ¶135. (Pet. 59)	(EX1003 ¶135)
<p>A POSITA would have understood that the disclosed functionality is performed by executing instructions in a CPU or equivalent, or performed by a hardware equivalent to such a CPU, because without such a component, there would be no apparatus to implement the disclosed functionality. Kim also inherently (necessarily) discloses such a CPU or equivalent for the same reasons. It also would have been obvious to a POSITA to implement the functionality of Figure 4 in a CPU or equivalent as a well-known way of implementing such functionality. Such a CPU would have been well-known to a POSITA. <i>E.g.</i>, EX1005 (Fujimura), 4:6-11 (image processing system can be implemented in a “general-purpose processor”). Motivation to do so arises from common sense and Fujimura, which discloses implementing any component of an image processing system in a “general-purpose processor.” <i>See</i> Ground 2, limitation 1.c; EX1003, ¶74. (Pet. 26)</p>	<p>A POSITA would have further understood that the disclosed functionality is performed by executing instructions in a general-purpose processor such as a CPU or equivalent, or performed by a hardware equivalent to such a CPU, because such a component would be required to implement the disclosed functionality. Kim also inherently (necessarily) discloses a processor such as a CPU or equivalent for the same reasons. It would have been obvious to a POSITA to implement the functionality of Figure 4 in a CPU or equivalent as a well-known way of implementing such functionality. Such a CPU would have been well-known to a POSITA. <i>E.g.</i>, EX1005 (Fujimura), 4:6-11 (image processing system can be implemented in a “general-purpose processor”). Motivation to do so arises from common sense and Fujimura, which discloses implementing any component of an image processing system in a “general-purpose processor.” <i>See</i> Ground 2, element 1.c. (EX1003, ¶74)</p>
If PO argues the portions of Fujimura cited above relate to different, incompatible embodiments (which they	If Patent Owner argues the portions of Fujimura cited above relate to different, incompatible embodiments

Petition	Dr. Schonfeld's Declaration (EX1003)
do not), it would have been obvious to a POSITA to combine such embodiments into a single system at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results. EX1003, ¶134. (Pet. 59)	(which they do not), it would have been obvious to a POSITA to combine such embodiments into a single system at least because such embodiments are described in the same prior art reference, are fully compatible with each other, and could be combined with minimal effort to achieve predictable results. (EX1003, ¶134)

The above citations are merely exemplary: Petitioner employs the same tactics for each Ground. *See, e.g.*, Pet. 26, 59, 69-71. Dr. Schonfeld thus does not provide any independent analysis or explanation why a POSITA would find something obvious or be motivated to modify Kim or Fujimura other than Petitioner's own conclusory and boilerplate statements that are copied-and-pasted attorney argument.

Indeed, particularly egregious examples of the conclusory nature of Dr. Schonfeld's parroting of Petitioner's legal conclusions are found in Dr. Schonfeld's extreme obviousness "catch-alls": "If Patent Owner argues that Fujimura does not disclose any element of the challenged claims, such element would have nonetheless been obvious to a POSITA in light of Fujimura. Practicing any element of the challenged claims in light of Fujimura would have been within the knowledge and skill of a POSITA...." (EX1003 ¶135 (emphasis added); *see also* ¶93, ¶168).

Such conclusory and superficial attorney argument in the guise of expert

testimony cannot serve as sufficient support for Petitioner's arguments. *See, e.g., Cardiocom, LLC v. Bosch Healthcare Sys., Inc.*, IPR2013-00439, Paper 26, 15-16 (P.T.A.B. Jan. 16, 2014).

Moreover, such conclusory opinions by an expert that merely parrot Petitioner's arguments should be accorded little weight when used to supply a missing limitation. *See Xerox Corp. et al. v. Bytemark, Inc.*, IPR2022-00624, Paper 12, 5 (P.T.A.B. Feb. 10, 2023). As discussed *infra*, Dr. Schonfeld's "opinions" are copied verbatim from the Petition, including in attempting to fill in missing limitations in violation of 37 C.F.R. § 42.104(b)(4).

Therefore, little to no weight should be given to Dr. Schonfeld's testimony.

VII. THE PETITION DOES NOT ESTABLISH THAT ANY CHALLENGED CLAIM WOULD HAVE BEEN OBVIOUS OVER KIM OR FUJIMURA

A. Ground 1: Petitioner Fails to Establish That Claims 1-3 Would Have Been Obvious Based on Kim

1. Petitioner Fails to Establish That Claim 1 Would Have Been Rendered Obvious In View of Kim

a. Petitioner Fails to Establish That Claim Limitation [1.b] Would Have Been Rendered Obvious In View of Kim

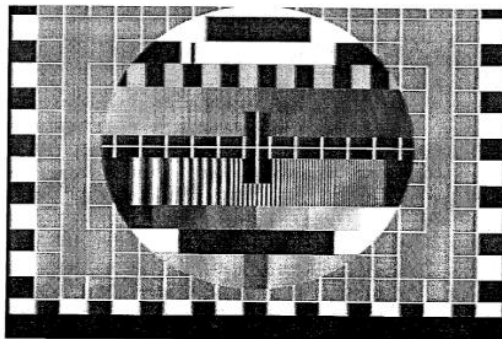
Claim limitation [1.b] recites "*a detector which detects whether pattern portions other than contents are contained in the video signal input to the input unit.*"

Petitioner fails to establish that claim limitation [1.b] would be rendered obvious in

view of Kim at least because Kim focuses on an entire frame image and does not actually detect “*whether pattern portions other than contents are contained in the video signal input to the video unit.*” Pet. 21-24; EX2017, ¶¶130-37.

Petitioner argues that (1) Kim’s “*r* calculation device 34” and (2) “apparatus 20” satisfy the claimed “*detector which detects whether pattern portions other than contents are contained in the video signal input to the input unit.*” Pet. 22-23; EX2017, ¶¶139-40. But neither of these elements determine “*whether pattern portions other than contents are contained.*” *Id.*

Kim’s “*r* calculation device 34” does not detect “*whether pattern portions other than contents are contained in the video signal input to the input unit.*” Kim describes whole-frame patterns, like Kim FIG. 1:



EX1004 Fig. 1; EX2017, ¶¶130-37. Kim’s “*r* calculation device 34” calculates a value *r* indicating a likelihood, between 0 and 1, that a frame is a “pattern-like image.” That value is calculated for the entire input image:

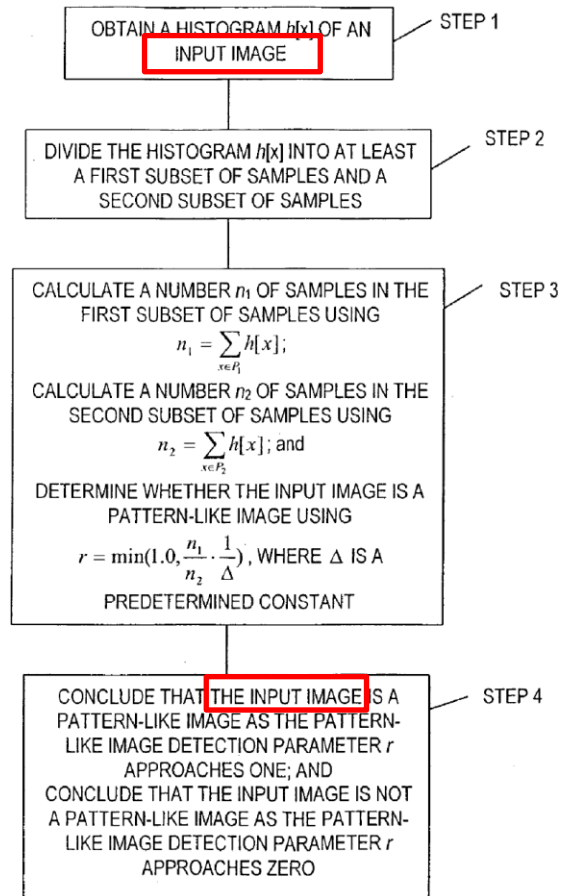


FIG. 5

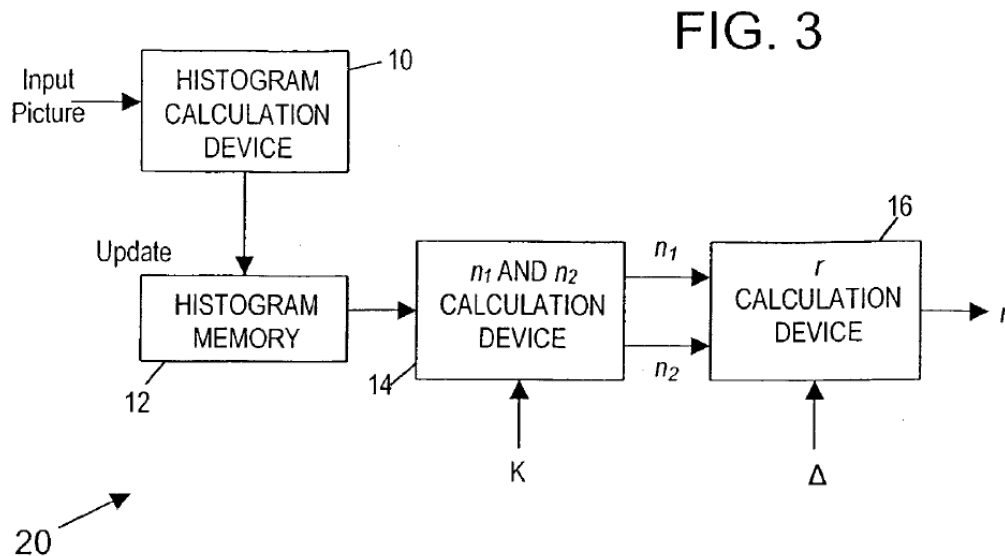
EX1005, FIG. 5 (annotated); EX2017, ¶¶130-37. As r approaches 1, it is more likely that the entire input image is a “pattern-like image” like Kim FIG. 1, and as r approaches 0, it is more likely that the entire input image is a “normal image.” EX1004 ¶[0039] (“the input image is most likely a pattern-like image as the value of the pattern-like image detection parameter r approaches 1 and that the input image is most likely a normal image as the value of the pattern-like image detection

parameter r approaches 0.”); EX2017, ¶¶130-37. Kim is therefore directed to assigning a value on a scale of 0 to 1 of how likely the entire input frame is directed to a pattern-like image and does not contemplate that some portion of the frame might be a pattern and some other portion of the same frame might not be a pattern. EX2017, ¶¶130-37; EX1004 ¶[0039]. As such, Kim cannot detect “*pattern portions other than contents*”; instead, Kim’s r calculation device determines a value indicative of how likely an entire frame is a pattern-like image. Kim thus detects whether the “*contents*” of a frame are a pattern and does not specifically detect “*pattern portions other than contents*.” EX2017, ¶¶130-37; EX1004 ¶[0039], Fig. 5.

In fact, there is no portion of Kim that distinguishes “*pattern portion[s]*” of a frame from “*contents*” of the same frame. EX2017, ¶134. Kim does not discuss a “portion” (or “part,” “segment,” or “section”) of a frame, much less the idea that any such “portion” would be a pattern. *See, e.g.*, EX1004 ¶[0040]; EX2017, ¶134. Instead, Kim describes assigning the value r to an entire image and refers to “pattern-like image” over eighty times, including in the Title, Abstract, Claims, Background of the Invention, Filed of the Invention, Summary of the Invention, Brief Description of the Drawings, and Description of the Preferred Embodiments sections. *See generally* EX1004; EX2017, ¶134.

Kim’s “apparatus 20” also does not detect “*whether pattern portions other*

than contents are contained in the video signal input to the input unit” for at least the same reasons as provided above regarding the “*r* calculation device.” EX2017, ¶135; *see* Pet. 23. After all, FIG. 3 indicates that the apparatus 20 includes the “*r* calculation device 16”:



EX1004 Fig. 3; EX2017, ¶135. The addition of other components of this apparatus, such as the elements calculating the constituent portions of r , do not change Kim's many deficiencies identified above. EX2017, ¶135.

Petitioner also argues that, if this limitation is construed as a means-plus-function limitation with a corresponding structure of a CPU or its equivalents, Kim discloses that the functions of “ r calculation device 34” are performed by a CPU or equivalent, or it would have been obvious for the reasons set forth in relation to limitation [1.c]. Pet. 24. But Petitioner has not put forth a proposed construction for

this “*detector*.” For the purposes of this dispute, Patent Owner contends that there is no claim construction necessary regarding the structure of “*detector*.” Regardless, Petitioner has not provided any rationale construing this term to have a specific structure. EX2017, ¶136. Moreover, for the reasons provided below regarding limitation [1.c], Petitioner fails to demonstrate that Kim “implicitly and inherently discloses that the functions of ‘r calculation device 34’ of Figure 4 are performed in a CPU or equivalent,” or that “it would have been obvious to a POSITA to implement them in a CPU or equivalent.” Pet. 24; EX2017, ¶136.

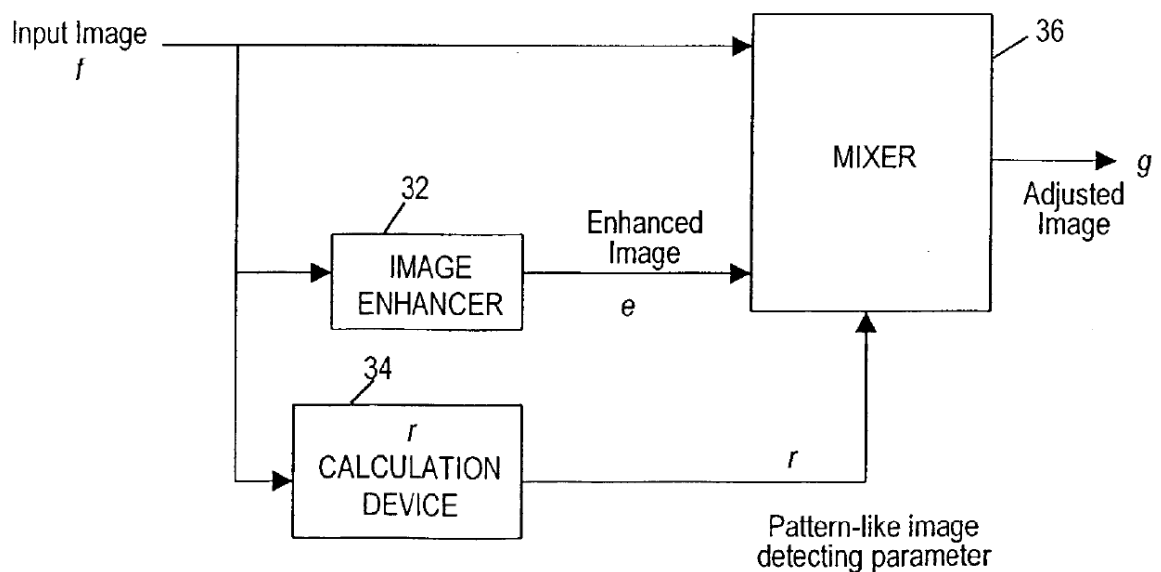
For at least the foregoing reasons, Petitioner fails to establish that claim limitation [1.b] would have been rendered obvious based on Kim.

b. Petitioner Fails to Establish That Claim Limitation [1.c] Would Have Been Rendered Obvious In View of Kim

Claim limitation [1.c] recites “*a corrector which corrects the video signal input to the input unit.*” Petitioner fails to establish limitation [1.c] would be rendered obvious in view of Kim at least because the elements of Kim identified by Petitioner are not a “*corrector*.” Pet. 24-26; EX2017, ¶¶138-45.

Petitioner argues that the Kim’s “[i]mage enhancer 32 and mixer 36” are “collectively therefore are a corrector.” Pet. 25. Petitioner does not clarify whether or not the claimed corrector should be interpreted as means-plus-function, referring

instead to a prior argument asserting the proposed structure is a “CPU 7 or equivalents therefore.” Pet. 26. But Kim’s “image enhancer 32” and “mixer 36” are not ever described as a CPU or any equivalent of a CPU. EX2017, ¶¶140-45. Consider, for example, FIG. 4 of Kim, reproduced below.



EX1004, FIG. 1. This block diagram (and the corresponding description in Kim) fail to indicate that the “image enhancer 32” and “mixer 36” are inherently or explicitly an equivalent of the ’645 Patent’s CPU 7. EX2017, ¶140. After all, there are many non-CPU ways to mix signals and/or to perform image enhancement. EX2017, ¶¶140-45.

Seemingly recognizing that Kim fails to describe its image enhancer 32 and/or mixer 36 as being a CPU, Petitioner asserts several other theories, which all fail as

well. EX2017, ¶¶141-45.

First, Petitioner asserts both (1) that a POSITA would have understood that the “*correct[ing]*” is performed by executing instructions in a CPU “because without such a component, there would be no apparatus to implement the disclosed functionality,” and (2) that “Kim inherently (necessarily) discloses such a CPU or equivalent for the same reasons.” Pet. 26. These two theories fail because they are based on the same faulty premise: Petitioner incorrectly assumes that a CPU is the only element that can “*correct[]*” the video signal. *See* Pet. 26. A CPU is not the only structure that can perform this function. EX2017, ¶¶142-43. For example, simplistic analog signals could always be mixed together using electrical engineering principles and without use of a CPU. *Id.*

Petitioner also argues that “it would have been obvious to a POSITA to implement the functionality of Figure 4 in a CPU or equivalent as a well-known way of implementing such functionality.” Pet. 26. This theory also fails because it is an unsupported (and incorrect) assumption. EX2017, ¶144. Petitioner provides no analysis or evidence that a POSITA would find such a process obvious. *Id.* Petitioner does try to avail to Fujimura’s disclosure of a “general-purpose processor” or “digital signal processor” as allegedly showing structure, (Pet. 26) but these arguments (1) do not show that Kim’s “image enhancer 32” and/or “mixer 36” must be

implemented in a CPU, (2) relate to entirely different portions of Fujimura that are not analogous to Kim's "image enhancer 32" and/or "mixer 36," and (3) fail to explain why image enhancement and/or mixing must be performed by a CPU. EX2017, ¶144.

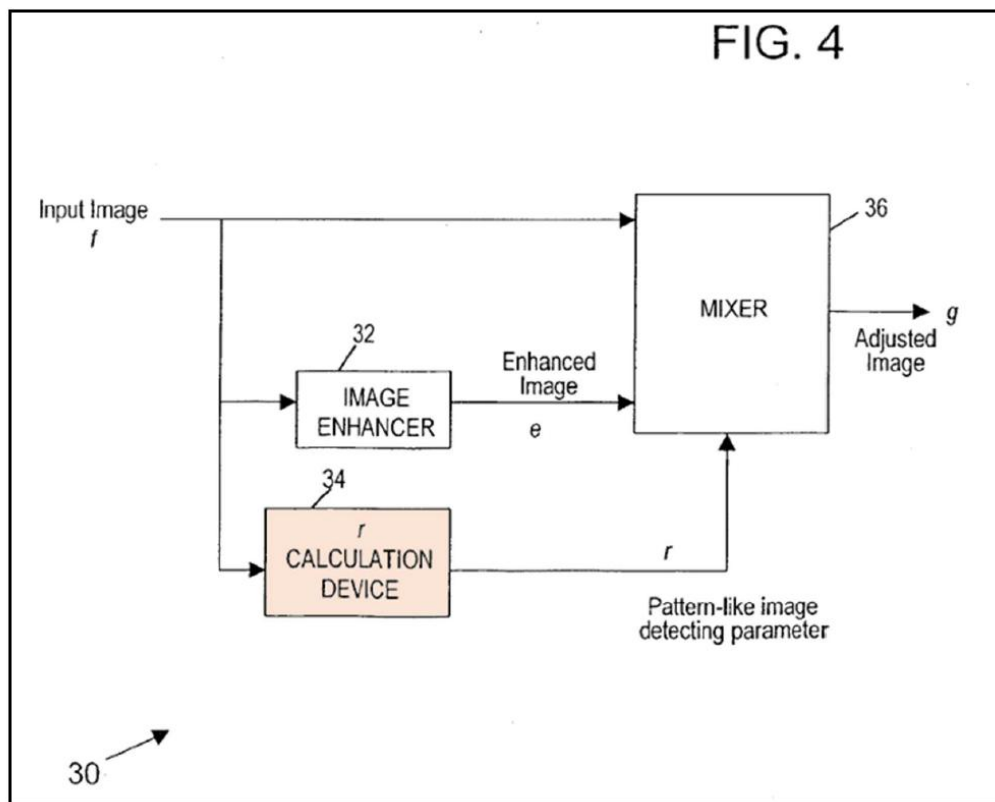
Petitioner has thus failed to provide any evidence supporting the contention that implementing the functionality in a CPU in Kim would be obvious, and its invalidity contentions therefore fail under both plain and ordinary meaning as well as a means-plus-function construction. EX2017, ¶145.

c. Petitioner Fails to Establish That Claim Limitation [1.d] Would Have Been Rendered Obvious In View of Kim

Claim limitation [1.d] recites "*a controller which controls the corrector to cause the corrector to correct the video signal input to the input unit when the pattern portions are not contained, and which controls the corrector to cause the corrector not to correct the video signal when the pattern portions are contained.*" Petitioner fails to establish that claim limitation [1.d] would be rendered obvious in view of Kim at least because (1) Kim's "r calculation device 34" fails to "*control[]*" anything, and (2) nothing in Kim controls any device to not correct the "*video signal*" because Kim always applies the correction to the frame to get an enhanced image whether or not "*pattern portions*" are detected. EX2017, ¶¶146-50. Petitioner has

also failed to show that Kim's r calculation device is a "controller." Pet. 27-29; EX2017, ¶149.

While Petitioner alleges that Kim's r calculation device 34 satisfies the controller limitation (Pet. 27), Petitioner fails to demonstrate how that r calculation device 34 "controls" the alleged corrector (Kim's "mixer 36"). EX2017, ¶147. In Kim, the "image enhancer 32" always enhances the "input image f " to generate the "Enhanced Image e ," and the " r calculation device 34" merely outputs a parameter, " r ," used by the "mixer 36" to include some, all, or none of the "Enhanced Image e " as part of "Adjusted image g ":



EX2017, ¶147. Petitioner's own expert agreed with this fact, noting that Kim "just applies the image enhancer 32 to the input image f always." EX2018, 42:2-6. In fact, because r can be a value between zero and one, Kim is designed to partially mix the already-generated "Enhanced Image e " with the "Input Image f " to form "Adjusted Image g ." EX1004 ¶[0042]. Kim always "*correct[s] the video signal*" by generating the "Enhanced Image e ," and the " r calculation device 34" merely outputs a value that is used by an entirely different device (the "mixer 36") to decide how much of that "Enhanced Image e " (if any) to use. EX2017, ¶147. The " r calculation device 34" cannot ever "*control[] the corrector to cause the corrector not to correct the video signal when the pattern portions are contained.*" EX2017, ¶¶147-48. The "Enhanced Image e " is always generated and the "mixer 36" always receives that enhanced image, Kim's mixer merely varies how much of that enhanced image is used based on the parameter r . *Id.*

Petitioner also fails to show that Kim's " r calculation device 34" is "*a controller.*" Under plain and ordinary meaning, a controller, at a minimum, comprises some sort of processing circuitry, such as a CPU. *See, e.g.,* EX2016, p. 3 ("[m]icrocontrollers combine the fundamental resources available in a microcomputer such as the CPU, memory, and I/O resources in a single chip"); EX2017, ¶149. For example, the following microcontroller block diagram shows a

CPU:

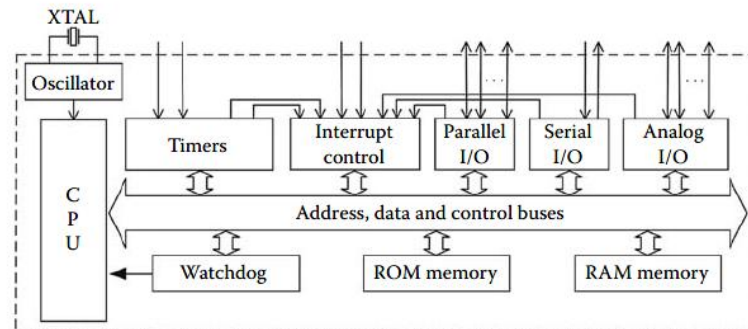


FIGURE 1.2
Basic block diagram of a microcontroller.

EX2016, 4; EX2017, ¶149. This is also how the '645 Patent describes control: it describes that a CPU causes correction of the video signal input based on when the pattern portions are contained:

FIG. 34 shows a processing flow in the CPU 7. Correction characteristics update processing in the CPU 7 is executed by receiving the interrupt 141 from the I/F unit 155. When the pattern flag is "0" at S3401, i.e., when there is no pattern portion, the CPU 7 calculates correction data to conduct the picture quality enhancement processing by using the method described in the first embodiment or the second embodiment at S3402, and transmits the correction data to the I/F unit 153 (S3404). When the pattern flag is "1" at S3401, i.e., when there is a pattern portion, the CPU 7 sets correction data="0" at S3403, and transmits the correction data to the I/F unit 153 (S3404).

EX1001, 18:50-61. In contrast, Petitioner provides no description as to how the "r calculation device 34" of Kim is "a controller." Kim's is silent as to a "controller,"

“CPU,” or the like and certainly does not disclose a controller or CPU in the context of the “*r* calculation device 34.” See EX1004; EX2017, ¶149. Instead, Petitioner simply asserts, without proof, that the “*r* calculation device 34” “controls mixer 36” and is therefore “*a controller*.” Pet. 27. But Kim’s system still acts to generate the corrected image through image enhancer 32 regardless of what the value of *r* is. The value *r* is one variable used to calculate how much of that already-generated corrected image is used. Plenty of components other than controllers (*e.g.*, sensors) output parameters/values but are not controllers. EX2017, ¶149. Thus, Petitioner has failed to show that the “*r* calculation device 34” is “*a controller*.”

Petitioner’s expert declaration remedies neither of the above deficiencies in Kim as it is essentially a word-for-word duplication of the Petition. Such conclusory and superficial attorney argument in the guise of expert testimony cannot serve as sufficient support for Petitioner’s arguments (as explained *supra* in Section VI).

In view of the foregoing, Petitioner has failed to establish that claim limitation [1.d] would be rendered obvious in view of Kim. Pet. 27-29; EX2017, ¶150.

2. Petitioner Fails to Establish That Claim 2 Would Have Been Rendered Obvious in View of Kim

Claim 2 depends from claim 1. Therefore, for at least the reasons provided above in relation to claim 1 in Ground 1, Petitioner fails to establish that claim 2 would have been rendered obvious based on Kim. EX2017, ¶¶151-53.

a. Petitioner Fails to Establish That Claim Limitation [2.b] Would Have Been Rendered Obvious In View of Kim

The Petition further fails to demonstrate that claim element [2.b] (“*wherein the corrector corrects the video signal according to the level or distribution detected by the characteristic point detector*”) would have been obvious, as the Petition’s treatment of this feature removes all meaning from the claim language to the point of rendering it superfluous. EX2017, ¶¶152-53.

Petitioner asks that the Board construe this element as only meaning that the correction is “based in part on” a result of the detection output from the characteristic point detector. The reason for this request is revealed in the Petition’s treatment of element [2.b]. Regarding Kim, the Petition asserts that “mixer 36 corrects image f of the incoming video based in part on parameter r,” “[p]arameter r is calculated from the luminance histogram using equations (1) through (5),” and “[m]ixer 36 (a corrector) therefore corrects the video signal according to the luminance histogram.”

Pet. 31.²

² During drafting the undersigned initially copied this quote from EX1002, at p. 39, before the citation was corrected to be from Pet. 31. No changes were needed to the text.

Petitioner's alleged construction improperly blurs the distinction between two different portions of the claims. EX2017, ¶¶152-53. First, Petitioner uses the calculation of parameter r , and the operation of mixer 36, as the claimed "controller" causing the "corrector" to correct/not correct the video signal based on whether the pattern portion is contained. Per the Petition, r is the decision (pattern/no pattern) to correct/not correct. So, the Petition has already used parameter r and mixer 36's formula using r to allegedly teach causing the "corrector" to correct/not correct. But then, inconsistently, Petitioner argues that the same process "corrects the video signal according to the level or distribution detected by the characteristic point detector." *Id.* This construction renders this separate claim language superfluous and thus is improper. EX2017, ¶¶152-53.

3. Petitioner Fails to Establish That Claim 3 Would Have Been Rendered Obvious in View of Kim

a. Petitioner Fails to Establish That Claim Limitation [3.b] Would Have Been Rendered Obvious In View of Kim

In relation to limitation [3.b], Petitioner cites back to limitation [1.b]. Pet. 32. ("Kim discloses this limitation. *See* limitation 1.b."). Therefore, for the reasons provided above in relation to limitation [1.b], Petitioner fails to establish that claim limitation [3.b] would have been rendered obvious in view of Kim. EX2017, ¶154.

b. Petitioner Fails to Establish That Claim Limitation [3.e] Would Have Been Rendered Obvious In View of Kim

Regarding limitation [3.e], Petitioner relies on similar rationale as in limitation [1.d]. Pet. 33 (“As described for limitation 1.d, calculation device 34 is a controller that controls mixer 36.”). As provided above in relation to limitation [1.d], Petitioner provides no analysis for how the r control device satisfies the “*controller*” or “*control*” aspects of the limitation. *See id.; supra* Section VII.A.1.b; EX2017, ¶155. Therefore, Petitioner fails to establish that claim limitation [3.e] would have been rendered obvious in view of Kim. *Id.*

4. Petitioner Fails to Establish That Claim 4 Would Have Been Rendered Obvious in View of Kim

Claim 4 depends from claim 1. Therefore, for at least the reasons provided above in relation to claim 1 in Ground 1, Petitioner fails to establish that claim 4 would have been rendered obvious based on Kim. EX2017, ¶170.

B. Ground 2: Petitioner Fails to Establish That Claims 1-4 Would Have Been Obvious Based on Fujimura

1. Petitioner Fails to Establish That Claim 1 Would Have Been Rendered Obvious In View of Fujimura

a. Petitioner Fails to Establish That Claim Limitations [1.a] and [1.b] Would Have Been Rendered Obvious In View of Fujimura

Claim limitation [1.a] recites “*an input unit to which a video signal containing contents is input.*” Claim limitation [1.b] recites “*a detector which detects whether*

pattern portions other than contents are contained in the video signal input to the input unit.” Petitioner fails to establish that claim limitations [1.a] and [1.b] would be rendered obvious in view of Fujimura. Pet. 36-42; EX2017, ¶¶157-59. As described above, the proper construction of the claimed “*video signal*” is “a frame or series of related frames, such as a scene.” *See supra* Section IV.A.

Petitioner starts its treatment of Fujimura describing frames of video, though quickly shifts to treating individual scanning lines of the video as the logical unit of video subject to analysis—the claimed “*video signal*.” Pet. 36-37. But Fujimura’s horizontal scanning lines do not have **both** pattern portions and contents other than the pattern portions. EX2017, ¶159. Instead, Fujimura’s technique steps through individual horizontal scanning lines to find all-black lines that represent letterbox boundaries. *Id.* Thus, a horizontal scanning line in Fujimura at best would be only contents, or only the alleged pattern portion. *Id.* Treatment of individual scanning lines as the claimed video signal is inconsistent with the discussions in the ’645 Patent, as well as the role of the video signal in the claim language itself. *Id.*

As discussed further with respect to element [1.d], this treatment of individual scanning lines as the claimed “*video signal*” also renders Fujimura’s disclosed approach as falling far short of disclosing the claimed features. *Id.*

b. Petitioner Fails to Establish That Claim Limitation [1.d] Would Have Been Rendered Obvious In View of Fujimura

Claim limitation [1.d] recites “*a controller which controls the corrector to cause the corrector to correct the video signal input to the input unit when the pattern portions are not contained, and which controls the corrector to cause the corrector not to correct the video signal when the pattern portions are contained.*”

Petitioner fails to establish that claim limitation [1.d] would be rendered obvious in view of Fujimura. Pet. 45-48. EX2017, ¶¶160-64.

Petitioner's inconsistent claim interpretations are best shown in the Petition's treatment of element [1.d] under Fujimura. The Petition repeatedly explains that it is applying individual horizontal scanning lines of Fujimura as the claimed video signal. See e.g., Pet. 45. Yet there is never an individual horizontal scanning line in Fujimura that includes both “*pattern portions*” and “*contents*” other than the “*pattern portions.*” EX2017, ¶¶161-63. Accordingly, if the individual horizontal scanning line of Fujimura is taken to be the claimed video signal, then that scanning line does not meet the requirements of the claims that the video signal include both pattern portions and contents other than the pattern portions. *Id.*

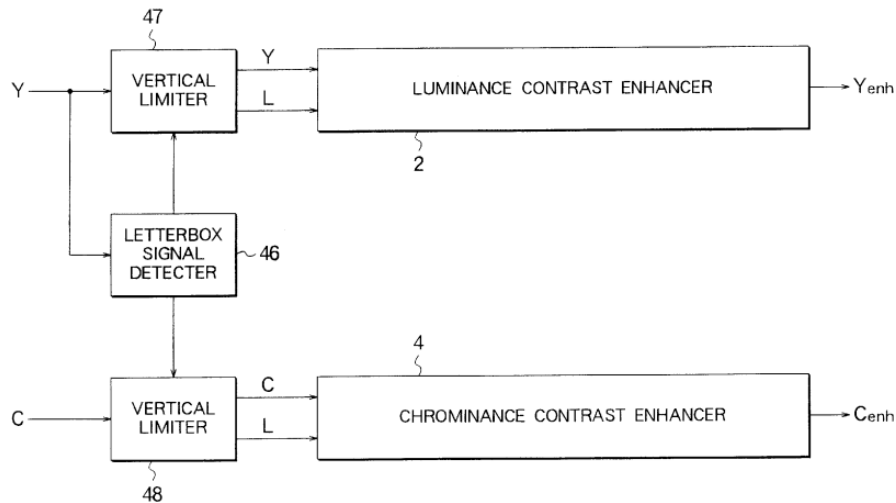
Although not argued by Petitioner with respect to claims 1 or 3, with respect to claim 5, Petitioner shifts to interpreting Fujimura's individual video frames as the

claimed “*video signal*.” This also fails. *Id.* Fujimura detects the start and end of the content area in a video and then applies picture correction to the content area while not correcting the letterbox areas. *Id.* But the claims require not applying the relevant correction to the “*video signal*” when the pattern portions are detected. *Id.* Fujimura still operates to correct a frame even when letterboxing is detected. *Id.*

Further, Petitioner is incorrect that the “vertical limiter 47” is somehow “*a controller*” even under a potential means-plus-function construction of that term (which the Petition is ambiguous regarding). EX2017, ¶162. As discussed above regarding Ground 1, under plain and ordinary meaning, “*a controller*,” at a minimum, comprises some sort of processing circuitry, such as a CPU. *See, e.g.*, EX2016, 3. And, as also described above with respect to Ground 1, this is consistent with how the ’645 Patent describes the “*controller*” because it describes that a CPU causes correction of the video signal input based on when the pattern portions are contained. EX1001, 18:50-61. But Petitioner fails to show that the “vertical limiter 47” is such a CPU. EX2017, ¶162. Rather, Petitioner relies on essentially copied-and-pasted attorney argument in its expert declaration. Importantly, while Fujimura does describe that certain elements may be “created from standard building blocks” including a “general-purpose processor” and/or “a digital signal processor,” this discussion does not involve the “vertical limiter 47.” *See* EX1005, 3:63-4:11. Rather,

that section only discusses the “luminance contrast enhancer” and the “chrominance contrast enhancer” and portions of those enhancers. *Id.*; EX2017, ¶162. In turn, Fujimura is silent as to what, if anything, would be used as the “vertical limiter 47.” *Id.* Petitioner is similarly silent. *Id.* And, a wide variety of non-CPU elements could be used to implement the functions of the “vertical limiter 47.” *Id.* Thus, Petitioner has not shown that Fujimura meets Petitioner’s own definition of a “*controller.*”

And Petitioner fails to show that Fujimura “*controls the corrector to cause the corrector not to correct the video signal when the pattern portions are contained.*” EX2017, ¶163. In Fujimura, the “vertical limiter 47” is one of two different vertical limiters (including “vertical limiter 48”) which receive information from a “letterbox signal detector 46” including “line numbers” for the “non-picture band.” EX1005, 13:34-58. Those vertical limiters then “provide the luminance signal Y and chrominance signal C to the luminance and chrominance contrast enhancers 2 and 4, together with letterbox control signals L.” *Id.*, 13:60-63. This flow is depicted in FIG. 17 of Fujimura:



EX1005, FIG. 17. Petitioner's arguments suggest that this feature is met because Fujimura selectively enhances horizontal scanning lines based on whether or not they are part of a letterbox section. Pet. 66-67. But the individual correction of horizontal scanning lines is not what the claim requires. EX2017, ¶163. The claim requires that the controller "*controls the corrector to cause the corrector not to correct the video signal when the pattern portions are contained.*" As discussed above with respect to claim construction (in Sections IV.A and IV.B), this "*video signal*" is the whole frame, not a portion thereof. EX2017, ¶163. Fujimura accounts for no such scenario: it does correct portions of the frame "*when the pattern portions are contained*" in the frame. *Id.* Fujimura is clear that its goal is to solve a problem "so that contrast enhancement processing can be limited to the picture area" when letterbox bars are present. *Id.*; EX1005, 2:48-55.

The Petition fails to address how a vertical limiter is "*a controller*" as recited

in limitation [1.d], fails to show that Fujimura “*controls the corrector to cause the corrector not to correct the video signal when the pattern portions are contained,*” and thus fails to show how limitation [1.d] is rendered obvious by Fujimura. EX2017, ¶164.

2. Petitioner Fails to Establish That Claim 2 Would Have Been Rendered Obvious in View of Fujimura

Claim 2 depends from claim 1. Therefore, for at least the reasons provided above in relation to claim 1 in Ground 1, Petitioner fails to establish that claim 2 would have been rendered obvious based on Fujimura. EX2017, ¶165.

a. Petitioner Fails to Establish That Claim Limitation [2.b] Would Have Been Rendered Obvious In View of Fujimura

As with Kim in Ground 1, the Petition fails to demonstrate that claim element [2.b] would have been obvious in view of Fujimura, as the Petition's treatment of this feature removes all meaning from the claim language to the point of rendering it superfluous. EX2017, ¶¶166-67.

Regarding Fujimura, the Petition asserts that this feature is met by letterbox signal detector 46 operating to detect a starting line of the picture area. Pet. 50-51. And since the correction is performed based on where the picture area is, this teaches limitation [2.b]. *Id.* Yet, again, the Petition already used the letterbox signal detector's detection of the letterbox boundaries as the claimed “*controller*” which

controls the “*corrector*” to cause the “*corrector*” to correct / not correct the “*video signal*” based on whether “*pattern portions*” are contained. Pet. 40-42; EX2017, ¶¶166-67. According to the Petition, the output from letterbox signal detector (the start and end lines of the picture area) correspond to pattern or no pattern, and that output decides to/not to correct the “*video signal*.” So, the Petition has already used the output of letterbox signal detector to meet the claim feature of controlling the “*corrector*” to correct or not correct. It is improper to use the same decision from the alleged pattern detector to also serve as the later, and separate, recitation that the correction itself is carried out based on the visual characteristics detected by the characteristic point detector. EX2017, ¶¶166-67. After all, the construction renders this separate claim language superfluous. *Id.*

3. Petitioner Fails to Establish That Claim 3 Would Have Been Rendered Obvious in View of Fujimura

a. Petitioner Fails to Establish That Claim Limitation [3.b] Would Have Been Rendered Obvious in View of Fujimura

In relation to this limitation, Petitioner merely cites back to limitation [1.b]. Pet. 52. (“Fujimura discloses this limitation. *See* limitation 1.b.”). Therefore, for the reasons provided above in relation to limitation [1.b], Petitioner fails to establish that claim limitation [3.b] would have been rendered obvious in view of Kim. EX2017,

¶168.

b. Petitioner Fails to Establish That Claim Limitation [3.e] Would Have Been Rendered Obvious in View of Fujimura

Claim limitation [3.e] recites “*a controller which controls the corrector to cause the corrector not to change the correction characteristics in the corrector when the pattern portions are contained.*” Pet. 56-57. Petitioner fails to establish that claim limitation [3.e] would be rendered obvious in view of Fujimura for at least the same reasons as provided above regarding claim 1. EX2017, ¶169. After all, the “vertical limiter 47” is not “*a controller,*” and in any event does not perform steps like causing “*the corrector not to change the correction characteristics in the corrector when the pattern portions are contained.*” *Id.* To the contrary, as discussed above regarding claim 1, Fujimura’s vertical limiter 47 is line-by-line, not frame-by-frame, meaning that it does “*change the correction characteristics in the corrector*” (on a line-by-line basis) when “*pattern portions are contained*” in a frame. *Id.*

4. Petitioner Fails to Establish That Claim 4 Would Have Been Rendered Obvious in View of Fujimura

Claim 4 depends from claim 1. Therefore, for at least the reasons provided above in relation to claim 1 in Ground 1, Petitioner fails to establish that claim 4 would have been rendered obvious based on Fujimura. EX2017, ¶170.

C. Ground 3: Petitioner Fails to Establish That Claims 5-8 Would Have Been Obvious Based on Fujimura and Kim

1. Petitioner Fails to Establish That Claim 5 Would Have Been Rendered Obvious in View of Fujimura and Kim

a. The Proposed Combination of Fujimura and Kim is Nonsensical and Would Not have been Obvious to a Person of Ordinary Skill in the Art

Petitioner's proposed combination of Fujimura and Kim is fatally deficient: Petitioner fails to identify how, if at all, the systems would have been combined. EX2017, ¶¶171-81. And, regardless of how the references would be combined, the proposed combination would defeat the utility of either/both references. *Id.*

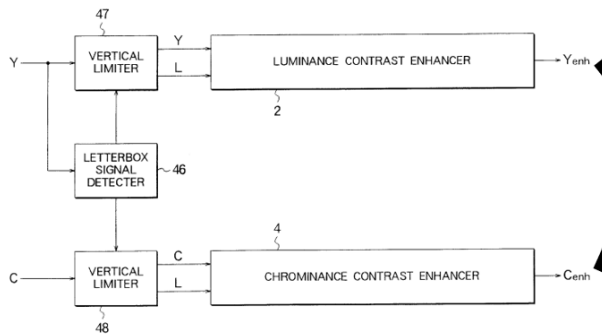
Because the Petition fails to identify how the two references would be combined, Dr. Turk has explored possible combination approaches in his declaration. *Id.* This analysis illustrates that the combination of both references introduces more problems than it solves. *Id.* For example, in many common use cases, the two systems would redundantly process (and thereby over-process) an image. *Id.* In turn, either possible combination of Kim and Fujimura would have introduced more problems for a POSITA than it would have solved. *Id.* Neither Petitioner nor Petitioner's expert even begin to recognize such issues, much less how they would be remedied. *Id.* Moreover, such problems would not be easy for a POSITA to solve and would require substantial reconfiguration of either/both Fujimura and/or Kim. *Id.*

i. Example Combination 1: Fujimura Output to Kim Input

As already discussed above, Fujimura teaches identifying boundaries to restrict correction in a single frame, while Kim teaches assigning a value to an entire frame to determine to what degree to apply image enhancement. In particular, Fujimura involves outputting the starting and ending lines of a picture portion when a video signal is a letterbox signal. *See* EX1005, 13:50-58. Fujimura thereby enables restriction of contrast enhance operations “to the area between the starting and ending lines of the picture area.” *See id.*, 14:50-59. In contrast, Kim assigns a value to an entire input image on how likely the entire input image is a “pattern- like image” or a “normal image.” *See, e.g.*, EX1004 ¶[0039] (“One can conclude that the input image is most likely a pattern-like image as the value of the pattern-like image detection parameter r approaches 1 and that the input image is most likely a normal image as the value of the pattern-like image detection parameter r approaches 0.”); *see also supra* Section VII.A.1.a.

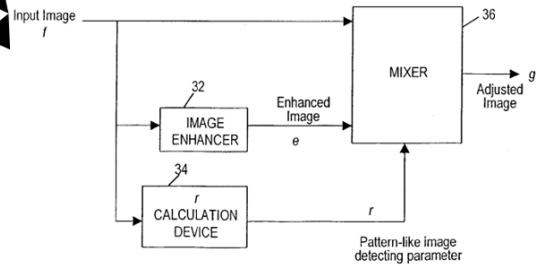
If Fujimura's line/boundary-based approach were performed before Kim, the output of its luminance and/or chrominance processing would flow, as “input image f ,” to Kim's processing:

FIG. 17



FUJIMURA

FIG. 4



KIM

30 →

EX2017, ¶¶175-78. But this approach has numerous flaws. *Id.* If a letterboxed video signal were fed into Fujimura, then it could detect the letterboxing, correct the non-letterboxed portion, and then output the corrected signal as input into Kim. *Id.* But Kim would then re-enhance the already-enhanced video content, calculate r to determine whether the total frame was a pattern, and then (presumably) output the redundantly enhanced image using the “mixer 36.” *Id.* The combined process would thereby enhance redundantly, wasting power in direct contravention of the problems addressed by the '645 Patent. It is also possible that imprecision with respect to the calculation of r could result in portion(s) of the “Enhanced Image e ” being included as part of the “Adjusted Image,” meaning that the output might be over-corrected. *Id.*

Further issues would arise if a whole-frame pattern were fed into this system.

EX2017, ¶178. Assume that Kim's whole-frame pattern, depicted in FIG. 1 of Kim, were fed into the above system.

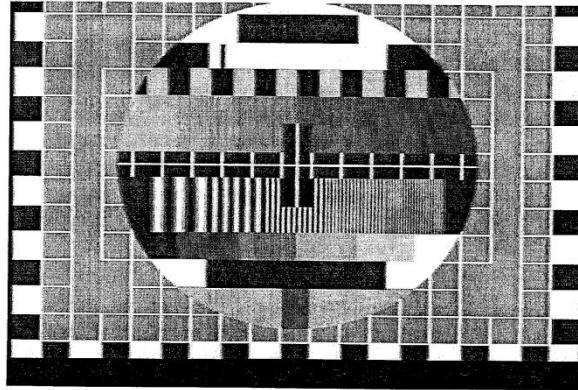
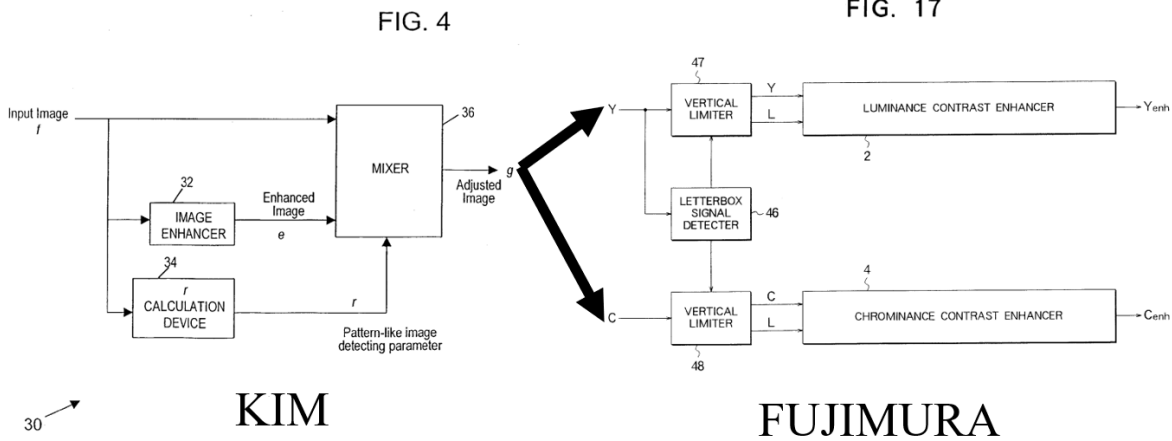


FIG. 1

EX1004, FIG. 1. Here, the whole-frame pattern shows a substantially black portion at the bottom, meaning that Fujimura might key on the bottom black bar as part of letterboxing. *Id.* This would potentially result in Fujimura performing corrections on the pattern above that black bar, contradicting Kim's approach of avoiding the correction of such patterns. *Id.*

ii. Example Combination 2: Kim Output to Fujimura Input

The reverse approach, using Kim's output as Fujimura's input, also introduces a variety of problems for a POSITA. EX2017, ¶¶179-81. In this example, the "Adjusted Image g" of Kim would be fed, likely line-by-line, to Fujimura:



EX2017, ¶¶179-80. If letterboxed content is fed into this system as “Input image f ,” to any extent that the frame(s) were even remotely still or similar, Kim would use at least a portion of the “Enhanced image e ” to generate the “Adjusted image g ,” meaning that at least a portion of the letterboxing portion of the video would be corrected. *Id.* Then, Fujimura might have difficulty operating: if the processing of Kim changed the luminance of the letterboxed portions (*e.g.*, by brightening them), then Fujimura might not identify that letterboxing. *Id.* And, even if such letterboxing were identified, the content portions of the video could be double-corrected: once by Kim, and then redundantly by Fujimura. *Id.* Yet again, this combination would waste substantial computational (and power) resources in direct contravention of the purposes of the ’645 Patent.

The problems with this combination are similar but slightly different if a pattern, like that of FIG. 1 of Kim, were provided to as input. EX2017, ¶181. In that

circumstance, Kim might output an “Adjusted image g” that does not correct the pattern. *Id.* But because the pattern in FIG. 1 still features a black stripe at the bottom, Fujimura might still correct the portions above that black bar. *Id.* The output of this combination might thereby defeat the entire operating principle of Kim. *Id.*

b. Petitioner Fails to Establish That Claim Limitations [5.b] and [5.c] Would Have Been Rendered Obvious in View of Fujimura and Kim

Claim limitation [5.b] recites “*a pattern portion detector which detects whether a pattern portion other than contents is contained in the video signal input to the input unit,*” and claim limitation [5.c] recites: “*a no-picture area detector which detects whether the pattern portions are no-picture areas having a single color.*” Petitioner fails to establish limitation [5.b] and [5.c], particularly in combination, would be obvious in view of Fujimura and Kim. EX2017, ¶¶182-85. That is at least because the proposed combination does not both (1) “*detect[] . . . a pattern portion other than contents*” and (2) detect whether the “*pattern portions are no-picture areas*” but instead operates on the presumption that all “*pattern portions are no-picture areas.*” *Id.*; Pet. 62-62.

In Ground 3 and with respect to limitations [5.b] and [5.c], Petitioner re-incorporates its Ground 2 arguments, asserting that the “*pattern portions*” are Fujimura’s “black non-picture bands above and below the picture area.” Pet. 62-63.

But, by this logic, the Fujimura/Kim combination need never decide “*whether the pattern portions are no-picture areas having a single color*” because the “*pattern portions*” calculated by Fujimura (e.g., by counting dark pixels) will always be “*no-picture areas having a single color.*” EX2017, ¶183. Fujimura does not contemplate other types of “*pattern portions.*” *Id.* Thus, in the proposed combination, there is no need for a “*no-picture area detector*” in the first place, as Petitioner’s read of the “*pattern portion detector*” would already guarantee that a “*no-picture area[]*” was present. *Id.*

Seemingly anticipating this argument, Petitioner argues that the claim recites the “*no-picture area detector*” and the “*pattern portion detector*” “functionally, rather than structurally, and no intrinsic evidence prohibits them from overlapping or from one being a subpart of the other.” Pet. 65. But, even if that were true (not conceded by Patent Owner), Petitioner’s reading of Fujimura and the claims would still essentially ignore the “*function[]*” in the claims. EX2017, ¶¶184. That is, even if the claim only “functionally” required (1) detecting a “*pattern portion*” and then (2) determining whether that “*pattern portion*” is a “*no-picture area,*” the second step would be unnecessary in Fujimura because Fujimura’s system is exclusively designed to identify letterboxing no-picture areas. *Id.* Petitioner’s arguments thus impermissibly read out an entire claim element, functional or not.

c. Petitioner Fails to Establish That Claim Limitations [5.e.i] Would Have Been Rendered Obvious in View of Fujimura and Kim

Claim limitation [5.e.i] recites “*a controller which controls the corrector to cause the corrector to correct the video signal input to the input unit when the pattern portions are not contained and when the pattern portions are the no-picture areas.*” For this limitation, Petitioner relies on similar rationale to Ground 2, limitation [1.d]. *See* Pet. 45-48, 66-67. Petitioner fails to establish that claim limitation [5.e.i] would be rendered obvious in view of Fujimura and Kim for at least the same reasons as provided above regarding Ground 2, limitation [1.d]. EX2017, ¶¶186-88. For instance, Petitioner fails to identify a “*controller*” that controls anything in the first place. *Id.*

Note that Petitioner's assertion that the “vertical limiter 47” is the claimed “*controller*” fails here because Fujimura's “vertical limiter 47” does not “*correct the video signal input to the input unit when the pattern portions are not contained and when the pattern portions are the no-picture areas.*” EX2017, ¶¶187-88. In Fujimura, there is no distinction between “*pattern portions*” and “*no-picture areas.*” *Id.* There is, therefore, no way that Fujimura could decide both (1) “*when the pattern portions are not contained*” and (2) “*when the pattern portions are the no-picture areas.*” *Id.*

Kim does not remedy Fujimura's deficiencies at least because there is no feasible way that Kim's functionality could be combined to improve the control of Fujimura's "vertical limiter 47." EX2017, ¶188. Fujimura's vertical limiters are, as their name implies, focused on controlling the vertical scan lines for (e.g.) luminance and/or chrominance enhancement. *Id.* There is no element in Kim that would transform these line number-focused elements into elements that could control frame-level enhancement "*when pattern portions are*" or are not contained, much less to decide to do so based on whether "*pattern portions are the no-picture areas.*" *Id.* Petitioner does not even begin to detail how such an improvement would be effectuated. *Id.*

d. Petitioner Fails to Establish That Claim Limitation [5.e.ii] Would Have Been Rendered Obvious in View of Fujimura and Kim

Claim limitation [5.e.ii] recites "*a controller*" which "*controls the corrector to cause the corrector not to correct the video signal when the pattern portions are not the no-picture areas.*" Petitioner fails to establish that claim limitation [5.e.ii] would be rendered obvious in view of Fujimura and Kim for at least the same reasons provided above regarding limitation [5.e.i], as well as for the many reasons described above regarding the deficiencies of the proposed combination as a whole. Pet. 67-71. EX2017, ¶¶189-91. After all, Fujimura assumes that all "*pattern portions*" are

“*no-picture areas*,” and it’s far from clear how Kim would modify the “vertical limiter 47” (the alleged “*controller*”) to account for “*pattern portions [that] are not the no-picture areas.*” *Id.*

Petitioner’s hand-waving assertions regarding the proposed combination of Fujimura and Kim underscore the illogical nature of that combination. EX2017, ¶190. After relying on Fujimura to disclose the other limitations of claim 5 (Pet. 59-67), Petitioner alleges that “a POSITA would have been motivated to add Kim’s functionality to Fujimura to account for such patterns for which Fujimura does not account.” Pet. 71. But, as discussed above in Section VII.C.1, combining Kim and Fujimura in either way (*e.g.*, Kim output to Fujimura input, or vice versa) introduces numerous issues. EX2017, ¶190. In turn, even if a POSITA were somehow motivated to combine the references, doing so would be an onerous task that would introduce a wide variety of issues that could not be easily corrected by a POSITA. *Id.* The desire to “account for such patterns to which Fujimura does not account” is not sufficient explanation as to how these many hurdles would be overcome. *Id.*

For at least the foregoing reasons, Petitioner fails to show that claim limitation [5.e.ii] would have been rendered obvious based on Fujimura and Kim. *Id.*

2. Petitioner Fails to Establish That Claims 6-8 Would Have Been Rendered Obvious in View of Fujimura and Kim

Claims 6-8 depend from claim 5. Therefore, for at least the reasons provided

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above in relation to claim 5, Petitioner fails to establish that claims 6-8 would have been rendered obvious based on Fujimura and Kim. EX2017, ¶192.

VIII. CONCLUSION

For at least the foregoing reasons, the Board should uphold the patentability of the challenged claims.

Date: May 12, 2026

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CERTIFICATE OF SERVICE

I hereby certify that on this 12th day of May, 2026, a copy of the attached **PATENT OWNER'S RESPONSE** was served by electronic mail to the attorneys of record, at the following addresses:

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CERTIFICATION PURSUANT TO 37 C.F.R. § 42.24(d)

Pursuant 37 CFR 42.24(d), the undersigned certifies that this Response and complies with the type-volume limitation of 37 CFR § 42.24(a). The word count application of the word processing program used to prepare this Patent Owner's Response indicates that the Response contains 13,389 words, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a).

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