

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

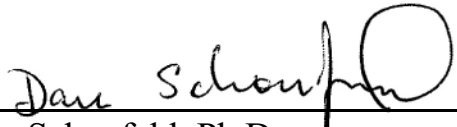
MAXELL, LTD.,
Patent Owner

Inter Partes Review No.: IPR2025-01312
U.S. Patent No. 7,952,645

**SUPPLEMENTAL DECLARATION OF DR. DAN SCHONFELD
REGARDING PATENT OWNER'S RESPONSE**

I hereby declare under penalty of perjury under the laws of the United States of America that the following is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code.

Date: July 31, 2026



Dan Schonfeld, Ph.D.

TABLE OF CONTENTS

I.	INTRODUCTION	1
A.	Background and Qualifications	1
B.	Materials Considered.....	1
II.	LEGAL STANDARDS	2
III.	THE '645 PATENT	2
A.	A Person of Ordinary Skill in the Art	2
IV.	CLAIM CONSTRUCTION	2
A.	“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)	3
B.	“a controller” (claims 1, 3, 5).....	4
V.	KIM DISCLOSES AND RENDERS OBVIOUS CLAIMS 1-3.....	6
A.	Kim and Claim Element 1.c	6
B.	Kim and Claim Element 1.d.....	8
VI.	FUJIMURA DISCLOSES AND RENDERS OBVIOUS CLAIMS 1-4.	9
A.	Fujimura and Claim Elements 1.a and 1.b	9
B.	Fujimura and Claim Element 1.d	10
VII.	FUJIMURA COMBINED WITH KIM DISCLOSES AND RENDER OBVIOUS CLAIMS 5-8.....	12
A.	Combining Fujimura and Kim	12
B.	Fujimura Discloses Claim Elements 5.b and 5.c	13
C.	Fujimura Discloses Claim Element 5.e.i.....	14
VIII.	CONCLUSION.....	15

EXHIBITS

Exhibit No.	Description
1001	U.S. Patent No. 7,952,645 (“the ‘645 patent”).
1002	File History of U.S. Patent No. 7,952,645.
1003	Declaration of Dr. Dan Schonfeld.
1004	U.S. Patent App. Pub. No. 2004/0156545 (“Kim”).
1005	U.S. Patent No. 5,808,697 (“Fujimura”).
1006	ITU “Recommendation ITU-R BT.1298*; Enhanced wide-screen NTSC TV transmission system” (1997) (retrieved from https://www.itu.int/dms_pubrec/itu-r/rec/bt/R-REC-BT.1298-0-199710-W!!PDF-E.pdf).
1007	Definition of “signal” from <i>Chambers Dictionary of Science & Technology</i> (2007).
1008	Definition of “according to” from <i>The New Oxford American Dictionary</i> (2nd ed. 2005).
1009	Definition of “according to” from <i>Webster’s New College Dictionary</i> (2005).
1010	Definition of “according to” from <i>The Chambers Dictionary</i> (10th ed. 2007).
1011	Patent Owner’s responsive claim construction brief from <i>Maxell, Ltd., v. Lenovo Group Ltd.</i> , No. 6:21-cv-01169 (W.D. Tex. Jun. 13, 2022).
1012	Patent Owner’s sur-reply claim construction brief from <i>Maxell, Ltd., v. Lenovo Group Ltd.</i> , No. 6:21-cv-01169 (W.D. Tex. Jul. 11, 2022).
1013	Patent Owner’s infringement contentions cover pleading from <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00052 (E.D. Tex.).
1014	Patent Owner’s ‘645 patent infringement contentions claim chart from <i>Maxell, Ltd. v. Samsung Elecs. Co., Ltd.</i> , No. 5:25-cv-00052 (E.D. Tex.).
1015	Petitioner’s “Sotera plus” Stipulation.
1016	Complaint from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:23-cv-00092 (E.D. Tex. Sept. 7, 2023).
1017	Order from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:23-cv-00092 (E.D. Tex. Mar. 21, 2025).
1018	Order from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:23-cv-00092 (E.D. Tex. Jul. 9, 2025).

Exhibit No.	Description
1019	Order from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:23-cv-00092 (E.D. Tex. May 2, 2025) (public version).
1020	Order from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:23-cv-00092 (E.D. Tex. Sept. 18, 2025) (public version).
1021	Excerpts of the trial transcript from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:23-cv-00092 (E.D. Tex. May 22, 2025).
1022	Letter from Maxell to Samsung dated July 7, 2021.
1023	Email thread between Maxell and Samsung from July 2021 to January 2022.
1024	Letter from Maxell to Samsung dated December 29, 2021.
1025	IPR2024-00867, Paper 40 (Petitioner’s Response to Patent Owner’s Request for Authorization to File Materials from Related Matters).
1026	IPR2024-00717, Paper 33 (Order Denying Patent Owner’s Request for Authorization to File Materials).
1027	IPR2024-00828, Paper 42 (Petitioner’s Response to Patent Owner’s Motion to Submit Supplemental Information).
1028	IPR2024-00828, Paper 47 (Petitioner’s Sur-reply to Patent Owner’s Motion to Submit Supplemental Information).
1029	IPR2024-00828, Paper 50 (Order Denying Patent Owner’s Motion to Submit Supplemental Information).
1030	IPR2024-00735, Paper 41 (Petitioner’s Opposition to Motion to Submit Supplemental Information).
1031	U.S. Patent No. 7,046,302 (“Konuma”).
1032	Petitioner’s Motion to Stay Pending <i>Inter Partes</i> Review from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:25-cv-00052 (E.D. Tex. Oct. 24, 2025).
1033	“Order Focusing Patent Claims and Prior Art” from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:25-cv-00052 (E.D. Tex. Aug. 18, 2025).
1034	Law360 article, “Stewart Says New Patent Policies Aim to Bring Stability,” dated Sept. 8, 2025.
1035	Supplemental Declaration of Dr. Dan Schonfeld Regarding Patent Owner’s Motion to Amend.
1036	U.S. Patent App. Pub. No. 2006/0258289 (“Dua”).
1037	Joint Claim Construction Statement from <i>Maxell, Ltd. v. Samsung Elecs. Co.</i> , No. 5:25-cv-00052 (E.D. Tex. Jan. 28, 2026).

Exhibit No.	Description
1038	Supplemental Declaration of Dr. Dan Schonfeld Regarding Patent Owner's Response.
1039	U.S. Patent No. 8,139,157 ("Someya").
1040	U.S. Patent No. 8,792,039 ("Hirooka").
1041	U.S. Patent No. 8,184,200 ("Biswas").
1042	U.S. Patent No. 6,148,103 ("Nenonen").
1043	Definition of "when" from <i>The New Oxford American Dictionary</i> (2nd ed. 2005).
1044	Definition of "when" from <i>Webster's New College Dictionary</i> (2005).
1045	Definition of "controller" from <i>Dictionary of ICT</i> (4th ed. 2004).
1046	Definition of "controller" from <i>Wiley Electrical and Electronics Engineering Dictionary</i> (2004).
1047	U.S. Patent No. 6,125,371 ("Bohannon").
1048	Markus P.J. Fromherz, <i>Model-Based Computing for Design and Control of Reconfigurable Systems</i> , AI MAGAZINE, Winter 2004.
1049	A.S. Bishell, <i>Designing the Control Architecture for Algorithm Specific Custom Processors on FPGAs</i> , Elecs. N.Z. Conf. (Nov. 2007).
1050	Joel Johnson, <i>Drive Safe</i> , POPULAR MECHANICS, May 2006.
1051	Matthew Turk, <i>Perceptual Interfaces</i> , EMERGING TOPICS IN COMPUTER VISION, 2004.
1052	Definition of "pixel" from <i>Dictionary of Computer Vision and Image Processing</i> (2005).
1053	International Organization for Standardization, <i>Digital imaging — Specification guideline for digital cameras</i> , ISO 18383:2025, (2nd ed. 2025).
1054	Sony, <i>What is a pixel and how does it form a picture?</i> , Sony USA (May 1, 2024), https://www.sony.com/electronics/support/articles/00342545 .
1055	Transcript of deposition of Patent Owner's expert Dr. Matthew Turk (Jul. 21, 2026).

TABLE OF CLAIMS

[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] 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;
[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.i]	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,
[5.e.ii]	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

1. I, Dr. Dan Schonfeld, have been retained by counsel for Petitioners Samsung Electronics Co. Ltd. and Samsung Electronics America, Inc. (collectively, “Samsung”) as an expert witness in this *inter partes* review. I have been asked to provide my opinion about certain topics related to Maxell’s Response (dated May 12, 2026) to Samsung’s Petition.

2. Samsung counsel has asked me to address only certain parts of Maxell’s Response. I understand from Samsung counsel that no expert opinion is needed to respond to the other parts of Maxell’s Response.

3. I have been retained at my normal hourly rate of \$800 per hour. My compensation is not contingent upon my performance, the outcome of this matter, or any issues involved in or related to this matter.

A. Background and Qualifications

4. I set forth my background and qualifications in my first declaration regarding the ’645 patent in this IPR, titled “Declaration of Dan Schonfeld in Support of Petition for *Inter Partes* Review of U.S. Patent No. 7,952,645.” EX1003 (“Original Declaration”). I incorporate that section of my Original Declaration here by reference.

B. Materials Considered

5. In preparing this declaration and forming my opinions, I have considered the materials referenced in this declaration, including in the table of

exhibits at the beginning of this declaration. My opinions also are based on my years of education, research, and experience, as well as my review of relevant materials. I also have considered Maxell's Response.

II. LEGAL STANDARDS

6. I set forth certain relevant legal standards in my Original Declaration, and I incorporate those legal standards here by reference. EX1003.

III. THE '645 PATENT

7. I provided an overview of the '645 patent and its prosecution history in my Original Declaration, and I incorporate that overview here by reference. EX1003.

A. A Person of Ordinary Skill in the Art

8. I provided my opinion about a person of ordinary skill in the art ("POSITA") of the '645 patent in my Original Declaration, and I incorporate that opinion here by reference. EX1003.

IV. CLAIM CONSTRUCTION

9. I provided my opinion about the construction of certain claim terms in my Original Declaration, and I incorporate those opinions here by reference. EX1003. Below, I further address the construction of certain claim terms in light of Maxell's Response.

- A. **“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)**

10. In my Original Declaration, I explained that I understood from counsel that Maxell might assert that these claim elements are means-plus-function elements. EX1003, ¶¶42-43.

11. In Maxell’s Response, Maxell says that “the claimed ‘corrector’ language includes ‘means-plus-function limitations and that the corresponding structure is [CPU 7] or equivalents thereof.’” Resp. at 10.

12. I understand from counsel that, to be a “means-plus-function” claim element, the claim element must recite a function without reciting a structure to perform the function. I understand from counsel that a claim term’s structure can be inferred from its function. I also understand from counsel that a claim term can refer to a class of structures (*i.e.*, the claim term does not have to recite or imply a single structure). For these claim elements, I understand that the functions are “corrects the video signal input to the input unit” (claims 1 and 5) and “changes correction characteristics according to a result of detection output from the characteristic point detector” (claim 3). I understand from counsel that the relevant question is whether the recited “corrector” implies a structure to a POSITA.

13. In my opinion, the recited “corrector” would be understood to a POSITA to refer to the class of structures that perform video correction, and such

structures were well known. *See, e.g.*, EX1039, 2:18-19 (“A video corrector performs a video correction on the video signal”); EX1040, 6:40-47 (“image corrector portion” performs image correction); EX1041, 3:4-11 (“error corrector” corrects errors in a video frame).

14. Such structures were well known in part because video enhancement functionality was well known. *See, e.g.*, EX1004 (Kim), ¶41 (“a number of known enhancement methods”); EX1005 (Fujimura), 1:7-10 (“well-known histogram equalization method” enhances a video’s luminance contrast); EX1042, 1:14-15 (“Histogram equalization is a known method for maximizing picture contrast.”).

15. Such structures could (and often would) take the form of, for example, dedicated hardware that performs video correction or instructions to perform video correction that are executed by a processor. A POSITA would have understood such structures to typically include an input module, a buffer for storing the input, a module to modify the input, and an output module. A POSITA also would have understood the *correctors* identified in Kim and Fujimura to include this or similar structure.

B. “a controller” (claims 1, 3, 5)

16. In Maxell’s Response, it argues that “a controller” must include “some sort of processing circuitry, such as a CPU.” Resp., 40-41. I disagree. The plain meaning of “controller” is broader, and includes components without

circuitry, such as software.

17. This conclusion is confirmed by various publications. For example, a dictionary definition from 2004 defines “controller” as “a hardware or software device” EX1045, 4. Another dictionary from 2004 broadly defines “controller” to include “[a] signal, circuit, device or system which controls any given mechanism, function, process, or piece of equipment.” EX1046, 4. A patent filed in 1997 explains that “[t]hose skilled in the art should be familiar with the use of controllers in processing environments generally” and that such “[c]ontrollers may be implemented in software, firmware, [or] hardware” EX1047, 4:52-57. Computing publications also referred to controllers that are software. *E.g.*, EX1048 (article from “AI Magazine”), 3 (“The system controller ... is the most challenging piece of software ...”); EX1049 (research paper), 2 (a “software controller ... [u]ses ... instructions defined in software”); EX1050 (article from “Popular Mechanics”), 5 (“USB software controller within [Windows] XP”). Even Maxell’s expert Dr. Turk has used “controller” more broadly. EX1051, 32 (“the human brain is a ... controller”).

18. Maxell cites a passage describing “microcontrollers” from a document titled “Microcontrollers.” Resp., 40 (citing EX2016). But a POSITA would have recognized that “microcontroller” is a narrower term that specifically refers to a microprocessor-based controller.

V. KIM DISCLOSES AND RENDERS OBVIOUS CLAIMS 1-3.

A. Kim and Claim Element 1.c

19. In my Original Declaration, I explained how Kim discloses claim element 1.c (“a corrector which corrects the video signal input to the input unit; and”). EX1003, ¶¶71-74. I opined that Kim inherently (necessarily) discloses a processor such as a CPU or equivalent, and that it would have been obvious to a POSITA to implement the functionality of Figure 4 in a CPU or equivalent. *Id.*, ¶74.

20. Maxell argues that Kim does not inherently disclose a CPU or equivalent because “analog signals” can be “mixed together ... without use of a CPU.” Resp., 36-37. But Maxell’s argument overlooks the fact that Kim is directed to *digital* signals. Kim’s “input picture (field or frame) f” is a digital signal because it is “composed of J pixels,” *i.e.*, picture elements, which are digital data because they include, for example, “a specific gradation level x” that varies from “0” to “L,” which typically is 255. EX1004 (Kim), ¶22. And Kim’s use of the word “pixel” further indicates a digital image. EX1052, 3 (defining “pixel” to be “[t]he intensity values of a digital image”); EX1053, 9 (defining “pixel” as “the smallest geometric unit of information in a digital representation of an image”); EX1054, 1 (“pixel ... refers to the smallest unit of a digital image”). Moreover, even if Kim’s signals were analog, the analog processor would be equivalent to a

CPU.

21. In my Original Declaration, I explained that motivation to implement the functionality of Kim's Figure 4 in a CPU or equivalent comes from various places, one of which is Fujimura's disclosure of implementing any component of an image processing system in a "general-purpose processor." EX1003, ¶74; EX1005 (Fujimura), 4:6-11. A POSITA would have been particularly motivated to implement the functionality of Kim's Figure 4 using a general-purpose processor, such as a CPU, rather than dedicated hardware, because a CPU provides a flexible implementation that allows its functionality to be modified by updating its software.

22. Maxell also argues that Fujimura is "not analogous" to Kim. Resp., 37-38. I understand from counsel that, when combining prior art references, the relevant inquiry is whether each prior art reference is analogous *to the challenged patent*, not to each other. Nonetheless, Kim and Fujimura are analogous to each other and to the '645 patent. I understand from counsel that one circumstance in which two pieces of prior art are "analogous" is when they are in the same "field of endeavor." Kim, Fujimura, and the '645 patent are all in the same field of endeavor because all are directed to video processing and correction. EX1004 (Kim), ¶1 (contrast enhancement); EX1005 (Fujimura), 1:3-6 (same); EX1003 (my Original Declaration), ¶¶57, 61, 71-73 (Kim's video enhancement), 104-105

(Fujimura's video enhancement); EX1001, 1:9-13 (video processing). Thus, Kim, Fujimura, and the '645 patent are all analogous.

B. Kim and Claim Element 1.d

23. In my Original Declaration, I explained how Kim discloses claim element 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”). EX1003, ¶¶75-77. I explained that, in Kim, if r equals 1, input image f is “a pattern-like image,” equation 6 becomes $g=f$, and mixer 36 outputs adjusted image g that is the same as image f , meaning it did not correct image f . *Id.*, ¶75.

24. Maxell argues that Kim “always” corrects the video signal by generating the enhanced image e . Resp., 39-40. But Kim's output is not enhanced image e , it is “adjusted image g .” EX1003, ¶75; EX1004 (Kim), Fig. 4. And, as described above, when there is “pattern-like image,” adjusted image g is equal to input image f . Although image enhancer 32 still creates enhanced image e , mixer 36 does not use and does not output enhanced image e in the scenario described above. A POSITA would have understood that claim element 1.d in the context of the claim refers to the video signal output rather than a purely internal video signal, and that temporary creation of enhanced image e that is subsequently discarded in

the scenario above is not “correct[ing] the video signal input.”

25. Also, I explained that Kim’s mixer 36 alone can be the *corrector* of this claim element. EX1003, ¶72. In this mapping, Maxell’s argument above does not apply because it relies on correction performed at image enhancer 32, a different component. And claim element 1.d does not prohibit a component other than *the corrector* from correcting a copy of the input image, especially where that corrected copy is never used and never output.

26. Maxell also argues that “r calculation device 34” is not the *controller* of this claim element because image enhancer 32 always creates an enhanced image. Resp. at 42. But “r calculation device 34” controls whether mixer 36 will fully correct the image (when r equals 1) or will not correct the image at all (when r equals 0), by providing r to mixer 36. EX1003, ¶¶75-77. R calculation device 34, therefore, performs the *control[ling]* of this claim element.

VI. FUJIMURA DISCLOSES AND RENDERS OBVIOUS CLAIMS 1-4.

A. Fujimura and Claim Elements 1.a and 1.b

27. In my Original Declaration, I explained how Fujimura discloses elements 1.a (“an input unit to which a video signal containing contents is input”) and 1.b (“a detector which detects whether pattern portions other than contents are contained in the video signal input to the input unit”). EX1003, ¶¶97-103. For these claim elements, I explained that a scanning line in Fujimura is a *video signal*.

Id., ¶97.

28. Maxell argues that Fujimura does not disclose a scanning line that includes both content and pattern portions. Resp., 46. I disagree. Fujimura discloses classifying each pixel in a scanning line as either “bright or dark.” EX1003, ¶102; EX1005 (Fujimura), 14:7-12. Lines with dark pixels above a certain threshold are classified as being part of a letterbox band. EX1003, ¶102; EX1005, 14:13-36. A POSITA would have understood this description to disclose the case where a scanning line has some bright pixels (which can be *content*), but not enough to classify the line as part of the picture area. Thus, Fujimura discloses a scanning line (*video signal*) that includes some bright pixels that are *content* and a number of dark pixels above the threshold (*pattern portions*). EX1003, ¶102.

29. Fujimura discloses an example of such a scanning line when it discloses that a letterbox band can include a caption, the pixels of which are bright pixels. EX1005 (Fujimura), 13:53-58 (“a caption is present in the non-picture band beneath the picture area”), 14:1-6 (“If a caption is present in the lower non-picture band ...”), 14:41-50 (detecting a caption’s bright pixels). Maxell’s expert Dr. Turk confirmed that captions are an example of bright pixels in a letterbox band. EX1055, 83:3-19.

B. Fujimura and Claim Element 1.d

30. In my Original Declaration, I explained how Fujimura discloses claim

element 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”). EX1003, ¶¶108-111. I explained that Fujimura’s vertical limiter 47 satisfies the recited *controller*. *Id.*, ¶¶109-111.

31. Maxell argues that the claim term *controller* requires “processing circuitry, such as a CPU.” Resp., 48-49. I disagree. The plain meaning of “controller” does not require “processing circuitry” because it includes, for example, software. § IV.B.

32. Nonetheless, Fujimura discloses processing circuitry for vertical limiter 47 (the *controller*). Fujimura discloses “add[ing] ... vertical limiter 47 ... to the luminance contrast enhancer 2.” EX1005 (Fujimura), 13:34-38. And luminance contrast enhancer 2 can be implemented using “a general-purpose processor,” which would include processing circuitry. *Id.*, 3:63-4:11. A POSITA would have understood that disclosure to also apply to any “add[itions]” to the luminance contrast enhancer, such as vertical limiter 47, because such “add[itions]” become a functional part of the contrast enhancer. *Id.*, 13:34-38; Fig. 17 (showing the two communicatively coupled). Maxell’s related argument that Fujimura is “silent as to what, if anything, would be used as the ‘vertical limiter

47,” therefore, is incorrect. Resp., 49.

33. A POSITA also would have understood that Fujimura necessarily (inherently) discloses processing circuitry that is used to implement the functionality of vertical limiter 47 because, for example, if vertical limiter 47 were software, it still would require circuitry to execute. It also would have been obvious to a POSITA to implement vertical limiter 47 using processing circuitry for the same reason. Motivation to do so arises from Fujimura’s disclosure of implementing luminance contrast enhancer 2 using “a general-purpose processor,” which would have led a POSITA to do the same for components “add[ed]” to the contrast enhancer. EX1005, 3:63-4:11. A POSITA would have been particularly motivated to implement vertical limiter 47 using a general-purpose processor, such as a CPU, rather than dedicated hardware, because a CPU provides a flexible implementation that allows its functionality to be modified by updating its software. Doing so would have amounted to merely choosing from a finite number of identified, predictable solutions for implementing the vertical limiter 47. Doing so also would have been within the judgment and creativity of a POSITA.

VII. FUJIMURA COMBINED WITH KIM DISCLOSES AND RENDER OBVIOUS CLAIMS 5-8.

A. Combining Fujimura and Kim

34. In my Original Declaration, I explained how the combination of Fujimura and Kim disclosed all the elements of claims 5-8. EX1003, ¶¶136-166. I

also explained how it would have been obvious to a POSITA to combine the functionality of Kim that I cited for claim element 5.e.ii with Fujimura. *Id.*, ¶¶152-158. I explained that, in the combination, Fujimura would include the additional functionality of not correcting the image if calculation device 34 detects a pattern (*i.e.*, if $r=1$), as Kim discloses. *Id.*, ¶155. Stated differently, if $r=1$ for an image, the modified Fujimura would not correct the image; otherwise, it would proceed normally (*i.e.*, it would correct picture areas but not correct the letterbox band areas). *Id.*

35. Maxell makes arguments based on a combination in which Kim's Figure 4 and Fujimura's Figure 17 are placed side-by-side. *Resp.*, 55-59. But I did not propose such a combination, as described above. And I understand from counsel that an obviousness combination does not require placing figures side-by-side as Maxell does. Maxell's arguments based on those figures, therefore, do not apply to my proposed combination.

B. Fujimura Discloses Claim Elements 5.b and 5.c

36. In my Original Declaration, I explained how Fujimura discloses claim elements 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;”) and 5.c (“a no-picture area detector which detects whether the pattern portions are no-picture areas having a single color;”). EX1007, ¶¶140-147. I also explained that

Fujimura detects letterbox bands (*no-picture areas having a single color*). *Id.*, ¶¶143-146.

37. Maxell argues that Fujimura does not disclose these claim elements because “Fujimura does not contemplate other types of ‘pattern portions,’” meaning pattern portions other than letterbox bands. Resp., 59-60. But the language of these claim elements does not require detecting other types of pattern portions (*i.e.*, does not require detecting multiple types of pattern portions). Claim element 5.c requires detecting only “whether the pattern portions are no-picture areas having a single color,” which requires detecting only one type of pattern portion (namely, *no-picture areas having a single color*).

38. Maxell underlines the word “whether” in this claim element. Resp., 60. But the plain meaning of claim element 5.c, including its use of the word “whether,” includes determining if the image includes *no-picture areas having a single color* or not, which again requires detecting only one type of pattern portion (namely, *no-picture areas having a single color*).

C. Fujimura Discloses Claim Element 5.e.i

39. In my Original Declaration, I explained how Fujimura discloses claim element 5.e.i (“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”). EX1003,

¶¶149-151. I explained that, in Fujimura, when an image (*video signal*) does not contain the black non-picture bands or other pattern portions (*when the pattern portions are not contained*), and is purely a picture area, Fujimura corrects the image. *Id.* Fujimura discloses such a frame (*i.e.*, a frame that does not contain letterbox bands and is purely a picture area). For example, Fujimura discloses the frame of Figure 18 in a 16:9 aspect ratio, which would not include letterbox bands because the letterbox bands are added as a result of changing to a 4:3 aspect ratio. EX1005, 13:42-49. Fujimura's disclosure of detecting a letterbox signal implies that a frame may not include letterbox bands, and a POSITA would have understood that such a frame can be (and typically would be) purely a picture area. *Id.*, 13:53-58 ("If the luminance signal is a letterbox signal ...").

VIII. CONCLUSION

40. For these reasons and the reasons in my Original Declaration, it is still my opinion that the claims of the '645 patent are unpatentable.