

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

138 EAST LCD ADVANCEMENTS LIMITED,
Patent Owner.

IPR2024-00958
U.S. Patent 8,482,638

**PETITIONER'S OPPOSITION TO PATENT OWNER'S
REVISED NON-CONTINGENT MOTION TO AMEND**

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. GROUND 1: SUBSTITUTE CLAIMS 7, 8, AND 10-12 WOULD HAVE BEEN OBVIOUS OVER PARULSKI AND SAFONOV	3
A. Independent Claim 7	3
1. It is undisputed that Parulski discloses or renders obvious [7Preamble]-[7d], [7e(i)[1-3]], [7e(ii)], [7f], and [7g].....	3
2. Parulski and Safonov render obvious [7e(i)[4]]: “a composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image”	4
B. Dependent Claims 8 and 10-12	16
III. GROUND 2: SUBSTITUTE CLAIMS 7, 8, AND 10-12 WOULD HAVE BEEN OBVIOUS OVER PARULSKI AND JOHNSON	16
A. Independent Claim 7	16
1. It is undisputed that Parulski discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g]	16
2. Parulski and Johnson render obvious [7e(i)[4]]: “a composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image”	17
B. Dependent Claims 8 and 10-12	19
IV. GROUND 3: SUBSTITUTE CLAIMS 7, 8, AND 10-12 WOULD HAVE BEEN OBVIOUS OVER PARULSKI, JOHNSON, AND SAFONOV	19
A. Independent Claim 7	19

1.	It is undisputed that Parulski discloses or renders obvious [7preamble]-[7d], [7e(i)[3]], [7e(ii)], and [7f]-[7g].....	19
2.	Parulski, Johnson, and Safonov render obvious [7e(i)[4]]: “a composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image”	19
B.	Dependent Claims 8 and 10-12	22
V.	GROUND 4: SUBSTITUTE CLAIMS 7, 8, AND 10-12 ARE UNPATENTABLE OVER PARULSKI AND HOSHINO	22
A.	Hoshino is Prior Art	22
B.	Independent Claim 7	23
1.	It is undisputed that Parulski discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g]	23
2.	Parulski and Hoshino render obvious [7e(i)[4]]	24
C.	Dependent Claims 8 and 10-12	25
VI.	CONCLUSION.....	25

TABLE OF AUTHORITIES

Page(s)

Cases

<i>CyWee Grp. Ltd. v. ZTE (USA), Inc.</i> , 90 F.4th 1358 (Fed. Cir. 2024)	11
<i>In re Keller</i> , 642 F.2d 413 (CCPA 1981)	12
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	10, 15, 21
<i>In re Merck & Co., Inc.</i> , 800 F.2d 1091 (Fed. Cir. 1986)	12
<i>In re Mouttet</i> , 686 F.3d 1322 (Fed. Cir. 2012)	12
<i>In re NuVasive, Inc.</i> , 841 F.3d 966 (Fed. Cir. 2016)	2, 22, 23
<i>Ruiz v. A.B. Chance Co.</i> , 357 F.3d 1270 (Fed. Cir. 2004)	10
<i>Slot Speaker Techs., Inc. v. Apple Inc.</i> , 680 F. App’x 932 (Fed. Cir. 2017)	21

Statutes

35 U.S.C. § 102(e)	23
--------------------------	----

Other Authorities

37 C.F.R. § 42.63(b)	23
Consolidated Trial Practice Guide	3, 22, 23
F.R.E. 901	23

UPDATED LIST OF EXHIBITS

Exhibit	Description
Ex. 1001	U.S. Patent No. 8,482,638 to Shiohara (“the ’638 patent”)
Ex. 1002	File History of U.S. Patent No. 8,482,638
Ex. 1003	Declaration of Dr. Robert Stevenson (“Stevenson”)
Ex. 1004	CV of Dr. Robert Stevenson
Ex. 1005	U.S. Patent Application Publication No. 2008/0218611 to Parulski et al. (“Parulski”)
Ex. 1006	South Korean Patent Publication No. 10-2007-0046010 to Safonov (“Safonov”)
Ex. 1007	Certified Translation of South Korean Patent Publication No. 10-2007-0046010 to Safonov (“Safonov”) ¹
Ex. 1008	Reserved
Ex. 1009	U.S. Patent Application Publication No. 2013/0121569 to Yadav (“Yadav”)
Ex. 1010	U.S. Patent No. 7,643,082 to Onozawa (“Onozawa”)
Ex. 1011	U.S. Patent No. 7,701,500 to Aizawa et al. (“Aizawa”)
Ex. 1012	U.S. Patent No. 7,424,215 to Ito et al. (“Ito”)
Ex. 1013	U.S. Patent No. 5,317,351 to Takahara et al. (“Takahara”)
Ex. 1014	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 3:23-cv-03046-VC, Dkt. 46 (N.D. Cal. Oct. 27, 2023)
Ex. 1015	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 3:23-cv-03046-VC, Dkt. 1 (N.D. Cal. June 21, 2023)

¹ Citations to Safonov are made to the certified English translation.

Exhibit	Description
Ex. 1016	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 3:23-cv-03046-VC, Dkt. 50 (N.D. Cal. Nov. 15, 2023)
Ex. 1017	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 3:23-cv-03046-VC, Dkt. 51 (N.D. Cal. Nov. 15, 2023)
Ex. 1018	U.S. Patent No. 7,659,923 to Johnson (“Johnson”)
Ex. 1019	U.S. Patent Application Publication No. 2008/0239133 to Cazier et al. (“Cazier”)
Ex. 1020	U.S. Patent Application Publication No. 2006/0245640 to Szczuka (“Szczuka”)
Ex. 1021	U.S. Patent Application Publication No. 2010/0238325 to Hoshino et al. (“Hoshino”)
Ex. 1022	Reply declaration of Dr. Robert Stevenson (“Stevenson Reply”)
Ex. 1023	Deposition of Samuel Wu
Ex. 1024	Third declaration of Dr. Robert Stevenson (“Stevenson 3rd”)
Ex. 1025	Thomas Porter & Tom Duff, <i>Compositing Digital Images</i> , 18 Computer Graphics No. 3, July 1984
Ex. 1026	Jue Wang & Michael F. Cohen, <i>Image and Video Matting: A Survey</i> , 3 Foundations and Trends in Computer Graphics, and Vision 2, 2008

I. INTRODUCTION

The Board should deny Patent Owner’s Revised Non-Contingent Motion to Amend (Paper 22, “RevMTA”) because substitute independent claim 7 is obvious over the following grounds:

Ground	Claims	Basis	Prior Art
1	7, 8, 10-12	§ 103	Parulski (Ex. 1005) and Safonov (Ex. 1006)
2	7, 8, 10-12	§ 103	Parulski and Johnson (Ex. 1018)
3	7, 8, 10-12	§ 103	Parulski, Safonov, and Johnson
4	7, 8, 10-12	§ 103	Parulski and Hoshino (Ex. 1021)

Patent Owner’s arguments are directed generally to the “composite image generating unit” limitation ([7e(i)]²) of substitute claim 7 and specifically focused on revised [7e(i)[4]]. *See generally* RevMTA. Limitation [7e(i)[4]] now recites “generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image.” *See, e.g.*, RevMTA, 3, 7, 11, 12, Appendix A. In response to Petitioner’s

² The RevMTA does not number substitute claim 7’s elements. For ease of reference and discussion, Petitioner assigns element numbers similar to original claim 1 (e.g., substitute [7a] corresponds to original [1a]) and retains Patent Owner’s breakdown [1]-[4] of [7e(i)]. *See attached* Claims Appendix.

Opposition to Its Motion to Amend (Paper 19, “Opp. MTA”) and the Board’s Preliminary Guidance (Paper 21, “Prelim. Guidance”), Patent Owner revised limitation [7e(i)[4]] to include “by mixing pixel values of the partial image with pixel values of the main image.” *See, e.g.*, RevMTA, 3, 7, 11, 12, Appendix A.

Patent Owner does not dispute that Parulski alone discloses or renders obvious substitute [7Preamble]-[7d] and [7f]-[7g], which are identical to original limitations [1Preamble]-[1d] and [1f]-[1g], respectively, or that Parulski discloses or renders obvious [7e(ii)], which corresponds to the magnification limitation of original claim element [1e]. *See generally* RevMTA; MTA. Patent Owner also does not dispute that Parulski discloses or renders obvious substitute [7e(i)[1]], [7e(i)[2]], or [7e(i)[3]] in its Revised Motion to Amend. *See generally id.*

Patent Owner also does not dispute that Parulski discloses or renders obvious the additional limitations of original claims 2 and 5-6, which are substantively identical to substitute claims 8 and 11-12. *See generally* RevMTA; MTA. Nor does Patent Owner dispute that Parulski discloses or renders obvious original claim elements [4a] and [4c], which are substantively identical to substitute claim 10. *See generally id.*

Any arguments regarding [7Preamble]-[7d], [7e(i)[1-3]], [7e(ii)]-[7g], and claims 8 and 10-12 should be considered waived. *See In re NuVasive, Inc.*, 841 F.3d 966, 974 (Fed. Cir. 2016) (explaining the Board “was not required to address

undisputed matters”); Consolidated Trial Practice Guide 94 (“CTPG”)³ (“Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived.”); Scheduling Order 8 (same). Accordingly, this Opposition focuses on element [7e(i)[4]], which is the only element in dispute, and may refer to the Petition and Opposition to MTA when discussing certain unchallenged claim elements.

II. GROUND 1: SUBSTITUTE CLAIMS 7, 8, AND 10-12 WOULD HAVE BEEN OBVIOUS OVER PARULSKI AND SAFONOV

A. Independent Claim 7

1. It is undisputed that Parulski discloses or renders obvious [7Preamble]-[7d], [7e(i)[1-3]], [7e(ii)], [7f], and [7g]

Substitute claim elements [7Preamble]-[7d], [7e(i)[3]], [7e(ii)], [7f], and [7g] are disclosed or rendered obvious by Parulski, as discussed in the Petition for original elements [1Preamble]-[1d], [1e], [1f], and [1g], respectively. Pet. 10-33; Stevenson 3rd ¶¶44-71, 89-105. Patent Owner does not contest that substitute claim elements [7e(i)[1-2]] are rendered obvious by Parulski, as mapped in Petitioner’s Opposition to Patent Owner’s original Motion to Amend. *See generally* RevMTA; Opp. MTA 3-7. Combining Safonov with Parulski for

³ Available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>

MURL=TrialsPracticeGuideConsolidated.

limitation [7e(i)[4]] does not alter this obviousness analysis. As such, Parulski and Safonov also disclose or render obvious [7Preamble]-[7d], [7e(i)[1-3]], [7e(ii)], [7f], and [7g]. *See* Pet. 10-33; Opp. MTA 3-10; Stevenson 3rd ¶¶44-105.

2. Parulski and Safonov render obvious [7e(i)[4]]: “a composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image”

Parulski in combination with Safonov renders obvious a “composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main.” Stevenson 3rd ¶74.

As explained in the Petition and Opposition to MTA, and not disputed by Patent Owner, Parulski discloses the composite image generating unit that replaces portions of the first image (“main image”) obtained using the first imaging stage 1 with a “corresponding portion” of the second image (“sub-image”) obtained using the second imaging stage 2 to create an enhanced or modified image. Pet. 21; Opp. MTA 3-7; *see generally* RevMTA. The composite image provides an improved image with, for example, “relatively low noise and good sharpness.” Pet. 21; Opp. MTA 3-4; Stevenson 3rd ¶84; *see* Parulski [0030], [0031].

Patent Owner argues that Parulski fails to disclose a specific mechanism for “‘replacing’ portions of the primary image with corresponding portions of the

secondary image” and that Parulski’s “replacement” would be different from the claimed “superimposing ... by mixing pixel values of the partial image with pixel values of the main image.” *See* RevMTA 13-18. According to Patent Owner, “the pixel values of a combined image resulting from replacing one image with another are only based on the characteristics of the replacement image” where “the pixel values of a combined image created by superimposing two images by mixing pixel values is based on characteristics of both images.” *Id.* at 16.

Patent Owner does not dispute, however, that alpha blending “generate[s] a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image,” as claimed.⁴ *See generally* RevMTA. Patent Owner also does not dispute that alpha blending (and therefore “mixing pixel values” of multiple images) is disclosed by Safonov, that alpha blending was well known in the art before the critical date, or that using alpha blending to combine or replace portions of images was well known to and within a POSITA’s skill before the earliest priority date of the ’807 patent. RevMTA 18.

⁴ Patent Owner relies on disclosure of alpha blending in U.S. App. No. 12/976,048 to support its revision to limitation [7e(i)[4]]. RevMTA 6-7 (citing Ex. 1002 at 29 (¶25)).

Patent Owner instead disputes the Petition's and Opposition to MTA's showing that a POSTA was motivated to combine Parulski and Safonov by arguing that the combination of Parulski and Safonov is based on hindsight by attacking the disclosures of the references individually, not in their combination. RevMTA 18-22.⁵ These arguments are not supported by the facts or law.

a. Motivation to combine Parulski and Safonov

As explained in the Petition and Opposition to MTA, a POSITA would have been motivated to modify Parulski's composite image generating unit to use alpha blending to combine Parulski's main image and sub-image portion when creating the composite, augmented, or enhanced image. Pet. 24-26, 56-59; Opp. MTA 3-10; Stevenson 3rd ¶¶72-87. A POSITA would have been motivated to improve upon Parulski's replacement by using Safonov's alpha blending to mix the pixels of the main and sub-images or, to the extent Parulski's replacement is silent on the replacement method, a POSITA would have looked to Safonov's alpha blending to mix pixels of two images as a known way to combine Parulski's main image and sub-image. Stevenson ¶¶94-103, 169-179; Pet. 24-26, 55-60; Opp. MTA 3-10;

⁵ Notably, Patent Owner did not dispute the motivation to combine Parulski and Safonov in its previous Motion to Amend and the reasons for motivation remain sufficient because the substance of Patent Owner's amendment has not changed.

Stevenson 3rd ¶¶72-87. In either case, a POSITA would have found it desirable to combine Parulski's main and sub-images by using alpha blending (mixing pixels) to minimize or hide at least the edges where the main image and the sub-image meet. Stevenson 3rd ¶76. A POSITA would have been motivated to do this to, for example, smooth the transition between the sub-image that has less blur or improved dynamic range compared to the main image. Pet. 23-24, 55-57; Opp. MTA 7-8; Stevenson ¶¶93-97, 168-170; Stevenson 3rd ¶76; *see also* Prelim. Guidance 14; Ex. 1025, 1; Ex. 1026 (Image and Video Matting), 1, 7, 21.

A POSITA would have found it obvious to use alpha blending to mix pixels of Parulski's replacement sub-image portion and the main image to improve the dynamic range of the composite image (e.g., to improve contrast in highlights or shadows) and/or to blend away any differences in resolution, sharpness, color variation, or gain settings, thereby cohesively integrating the sub-image into the main image (e.g., superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image). Pet. 23-24; Opp. MTA 18-19; Stevenson 3rd ¶76. Indeed, the very purpose of alpha blending is to use the "alpha channel" to mix pixels from two images such as the resulting pixel represents the combination of the two pixels in the replaced area at the overlapping portions, like the overlapping portions of the main image and the sub-image in Parulski. Ex. 1009, [0003], [0007]; Stevenson ¶¶98-100;

Stevenson 3rd ¶78; *see also* Safonov, 7; Ex. 1025 (Porter 84), 1-3; *see generally* Ex. 1026 (Image and Video Matting).

Patent Owner does not dispute the Petition’s showing that a POSITA would have known that alpha blending would improve composite images or that alpha blending was well known in the art before the critical date, or that alpha blending was well within a POSITA’s skill.⁶ *See* RevMTA 18, 20; MTA 14-15, 23-25, 24 n.5. Nor can it. Alpha blending when combining two images or portions of images dates back to at least the 1980s. Stevenson 3rd ¶80; Ex. 1026 (citing Ex. 1025), 1; *see generally* Ex. 1025 (published 1984). Patent Owner also does not dispute that one known use of alpha blending was to smooth the combination of two different images or layers. *See* Ex. 1009, [0003], [0007]; Ex. 1025, 1; Ex. 1026, 1, 7, 21.

Patent Owner acknowledges that Safonov’s alpha blending is used to enhance shadows and highlights in a source image. RevMTA 18-19 (“Safonov is directed to shadow and highlight correction”). Safonov’s process combines two images using alpha blending and provides a method to achieve Parulski’s similar objective of replacing image portions to “broaden[]” the “dynamic range” of the

⁶ Patent Owner’s silence on a POSITA’s knowledge of alpha blending as of the alleged critical date at least tacitly confirms the Petition’s showing that alpha blending was well known and within a POSITA’s skill. *See* Pet. 24-27, 56-59.

main image, by using “under- or over-exposed” images to “capture detail” in “highlights” or “shadows” that are then “replac[ed]” in the main image to create an improved composite image. *Compare* Parulski [0140], *with* Safonov, 7-8. Because Safonov teaches an example method to achieve Parulski’s goal when combining images, a POSITA would have been motivated to use Safonov’s alpha blending in Parulski composite image generation by superimposing the partial image on the main image by mixing pixel values, as recited in [7e(i)[4]]. Stevenson 3rd ¶¶77-87; *see* Pet. 54-59.

b. The motivation to combine Parulski and Safonov is not based on hindsight

Patent Owner argues that the combination of Parulski and Safonov is based on hindsight, RevMTA 20-22, but Patent Owner fails to rebut the Petition’s showing that combining Parulski with Safonov was within the knowledge and ability of a POSITA at the time of the claimed invention.

Patent Owner argues that Petitioner’s combination is based on improper hindsight because, according to Patent Owner, it “seeks to stitch Safonov’s alpha blending patch together with Parulski’s ‘replacement’ patch to create something that allegedly looks like the claimed invention.” RevMTA 20. Patent Owner alleges that using alpha blending to minimize or hide edges or smooth a transition between a replaced portion and a main image are not explicitly disclosed in

Parulski or Safonov. RevMTA 21 (“Parulski does not mention minimizing or hiding edges Safonov likewise does not use alpha blending to minimize or hide edges.”). That misstates the law. The Supreme Court rejected any requirement that “express, written motivation to combine” must be found in the references. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 402 (2007); *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1276 (Fed. Cir. 2004). Rather, the motivation may come from the knowledge of a POSITA or another reason outside of the references. *KSR*, 550 U.S. at 418.

Notwithstanding Patent Owner’s incorrect statement of the law, Parulski and Safonov do provide an express motivation. As explained above, and in the Petition, Parulski has a goal of enhancing dynamic range or increasing the sharpness of an image by combining it with a sub-image. Pet. 21, 25-26. Safonov teaches that dynamic range or sharpness of an image can be improved by alpha blending the image with another image with high local contrast in the areas desired for improvement. *See, e.g., Safonov*, 7-8.⁷ Thus, Safonov and Parulski would have

⁷ Patent Owner argues that Parulski is silent on how replacement occurs. RevMTA 17-18. As such, a POSITA would have looked to Safonov for a method to achieve Parulski’s desired dynamic range improvement and/or improves sharpness.

motivated a POSITA to modify Parulski's composite image generating system to enhance the quality of the augmented modified image by using alpha blending to improve contrast or dynamic range and sharpness of desired areas of the image. Stevenson 3rd ¶¶74-88.

Moreover, a POSITA would have remained motivated to use alpha blending to mix pixels from Parulski's replacement image and main image to transition between them to create a region that obscures boundaries where the contrasts or sharpness changes from one image to the other. Pet. 23-24, 55-57; Opp. MTA 7-8; Stevenson ¶¶93-97, 168-170; Stevenson 3rd ¶76; Parulski, [0030]-[0031]. Using alpha blending in this way to smooth the combination of two different images or layers was known in the art, and a POSITA would have remained motivated to do so. Ex. 1009, [0003], [0007]; Ex. 1025, 1; Ex. 1026, 1, 7, 21; Pet. 24-25, 56-57; Stevenson ¶¶95-97, 170; Stevenson 3rd ¶76. Patent Owner fails to show any flaw in these motivations.

c. Expectation of success in combining Parulski and Safonov

Patent Owner does not dispute that alpha blending was a conventional

Stevenson 3rd ¶84; *CyWee Grp. Ltd. v. ZTE (USA), Inc.*, 90 F.4th 1358, 1366 (Fed. Cir. 2024).

technique at the time or that a POSITA would have had a reasonable expectation of success with the combination. *See* Pet. 56-59; Stevenson ¶¶169-179; Stevenson 3rd ¶¶86-88.

d. Patent Owner’s individual criticisms of the references are irrelevant

Patent Owner continues to attack Parulski and Safonov individually but does not substantively address the combination, and therefore cannot rebut the Petition’s obviousness showing. *In re Keller*, 642 F.2d 413 (CCPA 1981); *In re Merck & Co., Inc.*, 800 F.2d 1091 (Fed. Cir. 1986); *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012). “[T]he test for obviousness is what the combined teachings of the references would have suggested to [a POSITA].” *Mouttet*, 686 F.3d at 1333.

Patent Owner argues that Parulski does not disclose “generat[ing] a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image.” RevMTA 13. Patent Owner focuses on the word “replace” in Parulski and alleges that Parulski “fails to explain how the alleged [replacing] is achieved.” RevMTA 12-13. Even if Patent Owner’s argument is taken at face value, it fails to

acknowledge that the **combination** of Parulski and Safonov⁸ in the Petition renders obvious the claimed “superimposing the partial image on the main image by mixing pixel values.” As explained above, a POSITA would have found it obvious to improve on Parulski’s replacement by using alpha blending or, if Patent Owner’s allegation is believed, would have found it obvious to look to alpha blending as way to achieve Parulski’s replacement with the goal of “gener[ating] an enhanced image” with improved “dynamic range.” Parulski, [0026], [0031]; *see supra* § II.A.2.a; *see also* Parulski, Abstract, [0030], [0059], [0064], FIG. 26; Stevenson 3rd ¶84. Patent Owner does not dispute that Parulski discloses generating an enhanced composite image created by combining a main image and partial image. RevMTA 12-13. Moreover, as discussed above, Patent Owner does not dispute that Safonov teaches alpha blending by mixing pixel values. *Supra* § II.A.2. And, as in the combination, both Parulski and Safonov combine their images to achieve greater dynamic ranges (e.g., contrast in shadows/highlights) and increase sharpness. *Supra* § II.A.2; Stevenson 3rd ¶84.

Patent Owner also alleges that “nothing in Safonov relates to ... combining

⁸ The Petition also shows that alpha blending (e.g., mixing pixel values) would have been obvious based on Parulski alone, which the RevMTA has not challenged. *See* Pet. 23-27.

images at all.” RevMTA 19. This is incorrect. As explained above, Safonov alpha blends (mixes pixels) from different images, such as one with high contrast in shadows or one with high contrast in highlights, with a main or source image to improve the source image’s image quality. Safonov, 7-8; Stevenson 3rd ¶¶32-35, 75, 78. The Board has already recognized that Safonov contradicts Patent Owner’s argument. Prelim. Guidance 13. Safonov applies alpha blending to at least two images—a “source image I ,” “detail image D_s ” and/or “digital image D_h ,” where D_s may be used to “increase the local contrast and luminance of the source image I using the ... alpha blending formula of I and D_s ,” and D_h may be used to “to increase the local contrast of the source image I and also reduce luminance using the ... alpha blending formula of I and D_h .” Safonov 7-8, Prelim. Guidance 13. Safonov’s alpha-blending formula (4) includes portions of images D_h and D_s and corresponding alpha coefficients a_h and a_s to mix their pixels with each other. Their pixels are also mixed with pixels of the source image $I(r,c)$:

$$\begin{aligned} I_e(r,c) &= (I_{es}(r,c) + I_{eh}(r,c))/2 = \\ &= I(r,c) + k_s * (1 - a_s(r,c)) * (D_s(r,c) - I(r,c)) - k_h * (1 - a_h(r,c)) * (I(r,c) - D_h(r,c)), \end{aligned} \quad (4)$$

Safonov, 8 (formula (4)); Prelim. Guidance 13. Patent Owner’s argument that Safonov discloses using bilateral filters to create the “detail image” and “digital image” does not alter that Safonov discloses the claimed mixing of pixels. Safonov discloses creating the “detail image” and “digital image” by using bilateral filters

on the source image, which creates the additional “detail” and “digital” images. Safonov, 7-11. When the alpha blending occurs, at least these two images are blended together, and also with the original source image. Safonov, 7-11. How the “detail image D_s ” and “digital image D_h ” are created is irrelevant because, when the alpha blending occurs, they are distinct images from each other and the source image. Regardless, Patent Owner’s argument also fails because it improperly attacks Safonov individually and does not address the **combination** of Parulski and Safonov in the Petition. The Petition’s combination relies on Parulski for the teaching of combining two images, with the goal of improving dynamic range or sharpness, or mitigating the transition between the combined images. *See* Pet. 54-59. Safonov teaches that alpha blending was a known way to combine images for similar purposes. *See* Pet. 54-59. Notably, Patent Owner does not dispute that using alpha blending to combine two images was well known, which is the result of combining Parulski and Safonov. *See generally* RevMTA; *KSR*, 550 U.S. at 416-17.

Thus, a POSITA would have found it obvious to combine Parulski’s primary image (main image) and corresponding replacement secondary image portions (cutout region of the sub-image) using alpha blending, as taught by Safonov. Accordingly, Parulski and Safonov render obvious a “composite image generating unit configured to ... generate a composite image by superimposing the partial

image on the main image by mixing pixel values of the partial image with pixel values of the main image,” as recited in element [7e(i)[4]] and, accordingly, substitute claim 7. Stevenson 3rd ¶¶74-88.

B. Dependent Claims 8 and 10-12

Parulski discloses or renders obvious the additional limitations of substitute claims 8 and 10-12, which are substantively identical to original claims 2, 5-6, and the remaining portions of original claim 4, as explained above. Pet. 33-44, 46-54, 60; Stevenson ¶¶119-145, 150-165, 180. Patent Owner does not contest this. *See generally* RevMTA; MTA. Combining Safonov with Parulski for limitation [7e(i)[4]] does not alter this analysis. As such, Parulski and Safonov also renders obvious substitute claims 8 and 10-12. Stevenson 3rd ¶¶106-151.

III. GROUND 2: SUBSTITUTE CLAIMS 7, 8, AND 10-12 WOULD HAVE BEEN OBVIOUS OVER PARULSKI AND JOHNSON

A. Independent Claim 7

1. It is undisputed that Parulski discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g]

Parulski (thus, the combination of Parulski and Johnson) discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g], as explained in Ground 1 and the Petition and Opposition to MTA. *Supra* § II.A.1; Stevenson 3rd ¶152.

2. **Parulski and Johnson render obvious [7e(i)[4]]: “a composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image”**

Parulski in combination with Johnson renders obvious a “composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image.” Stevenson 3rd ¶¶152-164.

Patent Owner does not dispute that Johnson discloses a “digital camera” including an “image processing unit” (e.g., composite image generating unit) for “creat[ing] a single composite image from the two original images” that “blend[s] the two images together to create a third preferred image as the final image.” RevMTA 22-23; Johnson, Abstract, 1:51-61, 3:26-34, 4:19-22, FIGS. 3-4. Patent Owner also does not dispute that Johnson’s image processing unit utilizes an “algorithm” to determine a “preferred region[]” (cutout region) in a “source” image (sub-image), such as a first image 24, and cuts out a partial image from the cutout region that is then “blended into” another image to create a single, composite image. RevMTA 22-23; Johnson, 3:15-18, 3:26-50, FIGS. 3-4. Patent Owner also does not dispute Johnson creates a composite image by superimposition. RevMTA 22-23.

Patent Owner also does not dispute that a POSITA would have been

motivated to combine Parulski and Johnson. RevMTA 22-23; Opp. MTA 14-17.

Patent Owner disputes only whether Johnson discloses “mixing of pixel values.” RevMTA 23. Patent Owner’s argument relies on the single instance of the phrase “effectively replace” in Johnson. RevMTA 23. But this interpretation fails at least because it does not account for the word “effectively” in the context of Johnson’s disclosure. RevMTA 23. When read in context, “effectively replace” does not mean replacement without any mixing. Stevenson 3rd ¶156. For example, Johnson discloses that “[s]ince both images are preferred sources for one or more regions, the final image is generated by *blending*.” Johnson, 3:39-40 (emphasis added). Johnson goes on to explain that “the first image (the two eyes of subject C 32) are *blended into* the base image to create the *blended* final image.” Johnson, 3:40-45 (emphases added). Johnson also describes the composite image as having “*blended* elements [that] *come from two images*,” which a POSITA would have understood refers to alpha blending. Johnson, 3:62-65 (emphases added); Stevenson 3rd ¶156. Thus, “effectively replace” refers to the fact that the original image and final image look similar, except that the eyes are open; it does not mean the pixels are not mixed. Stevenson 3rd ¶156. Blending helps eliminate or minimize the boundaries of the replacement open-eye portion that was superimposed onto the original image. Ex. 1009, [0003], [0007]; Stevenson ¶¶98-100; Stevenson 3rd ¶¶76, 156; *see also* Safonov, 7-8; Ex. 1025 (Porter 84),

1-3; *see generally* Ex. 1026 (Image and Video Matting). Thus, Johnson discloses Patent Owner’s interpretation of “mixing pixel values.” Stevenson 3rd ¶156.

Accordingly, Parulski in view of Johnson would have rendered obvious [7e(i)[4]] and, likewise, substitute claim 7. Stevenson 3rd ¶¶152-160.

B. Dependent Claims 8 and 10-12

Parulski (and the combination of Parulski and Johnson) discloses or renders obvious substitute claims 8 and 10-12, as explained in Ground 1 and the Petition. *Supra* § II.B; Stevenson 3rd ¶165.

IV. GROUND 3: SUBSTITUTE CLAIMS 7, 8, AND 10-12 WOULD HAVE BEEN OBVIOUS OVER PARULSKI, JOHNSON, AND SAFONOV

A. Independent Claim 7

1. It is undisputed that Parulski discloses or renders obvious [7preamble]-[7d], [7e(i)[3]], [7e(ii)], and [7f]-[7g]

It is undisputed that Parulski (thus, the combination of Parulski, Johnson, and Safonov) discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g], as explained in Ground 1 and the Petition. *Supra* § II.A.1; Stevenson 3rd ¶166.

2. Parulski, Johnson, and Safonov render obvious [7e(i)[4]]: “a composite image generating unit configured to ... generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image”

As explained in Ground 2, Parulski and Johnson render obvious [7e(i)[4]]. Patent Owner’s disputes regarding Johnson do not address the situation where

Safonov if used to alpha-blend as Johnson’s described “blending.” *See* RevMTA 22-23. Nor has Patent Owner disputed that there is a motivation to combine Parulski, Johnson, and Safonov as in Petitioner’s Opposition to MTA to use “alpha blending” as the “blending” to improve the final composite image quality. Opp. MTA 18-19. For this reason, the RevMTA has failed to show that substitute claim 7 is patentable over the combination of Parulski, Johnson, and Safonov.

Nevertheless, if the Board finds that the combination of “blending” two images in Parulski and Johnson does not render obvious generating a composite image by “superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image,” Safonov renders this obvious. Stevenson 3rd ¶¶166-171.

As explained in Ground 1, Patent Owner does not dispute that Safonov discloses performing combining two images using alpha blending to “superimpos[e] the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image” as in substitute [7e(i)[4]]. *Supra* § II.A.2.

a. Motivation to combine Parulski, Johnson, and Safonov

A POSITA would have been motivated to use Safonov’s well-known alpha-blending technique as the disclosed “blend[ing]” when combining image

portions in the Parulski-Johnson combination because alpha blending was known to allow, and would have allowed, the partial image (in the Parulski-Johnson combination) to be more seamlessly integrated into the main image and minimized or mitigated the visual transition between the superimposed portion and the main image. *See* Ex. 1009, [0003]; Stevenson ¶¶171-172; Stevenson 3rd ¶169; *see supra* Grounds 1, 2. A POSITA also would have been motivated to utilize alpha blending because it was a well-known technique used to edit, process, and combine images, and thus represents a known technique in the art that would have yielded predictable results. Ex. 1009, [0003]; Stevenson ¶173; Stevenson 3rd ¶169; *KSR*, 550 U.S. at 416; *Slot Speaker Techs., Inc. v. Apple Inc.*, 680 F. App'x 932, 943-44 (Fed. Cir. 2017). Patent Owner does not dispute either of these showings or identified any error in the **combination** of Parulski, Johnson, and Safonov from Petitioner's Opposition. RevMTA 22-23; Opp. MTA 18-19.

b. Expectation of Success in Combining Parulski, Johnson, and Safonov

Patent Owner does not dispute that a POSITA would have had a reasonable expectation of success in using Safonov's alpha blending as the "blend[ing]" in the Parulski-Johnson combination because it would have merely involved incorporating a known image-blending technique used when combining multiple digital camera images and was well within the POSITA's skill to incorporate.

Stevenson 3rd ¶170; Opp. MTA 18-19.⁹ Thus, the Parulski-Johnson-Safonov combination still renders obvious the claimed composite image generating unit of substitute claim 7 and, accordingly, substitute claim 7. Stevenson 3rd ¶171.

B. Dependent Claims 8 and 10-12

Parulski (and the combination of Parulski, Safonov, and Johnson) discloses or renders obvious substitute claims 8 and 10-12, as explained in Ground 1 and the Petition. *Supra* § II.A.2.d; Stevenson 3rd ¶172.

V. GROUND 4: SUBSTITUTE CLAIMS 7, 8, AND 10-12 ARE UNPATENTABLE OVER PARULSKI AND HOSHINO

Patent Owner does not dispute that the combination of Parulski and Hoshino renders obvious substitute claims 7, 8, and 10-12. RevMTA 23-25; *see also* Prelim. Guidance 19-23; Opp. MTA 20-25. Accordingly, any substantive arguments against the combination are waived. *See NuVasive*, 841 F.3d at 974; CTPG 94; Scheduling Order 8. Instead, Patent Owner only disputes that Hoshino is prior art. RevMTA 23-24.

A. Hoshino is Prior Art

Hoshino was filed March 19, 2010, and published September 23, 2010,

⁹ Patent Owner waived the ability to challenge the expectation of success of combining Parulski, Safonov, and Johnson. *NuVasive*, 841 F.3d at 974; CTPG 94; Scheduling Order 8.

making it prior art under 35 U.S.C. § 102(e) at least because Patent Owner has not established that substitute claims 7-12 are entitled to a priority date of December 25, 2009. Patent Owner has not established entitlement to a December 25, 2009, priority date because it has not provided a proper certified translation from which priority can be established because the declarant does not speak Japanese and therefore cannot confirm the accuracy. *See* Papers 10, 12; 37 C.F.R. § 42.63(b); F.R.E. 901; Ex. 1023, 15:20-22, 16:1-17:1. Patent Owner also failed to produce the declarant for a deposition, which violates the Board's rules on routine discovery. CTPG 23. Without this priority claim, the earliest priority date is the filing date of the '638 patent: December 22, 2010, making Hoshino prior art.

B. Independent Claim 7

Although Patent Owner has waived any substantive challenges to the combination of Parulski and Hoshino regarding substitute claim 7 by not disputing it in the RevMTA, Petitioner provides the combination for the Board's convenience. *NuVasive*, 841 F.3d at 974; CTPG 94; Scheduling Order 8.

1. It is undisputed that Parulski discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g]

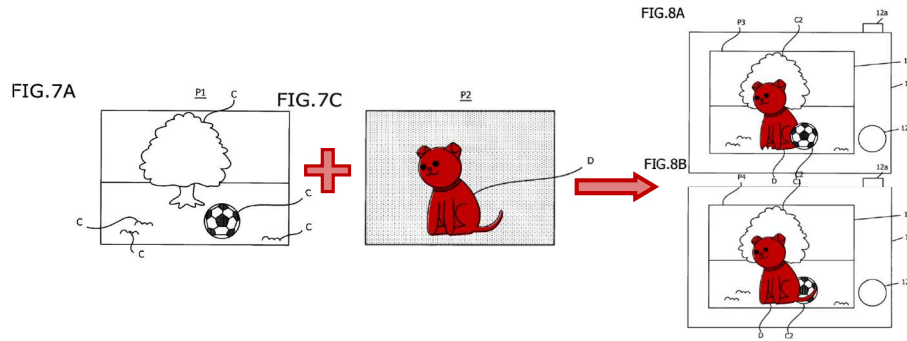
It is undisputed that Parulski (thus, the combination of Parulski and Hoshino) discloses or renders obvious [7preamble]-[7d], [7e(i)[1-3]], [7e(ii)], and [7f]-[7g], as explained in Ground 1 and the Petition. *Supra* § II.A.1; Stevenson 3rd

¶173.

2. Parulski and Hoshino render obvious [7e(i)[4]]

As explained in the Opposition to MTA, Hoshino discloses a “camera device” including an “image processing subunit” (composite image generating unit) that “extracts [a] subject image D [(cut out a partial image)] from [a] subject-background picture E1 based on the difference information” and “combines the subject image D” with a “background image P1” (main image) using alpha blending. Hoshino, [0021], [0035], [0037], [0039]-[0040], [0118], FIGS. 2, 4; Opp. MTA 21. For example, Hoshino generates “combined image[s] P3” and “P4”¹⁰ by “superimpos[ing]” the **extracted subject image D (cutout partial image)** on a “background image P1” (main image). Hoshino, [0011], [0016]-[0017], [0100], [0118], FIGS. 7A-8B; *see also* Hoshino, FIG. 4 (describing combined image-producing process); Opp. MTA 22-23. Subject image D is “alpha blend[ed]” (e.g., by mixing pixels) and superimposed on the background image. *E.g.*, Hoshino, [0048]-[0052], [0086]-[0104], [0115]-[0118], FIGS. 4, 7A-8B; *see also* Hoshino, [0038]; Opp. MTA 22-23; Stevenson 3rd ¶¶175-176.

¹⁰ Superimposing and alpha blending subject image D with the background to create either of combined images P3 and P4 is sufficient to render claim 7 obvious.



Hoshino, FIGS. 7A, 7C, 8A-8B (annotated). Patent Owner does not dispute that Hoshino's alpha blending when combining the two images is "mixing pixel values of the partial image with pixel values of the main image." *See generally* RevMTA.

Patent Owner also does not dispute that a POSITA would have been motivated to combine Parulski and Hoshino and had a reasonable expectation of success in doing so. *See generally* RevMTA.

Accordingly, Parulski and Hoshino render obvious substitute claim 7. Stevenson 3rd ¶¶173-180.

C. Dependent Claims 8 and 10-12

Parulski (and the combination of Parulski and Hoshino) discloses or renders obvious substitute claims 8 and 10-12, as explained in Ground 1 and the Petition. *Supra* § II.A.2.d; Stevenson 3rd ¶181.

VI. CONCLUSION

For the foregoing reasons, the Board should deny Patent Owner's Revised Motion to Amend.

Respectfully submitted,

Dated: September 15, 2025

/Kevin D. Rodkey/

Kevin D. Rodkey
Backup Counsel for Petitioner
Reg. No. 65,506

CLAIMS APPENDIX

The substitute claims presented by Patent Owner have been reproduced below with element numbering:

Claim Number	Claim Elements
7	[7Preamble] A digital camera having a focusing function and a focal length varying function of a main lens, the digital camera comprising:
	[7a] a main imaging unit configured to generate a main image by performing a photoelectric conversion from a subject obtained via the main lens;
	[7b] a sub-imaging unit configured to generate a sub-image by performing a photoelectric conversion from the subject obtained via a sub-lens;
	[7c] a focal length acquiring unit configured to acquire the focal length of the main lens;
	[7d] a magnification setting unit configured to set a level of magnification on the basis of the focal length;
	[7e] [7e(i)] a composite image generating unit configured to [1] determine a cutout region in the sub-image, [2] cut out a partial image from the cutout region, [3] magnify at the level of magnification at least one of the main image and the

Claim Number	Claim Elements
	sub-image, and [4] generate a composite image by superimposing the partial image on the main image by mixing pixel values of the partial image with pixel values of the main image, [7e(ii)] wherein the generation of the composite image occurs after at least one of the main image and the sub-image is magnified at the level of magnification;
	[7f] an image display unit configured to display the composite image; and
	[7g] wherein the magnification setting unit is configured to set the level of the magnification in order to match substantially a size of the main image and a size of the sub-image.
8	The digital camera according to claim 7, wherein the sub-lens is a pan-focus lens.
9	The digital camera according to claim 7, wherein the magnification setting unit is configured to set the level of the magnification in a correction mode in which a predetermined magnification rule applies in setting the level of the magnification, and the digital camera further includes an instruction receiving unit configured to receive an instruction to change the level of the magnification such that difference between the size of the main image and the size of the

Claim Number	Claim Elements
	sub-image in the composite image is less than or equal to a predetermined amount in the correction mode, and a correcting unit configured to correct the magnification rule by using amount to change the level of the magnification as amount of correction in the correction mode, when the focal length of the main lens is in predetermined length.
10	[10Preamble] The digital camera according to claim 7, further comprising
	[10i] A focusing amount acquiring unit configured to acquire amount [sic] of the focusing, wherein
	[10ii] misalignment of the composite image decreases as the composite image is in focus with the subject on the basis of the amount and a predetermined cutout rule.
11	The digital camera according to claim 10, wherein the predetermined cutout rule is based on a principle of triangulation based on an interval between the main lens and the sub-lens, and distance from the digital camera to the subject on the basis of the amount.
12	The digital camera according to claim 7, wherein the main image of the object is captured from a different angle from the sub-image of the subject.

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing **Petitioner's Opposition to Patent Owner's Revised Non-Contingent Motion to Amend** contains 25 pages or less, excluding those portions identified in 37 C.F.R. § 42.24(b), as measured by the word-processing system used to prepare this paper.

Dated: September 15, 2025

/Kevin D. Rodkey/

Kevin D. Rodkey
Backup Counsel for Petitioner
Reg. No. 65,506

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **Petitioner's Opposition to Patent Owner's Revised Non-Contingent Motion to Amend** was served on September 15, 2022, via email directed to counsel of record for the Patent Owner at the following:

Cyrus A. Morton
CMorton@RobinsKaplan.com

Samuel J. LaRoque
SLaRoque@RobinsKaplan.com

Aaron R. Fahrenkrog
AFahrenkrog@RobinsKaplan.com

Emily J. Tremblay
ETremblay@RobinsKaplan.com

William R. Jones
WJones@RobinsKaplan.com

Derrick J. Carman
DCarman@RobinsKaplan.com

Dated: September 15, 2025

/Lisa C. Hines/

Lisa C. Hines
Case Manager
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP