

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 NON-CONTINGENT MOTION TO AMEND**

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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”)
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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.

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Ex. 1016	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 3:23-cv-03046-VC, Dkt. 50 (N.D. Cal. Nov. 15, 2023)
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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

I. INTRODUCTION

The Board should deny Patent Owner’s Non-Contingent Motion to Amend (Paper 9, “MTA”) 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, which it breaks into four parts [1]-[4]. *See generally* MTA; MTA 11-25. Within [7e(i)], the MTA does not dispute that Parulski discloses or renders obvious at least sub-element [3] (magnification); thus, Patent Owner’s arguments are particularly directed to

² The MTA 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.

[7e(i)][1], [2], and [4]. *See generally* MTA.

For example, Patent Owner does not dispute that Parulski alone discloses or renders obvious original limitations [1Preamble]-[1d] and [1f]-[1g], which are identical to substitute [7Preamble]-[7d] and [7f]-[7g], respectively, or that Parulski discloses or renders obvious [7e(ii)], which corresponds to the magnification limitation of original claim element [1e]. *See generally* MTA. 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* 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* MTA.

Any arguments regarding [7Preamble]-[7d], [7e(i)[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 (“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 remaining elements [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]], and may refer to the Petition 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. [7Preamble]-[7d], [7e(i)[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. Patent Owner does not contest this. *See generally* MTA. Combining Safonov with Parulski for limitation [7e(i)[4]] does not alter this obviousness analysis. Pet. 54-59. As such, Parulski and Safonov also disclose or render obvious [7Preamble]-[7d], [7e(i)[3]], [7e(ii)], [7f], and [7g].

2. [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 sub-image, and [4] generate a composite image by superimposing the partial image on the main image,”

a. Parulski Discloses or Renders Obvious [7e(i)]

Parulski discloses or suggests at least 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 sub-image, and [4] generate a composite image by [replacing] the partial image on the main image. The MTA contests, at most, whether Parulski discloses or renders obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]].

MTA 11-25.

As explained in the Petition, Parulski discloses replacing 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 with “relatively low noise and good sharpness.” Pet. 21 (citing Parulski, Abstract, [0026], [0030]-[0032], [0064]-[0065], [0106]-[0113], [0118], [0120], [0138]-[0140], [0142], [0145]). In various examples, this can create a “modified image” with a “broadened dynamic range” or reduced motion blur. Pet. 21 (citing Parulski, [0031], [0140], [0145], claims 11, 40).

Patent Owner argues that Parulski does not explain how to replace the image. *See* MTA 11, 13-14, 16, 18-20, 21-22. This is incorrect. Parulski describes three steps: “identify[ing]” an object in an image (Parulski, [0071], [0107]-[0109], [0132]); “extract[ing]” an object from an image (Parulski, [0071], [0108]); and “replac[ing]” a portion of one image with a “corresponding portion[]” of the second image (Parulski, [0031], [0140], [0145], claims 11, 40). *See* Pet. 36-37, 44-46. In one example, Parulski discloses generating a composite image by “replac[ing]” “portions of the primary image (areas of lower noise but with some motion blur) ... with corresponding portions of the secondary image (areas of higher noise but little or no motion blur),” which creates “a modified image with

relatively low noise and good sharpness.” Parulski, [0145]; Parulski [0031], claims 11, 40 (“a modified primary image is then formed by replacing portions of the primary image with portions of the secondary image such that the level of motion blur is reduced while minimizing an increase in the noise level”). Parulski similarly discloses generating a composite image having a “broadened dynamic range” in the primary image to, for example, use an under- or overexposed second image to capture missing details in highlights and/or shadows when “replacing portions of the primary image with portions of the secondary image.” Parulski, [0140].

A POSITA would have understood that Parulski’s use of “corresponding portions of the secondary image” to replace portions of the primary image corresponds to cutting out a partial image selected from a determined cutout region. Stevenson Reply ¶73. Patent Owner does not refute that such a suggestion exists, only that Parulski does not describe with specificity how it selects the corresponding portions of the secondary image to cut out. *See* MTA 15-23. The claims, however, do not require a specific determination. Regardless, Parulski discloses object identification and extraction, which is sufficient to meet the claim language. Parulski, [0071], [0107]-[0109], [0132]. Parulski also explains that “aspects of the embodiments ... may be provided in software,” and that such software “is conventional and within the ordinary skill in such arts.” Parulski, [0063]. Parulski thus contemplates using conventional software and image-

processing techniques to identify and extract (select and cut out) the secondary image used to replace the “corresponding portions” of the primary image. Parulski, [0031], [0071], [0107]-[0109], [0132], [0140], [0145]. This “identification” and “extraction” of an object in the second image that is then used to “replace” the “corresponding portion” of the main image describes [1] determining a cutout region (identified and extracted portion) in the sub-image (second image), [2] cutting out (extracting) the partial image (identified object for replacement into the main image), and [4] generating a composite image by replacing the extracted object in the main image after magnifying the images at the level of magnification of one of the main image and the sub-image,³ as in [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]], respectively. Stevenson Reply ¶73.

Thus, Parulski discloses or suggests [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]] because its generated composite image is created “by replacing portions of the

³ Parulski discloses the magnification element by, for example, making the magnification of the images the same size (e.g., by upsampling) based on their respective focal lengths. Pet. 20-27; Stevenson ¶¶89-103. Because Parulski’s upsampled sub-image is upsampled to the same size as the main image, it has been magnified at the level of magnification. *E.g.*, Pet. 19, 23 (citing Parulski, [0066], [0093], [0097], [0101], [0104], FIGS. 3, 4, 6, 9, 11; Stevenson ¶¶86-87, 92).

primary image with portions of the secondary image.” Parulski, [0114], [0140], [0145]; *see also* Parulski, Abstract, [0026], [0030]-[0032], [0064]-[0065], [0106]-[0113], [0118]-[0120], [0142], FIG. 14; Stevenson Reply ¶73.

b. Safonov Renders Obvious Generating a Composite Image by Superimposing the Partial Image on the Main Image

Patent Owner argues that Parulski’s “replacement” is different from the claimed “superimposing” because “the resultant image of two superimposed images is based on characteristics of both images while the resultant image resulting from replacing one image with another is only the characteristics of the replaced image.” MTA 14.⁴ But Patent Owner cites no evidence to corroborate its conveniently narrow interpretation of “superimposing,” and the Federal Circuit has repeatedly “cautioned against limiting the claimed invention to preferred embodiments or specific examples in the specification.” *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1328 (Fed. Cir. 2002) (citations omitted).

Nonetheless, Safonov discloses and renders obvious generating a composite

⁴ The MTA does not challenge that a POSITA would have found it obvious to use alpha blending in Parulski’s “replac[ing].” *See* MTA 11-25 (addressing only Parulski’s express disclosure); Pet. 23-27; Stevenson ¶¶93-103. The Board could thus find that Parulski alone renders obvious substitute claim 7.

image by superimposing the partial image on the main image ([7e(i)[4]) because it teaches using alpha blending⁵ when combining two images to obtain a single, higher-quality composite image. Pet. 54-59 (citing Safonov, Abstract, 7; Stevenson ¶¶166-179); Stevenson Reply ¶¶74-87. A POSITA would have understood that Parulski's combined image should be created in a way that minimizes or hides the edges where the main image and the sub-image (identified, extracted, and replaced image, e.g., with less blur or improved dynamic range) meet, and would have recognized that blending the images would have smoothed the transition between the replaced portion of the main image (cutout sub-image portion) and the main image. Pet. 23-24; Stevenson ¶168. A POSITA would have found it obvious to use alpha blending on some (e.g., edges) or all of the replacement sub-image portion 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 under Patent Owner's narrow definition). *Id.*

Patent Owner does not dispute that Safonov teaches alpha blending to improve 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, at least tacitly confirming that it was. *See* MTA 14-15, 23-25, 24 n.5.

⁵ Patent Owner concedes alpha blending is a type of superimposition. MTA 14-15.

Patent Owner alleges only that “[n]othing in Safonov relates to ... combining images at all.” MTA 24. This improperly attacks Safonov individually and does not address the *combination* of Parulski and Safonov. The MTA does not refute any of the motivations identified for the combination in the Petition. Pet. 54-59. Regardless, Safonov contradicts Patent Owner’s argument. Safonov applies alpha blending to two images—a first “source image I ” and second “digital image,” D_h or D_s , 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. Safonov’s alpha-blending formula (4) includes portions of D_h and D_s :

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

Safonov, 8 (formula (4)).

Moreover, Patent Owner acknowledges that Safonov’s alpha blending is used to enhance shadows and highlights. MTA 24. This serves the same purpose as Parulski’s image-portion replacement to “broaden[]” the “dynamic range” of the 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. Parulski [0140]. This similarity only enhances a

POSITA's motivation to combine Safonov's alpha blending with Parulski to generate a composite image by superimposing the partial image on the main image, as recited in [7e(i)[4]]. Stevenson Reply ¶¶77-87; *see* Pet. 54-59.

Thus, a POSITA would have found it obvious to combine, by superimposition, 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 claim element [7e(i)] and, accordingly, substitute claim 7. Stevenson Reply ¶¶74-87.

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* MTA. Combining Safonov with Parulski for limitation [7e(i)[4]] does not alter this analysis. As such, Parulski and Safonov also render obvious substitute claims 8 and 10-12. Stevenson Reply ¶¶105-150.

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

A. Overview of Prior Art Johnson (Ex. 1018)

Johnson, filed June 20, 2006, and issued February 9, 2010, is prior art to the

'638 patent under 35 U.S.C. § 102(e). Johnson, cover. Johnson is analogous art to the '638 patent. Johnson is directed to the same field of endeavor such as creating a composite image from multiple captured images. Johnson also seeks to solve at least one of the same problems as the '638 patent: creating an enhanced image by combining multiple images to create a composite image. *Compare* Ex. 1001, 1:47-50, *with* Johnson, Abstract, 3:46-50, FIG. 4; Stevenson Reply ¶38.

B. Independent Claim 7

1. [7preamble]-[7d], [7e(i)[3]], [7e(ii)], and [7f]-[7g]

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

2. [7e(i)]

As in Ground 1, the MTA contests, at most, whether Parulski discloses or renders obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]] of substitute claim 7. MTA 11-25. If the Board finds that Parulski does not at least suggest or render obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]], Johnson renders these features obvious. Stevenson Reply ¶¶152-163.

a. Johnson Discloses and Renders Obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]]

Johnson discloses a “digital camera” including an “image processing unit” (e.g., composite image generating unit) for “identif[ying] regions of difference

between ... two images,” for example, “that eyes are partially or fully closed in one of the two images,” and “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.” Johnson, Abstract, 1:51-61, 3:26-34, 4:19-22, FIGS. 3-4. 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. Johnson, 3:15-18, 3:26-50, FIGS. 3-4. Figure 3 shows these “image processing steps,” including generating a composite image by blending a preferred region from source image 1 into main image 2.

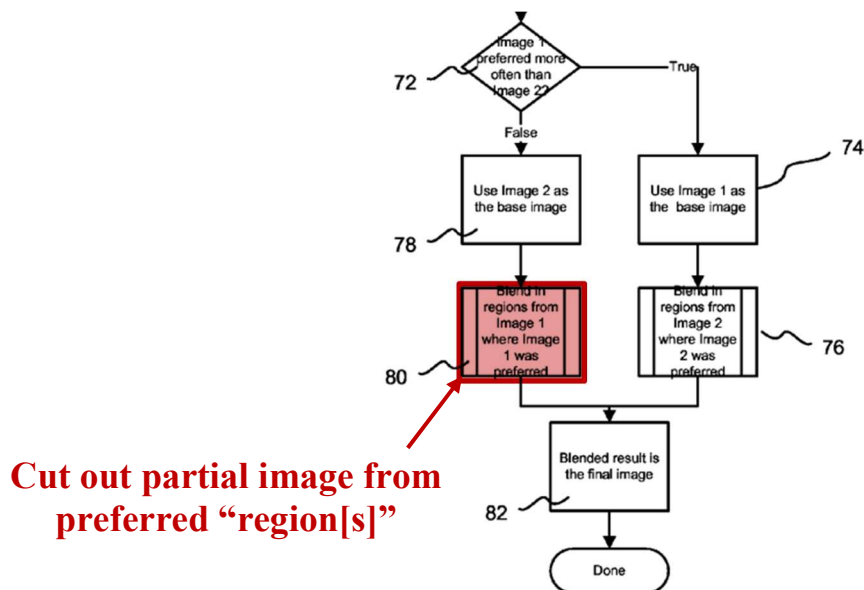


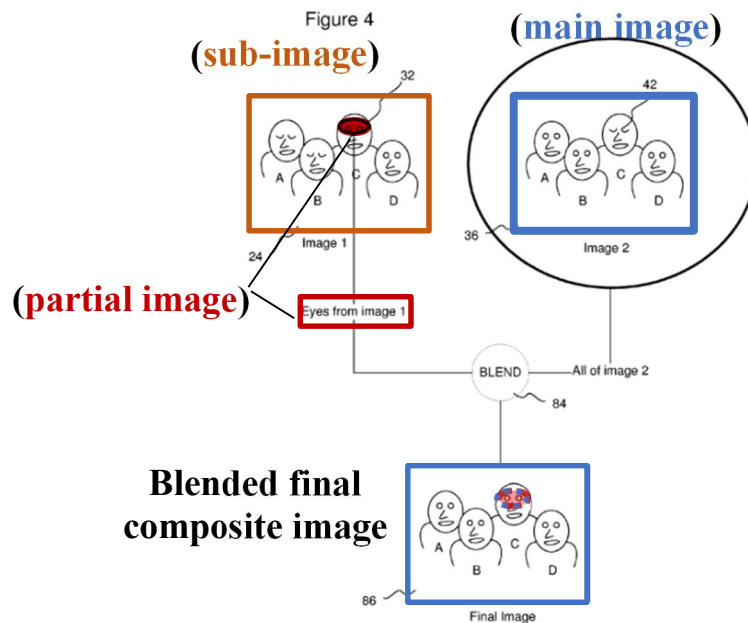
Figure 3

Johnson, FIG. 3 (annotated, excerpted).

In one example, the algorithm “identif[ies] regions of significant difference between the first image 24 and the second image 36” based on a “correlation” operation (e.g., “face and/or eye recognition processing”) to determine that a person/subject 32’s eyes are open in the first image 24, but closed in the second image 36. Johnson, 1:51-53, 3:26-34, 3:46-50, 4:19-22, FIGS. 3-4. Because open eyes are preferable to closed eyes, Johnson’s algorithm “chooses the first image as the source for the ... two regions (two eyes of Subject C 32)” to be incorporated in the second image (“base image”). Johnson, 3:37-45, FIGS. 3-4. That is, Johnson’s algorithm determines a cutout region in the “preferred image” (sub-image) and cuts out a partial image (e.g., subject 32’s eyes) from the image cutout region to incorporate and “blend[]” the partial image into the “base image” (main image). Johnson, 3:37-45; Stevenson Reply ¶154.

Johnson’s algorithm also generates a composite image by superimposing because it “blend[s]” the selected region “into the base image to create the blended [composite] final image 82.” Johnson, 3:40-50 (“The region of each eye from Subject C 32 is blended 84 into the content of the second image 36, which effectively replaces the closed eyes of Subject C 42, creating a single final image 86 where all subjects have open eyes.”); Stevenson Reply ¶155. Figure 4 illustrates “blend[ing]” (superimposing) an eye region (partial image) of “**image 1**” (sub-

image) with the corresponding eye region in “image 2” (main image) to generate a “final image” (composite image) having “elements of both images” (characteristics of both images). Johnson, 1:59-61, 3:46-50, FIG. 4.



Johnson, FIG. 4 (annotated). Thus, Johnson discloses Patent Owner’s narrow interpretation of “superimposing” requiring “the resultant image of two superimposed images” to be “based on characteristics of both images.” MTA 14; *see* Stevenson Reply ¶155.

b. Motivation to Combine Parulski and Johnson

Johnson further discloses that “blend[ing]” (superimposing) a desired region (cut partial image) of image 1 (sub-image) into image 2 (main image) “provide[s] an optimal result.” Johnson, 3:46-53, 5:27-57 (enumerating various advantages of the disclosed processing algorithm). Thus, if the Board finds that Parulski does not

disclose or render obvious how portions of images are combined to generate a final composite image, Johnson provides this teaching.

A POSITA would have been motivated and found it obvious to include the portion correlation, cutting, and blending processes of Johnson into Parulski's portion extraction and replacement because it would have required using only known techniques to improve a similar device (digital camera having a composite image generating unit) to yield predictable results (generating a composite image by superimposition). Stevenson Reply ¶¶156-159; *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); *Slot Speaker Techs., Inc. v. Apple Inc.*, 680 F. App'x 932, 943-44 (Fed. Cir. 2017); *see* Cazier, [0045], [0059]-[0060] (describing "selection module" for "identify[ing] a portion of an image to be manipulated via a swap function or other editing function"). A POSITA would have recognized that Johnson's solution to blend a preferred cutout portion of a sub-image into a correlated portion of the main image aligns with Parulski's goal of replacing the non-preferred blurred or washed out/obscured portions of a main image with the preferred sharp image or detail-visible portions of a sub-image, and would have understood that modifying Parulski to implement Johnson's cutout and blending processes would have furthered Parulski's to obtain an enhanced image to provide an "optimal result." Parulski, [0031], [0071], [0107]-[0109], [0140], [0145]; Johnson, 3:51-53; Stevenson Reply ¶157.

c. Expectation of Success in Combining Parulski and Johnson

A POSITA would have had a reasonable expectation of success in configuring Parulski's digital camera to execute Johnson's cutting and blending (superimposing) processes because Johnson, like Parulski, generates composite images using elements of both a primary and secondary image. *Compare* Johnson, Abstract, FIG. 4, *with* Parulski, [0031], [0140], [0145], claims 11, 40; *see also* Ex. 1001, 1:47-50. Johnson's image processing, like Parulski, is implemented using software (e.g., algorithm), which would have required only routine skill to integrate. *Compare* Johnson, 1:13-15, 1:51-61, 3:14-34, FIG. 3, *with* Parulski, [0063]; Stevenson Reply ¶¶160-162; *see also* Szczuka [0099] ("algorithms may ... be employed to merge or *superimpose*[] the images onto each other ... such that the superimposed images together enhance the contrast of the image" (emphasis added)).

A POSITA would have found combining Parulski and Johnson to generate a composite image by superimposing a selected cutout region from a sub-image onto a main image to be a straightforward application of known, conventional software operations used according to their known functions to yield predictable results. *See* Parulski, [0063] (software implementation was "conventional and within the ordinary skill in such arts"); Szczuka, [0106] (using computer program software

for superimposition); *see KSR*, 550 U.S. at 416; *Slot Speaker*, 680 F. App'x at 943-44.

C. 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.

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

A. Independent Claim 7

1. [7preamble]-[7d], [7e(i)[3]], [7e(ii)], and [7f]-[7g]

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

2. [7e(i)]

As explained in Ground 2, Parulski and Johnson render obvious [7e(i)]. If Patent Owner disputes or the Board finds that Parulski and Johnson do not render obvious generating a composite image by superimposing the partial image on the main image using alpha blending per se, Safonov renders this obvious. Stevenson Reply ¶¶166-170.

As explained in Ground 1, Safonov discloses performing alpha blending on two images to obtain a single, higher-quality composite image. Pet. 55-59 (citing

Safonov, Abstract, 7; Stevenson ¶¶166-179). Safonov discloses this in the same context as Parulski, for example, improving the dynamic range of the image. *Supra* § II.A.2. And the Petition explains (and not contested by the MTA) that a POSITA would have known that Safonov’s alpha blending was a common, conventional technique used when combining images because it permits one image to be overlaid on the other, and the alpha channel or transparency can be used to smooth away differences in the images. Pet. 56-57; Safonov, 7; Yadav, [0003] (“In computer graphics, alpha blending, or alpha channel blending, refers to the use of an alpha channel with other channels in an image in order to show translucency.”), [0007]. Indeed, one known purpose of alpha blending was to smooth the combination of two different images or layers. Yadav, [0003], [0007]; Stevenson ¶170; *see also* Ex. 1001, 7:21-35.

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 “blend[ing]” for combining image portions in the Parulski-Johnson combination because alpha blending 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* Yadav, [0003];

Stevenson ¶¶171-172; Stevenson Reply ¶168; *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. Yadav, [0003]; Stevenson ¶173; *KSR*, 550 U.S. at 416; *Slot Speaker*, 680 F. App'x at 943-44.

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

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 Reply ¶169. Thus, the Parulski-Johnson-Safonov combination renders obvious the claimed composite image generating unit of substitute claim 7 and, accordingly, substitute claim 7. Stevenson Reply ¶170.

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.B.

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

A. Overview of Prior Art Hoshino (Ex. 1021)

Hoshino, filed March 19, 2010, and published September 23, 2010, is 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, 2009.⁶

Hoshino, cover. Hoshino is analogous art to the '638 patent. Hoshino is directed to the same field of endeavor such as creating a composite image from multiple captured images. Hoshino also seeks to solve at least one of the same problems as the '638 patent: creating an enhanced image by combining multiple images to create a composite image. *Compare* Ex. 1001, 1:47-50, *with* Hoshino, [0005]-[0007], FIG. 4; Stevenson Reply ¶41.

⁶ 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); FRE 901; Ex. 1023, 15:20-22, 16, 1-2, 17:1-2.

B. Independent Claim 7

1. [7preamble]-[7d], [7e(i)[3]], [7e(ii)], and [7f]-[7g]

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

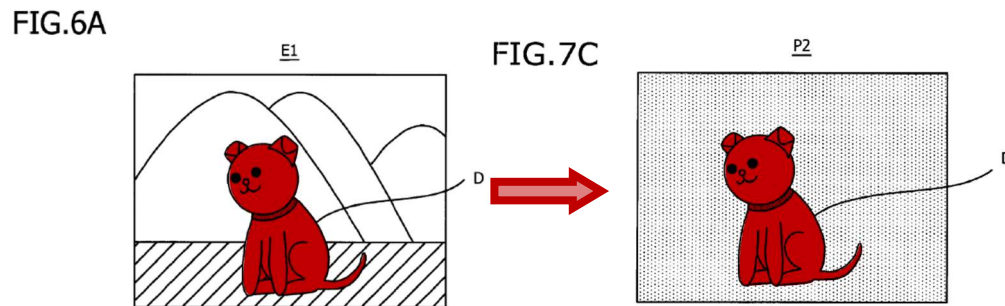
2. [7e(i)]

As in Ground 1, the MTA contests, at most, whether Parulski discloses or renders obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]] of substitute claim 7. MTA 11-25. If the Board finds that Parulski does not at least suggest or render obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]], Hoshino renders these features obvious. Stevenson Reply ¶¶173-179.

a. Hoshino Discloses and Renders Obvious [7e(i)[1]], [7e(i)[2]], and [7e(i)[4]]

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). Hoshino, [0021], [0035], [0037], [0039]-[0040], [0118], FIGS. 2, 4. When combining, “the subject image D is superimposed on the background image P1” and “the subject image D is alpha blended with [the] predetermined background.” Hoshino, [0035], [0037], [0039]-[0040], [0118],

FIGS. 2, 4. Figure 2 illustrates a “process for extracting” (“cutting out a subject image from a subject-background image”) (determining a cutout region in the sub-image), for example, by “generat[ing] difference information between each pair of corresponding pixels of the coordinated subject-background image E1 and background-only image E2.” Hoshino, [0011], [0061], [0037], [0068]-[0076] (describing the difference information determination), FIG. 2. Figures 6A and 7C below illustrate the determined and extracted cutout region, “subject image D.” Hoshino, [0026]-[0027], FIGS. 6A, 7C.

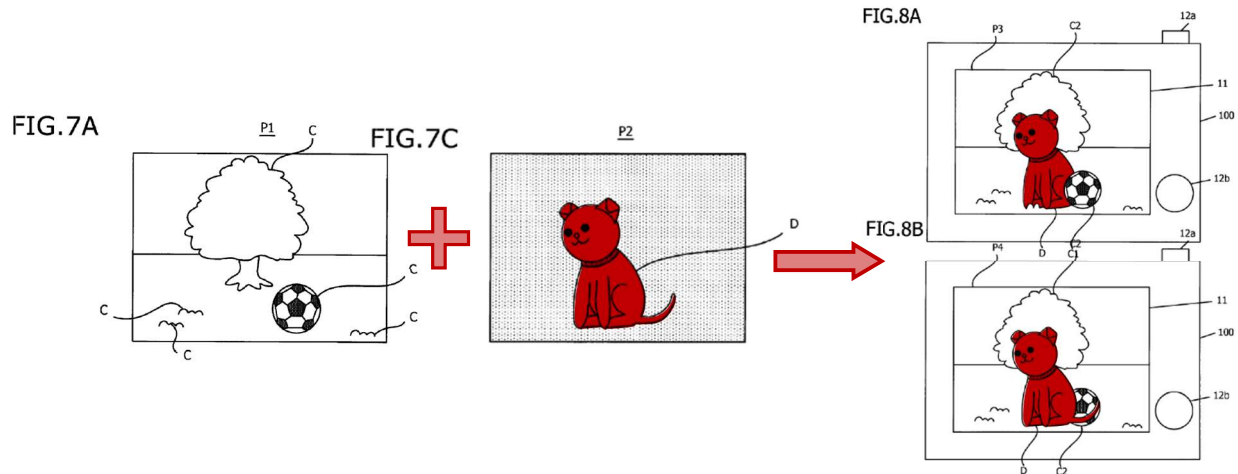


Hoshino, FIGS. 6A, 7C (annotated).

Hoshino then generates “combined image[s] P3” and “P4”⁷ 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-

⁷ 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.

producing process). Specifically, subject image D is “alpha blend[ed]” and superimposed on the background image. *E.g.*, Hoshino, [0048]-[0052], [0086]-[0104], [0115]-[0118], FIGS. 4, 7A-8B; *see also* Hoshino, [0038].



Hoshino, FIGS. 7A, 7C, 8A-8B (annotated).

Thus, if the Board finds that Parulski fails to disclose or render obvious combining images to generate a final composite image using superimposition, Hoshino provides these teachings and renders obvious substitute claim 7.

b. Motivation to Combine Parulski and Hoshino

Hoshino explains that the “mere combin[ing] of the subject image and the background image might produce an unnatural image,” and discloses techniques to produce better combined images. Hoshino, [0005]-[0006], [0103]-[0104]. A POSITA would have been motivated and found it obvious to use Hoshino’s correlation, cutting, and superimposition (e.g., alpha-blending) processes as part of Parulski’s replacing a portion of the main image with the extracted sub-image

portion for the same reasons articulated in Grounds 2 and 3, and to produce a more natural-looking combined image. Hoshino, [0005]-[0006], [0103]-[0104], FIGS. 2, 4; Stevenson Reply ¶177.

c. Expectation of Success in Combining Parulski and Hoshino

A POSITA would have had a reasonable expectation of success in executing Hoshino's correlation, cutting, and superimposition in Parulski because Hoshino, like Parulski, is directed to generating composite images using elements of a primary and secondary image. *Compare* Hoshino, [0005]-[0007], FIG. 4, *with* Parulski, [0063]; Stevenson Reply ¶178; *see also* Ex. 1001, 1:47-50. Hoshino, like Parulski, implements its image processing using a computer program, which would have required only routine skill to integrate. *Compare* Parulski, [0063], *with* Hoshino, [0008]; *see also* Szczuka, [0099], [0106]. Thus, generating a composite image by superimposing a selected cutout region from a sub-image onto a main image would have been a straightforward application of known, conventional software operations used according to their known functions to yield predictable results. Parulski, [0063]; *see KSR*, 550 U.S. at 416; *Slot Speaker*, 680 F. App'x at 943-44.

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.B.

VI. THE MTA’S REMAINING ARGUMENTS ARE INAPPOSITE

The MTA argues that “sharpening,” “modifying the dynamic range,” and “scene analysis” are not “superimposing” (MTA 19-23), but these arguments are moot in view of the grounds in this Opposition. They are also inapposite because they provide additional details describing the improved results of Parulski’s combined image.

VII. CONCLUSION

For the foregoing reasons, the Board should deny Patent Owner’s MTA.

Respectfully submitted,

Dated: June 16, 2025

/Kevin D. Rodkey/

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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 sub-

Claim Number	Claim Elements
	image, and [4] generate a composite image by superimposing the partial image on 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 sub-image in the composite image is less than or equal to a predetermined amount in the correction mode, and a

Claim Number	Claim Elements
	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 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: June 16, 2025

/Kevin Rodkey/

Kevin D. Rodkey
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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **Petitioner's Opposition to Patent Owner's Non-Contingent Motion to Amend** was served on June 16, 2022, via email directed to counsel of record for the Patent Owner at the following:

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