

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

138 EAST LCD ADVANCEMENTS LIMITED,
Patent Owner.

IPR2024-00957
Patent 7,454,056 B2

Before KRISTEN L. DROESCH, GEORGE R. HOSKINS, and
CHRISTOPHER M. KAISER, *Administrative Patent Judges*.

HOSKINS, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner Google LLC has filed a Petition (Paper 1, “Pet.”) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of U.S. Patent No. 7,454,056 B2 (Ex. 1001, “the ’056 patent”), claims 1–18.

After the Petition was filed, Patent Owner 138 East LCD Advancements Limited filed a Statutory Disclaimer of claims 9 and 17. *See* Ex. 2002. Patent Owner also filed a Preliminary Response (Paper 6, “Prelim. Resp.”) opposing institution of review as to the remaining claims 1–8, 10–16, and 18.

Pursuant to 35 U.S.C. § 314(a), institution of review requires the information in the record to demonstrate a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim. Applying that standard on behalf of the Director (37 C.F.R. § 42.4(a)), we institute an *inter partes* review to determine whether Petitioner demonstrates by a preponderance of the evidence that claims 1–8, 10–16, and 18 are unpatentable, considering all grounds in the Petition directed to those claims. We do not institute review as to claims 9 and 17 on any ground because they have been disclaimed. *See* 37 C.F.R. § 42.107(e).

II. BACKGROUND

A. *Real Parties-in-Interest and Related Proceedings*

Petitioner identifies itself (i.e., Google LLC) as a real party-in-interest. *See* Pet. 78. Patent Owner identifies itself (i.e., 138 East LCD Advancements Limited) and Longitude Licensing Limited as real parties-in-interest. *See* Paper 3, 1.

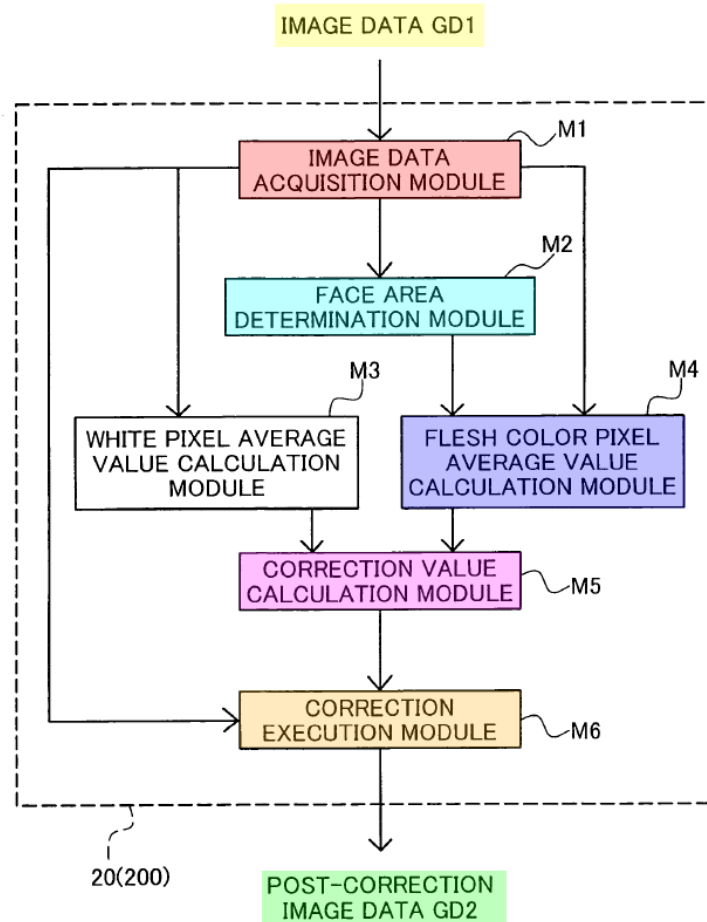
The parties also identify *Longitude Licensing Ltd. v. Google LLC*, Case No. 3:23-cv-03046 (N.D. Cal.), Case No. 24-1202 (Fed. Cir.), as a related matter. *See* Pet. 78; Paper 3, 1.

Petitioner has filed six other IPR challenges to patents owned by Patent Owner. They are IPR2024-00955 (U.S. Patent No. 7,668,365 B2); IPR2024-00956 (U.S. Patent No. 8,355,574 B2); IPR2024-00958 (U.S. Patent No. 8,482,638 B2); IPR2024-00959 (U.S. Patent No. 7,428,082 B2); IPR2024-00960 (U.S. Patent No. 7,486,807 B2); and IPR2024-00961 (U.S. Patent No. 7,945,109 B2).

B. The '056 Patent Specification

The '056 patent is directed to a device and method that correct the color balance in a digitally stored photographic image. *See* Ex. 1001, codes (54) and (57), 1:5–15. Figure 2 of the '056 patent is reproduced below (on the next page), with our color annotations added.

Fig.2



'056 Patent, Figure 2 (Annotated in Color).

Figure 2 is a functional block diagram of personal computer 20 with CPU 200 comprising several modules M1–M6. *See id.* at 4:6–7, 5:19–6:9.

Image data acquisition module M1 (red) acquires image data GD1 (yellow) which is the target of the '056 patent's color balance correction method. *See id.* at 5:24–26.

Face area determination module M2 (blue) receives image data GD1 from module M1 and analyzes it to “determine[] an area containing the face part of a human subject.” *Id.* at 5:26–28, 5:33–36. Module M2 “is equivalent to” the “specific subject area determination module” in the '056 patent claims, as embodied in Figure 2. *Id.* at 6:4–6.

Flesh color pixel average value calculation module M4 (purple) receives the face area determination results from module M2, as well as image data GD1 from module M1. *See id.* at 5:28–32, 5:36–38, 5:44–47. Module M4 “analyzes the image data corresponding to the determined face area” and “calculates the flesh color pixel average value.” *Id.* at 5:47–50. This calculation “may be executed using weighted distribution with a weight in a center area of the [face area] larger than a weight in an area outside the center area,” so the subsequent color balance correction “better reflects the characteristic of the center area” which “improve[s] the appearance of the subject in the image.” *Id.* at 2:4–13, 8:3–52 (Figs. 7–8), 11:64–12:17. Module M4 “is equivalent to” the “specific subject characteristic value calculation module” in the ’056 patent claims, as embodied in Figure 2. *Id.* at 6:6–9.

Correction value calculation module M5 (pink) receives the average value from module M4. *See id.* at 5:47–52. Module M5 calculates “a correction value for color balance correction . . . based on the flesh color pixel average value . . . and a preset flesh color pixel average value.” *Id.* at 5:53–59.

Correction execution module M6 (orange) receives the correction value from module M5, as well as image data GD1 from module M1. *See id.* at 5:26–28, 5:59–66. Module M6 uses the correction value to “execute[] color balance correction on the overall image data GD1, and generates post correction image data GD2” (green). *Id.* at 5:66–6:3.

C. The '056 Patent Claims

The '056 patent lists eighteen claims, all of which are challenged in the Petition. *See* Ex. 1001, 14:44–18:56; Pet. 1–2. Patent Owner has disclaimed independent claims 9 and 17. *See* Prelim. Resp. 1, 21; Ex. 2002. The remaining challenged claims include six independent claims 1, 8, 10, 11, 12, and 18, and dependent claims 2–7 and 13–16.

Independent claim 1 illustratively recites:

1. An image processing device for executing color balance correction on image data of a photographed image, said image processing device comprising:
 - an image data acquisition module that acquires said image data;
 - a specific subject area determination module that determines a specific subject area in said photographed image, wherein said specific subject area contains a specific subject in said photographed image;
 - a specific subject characteristic value calculation module that calculates a specific subject characteristic value, wherein said specific subject characteristic value represents a characteristic of image data corresponding to said determined specific subject area,
 - wherein said specific subject characteristic value calculation is executed using weighted distribution, and
 - wherein said weighted distribution is set so as to be a weight in a center area of said specific subject area larger than a weight in an area outside said center area;
 - a correction value calculation module that calculates a correction value for color balance correction using said calculated specific subject characteristic value and a preset characteristic target value; and
 - a correction execution module that executes said color balance correction on said image data using said calculated correction value.

Ex. 1001, 14:45–15:3 (one line break added).

D. Asserted Prior Art

Petitioner relies on the following five references as prior art against the '056 patent. *See* Pet. 1–2.

Name	Reference	Exhibit No.
Yano	US 2004/0021779 A1	1005
Schröder	US 6,898,312 B2	1006
Steinberg	US 7,440,593 B1	1007
Kuwata	US 2003/0043394 A1	1008
Nakamura	US 5,557,688	1009

Patent Owner does not dispute at this time that these references are prior art against the '056 patent. *See* Prelim. Resp. *generally*.

E. Asserted Grounds

Petitioner asserts the following six grounds of unpatentability. *See* Pet. 1–2.

35 U.S.C. §	References	Claim(s) Challenged
103(a) ¹	Yano, Schröder	1, 3–7, 11
103(a)	Yano, Schröder, Steinberg	2, 8, 12–16, 18

¹ Amendments to 35 U.S.C. § 103 enacted by the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”) took effect in March 2013. The '056 patent issued from an application filed in 2005. *See* Ex. 1001, code (22). Therefore, we apply the pre-AIA version of § 103.

35 U.S.C. §	References	Claim(s) Challenged
103(a)	Yano, Kuwata	9, 17
103(a)	Yano, Schröder, Kuwata	9, 17
103(a)	Yano, Nakamura	10
103(a)	Yano, Schröder, Nakamura	10

F. Testimonial Evidence

Petitioner relies on the proffered expert witness testimony of Kenneth Parulski, M.S. (Exhibit 1003). Patent Owner relies on the proffered expert witness testimony of Nikolaos Papanikolopoulos, Ph.D. (Exhibit 2001).

III. PETITIONER’S GROUNDS OF UNPATENTABILITY

A. Legal Standards — Petitioner’s Burden

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

B. Legal Standards — Obviousness

A patent claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness, if made available in the record, which has not happened here. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Ordinary Skill in the Art

Petitioner contends a person having ordinary skill in the art pertaining to the ’056 patent “would have had a bachelor’s degree or equivalent in electrical engineering, computer science, or a related field, in addition to three years in research, design, or development in digital image processing.” Pet. 16; Ex. 1003 ¶¶ 68–69.

“Patent Owner does not dispute the level of skill for a person of ordinary skill in the art . . . set forth in the Petition.” Prelim. Resp. 8; Ex. 2001 ¶¶ 27–28.

For purposes of this Decision, we adopt Petitioner’s assessment of the level of ordinary skill in the art, as it appears to be consistent with the ’056 patent and the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

D. Claim Construction

We interpret the ’056 patent claims “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). This “includ[es]

construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

Petitioner argues “[n]o terms need to be construed . . . to resolve unpatentability.” Pet. 16–17.

“Patent Owner contends that the claim terms should receive their ordinary and customary meaning in light of the specification and prosecution history, as understood by a person of ordinary skill in the art.” Prelim. Resp. 8. Patent Owner does not proffer any constructions for particular terms. *See id.*

Based on the arguments and evidence presented at this time, we determine no explicit construction is needed to resolve the parties’ controversy. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

E. Ground One — Obviousness over Yano and Schröder

In Ground One, Petitioner asserts claims 1, 3–7, and 11 of the ’056 patent are unpatentable as having been obvious over Yano and Schröder. *See* Pet. 1, 5–9, 17–45. Patent Owner disagrees. *See* Prelim. Resp. 1, 9–15.

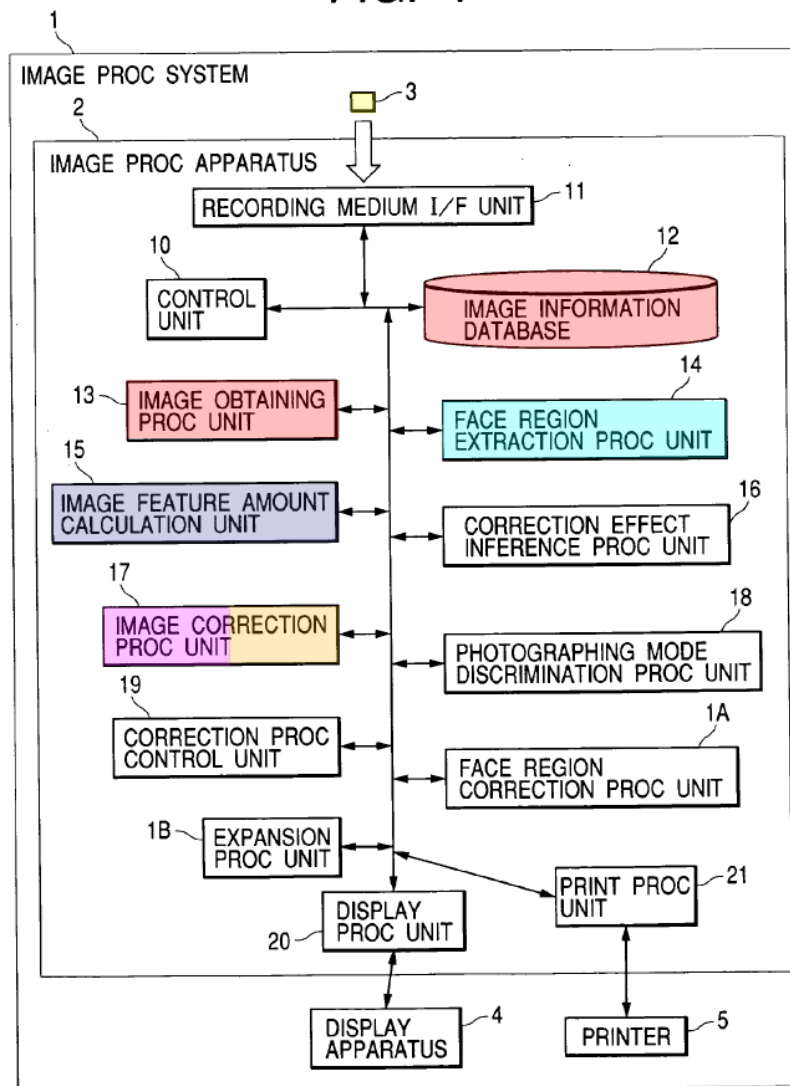
We summarize the disclosures of Yano and Schröder. Then we consider the parties’ competing contentions, and we conclude the record demonstrates a reasonable likelihood that Petitioner would prevail with

respect to at least claim 1. Therefore, we grant the petitioned *inter partes* review.

1. Yano

Yano is directed to an image processing apparatus and method which “automatically correct image data and output the person image of an optimum characteristic.” Ex. 1005, codes (54) and (57). Figure 1 of Yano is reproduced below, with our color annotations added.

FIG. 1



Yano, Figure 1 (Annotated in Color).

Figure 1 is a block diagram showing the functional structure of image processing system 1 including image processing apparatus 2, display apparatus 4, and printer 5. *See id.* ¶¶ 10, 15, 17.

Image obtaining processing unit 13 (red) obtains image data from recording medium 3 (yellow) and stores the image data in database 12 (red), in order to apply “an image correction process to image data photographed in a person mode (in this mode, a person is included in a subject).” *Id.* ¶¶ 15–16, 24, 37–39. Specifically, Yano’s process “correct[s] a face region of the person so that it becomes an image of appropriate lightness.” *Id.* ¶ 16.

Face region extraction processing unit 14 (blue) “extracts the face region of [a] person from the image data.” *Id.* ¶¶ 24, 40.

Image feature amount calculation unit 15 (purple) “calculates, as the image feature amount, a lightness distribution of the pixels in a flesh color region and an area of the face region.” *Id.* ¶¶ 25, 40.

Correction effect inference processing unit 16 (uncolored) “infers whether or not a correction effect can be obtained by correcting characteristics (lightness, hue, etc.) of the image data,” based on “the size of the area of the face region.” *Id.* ¶¶ 26, 41. If unit 16 infers the correction effect can be obtained, then image correction processing unit 17 (pink and orange) “corrects the characteristic of the image data on the basis of the image feature amount, and then outputs the post-correction image data.” *Id.* ¶¶ 27–28, 42.

2. Schröder

Schröder is directed to a device and method for color correction of selected “reference parts” in photographic images. *See Ex. 1006, codes (54)*

and (57), 1:7–18, 3:53–54. The reference part “usually represents a spatial section of the image” and is selected “such that the part is related to a reference color, usually at least most of the color values and the part are similar or even equal.” *Id.* at 3:54–4:2. The selection may be performed automatically, utilizing “spatial information included in the image data” such as “structure information or patterns.” *Id.* at 6:61–7:6, 17:11–30.

Schröder determines a color transformation to be applied to the selected reference part, “based on the reference colors (memory colors) assigned to the selected parts of the image” which “represent models of ideal memory colors,” in order “to achieve a corrected image.” *Id.* at 4:12–43. The reference colors utilized to perform this transformation may “represent knowledge about typical memory colors in photographic images” (*id.* at 2:50–3:4, 4:43–46), or may be determined from the image data itself either automatically or by user selection (*see id.* at 6:36–60, 9:30–39). “If, for instance, the algorithm identifies in the image the pattern of a face of a human being, then a reference color, which corresponds to the color of skin, may be assigned to the corresponding part of the image.” *Id.* at 7:6–13, 17:30–33.

“If the [reference] part consists of more than one pixel, the color value assigned to the [reference] part may be a function of the color values of the pixels in the [reference] part.” *Id.* at 10:40–51. “The function may, for instance, be the arithmetic medium or the median of the color values of the pixels or the color values in the center of the [reference] part may be more weighted than the color values of the pixels in the periphery of the reference part.” *Id.* at 10:51–56.

3. *Claim 1*

Petitioner provides arguments and evidence in support of contending claim 1 is unpatentable as having been obvious over Yano and Schröder, including supporting testimony from Mr. Parulski. *See* Pet. 5–9, 17–36; Ex. 1003 ¶¶ 84–90, 99–126. Patent Owner opposes, as supported by testimony from Dr. Papanikolopoulos. *See* Prelim. Resp. 1, 9–15; Ex. 2001 ¶¶ 49–58. For the following reasons, we conclude Petitioner has demonstrated a reasonable likelihood of prevailing on its assertions for claim 1.

(i) *Claim Preamble*

The preamble of claim 1 refers to “[a]n image processing device for executing color balance correction on image data of a photographed image.” Ex. 1001, 14:45–47. Petitioner assumes the preamble is limiting, and contends Yano discloses an image processing device for executing color balance correction on image data of a photographed image. *See* Pet. 17–19 (citing Ex. 1005, Fig. 4, ¶¶ 13, 15, 54–63; Ex. 1001, 2:29–33); Ex. 1003 ¶¶ 99–101).

We conclude this contention, which Patent Owner does not oppose at this time, is supported sufficiently by the cited disclosures in Yano and by Mr. Parulski’s testimony to justify institution of review. In particular, Yano describes how its image processing apparatus 2 can be “a PC or the like” that performs “an image correction process.” Ex. 1005, Fig. 2, ¶¶ 13, 15. Further, Yano’s process corrects an image “so that the face region . . . comes to have optimum lightness” having “an appropriate flesh color that human beings feel desirable.” *Id.* ¶¶ 42, 54.

(ii) Image Data Acquisition Module

Claim 1 next recites that the claimed device comprises “an image data acquisition module that acquires said image data.” Ex. 1001, 14:48–49. Petitioner contends Yano’s device 2 includes such a module as image obtaining processing unit 13. *See* Pet. 19–20 (citing Ex. 1005, Fig. 1, ¶¶ 17–18, 21, 24, 38); Ex. 1003 ¶ 102.

We conclude this contention, which Patent Owner does not oppose at this time, is supported sufficiently by the cited disclosures in Yano and by Mr. Parulski’s testimony to justify institution of review. In particular, Yano’s unit 13 “obtains . . . the image data . . . from the recording medium 3 on which the image data indicating the image including the person has been recorded,” and stores the image information in database 12. Ex. 1005, Fig. 1, ¶¶ 24, 38.

(iii) Specific Subject Area Determination Module

Claim 1 next recites that the claimed device comprises “a specific subject area determination module that determines a specific subject area in said photographed image, wherein said specific subject area contains a specific subject in said photographed image.” Ex. 1001, 14:50–53. Petitioner contends Yano’s device 2 includes such a module as face region extraction processing unit 14. *See* Pet. 20–22 (citing Ex. 1005, Figs. 1 and 3C, ¶¶ 16, 24, 32–34); Ex. 1003 ¶¶ 103–106.

We conclude this contention, which Patent Owner does not oppose at this time, is supported sufficiently by the cited disclosures in Yano and by Mr. Parulski’s testimony to justify institution of review. In particular, Yano’s unit 14 “extracts the face region of the person from the image data

obtained by the image obtaining processing unit 13.” Ex. 1005 ¶¶ 24, 32. The ’056 patent expressly identifies a “face region” as one example of the claimed “specific subject area” that “contains a specific subject” as recited in claim 1. Ex. 1001, 6:4–9, 14:50–53.

(iv) Specific Subject Characteristic Value Calculation Module

Claim 1 next recites that the claimed device comprises “a specific subject characteristic value calculation module that calculates a specific subject characteristic value, wherein said specific subject characteristic value represents a characteristic of image data corresponding to said determined specific subject area.” Ex. 1001, 14:54–58. This calculation further “is executed using weighted distribution . . . set so as to be a weight in a center area of said specific subject area larger than a weight in an area outside said center area.” *Id.* at 14:58–63.

Petitioner contends the combination of Yano and Schröder renders this claimed module obvious. *See* Pet. 22–28. Patent Owner disagrees. *See* Prelim. Resp. 1, 10–15.

(a) Petitioner’s Contentions

Petitioner contends Yano’s image feature amount calculation unit 15 is a specific subject characteristic value calculation module that calculates a specific subject characteristic value representing a characteristic of image data corresponding to the determined specific subject area. *See* Pet. 22–24 (citing Ex. 1005, Fig. 1, ¶¶ 25, 55–57, 61; Ex. 1003 ¶¶ 107–108). Specifically, Petitioner asserts Yano’s unit 15 “calculates an image feature amount” (calculates a specific subject characteristic value that represents a characteristic of image data) ‘of the face region extracted from the image

data by the face region extraction processing unit 14' (corresponding to said determined specific subject area)." *Id.* at 23 (citing Ex. 1005 ¶ 25); Ex. 1003 ¶ 108. "For example," according to Petitioner, Yano's unit 15 "calculates a 'statistics value' (e.g., average hue value) of pixels within the face region." Pet. 23 (citing Ex. 1005 ¶¶ 55–57, 61); Ex. 1003 ¶ 108.

Petitioner then contends the combination of Yano and Schröder would have motivated a person of ordinary skill in the art to perform Yano's calculation utilizing a weighted distribution, wherein a center area of Yano's determined face region is given a larger weight than an area outside the center area. *See* Pet. 24–28; Ex. 1003 ¶¶ 109–115. Petitioner relies on Yano as "disclos[ing] several examples of a 'statistics value' of the pixels within the face region, including their average hue value." Pet. 24–25 (citing Ex. 1005 ¶¶ 55–57, 61); Ex. 1003 ¶ 110. Petitioner relies on Schröder as supporting that a person of ordinary skill in the art "would have found it obvious to calculate [Yano's] average hue value using a weighted distribution that weights pixel values in a center area of the face region larger than pixel values in an area outside the center area." Pet. 25; Ex. 1003 ¶ 110.

Specifically, according to Petitioner, Schröder "like Yano . . . discloses an 'automatic color correction' process that automatically detects, for example, 'skin regions . . . using a structural face detector,'" and Schröder describes the detected skin regions as "reference parts" (among other related terms). Pet. 25 & n.3 (citing Ex. 1006, 3:53–65, 4:12–49, 6:46–55, 7:9–13, 9:30–36, 10:35–11:11, 17:11–33); Ex. 1003 ¶ 111. Petitioner asserts Schröder "discloses determining the color value of the reference part using 'a function of the color values of the pixels in the

[reference] part,’” which Petitioner argues is “[s]imilar to Yano’s ‘average hue of the flesh color in the face region.’” Pet. 26 (citing Ex. 1005 ¶ 61; Ex. 1006, 10:47–60); Ex. 1003 ¶ 112. Schröder further, according to Petitioner, “calculate[s] a characteristic color value (specific subject characteristic value) of the reference part using a weighted distribution . . . that weights ‘the color values in the center of the [reference] part . . . more . . . than the color values of the pixels in the periphery of the reference part.’” Pet. 26 (citing Ex. 1006, 10:47–60, 10:63–11:6); Ex. 1003 ¶ 112.

Petitioner contends and Mr. Parulski testifies that a person of ordinary skill in the art “would have been motivated to use Schröder’s² function that weights color pixel values in the center of a reference part more than in its periphery to determine Yano’s average hue value of the flesh color in the face region.” Pet. 26; Ex. 1003 ¶ 113. This is “because doing so would have placed greater emphasis on the hue values of pixels in the center of the face region, where viewers of the image are more likely to focus” and where “the hue values . . . are the closest to the ‘appropriate flesh color that human beings feel desirable.” Pet. 26–27 (citing Ex. 1005 ¶¶ 54, 60–63); Ex. 1003 ¶ 113 (further citing Ex. 1019 ¶ 110). It moreover would, according to Petitioner and Mr. Parulski, be “advantageous because it would have reduced the impact of pixels at the ‘periphery’ of Yano’s face region, where head hair, facial hair, head coverings, scarfs, and other clothing were known to potentially impact the hue of pixels at the edge.” Pet. 27 (citing Ex. 1006, 10:51–56); Ex. 1003 ¶ 114 (further citing Ex. 1011 ¶¶ 21, 34–37).

² For internal consistency in this Decision, we refer to “Schröder” even when quoting from the parties’ briefs that refer instead to “Schroder.”

Petitioner finally asserts this could have been done with a reasonable expectation of success. *See* Pet. 27–28 (citing Ex. 1005 ¶¶ 54–63; Ex. 1006, 4:12–46, 17:11–33); Ex. 1003 ¶ 115.

(b) *Patent Owner’s Contentions*

Patent Owner asserts Yano’s image feature amount calculation unit 15 “calculates an ‘image feature amount[’] . . . *per pixel*,” and “Yano does not describe using a weighted distribution as part of calculating ‘image feature amounts.’” Prelim. Resp. 10–11 (emphasis added) (citing Ex. 1005 ¶¶ 25, 40); Ex. 2001 ¶ 51.

Patent Owner also argues Schröder’s color correction: (1) identifies “reference parts” in an image to be corrected; and then (2) determines a “transformation” for the pixels in those reference parts “based on the reference colors (memory colors) assigned to the selected parts [reference parts] of the image” wherein “a reference part . . . includes more than one pixel.” Prelim. Resp. 11–12 (citing Ex. 1006, Figs. 2 and 3, 3:44–65, 4:12–35, 6:36–60, 10:47–60); Ex. 2001 ¶¶ 53–54. However, Patent Owner asserts that “[n]otably, Schröder *does not select reference parts based on image-specific subjects*,” and instead “Schröder explains that a ‘reference part of the image usually represents a spatial section of the image,’ based on color.” Prelim. Resp. 12 (citing Ex. 1006, 3:55–56); Ex. 2001 ¶ 54. Patent Owner therefore concludes that “like Yano, Schröder . . . does not teach or suggest calculating a ‘specific subject characteristic value,’ for image data corresponding to a determined specific subject area, using a weighted distribution.” Prelim. Resp. 12 (citing Ex. 1006, Fig. 7); Ex. 2001 ¶ 54.

Patent Owner moreover asserts the subject limitation of claim 1 “provides that the ‘specific subject characteristic value’ ‘represents a characteristic of image data corresponding to said determined specific subject area,’” so claim 1 “does not recite using weighted distribution to perform *any* calculation for *any* image data” and instead “requires a particular calculation *for that specific subject characteristic value* and related image data.” Prelim. Resp. 13 (citing Ex. 1001, 14:54–63). Patent Owner argues Petitioner “fails to show that Schröder cures Yano’s deficiency” as to that subject matter, “because Schröder does not *calculate a specific subject characteristic value of image data corresponding to said determined specific subject area.*” Prelim. Resp. 13–14 (citing Pet. 26; Ex. 1006, 3:55–56, 4:1–2, 6:46–60); Ex. 2001 ¶¶ 54–58.

(c) *Analysis and Conclusion*

We presently conclude the preliminary record supports, sufficiently to justify institution, Petitioner’s contention that a person of ordinary skill in the art would have been motivated to combine Yano and Schröder to practice the invention of claim 1, as follows.

We presently agree with Petitioner’s contention that Yano’s image feature amount calculation unit 15 is a “specific subject characteristic value calculation module” per claim 1, except for the “weighted distribution” aspect of the claim. *See* Pet. 22–24. That is, Yano’s unit 15 calculates the *average hue value* (the claimed “specific subject characteristic value”) of pixels within a *face region* of the image data (the claimed “determined specific subject area”) as determined by Yano’s face region extraction processing unit 14. *See* Ex. 1005, Fig. 1, ¶¶ 25, 40, 54–57, 61.

This preliminary finding is supported by Mr. Parulski's testimony. See Ex. 1003 ¶ 108. Dr. Papanikolopoulos in response testifies that "Yano describes performing a calculation *per pixel*." Ex. 2001 ¶¶ 49–51 (emphasis added). Yano pertinently describes calculating "a lightness distribution of the pixels" (Ex. 1005 ¶ 25), as follows:

[T]he image feature amount calculation unit 15 discriminates whether or not each pixel value within the extracted face region 33 belongs to a predetermined flesh color region, and calculates a statistics value indicating the lightness distribution of the pixels of the flesh color region. At that time, the lightness calculated by the image feature amount calculation unit 15 is obtained by, for example, calculating the average value of the R, G and B values of each pixel. Moreover, as the above statistics value, for example, the image feature amount calculation unit 15 calculates histograms, average values and distribution values of the lightness, hue and the like in regard to each pixel of the face region 33, and calculates the total number of pixels included in the face region 33. Incidentally, the calculation of the image feature amount of the face region 33 by the image feature amount calculation unit 15 is performed to the entire face region 33 extracted by the face region extraction processing unit 14.

Ex. 1005 ¶ 40. We acknowledge that the foregoing description at times refers to "each pixel." However, in context, we understand those references to mean that "each pixel" in the determined face region that belongs to the predetermined flesh color region is utilized to calculate one or more statistics values representing the lightness distribution of the collection of pixels. Yano utilizes those statistical calculation(s) to "correct[]" the face region of the person to generate the image of an appropriate flesh color that human beings feel desirable." *Id.* ¶¶ 54–57, 61.

Dr. Papanikolopoulos also testifies that "Yano does not disclose calculating a specific subject characteristic value using weighted

distribution.” Ex. 2001 ¶ 56. Mr. Parulski agrees (*e.g.*, Ex. 1003 ¶¶ 110–114), and so do we.

We next agree at this time with Petitioner’s contention that Schröder discloses utilizing a *weighted distribution* to implement color correction within a determined *reference part* of an image, wherein the center area of the reference part is weighted more than the area in the periphery of the reference part. *See* Pet. 24–26; Ex. 1006, 3:53–65, 6:46–55, 9:30–36, 10:35–47, 10:61–11:6, 17:11–35 (discussing “reference parts” and how to determine them); *id.* at 10:47–60 (discussing color correction of reference parts utilizing a weighted distribution). This preliminary finding is supported by Mr. Parulski’s testimony, and is not disputed by Dr. Papanikolopoulos. *See* Ex. 1003 ¶¶ 111–112, 114; Ex. 2001 ¶¶ 52–58.

Thus, Patent Owner’s and Dr. Papanikolopoulos’s opposition that Schröder falls short of claim 1 because Schröder’s *weighted distribution* color correction is not applied to an *image-specific subject area* such as a *face region* misses the mark set by Petitioner’s combination of Yano and Schröder. *See, e.g.*, Ex. 2001 ¶¶ 54, 57–58. Specifically, even accepting the opposition’s premise as an accurate reading of Schröder’s disclosure, it overlooks that Yano discloses applying color correction to an *image-specific subject area* such as a *face region*, as discussed above. In this way, the combined teachings of Yano (*i.e.*, color-correcting an image-specific subject area such as a face region in an image) and Schröder (*i.e.*, color-correcting a reference part in an image utilizing a weighted distribution favoring the center area of the reference part) lead to the claimed invention.

Patent Owner’s position in this regard invites us to err “by looking at [Schröder] individually” and separately from Yano, because “[t]he question

in an obviousness inquiry is whether it would have been obvious to a person of ordinary skill in the art to combine the relevant disclosures of the two references, not whether each individual reference discloses all of the necessary elements.” *Palo Alto Networks, Inc. v. Centripetal Networks LLC*, 122 F.4th 1378, 1385–86 (Fed. Cir. 2024) (quoting *Game & Tech. Co. v. Wargaming Grp. Ltd.*, 942 F.3d 1343, 1352 (Fed. Cir. 2019)); *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (nonobviousness is not established by attacking references individually when unpatentability is predicated upon a combination of prior art disclosures); *see also KSR*, 550 U.S. at 420–421 (stating “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton,” and “in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle”).

Moreover, we disagree with the premise of Patent Owner’s argument and Dr. Papanikolopoulos’s testimony that Schröder does not disclose its “reference part” may be an *image-specific subject area* such as a *face region*. In particular, Schröder describes how to utilize “spatial information” such as “patterns” in the image data to select a reference part for color correction, including “for instance” when “the algorithm identifies in the image the pattern of a face of a human being” such that “a reference color, which corresponds to the color of skin, may be assigned to the corresponding part of the image.” Ex. 1006, 6:61–7:16; *see also id.* at 17:11–35 (“For instance, skin regions can be automatically detected using a *structural face detector* or using other methods and, of course, a skin color will be assigned to the detected skin regions.” (emphasis added)).

Finally, as to motivation to combine Yano and Schröder to practice the invention of claim 1, Petitioner’s contentions and Mr. Parulski’s testimony justify institution of review. In particular, Mr. Parulski testifies that a person of ordinary skill in the art would have been motivated to use Schröder’s weighted distribution that weighs pixels in the center area of Yano’s face region more than in its periphery to determine Yano’s average hue value in the face region, because viewers of the image are more likely to focus on that center area and it would reduce the impact of hair and other items that may appear at the edge of the face region. *See* Pet. 26–27; Ex. 1003 ¶¶ 112–114.

For the foregoing reasons, we conclude the preliminary record supports, sufficiently to justify institution, Petitioner’s contention that a person of ordinary skill in the art would have been motivated to combine Yano and Schröder to practice the invention of claim 1.

(v) *Correction Value Calculation Module*

Claim 1 next recites that the claimed device comprises “a correction value calculation module that calculates a correction value for color balance correction using said calculated specific subject characteristic value and a preset characteristic target value.” Ex. 1001, 14:64–67. Petitioner contends Yano’s device 2 includes such a module as its image correction processing unit 17. *See* Pet. 28–30 (citing Ex. 1005, Fig. 1, ¶¶ 27, 60–63); Ex. 1003 ¶¶ 116–119. Petitioner alternatively contends that the combination of Yano and Schröder would have motivated a person of ordinary skill in the art to configure Yano’s unit 17 in the fashion claimed with a reasonable expectation of success. *See* Pet. 28, 30–34 (citing Ex. 1005, Fig. 1, ¶¶ 27,

32, 35, 61–63; Ex. 1006, Fig. 7, 7:20–30, 11:7–58, 19:32–58); Ex. 1003 ¶¶ 116, 120–123 (further citing Ex. 1011 ¶¶ 24–25, 36–37).

We conclude the foregoing contentions, which Patent Owner does not oppose at this time, are supported sufficiently by the cited disclosures in Yano and Schröder, and by Mr. Parulski’s testimony, to justify institution of review.

(vi) Correction Execution Module

Claim 1 finally recites that the claimed device comprises “a correction execution module that executes said color balance correction on said image data using said calculated correction value.” Ex. 1001, 15:1–3. Petitioner contends Yano’s device 2 includes such a module as its image correction processing unit 17, and alternatively contends that the combination of Yano and Schröder would have motivated a person of ordinary skill in the art to configure Yano’s unit 17 in the fashion claimed with a reasonable expectation of success. *See* Pet. 34–36 (citing Pet. 28–34; Ex. 1005, Fig. 1, ¶¶ 27, 60–63); Ex. 1003 ¶¶ 124–126.

We conclude the foregoing contentions, which Patent Owner does not oppose at this time, are supported sufficiently by the cited disclosures in Yano and Schröder, and by Mr. Parulski’s testimony, to justify institution of review.

(vii) Conclusion as to Claim 1

We conclude Petitioner has demonstrated a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable as having been obvious over Yano and Schröder.

4. *Claims 3–7 and 11*

Petitioner provides arguments and evidence in support of contending claims 3–7, each of which depends from claim 1, are unpatentable as having been obvious over Yano and Schröder. *See* Ex. 1001, 15:10–46; Pet. 36–44; Ex. 1003 ¶¶ 127–139. Petitioner also contends independent claim 11 is unpatentable as having been obvious over Yano and Schröder. *See* Ex. 1001, 16:57–17:10; Pet. 44–45; Ex. 1003 ¶¶ 140–146.

Patent Owner opposes, relying on arguments and testimony from Dr. Papanikolopoulos discussed above in connection with claim 1. *See* Prelim. Resp. 15; Ex. 2001 ¶ 59.

“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” 37 C.F.R. § 42.108(a). Thus, pursuant to USPTO rules and policy implementing *SAS Inst. Inc. v. Iancu*, 584 U.S. 357 (2018), we “either (1) institute as to all claims challenged in the petition and on all grounds in the petition, or (2) institute on no claims and deny institution.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“CTPG”), 5–6, 64.³ We “will not institute on fewer than all claims or all challenges in a petition.” *Id.* at 5, 64; *see also* *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1359–60 (Fed. Cir. 2018) (stating a decision to institute is “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Thus, because we have decided to grant institution on claim 1, we do the same for claims 3–7 and 11. *See supra* Section III.E.3; 37 C.F.R.

³ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

§ 42.108(a); CTPG 5–6, 64. Further, Patent Owner does not address these claims apart from arguments we have considered above in connection with claim 1, so there is nothing further for us to address with respect to these claims at this time. *See* CTPG 5–6, 64.

5. *Conclusion as to Ground One*

We conclude the record demonstrates a reasonable likelihood that Petitioner would prevail with respect to challenging claim 1 as having been obvious over Yano and Schröder, so we grant institution of review on Petitioner’s Ground One.

F. Ground Two — Obviousness over Yano, Schröder, and Steinberg

In Ground Two, Petitioner asserts claims 2, 8, 12–16, and 18 of the ’056 patent are unpatentable as having been obvious over Yano, Schröder, and Steinberg. *See* Pet. 1, 5–10, 46–60. Patent Owner disagrees. *See* Prelim. Resp. 15–21.

As discussed above, because we have decided to grant institution on Ground One, we do the same for Ground Two. *See supra* Section III.E.4; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Nonetheless, we will address Patent Owner’s arguments concerning Ground Two separately from Ground One, to provide guidance to the parties for the upcoming trial. *See* CTPG 6, 64.

1. *Claim 8*

Claim 8 is an independent claim directed to an image processing device that is similar to claim 1. *Compare* Ex. 1001, 14:45–15:3 (claim 1), *with id.* at 15:47–16:7 (claim 8). As pertinent here, claim 8 differs from claim 1 in adding that the specific subject characteristic value calculation

module, “when a plurality of said specific subject areas are determined,” executes its calculation “using weighted distribution, wherein said weighted distribution is set according to a size of each specific subject area on each specific subject characteristic value of said plurality of specific subject areas.” Ex. 1001, 15:67–16:7.

The ’056 patent specification correspondingly describes that, when the plurality of specific subject areas are “face areas,” then “the flesh color pixel average value [may be] calculated for each of the determined plurality of face areas using weighted distribution set according to the size of the face area.” *Id.* at 12:18–22. “As a result [the] flesh color pixel average value . . . better reflects the flesh color of a large face part which tends to affect the appearance,” such that “it is possible to do color balance correction in a direction that will further improve the appearance of the human subject image.” *Id.* at 12:22–28.

Petitioner contends “Yano discloses that a plurality of face regions [33] (specific subject areas) may be determined,” in which case Yano’s “‘average hue of the flesh color’ (said specific subject characteristic value) . . . is calculated ‘using the average value of the image feature amounts in the respective face regions 33’ (each specific subject characteristic value of said plurality of specific subject areas).” Pet. 47–48 (citing Ex. 1005 ¶¶ 34, 46, 50, 59, 61, 63); Ex. 1003 ¶ 154. Petitioner then asserts that when performing this calculation in Yano, a person of ordinary skill in the art “would have found it obvious to implement Steinberg’s teaching of weighting the face regions based on their size to set a weighted distribution according to the size of each face region on each average hue value of the face regions . . . to emphasize the hue of larger face regions

more than smaller face regions in Yano’s calculation of the overall average hue of the flesh color,” thereby satisfying claim 8. Pet. 48; *id.* at 48–49 (citing Ex. 1005 ¶¶ 61, 63; Ex. 1007, 12:9–19, 17:1–13, 18:32–63, 19:8–12); Ex. 1003 ¶¶ 155–156. Petitioner asserts this would have been done for various reasons. *See* Pet. 49–50; Ex. 1003 ¶ 157.

Patent Owner opposes Petitioner’s foregoing assertions. *See* Prelim. Resp. 15–20; Ex. 2001 ¶¶ 60–68. Patent Owner argues “the Petition fails to show that Steinberg teaches or suggests calculating a specific subject characteristic value using weighted distribution based on the size of specific subject areas.” Prelim. Resp. 17; Ex. 2001 ¶ 64. According to Patent Owner, even if Steinberg’s process gives each face a weight based on the size of the face to define the importance of the face in relation to other faces, “the Petition cites no evidence that suggests that Steinberg teaches using those weights to calculate a specific subject characteristic value or other attribute.” Prelim. Resp. 18 (citing Pet. 49; Ex. 1007, 18:59–63); Ex. 2001 ¶ 65. Patent Owner’s view is that “Steinberg discloses *no* calculation using its ‘weight’ or ‘importance’ designations,” and “[a]t most, Steinberg describes weighting pixel groups as part of setting exposure or using flash.” Prelim. Resp. 18–20 (discussing Ex. 1007, 11:67–12:19, 18:58–63, 19:8–12); Ex. 2001 ¶¶ 65–68.

We conclude the preliminary record supports, sufficiently to justify institution, Petitioner’s foregoing assertions. As discussed above in connection with Ground One in the context of claim 1, we agree with Petitioner’s contention that Yano’s image feature amount calculation unit 15 is a “specific subject characteristic value calculation module” per claim 8, except for the “weighted distribution” aspect of the claim. *See supra*

Section III.E.3(iv). That is, Yano’s unit 15 calculates the *average hue value* (the claimed “specific subject characteristic value”) of pixels within a *face region* of the image data (the claimed “determined specific subject area”) as determined by Yano’s face region extraction processing unit 14. *See id.*

Thus, Patent Owner’s and Dr. Papanikolopoulos’s opposition that Steinberg falls short of claim 8 because Steinberg’s *weighted distribution* is not utilized to *calculate a specific subject characteristic value* misses the mark set by Petitioner’s combination of Yano and Steinberg. *See, e.g.,* Ex. 2001 ¶¶ 63–68. Specifically, even accepting the opposition’s premise as an accurate reading of Steinberg’s disclosure, it overlooks that Yano discloses applying color correction to *calculate a specific subject characteristic value*, as discussed above. In this way, the combined teachings of Yano (i.e., color-correcting a face region in an image by calculating an average hue value in the face region) and Steinberg (i.e., giving each face among a plurality of faces a weight based on the relative sizes of the faces to define the importance of each face in relation to the other faces in order to improve a photographic image) lead to the claimed invention. Patent Owner’s position in this regard invites us to err by looking at Steinberg individually and separately from Yano. *See Palo Alto Networks*, 122 F.4th at 1385–86; *Merck*, 800 F.2d at 1097.

2. Claims 2, 12–16, and 18

Patent Owner does not address claims 2, 12–16, and 18 in Ground Two apart from arguments and testimony from Dr. Papanikolopoulos discussed above in connection with claim 1 or claim 8. *See Prelim.*

Resp. 20–21; Ex. 2001 ¶¶ 69–70. Therefore, there is nothing further for us to address with respect to these claims at this time. *See* CTPG 5–6, 64.

G. Grounds Three and Four — Obviousness over Yano, Kuwata, and Schröder

In Ground Three, Petitioner asserts claims 9 and 17 of the '056 patent are unpatentable as having been obvious over Yano and Kuwata. *See* Pet. 2, 60–68. In Ground Four, Petitioner asserts those claims are unpatentable as having been obvious over Yano, Schröder, and Kuwata. *See id.*

Patent Owner argues the Board need not consider these two grounds because Patent Owner disclaimed claims 9 and 17 after the Petition was filed. *See* Prelim. Resp. 1, 21. We agree, for the following reasons.

The record before us establishes that Patent Owner statutorily disclaimed claims 9 and 17 on October 14, 2024. *See* Ex. 2002. A disclaimer under 35 U.S.C. § 253(a) is “considered as part of the original patent” as of the date on which it is “recorded” in the Office. 35 U.S.C. § 253(a). For a disclaimer to be “recorded” in the Office, the disclaimer must:

- (1) Be signed by the patentee, or an attorney or agent of record;
- (2) Identify the patent and complete claim or claims, or term being disclaimed. . . .;
- (3) State the present extent of patentee’s ownership interest in the patent; and
- (4) Be accompanied by the fee set forth in [37 C.F.R.] § 1.20(d).

37 C.F.R. § 1.321(a); *see also Vectra Fitness, Inc. v. TNWK Corp.*, 162 F.3d 1379, 1382 (Fed. Cir. 1998) (holding § 253 disclaimer is immediately “recorded” on date the USPTO receives a disclaimer meeting the requirements of § 1.321(a), and no further action is required in the USPTO).

Patent Owner’s filing of Exhibit 2002 appears to have met these requirements. *See* Ex. 2002, 1–2 (“Disclaimer in a Patent Under 37 C.F.R. 1.321(a)); *id.* at 3–6 (“Electronic Payment Receipt” and “Electronic Acknowledgment Receipt”).

Pursuant to our Rules: “The patent owner may file a statutory disclaimer,” and “[n]o *inter partes* review will be instituted based on disclaimed claims.” 37 C.F.R. § 42.107(e). As a result of the statutory disclaimer, claims 9 and 17 are no longer regarded as claims challenged in the Petition. *See Vectra*, 162 F.3d at 1383 (“This court has interpreted the term ‘considered as part of the original patent’ in section 253 to mean that the patent is treated as though the disclaimed claims never existed.”) (citing *Guinn v. Kopf*, 96 F.3d 1419, 1422 (Fed. Cir. 1996)); *see also Sanofi-Aventis U.S., LLC v. Dr. Reddy’s Labs., Inc.*, 933 F.3d 1367, 1372–75 (Fed. Cir. 2019) (disclaimer of claims during District Court patent infringement litigation “mooted any controversy” over the disclaimed claims, ending the Article III case or controversy requirement for District Court jurisdiction).

In considering Federal Circuit precedent and our rules, we conclude we cannot institute a trial on claims that have been disclaimed, and, thus, no longer exist. Our conclusion is consistent with the statutory scope of *inter partes* review as laid out in 35 U.S.C. §§ 311(b) and 318(a) and is not at odds with *SAS*, *supra*. *See, e.g., SAS*, 584 U.S. at 367 (recognizing that “the claims challenged ‘in the petition’ will not always survive to the end of the case; some may drop out thanks to the patent owner’s actions”). Accordingly, we treat claims 9 and 17 as having never been part of the ’056 patent, such that Petitioner cannot seek *inter partes* review of those claims.

Thus, we deny institution of review as to whether disclaimed claims 9 and 17 are unpatentable per Petitioner’s Grounds Three and Four.

H. Grounds Five and Six — Obviousness over Yano, Nakamura, and Schröder

In Ground Five, Petitioner asserts claim 10 of the ’056 patent is unpatentable as having been obvious over Yano and Nakamura. *See* Pet. 2, 69–75. In Ground Six, Petitioner asserts claim 10 is unpatentable as having been obvious over Yano, Schröder, and Nakamura. *See id.* Patent Owner disagrees. *See* Prelim. Resp. 22–27.

As discussed above, because we have decided to grant institution on Ground One, we do the same for Grounds Five and Six. *See supra* Section III.E.4; 37 C.F.R. § 42.108(a); CTPG 5–6, 64. Nonetheless, we will address Patent Owner’s arguments concerning Grounds Five and Six separately from Ground One, to provide guidance to the parties for the upcoming trial. *See* CTPG 6, 64.

Claim 10 is an independent claim directed to an image processing device that is similar to claim 1. *Compare* Ex. 1001, 14:45–15:3 (claim 1), *with id.* at 16:32–56 (claim 10). As pertinent here, claim 10 differs from claim 1 in adding that the specific subject area determination module “determines said specific subject area using pixel values of pixel data included in a target area for determination, and a position of said target area in said photographed image.” Ex. 1001, 16:40–44; *see also id.* at 3:24–34, 6:41–7:30 (supporting specification disclosures).

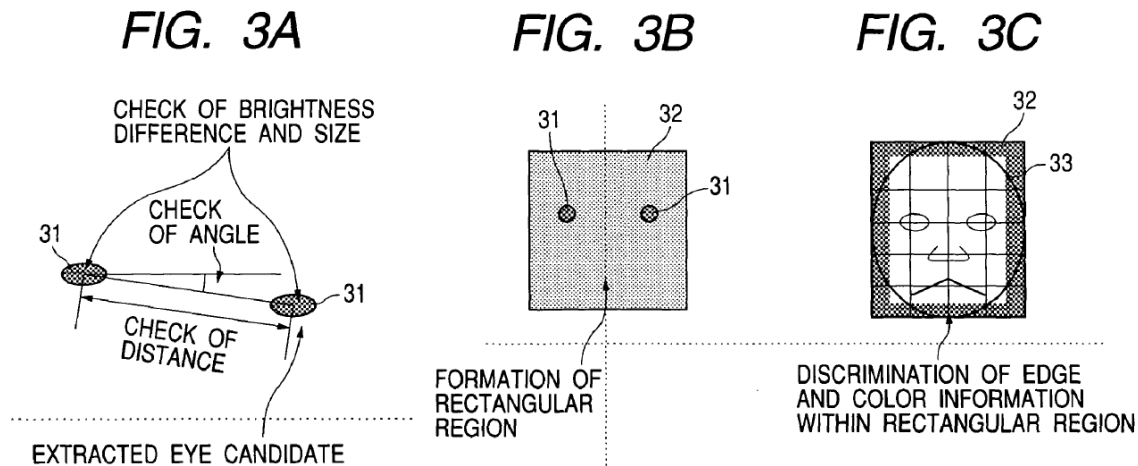
1. Petitioner's Reliance on Yano

Petitioner cites Yano's face region extraction processing unit 14 as disclosing, per claim 10, a specific subject area determination module that determines a specific subject area in a photographed image (that is, a human face) using pixel values in a target area. *See* Pet. 69–72 (citing Ex. 1005, Figs. 3A–3C, ¶¶ 24, 32–34); Ex. 1003 ¶¶ 209–212. In support, Petitioner asserts Yano's unit 14 identifies a pair of eye candidates within the image, and then sets rectangular region 32 based on the positions of the eye candidates to define “a target area for determination of the face region.” Pet. 70–72; Ex. 1003 ¶¶ 210–211.

Patent Owner argues Yano “teaches that its ‘face region extraction’ process begins after the face region extraction processing unit extracts the face region.” Prelim. Resp. 9 (citing Ex. 1005, Fig. 1, ¶¶ 24, 32); Ex. 2001 ¶ 50. Patent Owner maintains “Yano does not describe *how* it identifies and extracts that face region.” Prelim. Resp. 9–10 (citing Ex. 1005, Figs. 3B and 3C, ¶¶ 32–34); Ex. 2001 ¶ 50. In Patent Owner's view, Yano “at most . . . explains that *after extracting a face region*, Yano . . . identifies and extracts ‘eye candidates’ in the extracted region, and, if ‘the extracted pair of eye candidates indicates the eyes,’ ‘sets a rectangular region’ based on the eye candidates.” Prelim. Resp. 9–10 (emphasis added); Ex. 2001 ¶ 50.

We conclude the preliminary record supports, sufficiently to justify institution, Petitioner's foregoing reliance on Yano. Yano describes unit 14 as a “face region extraction” unit that “extracts the face region of the person from the image data,” as illustrated by Figures 3A–3C. Ex. 1005 ¶¶ 24, 32. Patent Owner's position that the process illustrated in Figures 3A–3C does not, in fact, extract a face region from the image data is belied by Yano's

plain description of what the process accomplishes, as well as the illustrations in Figures 3A–3C showing how the process determines a face region, which we reproduce below.



Yano, Figures 3A–3C.

Figures 3A–3C are diagrams showing a concrete example of the process implemented by face region extraction processing unit 15. *See id.* ¶¶ 12, 32.

Patent Owner's position relies on the following passage in Yano that introduces its description of the process illustrated in Figures 3A–3C (with our emphases added):

Next, a concrete example of the process by the face region extraction processing unit 14 will be explained with reference to the drawings. FIGS. 3A, 3B and 3C are diagrams showing the concrete example of the process by the face region extraction processing unit 14 shown in FIG. 1. That is, first, the face region is extracted from the image data. Then, the face region extraction processing unit 14 performs a low-pass filter process to the extracted image data and simultaneously reduces the image (face region) to a predetermined image size. . . .

Then, from the pixel values of the reduced image data, the face region extraction processing unit 14 [performs the process illustrated in Figures 3A–3C].

Id. ¶¶ 32–34 (underlined emphases added).

Regardless of what exactly happens in the tersely described “first” step, we conclude based on the present record that the succeeding steps do in fact determine a face region using pixel values included in a target area for determination, as recited in claim 10. *See id.* at Figs. 3A–3C, ¶¶ 33–34. In particular, Yano describes Figure 3C as illustrating how “unit 14 *determines a face region 33 based on*” the rectangular region 32 and uniformity of color within region 32. *Id.* ¶ 34 (emphasis added). Further: “If both the condition of the edge and the condition of the color information are satisfied, the face region extraction processing unit 14 *extracts the region in question as the face region 33.*” *Id.* (emphasis added).

Thus, we conclude the preliminary record supports, sufficiently to justify institution, Petitioner’s reliance on Yano in connection with the specific subject area determination module of claim 10. Petitioner then argues a person of ordinary skill in the art “would have found it obvious to implement Nakamura’s exclusion of potential face regions” as part of Yano’s face area determination, thereby additionally determining the face area using “a position of said target area in said photographed image” as further required by claim 10. Pet. 72. We discuss that argument next.

2. *Petitioner’s Reliance on Nakamura*

Petitioner argues a person of ordinary skill in the art “would have found it obvious to implement Nakamura’s exclusion of potential face regions that contact the outer edge of the image based on the position of Yano’s rectangular region 32 in the photographed image (a position of said target area in said photographed image) to improve the identification of face regions.” Pet. 72; Ex. 1003 ¶ 212. Specifically, according to Petitioner:

“Because human faces ‘usually exist[] at a central area of the original image,’ Nakamura teaches that the extraction of face regions can be improved by excluding ‘regions of the image contacting the outer edge (frame of the image) of the original image’ because these regions ‘are usually not characteristic images and are portions of the background or the like.’ Pet. 72–73 (citing Ex. 1009, Fig. 2, 1:59–64, 2:21–25, 4:46–48, 8:40–9:18); Ex. 1003 ¶ 212. Thus, Petitioner concludes a person of ordinary skill in the art “would have been motivated to implement Nakamura’s step of excluding color regions contacting the outer edge of the image by configuring [Yano’s] face region extraction processing unit 14 to consider the position of any rectangular regions 32 and extract a face region 33 only from rectangular regions 32 that do not contact the outer edge of the image.” Pet. 73–74 (citing Ex. 1005 ¶¶ 27, 54, 60–63; Ex. 1009, 10:58–64); Ex. 1003 ¶ 213.

Patent Owner asserts Nakamura provides a rudimentary method for extracting characteristic image data (such as density data) of a human face in a color image. See Prelim Resp. 22 (citing Ex. 1009, 1:10–15, 3:27–31, 3:41–52, 3:61–4:12); Ex. 2001 ¶ 72. Patent Owner argues “Nakamura does not describe determining a specific subject area using a position of a target area for that subject for determination” as required by claim 10, because Nakamura instead “*eliminates* regions” contacting the outer edges of the original image to evaluate all remaining areas where it is likely that a human face will be located in order to “*assum[e]* a face region.” Prelim Resp. 22–24, 26 (citing Ex. 1009, Figs. 2 and 6–8, 3:39–4:12, 9:1–15, 10:64–11:46); Ex. 2001 ¶¶ 73, 76–77. Patent Owner concludes “Nakamura does not describe how to select that region” because “Nakamura selects the

region and *then* determines whether it contains a human face.” Prelim. Resp. 24–25, 26–27 (citing Ex. 1009, Fig. 8, 11:44–12:44); Ex. 2001 ¶¶ 74, 77.

We conclude the preliminary record supports, sufficiently to justify institution, Petitioner’s foregoing combination of Yano and Nakamura. As discussed above in Section III.H.1, we agree with Petitioner’s contention that Yano’s unit 14 is a specific subject area determination module that determines a specific subject area in a photographed image (that is, a human face) using pixel values in a target area, per claim 10. Thus, Patent Owner’s and Dr. Papanikolopoulos’s opposition that Nakamura falls short of claim 10 because Nakamura does not *determine a face region* misses the mark set by Petitioner’s combination of Yano and Nakamura. *See, e.g.*, Ex. 2001 ¶¶ 72–78. Specifically, even accepting the opposition’s premise as an accurate reading of Nakamura’s disclosure, it overlooks that Yano discloses determining a face region. In this way, the combined teachings of Yano (i.e., determining a face region in a photographed image using pixel values in a target area) and Nakamura (i.e., excluding regions positioned at the outer edges of the image when extracting characteristic image data of a human face) lead to the claimed invention. Patent Owner’s position in this regard invites us to err by looking at Nakamura individually and separately from Yano. *See Palo Alto Networks*, 122 F.4th at 1385–86; *Merck*, 800 F.2d at 1097.

IV. CONCLUSION

For the above reasons, we determine the information in the record demonstrates a reasonable likelihood that Petitioner would prevail with

respect to at least one challenged claim. We, therefore, institute an *inter partes* review of claims 1–8, 10–16, and 18 on all grounds presented in the Petition against those claims. *See* 35 U.S.C. § 314(a); 37 C.F.R.

§ 42.108(a). We do not institute review as to the other challenged claims 9 and 17 on any ground, because they have been disclaimed by Patent Owner. *See* Ex. 2002; 37 C.F.R. § 42.107(e).

At this preliminary stage, the Board has not made a final determination with respect to the patentability of the challenged claims or any underlying factual or legal issue. The Board’s final determination will be based on the record as developed during the *inter partes* review. Any arguments not raised by Patent Owner in a timely-filed response may be deemed waived.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–8, 10–16, and 18 of the ’056 patent on all grounds presented in the Petition against those claims;

FURTHER ORDERED that an *inter partes* review is not instituted for the disclaimed claims 9 and 17 of the ’056 patent on any ground; and

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

IPR2024-00957
Patent 7,454,056 B2

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