

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NIKON CORPORATION, PANASONIC ENTERTAINMENT &
COMMUNICATION CO., LTD., OLYMPUS CORPORATION, OM DIGITAL
SOLUTIONS CORPORATION, FUJIFILM NORTH AMERICA
CORPORATION, FUJIFILM CORPORATION,

Petitioners

v.

OPTIMUM IMAGING TECHNOLOGIES LLC,

Patent Owner

Case IPR2024-01373

Patent No. 7,612,805

PATENT OWNER PRELIMINARY RESPONSE

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
United States Patent and Trademark Office
P.O. Box 1450
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<u>PATENT OWNER'S LIST OF EXHIBITS</u>	
EX. 2001	RESERVED
EX. 2002	Institution Decision, IPR2020-01321, Paper 10 (PTAB Mar. 1, 2021)
EX. 2003	Patent Owner Preliminary Response, IPR2024-00924, Paper 8 (PTAB Sep. 20, 2024)
EX. 2004	Scheduling Order, <i>Optimum Imaging Technologies LLC v. Nikon Corp.</i> , No. 4:23-cv-00923, Dkt. 37 (E.D. Tex. Oct. 2, 2024)

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I. INTRODUCTION

Patent Owner respectfully submits this Patent Owner Preliminary Response (“POPR”) to request the Board deny institution. Petitioners challenge claims 1-9 and 18-24 of Patent No. 7,612,805 (“the ‘805 Patent”). Petition at 3. Petitioners’ arguments fail for at least three reasons.¹

First, instituting this IPR would not be a good use of the Board’s resources in view of related proceedings involving the ‘805 Patent.

Second, the proposed modifications are replete with hindsight bias. Petitioners fail to meet their burden to establish obviousness.

Third, even with the modifications, the proposed combinations have many deficiencies and do not meet the limitations of the challenged claims.

II. THE TIMING OF RELATED PROCEEDINGS SHOWS THAT INSTITUTING THIS IPR WOULD NOT BE AN EFFICIENT USE OF THE BOARD’S RESOURCES

As reflected in Patent Owner’s Updated Mandatory Notices (Paper 7), the ‘805 Patent is involved in multiple parallel district court proceedings and has been challenged by a different petitioner in each of IPR2020-01321 (institution denied), IPR2024-00924 (pending), and IPR2025-00461 (pending).

¹ This POPR briefly addresses the challenged independent claims of the ‘805 Patent.

Patent Owner reserves all rights to address all grounds and all claims.

The district court scheduling order set a final pretrial conference for October 29, 2025. EX. 2004 at 6. This conference will occur long before a final written decision would be expected in this IPR in April 2026. Following a court ordered reduction of asserted claims, Patent Owner now asserts claims 1-4, 8-9, 18, 21, and 24 of the ‘805 Patent in the parallel district court proceedings.² The parties will have expended significant resources by the time of an institution decision in this IPR, let alone by the time of a final written decision in this IPR in April 2026. Instituting this IPR would not be a good use of resources. The validity of the ‘805 Patent should be evaluated in district court.³

IPR2020-01321 involving overlapping claims and the same primary reference Niikawa was denied institution because the Board found that the merits

² Patent Owner previously asserted claims 1-14, 18, 21, 24, and 26 of the ‘805 Patent in the parallel district court proceedings.

³ Based on current law/policy, Patent Owner understands that a *Sotera*-style stipulation precludes discretionary denial under *Fintiv*. See, e.g., Former Director Vidal, Memorandum, ‘Interim Procedure for Discretionary Denials in AIA PostGrant Proceedings with Parallel District Court Litigation’ dated June 21, 2022. If there is an intervening change in law/policy, Patent Owner will seek authorization for supplemental briefing to address the *Fintiv* factors in detail.

did not outweigh the other *Fintiv* factors favoring denial. EX. 2002 at 11. As in the prior IPR2020-01321, the merits of this IPR do not justify institution.

IPR2024-00924 involving overlapping claims, but different grounds, was instituted on December 12, 2024. A final written decision in IPR2024-00924 will be entered long before a final written decision would be expected in this IPR in April 2026. Because the validity of the ‘805 Patent will already be evaluated by the Board in IPR2024-00924, instituting this IPR would not be a good use of the Board’s resources. Moreover, as discussed above, the validity of the ‘805 Patent should be evaluated in district court. Instituting this IPR would be extremely burdensome for the parties and the Board. Patent Owner should not be forced to repeatedly defend the validity of the ‘805 Patent in multiple IPRs, as well as in district court.⁴

⁴ Based on current law/policy, Patent Owner understands that multiple petitions filed by different parties without a “significant relationship” may preclude discretionary denial under *General Plastic*. See, e.g., *Videndum Production v. Rotolight*, IPR2023-01218, Paper 12 at 6 (PTAB Apr. 19, 2024). If there is an intervening change in law/policy or in facts/circumstances, Patent Owner will seek authorization for supplemental briefing to address the *General Plastic* factors and relevant facts/circumstances in detail.

IPR2025-00461 involving the same claims and the same grounds was recently filed, with no justification for the delay in filing that petition. The complaints in the parallel district court proceedings were filed in October 2023. The petitioner-defendants in IPR2025-00461 and this IPR are not being efficient. For at least the reasons discussed above, instituting this IPR would not be a good use of the Board's resources and the validity of the '805 Patent should be evaluated in district court.

III. THE '805 PATENT CLAIMS NOVEL AND NON-OBVIOUS SYSTEMS AND METHODS FOR CORRECTING ABERRATIONS IN A DIGITAL CAMERA

The '805 Patent claims systems and methods that perform in-camera aberration correction using novel and non-obvious combinations of hardware and software. EX. 1001 at Abstract (“A system is disclosed for the automated correction of optical and digital aberrations in a digital imaging system.”)

“Though every major advance in photography has solved an important problem, there are still remaining photographic problems to be solved in order to meet the goals of *optimizing optical imaging quality* while *increasing simplicity and efficiency* and *lowering cost*.” EX. 1001 at 3:13-17 (emphasis added).

“The present system dramatically improves image quality. This digital imaging system eliminates, or minimizes, post-production processes. In addition, the system presents substantial cost savings as well as time savings relative to

existing digital imaging systems because of the automation of integrated in-camera optical and digital corrections of aberrations.” EX. 1001 at 7:13-20.

To achieve the advantages described in the specification, the independent claims of the ’805 Patent recite, *inter alia*, “a digital camera mechanism”, “system software”, “a microprocessor”, “a digital signal processor”, and “a database management system.”

As claimed, the system can identify the specific aberrations and the specific solution for each aberration. The aberrations are corrected using, *inter alia*, the digital signal processor.

As explained in the ’805 Patent, “[t]his in-camera corrective feature provides a powerful tool to rapidly manipulate an image without using post-production editing software tools.” EX. 1001 at 16:8-11.

The ’805 Patent includes 32 claims. Exemplary independent claim 9 is set forth below:

9[pre]	A digital imaging system for image filtration comprising:
9[a]	a digital camera mechanism, an optical lens mechanism, a digital sensor, a microprocessor, a digital signal processor, an application specific integrated circuit, system software, a database management system and a memory storage sub-system;

9[b]	wherein the aberrations from the optical lens mechanism are corrected by applying digital filtration by using the application specific integrated circuit and the digital signal processor;
9[c]	wherein the microprocessor is used to provide digital and optical data to the digital signal processor;
9[d]	wherein the system software is organized to identify specific optical aberrations and to access the database to identify specific corrections to the aberrations;
9[e]	wherein the system software forwards the data from the digital sensor to the digital processor;
9[f]	wherein the digital signal processor selects a specific procedure to optimize the image and corrects the aberrations;
9[g]	wherein the lens type is a zoom lens;
9[h]	wherein the lens focal length alternates from specific fixed focal length lens settings in a succession of steps;
9[i]	wherein optical aberrations are corrected with digital filtration to modify multiple images from different focal lengths in a succession of data files; and

9[j]	wherein the modified data file consisting of the digital data optimized from the aberrations that are corrected from the original optical image is stored in memory.
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A. PERSON OF ORDINARY SKILL IN THE ART (“POSA”) WAS PREVIOUSLY DEFINED BY THE DISTRICT COURT

Petitioners propose a POSA would have had “a bachelor’s degree in electrical engineering, physics, or a related field, with at least two years of industry experience and/or research, both concerning digital camera system design and image processing.” Petition at 7.

The district court found that a POSA would have had “an electrical engineering degree and three years of relevant experience.” EX. 1009 at 6.

Patent Owner submits that the district court’s definition of a POSA should be adopted for purposes of determining whether to institute. Patent Owner reserves all rights regarding the correct definition of a POSA.

B. CLAIM CONSTRUCTION

Petitioners state that the plain and ordinary meaning of claim terms/phrases is sufficient for determining whether to institute. Petition at 7. Patent Owner reserves all rights regarding the correct claim constructions.

IV. GROUND 1(A) AND 1(B) FAIL

A. LACK OF PARTICULARITY IN THE PETITION

Petitioners analyze both Grounds 1(a) and 1(b) in a single section V.A.

Petitioners do not separately analyze each ground. It is unclear whether Petitioners are relying on (i) unmodified Niikawa, (ii) modified Niikawa, (iii) unmodified Niikawa + Enomoto, or (iv) modified Niikawa + Enomoto for each claim limitation. This lack of particularity puts the burden on Patent Owner to decipher Petitioners' arguments for each claim limitation and makes it difficult to understand which features of which references in which combination Petitioners are relying on when assessing *each claim as a whole*.

The Federal Circuit has emphasized the particularity requirements of § 312(a)(3) as being “of the utmost importance.” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016). “Unlike district court litigation—where parties have greater freedom to revise and develop their arguments over time and in response to newly discovered material—the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute.” *Id.* Consistent with the Federal Circuit caselaw, the Consolidated Trial Practice Guide emphasizes the importance to “focus on concise, well-organized, easy-to-follow arguments supported by readily identifiable

evidence of record.” Patent Trial and Appeal Board Consolidated Trial Practice Guide (November 2019) at 39.

It is improper to put the burden on Patent Owner to decipher Petitioners’ arguments. The lack of particularity in Petitioners’ analysis in section V.A does not provide Patent Owner a reasonable opportunity to respond to Ground 1(a) or Ground 1(b). Because of the lack of particularity, Petitioners fail to meet their burden.

B. GROUND 1(A) BASED ON NIIKAWA FAILS

In Ground 1(a), Petitioners challenge independent claims 9 and 24. Petition at 4. Petitioners’ analysis for Ground 1(a) fails for at least five reasons.

First, Petitioners argue that Niikawa’s shading ROM 153 corresponds to the claimed “database”. *See, e.g.*, Petition at 28. Independent claims 9 and 24 recite limitations involving the “database.” *See, e.g.*, claim 9[d], 24[g], and 24[h]. Petitioners fail to show that Niikawa’s shading ROM 153 is updatable. In IPR2024-00924, Patent Owner made clear that the recited “database” in the ‘805 Patent is updatable which amounts to prosecution history disclaimer. EX. 2003 at 28-29; *CUPP Computing AS v. Trend Micro Inc.*, 53 F.4th 1376, 1383 (Fed. Cir. 2022)(“To be clear, a disclaimer in an IPR proceeding is binding in later

proceedings, whether before the PTO or in court.”).⁵ The ‘805 Patent explains that the updatable database is a “particularly important” feature to both the manufacturer and the user when, for example, a new lens is used. EX. 1001 at 28:53-56. Moreover, a POSA would have understood that Niikawa’s shading ROM 153 is read-only memory that is “prepared in advance” and not updatable. EX. 1005 at Abstract (“A plurality of correction tables for use in shading correction are prepared in advance in a shading ROM of the digital camera.”).

Second, Petitioners argue that Niikawa’s shading correction circuit 123, which is a hardware circuit, corresponds to the claimed “digital signal processor”. Petition at 23-24. However, as conceded by Petitioners, Niikawa distinguishes a hardware circuit from a processor in the context of that disclosure. *Id.* As such, Petitioners fails to establish that Niikawa’s shading correction circuit 123 discloses the claimed “digital signal processor.”

⁵ Patent Owner made similar arguments in the preliminary response in IPR2024-00923 addressing related Patent No. 10,873,685, which was filed before the petition in this IPR. Petitioners admit they were aware of the preliminary response in IPR2024-00923 on the day it was filed. IPR2024-01220, Paper 1 at 77-78 (PTAB Aug. 29, 2024). Petitioners had fair notice and opportunity to address the “database” claim limitations in the petition in this IPR.

Third, Petitioners argue that a POSA would be motivated to replace Niikawa's shading correction circuit 123 with a processor. Petition at 24. Niikawa's shading correction circuit 123 performs a simple multiplication operation. There is no reason a POSA would have been motivated to use a processor, at greater cost and requiring more processing power, to perform simple multiplication. Petitioners are using hindsight bias. Petitioners argue that this would have been a "simple substitution" of known components, but Petitioners identify no reason a POSA would perform this substitution. Petition at 24. Petitioners cite to the expert declaration which opined a POSA wanting to change the functionality "would have used a processor instead of the functionally fixed shading correction circuit" (EX. 1003 at ¶107), but neither Petitioners nor their expert identify any change in functionality of Niikawa's shading correction circuit 123 that would prompt the substitution of a processor. EX. 1003 at ¶¶108-109. A POSA understanding the limited processing power/battery life of a camera, and mindful of cost constraints, would not have been motivated to make this substitution.

Fourth, Petitioners argue that "a POSA would have been motivated to implement the hardware circuits [121, 122, 124, 125] of signal processor 120 on an ASIC." Petition at 26. As disclosed, Niikawa's signal processor 120 includes circuits 121, 122, 123, 124, and 125. EX. 1005 at [0079]; FIG. 5. Petitioners do not

explain why a POSA would only have included circuits 121, 122, 124, and 125 of signal processor 120 on an ASIC and why a POSA would have **not** included the shading correction circuit 123 of signal processor 120 on the ASIC. Petitioners are using hindsight bias.

Fifth, Petitioners' analysis for claims 9 and 24 is inconsistent. For claim 9, Petitioners argue that the "shading corrector" selects the multiplication function (the specific procedure). Petition at 39. However, for claim 24, Petitioners argue that the general controller 150 selects the operational process (*e.g.*, the multiplication function) for the shading corrector to perform. Petition at 47. Petitioners fail to establish which component of Niikawa, modified or unmodified, performs the alleged selection.

As disclosed, Niikawa's shading correction circuit 123 is a hardwired circuit which a POSA would understand does not "select" a multiplication operation. A POSA would also understand that Niikawa's general controller 150 does not "select" the operational process of the shading correction circuit 123.

As discussed above, the lack of particularity in Petitioners' analysis of Grounds 1(a) makes it difficult to decipher Petitioners' arguments based on Niikawa alone. It appears that the only alleged motivation to modify Niikawa to perform the alleged selection is based on Enomoto and addressed below for Ground 1(b).

C. GROUND 1(B) BASED ON NIIKAWA + ENOMOTO FAILS

In Ground 1(b), Petitioners challenge independent claims 9 and 24. Petition at 4. Petitioners’ analysis for Ground 1(b) fails for at least seven additional reasons.

First, Petitioners equate Niikawa’s general controller 150 and Enomoto’s CPU of image processing apparatus 14. Petition at 37-38. Petitioners mischaracterize the disclosure of Enomoto. With respect to FIG. 1, Enomoto discloses a scanner 12, an image processing apparatus 14 (connected to display device 20, keyboard 18a, and mouse 18b), and a printer 16. EX. 1006 at 9:66-10:22. *A POSA would have understood that the Enomoto’s image processing apparatus 14 is an exemplary desktop computer, not a digital camera.* In the context of Enomoto, the scanner is the “image reading apparatus” and the printer is the “image recording apparatus”. EX. 1006 at 1:62-2:4. Petitioners fail to establish that Niikawa’s general controller 150 would have the same processing power and capability as the CPU of image processing apparatus 14, a desktop computer.

Second, Petitioners argue that Enomoto’s disclosure relates to in-camera aberration correction. Petition at 14. Petitioners again mischaracterize Enomoto’s disclosure. Enomoto explains that various image reading means can be used in place of the scanner 12, including for example, a digital camera. EX. 1006 at 11:35-52 (referring to “image reading means” that supply image data into the image processing apparatus 14). *There is no disclosure in Enomoto of a digital*

camera performing the functionality of the image processing unit 14. The image reading apparatus (scanner) 12 and the image processing unit 14 are separate devices. The image reading apparatus (scanner) 12 does not have the functionality on which Petitioners rely. Enomoto does not disclose in-camera aberration correction. Instead, Enomoto highlights one of the problems the '805 Patent was designed to avoid. The prior art was heavily dependent on CPU-intensive processes, including post-production programs on an external computer like Photoshop. *See, e.g.,* EX. 1001 at 6:37-44.

Third, Petitioners do not address the components of Enomoto's imaging processing unit 14 or explain how they relate to or would otherwise be implemented in Niikawa's digital camera. With respect to FIG. 2 of Enomoto, there are several internal components of Enomoto's image processing unit 14 related to image processing, including aberration correcting part 56. EX. 1006 at 11:66-12:7. Petitioners also do not address the components of aberration correcting part 56 or explain how they relate to or would otherwise be implemented in Niikawa's digital camera. FIG. 3 of Enomoto shows internal components of aberration correcting part 56, including the coordinates transforming section 56A and the enlarging/contracting section 56b. Petitioners fail to explain **how** the components of Enomoto actually work or **why** a POSA would have been motivated to incorporate the teachings of Enomoto in Niikawa's digital camera. For at least

these reasons, Petitioner fails to establish a POSA would have combined the teachings of Niikawa and Enomoto or that a POSA would have been able to do so with a reasonable expectation of success.

Fourth, Petitioners argue that a POSA would have been motivated to modify the programs stored in Niikawa's ROM 151 and the correction tables stored in Niikawa's shading ROM 153 based on the teachings of Enomoto. Petition at 38, 41. Petitioners further argue that the Enomoto's correction coefficients could be stored in the modified shading ROM 153 and applied by Niikawa's "shading corrector" multiplication operation. *See id.* Enomoto expressly discloses that if aberrations are corrected separately, "much time is required to perform mathematical operations and, in addition, mathematical operations for interpolation must be performed several times, which may lead to image deterioration." EX. 1006 at 15:17-24. Thus, a POSA reading Enomoto would not have been motivated to perform separate multiplication operations. Petitioners also do not explain how their proposed combination would correct aberrations simultaneously as taught by Enomoto. For at least these reasons, Petitioners' proposed combination of Niikawa and Enomoto fails.

Fifth, Enomoto does not disclose correction coefficients like Niikawa. In Enomoto, the lens characteristics (alleged correction coefficients) are used by the coordinates transforming section 56A and the enlarging/contracting section 56b to

calculate an offset in the pixel positions of R and B from the reference color G.

EX. 1006 at 15:56-16:10. The way the alleged correction coefficients are used in Enomoto is completely different than in Niikawa. For example, Enomoto explains that section 56A uses the lens characteristics to “calculate[] the offsets Δr and Δb ... from i_g , the pixel position of image data G, at i_r and i_b , respectively, ... as well as the offset D of i_g .” EX. 1006 at 16:18-36; FIG. 3. Then, “ Δr and D are added to i_r ” and “ Δb and D are added to i_b ” and “D is added to i_g ”. EX. 1006 at 16:37-48.

With these calculations, the corrections of the R and B images are performed with reference to the G image. EX. 1006 at 16:49-56. Then, section 56B performs image scaling by using interpolation. EX. 1006 at 16:47-65. Again, Petitioners do not explain **how** the components of Enomoto actually work or **why** a POSA would have been motivated to incorporate the teachings of Enomoto in Niikawa’s digital camera. The calculations taught by Enomoto are inapposite to the simple multiplication operation taught by Niikawa. Petitioners do not explain how the alleged correction coefficients are used in Enomoto’s aberration correcting part 56. Petitioners also do not explain how Enomoto’s calculations would be incorporated into Niikawa’s digital camera. Again, Enomoto’s processes are performed by imaging processing apparatus 14, a desktop computer. Enomoto does not disclose in-camera aberration correction.

Sixth, Petitioners' analysis for claims 9 and 24 is inconsistent. For claim 9, Petitioners argue that a POSA would have been motivated to modify Niikawa's "shading corrector" to select a specific procedure, based on the teachings of Enomoto. Petition at 40. For claim 24, Petitioners argue that a POSA would have been motivated to modify Niikawa's general controller 150 to select a specific procedure, based on the teachings of Enomoto. Petition at 50. Petitioners fail to establish which component of Niikawa would be modified based on which teaching of Enomoto to perform the alleged selection. Also, as discussed below, Petitioners mischaracterize the disclosure of Enomoto.

Seventh, Petitioners' alleged modifications based on Enomoto are inconsistent. Petitioners argue that Enomoto's aberration correcting part 56 selects aberration correction procedures. Petition at 41. Petitioners later argue that Enomoto's CPU of image processing unit 14 selects aberration correction procedures. Petition at 50. Like with Niikawa, Petitioners' analysis of Enomoto is inconsistent. Petitioners do not clearly identify which component of Enomoto

performs the alleged selection and Petitioners do not explain why a POSA would modify Niikawa as proposed for each of claims 9 and 24.⁶

Petitioners’ characterization of Enomoto is also incorrect. As disclosed in Enomoto, neither the aberration correcting part 56 nor the CPU of image processing apparatus 14 of Enomoto performs the alleged selection. Enomoto explains that the image processing apparatus 14 includes a keyboard and mouse for “selecting and commanding a specific processing step” which a POSA would understand is performed by the operator of the image processing apparatus 14. EX. 1006 at 10:12-16. Enomoto further discloses the image processing conditions setting subsection 72 “selects a particular image processing step to be performed” “in response to commands” from the operator. EX. 1006 at 20:3-8, 20:14-22. Petitioners do not identify subsection 72 as corresponding to any of the claimed components.⁷ Petitioners fail to establish that a POSA would modify Niikawa based on Enomoto as proposed.

⁶ Petitioners’ analysis is also inconsistent at least because aberration correcting part 56 and the CPU are both part of image processing unit 14, which is a desktop computer.

⁷ Similarly, Enomoto’s key correction subsection 74 operates in response to commands from the operator. EX. 1006 at 20:28-37. The parameter coordinating

Lastly, as discussed above with respect to Ground 1(a), Petitioners fail to show that Niikawa's shading ROM 153, even if modified based on Enomoto, is updatable. *Contra* Petition at 49. Independent claims 9 and 24 recite limitations involving the "database". See, e.g., claim 9[d], 24[g], and 24[h]. Patent Owner made clear that the recited "database" is updatable. See *infra*.

V. GROUND 2(A) AND 2(B) FAIL

In Grounds 2(a) and 2(b), Petitioners challenge independent claims 1 and 18. Petition at 4. Ground 2(a) is based on Niikawa + Levien. *Id.* Ground 2(b) is based on Niikawa + Enomoto + Levien. *Id.*

Again, Petitioners analyze both Grounds 2(a) and 2(b) in a single section V.B. Petitioners also refer back to the analysis in section V.A. For the same reasons discussed above, there is a lack of particularity in the petition and Petitioners' analysis makes it difficult to understand which features of which references in which combination Petitioners are relying on when assessing ***each claim as a whole***. Because of the lack of particularity, Petitioners fail to meet their burden.

subsection 76 sets the imaging processing conditions in the processing subsection 54 (including aberration correcting part 56) based on the image processing conditions set by the subsection 72. EX. 1006 at 20:38-48. Petitioners do not identify subsections 72, 74, 76 as corresponding to any of the claimed components.

For at least the reasons discussed above regarding Grounds 1(a) and 1(b), Grounds 2(a) and 2(b) fail as well. Below, Patent Owner submits that there are at least two additional reasons that each of Grounds 2(a) and 2(b) fail.

First, Petitioners' analysis for claims 1 and 18 is inconsistent. Petitioners argue Niikawa's "shading corrector" performs the alleged selection, or would be modified to perform the alleged selection. Petitioners later argue that Niikawa's general controller 150 performs the alleged selection, or would be modified to perform the alleged selection. For the same reasons discussed above with respect to claims 9 and 24, Petitioners fail to establish which component performs the alleged selection, or would be modified to perform the alleged selection, based on which teaching.

Second, Petitioners argue that Niikawa's "shading corrector" could be modified to incorporate Levien's sharpening transfer function 20. Petition at 58. Petitioners' proposed combination would change the principle of operation of Niikawa. Levien teaches that the sharpening transfer function 20 includes a FFT analyzer 38 and a filter coefficient generator 40. EX. 1007, FIG. 7. Levien explains that, in operation, the FFT analyzer 38 and filter coefficient generator 40 compute the sharpening parameters, SF, and FIR filter coefficients. EX. 1007 at 4:11-14. Because Petitioners propose Niikawa's "shading corrector" incorporates Levien's sharpening transfer function 20, the proposed combination fails to render obvious

each of claims 1 and 18 **as a whole**. For example, in the proposed combination of Niikawa + Levien, there is no need to access shading ROM 153 because the “shading corrector” would compute the parameters/coefficients itself. As another example, in the proposed combination of Niikawa + Levien, there is no alleged selection performed by the “shading corrector” or by the general controller 150; as proposed, Niikawa’s “shading corrector” is itself the sharpening transfer function 20 of Levien. See Petition at 58.⁸

VI. GROUND 3 FAILS

In Ground 3, Petitioners challenge independent claims 4 and 21. Petition at 4. Ground 3 is based on Niikawa + Enomoto + Yamasaki. *Id.*

Again, Petitioners refer back to the analysis in section V.A. For the same reasons discussed above, there is a lack of particularity in the petition and Petitioners’ analysis makes it difficult to understand which features of which references in which combination Petitioners are relying on when assessing **each claim as a whole**. Because of the lack of particularity, Petitioners fail to meet their burden.

⁸ Petitioners also do not provide any additional analysis to modify the alleged selection in Niikawa + Levien or Niikawa + Enomoto + Levien. See Petition at 55 (referring to 9[f]) and Petition at 63 (referring back to 24[h]).

For at least the reasons discussed above regarding Grounds 1(a) and 1(b), Ground 3 fails as well. Below, Patent Owner submits that there are at least six additional reasons that Ground 3 fails.

First, Petitioners' analysis for claims 4 and 21 is inconsistent. Petitioners argue Niikawa's "shading corrector" performs the alleged selection, or would be modified to perform the alleged selection. Petitioners later argue that Niikawa's general controller 150 performs the alleged selection, or would be modified to perform the alleged selection. For the same reasons discussed above with respect to claims 9 and 24, Petitioners fail to establish which component performs the alleged selection, or would be modified to perform the alleged selection, based on which teaching.

Second, Petitioners mischaracterize the disclosure of Niikawa. Petition at 66. Niikawa teaches that a first image, focused on the main subject, and a second image, focused on the background, can be synthesized *so that both the main subject and the background are in focus* in the synthesized image. EX. 1005 at [0237]. Therefore, a POSA would have understood that Niikawa teaches the synthesized image has no blur.

Third, a POSA would not have been motivated to combine Niikawa and/or Enomoto with Yamasaki as proposed. Niikawa teaches synthesizing two images so that both the subject and the background are in focus. EX. 1005 at [0237]. Therefore,

Niikawa teaches **removing blur**. Enomoto teaches methods to create high-quality images that are “free from... blurring”. EX. 1006 at Abstract, 4:1-4. Therefore, Enomoto teaches **removing blur**. In contrast to Niikawa and Enomoto, Yamasaki teaches **adding blur**. EX. 1008 at [0001]. As such, a POSA would not have combined Niikawa and/or Enomoto with Yamasaki as proposed. Petitioners are using hindsight bias.

Fourth, Yamasaki’s image processing apparatus and methods are inapposite to Niikawa and Enomoto. Yamasaki teaches an imaging sensing lens 202 with four apertures 205a-d and four corresponding color filters 206a-d. EX. 1008 at [0058]. Because there are multiple, independent optical systems, their images have parallax. EX. 1008 at [0055]. Yamasaki explains, for example, “[s]ince the lens portion 202a of the image sensing lens 202 has a green color filter and the lens portion 202c has a red color filter, they have different parallax change sensitivities due to wavelengths.” EX. 1008 at [0070]. Yamasaki is directed at correcting the deviation between, for example, lens portions 202a (green) and 202c (red). EX. 1008 at [0066]. Even in Yamasaki’s second embodiment (portrait mode), Yamasaki relies on the same image processing unit. EX. 1008 at [0105]-[0106]. The second embodiment also relies on the same deviation correction image process. EX. 1008 at [0115]. A POSA would not be motivated to incorporate the teachings of Yamasaki as

proposed. Yamasaki does not disclose synthesizing successive images taken one after the other.

Fifth, Petitioners do not establish that the three references, Niikawa, Enomoto, and Yamasaki are properly combinable. For example, Petitioners allege motivations to modify Niikawa's general controller 150 based on Yamasaki (Petition at 68), but Petitioners do not address Niikawa+Enomoto further modified by Yamasaki. Petitioners fail to establish that the proposed combination of Niikawa+Enomoto+Yamasaki renders obvious each of claims 4 and 21 **as a whole**.

Sixth, for limitations 4[j] and 21[i], Petitioners argue that in the Niikawa+Enomoto+Yamasaki combination, a POSA would modify Niikawa's "shading corrector" to use Enomoto's "sharpening filter" for the main subject and Yamasaki's "blur filter" for the background. Petition at 71. Petitioners fail to meet their burden with respect to the proposed combination. For example, Petitioners do not explain the use of a sharpening filter or block 54B in Enomoto or otherwise explain why a POSA would be motivated to incorporate them into Niikawa.⁹ Petitioners are using hindsight bias. Petitioners' extensive modifications wholly

⁹ Petitioners refer to their analysis of claim limitations 9[d] and 9[e], but that analysis does not discuss a sharpening filter or block 54B disclosed in Enomoto. Petition at 69; *see also* Petition at 35-39.

disregard the digital camera that is actually disclosed in Niikawa. As emphasized by Petitioners, Niikawa teaches a special hardware circuit - shading correction circuit 123 (unmodified) - to perform shading correction with relatively high speed. Petition at 25; EX. 1005 at [0122].

Moreover, to the extent Petitioners attempt to equate Niikawa's "shading corrector" and Enomoto's aberration correcting part 56, Petitioners' analysis fails. As disclosed in Enomoto, aberration correcting part 56 **outputs** the image data to block 54B where the image data is subjected to sharpening in the block 54B. EX. 1006 at 22:5-14, 22:31-35, FIGS. 2, 3. Thus, aberration correcting part 56 and block 54B of Enomoto are separate components with different functionality. And sharpening by block 54B occurs **after** any alleged correction by aberration correcting part 56.

Lastly, as discussed above, Enomoto's alleged correction is performed by image processing unit 14, a desktop computer. Yamasaki similarly encourages a POSA, in order to improve the processing speed, to perform its image processes for portrait mode "on an application of an apparatus such as a PC or the like which has a high-speed CPU." EX. 1008 at [0120]. A POSA looking to find low-cost, high-speed, and high-efficiency solutions for in-camera aberration correction would not be motivated to create the combination of Niikawa+Enomoto+Yamasaki as proposed by Petitioners.

VII. CONCLUSION

For at least the reasons set forth herein, Patent Owner respectfully requests that institution be denied.

Respectfully submitted,

Date: January 28, 2025

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CERTIFICATE OF COMPLIANCE

This Patent Owner Preliminary Response (“POPR”) consists of 5,233 words, which is no more than 14,000 words, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The POPR complies with the type-volume as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare the paper (Microsoft Word).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned hereby certifies the PATENT OWNER PRELIMINARY RESPONSE and all exhibits thereto were served on the undersigned date via email, as authorized by Petitioners, at the following email addresses:

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