

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY CORPORATION,

Petitioner

v.

OPTIMUM IMAGING TECHNOLOGIES LLC,

Patent Owner

Case IPR2024-00923

Patent No. 10,873,685

PATENT OWNER PRELIMINARY RESPONSE

Mail Stop PATENT BOARD
Patent Trial and Appeal Board
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

<u>PATENT OWNER’S LIST OF EXHIBITS</u>	
EX. 2001	Excerpt for E.D. Tex from U.S. District Courts–Combined Civil and Criminal Federal Court Management Statistics, p. 35 (June 30, 2024), accessed at https://www.uscourts.gov/statistics-reports/federal-court-management-statistics-june-2024 on August 9, 2024
EX. 2002	Global Dossier Patent Family for U.S. Pub. No. 20050280877 (Watanabe), accessed at https://globaldossier.uspto.gov/result/publication/US/20050280877/118382 on August 9, 2024
EX. 2003	Extract from the Register of European Patents for EP1608140 (Watanabe foreign counterpart), accessed at https://register.epo.org/application?number=EP05253548&Ing=en&tab=doclist on August 13, 2024
EX. 2004	Translation of Japanese Patent Application No. 2004-233872, submitted during prosecution of EP1608140 on June 1, 2006 (“EPO Translation”)
EX. 2005	Written submission in preparation to/during oral proceedings, submitted during prosecution of EP1608140 on April 5, 2011
EX. 2006	Skolnick, David, et al., “Why Use DSP? Digital Signal Processing 101 – An introductory course in DSP system design: Part 1”, Analog Dialogue, vol. 31, no. 1, pp. 3-6 (1997), accessed at https://www.analog.com/media/en/analog-dialogue/volume-31/number-1/articles/volume31-number1.pdf on August 20, 2024
EX. 2007	Harris, Tom, “How Camcorders Work - The CCD”, Internet Archive (Nov. 24, 2005), accessed at

	https://web.archive.org/web/20051124054808/https://electronics.howstuffworks.com/camcorder2.htm on August 17, 2024
EX. 2008	Wilson, Tracy, et al., “How Digital Cameras Work”, Internet Archive (Nov. 25, 2005), accessed at https://web.archive.org/web/20051125112635/http://electronics.howstuffworks.com/digital-camera.htm on August 17, 2024
EX. 2009	Wilson, Tracy, et al., “How Digital Cameras Work - More on Capturing Color”, Internet Archive (Nov. 25, 2005), accessed at https://web.archive.org/web/20051125115620/http://electronics.howstuffworks.com/digital-camera5.htm on August 17, 2024
EX. 2010	Wilson, Tracy, et al., “How Digital Cameras Work - A Filmless Camera”, Internet Archive (Nov. 25, 2005), accessed at https://web.archive.org/web/20051125115507/http://electronics.howstuffworks.com/digital-camera2.htm on August 17, 2024
EX. 2011	U.S. Patent No. 7,612,805 (“the ’805 Patent”)
EX. 2012	U.S. Patent No. 8,451,339 (“the ’339 Patent”)
EX. 2013	Patent Owner’s Proposed Schedule in Parallel Litigation
EX. 2014	Order Governing Proceedings, No. 4:23-cv-928, Dkt. 24 (E.D. Tex. July 23, 2024)

TABLE OF CONTENTS

I. INTRODUCTION	1
II. THE <i>FINTIV</i> FACTORS WEIGH IN FAVOR OF DISCRETIONARY DENIAL	2
A. <i>FINTIV</i> FACTOR 1 FAVORS DENIAL	2
B. <i>FINTIV</i> FACTOR 2 FAVORS DENIAL	3
C. <i>FINTIV</i> FACTOR 3 FAVORS DENIAL	5
D. <i>FINTIV</i> FACTOR 4 FAVORS DENIAL	7
E. <i>FINTIV</i> FACTOR 5 FAVORS DENIAL	7
F. <i>FINTIV</i> FACTOR 6 FAVORS DENIAL	8
III. THE '685 PATENT CLAIMS NOVEL AND NON-OBVIOUS SYSTEMS FOR CORRECTING ABERRATIONS IN A DIGITAL VIDEO CAMERA.....	9
A. THE BOARD DENIED INSTITUTION OF RELATED PATENTS INVOLVING OVERLAPPING PRIOR ART REFERENCES	11
B. THE EXAMINER REVIEWED THE OVERLAPPING PRIOR ART REFERENCES AND ARGUMENTS DURING PROSECUTION OF THE '685 PATENT AND ALLOWED THE ISSUED CLAIMS	13
C. PERSON OF ORDINARY SKILL IN THE ART ("POSA") WAS PREVIOUSLY DEFINED BY THE DISTRICT COURT	14
D. CLAIM CONSTRUCTION WAS PREVIOUSLY PERFORMED BY THE DISTRICT COURT	15
1. "uses... software to identify at least one optical image aberration"	15
2. "vignetting"	16
IV. THE GROUNDS ARE WEAK	17

A.	GROUND 1: WATANABE FAILS	17
1.	Watanabe discloses two embodiments that use different process information.....	17
2.	Petitioner fails to meet its burden with respect to “a digital video camera”..	24
3.	Petitioner fails to meet its burden with respect to “applying digital filtration using the digital signal processor”	32
4.	Petitioner fails to meet its burden with respect to “a digital signal processor configured to access a database management system”	34
5.	Petitioner fails to meet its burden with respect to “database”	36
6.	Petitioner fails to meet its burden with respect to “database management system”	37
7.	Petitioner fails to meet its burden with respect to “an integrated circuit”	39
8.	Petitioner fails to meet its burden with respect to “curvature of field aberrations”	40
B.	GROUND 2-7: WATANABE COMBINATIONS GENERALLY FAIL ...	40
C.	GROUND 2: WATANABE + KISHIDA FAILS	43
1.	Petitioner fails to establish a motivation to combine Watanabe and Kishida	43
2.	Petitioner fails to explain how a POSA would implement Kishida’s techniques in Watanabe’s system.....	43
3.	Petitioner fails to address a background image as taught by Kishida.....	48
4.	Petitioner fails to address a control value as taught by Kishida	49
5.	Petitioner fails to address user selection taught by Kishida.....	49
6.	Petitioner fails to address how the background image taught by Kishida relates to the process information of Watanabe	49

7. Petitioner fails to address the order of corrections in the modified system...	50
D. GROUND 3: WATANABE + KITA FAILS	50
1. Petitioner fails to address the hardware components of Kita’s signal processing unit 65	51
2. Petitioner fails to address Kita’s JPEG compression unit 65-3 in Kita versus Watanabe’s JPEG compression/extraction circuit 62	53
3. Petitioner fails to address Kita’s table 87 versus Watanabe’s table 70	53
E. GROUND 4: WATANABE + TAKANE FAILS	54
1. Petitioner is using hindsight bias to combine Watanabe and Takane as proposed	55
2. Petitioner fails to meet its burden with respect to claims 10 and 18	56
3. Petitioner fails to meet its burden with respect to claims 28 and 30	57
F. GROUND 5: WATANABE + HISAMATSU FAILS	59
G. GROUND 6: WATANABE + TURNER FAILS	60
H. GROUND 7: WATANABE + LIEGE FAILS	62
1. Petitioner fails to appreciate the astigmatism disclosed in Liege	63
2. A POSA would not be motivated to use Liege’s teachings because they are highly inefficient and require a great deal of processing power	64
3. Petitioner fails to explain how a POSA would implement Liege’s operators in Watanabe’s system	64
I. GROUND 8: TAKANE + WATANABE FAILS	66
1. Petitioner fails to meet its burden with respect to “a digital signal processor”	67
2. Petitioner fails to meet its burden with respect to a “database” and a “database management system”	68

3.	Petitioner fails to meet its burden with respect to “a digital signal processor configured to access a database management system”	71
4.	Petitioner’s analysis is inconsistent with respect to claim 10	71
V.	CONCLUSION.....	72

I. INTRODUCTION

Patent Owner respectfully submits that the Board should deny institution for at least three reasons.

First, the *Fintiv* factors regarding parallel district court litigations favor discretionary denial.¹ There is a significant overlap of issues, particularly given that Petitioner did not file any stipulation with respect to overlapping references. The judicial statistics for the Eastern District of Texas show that trial in the parallel litigation between Patent Owner and Petitioner is expected three months before a final written decision in this IPR. The Patent Owner's proposed schedule (using the Court's guidelines) shows that trial is expected to occur two weeks before a final written decision in this IPR. Under either approach, the district court will resolve the issues before the Board.

Second, the Watanabe reference has many deficiencies and even as modified, does not meet the limitations of the challenged claims. Petitioner also

¹ See generally *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 (PTAB March 20, 2020)(precedential)("Fintiv"); see also Director Vidal, Memorandum, 'Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation' dated June 21, 2022 ("Vidal Memorandum").

relies on the combination of Takane and Watanabe which fails for at least the same reasons.

Third, the proposed combinations are replete with hindsight bias. Petitioner fails to meet its burden to establish obviousness.

II. THE *FINTIV* FACTORS WEIGH IN FAVOR OF DISCRETIONARY DENIAL

As explained below, the *Fintiv* factors favor denial and Petitioner does not meet its burden to establish compelling merits. The parallel litigation involving the same parties and overlapping claims will resolve the issues presented here and institution should be denied to avoid conflicting decisions and a waste of the Board's resources.

A. *FINTIV* FACTOR 1 FAVORS DENIAL

The first *Fintiv* factor is whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted.

Patent Owner respectfully submits that this factor favors denial or at minimum, is neutral. There is no evidence that Judge Mazzant would stay the parallel litigation pre- or post-institution.

Petitioner alleges that it will seek a pre-institution stay (Petition at 72) though no such motion has been filed and there is no evidence that Judge Mazzant would grant such a motion. Judge Mazzant himself has noted that when a motion to stay is

filed before the Board institutes review, courts in his district refrain from ruling on the motion or deny the motion without prejudice. *SB IP Holdings, LLC v. Vivint, Inc.*, No. 4:21-cv-00912-ALM, Dkt. 59 at *2 (E.D. Tex. April 6, 2023). Therefore, a pre-institution stay is highly unlikely.

Also, according to DocketNavigator, Judge Mazzant has only ever granted one motion to stay pending post-grant review where the plaintiff/patent owner itself filed a motion to stay its own infringement action after the Board instituted review. *OnPoint Systems, LLC v. Protect Animals With Satellites, LLC*, No. 4:20-cv-657-ALM, Dkt. 115 (E.D. Tex. July 12, 2022). Therefore, even post-institution, a stay is highly unlikely.

B. *FINTIV* FACTOR 2 FAVORS DENIAL

The second *Fintiv* factor is the proximity of the court's trial date to the Board's projected statutory deadline for a final written decision.

The complaint in the parallel litigation was filed on October 18, 2023. EX. 1038 at 1. Based on the most recent statistics (dated June 30, 2024), the median time-to-trial for civil cases in the Eastern District of Texas is 21.6 months. EX. 2001. Thus, trial is statistically expected by August 2025.

The final written decision is expected by November 2025.

Because trial is statistically expected to occur *three months before* a final written decision in this IPR, this factor favors denial.

Petitioner suggests that it filed the petition “expeditiously” (Petition at 72,) but Petitioner ignores that there were over seven months between the filing of the complaint and the filing of the petition. Notably, Petitioner did not submit a declaration regarding when it became aware of the filed complaint, when it conducted a prior art search and/or became aware of the cited prior art references, and Petitioner did not otherwise explain its actions over the course of the elapsed seven months. Petitioner ultimately fails to establish that it was expeditious. *See Fintiv* at 12 (favoring denial if the petitioner cannot explain the delay in filing its petition).

After filing the complaint on October 18, 2023, the complaint was served on the Texas Secretary of State on October 30, 2023. Patent Owner then proceeded with service through the Hague Convention on January 19, 2024, which was completed on May 13, 2024. EX. 1038; Petition at 72. Patent Owner respectfully submits that Petitioner was aware of the filed complaint well before May 13, 2024.² Additionally, Petitioner recycled multiple prior art references from the prior Canon IPRs (*see*

² For example, Petitioner obtained certified translations at least as early as February 22, 2024. EX. 1006 at 1; EX. 1007 at 1; EX. 1008 at 1; EX. 1010 at 1.

section IIIA) and used the same expert from the prior Canon IPRs in preparing the instant petition. Therefore, Petitioner could have filed the petition well before May 13, 2024.

Petitioner also alleges that “late service” renders the median time-to-trial analysis inapplicable (Petition at 73,) but this argument directly contradicts the guidance in the Vidal Memorandum. Also, in preparation for the case management conference, the Patent Owner has a proposed schedule consistent with the Court’s guidelines, including that the Court set the pretrial conference for October 29, 2025, (*see* EX. 2014), with a trial starting November 17, 2025, which is approximately two weeks before the expected final written decision in this IPR. EX. 2013.

Even if instituted, a stay of the parallel litigation is unlikely, as discussed above, and there will have been significant investment by the parties and the court by November 2025, as discussed below.

C. *FINTIV* FACTOR 3 FAVORS DENIAL

The third *Fintiv* factor is the investment in the parallel proceeding by the court and the parties.

There is a case management conference set for September 19, 2024. In preparation for the case management conference, Patent Owner has proposed a schedule consistent with the Court’s guidelines. *Id.*

By the time of an expected institution decision in November 2024, the parties will have completed infringement and invalidity contentions³, as well as exchanged proposed terms for constructions and preliminary constructions. *Id.*

As discussed above, the district court is unlikely to stay the parallel litigation pre- or post-institution.

By the time of an expected final written decision in November 2025, the parties will have completed much of the work associated with trial, including fact discovery, expert discovery, *Daubert* motions, dispositive motions, motions in *limine*, and a final pretrial conference that has already been set by the Court for October 29, 2025. *Id.* As noted above, the proposed trial date is November 17, 2025, which is approximately two weeks before a final written decision is expected in this IPR. *Id.*

It would be inefficient to institute this IPR and there is a high risk of conflicting decisions particularly given that Petitioner did not file a stipulation regarding overlapping references, as discussed below.

³ Patent Owner's infringement contentions are due on September 27, 2024.

Petitioner's invalidity contentions are due on October 24, 2024.

D. *FINTIV* FACTOR 4 FAVORS DENIAL

The fourth *Fintiv* factor is the overlap between issues raised in the petition and in the parallel proceeding.

Petitioner challenges claims 1-19 and 22-30 of the '685 Patent in the petition, with claims 1, 6, and 14 being independent. Petition at 1. Patent Owner alleges infringement of claims 1-30 in the parallel litigation. As such, the validity of the challenged claims will likely be resolved in the district court proceedings before the expected final written decision in this IPR. Further, claims 20 and 21 would still have to be addressed by the Court.

Additionally, Petitioner did *not* file any stipulation regarding overlapping issues, which creates concerns of inefficiency and the possibility of conflicting decisions. Vidal Memorandum at 7. It is likely that Petitioner will rely on the same references in the parallel litigation. The lack of a stipulation weighs in favor of denial.

E. *FINTIV* FACTOR 5 FAVORS DENIAL

The fifth *Fintiv* factor is whether the petitioner and the defendant in the parallel proceeding are the same party.

The petitioner is the defendant in the parallel litigation. Accordingly, this factor favors denial.

F. *FINTIV* FACTOR 6 FAVORS DENIAL

The sixth *Fintiv* factor is other circumstances that impact the Board's exercise of discretion, including the merits.

In the prior Canon IPRs, the Board found the merits of Watanabe as a primary reference did not outweigh the other discretionary factors. The same is true here, particularly given that Watanabe was already reviewed and considered during original prosecution of the '685 Patent.

As discussed in detail below, neither of the primary references, Watanabe or Takane, disclose or render obvious the independent claim limitations. None of the secondary references cure the deficiencies of Watanabe and Takane and Petitioner fails to establish that the secondary references are properly combinable.

In this paper, Patent Owner will briefly address all grounds to show that instituting this IPR would not be an efficient use of the Board's time and resources. *Chevron Oronite Co. LLC v. Infineum USA L.P.*, IPR2018-00923, Paper 9 (PTAB Nov. 7, 2018)(informative)(insufficient number of proposed grounds/challenges to claims meet reasonable likelihood standard); *Deeper, UAB v. Vexilar, Inc.*, IPR2018-01310, Paper 7 (PTAB Jan. 24, 2019)(informative)(same). The merits of Grounds 1-8 are weak and do not meet the institution standard. Even if the Board disagrees with some of Patent Owner's arguments, there is an insufficient number of grounds that meet the institution standard. Therefore, institution would not be

efficient. *See SAS Inst. Inc.*, 138 S. Ct. 1348, 1354 (2018)(concluding that the Board must address every claim the petitioner has challenged and rejecting the practice of “partial institution”).

Additionally, as discussed above, the parallel litigation involves claims 1-30 and therefore, the validity of all challenged claims will be resolved by the district court. Because Petitioner did not file any stipulation, it is expected that Petitioner will rely on the same references in the parallel litigation. For at least these reasons, institution would not be efficient.

III. THE '685 PATENT CLAIMS NOVEL AND NON-OBVIOUS SYSTEMS FOR CORRECTING ABERRATIONS IN A DIGITAL VIDEO CAMERA

The '685 Patent claims systems that perform in-camera aberration correction use novel and non-obvious combinations of hardware and software. EX. 1011 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 3:19-23 (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 7:23-29.

To achieve the advantages described in the specification, the independent claims of the '685 Patent recite, *inter alia*, “a digital video camera”, “in-camera software”, “an integrated circuit”, “a digital signal processor”, and “a database management system.”

As claimed, “at least one optical image aberration” is identified by using the integrated circuit and the in-camera software. The database contains a “plurality of optical image aberration corrections.” Thus, the system can identify the specific aberrations and the specific solution for each aberration. The aberration is then corrected by the digital signal processor.

As explained in the '685 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 16:34-36.

The '685 Patent includes 30 claims, with claims 1, 6, and 14 being independent. Exemplary independent claim 1 is set forth below:

Claim 1	
1[pre]	A digital imaging system for correcting optical image aberrations in a digital video, comprising:
1[a]	a digital video camera including in-camera software, an optical lens mechanism, at least one digital sensor for capturing the digital video, an integrated circuit including; a digital signal processor configured to access a database management system including a plurality of optical image aberration corrections, and a memory storage sub-system;
1[b]	wherein the optical lens mechanism is a zoom lens or a fixed focal length lens;
1[c]	wherein the integrated circuit uses the in-camera software to identify at least one optical image aberration and
1[d]	[wherein the integrated circuit uses the in-camera software] to correct the at least one optical image aberration in at least one frame of the digital video using at least one of the plurality of optical image aberration corrections in the database;
1[e]	wherein the video is captured by the at least one digital sensor and is forwarded to the digital signal processor;
1[f]	wherein the video image file with the at least one optical image aberration is corrected by applying digital filtration using the digital signal processor; and
1[g]	wherein the corrected video consisting of the digital data optimized from the at least one optical image aberration that are corrected from the original video image is stored in the memory storage sub-system.

A. THE BOARD DENIED INSTITUTION OF RELATED PATENTS INVOLVING OVERLAPPING PRIOR ART REFERENCES

The '685 Patent, U.S. Patent No. 7,612,805 (“the '805 Patent,” EX. 2011), and U.S. Patent No. 8,451,339 (“the '339 Patent,” EX. 2012) issued from related continuation applications and claim priority to the same provisional application, No. 60/807,065 filed July 11, 2006.

A different petitioner, Canon Inc., challenged the '805 and '339 Patents in IPR2020-01321 and IPR2020-01322 (the “Canon IPRs”). EX1030; EX. 1032.

The '805 Patent was challenged in IPR2020-01321 based on the following obviousness grounds:

- Niikawa
- Niikawa + Kawanishi
- Niikawa + Russ
- **Watanabe**
- **Watanabe** + Russ

The Board denied institution finding that the merits did not outweigh the other *Fintiv* factors favoring denial. EX. 1033 at 11.

The '339 Patent was challenged in IPR2020-01322 based on the following obviousness grounds:

- Niikawa
- Niikawa + **Kita**
- Niikawa + **Kishida**
- **Watanabe**
- **Watanabe** + **Kita**

The Board denied institution finding that the merits did not outweigh the other *Fintiv* factors favoring denial. EX. 1031 at 11.

The rationale for relying on Watanabe as a primary reference was substantially the same in IPR2020-01321 and IPR2020-01322 as well as in this IPR.

The rationale for relying on Kita and Kishida as secondary references was substantially the same in IPR2020-01322 as in this IPR.

As done in the prior Canon IPRs, the Board should exercise its discretion to deny institution in this IPR.

B. THE EXAMINER REVIEWED THE OVERLAPPING PRIOR ART REFERENCES AND ARGUMENTS DURING PROSECUTION OF THE '685 PATENT AND ALLOWED THE ISSUED CLAIMS

The examiner reviewed the papers and exhibits from the prior Canon IPRs and allowed the claims of the '685 Patent over these references and arguments. Notably, this includes Watanabe, Kishida, and Kita, which are relied on by Petitioner in this IPR. This also includes the expert testimony from the same expert, Dr. Laub.

Also, as noted by Petitioner, Liege's parent patent was also reviewed by the examiner during prosecution of the '685 Patent. EX. 1002 at 1632. The claims of the '685 Patent were allowed over this disclosure.

The examiner expressly referred to Watanabe in the Notice of Allowance (EX. 1002 at 1572) and the examiner identified specific independent claim limitations that were not in the prior art (EX. 1002 at 1573-1575). Additionally, as discussed below, Watanabe does ***not*** disclose or render obvious a digital video

camera as claimed. There was no material error by the examiner during prosecution.

C. PERSON OF ORDINARY SKILL IN THE ART (“POSA”) WAS PREVIOUSLY DEFINED BY THE DISTRICT COURT

Petitioner proposes 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. 1027 at 6.

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

Petitioner’s expert, Dr. Laub, does not meet the definition of a POSA, at least because Dr. Laub does not have a degree in electrical engineering. *See* EX. 1004 at 6. As such, Dr. Laub is not qualified to offer expert testimony from the perspective of a skilled artisan. *Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1376-1377 (Fed. Cir. 2022)(“To offer expert testimony from the perspective of a skilled artisan in a patent case—like for claim construction, validity, or infringement—a witness must at least have ordinary skill

in the art. Without that skill, the witness' opinions are neither relevant nor reliable.”); *see also id.* at 1377 (“[T]o be qualified to offer expert testimony on issues from the vantage point of an ordinarily skilled artisan in a patent case, an expert must at a minimum possess ordinary skill in the art.”).

D. CLAIM CONSTRUCTION WAS PREVIOUSLY PERFORMED BY THE DISTRICT COURT

Petitioner identifies one phrase and one term in the petition for construction. Petition at 7-8.

1. “uses... software to identify at least one optical image aberration”

Similar phrases are present in the independent claims of the related ’339 and ’805 Patents and were previously construed by the district court. The district court construed the phrases “identify[ing] specific optical aberrations” and “identify at least one optical aberration” to each carry its plain meaning. EX. 1027 at 13. The district court determined that the claim language is clear on its face. *See also* EX. 1027 at 11 (“The parties do not seem to dispute that the underlying phrase ‘identifying specific optical aberrations’ would be clear and unambiguous to one of ordinary skill”).

Like the district court, the Board should use the plain meaning of this phrase in the '685 Patent for purposes of institution. Patent Owner reserves all rights regarding the correct construction of this phrase.

Based on the below arguments, the Board need not construe this phrase for purposes of institution. Patent Owner expressly reserves all rights as to all grounds if this IPR is instituted.

2. “*vignetting*”

This term is present in the claims of the related '339 and '805 Patents and was previously construed by the district court.

The district court construed this phrase to mean “an effect in which the edges of an image are darker than the image’s center.” EX. 1027 at 10.

Patent Owner submits that the district court’s construction of this term should be adopted for purposes of institution. Patent Owner reserves all rights regarding the correct construction of this term.

IV. THE GROUNDS ARE WEAK⁴

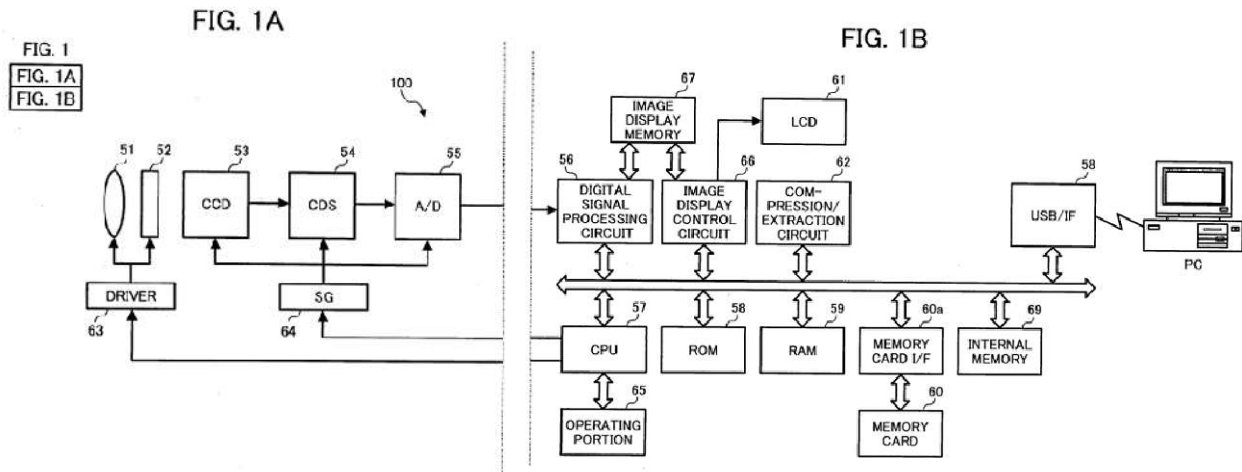
A. GROUND 1: WATANABE FAILS

Ground	Reference(s)	Claim(s)
1	Watanabe	1-2, 5-7, 11-12, 14-15, 17, 27, 29

1. *Watanabe discloses two embodiments that use different process information*

a. **The relied-upon first embodiment of Watanabe**

Petitioner relies on the first embodiment of Watanabe that is related to a “digital still camera.” EX. 1005 at [0040] and [0042]. With respect to FIGS. 1A-1B, reproduced below, Watanabe discloses a digital still camera 100:



See also EX. 1005, [0035].

⁴ Patent Owner briefly addresses all grounds in this paper, but reserves all rights to fully address all arguments and all grounds if this IPR is instituted.

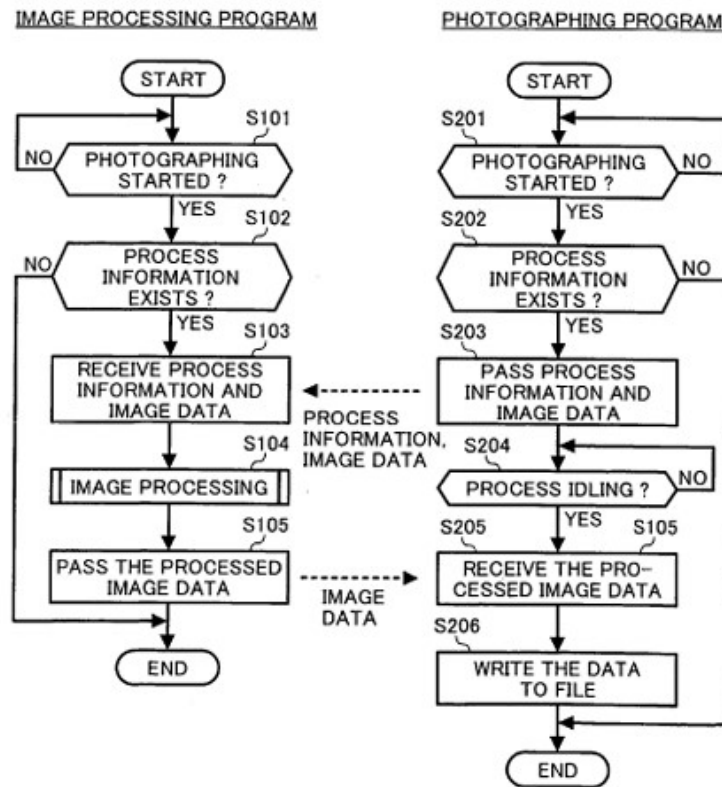
Operating portion 65 includes buttons for selecting a function by the operator, *e.g.*, a release button used at the time of photographing. EX. 1005 at [0041].

ROM 58 stores a control program that includes an “imaging processing program” and a “photographing program.” EX. 1005 at [0042].⁵ The CPU 57 executes both programs. EX. 1005 at [0060].

FIG. 4 (below) shows the steps performed by the “imaging processing program” versus the “photographing program.”

⁵ CPU 57 “controls operation of each part of the digital still camera... by way of an photographing program.” EX. 1005 at [00042]. CPU 57 “processes image data by way of an image processing program.” *Id.*

FIG. 4

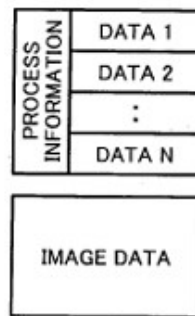


When the release button is pushed (S101 and S201), and when process information exists (S102 and S202), the image data is produced and transferred together with the process information from the photographing program to the image processing program (S103 and S203). EX. 1005 at [0058] and [0061]. The image processing program executes an image process on the image data in accordance with the process information (S104). EX. 1005 at [0062].

The processed image data is then transferred from the image processing program to the photographing program (S105). EX. 1005 at [0062]. The processed image data is then recorded (S206). EX. 1005 at [0063].

With respect to FIG. 2, reproduced below, Watanabe explains that “various data (data 1-data N) are added to image data as process information.” EX. 1005 at [0046]. For example, information of a lens type, a focusing point, and a zoom position may correspond to data 1, data 2, and data 3, respectively. EX. 1005 at [0047]; FIG. 3.

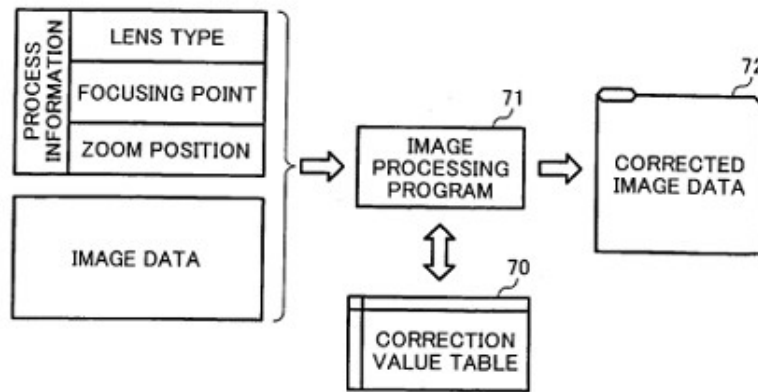
FIG. 2



With respect to FIG. 3, reproduced below, Watanabe discloses tables 70 with correction values, prepared in advance, for each lens type. EX. 1005 at [0047]. The CPU 57 determines a table according to lens type (data 1) and then determines the correction values according to the focusing point (data 2) and zoom position (data

3). EX. 1005 at [0047]. Thus, the image process performed by the image processing program, discussed above with respect to FIG. 4, step 104, is selected based on data 1-data 3. EX. 1005 at [0047].

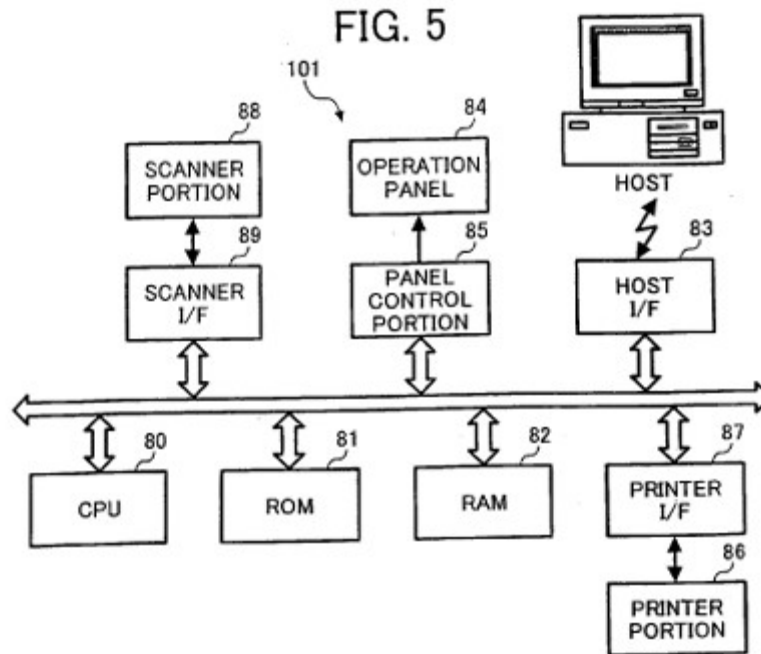
FIG. 3



b. The second embodiment of Watanabe

In context of Watanabe, the patentee expressly distinguished the process information of the first and second embodiments; the patentee expressly distinguished identifying a correction versus identifying an aberration. Watanabe teaches identification of corrections should be used with a look-up table (in the relied-upon first embodiment), while identification of aberrations should not use a look-up table (in the second embodiment).

The second embodiment of Watanabe relates to a multifunction printer 101 as the image recording apparatus. EX. 1005 at [0067]; FIG. 5.⁶

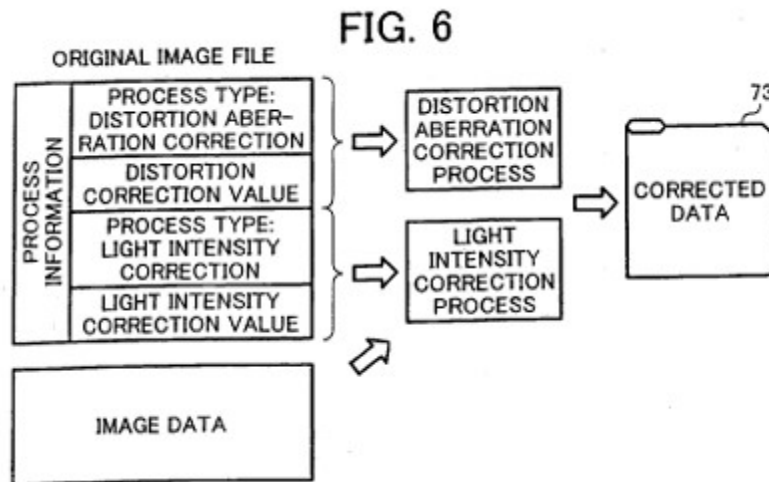


Like in the first embodiment, Watanabe discloses that in the second embodiment, “the CPU 80 executes a distortion aberration correction process and a peripheral light intensity correction process according to the image correction processing program 71.” EX. 1005 at [0070]. In both embodiments, the CPU executes the aberration correction process.

⁶ As discussed herein, the second embodiment of Watanabe does not disclose at least the use of a digital signal processor, a database, or a database management system as claimed in the '685 Patent.

Like in the first embodiment, Watanabe discloses that in the second embodiment, process information is added to image data. EX. 1005 at [0070].

However, the process information in the second embodiment is different from the process information in the first embodiment. In the second embodiment, “the process information is relative to a process type of distortion aberration correction, a correction value concerning distortion aberration, a process type of peripheral light intensity correction, and a correction value concerning peripheral light intensity.” EX. 1005 at [0070]; FIG. 6.



The EPO prosecution history makes clear that in the second embodiment, the process information includes values that “represent an aberration directly (i.e., the ‘information of distortion aberration’).” EX. 2005 at 2. The patentee distinguished this type of process information from data referring to “capture conditions” such as focusing point (subject distance) and zoom position (focal

length). EX. 2005 at 2. The patentee therefore distinguished the process information of the second embodiment from the process information of the first embodiment. The patentee explicitly refers to differences in these two approaches by comparing FIGS. 3 and 6 and FIGS. 11 and 13 of Watanabe. EX. 2005 at 3.

The patentee explicitly stated that the process information of the second embodiment avoids the use of a look-up table. EX. 2005 at 3. The patentee stated that with the process information of the second embodiment (*i.e.*, the “information of distortion aberration”), that “it is no longer necessary to refer to a look-up table in order to carry out the image processing using the process information.” EX. 2005 at 3. In contrast, the process information of the first embodiment (*e.g.*, focusing point, zoom position) does use a look-up table.

2. Petitioner fails to meet its burden with respect to “a digital video camera”

Petitioner fails to establish that Watanabe discloses or renders obvious “a digital video camera” as required by claims 1[a], 6[a], and 14[a].

At least because Watanabe does not disclose or render obvious a digital video camera, Watanabe does not disclose or render obvious the claim limitations related to “digital video”, “video”, “video file”, “video image file”, “video frame”, “video image frame”, “corrected video”, “corrected digital video file” or “original video image” as recited in claims 1, 6, 11, 14, 17

a. Watanabe does not disclose “a digital video camera”

With respect to the first embodiment, Watanabe repeatedly refers to a “digital still camera.” *E.g.*, EX. 1005 at [0040] and [0042]. In a second embodiment, Watanabe refers to a multifunction printer EX. 1005 at [0067]. Watanabe never refers to a “video camera” or “videography.” Watanabe suggests that the present invention could be applied to a copier, a printer, or a facsimile, none of which are directed to video, including that of a digital video camera. EX. 1005 at [0080].

Watanabe refers to JPEG. EX. 1005 at [0038]. Watanabe never refers to MPEG. A POSA would understand that JPEG is used for still images, while MPEG is used for video.

i. Petitioner misplaces reliance on its translation of JP-872

Petitioner relies on an incorrect translation of the priority document, JP-872 (EX. 1006), to suggest that Watanabe’s CCD captures video. Petition at 12; *see also* Petition at 14 (alleging that Watanabe discloses a CCD that captures video). Petitioner’s reliance on this translation is misplaced at least because the translation is incorrect and the translation does not make sense.

First, Petitioner’s translation is incorrect.

Petitioner’s translation incorrectly refers to “video input,” which should instead read “image input.”

Petitioner’s translation of JP-872 reads: “The CCD 3 is a circuit that converts the *video input through the lens unit* into an electrical signal (analog image data), and the CDS circuit 4 is a circuit for reducing noise for the CCD type image sensor.” EX. 1006 at 7 (emphasis added). Petitioner’s translation refers to “video input.”

As shown by Global Dossier, Watanabe has a related foreign counterpart publication, EP1608140. EX. 2002; EX. 2003. A translation of JP-872 was submitted by the patentee with the EPO to claim foreign priority (“EPO translation”). The EPO translation of JP-872 is different from Petitioner’s translation of JP-872.

The EPO translation of JP-872 reads: “The CCD 3 is a circuit for converting *an image input through the lens unit* to electrical signals (analogue image data), and the CDS circuit 4 is a circuit for reducing noise for the CCD-type image pickup device.” EX. 2004 at 8:11-14 (emphasis added). The EPO translation’s reference to “image input,” as opposed to “video input,” appears correct and is consistent with Watanabe itself.

Watanabe reads: “The CCD 53 is a circuit for converting *an image inputted through the lens unit* to electrical signals (analogue image data), and the CDS circuit is a circuit for reducing noise for the CCD-type image photographing device.” EX. 1005 at [0037](emphasis added). Again, Watanabe refers to image input and not video input.

Second, Petitioner’s translation does not make sense.

A CCD in a digital camera captures light intensity levels at specific pixel locations. In Watanabe, the CCD 53 is configured to capture still image input. Watanabe does not disclose a CCD configured for a video camera. Moreover, a video camera requires the CCD to capture multiple images every second, which can then be stitched together to give the impression of movement. *See id.* Even in a video camera, the CCD uses image input, not video input, and Watanabe does not disclose capturing multiple images every second or stitching those images together.

In Watanabe, light enters through lens 51 and is captured by the CCD 53. EX. 1005 at [0036]. The output of CCD 53 is passed through CDS 54 and converted by the A/D converter 55 to digital signals. EX. 1005 at [0037].⁷

⁷ Watanabe’s CDS 54 is a correlated double sampling circuit. EX. 1005 at [0035].

A POSA would understand that a CDS can be used to mitigate noise in the CCD.

Watanabe's CCD 53 is a charge coupled device. EX. 1005 at [0035]. A POSA would understand that a CCD uses an array of pixels, where each pixel is exposed to light photons that generate a charge. More light means more charge and less light means less charge.⁸

The A/D converter 55 is an analog-to-digital converter. *See* EX. 1005 at [0037]. The A/D converter 55 will convert each pixel's charge into a digital value by measuring the amount of charge at each pixel. A POSA would understand that the A/D converter will "sample" (*i.e.*, measure) each pixel at a particular rate, known as the sampling rate or sampling frequency.

In view of the above, it does not make sense that the CCD 53 would capture video input. As disclosed in Watanabe, a mechanical shutter of the mechanical structure 52 shields light during reading out charge stored on the CCD. EX. 1005 at [0036]. If the shutter were left open for an extended period of time, all of the pixels would be fully charged. In reality, the CCD must capture the light intensity charge in the pixels for a single still image, the charge must be converted by the A/D converter 55, and then the CCD must be reset. Thus, the reference in Petitioner's

⁸ A POSA would understand that most CCDs use a Bayer filter for RGB colors, where each pixel captures red, green, or blue light. *See, e.g.*, EX. 2007 at 3; EX. 2009 at 1; EX. 1001 at 5:12-24.

translation to “video input” as opposed to “image input” does not make sense – a video is not input from the lens unit to the CCD 53.

ii. Petitioner misplaces reliance on Watanabe’s reference to NTSC

Petitioner relies on Watanabe’s reference to NTSC sampling frequency to suggest that Watanabe discloses a digital video camera. Petition at 12. Petitioner is incorrect. As discussed above, the sampling rate of the A/D converter relates to sampling the pixels in a single image, not multiple images. Each pixel in the image is sampled one-by-one at a particular rate.

Watanabe discloses “output signals from the CCD 53 pass through the CDS circuit 54 and are converted by the A/D converter to digital signals at optimum sampling frequency (*e.g.* an integral multiple of sub-carrier frequency of an NTSC signal).” EX. 1005 at [0037]. This sentence in Watanabe merely discloses a possible sampling rate/frequency of a fast A/D converter. According to NTSC, a sampling rate of 14.32 MHz (four times the color subcarrier frequency) is the accepted standard. EX. 1015 at 1 (section 1.1).⁹ A POSA would understand that Watanabe suggests the A/D converter 55 could take 14 million samples of the

⁹ In the NTSC standard, color information is carried on a “color subcarrier” of 3.579545 MHz. EX. 1017 at 2 (section III.A).

pixels in a CCD sensor in one second for each *single* image. This sentence does not disclose that Watanabe “digitizes video” or digitizes multiple images per second.

Contra Petition at 12.

Ultimately, the sampling rate of the A/D converter does not suggest that Watanabe’s digital still camera could be interpreted as a digital video camera.

b. Watanabe does not render obvious “a digital video camera”

As discussed above, Watanabe does not disclose or otherwise suggest applying its teachings to a “digital video camera.” Petitioner provides no motivation for a POSA to do so. Petitioner is using hindsight bias.

Petitioner argues it would have been “routine” to use a digital video camera to achieve what Watanabe describes because digital video comprises successive images that could be corrected in the same way. Petition at 12-13. Petitioner is incorrect at least because correcting video requires additional operations, for example, accommodating a changing of the focusing point and the zoom position for subjects. Therefore, correcting video requires additional functionality that is not disclosed in Watanabe. For example, there is no disclosure in Watanabe for stitching together multiple successive images to create a video.

As noted in the ’685 Patent, Petitioner’s proposed modification would not have been routine for a POSA. *See, e.g.*, EX. 1001 at 27:29-41 (“...video presents

new classes of dynamic problems, most notably regarding the matter of tracking changing subjects in real time...”). Watanabe is not optimized to capture and correct successive frames, let alone capture and correct aberrations in successive frames in the same manner.

Watanabe relies on appending process information to the image data for a single still image. EX. 1005 at [0046]. Watanabe’s teachings would be extremely inefficient for successive frames. A POSA would not be motivated to apply Watanabe’s teachings to video because it would be time-consuming and power-consuming. The process information would be different for each frame and the amount of the transferred data would be large.

Because the process information would be different for each image, Watanabe would not use the same “correction values” or “image process” for successive images. For example, Watanabe relies on “focusing point” as data 2 and “zoom position as data 3 in the process information. A digital video with a moving subject would result in a different focusing point and zoom position in each frame of video. Thus, the process information would be different for each frame.

Watanabe’s CPU would also have to determine a different correction value from table 70 for each frame and select a different image process for each frame.

3. Petitioner fails to meet its burden with respect to “applying digital filtration using the digital signal processor”

Petitioner fails to establish that Watanabe discloses or renders obvious that “the video image file with the at least one optical image aberration is corrected by applying digital filtration using the digital signal processor” as required by claim 1[f]. For the same reasons, Petitioner fails to meet its burden with respect to claims 6[e] and 14[g].

Petitioner appears to agree that the ’685 Patent describes correcting aberrations using “in-camera digital filtration.” Petition at 4 (citing EX. 1001 at 7:30-37; 8:11-17). The claim language makes clear that the aberration is corrected by applying digital filtration using the digital signal processor.

Petitioner argues that Watanabe’s circuit 56 corrects optical image aberrations by applying corrections from the database. Petition at 24. Petitioner is incorrect at least because Watanabe does not disclose circuit 56 executing aberration correction.

In contrast, Watanabe expressly discloses that “CPU 57 executes... a correction process on image data...” EX. 1005 at [0042]. Watanabe also discloses that CPU 57 “processes image data by way of an image processing program.” EX. 1005 at [0042]. Watanabe further discloses that “CPU 57 executes the image processing program” including step 104 for “image processing” shown in FIG. 4.

EX. 1005 at [0060]; *see also* FIG. 3 (image processing program 71 accessing correction value table 70). **Therefore, a POSA reading Watanabe would understand it is the CPU 57 that executes aberration correction, not circuit 56.** Watanabe relies heavily on CPU 57 which has more functionality and in turn, requires more processing power, than circuit 56. Watanabe's heavy dependence on the CPU 57 is contrary to the claimed inventions of the '685 Patent that efficiently distribute the workload by using the digital signal processor for specific functions.

Watanabe does not disclose that circuit 56 corrects an aberration by applying digital filtration, or that circuit 56 corrects an aberration using the correction values in tables 70. *Contra* Petition at 24. Petitioner misinterprets Watanabe's one-sentence disclosure that "the digital signal processing circuit 56 sorts out the image data inputted from the A/D converter 55 into color-difference data and brightness data, and executes various process, correction and a data process for image compressing/extracting." EX. 1005 at [0038]; Petition at 24-25. However, this sentence does not disclose that circuit 56 performs aberration correction to video image data based on the process information. Nor does this sentence disclose that circuit 56 obtains correction values from tables 70. As discussed below, regardless of whatever "correction" may be performed by Watanabe's circuit 56, there is no disclosure that circuit 56 performs the functions of the claimed "digital signal processor" in the '685 Patent.

A POSA would understand that the output from the A/D converter will be subject to certain digital “corrections” including, for example, gamma correction.¹⁰ A POSA would understand that brightness is not perceived by humans in a linear manner and so gamma correction can be used to correct a pixel’s numerical value and luminance value according to a mathematical curve. Without gamma correction, the image can appear too dark or washed out. These digital “corrections” are distinct from the optical image aberration correction as claimed in the ’685 Patent.

4. Petitioner fails to meet its burden with respect to “a digital signal processor configured to access a database management system”

Petitioner fails to establish that Watanabe discloses or renders obvious “a digital signal processor configured to access a database management system” as

¹⁰ This understanding is consistent with, *e.g.*, Takane’s disclosure of signal processing circuit 50 which processes the data, *e.g.*, white balance adjustment, gamma correction, sharpness correction, and converts the RGB data into a YC signal, ***prior to*** further processing by distortion correction circuits 56/58. EX. 1009 at [0044]. Signal processing circuit 50 of Takane does not perform optical image aberration correction as claimed in the ’685 Patent.

required by claim 1[a]. For the same reasons, Petitioner fails to meet its burden with respect to claims 6[a] and 14[a].

Petitioner argues that Watanabe's CPU 57 uses a control program and that the control program comprises a database management system where tables 70 are a database. Petition at 19. Petitioner fails to establish that Watanabe's circuit 56 is configured to access tables 70, the control program generally, or the image processing program in the control program specifically, in order to perform aberration correction as claimed.

As discussed above, Watanabe discloses tables 70 for each lens and the CPU 57 determines a table according to lens type (data 1) and determines the correction values according to the focusing point (data 2) and zoom position (data 3). Therefore, a POSA would have understood that CPU 57, not circuit 56, accesses the alleged "database" of tables 70. Petitioner fails to establish Watanabe's circuit 56 accesses or is configured to access the alleged "database" of tables 70.

Moreover, Petitioner fails to establish that Watanabe's circuit 56 is configured to access the control program that determines a table according to lens type (data 1) and determines the correction values according to the focusing point (data 2) and zoom position (data 3). There is no disclosure in Watanabe that circuit 56 obtains the process information. There is no disclosure in Watanabe that circuit 56 obtains the correction values.

Furthermore, Petitioner fails to distinguish the “imaging processing program” from the “photographing program” of Watanabe’s control program. As discussed above, it is S104 of the image processing program that performs “image processing.” EX. 1005 at FIG. 4. There is no disclosure in Watanabe that circuit 56 is configured to access the image processing program instructions. To the contrary, Watanabe discloses CPU 57 executes the image processing program.

5. Petitioner fails to meet its burden with respect to “database”

Petitioner fails to establish that Watanabe discloses tables 70 correspond to a “database” as required by claims 1[d], [5]. 14[e], and 14[f].

Watanabe describes that tables 70 are prepared in advance. EX. 1005 at [0047]. Watanabe does not describe whether tables 70 are stored or hardcoded, or otherwise manipulatable, updatable, etc. Watanabe’s disclosure of tables 70 does not correspond to the claimed “database” of the ’685 Patent.

In contrast to Watanabe, the ’685 Patent describes:

- “In the process, the camera identifies a specific lens and refers to a database that matches the lens type with the specific aberrations” EX. 1001 at 10:60-62.
- “The dynamics of correcting multiple simultaneous aberrations may be complex, but since the number and type of aberrations are constrained to a specific lens type, a centralized database may be accessed with specific corrections for each respective aberration.” EX. 1001 at 12:53-58.

- “[S]oftware files are periodically downloaded to the camera in order to update the camera settings and the database system” EX. 1001 at 29:13-15.
- For example, “as the camera manufacturer provides new lenses for the camera, it becomes necessary to load new updated settings to accommodate corrections for the new lenses” EX. 1001 at 29:15-18.
- As another example, “as the camera requires new software updates with improved algorithms to further optimize the corrective functions of both the optical and digital mechanisms, the camera will automatically accept these” EX. 1001 at 29:18-22.

The '685 Patent explains that the updatable database is a “particularly important” feature to both the manufacturer and the user. EX. 1001 at 29:22-26 (“This feature is particularly important to both manufacturer and user because the ability to update software capability periodically will protect a user from needing to upgrade major hardware such as with a lens replacement.”) There is no disclosure in Watanabe that the tables 70 are updatable.

6. Petitioner fails to meet its burden with respect to “database management system”

Petitioner fails to establish that Watanabe’s control program is a “database management system” as required by claims 1[a], 6[a], and 14[a].

Petitioner argues that a database management system is “software used to create, store, retrieve, change, manipulate, sort, format and print... information in a

database.” Petition at 18.¹¹ However, Petitioner fails to establish that Watanabe’s control program creates, stores, changes, manipulates, sorts, formats, or prints information in tables 70.

Moreover, Petitioner points to Watanabe’s “control program,” but fails to distinguish the “imaging processing program” from the “photographing program” of Watanabe’s control program. As discussed above, it is S104 of the image processing program that performs “image processing.” EX. 1005 at FIG. 4; *see also* FIG. 3 (image processing program 71 accessing correction value table 70). There is no disclosure that the image processing program corresponds to the claimed database management system.¹²

With respect to the image processing program, Watanabe’s use of a lookup table is a simple operation that does not require a database management system as claimed.

¹¹ Patent Owner reserves all rights regarding the correct construction of the phrase “database management system.”

¹² There is also no disclosure that the photographing program corresponds to the claimed database management system.

7. *Petitioner fails to meet its burden with respect to “an integrated circuit”*

Petitioner fails to establish that Watanabe renders obvious “an integrated circuit including a digital signal processor” as required by claims 1[a], 6[a], and 14[a]. Petitioner is using hindsight bias in alleging that it would have been obvious for a POSA to combine Watanabe’s CPU 57 and circuit 56 in an integrated system-on-chip (“SoC”). Petition at 15-17.

Watanabe discloses CPU 57 and circuit 56 as separate and discrete components. EX. 1005, [0035], FIG. 1B. A POSA would understand that a SoC is usually designed for a very specific purpose. However, Watanabe’s CPU 57 and circuit 56 serve different purposes and perform multiple different functions.

Watanabe discloses that CPU 57 “controls operation of each part of the digital still camera... by way of an photographing program.” EX. 1005 at [0042]. Therefore, it would ***not*** have been obvious to implement CPU 57 and circuit 56 on a SoC. *Contra* Petition at 17. The CPU 57 does not only control circuit 56. CPU 57 processes and executes programs stored in ROM and RAM. *Id.* at [0039]. CPU 57 also controls each part of the system according to the photographing program. *Id.* at [0059]. Though this alleged integration may “provide fast communication and efficient memory sharing” for the operation of circuit 56 (*see* Petition at 16), the overall efficiency of the camera would be reduced as a CPU would still be required

to control other functions within the camera. There would be slower communication and less efficient memory sharing between CPU 57 and the other camera components. Petitioner is applying hindsight bias using the claims of the '685 Patent as a roadmap.

8. Petitioner fails to meet its burden with respect to “curvature of field aberrations”

Petitioner fails to establish that Watanabe discloses “the system includes machine readable instructions for the system to correct for curvature of field aberrations” as required by claim 29.

Petitioner’s translation of JP-872 again appears incorrect with respect to “curvature aberration correction.” Petition at 27-28; EX. 1006 at 8. The EPO translation of JP-872 reads “distortion aberration correction” (EX. 2004 at 10:10-11) and Watanabe reads “distortion aberration correction” (EX. 1005 at [0046]).

Petitioner therefore relies on an incorrect translation of JP-872. Neither the EPO translation of JP-872 nor Watanabe refer to “curvature aberration correction.”

B. GROUNDS 2-7: WATANABE COMBINATIONS GENERALLY FAIL

Petitioner fails to meet its burden with respect to the independent claims in Ground 1. Petitioner does not suggest that any of the secondary references cure the deficiencies of Watanabe in Ground 1 and therefore, Grounds 2-7 fail as well.

Petitioner’s conclusory analysis in Grounds 2-7 fails to establish that Watanabe is properly combinable with any of the secondary references. In each of Grounds 2-7, Petitioner’s analysis boils down to arguing that a POSA would have implemented the additional teachings into Watanabe’s “control program.” See EX. 1003, ¶¶327, 359, 389, 414, 425, 432. Petitioner is using hindsight bias in its proposed Watanabe combinations. See, e.g., *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (“Although the *KSR* test is flexible, the Board must still be careful not to allow hindsight reconstruction of references ... without any explanation as to how or why the references would be combined to produce the claimed invention.”)

In the proposed combinations, the aberrations being corrected, and the methods used for their correction, are so different that they are not properly combinable, much less applicable to the ’685 Patent. A common goal of “improving capabilities” and “optimizing images” is not sufficient motivation for a POSA to combine the specific technical teachings of these references in the proposed combinations.

In Ground 1, Petitioner alleges that Watanabe’s “control program” corresponds to the claimed database management system (DBMS) and that Watanabe’s circuit 56 corresponds to the claimed digital signal processor (DSP). In Grounds 2-7, Petitioner proposed adding functionality to the “control program”

which is the alleged DBMS, not the alleged DSP. Petitioner fails to establish that circuit 56, specifically, would perform same functions as the claimed digital signal processor recited in the dependent claims. It is the image processing program executed by CPU 57 that performs aberration correction in Watanabe, not circuit 56.

Additionally, Petitioner fails to address the fact that Watanabe’s “control program” consists of two separate programs with two separate sets of instructions. In the proposed combinations, Petitioner does not discuss adding functionality to a particular set of instructions.

Overall, Petitioner fails to explain *how* the techniques taught by the secondary references actually work or *why* a POSITA would have been motivated to implement the specific teachings in Watanabe’s system. “[A] clear, evidence supported account of the contemplated workings of the combination is a prerequisite” to concluding “that a relevant skilled artisan would have been motivated to make the combination and reasonably expect success in doing so.” *Personal Web Techs., LLC v. Apple*, 848 F.3d 987, 994 (Fed. Cir. 2017).

Finally, as noted above, Dr. Laub does not qualify as a POSA. Petitioner fails to establish that it would have been within the ordinary skill of a POSA to combine the references or that a POSA would have a reasonable expectation of success in doing so.

C. GROUND 2: WATANABE + KISHIDA FAILS

Ground	Reference(s)	Claim(s)
2	Watanabe + Kishida	3, 13, 19

Petitioner states that Watanabe does not disclose optimizing exposures, alone or in cooperation with shading corrections. Petition at 40. Petitioner thus relies on Kishida.

1. Petitioner fails to establish a motivation to combine Watanabe and Kishida

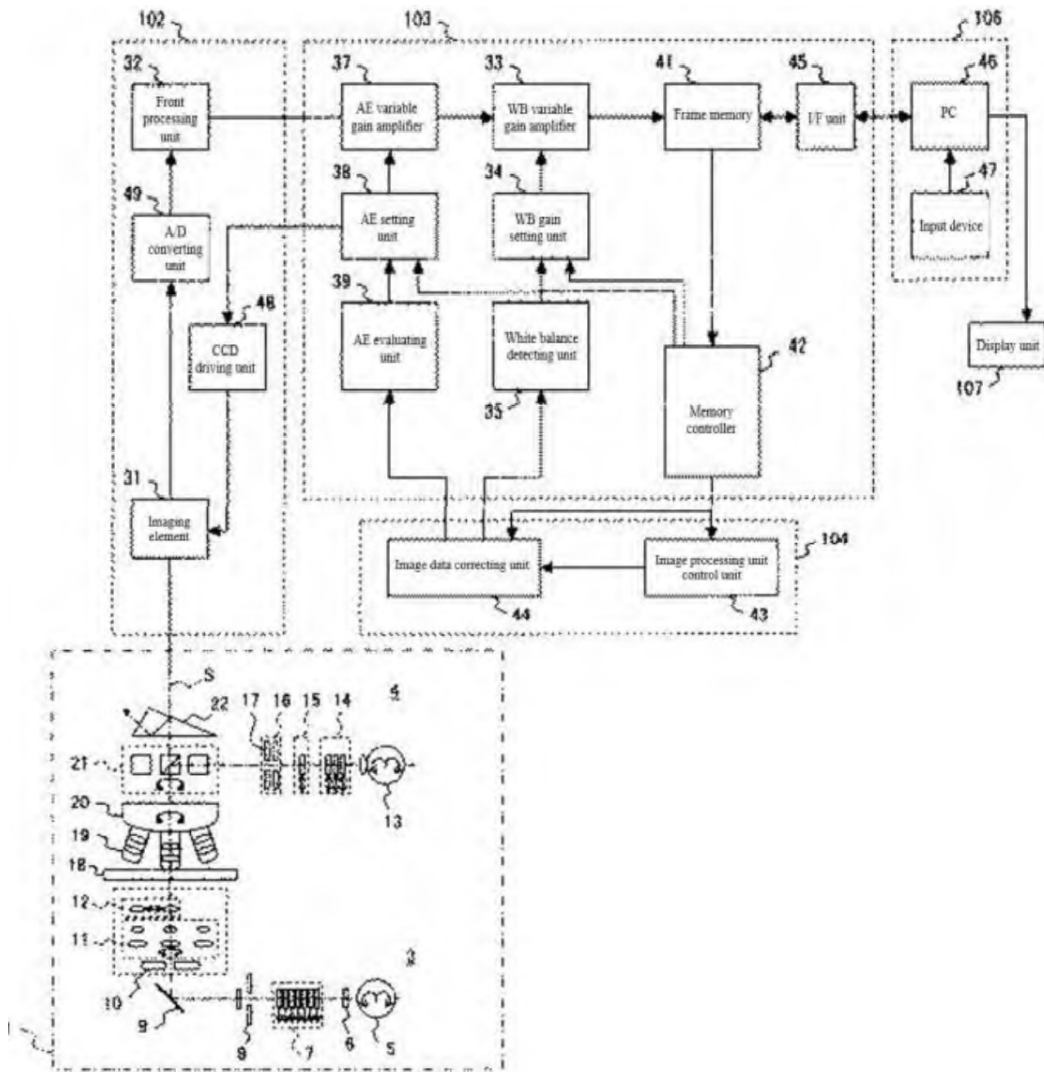
Kishida relates to correction of an observation image by a microscope 1. EX. 1007 at Abstract. There is nothing to suggest that a POSA interested in optimizing a digital video camera would look to a reference focused on an exemplary microscope. Kishida's teachings relate to a static subject and a static background. Additionally, Kishida does not disclose a digital signal processor and Petitioner does not address the different hardware components of Kishida or how they would be incorporated into Watanabe's system.

2. Petitioner fails to explain how a POSA would implement Kishida's techniques in Watanabe's system

Petitioner argues it would be obvious to implement Kishida's software for exposure correction control based on shading prediction into Watanabe's control program. Petition at 41; EX. 1003 at ¶327.

Petitioner's conclusory analysis fails to explain how Kishida's techniques are combinable with Watanabe's system. Petitioner simply argued it would be obvious to implement shading correction in Watanabe's control program, without considering how that shading correction is actually performed by Kishida. For example, Petitioner does not explain the required "background image" for predicting the prediction result as taught by Kishida. There is nothing to suggest that a POSA would have implemented Kishida's techniques, software or otherwise, into Watanabe's system.

FIG. 2 of Kishida is shown below:

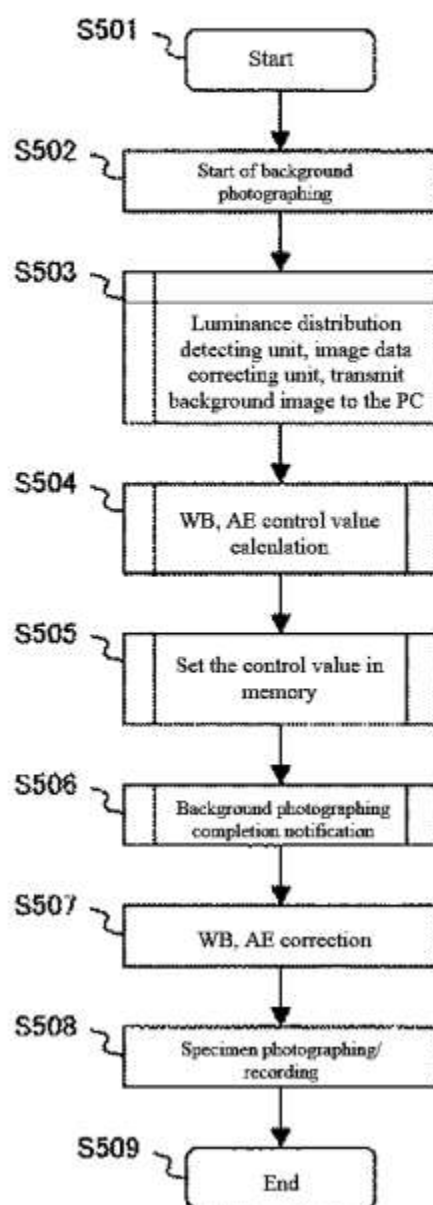


Petitioner relies on exposure correction control based on shading prediction as taught by Kishida. Petition at 43. **However, the exposure correction control based on shading prediction is performed by the external PC 46 of Kishida.** EX. 1007 at [0044] (“...in the following explanation, the processing performed by the PC 46 is realized by the CPU of the PC 46...”). Thus, the process of Kishida does not relate to in-camera correction.

As further discussed below, based on Kishida's disclosure, a POSA would not be motivated to implement Kishida's techniques in Watanabe's system and Petitioner does not show otherwise. For example, in Kishida, "[t]he user of this system first removes the observation specimen on the stage 18 from the field of view of the observation image. Here, an instruction is given to operate an input device 47, such as a mouse, to click one of the positions on the background photographing button 301 displayed on the imaging screen When the PC 46 receives this instruction, it starts executing the steps shown in Fig. 4." EX. 1007 at [0045]; *see also* FIG. 4, [0046]-[0058].

[Fig. 4]

Diagram showing the processing steps of photographing and recording an observation image.



3. *Petitioner fails to address a background image as taught by Kishida*

Kishida teaches exposure or white balance correction based on a shading prediction result. EX. 1007 at [0010]. Kishida explains that the prediction result is predicted from **the background image, which is an image captured separately from the object image and does not represent the object.** EX. 1007 at [0015]. Kishida explains that the background image is an image that is stored in a memory unit of the PC 46 itself. EX. 1007 at [0043].

Petitioner fails to address why a POSA reading Watanabe would be motivated to use a background image as described in Kishida in order to predict the prediction result. In the context of microscopes, there is a consistent, static background and it is possible to capture a background image in which the observation specimen is not shown. *See, e.g.,* EX. 1007 at [0048]. “Moreover, it is desirable that the photographing environment (amount of irradiation light, focal point, etc.) during the capturing of this background image be the same as that during the capturing of the observation specimen image to be performed later.” EX. 1007 at [0048].

In the context of digital still cameras, there is not a consistent background and it is unlikely a background without the subject could be obtained. This is equally, if not more, true for digital video cameras.

4. Petitioner fails to address a control value as taught by Kishida

Further to above, Kishida teaches calculating a control value for exposure correction control based on the difference of the luminance average values, where the control value is used to determine the amount of exposure correction in the specified area 305. EX. 1007 at [0052], [0058]. Kishida's control value is specific to the background in the background image. While this may be useful for a microscope with a static background, it would not be useful for a digital still camera, let alone a digital video camera.

5. Petitioner fails to address user selection taught by Kishida

Kishida explains "[t]he user of this system specifies this specified area 305 as an area for performing automatic exposure correction or white balance correction." EX. 1007 at [0035]. Thus, Kishida relies on user-intervention and Petitioner does not explain how user-intervention would be incorporated into Watanabe's system.

6. Petitioner fails to address how the background image taught by Kishida relates to the process information of Watanabe

Petitioner does not address how the "imaging processing program" or the "photographing program" of Watanabe would implement Kishida's shading correction consistent with the teachings of Watanabe as they relate to process information and tables 70.

7. Petitioner fails to address the order of corrections in the modified system

Kishida warns that if the shading correction is applied to an image after an exposure or white balance correction has already been applied to the image, there is a risk of over-correction. EX. 1007 at [0007].

Because Watanabe does not perform corrections based on aberration type, Watanabe does not contemplate performing different corrections in a different order. Petitioner does not address how Watanabe’s control program would purposefully order the corrections allegedly performed by Watanabe’s circuit 56, consistent with the teachings of Kishida.

D. GROUND 3: WATANABE + KITA FAILS

Ground	Reference(s)	Claim(s)
3	Watanabe + Kita	4, 8, 9, 16

Claims 4, 8, 9, and 16 each require “the digital signal processor applies at least one fast Fourier transform (FFT) algorithm.”

Petitioner argues that “Kita’s techniques used software that could be implemented in Watanabe’s system.” Petition at 45. Petitioner’s combination is not sufficiently clear. Petitioner does not explain *how* Kita’s techniques would be implemented in Watanabe’s system. For example, Petitioner does not identify a digital signal processor in Kita.

To the extent Petitioner argues that Kita's CAMDSP corresponds to a digital signal processor because of Kita's choice in terminology (DSP), the CAMDSP is a different component than the MTF correcting unit 5-1. Thus, Kita teaches that the component specifically identified as a digital signal processor in Kita is not itself involved with the application of a fast Fourier transform and thus, teaches away from the claims of the '685 Patent.

1. Petitioner fails to address the hardware components of Kita's signal processing unit 65

Petitioner's conclusory argument that Kita's software could be implemented in Watanabe's control program shows that Ground 3 must fail. Petitioner does not specifically address Watanabe's circuit 56, the alleged digital signal processor, in its analysis. Petitioner does not specifically identify Kita's software that is alleged to be incorporated into Watanabe. Petitioner does not address Kita's hardware at all.

Kita's teachings rely on distinct hardware elements that are not present in Watanabe's system. Petitioner does not address Kita's hardware components that are necessary to perform MTF correction. Petitioner does not explain how Kita's hardware components would be incorporated into Watanabe's system.

With respect to FIG. 6, Kita discloses signal processing unit 65 including MTF correcting unit 65-1, camera processing unit (CAMDSP) 65-2, and JPEG compression unit 65-3.

Camera signal processing by the CAMDSP 65-2 is applied to the A/D converted image. EX. 1008 at [0054]. Kita teaches the zooming amount, defocusing amount, and diaphragming amount are determined by an exchange between CAMDSP 65-2 and camera control unit 66. EX. 1008 at [0049]. The image information output from CAMDSP 65-2 is input to the MTF correcting unit 65-1 at the same time as the zooming amount, defocusing amount, and diaphragming amount (*e.g.*, aperture of an iris diaphragm). EX. 1008 at [0057]; EX. 1003 at ¶85.

The zooming amount, defocusing amount, and diaphragming amount are used as keys to select MTF correction filters. EX. 1008 at [0059].

The MTF correction filter is determined from table 87 according to each parameter. EX. 1008 at [0059].

The MTF correction filter is applied by the MTF correction unit 65-1. EX. 1008 at [0046].

Further components of the MTF correcting unit 65-1 are shown in FIG. 8 of Kita, including, for example, FFT calculation unit 83, IFFT calculation unit 85, table 87, and MTF interpolation processing unit 88. Each of these components

performs a specific function in Kita's system. EX. 1008 at [0057] – [0063]; FIG.

11. None of these components are present in Watanabe and Petitioner does not explain why a POSA would be motivated to add these components to Watanabe generally, or circuit 56 specifically.

2. Petitioner fails to address Kita's JPEG compression unit 65-3 in Kita versus Watanabe's JPEG compression/extraction circuit 62

Additionally, Kita's JPEG compression unit 65-3 is part of signal processing unit 65. When all blocks have been processed, the JPEG compression process is performed. EX. 1008 at [0063]. However, Watanabe already includes JPEG compression/extraction circuit 62, which is separate and distinct from circuit 56. To the extent Petitioner is arguing that Kita's signal processing unit 65 could be a substitute for Watanabe's circuit 56, this argument fails at least because it would not make sense to perform a compression process using Kita's unit 65-3 and then send the compressed data to Watanabe's JPEG compression/extraction circuit 62. This would be highly inefficient.

3. Petitioner fails to address Kita's table 87 versus Watanabe's table 70

Moreover, Petitioner does not address explain the use of Kita's table 87 versus Watanabe's table 70 for correction. Incorporating Kita's signal processing unit 65 would change the principle of operation of Watanabe's system. Kita teaches

that table 87 is part of MTF correcting unit 65-1 in signal processing unit 65.

Watanabe does not disclose that tables 70 are part of circuit 56.

If Kita's signal processing unit 65 were substituted for Watanabe's circuit 56, there would be no need to obtain correction values from Watanabe's tables 70.

Kita's MTF correction filter is the algorithm used to correct the MTF, which incorporates all aberrations.¹³ Kita does not disclose identifying specific aberrations or identifying specific corrections to aberrations. Kita's MTF filter is not selected for specific aberrations.

E. GROUND 4: WATANABE + TAKANE FAILS

Ground	Reference(s)	Claim(s)
4	Watanabe + Takane	10, 18, 28, 30

Petitioner states that Watanabe does not disclose correcting white balance, pin-cushion, or barrel distortions. Petition at 47. Petition thus relies on Takane.

¹³ Virtually all aberrations contribute to degradation of the MTF and the MTF reflects their total effect. The MTF correction filter allows for correction of all the aberrations that are incorporated in the MTF.

1. Petitioner is using hindsight bias to combine Watanabe and Takane as proposed

Petitioner's expert opines that a POSA would be motivated to add the functionality of (1) Takane's processing circuit 50, (2) Takane's first distortion correction circuit 56, and (3) Takane's second distortion correction circuit 58, by adding Takane's software to Watanabe's control program. EX. 1003 at ¶¶380, 384, 385-386, 389-390, 394. For example, Petitioner's expert relies on Watanabe's circuit 50 for white balance correction and then relies on selecting a distortion correction circuit 56 or 58 depending on whether the button is halfway depressed or fully depressed. EX. 1003 at ¶397. Petitioner's expert proposes that Takane's software could be added to Watanabe's control program, without requiring additional circuitry. EX. 1003 at ¶¶380, 386, 389, 390.

Petitioner's expert is using hindsight bias. *See W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983) ("The result is that the claims were used as a frame, and individual, naked parts of separate prior art references were employed as a mosaic to recreate a facsimile of the claimed invention. At no point did the [Petitioner], explain why that mosaic would have been obvious to one skilled in the art.").

Petitioner fails to appreciate that adding this software to Watanabe's control program would significantly increase power consumption by the CPU.

Additionally, Petitioner fails to explain how this additional functionality would not require additional circuitry. For example, Petitioner fails to establish that Watanabe's circuit 56, the alleged digital signal processor, is capable of incorporating this additional functionality.

Moreover, the proposed combination would change Watanabe's principle of operation. As discussed further below, Takane teaches storing correction parameters in circuits 56 and 58 and does not use a separate table as disclosed in Watanabe.

2. Petitioner fails to meet its burden with respect to claims 10 and 18

Petitioner relies on circuit 56 of Watanabe as corresponding to the claimed digital signal processor. Petition at 15 and 29. Petitioner specifically relies on the functionality of Takane's signal processing circuit 50, added to Watanabe's circuit 56. Petition at 48.

Takane discloses the signal processing circuit 50 inputs digital image data from the A/D converter, processes the data, e.g., white balance adjustment, gamma correction, sharpness correction, and converts the RGB data into a YC signal. EX. 1009 at [0044]. The output of circuit 50 is connected to the dynamic image signal processing circuit 52 and the still image signal processing circuit 54. EX. 1009 at [0044]-[0045]. The signal processing circuit 52/54 converts the gradation such that

the image size becomes a predetermined image size set in advance. EX. 1009 at [0047]. Then, the data is input to the first distortion correction circuit 56 or the second distortion correction circuit 58. EX. 1009 at [0053].

Petitioner does not allege that Takane's circuit 50 corresponds to the claimed digital signal processor.¹⁴ Petitioner fails to explain why a POSA would be motivated to implement the functionality of Takane's circuit 50 into Watanabe's circuit 56.

Additionally, Petitioner fails to explain *how* Takane performs, *e.g.*, white balance adjustment, gamma correction, or sharpness correction. Petitioner therefore fails to explain that incorporating Takane's teachings into Watanabe would have been within the ordinary skill of a POSA.

3. Petitioner fails to meet its burden with respect to claims 28 and 30

Petitioner analysis is unclear. Petition at 49-50. To Patent Owner's best understanding, Petitioner is relying on the functionality of Takane's circuits 56/58 incorporated into Watanabe's circuit 56, the alleged digital signal processor, by way of adding instructions to Watanabe's control program.

¹⁴ Notably, in Ground 8, Petitioner relies on Takane's first distortion correction circuit 56 as corresponding to the claimed digital signal processor.

Petitioner alleges that Takane describes correcting pin-cushion and barrel distortions and cites only to paragraph 5 of Takane for support. Petition at 49-50. Takane discloses that for pin-cushion and barrel distortions, it is known that the amount of distortion (amount of displacement) is determined in accordance with the distance from the optical center. EX. 1009 at [0005].

To the extent Petitioner is relying on the first distortion correction circuit 56 or the second distortion correction circuit 58, Petitioner's analysis of claims 28 and 30 is insufficient. Petitioner does not address how these circuits 56/58 of Takane function or how they would be implemented in Watanabe's system.

Takane teaches the first distortion correction circuit 56 can carry out processing at a low correction accuracy. EX. 1009 at Abstract, [0061], [0115]. The first distortion correction 56 carries out processing when the release button 18A is depressed halfway for a "preview display." EX. 1009 at [0091]; *see also* EX. 1009 at [0117]. Watanabe does not disclose depressing a release button only halfway for a preview display. Petitioner does not explain how Takane's teachings could be incorporated into Watanabe.

Takane teaches the second distortion correction circuit 58 can carry out processing at a high correction accuracy. EX. 1009 at Abstract. The second distortion correction 58 carries out processing when the release button 18A is fully depressed at the time of "actual photographing." EX. 1009 at [0092], [0117].

Unlike the first distortion circuit 56, the second distortion circuit 58 will correct optical distortion in both the horizontal and vertical directions. EX. 1009 at [0094]. Takane’s teachings are not properly combinable with Watanabe because it would change Watanabe’s principle of operation, specifically with respect to tables 70.

As noted by Petitioner, Takane explains that correction parameters are set in advance and *stored in the correction circuits themselves*. Petition at 54; *see also* EX. 1003 at ¶497 (“Takane stores correction parameters ‘in advance’ in first distortion correction circuit 56 based on the lens and focal length”).

A POSA would not be motivation to incorporate Takane’s teachings into Watanabe’s system, which uses correction values in tables 70.

F. GROUND 5: WATANABE + HISAMATSU FAILS

Ground	Reference(s)	Claim(s)
5	Watanabe + Hisamatsu	22-23, 25

Petitioner states that Watanabe does not disclose correcting spherical, chromatic, or coma aberrations. Petition at 50. Petition thus relies on Hisamatsu.

Petitioner and its expert provide only a conclusory analysis in Ground 5. This is not sufficient to meet Petitioner’s burden. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016)(“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The

petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness”).

Like Watanabe, as discussed above in section IV.A, Hisamatsu expressly relates to a “still camera.” Hisamatsu at [0002], [0005]. Neither Watanabe nor Hisamatsu disclose a video camera as claimed.

Hisamatsu discloses an “arithmetic operation unit” that performs “data arithmetic operation processing.” Hisamatsu at [0005], [00019]. However, Petitioner fails to identify where Hisamatsu discloses *how* to correct spherical, chromatic, or coma aberrations. *See also* EX. 1003 at ¶¶408-420. Regardless of whether spherical, chromatic, or coma aberrations were known, Petitioner does not establish that Hisamatsu discloses *how* to correct these aberrations. For example, Petitioner does not describe or otherwise explain the “data arithmetic operation processing” for correcting these aberrations. Hisamatsu, [0019].

G. GROUND 6: WATANABE + TURNER FAILS

Ground	Reference(s)	Claim(s)
6	Watanabe + Turner	24

Petitioner states that Watanabe does not disclose correcting light scattering. Petition at 51. Petitioner thus relies on Turner.

Turner explains “[l]ight scattering effects are removed from the corrected image frame based upon characteristics of the digital sensor.” EX. 1011 at Abstract. In Watanabe, Petitioner alleges that the CCD 53 corresponds to the claimed digital sensor. Petition at 14. Watanabe does not discuss correction values based on the characteristics of CCD 53. Instead, Watanabe discloses tables based on lens type, for example, lens 51. Petitioner fails to explain how a POSA would incorporate the teachings of Turner into Watanabe’s system.

Petitioner’s expert cites to paragraphs 2, 4-6, and 10 of Turner as support. EX. 1003 at ¶¶421-426. These generic paragraphs reference “light scattering” but do not explain *how* Turner corrects light scattering aberrations. Petitioner therefore fails to meet its burden.

Petitioner cannot allege that implementing Turner’s corrections in Watanabe’s system was within a POSA’s ordinary skill without explaining what Turner’s corrections are and how they are performed. The burden does not shift to Patent Owner. Petitioner fails to specifically cite the relied upon teachings of Turner and how they are properly combinable with Watanabe’s system. There are

additional inputs required for Turner's corrections, which a POSA reading Watanabe would not be motivated to incorporate.¹⁵

Neither Petitioner nor its expert cite support in alleging that the programming to implement Turner's corrections in Watanabe's system was within the POSA's ordinary skill. Petition at 52. EX. 1003 at ¶426.

H. GROUND 7: WATANABE + LIEGE FAILS

Ground	Reference(s)	Claim(s)
7	Watanabe + Liege	26

Petitioner states that Watanabe does not disclose correcting astigmatism aberrations. Petition at 53. Petitioner thus relies on Liege.

¹⁵ For example, Turner requires selecting a stable region of interest in a received image frame. EX. 1011 at FIG. 3 (block 154); [0020] and [0021]. It is unclear from Turner whether a user or some component performs this selecting. Then, Turner receives a plurality of image frames when the sensor is exposed to dark and light conditions, *e.g.*, placing a lens cover over the sensor to generate a dark condition. *See* EX. 1011 at Abstract, [0019].

1. Petitioner fails to appreciate the astigmatism disclosed in Liege

Liege discusses an “appliance chain” where the system corrects/modifies defects introduced by each appliance in the chain. EX. 1012 at 30:18-20.

There is formatted information 15 representing the defects of each appliance. EX. 1012 at 31:41-45. For example, formatted information for APP.1 through APP.n is represented as 15.1 through 15.n. EX. 1012 at 31:49-54.

Notably, Liege discloses that the observer (*e.g.*, the photographer) is an appliance. EX. 1012 at 8:19-36 (“Within the meaning of the invention, an appliance can be in particular... a human being having vision defects, such as astigmatism.”); *see also* EX. 1012 at 9:49-52 (explaining appliance chain P3 includes at least one observer). **Liege refers to astigmatism of an observer, not astigmatism aberration in an image.**

Liege discloses that preferably: “the method is more particularly designed to modify the visual quality of the image for an observer” where the formatted information is “related to the vision characteristics of the observer, especially functional anomalies of the eyes and/or of the brain of the observer.” EX. 1012 at 4:13-19; *see also* EX. 1012 at 36:21-25 (“to correct vision defects (such as astigmatism) of an observer 701”).

Petitioner thus fails to meet its burden with respect to claim 26 which recites “astigmatism aberrations.”

2. A POSA would not be motivated to use Liege’s teachings because they are highly inefficient and require a great deal of processing power

Further, a POSA would not be motivated to incorporate the teachings of Liege because it would require high processing power for multiple processes. As shown and described in FIG. 13A of Liege, image-processing operators 23.1 through 23.n process the images based on modified formatted information 15.1’ through 15.n’ respectively. EX. 1012 at 32:15-23; *see also* EX. 1012 at 34:47-56. Image-processing operator 23.1 processes the image based on modified formatted information 15.1’ and provides a modified image, which is then processed by each operator 23.2 through 23.n in a similar fashion. *Id.*

Thus, there are “n” number of operators 23 that each produce a modified image based on the defects of each appliance. This is contrary to the claimed inventions of the ’685 Patent.

3. Petitioner fails to explain how a POSA would implement Liege’s operators in Watanabe’s system

There are multiple operators involved in Liege. As described with respect to FIG. 13A of Liege, there are operators 20.1-20.n, operators 21.1-21.n, operators

22.1-22.n, and operators 23.1-23.n which each play an important role in the correction process.

Petitioner does not explain how the functionality of operators 20.1-20.n, or operators 21.2-21.n, or operators 22.1-22.n, or operators 23.1-23.n of Liege would be combined with Watanabe's system. In fact, Watanabe expressly teaches away from prior art where "process data need[s] to be transmitted between apparatuses and consequently the process becomes complicated." EX. 1005 at [0008]. As such, a POSA would not be motivated to combine Watanabe and Liege.

To the extent Petitioner is arguing that operators 23.1-23.n correspond to Watanabe's circuit 56, the alleged digital signal processor, Liege expressly states that operators 23.1-23.n do not modify the image based on formatted information 15.1-15.n, but rather based on modified formatted information 15.1'-15.n' provided by the operators 21.1-21.n and 22.1-22.n.

To the extent Petitioner is arguing that Watanabe's table 70 would include formatted information 15.1-15.n, which is not sufficient to perform image processing based on the teachings of Liege, because the operators 23.1-23.n require modified formatted information 15.1'-15.n'.

Ultimately, Petitioner fails to explain these implementation details of Liege's teachings. Petitioner fails to establish a POSA would be motivated to combine Watanabe and Liege or that doing so would be within the ordinary skill of a POSA.

I. GROUND 8: TAKANE + WATANABE FAILS

Ground	Reference(s)	Claim(s)
8	Takane + Watanabe	1-2, 6-7, 10, 12, 14-15, 17-18, 27-28, 30

Patent Owner expressly incorporates the arguments as to the disclosures of Watanabe and Takane disclosure in Grounds 1 and 4 herein.

Takane expressly distinguishes the first and second distortion correction circuits 56 and 58.

The first distortion correction circuit 56 can carry out processing at a low correction accuracy. EX. 1009 at Abstract, [0061], [0115]. The first distortion correction 56 carries out processing when the release button 18A is depressed halfway for a “preview display.” EX. 1009 at [0091]; *see also* EX. 1009 at [0117].

“The correction accuracy is intentionally lowered, and the processing time can be shortened and the circuit structure of the first distortion correction circuit 56 can be made simple.” EX. 1009 at [0061]. For example, in the described embodiment, “only the distortion in the horizontal direction is corrected at the first distortion correction circuit 56.” EX. 1009 at [0062]; *see also* EX. 1009 at [0080] (“Correction of the optical distortion is carried out at the relatively low correction accuracy of only horizontal direction correction, by the first distortion correction circuit 56.”); *see also* EX. 1009 at [0102](“...correction processing is carried out

by the first distortion correction circuit 56 such that the optical distortion in the horizontal direction is corrected.”).

The second distortion correction circuit 58 can carry out processing at a high correction accuracy. EX. 1009 at Abstract. The second distortion correction 58 carries out processing when the release button 18A is fully depressed at the time of “actual photographing.” EX. 1009 at [0092], [0117].

In contrast, the parameters stored in the second distortion correction circuit 58 give priority to the quality of each image and provide a high correction accuracy. EX. 1009 at [0063]. Unlike the first distortion circuit 56, the second distortion circuit 58 will correct optical distortion in both the horizontal and vertical directions. EX. 1009 at [0094].

1. Petitioner fails to meet its burden with respect to “a digital signal processor”

Petitioner relies on the first distortion correction circuit 56 of Takane as corresponding to the claimed “digital signal processor.” *See, e.g.*, Petition at 60-63. For at least the same reasons discussed above in section IV.E, Petitioner fails to establish that Takane’s first distortion correction circuit 56 is a digital signal processor.

2. *Petitioner fails to meet its burden with respect to a “database” and a “database management system”*

Petitioner relies on Watanabe for a “database” and a “database management system.” Petition at 56. For at least the same reasons discussed above in section IV.A, Petitioner fails to meet its burden in Ground 8.

Petitioner argues that a POSA would have been motivated to modify the teachings of Takane by storing Watanabe’s correction parameters for each image size, lens, focal length, and zoom position in Takane’s ROM 22. Petition at 57. Petitioner argues that Takane as modified would use Watanabe’s teachings to retrieve parameters from the database and load them into the distortion correction circuits. Petition at 57. Petitioner is using hindsight bias. Petitioner’s proposed modification changes Takane’s principle of operation.

First, a POSA would not be motivated to store correction parameters in the external ROM 22 as opposed to in the correction circuits 56/58. Takane’s ROM 22 is described as an **external** ROM. EX. 1009 at FIG. 1. The external ROM 22 may, for example, store bitmap data to be superposed on the subject and displayed on the LCD 16. EX. 1009 at [0070]-[0071]. The OSD (on screen display) 62 function displays various types of menus, mode mark, date, etc. such that they may be superposed on the subject and displayed on the LCD 16. *Id.*

Instead of using the external ROM 22, Takane explains that correction parameters are set in advance and stored in the correction circuits themselves. EX. 1009 at [0054] (“Parameters expressing a polynomial... are stored in advance in each of the first distortion correction circuit 56 and the second distortion circuit 58....”). Petitioner admits that Takane discloses storing correction parameters in the first distortion correction circuit 56 and second distortion correction circuit 58. Petition at 54 (citing Takane at [0054]); *see also* EX. 1003 at ¶497.

Petitioner argues a POSA would be motivated to use external ROM 22 for “simplified and streamlined access.” Petition at 57. However, Takane’s correction parameters are already stored in circuits 56 and 58 and moving the correction parameters to an external ROM would not provide simplified and streamlined access for circuits 56 and 58.

Second, a POSA reading Takane would not be motivated to add additional correction parameters for processing by the first distortion correction circuit 56, which purposefully uses fewer parameters and provides lower accuracy. Takane explains that “at the first distortion correction circuit 56, the image size which is the object of correction is fixed, and the number of parameters which must be held is lower than in a case in which a plurality of image sizes are objects of processing.” EX. 1009 at [0059]. Petitioner’s expert similarly testifies that the first distortion correction circuit 56 “corrects at lower accuracy, to be used only for low-

quality video in cameras with low processing capability.” EX. 1003 at ¶385.

Therefore, a POSA would not be motivated to increase corrections at Takane’s first distortion correction circuit 56.

Third, Petitioner does not explain how correction values stored in tables 70 of Watanabe could be used with Takane. Watanabe makes clear that the process information (lens type, focusing point, zoom position) is used to determine a table and then a correction value. Petitioner does not explain the different functionality of the “imaging processing program” and the “photographing program” of Watanabe, where it is the “photographing program” that appends the process information to the image data and it is the “imaging processing program” that performs imaging processing. *See, e.g.*, EX. 1005 at FIG. 4.

Takane does not disclose separate imaging processing versus photographing programs, the transfer of process information, or the reference to tables for correction values. Instead, Takane simply stores correction parameters in Takane’s correction circuits.

Fourth, even if the correction parameters were stored in external ROM 22 instead of circuit 56, Takane does not disclose a database management system. Accessing the correction parameters would be a simple lookup operation. Additionally, there is nothing to suggest that the correction parameters would be, for example, updatable.

In view of the above, the teachings of Takane and Watanabe are not properly combinable, and Petitioner fails to meet its burden.

3. *Petitioner fails to meet its burden with respect to “a digital signal processor configured to access a database management system”*

For at least the reasons discussed above, because the correction parameters are stored in circuits 56 and 58 of Takane, circuit 56 is not configured to access a database management system. A POSA would not be motivated to modify Takane’s circuit 56 to do so.

Additionally, Petitioner argues that, as modified, Takane’s “control routine” and “sub-routine” would access the alleged database management system based on the teachings of Watanabe. Petition at 56-57, 60. However, Petitioner fails to establish that Takane’s circuit 56 is configured to access the alleged database management system based on the teachings of Watanabe, which is heavily dependent on CPU 57. *See infra*, section IV.A. Petitioner’s proposed modification changes Takane’s principle of operation.

4. *Petitioner’s analysis is inconsistent with respect to claim 10*

Petitioner’s analysis for claim 10 is inconsistent with claim 6 from which claim 10 depends.

In claim 6, Petitioner relies on Takane's first distortion correction circuit 56 as corresponding to the claimed "digital signal processor." Petition at 64.

In claim 10, Petitioner relies on Takane's signal processing circuit 50 as corresponding to the claimed "digital signal processor." EX. 1003 at ¶528.

V. CONCLUSION

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

Respectfully submitted,

Date: August 29, 2024

By: /s/ Thomas M. Dunham

Thomas M. Dunham

Reg. No. 39,965

Cherian LLP

1901 L Street NW, Suite 700

Washington, D.C. 20036

(202) 838-1567

ATTORNEY FOR PATENT OWNER,
OPTIMUM IMAGING TECHNOLOGIES
LLC

CERTIFICATE OF COMPLIANCE

This Patent Owner Preliminary Response (“POPR”) consists of 13,255 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).

Respectfully submitted,

Date: August 29, 2024

By: /s/ Thomas M. Dunham

Thomas M. Dunham

Reg. No. 39,965

Cherian LLP

1901 L Street NW, Suite 700

Washington, D.C. 20036

(202) 838-1567

ATTORNEY FOR PATENT OWNER,
OPTIMUM IMAGING TECHNOLOGIES
LLC

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 Petitioner, at the following email addresses:

SMcKeown-PTAB@WolfGreenfield.com

AWichman-PTAB@WolfGreenfield.com

RPritzker-PTAB@WolfGreenfield.com

Respectfully submitted,

Date: August 29, 2024

By: /s/ Thomas M. Dunham

Thomas M. Dunham

Reg. No. 39,965

Cherian LLP

1901 L Street NW, Suite 700

Washington, D.C. 20036

(202) 838-1567

ATTORNEY FOR PATENT OWNER,
OPTIMUM IMAGING TECHNOLOGIES
LLC