

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY CORPRATION,
Petitioner,

v.

OPTIMUM IMAGING TECHNOLOGIES, LLC,
Patent Owner.

IPR2024-00924
Patent 7,612,805 B2

Before JOHN F. HORVATH, GARTH D. BAER, and
RUSSELL E. CASS, *Administrative Patent Judges*.

CASS, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

Sony Corporation (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–3, 9, 18–20, and 24 of U.S. Patent No. 7,612,805 B2 (Ex. 1001, “the ’805 patent”). Paper 2 (“Pet.”), 2. Optimum Imaging Technologies, LLC (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). We have jurisdiction and authority under 35 U.S.C. §§ 6, 314 and 37 C.F.R. § 42.4.

Upon consideration of the Petition and Preliminary Response, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of at least one challenged claim of the ’805 patent. Accordingly, we institute *inter partes* review of all challenged claims on all grounds raised.

B. Real Parties-in-Interest

Petitioner identifies itself as the real party-in-interest. Pet., xiii. Patent Owner identifies itself as the real party-in-interest. Paper 4, 1; Paper 6, 1.

C. Related Matters

Petitioner and Patent Owner identify numerous related patents, patent applications, *inter partes* reviews, and district court proceedings that can affect or be affected by this proceeding, including *Optimum Imaging Techs., LLC v. Sony Corp.*, 4:23-cv-00928 (EDTX) (the “district court proceeding”). See Pet., xi; Paper 4, 2; Paper 6, 2.

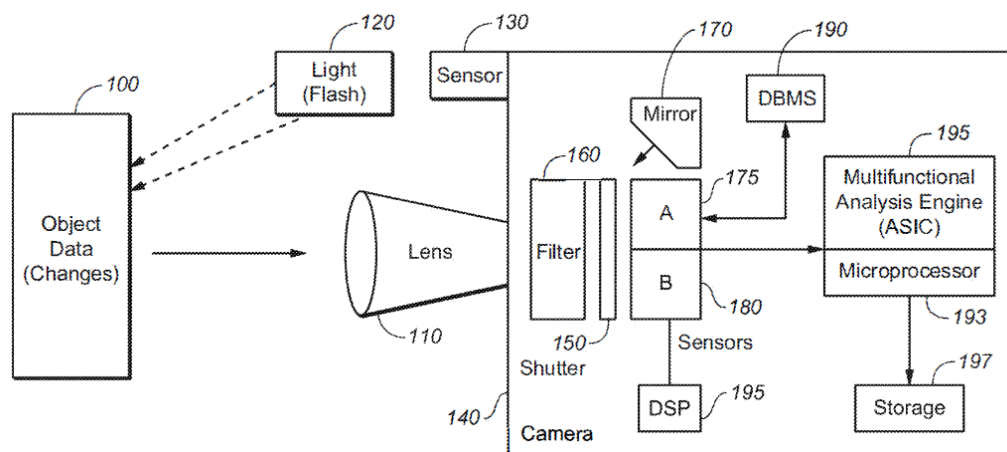
D. The ’805 Patent

The ’805 patent is directed toward an apparatus for “optical image collection, electronic organization and optimization of digital data using integrated circuits and software” with applications in “still and video

photography” as well as in “copying and scanning technologies.” Ex. 1001, 1:24–30. The apparatus provides “electronic methods to optimize optical processing, the digital capture of light and post-capture image organization.”

Id. at 1:16–18.

Figure 1 of the patent is reproduced below.



The figure “illustrates the overall structure of the system.” *Id.* at 29:52.

Digital camera 140 includes, *inter alia*, lens 110, sensors 175/180, DBMS 190,¹ digital signal processor (DSP) 195, microprocessor 193, ASIC (application specific integrated circuit) 195, and storage 197. *Id.* at 29:59–30:3, Fig. 1. Light from object 100 is focused by lens 110 onto at least one of the sensors 175/180. *Id.* at 29:58–60. The sensors are connected to ASIC 195 and/or microprocessor 193, which “process the [recorded] image and control the camera.” *Id.* at 29:66–30:1. “The digital image data is passed from the digital sensor to either the ASIC or microprocessor and then stored in memory.” *Id.* at 30:1–3.

¹ Although Figure 1 identifies element 190 as a DBMS or database management system, the patent identifies element 190 as a database. See Ex. 1001, 29:65.

The patent explains that every optical “lens with a unique optical formula will have specific aberrations, the corrections for which will be accessible in a database.” *Id.* at 11:13–15. Thus, when taking a picture, the camera “identifies a specific lens and refers to a database that matches the lens type with [its] specific aberrations.” *Id.* at 10:49–51. “After a specific lens type is identified (500) and a database is referenced (510), the lens type is matched with the specific optical aberrations (520)” and the DSP acts as a “digital filter [that] applies a correction to specific optical aberrations (530).” *Id.* at 30:44–47, Fig. 5. The digital filter “employ[s] the DSP hardware as well as specific software.” *Id.* at 31:1–3. It can make an image sharper, for example, by obtaining its frequency spectrum via Fast Fourier Transform (FFT), “differentiating the frequency spectrum,” and emphasizing the sharper, higher frequency components “by limiting the low frequency, as in a high pass filter.” *Id.* at 31:11–19.

This sequence of lens aberration correction steps is shown in Figure 7, which is reproduced below.

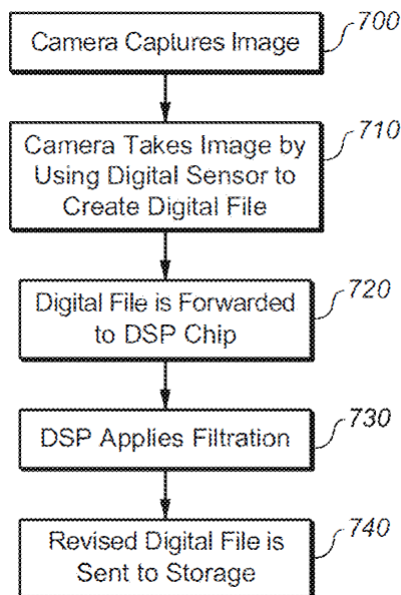


Figure 7 “is a flow chart of the process of digital image capture, processing, and storage.” *Id.* at 8:50–51. The camera “uses a digital sensor to create a digital file (710), the digital file is forwarded to the digital signal processor . . . (720),” which “applies the filtration (730) to correct the optical aberrations from the lenses,” and “[t]he revised digital file is then sent to storage (740).” *Id.* at 30:62–67.

E. Illustrative Claim

Claims 1, 9, 18, and 24 are independent, and claims 2, 3, 19, and 20 depend directly or indirectly from them. Ex. 1001, 36:49–41:33. Claim 9, which is illustrative of the challenged claims, is reproduced below.

9. A digital imaging system for image filtration comprising:

a digital camera mechanism, an optical lens mechanism, a digital sensor, a microprocessor, a digital signal processor, an application specific integrated circuit, system software, a database management system and a memory storage sub-system;

wherein the aberrations from the optical lens mechanism are corrected by applying digital filtration by using the application specific integrated circuit and the digital signal processor;

wherein the microprocessor is used to provide digital and optical data to the digital signal processor;

wherein the system software is organized to identify specific optical aberrations and to access the database to identify specific corrections to the aberrations;

wherein the system software forwards the data from the digital sensor to the digital processor;

wherein the digital signal processor selects a specific procedure to optimize the image and corrects the aberrations;

wherein the lens type is a zoom lens;

wherein the lens focal length alternates from specific fixed focal length lens settings in a succession of steps;

wherein optical aberrations are corrected with digital filtration to modify multiple images from different focal lengths in a succession of data files; and

wherein the modified data file consisting of the digital data optimized from the aberrations that are corrected from the original optical image is stored in memory.

Id. at 38:1–31.

F. Evidence

Reference		Effective Date	Exhibit
Watanabe	US 2005/0280877 A1	Dec. 22, 2005	1005
Russ	John C. Russ, <i>The Image Processing Handbook</i> , CRC Press, 4th ed. 2002	Jul. 26, 2002	1054
Takane	US 2003/0223007 A1	Dec. 4, 2003	1009

Petitioner also relies upon the Declaration of Leonard Laub. Ex. 1003.

G. Asserted Grounds

Petitioner asserts the challenged claims are unpatentable on the following grounds:

Ground	Claims	35 U.S.C. §	References
1	9, 24	103	Watanabe
2	1–3, 18–20	103	Watanabe, Russ
3	9, 24	103	Takane, Watanabe
4	1–3, 18–20	103	Takane, Watanabe, Russ

II. ANALYSIS

A. Discretionary Denial

We have discretion to deny a petition for *inter partes* review. *See* 35 U.S.C §§ 314(a), 325(d) (“In determining whether to institute or order a proceeding under . . . chapter 31, the Director may take into account

whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.”); *SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 366 (2018) (“[Section] 314(a) invests the Director with discretion on the question whether to institute review” (emphasis omitted)); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”);

1. § 314(a)

Petitioner has provided Patent Owner with a so-called *Sotera*² stipulation, stating “if IPR Nos. IPR202400923–00925, & 01046 are instituted, Sony will not pursue ‘any ground that [Sony] raised or reasonable could have raised’ during the IPRS in the related district court proceeding, *Optimum Imaging Technologies LLC v. Sony Corporation*, 4:23-cv-00928 (EDTX).” Ex. 2015. Per the Director’s guidance, “the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” *Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation* (June 21, 2022) (“Fintiv Memo”), 3.

Patent Owner does not specifically set forth an argument for discretionary denial under § 314(a), but argues that Petitioner’s stipulation “goes against the interests of fairness and efficiency” because it was not “submitted with the petitions or, at a minimum, prior to the filing of the

² *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB, Dec. 1, 2020) (precedential).

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POPR in IPR2024-00923.” Prelim. Resp. 43. Patent Owner also contends that “[a]llowing [P]etitioner[] to make a belated stipulation thwarts the policy objectives outlined in the [Fintiv Memo], including to ‘limit unnecessary and counterproductive litigation costs’ and to minimize ‘inefficiency and gamesmanship in AIA Proceedings.’” *Id.* at 44 (citing Fintiv Memo at 1). Patent Owner asserts that “[i]f the Board were to reject Petitioner’s belated stipulation, the Board would understand that the *Fintiv* factors overwhelmingly favor denial of institution.” *Id.*

The Fintiv Memo does not provide any deadlines by which a *Sotera* stipulation must be provided. Accordingly, in view of Petitioner’s *Sotera* stipulation, we do not exercise our discretion to deny institution under § 314(a).

2. Request for §325(d) Denial

Patent Owner requests discretionary denial, presumably pursuant to 35 U.S.C. § 325(d), in view of the Office’s previous consideration of requests for *inter partes* review of related patents. Prelim. Resp. 5–7.

The Board has set forth a two-part framework to consider whether to exercise discretion to deny institution under § 325(d):

- (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office;
- and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GMBH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). The

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Board considers *Becton, Dickinson*³ factors (a), (b), and (d) to determine whether “the same or substantially the same art or arguments previously were presented to the Office,” and if so, considers factors (c), (e), and (f) to determine “whether the petitioner has demonstrated a material error by the Office.” *Id.* at 10.

Patent Owner argues that Watanabe and Russ were previously presented to the Office in IPR2020-01321, addressing the same patent as the patent at issue here, and IPR2020-01322, challenging a related patent. Prelim. Resp. 5–6. Patent Owner further argues the rationales for relying on “Watanabe as a primary reference” and “Russ as secondary reference” in the previous IPRs were substantially the same as Petitioner’s rationale for relying on that art in this proceeding. *Id.* Thus, Patent Owner argues that we should deny institution of this IPR, or, at minimum, that “Ground 1 based on Watanabe and Ground 2 based on Watanabe + Russ do not justify institution.” *Id.* at 6.

Turning to step 1 of *Advanced Bionics*, Patent Owner shows that the Board previously considered Watanabe and Russ, but does not argue that the Board considered Takane. Therefore, Patent Owner has not shown that the same or substantially the same art relied on in Grounds 3 and 4 was previously presented to the office. Patent Owner also does not contend that Watanabe, Russ, or Takane were considered during prosecution of the ’805 patent. Consequently, we find that step 1 of *Advanced Bionics* is not satisfied for Grounds 3 and 4.

³ *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first para.).

For Grounds 1 and 2, for which step 1 of *Advanced Bionics* has been satisfied, we consider under step 2 *Becton, Dickenson* factors (c), (e), and (f) to determine “whether the petitioner has demonstrated a material error by the Office.” *Advanced Bionics*, Paper 6 at 10. Factor (c) “focuses on the record developed by the Office in previously reviewing art or arguments” and informs “the petitioner’s showing under factors (e) and (f).” *Id.* Factor (e) considers whether the petitioner has sufficiently shown how the Office erred in its prior consideration of the prior art and factor (f) considers the extent to which the facts and evidence in the Petition warrant reconsideration of the prior art. *Becton, Dickenson*, Paper 8 at 24–25.

The Office’s record of its previous consideration of Watanabe, Russ, and the merits of the challenges presented in IPR2020-01321 and IPR2020-01322 (the latter involving different claims in a different, but related, patent) is limited. In denying IPR2020-01321 and IPR2020-01322, the Office stated, without elaboration, that its review of the merits in those proceedings did not “outweigh the other *Fintiv* factors favoring denial of institution,” such as the imminent trial date of a related district court proceeding. *See Canon Inc. v. Optimum Imaging Techs. LLC*, IPR2020-01321, Paper 10 at 5, 11 (PTAB Mar. 1, 2021); *Canon Inc. v. Optimum Imaging Techs. LLC* IPR2020-01322, Paper 9 at 5–6, 11 (PTAB Mar. 1, 2021). But there is no discussion of the actual merits, e.g., whether Canon had shown that one or more claims were likely unpatentable over the references at issue. *Id.* Additionally, Watanabe and Russ were not cited during prosecution of the ’805 patent, so there was no discussion of those references during prosecution.

In such cases, i.e., when “the record of the Office’s previous consideration of the art is not well developed or silent . . . a petitioner may

show the Office erred by overlooking something persuasive under factors (e) and (f).” *Advanced Bionics* at 10. For the reasons discussed below, Petitioner demonstrates a reasonable likelihood of showing at least some of the challenged claims are unpatentable over Watanabe. Therefore, the Petition as a whole presents sufficient evidence that the Examiner erred in not rejecting those claims over Watanabe. Given the Petition’s merits, we also find that the prior IPRs, which did not include any substantive analysis of the unpatentability challenges, do not warrant discretionary denial under step 2 of *Advanced Bionics*.

Accordingly, for the reasons discussed above, we decline to exercise our discretion to deny institution under 35 U.S.C. § 325(d).

B. Level of Ordinary Skill in the Art

Petitioner identifies a person of ordinary skill in the art (“POSITA”) at the time of the invention as someone that 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.” Pet. 7 (citing Ex. 1003 ¶¶ 49–58). Patent Owner disputes this, arguing the district court has already found a person of ordinary skill in the art would have had “an electrical engineering degree and three years of relevant experience” and that this definition “should be adopted for purposes of institution.” Prelim. Resp. 7 (quoting Ex. 1027, 6). Patent Owner further argues that—should we adopt the district court’s definition—Petitioner’s declarant “is not qualified to offer expert testimony” in this proceeding because he “does not have a degree in electrical engineering.” *Id.* at 8 (citing Ex. 1004, 6).

“[T]he level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention.” *Okajima v.*

Bourdeau, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The Board may consider such factors as the types of problems encountered in the art, prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of workers in the field when determining the level of skill in the art. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

As noted above, the '805 patent describes a system for digital optical image collection, processing, and organization, which applies to “any imaging system that includes interactions between optics, digital image sensors, post-capture integrated circuits and digital storage components.” Ex. 1001, 1:21–24. Artisans and inventors in such fields are not limited to electrical engineers. They include physicists and others with sufficient knowledge of the physics of optical, electronic, and opto-electronic devices. Indeed, many of the pioneering inventions needed to understand the operation of a digital camera were made by physicists, including the inventions of the transistor,⁴ the integrated circuit (IC),⁵ the digital computer,⁶ and the charge-coupled device (CCD).⁷ For at least these reasons, we find Petitioner’s assessment of the level of skill in the art to be reasonable and commensurate with the problems and solutions disclosed in the prior art. *In re GPAC Inc.*, 57 F.3d at 1579.

Accordingly, at this stage of the proceeding, we adopt as our own Petitioner’s description of a person skilled in the art. We further find

⁴ Julius Edgar Lilienfeld (field-effect transistor) John Bardeen, Walter Brattain, William Shockley (point-contact transistor), William Shockley (bipolar transistor).

⁵ Robert Noyce (monolithic integrated circuit)

⁶ John Atanasoff and Clifford Berry (electronic digital computer)

⁷ George Smith and Willard Boyle (charge-coupled device)

Petitioner's declarant, who (a) has a bachelor's degree in physics as well as post-graduate education in physics and optics, (b) is a member of the Optical Society of America and the Institute of Electrical and Electronic Engineers, and (c) has extensive work experience in signal processing, imaging systems, optical information recording, and electro-optical system design and manufacturing, is a person having at least ordinary skill in the art. Ex. 1004, 5–6. He is therefore competent to provide testimony in this proceeding.

C. Claim Construction

In *inter partes* reviews, we interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b) (2019). Under this standard, a claim is construed “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.* However, only claim terms which are in controversy need to be construed and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Petitioner argues the following terms or phrases require construction: “using,” “succession,” and “wherein the system software is organized to identify specific optical aberrations and to access the database to identify specific corrections to the aberrations” (the “identifying aberrations” limitation). Pet. 7–8. Patent Owner argues that we should use the plain meaning of these terms and phrases and that they need not be construed because no patentability arguments rely on their precise meaning. Prelim. Resp. 8–10.

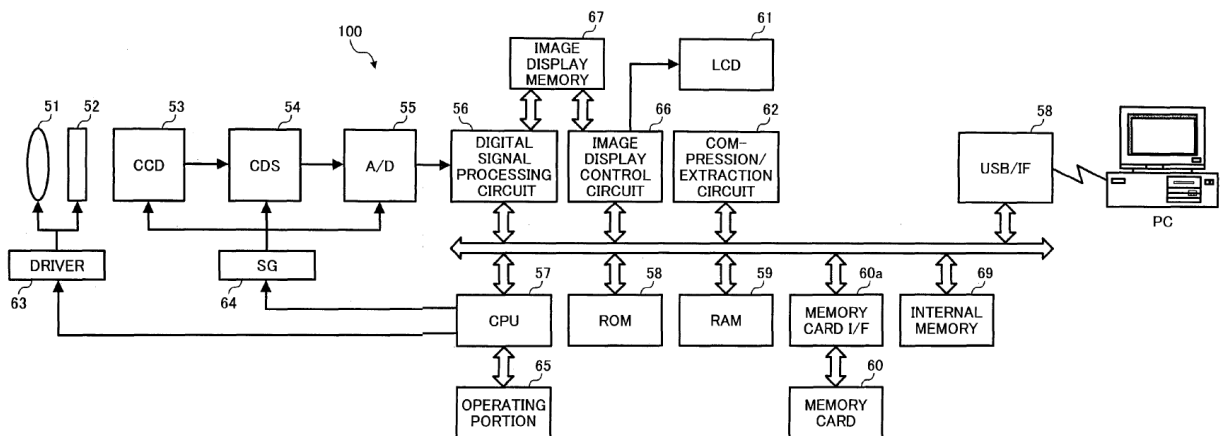
At this stage of the proceeding, we decline to construe any of Petitioner’s proposed terms and phrases because their precise meaning is not needed to resolve the parties’ disputes. We discuss below the meaning of other terms whose meanings are inherently disputed by the parties’ competing patentability contentions in the context of those competing contentions.

D. Obviousness over Watanabe

Petitioner contends claims 9 and 24 would have been obvious over Watanabe. Pet. 7–27. Patent Owner disagrees, and argues that Petitioner’s arguments are deficient in a number of respects. Prelim. Resp. 11–27. At this stage of the proceeding, we find Petitioner demonstrates a reasonable likelihood of showing at least one of the challenged claims is obvious over Watanabe for the reasons discussed below.

1. Watanabe

Watanabe discloses “an image processing system capable of automatically and simply executing an image process such as distortion aberration correction or peripheral light intensity correction.” Ex. 1005 ¶ 2. This can be done, for example, in digital camera 100, illustrated in Figures 1A and 1B, whose combination is reproduced below.



The Figure above is a composite image of Watanabe's Figures 1A and 1B. It is a schematic illustration of digital camera 100 having, *inter alia*, lens 51, charge-coupled device 53, A/D (analog-to-digital) converter 55, DSP 56, CPU 57, ROM 58, and RAM 59. *Id.* ¶ 35, Figs. 1A, 1B.

Light passing through lens 51 is focused on CCD 53, which converts the light into an analog electrical signal that is subsequently converted into a digital signal by A/D converter 55. *Id.* ¶ 37, Figs. 1A, 1B. The digital signal is sent to DSP 56, which “executes various processes, correction and a data process for image compressing/extracting.” *Id.* ¶ 38. CPU 57 “controls operation of each part of the digital still camera” by way of a control program stored in ROM 58 that includes a “photographing” and an “image processing” program. *Id.* ¶ 42, Fig. 4. The two programs are complimentary, with the “photographing” program sending image data and processing information to the “image processing” program when image processing information is available. *Id.* ¶¶ 60–63, Fig. 4. The “image processing” program allows “distortion aberration correction or peripheral light intensity correction [to] be executed automatically and simply according to the process information added to the image data.” *Id.* ¶ 64.

A high-level illustration of how the “image processing” program uses image processing information to generate a corrected image is illustrated in Figure 3, which is reproduced below.

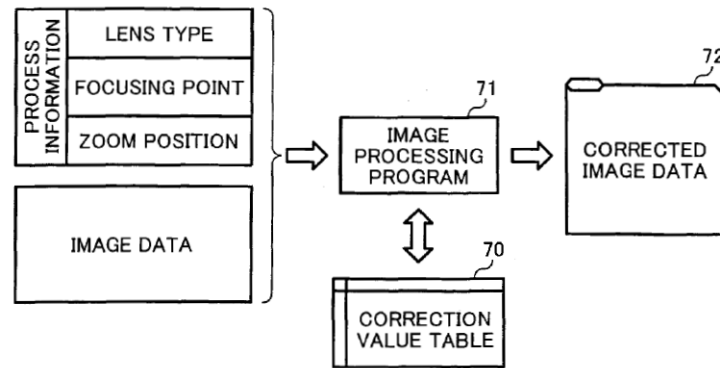


Figure 3 illustrates image processing program 71 generating corrected image data 72 from image data and image process information. *Id.*, Fig. 3. The image process information includes lens type, focusing point, and zoom position. *Id.* ¶ 47, Fig. 3. Correction value table 70 contains “distortion aberration correction values and peripheral light intensity correction values in accordance with focusing points and zoom positions . . . on a lens to lens basis.” *Id.* CPU 57, executing the image correction program, “determines a table according to a lens type and determines correction values according to a focusing point and a zoom position, and [corrected] image data 72 is obtained in compliance with the correction values.” *Id.* ¶ 47.

2. Claim 9

a) digital imaging system/digital camera mechanism

Claim 9 recites a digital imaging system for image filtration, comprising a digital camera mechanism. Ex. 1001, 38:1–3. Petitioner contends Watanabe teaches such a system/camera because it “describe[es] ‘an image recording apparatus and an image processing system’” that “applies image filtration by correcting optical image aberrations in digital images” and includes a CCD “that captures images, which are digitized.” Pet. 9 (quoting/citing Ex. 1005 ¶¶ 2, 32, 35, 37, Figs. 1A, 1B).

Patent Owner does not dispute this contention, with which we

preliminarily agree. Prelim. Resp. 11–27.

b) optical lens mechanism

Claim 9 further requires the digital imaging system to include an optical lens mechanism that is a “zoom lens” with a focal length that “alternates from specific fixed focal length lens settings in a succession of steps.” Ex. 1001, 38:3, 38:22–25. Petitioner contends Watanabe discloses a zoom lens by disclosing “correcting distortion ‘based on . . . zoom position for each lens.’” Pet. 13 (quoting/citing Ex. 1005 ¶¶ 35, 36, 47, 49, Figs. 1A, 3), 23. Petitioner further contends Watanabe suggests using a lens with a focal length that “alternates from specific fixed focal lens settings in a succession of steps” because one of ordinary skill “would understand that a zoom lens changes zoom positions such that images can be photographed at different magnifications.” *Id.* 24 (citing Ex. 1003 ¶¶ 208–11). According to Petitioner, Patent Owner “adopts a construction of ‘succession of steps’ as meaning that a zoom lens ‘successively move[s] through each zoom setting/position.’” *Id.* (citing Ex. 1032, 21–22). Petitioner also contends that “Watanabe describes a zoom lens that moves between multiple zoom positions, and Watanabe therefore describes a zoom lens that ‘successively move[s] through each zoom setting/position’” as the claim requires. *Id.* (citing Ex. 1005 ¶ 49; Ex. 1003 ¶¶ 66–68).

Patent Owner does not dispute this contention, with which we preliminarily agree. Prelim. Resp. 11–27.

c) digital sensor

Claim 9 further requires the digital imaging system to include a digital sensor. Ex. 1001, 38:3–4. Petitioner contends Watanabe discloses a digital sensor in the form of CCD 53 whose analog output is converted to digital via A/D converter 55. Pet. 10 (citing Ex. 1005 ¶¶ 35, 37, Fig. 1A; Ex. 1003

¶ 140). Petitioner further contends Watanabe's CCD 53 is a "digital" sensor because the '805 patent identifies CCDs as digital sensors even though they output analog signals. *Id.* (citing Ex. 1001, 13:63–15:4). Patent Owner does not dispute Petitioner's contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

d) microprocessor, system software

Claim 9 further requires the digital imaging system to include a microprocessor and system software. Ex. 1001, 38:4–6. Petitioner contends that Watanabe teaches these limitations because its camera includes CPU 57, and "because it 'stores programs' in read-only memory ('ROM')." Pet. 10–11 (citing Ex. 1005 ¶¶ 35, 38), 15 (citing Ex. 1005, 39, 42, Fig. 1B, Fig. 3). Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

e) digital signal processor, application specific integrated circuit

Claim 9 recites that the digital camera mechanism includes a "digital signal processor" (DSP) and an "application specific integrated circuit" (ASIC). Ex. 1001, 38:4–5. Claim 9 further requires that the digital signal processor: (1) corrects "aberrations from the optical lens mechanism" by "applying digital filtration using the application specific integrated circuit and the digital signal processor," and (2) "selects a specific procedure to optimize the image and correct[] the aberrations." *Id.* at 38:8–11, 38:19–21.

Petitioner argues that Watanabe includes a DSP 56. Pet. 10–11 (citing Ex. 1005 ¶¶ 35, 38, Fig. 1B). Petitioner also argues that ASIC's were known to be used in cameras for image processing, were off-the shelf components, and were known to have certain advantages, such as offloading labor-intensive operations, such as FFT operations, so that their higher speed hardware switching operations may be leveraged for repetitive tasks such as

aberration correction. Pet. 11–14 (citing Ex. 1026, 154–155; Ex. 1055, 1:65–2:4; Ex. 1079, 6:58–62, 21:54–57, 25:7–13; Ex. 1080, 9:28–47, 17:45–67, 24:48–25:3, 25:51–57; Ex. 1081, 7:48–8:23; Ex. 1003 ¶ 148–163).

Patent Owner argues that “Petitioner does not clearly identify the component of Watanabe that allegedly corresponds to the claimed ‘application specific integrated circuit’ (ASIC)” and that “[it] is not clear if Petitioner is relying on the disclosure of Watanabe or suggesting to add a separate ASIC to Watanabe’s system.” Prelim. Resp. 25 (citing Pet. 10–14).

At this stage of the proceeding, Petitioner demonstrates a reasonable likelihood of showing Watanabe teaches or suggests a DSP, which Patent Owner does not dispute. With respect to the ASIC, we understand that Petitioner is arguing that it would have been obvious to add an ASIC to Watanabe’s system, and determine that Petitioner’s contentions are supported by sufficient evidence at this stage of the proceeding.

f) DBMS

Claim 9 further requires the digital imaging system to include a database management system. Ex. 1001, 38:6. Petitioner contends Watanabe “describes using a database,” namely its “tables 70 including distortion aberration correction values and peripheral light intensity correction values in accordance with focusing points and zoom positions” that “are prepared in advance on a lens-to-lens basis.” Pet. 15 (quoting/citing Ex. 1005 ¶ 47, Fig. 3). Petitioner contends tables 70 are a database because “a database may be viewed as one or more tables of information.” *Id.* (quoting Ex. 1022, 2:8–9). Petitioner further contends Watanabe’s CPU 57 runs a program to control “the camera including ‘a correction process on image data’” and identifies the control program as a DBMS “because it is software that retrieves image correction data” from

tables 70. *Id.* at 16 (quoting/citing Ex. 1005 ¶¶ 42, 47–49, Figs. 3, 4; Ex. 1003 ¶¶ 175, 176). Moreover, Petitioner contends, a person skilled in the art would have understood Watanabe to teach using a DBMS to access the correction data in tables 70 because a routine use for DBMS’s was “accessing a database and managing the manipulation/use of its contents.” *Id.* at 17 (citing Ex. 1003 ¶ 166).

Patent Owner contends Watanabe’s tables 70 are not a database because they are not “updatable” and “[t]he ’805 [p]atent explains that the updatable database is a ‘particularly important’ feature” of the invention. Prelim. Resp. 22–23. But claim 9 recites a “database” not an “updatable database” and it is improper to read embodiments from the Specification into the claims. *See Philips v. AWH Corp.*, 415 F.3d 1303, 1323 (2005) (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”).

Patent Owner further contends Petitioner fails to demonstrate that Watanabe’s control program is a DBMS because its expert defined a DBMS as “software used to create, store, retrieve, change, manipulate, sort, format and print . . . information in a database” and Petitioner fails to demonstrate that Watanabe’s control program performs each of these functions. Prelim. Resp. 23–24 (quoting Ex. 1003 ¶ 172).

At this stage of the proceeding, we find Petitioner demonstrates a reasonable likelihood that Watanabe discloses a DBMS as that term is properly construed. We acknowledge the narrow construction provided by Petitioner’s expert, which is the basis of Patent Owner’s argument that Petitioner fails to show Watanabe discloses this limitation. But extrinsic evidence “is less significant than the intrinsic record in determining the

legally operative meaning of claim language.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1317 (Fed. Cir. 2005). This is so because “there is a virtually unbounded universe of potential extrinsic evidence of some marginal relevance that could be brought to bear on any claim construction question.” *Id.* at 1318. Thus, it is “unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence.” *Id.* at 1319.

We note the Specification contains neither the phrase “database management system” nor its acronym DBMS. The DBMS acronym does appear in Figure 1 (element 190) and Figure 35 (steps 3510 and 3520). Ex. 1001, Figs. 1, 35. However, only element 190 is part of a digital imaging system, as step 3510 refers to an “External Computer DBMS” and step 3520 refers to a “DBMS in [a] Distributed Network.” *Id.* at 36:27–32, Figs. 1, 35. Moreover, the Specification refers to each of the DBMS’s shown in these Figures as a “database” rather than a DBMS. *Id.* at 29:65 (referring to “database (190)”), 36:27–32 (referring to “an external computer database (3510)” and “the database of a distributed network (3520)”). Consequently, we preliminarily construe claim 9 to require a digital imaging system having a database. This construction provides the only antecedent basis to “the database” recited in a later limitation, which requires the “system software” to “access the database to identify specific correctios to the aberrations.” *Id.* at 38:14–16.

Petitioner contends, in the context of this limitation, that “Watanabe’s tables comprise a database” and “Watanabe describes using a database.” Pet. 15 (citing Ex. 1005 ¶ 47, Fig. 3; Ex. 1022, 2:8–12; Ex. 1003 ¶¶ 169–173). We agree, and find this is sufficient to demonstrate a reasonable likelihood of showing Watanabe teaches a DBMS as properly construed.

Should either party disagree with this preliminary construction, we encourage the parties to identify relevant intrinsic evidence on the meaning of the term DBMS as a component of a digital imaging system and, less preferably, extrinsic evidence showing the functional requirements of a DBMS for use in a digital imaging system, a digital camera, a consumer electronic device, or for general use and what those functional requirements mean, *e.g.*, what does it mean to print the information in a database.

g) memory-storage sub-system

Claim 9 further requires the digital imaging system to include a memory storage sub-system. Ex. 1001, 38:6–7. Petitioner contends Watanabe teaches this limitation by disclosing ROM 58, which “stores programs and data,” RAM 59, which “temporarily stores data,” and memory card 60 and internal memory 69, which “store image data in ‘an image data file.’” Pet. 16 (citing Ex. 1005 ¶¶ 35, 42; Ex. 1003 ¶¶ 177–178). Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

h) correcting aberrations by applying digital filtration

Claim 9 further requires the “aberrations from the optical lens mechanism are corrected by applying digital filtration by using the application specific integrated circuit and the digital signal processor.” Ex. 1001, 38:8–11.

Petitioner contends Watanabe discloses this limitation because DSP 56 “corrects optical image aberrations in images by applying corrections from its database.” *Id.* at 17 (citing Ex. 1005 ¶¶ 38, 42, 49, 59–62, Figs. 1A, 1B; Ex. 1003 ¶¶ 183, 184). Petitioner contends DSP 56 uses “digital filtration” to correct the image aberrations because a digital filter is a “computational process or algorithm by which a sampled signal or sequence

of numbers . . . is transformed into a second sequence of numbers” and DSP 56 “numerically processes the image” it receives from CCD 53 and A/D converter 55. *Id.* at 17 (citing Ex. 1028, 193; Ex. 1003 ¶¶ 102–109, 179–182, 185–187). Petitioner further contends the ’805 patent describes “digital filtration” in a similar manner by identifying “data interpolation as [an] example of ‘digital filtration.’” *Id.* at 18 (citing Ex. 1001, 14:62, 15:10–12).

Petitioner further argues that “Watanabe meets ‘using’ the ASIC and the DSP for the claimed function because each of the ASIC and the DSP would play a role in the claimed step. Pet. 18 (citing Ex. 1003 ¶¶ 63–65).

Patent Owner argues “Watanabe does not disclose [DSP] 56 executing aberration correction,” but instead “expressly discloses that ‘CPU 57 executes . . . a correction process on image data.’ Prelim. Resp. 19–20 (quoting Ex. 1005 ¶ 42). Patent Owner further argues that a person skilled in the art reading Watanabe would have understood that:

it is the CPU 57 that executes aberration correction, not [DSP] 56. Watanabe relies heavily on CPU 57 which has more functionality and in turn, requires more processing power, than [DSP] 56. Watanabe’s heavy dependence on the CPU 57 is contrary to the claimed inventions of the ’805 Patent that efficiently distribute the workload by using the digital signal processor for specific functions.

Id. at 20 (emphasis omitted). Acknowledging Petitioner’s reliance on Watanabe’s disclosure that DSP 56 “executes various process[es], correction and a data process for image compressing/extracting,” Patent Owner argues this “does not disclose that [DSP] 56 performs aberration correction” and does not “disclose that [DSP] 56 obtains correction values from tables 70.” *Id.* at 20–21 (quoting Ex. 1005 ¶ 38). Instead, Patent Owner argues, this discloses DSP 56 performs other types of corrections, such as gamma corrections. *Id.* at 21.

At this stage of the proceeding, Petitioner demonstrates a reasonable likelihood of showing Watanabe's DSP 56 performs aberration correction using the aberration correction values obtained from tables 70. Watanabe discloses DSP 56 receives image data from CCD 53 and A/D converter 55 and performs various processes on the image data, including a correction process. Ex. 1005 ¶¶ 38, Figs. 1A, 1B. Watanabe further discloses CPU 57 retrieves image correction parameters from tables 70 and controls each part of the digital camera, including DSP 56, while executing an image processing program. *Id.* ¶¶ 47, 59. Mr. Laub testifies that it is Watanabe's DSP 56 that uses the image correction parameters to "correct[] optical image aberrations in images." Ex. 1003 ¶ 183. At this stage of the proceeding, we find this testimony credible. Finally, Petitioner sufficiently shows at this stage of the proceeding that it would have been obvious that each of the ASIC and the DSP would play a role in the claimed step. *See* Pet. 18; Ex. 1003 ¶¶ 63–65.

i) microprocessor providing digital and optical data to the DSP

Claim 9 further requires that "the microprocessor is used to provide digital and optical data to the digital signal processor." Ex. 1001, 38:12–13. Petitioner argues that Watanabe's CPU 57 forwards digital image data to the DSP as well as "optical data" in the form of "information relative to distortion aberration" and "peripheral light intensity" added to the image data. Pet. 18–19 (citing Ex. 1005 ¶¶ 37, 38, 46, 61, 62). Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

j) identify optical aberration and correction algorithm

Claim 9 further requires that the “system software is organized to identify at specific optical aberrations and to access the database to identify specific corrections to the aberrations.” Ex. 1001, 38:14–16.

Petitioner argues that one of ordinary skill would have understood that Watanabe selects a “specific procedure to optimize the image,” such as an algorithm, and that “the stored parameters associated with such an algorithm correspond to the ‘specific corrections’ for the identified ‘specific optical aberrations’” recited in this limitation. Pet. 20 (citing Ex. 1069, 6:37–40; Ex. 1003 ¶¶ 196–200). Petitioner also asserts that “Watanabe’s in-camera software adds ‘information relative to distortion aberration’ and ‘peripheral light intensity’ (e.g., ‘optical aberrations’) to image data based on the lens used to capture the image.” *Id.* (citing Ex. 1005 ¶ 46; Ex. 1003 ¶ 194).

Petitioner also argues that Watanabe’s system software “identifies ‘specific corrections to the [optical] aberrations’—and therefore also identifies ‘specific optical aberrations’—by database lookup based on the lens type, focal length, and zoom position corresponding to the parameters when the image was taken.” Pet. 20 (citing Ex. 1003 ¶¶ 60–62, 195; Ex. 1005 ¶ 47). According to Petitioner, “Watanabe’s corrections are ‘specific corrections to the aberrations’ because its CPU uses an image processing program to correct the aberration by applying the correction values.” *Id.* at 21 (citing Ex. 1005 ¶ 48).

Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

k) System software forwards data from digital sensor to the digital processor

Claim 9 further requires that “system software forwards the data from the digital sensor to the digital processor.” Ex. 1001, 38:17–18. Petitioner argues that Watanabe meets this limitation because its CCD “captures image data and forwards it to the DSP.” Pet. 21 (citing Ex. 1005 ¶¶ 37, 38, 61, 62, Figs. 1A, 1B; Ex. 1003 ¶¶ 201, 202). Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

l) DSP selects procedure to optimize image and correct aberrations

Claim 9 further requires that “the digital signal processor selects a specific procedure to optimize the image and corrects the aberrations.” Ex. 1001, 38:19–21. Petitioner argues that Watanabe meets this limitation because it discloses that DSP 56 “executes various processes” including “correction” to “image data.” Pet. 22 (citing Ex. 1005 ¶ 38). Specifically, Petitioner asserts, “Watanabe’s DSP process the captured images and corrects distortion aberrations and peripheral light intensity, under CPU control, using the corrections from the database table 70 as shown in Fig. 3.” *Id.* (citing Ex. 1005 ¶¶ 42, 59, 60, Figs. 1A, 1B; Ex. 1003 ¶ 120). Petitioner also contends that one of ordinary skill would have understood that “a specific procedure to optimize the image” may be an algorithm, and that it would have been obvious to store such an algorithm in a database to be accessed by the DSP. Pet. 22–23 (citing Ex. 1069, 6:37–40; Ex. 1003 ¶¶ 194, 200–205).

Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

m) Optical aberrations corrected with digital filtration

Claim 9 further requires that “optical aberrations are corrected with digital filtration to modify multiple images from different focal lengths in a succession of data files.” Ex. 1001, 38:25–27.

Petitioner argues that Watanabe meets this limitation because it “corrects optical image aberrations in images at any focal length by applying corrections from the database.” Pet. 25 (citing Ex. 1005 ¶¶ 38, 49, 61, 62; Ex. 1003 ¶ 215). Petitioner asserts that “Watanabe’s DSP processes the captured images and corrects distortion aberrations and peripheral light intensity, under CPU control,” using “the correction data from the database table as shown in Fig. 3 across the succession of data files provided to the device.” *Id.* (citing Ex. 1005 ¶¶ 42, 59, 60, Figs. 1A, 1B; Ex. 1003 ¶ 215). Petitioner also contends that Watanabe discloses a “succession of data files” because Watanabe executes aberration correction according to zoom position. *Id.* (citing Ex. 1005 ¶ 49; Ex. 1003 ¶ 216).

Petitioner also argues that “the corrections that the DSP applies are ‘digital filtration’ because they numerically process the image data.” Pet. 26 (citing Ex. 1028, 193; Ex. 1001, 14:62, 15:10–12, 31:1–24; Ex. 1005 ¶¶ 48, 49, 62, 63; Ex. 1003 ¶¶ 179–181). According to Petitioner, “Watanabe makes corrections to ‘modify multiple images from different focal Lengths’ because Watanabe describes selecting corrections based on lens, focal length, and zoom position across images input to the device in succession.” *Id.* (citing Ex. 1005 ¶ 49; Ex. 1003 ¶¶ 215, 216).

Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

n) modified data file with digital data optimized from the corrected aberrations is stored in memory

Claim 9 further requires that “the modified data file consisting of the digital data optimized from the aberrations that are corrected from the original optical image is stored in memory.” Ex. 1001, 38:29–31.

Petitioner argues that Watanabe meets this limitation because it discloses “memory card 10 and memory card interface 10a storing processed image data (‘modified data file’) that is ‘optimized from aberrations.’” Pet. 27 (citing Ex. 1005, ¶¶ 58, 63; Ex. 1003 ¶ 217). Patent Owner does not dispute these contentions, with which we preliminarily agree. Prelim. Resp. 11–27.

o) Conclusion regarding claim 9

For the reasons discussed above, based on the present record, Petitioner demonstrates a reasonable likelihood of showing claim 9 is unpatentable as obvious over Watanabe.

E. Remaining Claims and Grounds

Because we find Petitioner has demonstrated a reasonable likelihood of showing at least one challenged claim is unpatentable as obvious over Watanabe, we need not review all of Petitioner’s challenges. *See* 35 U.S.C. § 314(a) (“The Director may not authorize an inter partes review to be instituted unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”).

III. CONCLUSION

We have reviewed the Petition and Patent Owner’s Preliminary Response, and have considered all of the evidence and arguments presented by Petitioner and Patent Owner. We find, at this stage of the proceeding, Petitioner has demonstrated a reasonable likelihood of showing at least one

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claim of the '805 patent is unpatentable. Accordingly, we institute *inter partes* review of all claims on all grounds raised in the Petition.

The Board has not yet made a final determination with respect to any claim construction issue, priority issue, or the patentability of any challenged claim.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314, an *inter partes* review is instituted on all challenged claims on all grounds; and

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

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