

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

138 EAST LCD ADVANCEMENTS LIMITED,
Patent Owner.

IPR2024-00958
Patent 8,482,638 B2

Before KRISTEN L. DROESCH, GEORGE R. HOSKINS, and
KEVIN C. TROCK, *Administrative Patent Judges*.

TROCK, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Google LLC (“Petitioner”) filed a Petition, Paper 1 (“Pet.” or “Petition”), to institute an *inter partes* review of claims 1, 2, and 4–6 (the “challenged claims”) of U.S. Patent No. 8,482,638 B2 (Ex. 1001, “the ’638 patent”). 138 East LCD Advancements Limited (“Patent Owner”) has not filed a Preliminary Response.

An *inter partes* review may not 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.” 35 U.S.C. § 314(a). Upon consideration of the Petition, and the evidence of record, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review.

B. Real Party in Interest

Petitioner identifies itself as the only real party in interest. Pet. 61. Patent Owner identifies 138 East LCD Advancements Limited and Longitude Licensing Limited as the real parties in interest. Paper 4, 1.

C. Related Proceedings

According to the parties, the ’638 patent was the subject of the following action: *Longitude Licensing Limited v. Google LLC*, No. 3:23-cv-03046 (N.D. Cal.) filed June 21, 2023, and dismissed as to the ’638 patent on November 15, 2023. Pet. 62; Paper 4, 1.

D. The ’638 Patent (Ex. 1001)

The ’638 patent relates to a digital camera capable of manual focusing and of varying the focal length of a main lens. Ex. 1001, 1:18–22.

According to the '638 patent, digital cameras traditionally included a double-image matching range finder that included a viewfinder optical system and a range finder optical system. *Id.* at 1:24–30. In these cameras, an image from the range finder optical system is superimposed on a viewfinder image inputted from the viewfinder optical system. *Id.* at 1:32–36. The '638 patent recognizes, however, that these cameras include complex mechanisms and require high precision in the manufacturing tolerances and assembly. *Id.* at 1:40–46. One stated objective of the '638 patent is to provide a digital camera for generating a composite image in which two images are superimposed by a simple mechanism. *Id.* at 1:47–50.

Figure 2 of the '638 patent (reproduced below) depicts a perspective view of a digital camera. *Id.* at 2:5.

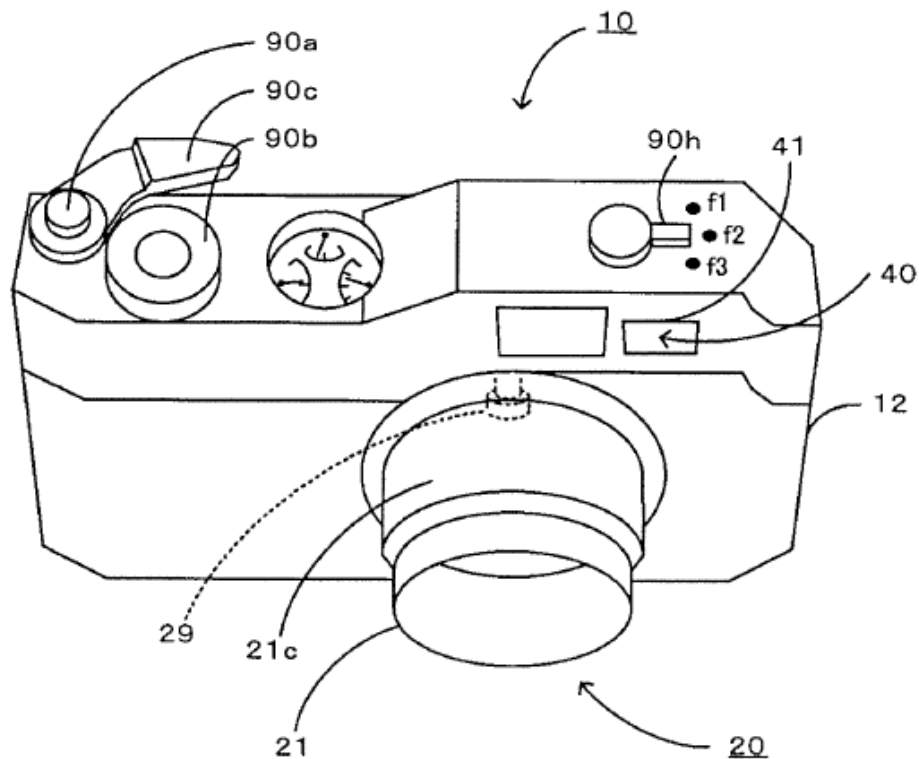


Fig. 2

Figure 2, above, depicts a perspective view showing a digital camera 10 with a main body 12, a main electronic imaging unit 20, a sub-electronic imaging unit 40, an electronic view finder (“EVF”) 82 (shown in Figure 3), and a focal point selection lever 90*h*. *Id.* at 2:29–46, 4:16–20. The main electronic imaging unit 20 contains an imaging lens 21 and a distance ring 21*c*. *Id.* at 2:51–53. The focal point selection lever 90*h* selects the focal length *f* of the attached imaging lens 21, while the distance ring 21*c* changes the focal point position. *Id.* at 2:66–3:3, 4:47–49. The main electronic imaging unit 20 performs a photoelectronic conversion to an image of a subject and outputs a digital signal. *Id.* at 2:35–37.

The sub-electronic imaging unit 40 contains a pan-focus sub-lens 41, which has a fixed focal length. *Id.* at 3:25–26. The sub-electronic imaging unit 40 performs a photoelectronic conversion to the subject and outputs a digital signal for generating a viewfinder image. *Id.* at 2:37–40.

Figure 1 of the ’638 patent is shown below.

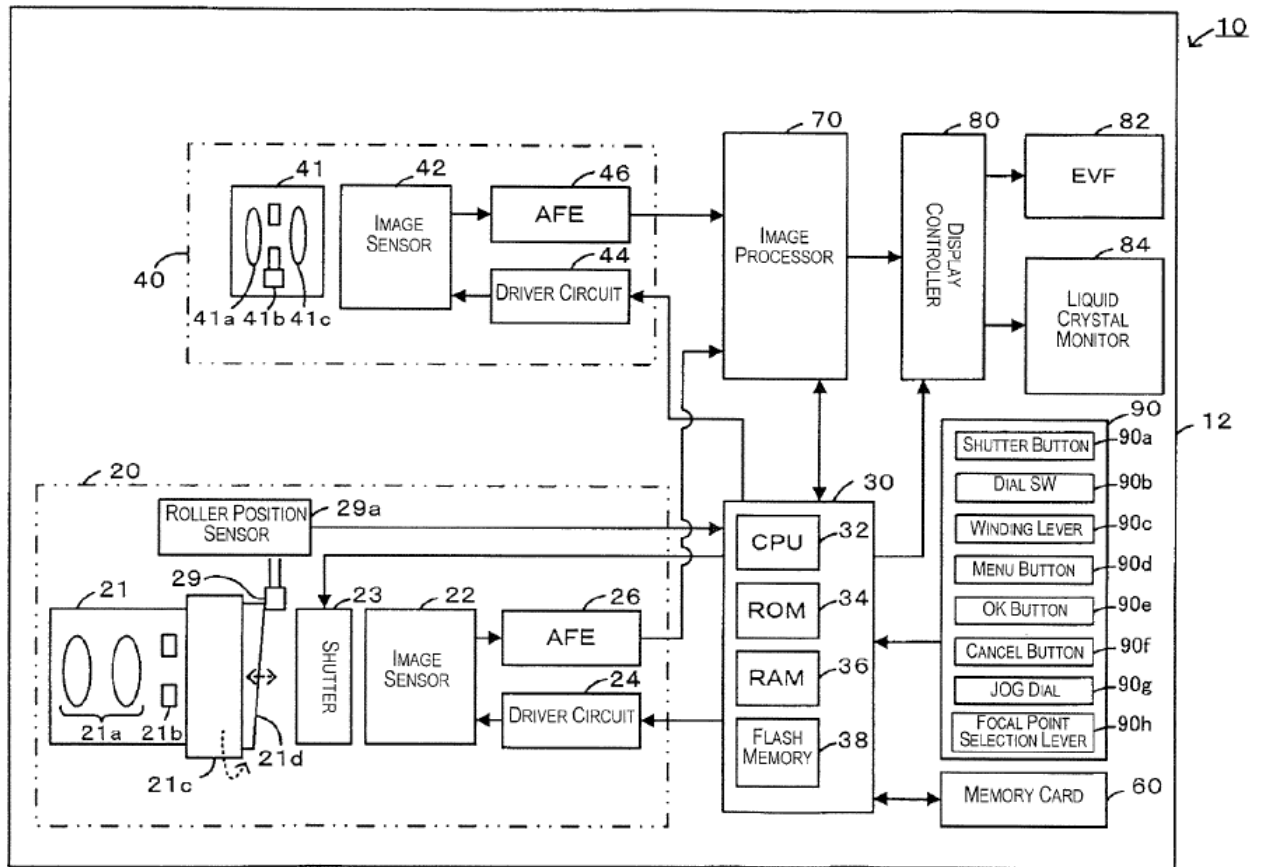


Fig. 1

Figure 1, above, is a view showing the overall configuration of digital camera 10, and includes main electronic imaging unit 20, sub-electronic imaging unit 40, EVF 82, image processor 70, and display controller 80. *Id.* at 2:29–40. Image processor 70 generates a main image and a sub-image from the digital signal outputs of the main electronic imaging unit 20 and sub-electronic imaging unit 40, respectively. *Id.* at 3:51–59. The image processor also generates a viewfinder image by superimposing a partial image from the sub-image on to the main image. *Id.* at 3:59–4:1. Display controller 80 displays the viewfinder image in the EVF 82.

Figure 6 of the '638 patent is reproduced below.

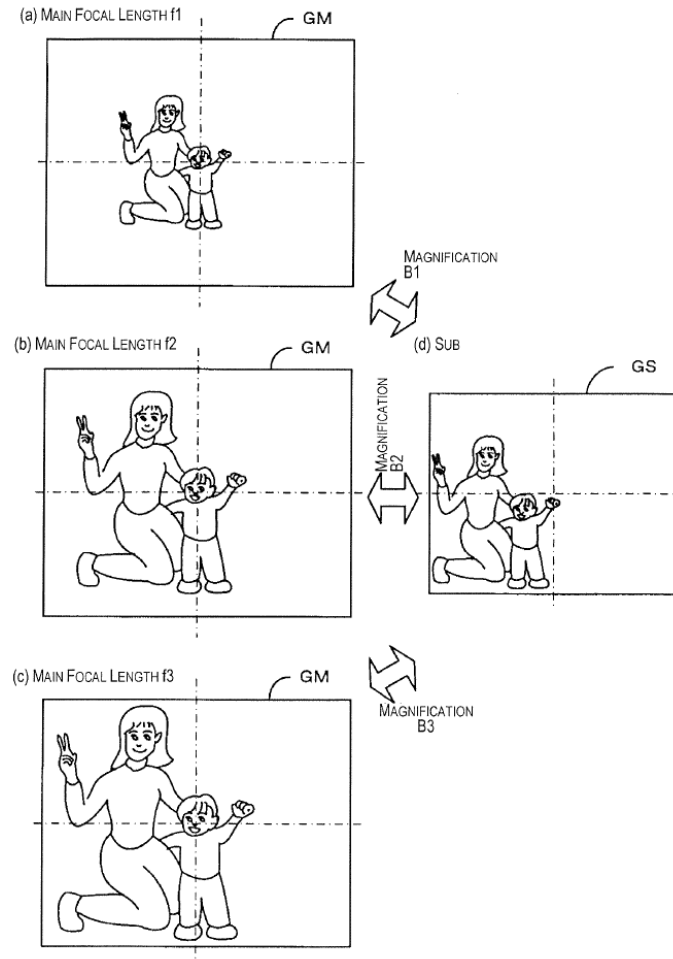


Fig. 6

Figure 6, above, illustrates the concept of a magnification rule, which is a rule for setting the magnification with respect to the sub-image so that the subject appears as the same size in the sub-image and the main image. *Id.* at 6:18–23. Figures 6(a) through 6(c) show the main image, and Figure 6(d) shows the sub-image. *Id.* at 6:23–25. The size of the subject appearing in Figures 6(a) through 6(c) changes according to the focal lengths f_1 , f_2 , and f_3 . *Id.* at 6:34–37. Adjustment magnifications, B_1 , B_2 , and B_3 , align the size of the subject image in the sub-image with the size of the subject in the main image, and correlate with focal lengths f_1 , f_2 , and f_3 . *Id.* at 6:37–45.

E. Challenged Claims

Petitioner challenges claims 1, 2, and 4–6 of the '638 patent. Pet. 1. Independent claim 1 the only independent claim is illustrative and reproduced below.

[1Preamble] A digital camera having a focusing function and a focal length varying function of a main lens, the digital camera comprising:

- [1a] a main imaging unit configured to generate a main image by performing a photoelectric conversion from a subject obtained via the main lens;
- [1b] a sub-imaging unit configured to generate a sub-image by performing a photoelectric conversion from the subject obtained via a sub-lens;
- [1c] a focal length acquiring unit configured to acquire the focal length of the main lens;
- [1d] a magnification setting unit configured to set a level of magnification on the basis of the focal length;
- [1e] a composite image generating unit configured to generate a composite image by combining the main image and the sub-image, after at least one of the main image and the sub-image is magnified at the level of magnification;
- [1f] an image display unit configured to display the composite image; and
- [1g] wherein the magnification setting unit is configured to set the level of the magnification in order to match substantially a size of the main image and a size of the sub-image.

Ex. 1001, 13:35–14:8 (numbering and formatting designated by Petitioner; *see* Pet. 10–32).

F. Evidence

Petitioner relies upon the following evidence:

- (1) U.S. Patent Application Publication No. US 2008/0218611 A1,

published Sept. 11, 2008 (“Parulski”) (Ex. 1005);

(2) Certified translation of K.R. Patent Publication No. 10-2007-0046010 A, published May 2, 2007 (“Safonov”) (Ex. 1007);

(3) Declaration of Robert Stevenson, Ph.D. (Ex. 1003).

G. Asserted Grounds of Unpatentability

Claims Challenged	35 U.S.C. §	References
1, 2, 4–6	103(a) ¹	Parulski
1, 2, 4–6	103(a)	Parulski, Safonov

II. ANALYSIS

A. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner describes a person of ordinary skill in the art as a person having “at least a bachelor’s degree in electrical engineering, computer science, or related engineering disciplines, and two years of experience in multi-lens camera systems.” Pet. 3–4. Petitioner further explains that “[r]elevant work experience can substitute for formal education and

¹ The ’638 patent was filed before the March 16, 2013, effective date of the § 103 provisions in the Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29. Ex. 1001, code (22). Accordingly, we cite to pre-AIA § 103(a).

additional education could substitute for work experience.” *Id.* (citing Ex. 1003 ¶ 50).

Petitioner’s description of a person of ordinary skill appears to be consistent with the subject matter of the ’638 patent. This is supported by the testimony of Petitioner’s declarant, Dr. Stevenson. *See* Ex. 1003 ¶ 50. We adopt Petitioner’s assessment of a person of ordinary skill for purposes of this Decision, with the exception of the qualifier “at least,” to keep the description from being vague and extending to a level reflecting more than “ordinary” skill. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

B. Claim Construction

For petitions filed on or after November 13, 2018, a claim shall be construed 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), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. 37 C.F.R. § 42.100 (2019). The Petition was accorded a filing date of June 20, 2024. Paper 3. Thus, we apply the claim construction standard as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc).

Under *Phillips*, claim terms are generally given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and even extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17. Usually,

the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (in the context of an *inter partes* review, applying *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Here, Petitioner asserts that “[n]o terms need construction to resolve the unpatentability issues in this Petition.” Pet. 4. Based on the current record, we determine preliminarily that no claim terms require express construction at this stage of the proceeding and that the ordinary and customary meaning of the claim terms should apply.

C. Patentability Challenges

As indicated above, Petitioner presents two grounds challenging the patentability of particular claims of the '638 patent under 35 U.S.C. § 103(a). Petitioner challenges claims 1, 2, and 4–6 based on (1) the teachings of Parulski; and (2) the combined teachings of Parulski and Safonov. Pet. 1.

1. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103(a) if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art;

(2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

The Supreme Court has made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention. *Id.*

2. Relevant Prior Art

a. *Parulski* (Ex. 1005)

Parulski is a U.S. Patent Application Publication that published on September 11, 2008, more than one year before the earliest priority date of the '638 patent. Ex. 1001, code (30); Ex. 1005, code (43). Petitioner asserts that *Parulski* is prior art under pre-AIA 35 U.S.C. § 102(a), (b), and (e). Pet. 4.

Parulski relates to a digital camera that uses multiple lenses and image sensors to provide an improved imaging capability. Ex. 1005 ¶ 1. *Parulski* describes first and second imaging stages, in which the sensor output from a

first imaging stage is used as a primary output image. *Id.* at code (57). The sensor output from the second imaging stage is then used as a secondary output image for modifying the primary output image. *Id.*

Figure 2A of Parulski, reproduced below, illustrates a perspective view of a digital camera. *Id.* ¶ 35.

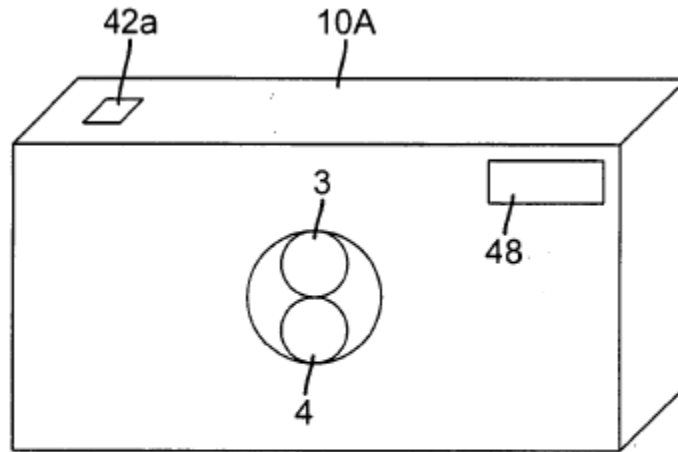


FIG. 2A

Figure 2A illustrates a frontal view of image capture assembly 10A. *Id.* ¶ 76. The image capture assembly 10A contains first zoom lens 3, second zoom lens 4, flash 48, and shutter button 42a. *Id.*

Figure 1 of Parulski, reproduced below, depicts a block diagram of a digital camera. *Id.* ¶ 34.

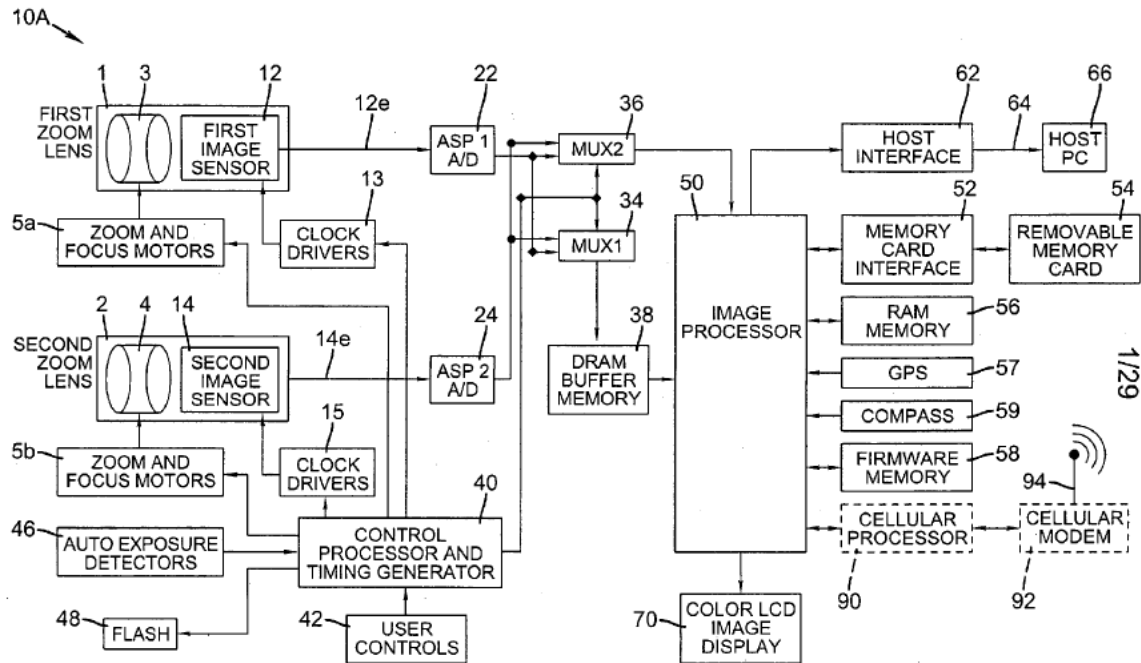


FIG. 1

Figure 1, above, depicts a block diagram of image capture assembly 10A. *Id.* ¶ 74. The image capture assembly 10A includes two imaging stages, 1 and 2. *Id.* ¶ 75. The imaging stages comprise zoom lenses 3 and 4, and image sensors 12 and 14. *Id.* ¶ 77. The first zoom lens 3 is controlled by zoom and focus motors 5a, and the second zoom lens 4 is controlled by zoom and focus motors 5b. *Id.* ¶ 75.

Figure 4 of Parulski, reproduced below, depicts a flow diagram for performing autofocus using a rangefinder with two image capture stages. *Id.* ¶ 37.

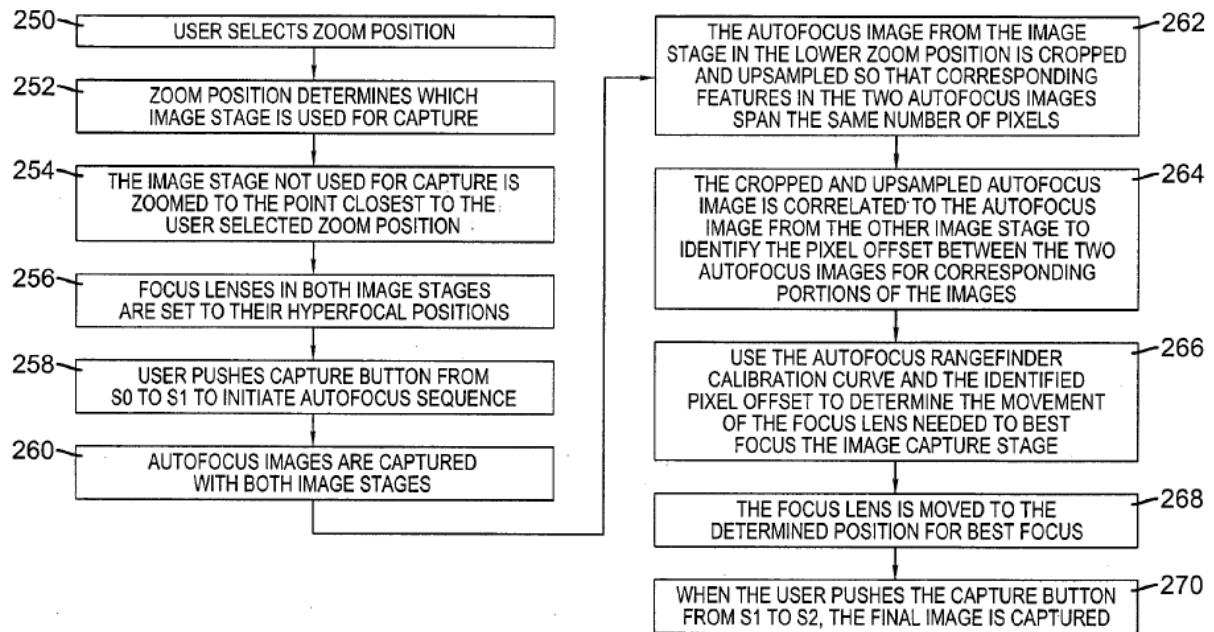


FIG. 4

Figure 4, above, illustrates a flow chart of an autofocus process using two image capture stages in a rangefinder configuration. *Id.* ¶ 92. At block 250 in Figure 4, a user determines the zoom position by adjusting a zoom control on the camera. *Id.* ¶ 92. The zoom position determines which of the first and second image capture stages is used for capturing the final image and which stage is used only for autofocus images. *Id.* At block 254, the image stage not used for capturing the final image is zoomed to a position closest to the user selected zoom position. *Id.*

At block 258, the user presses the shutter button 42a to initiate an autofocus sequence. *Id.* At block 260, autofocus images are then captured by both image capture stages. *Id.* ¶ 93. At blocks 262 and 264, the autofocus image from the image stage in a lower zoom position is cropped and correlated to the autofocus image from the other image stage to identify a pixel shift between the two autofocus images, and thereby produce a focus detection signal. *Id.* At block 266, a calibration factor is applied to the

focus detection signal to determine the distance the focus lens must be moved to produce a best focus condition for the image capture. *Id.* At block 268, the focus detection signal is applied to the zoom and focus motor 5a and the focus lens is then moved the determined distance in the image capture stage that will be used for the final image capture. *Id.*

b. Safonov (Ex. 1007)

Safonov is a certified English translation of Korean Patent Application No. 10-2007-0046010 (Ex. 1006), published on May 2, 2007, more than one year before the earliest priority date of the '638 patent. Ex. 1001, code (30); Ex. 1007, code (43). Petitioner asserts that Safonov is prior art under pre-AIA 35 U.S.C. § 102(a) and (b). Pet. 8.

Safonov relates to a method of digital image enhancement. Ex. 1007, code (57). Safonov explains that consumer photographs taken with digital cameras have low dynamic range in shadow areas. *Id.* at 5:1–2. Safonov further explains that “current technology used for local dynamic correction” has drawbacks, including not correcting the highlight tone, lacking a combination of global contrast adjustment and shadow correction, inducing halo-effects, increasing noise and JPEG artifacts in shadows, introducing posterization effects, and not automatically obtaining correction levels. *Id.* at 6.

Safonov describes a method of converting a digital image from an RGB color space to the luminance channel of the image, filtering the luminance channel by a bilateral filter, correcting shadow to increase local contrast and luminance, correcting highlight to increase local contrast and decrease luminance, and then converting the corrected image back into an RGB color space. *Id.* at code (57). Safonov also describes using alpha blending to increase the local contrast and luminance of an image. *Id.* at 7.

D. Obviousness Based on Parulski (Ground 1)

Petitioner contends claims 1, 2, and 4–6 are unpatentable as obvious under 35 U.S.C. § 103(a) over Parulski. Pet. 10–54. Petitioner provides testimonial evidence of Dr. Stevenson in support of its contentions. Ex. 1003 ¶¶ 66–118. We begin our analysis with independent claim 1.

1. Independent Claim 1
[IPreamble]

Claim 1 recites the following preamble: “A digital camera having a focusing function and a focal length varying function of a main lens, the digital camera comprising.”² Ex. 1001, 13:35–37.

Petitioner asserts that “Parulski discloses a digital camera having autofocus (‘focusing function’) and optical zoom range (‘focal length varying function’) for a main lens.” Pet 11. “For example,” Petitioner explains, “Parulski discloses a digital camera with ‘multiple image capture stages, each composed of a lens and an image sensor, wherein the lenses of the multiple image capture stages have different focal lengths to provide an extended optical zoom range.’” *Id.* (citing Ex. 1005 ¶ 64). According to Petitioner, “Parulski also discloses that ‘one image capture stage may be used to capture digital still images or video images while another image capture stage is simultaneously being used for another purpose, such as enhanced autofocus, generation of a secondary image, production of a range map, and the like.’” Pet. 11 (citing Ex. 1005 ¶ 65). Petitioner explains that “Parulski’s ‘one image capture stage,’ also referred to as the ‘first imaging stage,’ includes a main lens to capture a digital still image having both an

² Petitioner addresses the preamble of claim 1 only “[t]o the extent the preamble is limiting.” *See* Pet. 10.

‘autofocus’ focusing function and an ‘optical zoom range’ focal length varying function.” Pet. 11 (citing Ex. 1005 ¶¶ 64–65; Ex. 1003 ¶ 68).

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in the preamble.

[1a] a main imaging unit configured to generate a main image by performing a photoelectric conversion from a subject obtained via the main lens

Petitioner asserts that Parulski teaches this limitation by disclosing a “first image sensor . . . used to capture a first (i.e., primary) still image at a first (i.e., primary) focus distance” from the first zoom lens (“main lens”), and that “the first image sensor for the first imaging stage can be either a CCD (‘charged-coupled device’) or CMOS (‘complementary metal oxide semiconductor’) image sensor.” Pet. 12 (citing Ex. 1005 ¶ 78). Petitioner asserts that a person of ordinary skill in the art “would have understood that CCD and CMOS image sensors perform a photoelectric conversion from a subject obtained via the first zoom lens (‘main lens’) to generate an electronic image of the subject.” Pet. 12 (citing Ex. 1005 ¶ 7; Ex. 1001, 2:63–65, 3:25–33). Petitioner’s assertions are supported by the testimony of Dr. Stevenson. *See* Ex. 1003 ¶¶ 69–71.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1a].

[1b] a sub-imaging unit configured to generate a sub-image by performing a photoelectric conversion from the subject obtained via a sub-lens

Petitioner asserts that Parulski teaches this limitation by disclosing an image capture assembly “having a ‘second imaging stage’ (‘sub-imaging

unit’) that includes a second image lens, such as a ‘second zoom lens’ (‘sub-lens’) and a ‘second image sensor’ having a CCD image sensor.” Pet. 13 (citing Ex. 1005 ¶¶ 72, 78; *see also id.* ¶¶ 74–75). Petitioner asserts that “Parulski further discloses that its ‘second image sensor[] is used to simultaneously capture a second (i.e., secondary or sub) still image at a second (i.e., secondary) focus distance.’” Pet 13 (citing Ex. 1005 ¶ 72). Petitioner’s assertions are supported by the testimony of Dr. Stevenson. *See* Ex. 1003 ¶¶ 72–75.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1b].

[1c] a focal length acquiring unit configured to acquire the focal length of the main lens

Petitioner asserts that Parulski teaches this limitation by disclosing that the “lenses of the multiple image capture stages have different focal lengths to provide an extended optical zoom range for the image capture assembly,” and that “Parulski provides this extended zoom range using control processor 40 that supplies electric signals and controls the zoom motor of the first zoom lens of the first imaging unit (‘main lens’).” Pet. 14–15 (citing Ex. 1005 ¶¶ 64, 79). Petitioner explains that “Parulski discloses that the control processor 40 ‘controls the zoom and focus motors’” and “[t]he user selects a focal length by adjusting the zoom position for the main lens (‘first imaging stage 1’) using a zoom control 42c of the user controls 42.” Pet. 15 (citing Ex. 1005 ¶¶ 75, 79, 87, 92, 94).

Petitioner explains that Parulski also discloses that “the user determines the zoom position by adjusting the zoom control 42c on the camera.” Pet. 15 (citing Ex. 1005 ¶ 92). According to Petitioner, “[a]n

image of the scene in the first imaging lens is then captured by a corresponding image sensor 14 of the first imaging unit³] (main imaging unit) and ‘provides an image to a first image sensor 12.’” Pet. 15 (citing Ex. 1005 ¶ 75). “The image processor 50,” Petitioner explains, “selects the sensor output 12e’ from sensor 12 ‘from the first imaging stage 1’ as the main lens to ‘produce[] [a] focus detection signal[] that drive[s] the first ... focus adjuster[]’ using the second imaging stage’s autofocus function.” Pet. 15 (citing Ex. 1008 ¶¶ 80, 82).

Petitioner asserts that a person of ordinary skill in the art “would have understood reading Parulski’s disclosure that to properly focus the main lens, the image processor 50 would have acquired the focal length of the main lens to optimize the composite image.” Pet. 15 (citing Ex. 1003 ¶ 77). According to Petitioner, Parulski explains that “[t]he control processor and timing generator 40, in combination with the image processor 50 . . . selects the sensor output 14e from the second imaging stage 2 as the captured image signal and uses the sensor output 12e from the first imaging stage 1 to generate the focus detection signal for the selected imaging stage 2.” Pet. 15–16 (citing Ex. 1005 ¶ 82; Ex. 1003 ¶ 77).

Petitioner’s assertions are supported by Dr. Stevenson, where he further testifies that a person of ordinary skill in the art

would have understood that the lens movement required to achieve the correct focus varies with focal length; longer focal lengths generally require more precise adjustment than shorter focal lengths. Autofocus systems, like those in Parulski, use various algorithms to determine when an image is in focus (e.g.,

³ We find Petitioner’s discussion here of “image sensor 14 of the first imaging unit” somewhat confusing as Parulski’s Figure 1 depicts 14 as “second image sensor” and describes how “[t]he second zoom lens 4 . . . provides an image to a second image sensor 14.” See Ex. 1003 ¶ 75, Fig. 1.

contrast measure or phase difference measurements).
Regardless of the algorithm used, autofocus systems, such as in Parulski, use the detected focus signal and the information acquired about the focal length to determine the amount of lens adjustment that would be needed to bring the system into focus.

Ex. 1003 ¶ 77.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1c].

[1d] a magnification setting unit configured to set a level of magnification on the basis of the focal length

Petitioner asserts that Parulski teaches this limitation by disclosing modifying “the level of magnification of the image obtained from the sub-lens on the bases of the focal length of the main lens so that the images are the same size and can be used to create a composite image where a portion of the sub-image replaces a portion of the main image.” Pet. 16–17 (citing Ex. 1005 ¶¶ 31, 66, 75, 93, 97, 101, 104, 138–140, 145, Figs. 4, 6, 9, 11).

According to Petitioner, Parulski creates “a composite image using the main image and sub-image by replacing portions of the main image from the first imaging lens with ‘corresponding portions’ of the sub-image from the second imaging lens to obtain a modified image with relatively low noise and good sharpness.” Pet. 17 (citing Ex. 1005 ¶¶ 31, 138–140, 145).

Petitioner explains that “[b]ecause Parulski’s lenses ‘have different focal lengths,’ and therefore ‘different magnifications,’ the system modifies the sub-image by changing the magnification (e.g., upsampling to change the size of the sub-image) to make the images the same scale (‘magnification’)

to replace portions of the main image with corresponding portions of the sub-image.” Pet. 18 (citing Ex. 1005 ¶ 66).

“Therefore,” Petitioner explains, “the digital filters used to determine the autofocus may be adjusted, as a function of this difference in magnification, in order to compensate for the differences in magnification.” *Id.* “The magnification of the sub-image,” Petitioner explains, “is modified so that the size of the desired replacement portion is the same in both images.” *Id.* (citing Ex. 1003 ¶ 86). According to Petitioner, “Parulski discloses a magnification scaling of the second image by ‘upsampl[ing]’ the second image ‘so that corresponding features in the two autofocus images span the same numbers of pixels.’” Pet. 19 (citing Ex. 1005 ¶ 104).

Petitioner’s assertions are supported by the testimony of Dr. Stevenson. *See* Ex. 1003 ¶¶ 80–88.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1d].

[1e] a composite image generating unit configured to generate a composite image by combining the main image and the sub-image, after at least one of the main image and the sub-image is magnified at the level of magnification

Petitioner asserts that Parulski teaches this limitation by disclosing “replacing portions of the first image (‘main image’) obtained using the main lens of the first imaging stage 1 with a ‘corresponding portion’ of the second image.” Pet. 20–24 (citing Ex. 1005 ¶¶ 26, 30–32, 64, 65, 106–113, 118, 120, 138–140, 142, 145, Figs. 3, 4, 6, 9, 11, 26; Ex. 1005 ¶¶ 89–103). According to Petitioner, “Parulski discloses that ‘the secondary still image [(‘sub-image’)] is used to provide an enhancement signal that may, e.g.,

sharpen portions of the primary still image that are positioned near the secondary focus distance or may modify the dynamic range of the primary still image.” Pet. 20 (citing Ex. 1005 ¶ 72; Ex. 1003 ¶ 90).

“As one example,” Petitioner points out that a “modified image is created with a broadened dynamic range by replacing portions of the primary image with portions of the secondary image,” and “portions of the primary image (areas of lower noise but with some motion blur) are replaced with corresponding portions of the secondary image (areas of higher noise but little or no motion blur) to obtain a modified image with relatively low noise and good sharpness.” Pet. 21 (citing Ex. 1005 ¶¶ 31, 140, 145).

Petitioner explains that

Parulski’s system replaces portions of the main image with corresponding portions of the sub-image by making the magnification of the images the same size (e.g., by upsampling) based on their respective focal lengths. This would make the images the same scale (“magnification”) to permit the system to create the modified image, for example, to reduce noise or increase sharpness. *See* Pet. § V.B.1.e; [Ex. 1003] ¶ 92. Because the upsampled sub-image is upsampled to the same size as the main image, it has been magnified at the level of magnification.

Pet. 23 (citing Ex. 1005 ¶¶ 93, 97, 101, 104, Figs. 3, 4, 6, 9, 11; Ex. 1003 ¶ 92).

Petitioner’s assertions are supported by the testimony of Dr. Stevenson. *See* Ex. 1003 ¶¶ 89–103.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1e].

[1f] an image display unit configured to display the composite image

Petitioner asserts that Parulski teaches this limitation by disclosing that “the image capture assembly has a color liquid crystal display (‘LCD’) for displaying the images generated using Parulski’s multiple image stages” . . . “so that the user can see the image that will be saved or reproduced later.” Pet. 27–28 (citing Ex. 1005 ¶¶ 76, 87–90, Fig. 2B (“color LCD image display 70”); Ex. 1003 ¶ 106). Dr. Stevenson provides support, testifying that “an LCD was a common, conventional device used to display a captured image on a digital camera,” and that “one of the purposes of LCD display 70 is to display images or videos, which provides an advantage over traditional film cameras because the user can immediately see the image that is being saved to the camera’s memory and determine whether it is acceptable or should be retaken.” Ex. 1003 ¶ 109 (citing Ex. 1003 ¶¶ 76, 87–90).

Petitioner’s assertions are supported by the testimony of Dr. Stevenson. *See* Ex. 1003 ¶¶ 104–115.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1f].

[1g] wherein the magnification setting unit is configured to set the level of the magnification in order to match substantially a size of the main image and a size of the sub-image

Petitioner asserts that Parulski teaches this limitation by disclosing “replacing a portion of the main image with a corresponding portion of the sub-image that has been upsampled to create a modified composite image.” Pet. 32 (citing Ex. 1005 ¶¶ 31, 66, 75, 93, 97, 101, 104, 138–140, 145,

Figs. 4, 6, 9, 11; Ex. 1003 116–118). Petitioner asserts that “this describes setting the level of magnification so that the size of the main image and sub-image are substantially the same size or scale.” *Id.*

Dr. Stevenson testifies that

Parulski’s system replaces portions of the main image with corresponding portions of the sub-image by making the magnification of the images the same size (e.g., by upsampling) based on their respective focal lengths. This would make the images the same scale (“magnification”) to permit the system to create the modified image, for example, to reduce noise or increase sharpness. Because the upsampled sub-image is upsampled to the same size as the main image, it has been magnified at the level of magnification.

Ex. 1003 ¶ 92 (citing Ex. 1005 ¶¶ 93, 97, 101, 104, Figs. 3, 4, 6, 9, 11); *see also* Ex. 1003 ¶¶ 116–118.

Based on the preliminary record before us, we determine that Petitioner has made a sufficient showing, for purposes of institution, that Parulski teaches the subject matter recited in limitation [1g].

Conclusion as to Independent Claim 1

Based upon the current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge that independent claim 1 of the ’638 patent would have been obvious under 35 U.S.C. § 103(a) over the teachings of Parulski.

2. Dependent Claims 2 and 4–6

Petitioner contends that dependent claims 2 and 4–6 are unpatentable under 35 U.S.C. § 103(a) as obvious over the teachings of Parulski. Pet. 33–54. Petitioner provides the testimonial evidence of Dr. Stevenson in support of its contentions. Ex. 1003 ¶¶ 119–165.

We have considered Petitioner's evidence and arguments with respect to these dependent claims. However, because we determine that Petitioner demonstrates a reasonable likelihood of prevailing in its challenge to independent claim 1 under 35 U.S.C. § 103(a) as obvious over the teachings of Parulski, we institute *inter partes* review as to all other challenges in the Petition, including Petitioner's challenges to dependent claims 2 and 4–6. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

E. Obviousness Based on Parulski and Safonov (Ground 2)

Petitioner asserts claims 1, 2, and 4–6 are unpatentable as obvious under 35 U.S.C. § 103(a) over the combined teachings of Parulski and Safonov. Pet. 54–60. Petitioner provides the testimonial evidence of Dr. Stevenson in support of its contentions. Ex. 1003 ¶¶ 166–179.

We have considered Petitioner's evidence and arguments with respect to Ground 2. However, because we determine that Petitioner demonstrates a reasonable likelihood of prevailing in its challenge to independent claim 1 under 35 U.S.C. § 103(a) as obvious over the teachings of Parulski, we institute *inter partes* review as to all other challenges in the Petition, including Petitioner's challenges to claims 1, 2 and 4–6 as obvious over the combined teachings of Parulski and Safonov. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

III. CONCLUSION

For the foregoing reasons, we are persuaded that the Petition demonstrates a reasonable likelihood of prevailing in showing the unpatentability of at least one of the challenged claims of the '638 patent.

IV. ORDER

Accordingly, it is

ORDERED that an *inter partes* review is instituted as to all challenged claims on the grounds raised in the Petition; and

FURTHER ORDERED that *inter partes* review is instituted commencing on the entry date of this Order, and 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.

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