

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,

Petitioner,

v.

138 EAST LCD ADVANCEMENTS LIMITED,

Patent Owner.

Case No. IPR2024-00961

U.S. Patent No. 7,945,109

PETITION FOR *INTER PARTES* REVIEW

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Ex. 1001	U.S. Patent No. 7,945,109 to Nakami (“the ’109 patent”)
Ex. 1002	File History of U.S. Patent No. 7,945,109
Ex. 1003	Expert Declaration of Kenneth Parulski (“Parulski”)
Ex. 1004	Curriculum Vitae of Kenneth Parulski
Ex. 1005	U.S. Patent No. 6,556,784 to Onuki (“Onuki”)
Ex. 1006	U.S. Patent No. 7,212,668 to Luo et al. (“Luo-668”)
Ex. 1007	James R. Milch and Kenneth A. Parulski, <i>Using Metadata to Simplify Digital Photography</i> , IS&T’s 1999 PICS Conference, pp. 26-30 (1999)
Ex. 1008	Digital Still Camera Image File Format Standard (Exchangeable image file format for Digital Still Cameras: Exif), Version 2.1, Japan Elec. Indus. Dev. Ass’n (June 12, 1998) (“Exif”), <i>available at</i> http://web.archive.org/web/20010627233957/http://www.pima.net/standards/it10/PIMA15740/Exif_2-1.PDF (archived June 27, 2001)
Ex. 1009	U.S. Patent No. 6,373,992 to Nagao (“Nagao”)
Ex. 1010	U.S. Patent No. 6,301,440 to Bolle et al. (“Bolle”)
Ex. 1011	U.S. Patent No. 5,696,850 to Parulski et al. (“Parulski ’850”)
Ex. 1012	Kenneth A. Parulski et al., <i>A High-Performance Digital Color Video Camera</i> , SPIE Vol. 1448 Camera and Input Scanner Systems, pp. 45-57 (1991) (“Parulski 1991”)
Ex. 1013	Adobe Photoshop version 5.0 User Guide (1998) (“Photoshop 5.0”)

Ex. 1014	Ken Parulski and David Lewis, <i>Digital, Still-Optimized Architecture for Electronic Photography</i> , IS&T's 47th Annual Conference, pp. 665-67 (1994) ("Parulski 1994")
Ex. 1015	International Standard ISO 12233:2000(E), Photography — Electronic still picture cameras — Resolution measurements (1st ed. 2000) ("ISO 12233:2000")
Ex. 1016	Jeff Wignall, <i>How to Take Winning Pictures</i> , pp. 32-35 (Eastman Kodak Company 1989) ("Wignall")
Ex. 1017	Azreil Rosenfeld and Avinash C. Kak, <i>Digital Picture Processing</i> , pp. 178-203 (Academic Press, New York 1976) ("Rosenfeld")
Ex. 1018	William K. Pratt, <i>Digital Picture Processing</i> , pp. 318-27 (John Wiley & Sons, Inc. 1978) ("Pratt")
Ex. 1019	Declaration of Kelley M. Hayes Greenhill
Ex. 1020	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 23-cv-03046-VC, Dkt. 46 (N.D. Cal. Oct. 27, 2023).
Ex. 1021	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 23-cv-03046-VC, Dkt. 1 (N.D. Cal. Jun. 21, 2023).
Ex. 1022	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 23-cv-03046-VC, Dkt. 50 (N.D. Cal. Nov. 15, 2023).
Ex. 1023	<i>Longitude Licensing Ltd. v. Google LLC</i> , No. 23-cv-03046-VC, Dkt. 51 (N.D. Cal. Nov. 15, 2023).

I. PRELIMINARY STATEMENT

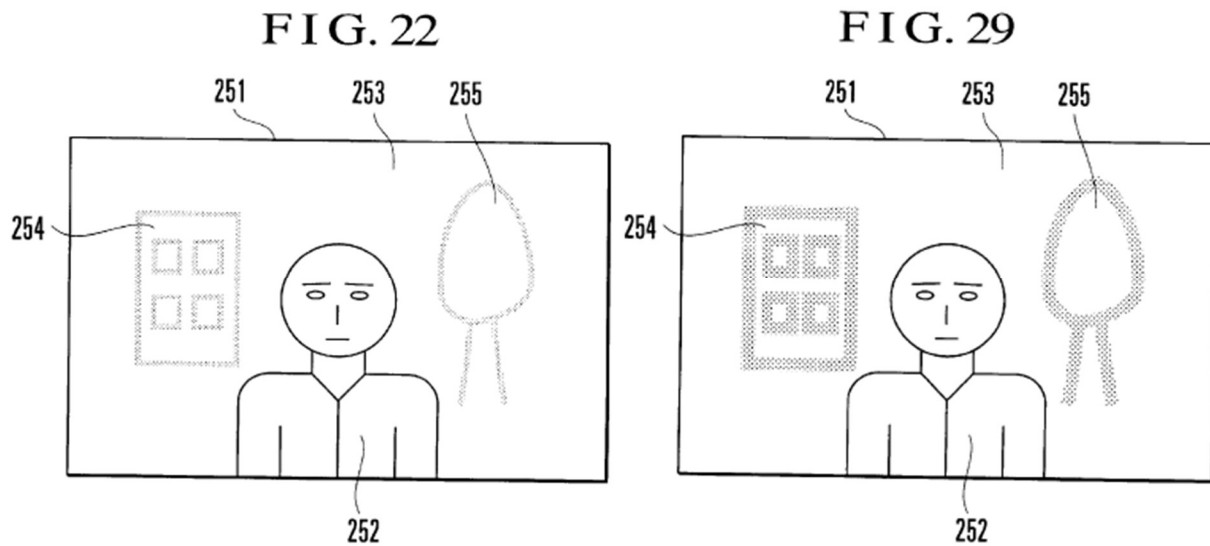
Petitioner Google LLC (“Petitioner”) requests *inter partes* review and cancellation of claims 1-3 (“challenged claims”) of U.S. Patent No. 7,945,109 (“the ’109 patent”) (Ex. 1001).

The challenged claims relate to an image processing technique for portrait images. Portrait images existed long before the ’109 patent and are typically characterized by a main subject appearing in focus, while the background appears out of focus and thus is blurred. Portrait images were so common that, years before the ’109 patent’s earliest claimed priority date, cameras came preprogrammed with portrait modes, and the standard specifying the file format for images captured by digital still cameras (“Exchangeable image file format for Digital Still Cameras,” or “Exif”) included a field to indicate that the corresponding image was taken in a “[p]ortrait mode (for closeup photos with the background out of focus).”

According to the ’109 patent, prior-art image processing techniques typically assumed that the major object of the image (e.g., person(s) in portrait mode) was in the central region of the image and performed image processing with an emphasis on that region. The ’109 patent purportedly sought to improve these techniques by associating information indicating the location of the major object in the image with the image data and using that location as the emphasis region for the image processing. In its portrait mode embodiment, as in the challenged claims, the ’109

patent discloses acquiring an image file including image data, information indicating the use of a portrait mode, and location information of a person in the image, and increasing sharpness of an area where the person is located and decreasing sharpness of an area where the person is not located based on the location information.

Each aspect of the challenged claims had been well known for years before the '109 patent's priority date. U.S. Patent No. 6,556,784 ("Onuki") (Ex. 1005) discloses nearly every feature of the claims. Onuki discloses a digital camera that stores image data together with information indicating the photo-taking mode used when taking the image and information indicating the location of the main object within the image. An image reproducing device acquires this information and, when the photo-taking mode information indicates a portrait mode, extracts the main object from the background and decreases the sharpness of the background based on the location information of the main object. Figure 22 (below left) depicts an example image photographed in the portrait mode before the image reproducing apparatus processes the image, and Figure 29 (below right) depicts the result after the image processing.



Onuki, FIGS. 22, 29.

While Onuki does not explicitly describe increasing the sharpness of an area in which the person appears, this would have been obvious in view of U.S. Patent No. 7,212,668 (“Luo-668”) (Ex. 1006). Similar to Onuki and the ’109 patent, Luo-668 discloses a technique for emphasizing the main object of the photographed image, including by “region sharpness.” Like Onuki, Luo-668 first determines the portion of the image corresponding to the main object and the portion corresponding to the background. Luo-668 then discloses modifying the pixels such that “the sharpness of main subject pixels is ... increased, while the sharpness of the background is reduced, thereby blurring the background.” Accordingly, the prior art teaches and renders obvious every feature of the challenged claims.

To the extent Patent Owner argues that Onuki's disclosure of storing the above information "together" does not disclose storing the above information in an *image file*, this would have been obvious because, as the '109 patent itself acknowledges, Exif specified the standard image file format for digital still cameras at the time. Applicant failed to provide a copy of Exif to the Examiner or disclose to the Examiner that Exif included fields for *every* feature of the image file recited in the claims and disclosed in Onuki: image data, an *ExposureProgram* tag (shooting scene information/photo-taking mode information), and a *SubjectLocation* tag (location information of a person in the image data/information indicating the main object location). It would have been obvious for the digital still camera described in Onuki to comply with the image file format standard and use an Exif file to store the information "together," as disclosed in Onuki.

The challenged claims should be canceled.

II. PRECISE RELIEF REQUESTED

Claims 1-3 of the '109 patent are unpatentable and should be canceled in view of the following prior art and unpatentability grounds.

Prior art:

Ex. 1005	U.S. Patent No. 6,556,784 (“Onuki”), filed December 20, 1999, and issued April 29, 2003; prior art to the ’109 patent under pre-AIA 35 U.S.C. § 102(e).
Ex. 1006	U.S. Patent No. 7,212,668 (“Luo-668”), filed August 18, 2000, and issued May 1, 2007; prior art to the ’109 patent under pre-AIA 35 U.S.C. § 102(e).
Ex. 1008	Digital Still Camera Image File Format Standard (Exchangeable image file format for Digital Still Cameras: Exif), Version 2.1, Japan Elec. Indus. Dev. Ass’n (June 12, 1998) (“Exif”), <i>available at</i> http://web.archive.org/web/20010627233957/http://www.pima.net/standards/it10/PIMA15740/Exif_2-1.PDF (archived June 27, 2001), published by December 1998; prior art to the ’109 patent under pre-AIA 35 U.S.C. § 102(b). <i>Infra</i> § VI.B.1.

Unpatentability Grounds:

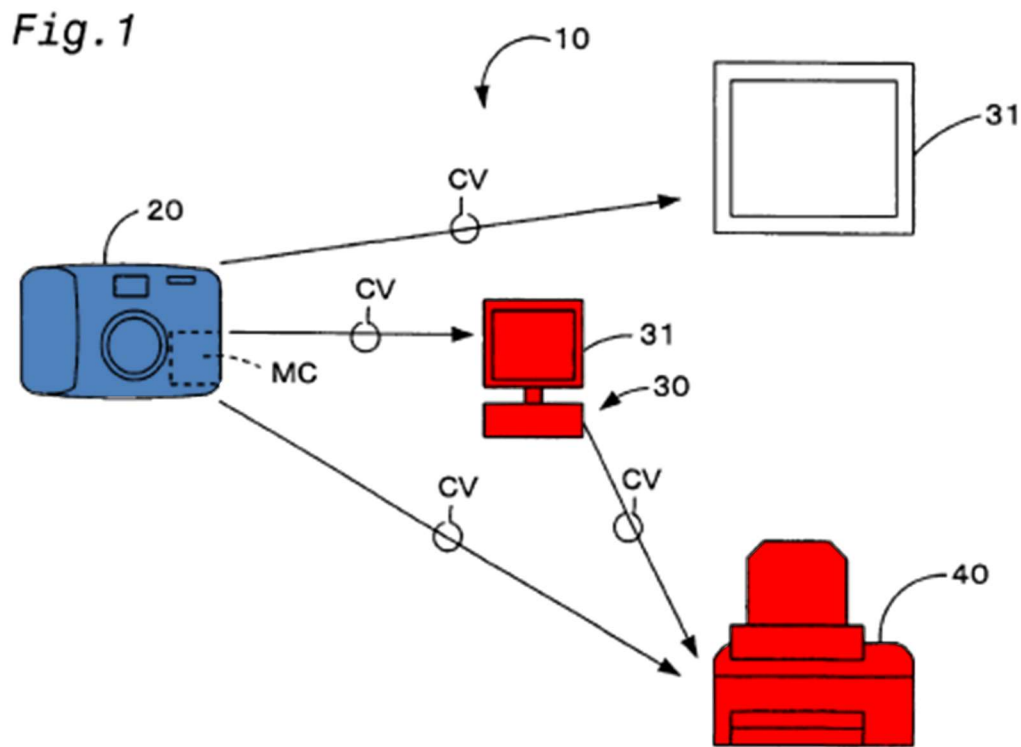
Ground 1	Onuki and Luo-668 render obvious claims 1-3.
Ground 2	Onuki, Luo-668, and Exif render obvious claims 1-3.

III. BACKGROUND

A. The '109 Patent

The '109 patent “relates to an image processing technique that uses major object information of images.” Ex. 1001, 1:14-15; Parulski ¶¶80-84. According to the specification, the “major object is not always located in the central region of an image,” so “conventional techniques that identify the central region of an image as an emphasis region had difficulties in achieving an image correction of the major object with high accuracy.” Ex. 1001, 1:19-36. The '109 patent attempts to solve this purported problem “by setting and using an appropriate emphasis region for every image data.” *Id.*, 1:40-43.

The '109 patent discloses an image processing system, depicted below, that includes “a digital still camera 20 as a shooting device that generates an image file including image data and image processing control information, which specifies image processing conditions in an image processing device.” *Id.*, 6:6-13.



Id., FIG. 1 (annotated).

To generate the image file, the camera “obtains preset image processing control information, i.e., setting information of a shot scene that was set by a photographer.” *Id.*, 8:16-21. “The shot scene may be in modes such as ... a portrait mode that is appropriate for shots that include primarily person(s).” *Id.*, 8:25-29. The camera also “obtains the focus location information at the time of the push-down of the shutter button,” which “indicates the location to which the focus is on within a shooting frame at the time of shooting.” *Id.*, 8:30-40. The camera then stores the preset image processing control information, the focus location information, and the rest of the image processing control information in one

portion of an image file (e.g., Exif image file), and image data generated by the camera in another portion of the image file. *Id.*, 8:48-53.

The **image processing device** then processes the image “using the image file that was generated in the **digital still camera 20**.” *Id.*, 6:6-13. The image processing device may be, for example, a personal computer having a CPU “that executes an image processing program.” *Id.*, 7:35-47. When the CPU “**detects the attachment of a memory card**,” it “**reads an image file**” from the memory card, **checks for** “**image processing control information CI**” in the image file, “**obtains the image processing control information CI including focus location information**,” and “**then executes image processing based on the obtained image processing control information CI**.” *Id.*, 9:8-11, 9:17-29. This process is depicted in Figure 7, below.

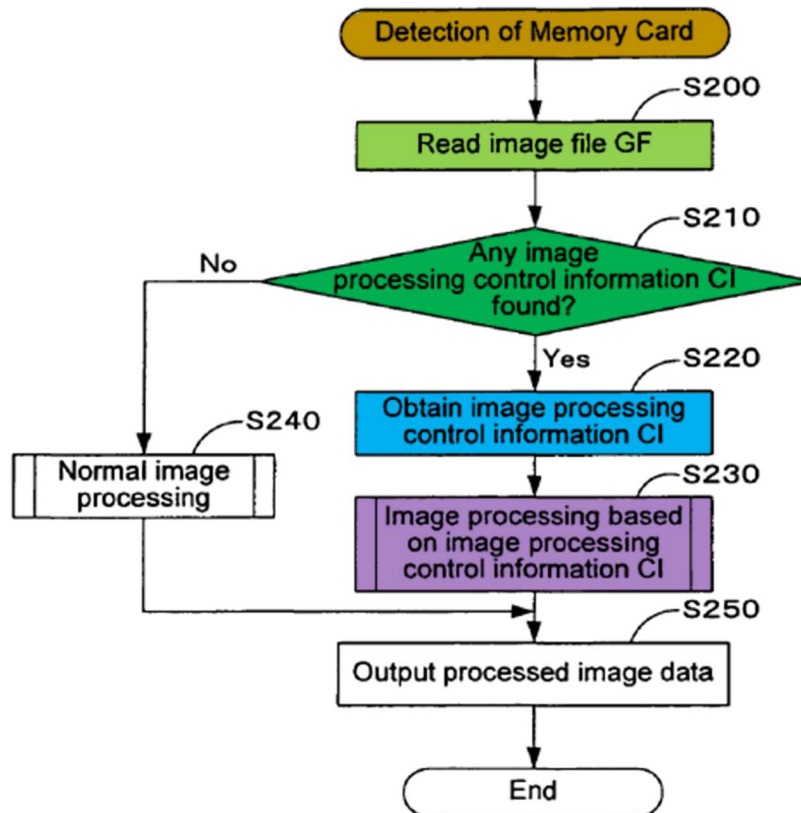


Fig. 7

Id., FIG. 7 (annotated).

As one embodiment, the '109 patent discloses using the focus location information for "a sharpness adjustment." *Id.*, 13:3-7. In this embodiment, the '109 patent discloses determining whether "a portrait mode was selected ... by analyzing the image processing control information CI." *Id.*, 13:17-20. If so, the '109 patent discloses adjusting the sharpness "without requiring any ad hoc selection processing." *Id.*, 13:14-17. This can be done by "strengthen[ing] the sharpness of an image at a focus location or in an emphasis region, or weaken[ing]

the sharpness of an image in the other regions by using a Gaussian distribution method, so as to blur away the backgrounds of the image in a suitable way.” *Id.*, 13:7-12. To determine the emphasis region, the ’109 patent discloses dividing the image into plural regions, using the focus location information to determine “a focus location on the image,” and “set[ting] a region at the determined location as an emphasis region.” *Id.*, 10:34-50.

B. Prosecution History

The ’109 patent was filed as U.S. Patent Application No. 12/456,491 (“the ’491 application”). Following rejections of the originally filed claims under 35 U.S.C. §§ 101, 102, and 112 and obviousness-type double patenting, Applicant canceled them and added three new independent claims. Ex. 1002, 176-181, 188-192. Regarding the § 102 rejection, Applicant argued that JP-11-136568 (“Hyodo”) discloses “a technique that stores an image and location information into a storage medium at the digital camera side” but does not disclose “a specific image processing application implemented at the image processing apparatus side using the location information as specified in the claimed subject matter.” *Id.*, 191-192. The Examiner then issued a notice of allowance, stating that the prior art of record did not teach or suggest “increasing the sharpness of image area [sic] where a person is located and decreasing the sharpness of other image areas, when the

shooting scene information associated with an image indicates a portrait scene, as claimed.” *Id.*, 202-206.

IV. LEVEL OF ORDINARY SKILL IN THE ART

Based on the relevant factors, *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995), a person of ordinary skill in the art (“POSITA”) would have had a Bachelor’s degree or equivalent in electrical engineering, computer science, or a related field, in addition to three years in research, design, or development in digital image processing. Parulski ¶70.

V. CLAIM CONSTRUCTION

No terms need to be construed under 37 C.F.R. § 42.100(b) to resolve the unpatentability issues in this Petition.¹ *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those [claim] terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

¹ Petitioner reserves the right to argue that certain limitations in the challenged claims are indefinite and/or require construction to resolve controversies in other forums.

VI. THE CHALLENGED CLAIMS ARE UNPATENTABLE

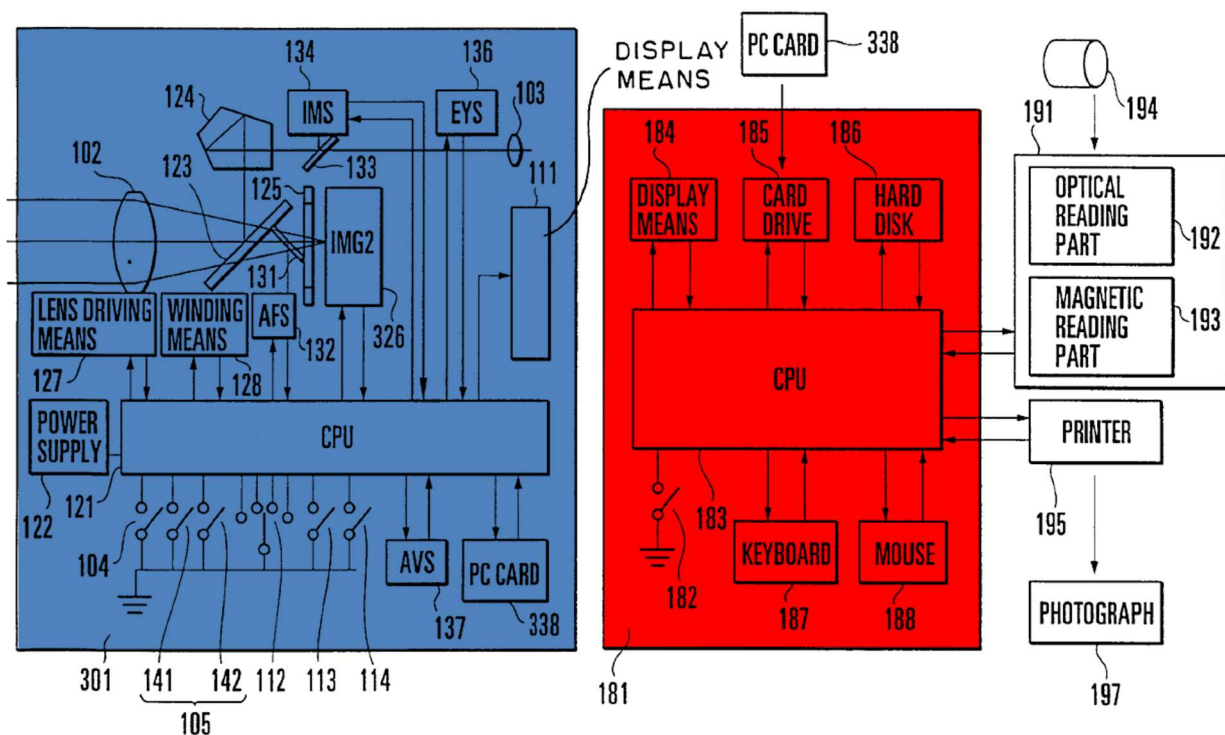
A. Ground 1: Claims 1-3 Are Obvious over Onuki and Luo-668

Onuki and Luo-668 render obvious claims 1-3 of the '109 patent.

1. Overview of Onuki

Onuki, similar to the '109 patent, discloses “an image recording/reproducing system including an **image recording apparatus** for acquiring an image in a particular fashion intended by the photographer” and “an **image reproducing apparatus** for reproducing the image acquired by the image recording apparatus after processing the image in a desired fashion.” Onuki, 1:9-15; Parulski ¶¶87-92. One embodiment of this system is depicted in Figure 30, below.

FIG. 30



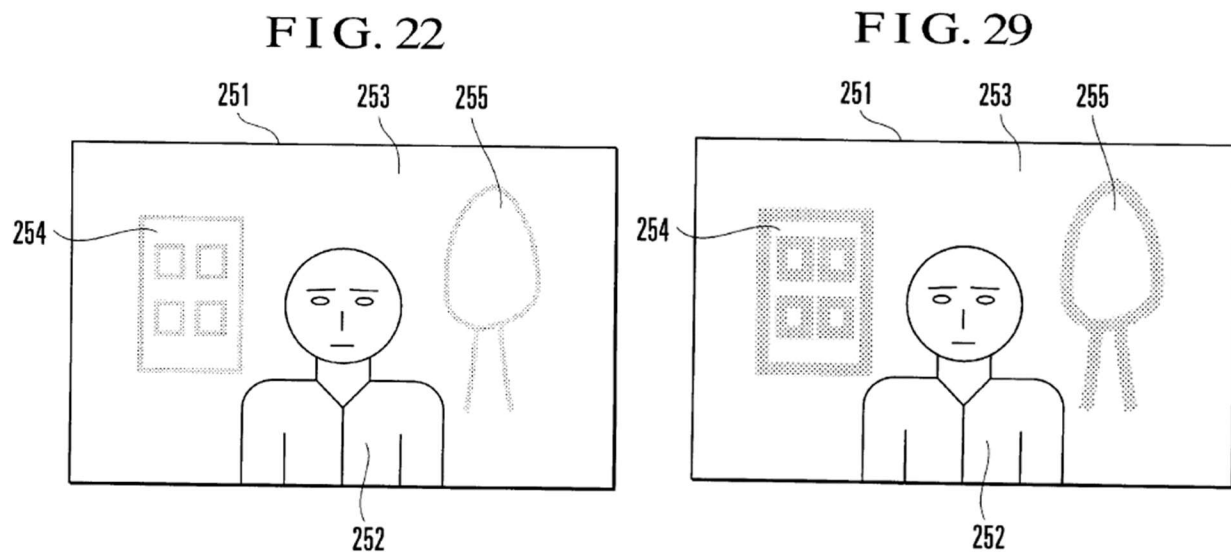
Onuki, FIG. 30 (annotated).

The **image recording apparatus** is a “digital camera” with “an image sensor 326” that is “capable of recording an image of an object together with photo-taking information,” such as “information indicating that the picture was taken in the portrait mode” and “information representing the main object location on the image plane determined on the basis of the detection of the visual line of the photographer.” Onuki, 4:43-46, 21:20-28, 22:20-25, 22:40-56. The “photo-taking information is recorded together with an image signal” representing a photographed image “in the PC card 338 serving as the image recording medium.” Onuki, 22:40-52.

The **image reproducing apparatus** “includes a PC card drive 185 for reading” the “image signal and photo-taking information stored in the PC card 338” and subjecting the image data to image processing based on the photo-taking information. Onuki, 6:59-7:3, 10:61-67, 22:5-11, 22:18-25, 22:40-65. For example, when the photo-taking mode indicates a portrait mode, the **image reproducing apparatus** separates the main object from the background, blurs the background, and embeds the main object into the blurred background image to obtain a final image. Onuki, 18:60-19:6, FIG. 23 (steps S2214-S2217).

“[B]ecause photo-taking mode information employed when a picture is taken is recorded together with an image and is supplied to an image reproducing

apparatus, the photographer can obtain a picture which has been subjected to desired image processing without having to perform a special operation or give a special order.” Onuki, 21:66-22:4. Figures 22 and 29, below, depict the image before and after image processing, respectively. Onuki, 3:65-67, 4:23-25, 18:17-22, 21:49-54.



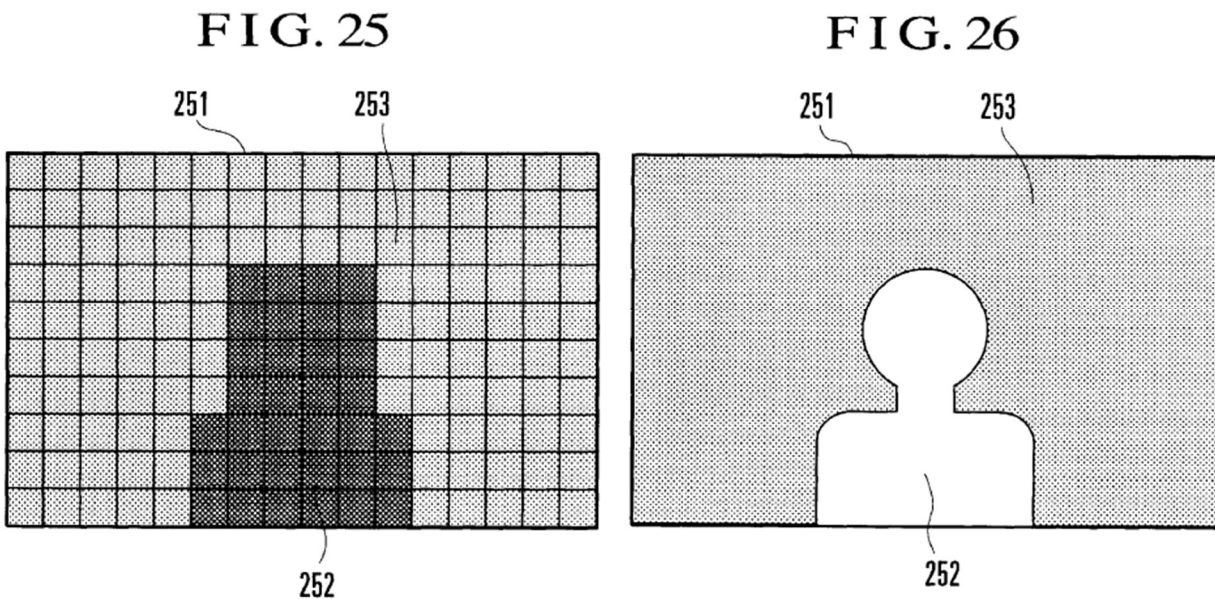
Onuki, FIGS. 22, 29.

To separate the main object from the background, Onuki discloses dividing the image into blocks, extracting “blocks which are more likely to belong to the main object image ... in accordance with the information of the main object location” recorded with the image information, and extracting a boundary line between the main object image and the background image in each of the boundary blocks of the extracted blocks. Onuki, 19:9-20:20, FIGS. 24-25. “[B]ecause information indicating the main object location on the image plane ... is recorded

together with an image and is supplied to an image reproducing apparatus, a main object can be precisely separated from a background, and thus it is possible to eliminate an error in a blurring enhancing process on the background image.”

Onuki, 22:5-11. Below, Figure 25 depicts the extracted boundary blocks 252 of an image, and Figure 26 depicts the image after extracting the main object image.

Onuki, 19:65-67, 20:20-23.



Onuki, FIGS. 25-26.

Onuki is analogous art to the '109 patent because it is in the same field of endeavor, namely, an image processing technique that uses major object information of images. Ex. 1001, 1:14-15; Onuki, 19:45-64, 22:5-11; Parulski ¶92. Onuki is also reasonably pertinent to at least one problem that the '109 patent sought to solve, including processing images where the major object is not

necessarily “located in the central region,” because it discloses using “information indicating the main object location on the image plane” when processing the image. Ex. 1001, 1:27-43; Onuki, 19:45-64, 22:5-11; Parulski ¶92.

2. Overview of Luo-668

Like Onuki, Luo-668 relates to “processing image pixels to emphasize the main subject of the image.” Luo-668, 1:7-9; Parulski ¶¶93-94. Luo-668 discloses emphasizing the main subject by both “altering pixel values in the main subject” and “altering pixel values in the background.” Luo-668, 1:50-56. For example, Luo-668 discloses varying “region sharpness” to emphasize the main subject of an image. Luo-668, 11:55-59. To perform this process, Luo-668 discloses “modifying the blur values of pixels in the digital image” based on belief values that categorize each pixel as part of the main subject or background “in such a way that the sharpness of main subject pixels is retained or increased, while the sharpness of the background is reduced, thereby blurring the background.” Luo-668, 11:64-12:4.

Luo-668 is analogous art to the ’109 patent because it is in the same field of endeavor, namely, an image processing technique that uses major object information of images. Ex. 1001, 1:14-15; Luo-668, 2:4-13, 11:55-12:4; Parulski ¶94. Luo-668 is also reasonably pertinent to at least one problem that the ’109 patent sought to solve, including processing images where the major object is not necessarily “located in the central region,” because it discloses generating “a main

subject belief map containing values indicating the location of a plurality of regions in the image, ... the belief values are related to the probability that the associated region is a main subject of the image.” Ex. 1001, 1:27-43; Luo-668, 2:4-13; Parulski ¶¶94. It is also reasonably pertinent to strengthening “the sharpness of an image at a focus location or in an emphasis region” and weakening “the sharpness of an image in the other regions,” as Luo-668 discloses increasing the sharpness of a main subject and reducing the sharpness of the background. Ex. 1001, 13:3-12; Luo-668, 11:64-12:4; Parulski ¶¶94.

3. Independent Claim 1

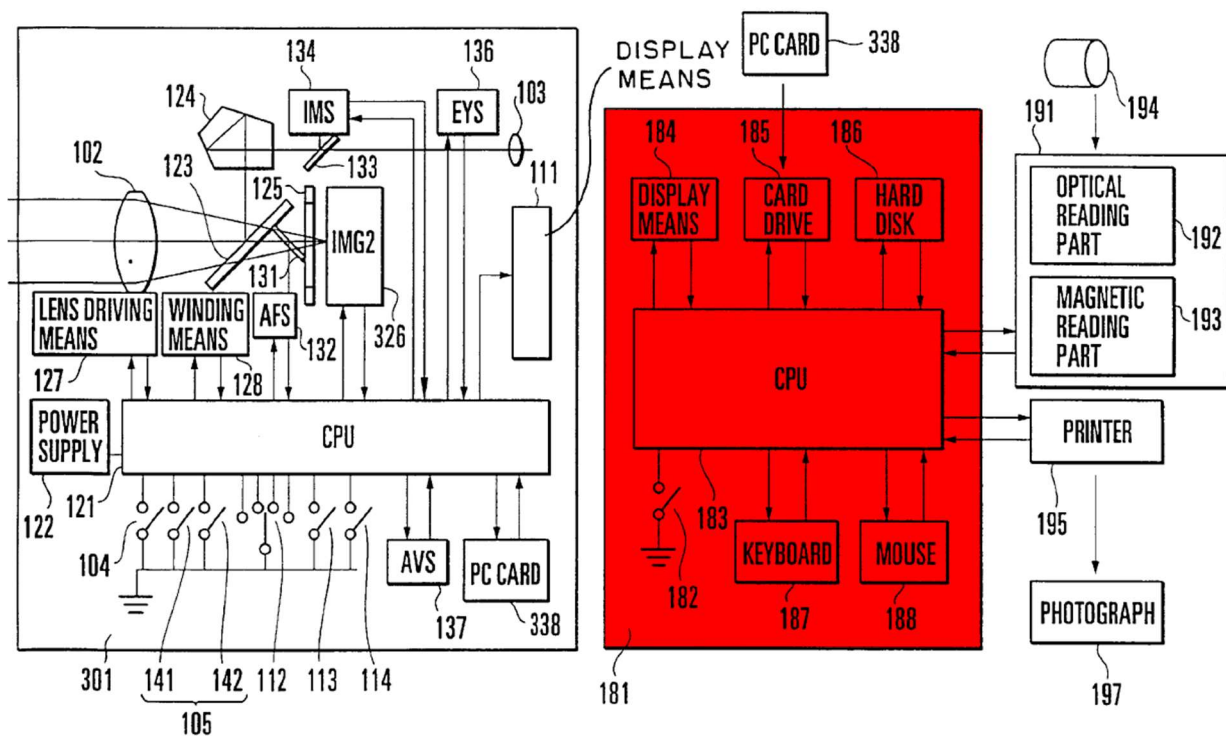
a. [1.pre]: “An image processing apparatus comprising:”

To the extent the preamble is limiting, Onuki discloses or suggests “[a]n image processing apparatus.” Parulski ¶¶101-102.

Onuki discloses an **image reproducing apparatus body 181** (image processing apparatus), shown in the schematic diagram below, that includes “a PC card drive 185 for reading information from the PC card 338” and a CPU 183. Onuki, 22:57-65, FIG. 30; Parulski ¶¶102. Figure 1 of Onuki depicts the **image reproducing apparatus** as a personal computer, for example. Onuki, 4:38-42, 4:55-62, FIG. 1; Parulski ¶¶102. The CPU 183 in the **image reproducing apparatus body 181** “is a control device including a ROM, a RAM, an EEPROM, an A/D converter

and a D/A converter”; “is responsible for controlling operations over the entire image reproducing apparatus”; and directs an “image reproducing flow” performed by the **image reproducing apparatus**. Onuki, 6:38-41, 10:40-67, 18:41-51; Parulski ¶102. The CPU 183 uses the PC card drive 185 to read “an image signal and photo-taking information stored in the PC card 338” and transfer the image signal and photo-taking information to the CPU 183 so that they may be “subjected to image processing.” Onuki, 10:44-67, 18:23-19:6, 22:57-65, FIG. 30; Parulski ¶102.

FIG. 30



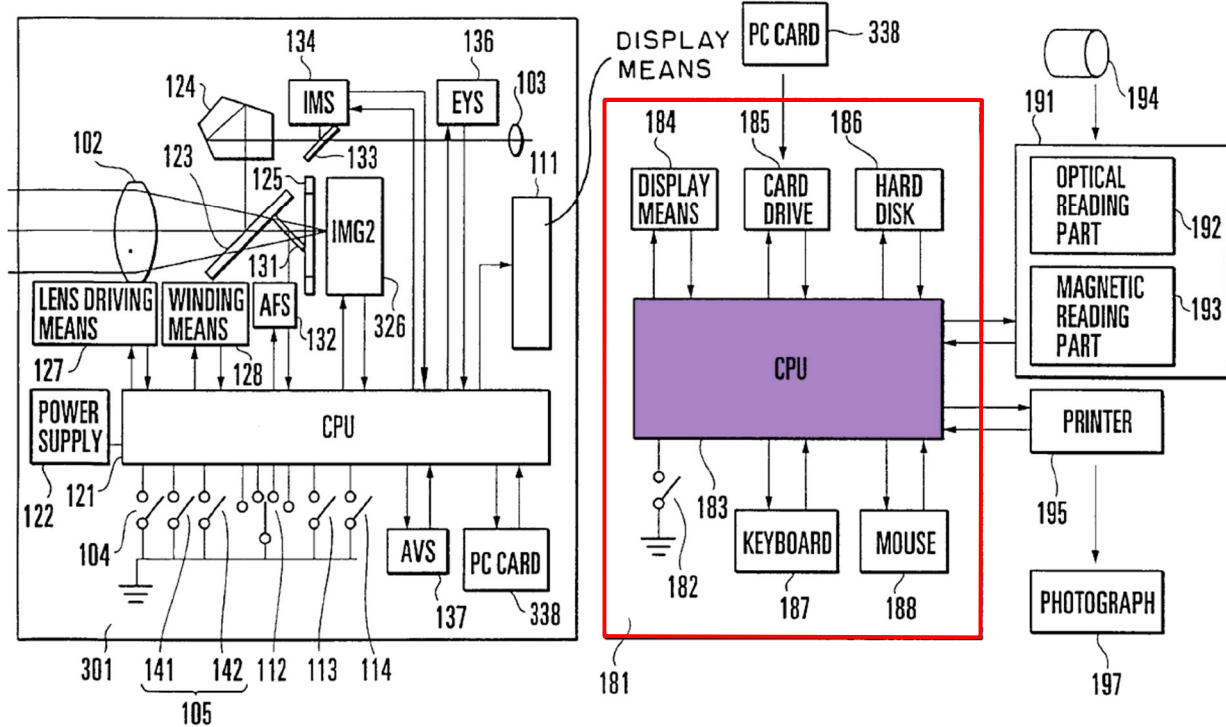
Onuki, FIG. 30 (annotated).

b. [1.a]: “a CPU, the CPU executing functions including”

Onuki discloses or suggests “a CPU, the CPU executing functions,” including the functions described in the following sections regarding [1.b]-[1.c]. Parulski ¶¶103-105; *infra* §§ VI.A.3.c-VI.A.3.d.

Onuki discloses that the **image reproducing apparatus** includes a **CPU 183**, as shown in Figure 30, below. Onuki, 6:36-41, FIG. 30; Parulski ¶104. This **CPU** executes functions because Onuki discloses that it “is a control device including a ROM, a RAM, an EEPROM, an A/D converter and a D/A converter”; “is responsible for controlling operations over the entire image reproducing apparatus”; and directs an “image reproducing flow” performed by the **image reproducing apparatus**. Onuki, 6:36-41, 10:40-67, 18:41-51; Parulski ¶104. Accordingly, functions executed by the **image reproducing apparatus** are controlled by the **CPU 183** and, therefore, executed by the **CPU 183**. Parulski ¶104.

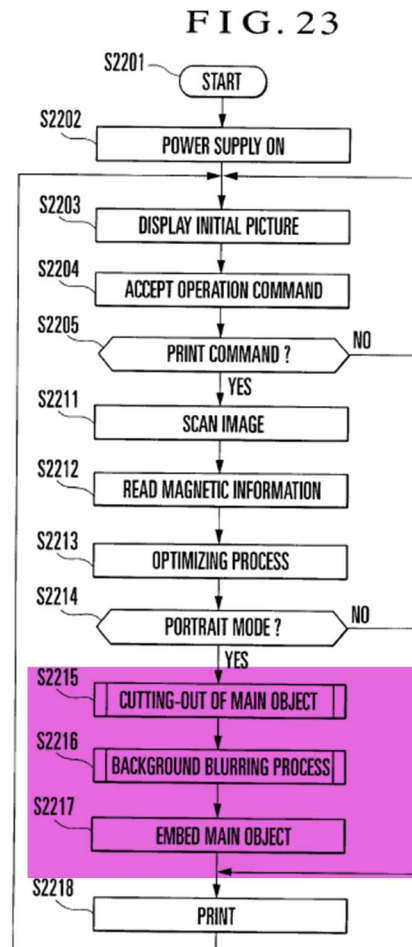
FIG. 30



Onuki, FIG. 30 (annotated).

Moreover, Onuki discloses the CPU executing image processing functions. Parulski ¶105. For example, when the CPU reads an image and photo-taking information via a film scanner, rather than via PC card drive 185, Onuki describes “a flow associated with an image processing and outputting operation,” where the image signal and photo-taking information are “transferred to the CPU 183” in steps S2211 and S2212, respectively. Onuki, 10:61-67, 18:23-26, 18:50-51, 22:57-65, FIG. 23; Parulski ¶105. Onuki then describes executing image processing functions, also applicable to the Figure 30 embodiment, like separating the main object from the background image, blurring the background, and embedding the

main object image “into the background image subjected to the background blurring process.” Onuki, 18:50-19:6, 22:59-65; Parulski ¶105. These **image processing functions** are highlighted in Figure 23, below. Onuki, 18:50-19:6, FIG. 23; Parulski ¶105.



Onuki, FIG. 23 (annotated).

c. [1.b]: “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data, and”

Onuki discloses or suggests “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data.” Parulski ¶¶106-112.

The ’109 patent does not restrict the claimed “image file” to a particular format or even a single file. Parulski ¶107. For example, the ’109 patent states that “any suitable image file that can contain the image data that is to be output by an output device and the image processing control information CI that specifies image processing conditions of the image data in an image processing device can be used.” Ex. 1001, 14:27-34. The ’109 patent also discloses that an “image file” could also include instances where “the image data and the image processing control information CI are stored in separate files” and, “at the point of image processing,” are “unified” such that they function “as if they are stored in one file.” *Id.*, 14:38-57. At least under this understanding of an “image file,” Onuki discloses acquiring an image file. Parulski ¶107.

Onuki discloses that a “digital camera” stores “an image signal” and “photo-taking information” “together” in a removable PC card 338. Onuki, 22:18-25, 22:40-52; Parulski ¶108. Onuki discloses that the image reproducing apparatus

reads the “image signal and photo-taking information stored in the PC card 338” via PC card drive 185 and subjects them to image processing. Onuki, 22:57-65, 10:61-67, 18:50-51; Parulski ¶108. The image reproducing apparatus’ CPU 183 “is responsible for controlling operations over the entire image reproducing apparatus,” which includes PC card drive 185, so Onuki discloses the CPU executing the acquiring function. Onuki, 6:38-41, 22:57-59; Parulski ¶108. Moreover, because Onuki discloses that the image signal and photo-taking information are stored “together,” read, and “subjected to image processing,” a POSITA would have understood that Onuki teaches the CPU acquiring an image file including the image signal and photo-taking information. Onuki, 21:66-22:11, 22:47-52, 22:57-65; Parulski ¶108.

Onuki’s image signal is “an electric signal representing a photographed image” and discloses the claimed “image data.” Onuki, 10:61-63, 22:40-52, 22:59-65; Parulski ¶109.

Onuki’s photo-taking information includes a “photo-taking mode,” which discloses the claimed “shooting scene information.” Onuki, 17:57-62; Parulski ¶110. For example, Onuki discloses that the photo-taking mode can indicate that “the image was photographed in the portrait mode.” Onuki, 15:19-23, 18:53-55; Parulski ¶110; *see* Ex. 1001, 15:4-5 (requiring that “the acquired shooting scene information indicates a portrait scene”). “[B]ecause photo-taking mode information

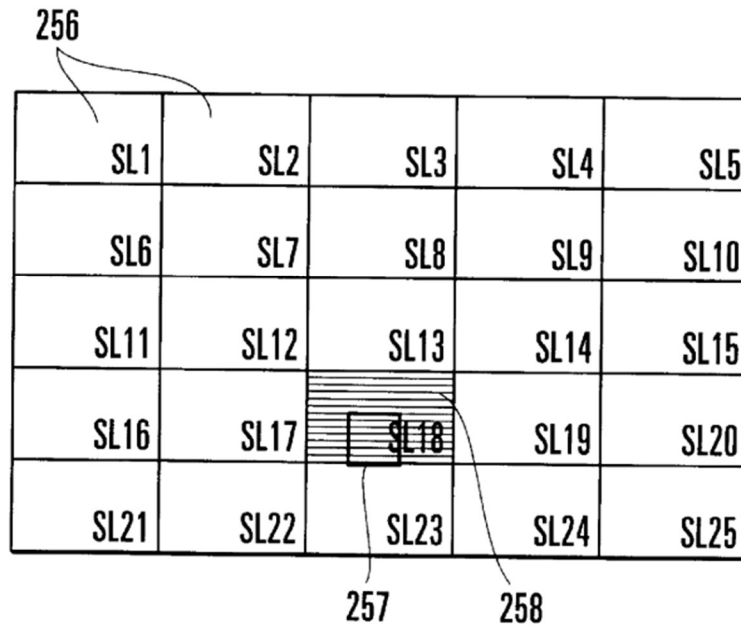
employed when a picture is taken is recorded together with an image and is supplied to an image reproducing apparatus, the photographer can obtain a picture which has been subjected to desired image processing without having to perform a special operation or give a special order.” Onuki, 21:66-22:4.

Onuki’s photo-taking information also includes a “main object location,” which discloses the claimed “location information of a person in the image data.” Onuki, 17:57-62; Parulski ¶111. For example, Onuki discloses that, in “a typical example of a portrait scene,” a person 252 is the main object and that the main object location represents an area of the image in which “the representative location of the main object” is located. Onuki, 15:33-37, 17:63-18:10, FIGS. 17, 22; Parulski ¶111. “[B]ecause information indicating the main object location on the image plane, inputted or detected when a picture was taken, is recorded together with an image and is supplied to an image reproducing apparatus, a main object can be precisely separated from a background, and thus it is possible to eliminate an error in a blurring enhancement process on the background image.” Onuki, 22:5-11.

For example, Onuki discloses, in Figure 21 below, “a schematic diagram illustrating a manner of defining the location of an object.” Onuki, 3:61-64, FIG. 21. The image plane is divided into 25 blocks, labeled SL1 through SL25. Onuki, 17:63-18:6, FIG. 21; Parulski ¶112. The “reference number 257 denotes a

point directed by a visual line of the photographer” detected by an eye-tracking sensor in the camera. Onuki, 17:63-18:6. Since point 257 is located in block SL18, “a code representing the block number of this area” is recorded by the camera and supplied to the image reproducing device. Onuki, 18:7-10, 22:57-65; Parulski ¶112.

FIG. 21



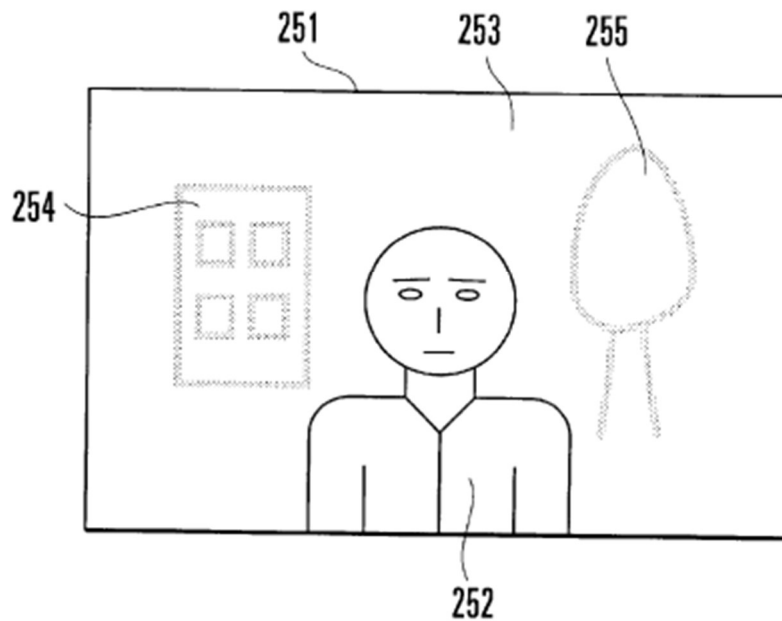
Onuki, FIG. 21.

- d. **[1.c]: “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene.”**

Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene.” Parulski ¶¶121-131.

Onuki discloses an image processing routine that decreases the sharpness of an area in which the person is not located based on the acquired main object location (location information) when the acquired photo-taking mode (shooting scene information) indicates a portrait mode (portrait scene). Onuki, 18:23-20:67, FIGS. 21-29; Parulski ¶122. Onuki discloses that a “portrait mode” refers to “a photo-taking mode in which only a main object is focused.” Onuki, 15:19-23. Figure 22, below, depicts “an example of an image photographed in the portrait mode” before the image reproducing apparatus performs image processing. Onuki, 18:17-19, FIG. 22; Parulski ¶122. As shown, the main object 252 in this image is a person. Onuki, 15:33-37, FIG. 22; Parulski ¶122.

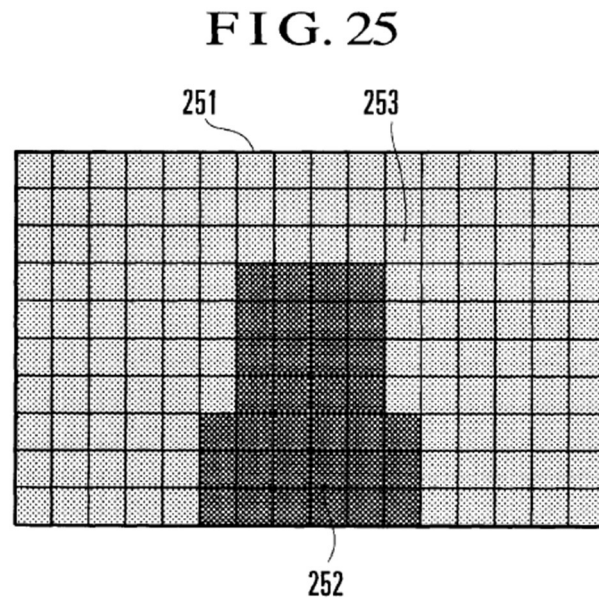
FIG. 22



Onuki, FIG. 22.

When the CPU of the image reproducing apparatus determines that the photo-taking mode indicates that “the image was photographed in the portrait mode,” “the main object is separated from the background image” based on the main object location. Onuki, 6:39-42, 18:60-65, 19:45-64, 21:40-48, 22:5-11, 22:59-65; Parulski ¶123. Onuki discloses first determining “whether the image was photographed in the portrait mode” based on the previously read photo-taking mode. Onuki, 18:53-55, 21:66-22:4; Parulski ¶123. If so, the image reproducing apparatus divides the image “into small blocks,” performs a spatial frequency analysis on each block, and preliminarily identifies whether each block “belongs to

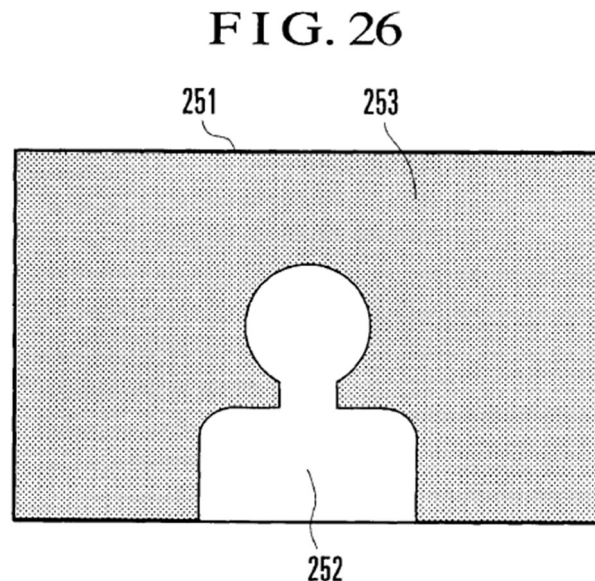
the main object image” based on this spatial frequency analysis. Onuki, 19:15-39; Parulski ¶123. This is shown below in Figure 25. Onuki, 19:40-44.



Onuki, FIG. 25.

The main object separation uses the “main object location represented by a location number assigned to a particular small area in the photo-taking image plane” (location information of a person in the image data acquired in an image file), along with a spatial frequency analysis of the image data, to “produce a single closed boundary line surrounding the main object image.” Onuki, 19:53-20:19; Parulski ¶124. The image reproducing apparatus determines which blocks correspond to the main object location and extracts “blocks which are more likely to belong to the main object image ... in accordance with the information of the main object location which was recorded when the image was photographed and

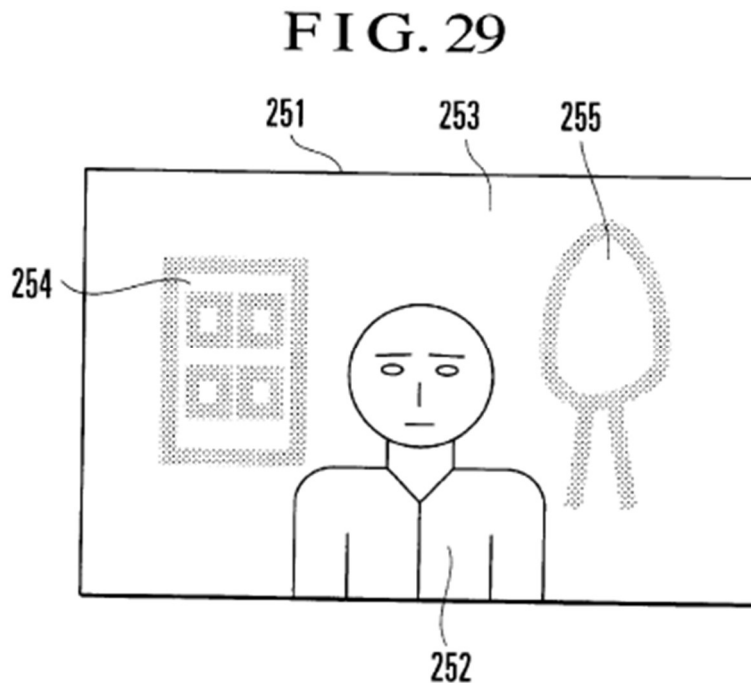
which has been detected.” Onuki, 19:45-64; Parulski ¶124. The image reproducing apparatus then extracts “a boundary line between the main object image and the background image” for each of the blocks on the boundary between the two, produces “a single closed boundary line surrounding the main object image,” and cuts out the main object image from the photographed image. Onuki, 19:65-20:19. Figure 26, below, depicts the resultant image with the main object (an area in which the person is located) separated from the background (an area in which the person is not located). Onuki, 20:20-23; Parulski ¶124.



Onuki, FIG. 26.

Onuki then discloses that “the background image remaining after the cutting-out of the main object image ... is subjected to a process for blurring the background image.” Onuki, 18:66-19:2. A POSITA would have understood that

this blurring process decreases sharpness of an area in which the person 252 is not located. Parulski ¶125; *see* Ex. 1001, 13:7-12 (disclosing that “blur[ring] away the backgrounds of the image in a suitable way” “weaken[s] the sharpness of an image” in a region other than “an emphasis region”). The main object image is then “embedded into the background image subjected to the background blurring process,” producing the final image of Figure 29, below, which shows the sharpness of the background decreased. Onuki, 19:3-8, 20:60-65, 21:49-53, FIG. 29.



Onuki, FIG. 29.

Because the background is separated from the main object image based on the main object location, this decrease in the sharpness of the background (an area

in which the person is not located) is based on the main object location. Parulski ¶126. “[B]ecause information indicating the main object location on the image plane ... is recorded together with an image and is supplied to an image reproducing apparatus, a main object can be precisely separated from a background, and thus it is possible to eliminate an error in a blurring enhancing process on the background image.” Onuki, 22:5-11.

While Onuki does not explicitly disclose also increasing the sharpness of an area in which the person is located, this would have been obvious in view of Luo-668. Parulski ¶127. Like Onuki, Luo-668 discloses “processing image pixels to emphasize the main subject of the image,” including by “blurring the background regions out of focus.” Luo-668, 1:7-9, 11:59-63; Parulski ¶127. But unlike Onuki, Luo-668 explicitly discloses that further emphasis can be created by both “altering pixel values in the main subject” and “altering pixel values in the background.” Luo-668, 1:50-56, 11:64-12:4; Parulski ¶127. Luo-668 discloses one form of emphasis by varying “region sharpness.” Luo-668, 11:55-59. To perform this process, Luo-668 discloses “modifying the blur values of pixels in the digital image” so that “the sharpness of main subject pixels is ... increased, while the sharpness of the background is reduced, thereby blurring the background.” Luo-668, 11:64-12:4; Parulski ¶127.

A POSITA would have been motivated to combine Onuki and Luo-668 to further emphasize the person that constitutes the main object in a photo taken in portrait mode by increasing the sharpness of the main object, including the area corresponding to the main object location. Parulski ¶128. Onuki discloses that, in portrait mode, a main object should be “focused.” Onuki, 15:21-23; Parulski ¶128. Even if the photographer properly captured the main object in focus, the main object’s sharpness is limited by various factors, including the type of lens, the resolution of the image sensor, and the amount of image compression used in the camera. Parulski ¶128. Increasing the sharpness was a well-known process used in digital image processing to make up for these shortcomings, and a POSITA would have been motivated to apply it when the portion of the image corresponding to the main object lacked the desired sharpness. *Id.* Doing so would have enhanced the appearance of the main object. *Id.*

Additionally, it was known that some or all of the main object may initially be out of focus for a variety of reasons. Parulski ¶129. For example, the main object may be out of focus due to errors in the focus adjustment step or if the main subject moves after setting the focus. *Id.*; Onuki, 6:20-25, 8:49-59, 16:53-65. Additionally, if the camera does not properly set the aperture, the main object may include areas that are out of focus. Onuki, 17:12-38 (disclosing that setting the aperture “to a too large value” means that “good focus is obtained only for a

particular part of an object”); Parulski ¶129. A POSITA would have been motivated to increase the sharpness of the main object, as taught by Luo-668, to improve the clarity of the features of the main object and further emphasize the main object against the background. Parulski ¶129.

Furthermore, Onuki discloses a system that includes a printer 195 “for producing a photograph 197 by printing a hard copy” of the processed images from the image reproducing apparatus 181. Onuki, 4:55-62, 4:66-5:2. A POSITA would have understood that hardcopy printers also generally reduced the sharpness of images, due to the digital printing process, and that “[t]he image quality of digital prints [could] be improved by using an appropriate sharpening or ‘edge enhancement’ filter.” U.S. Patent No. 5,696,850 (“Parulski ’850”) (Ex. 1011), 1:29-31; Parulski ¶130. Furthermore, “[t]he appropriate filter depend[ed] on the characteristics of the image input source (digital camera or film plus scanner), the output printer, and the print size.” Ex. 1011, 1:31-33; Parulski ¶130. A POSITA would have been motivated to use the image reproducing apparatus in Onuki to increase the sharpness of the main object, as taught by Luo-668, so that the photograph 197 produced by printer 195 in Onuki provided high-quality images, which properly depict the fine details of the main object in the print. Parulski ¶130.

A POSITA would have had a reasonable expectation of success of such a combination, as Onuki already discloses that the main object image is “cut out”

from the background and “saved,” allowing the image reproducing apparatus to easily increase the sharpness of the pixels constituting the main object image.

Onuki, 20:62-65. Adding Luo-668’s feature of increasing the sharpness of the main object would have been a combination of familiar elements according to known methods to yield predictable results, requiring a POSITA to apply only conventional image-sharpening techniques to the main object image cut out from the background to increase the sharpness of the main object. Parulski ¶131. Indeed, several techniques for sharpening an image, including by applying “Gaussian unsharp masking,” were well known, and a POSITA would have reasonably expected success in applying such techniques to the main object image to increase the sharpness of an area of the image in which the person is located. U.S. Patent No. 6,373,992 (“Nagao”) (Ex. 1009), 2:1-7, 5:1-12; Parulski ¶131.

4. Independent Claim 2

a. [2.pre]: “A method of image processing comprising:”

Onuki discloses or suggests “[a] method of image processing” for the reasons explained for [1.pre]. *Supra* § VI.A.3.a; Parulski ¶132.

- b. [2.a]: “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data; and”**

Onuki discloses or suggests “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data” for the reasons explained for [1.b]. *Supra* § VI.A.3.c; Parulski ¶133.

- c. [2.b]: “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene,”**

Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene” for the reasons explained for [1.c]. *Supra* § VI.A.3.d; Parulski ¶134.

- d. [2.c]: “wherein each of the operations of the method of image processing is executed by a CPU.”**

Onuki discloses or suggests “wherein each of the operations of the method of image processing is executed by a CPU” for the reasons explained for [1.a]. *Supra* § VI.A.3.b; Parulski ¶135.

5. Independent Claim 3

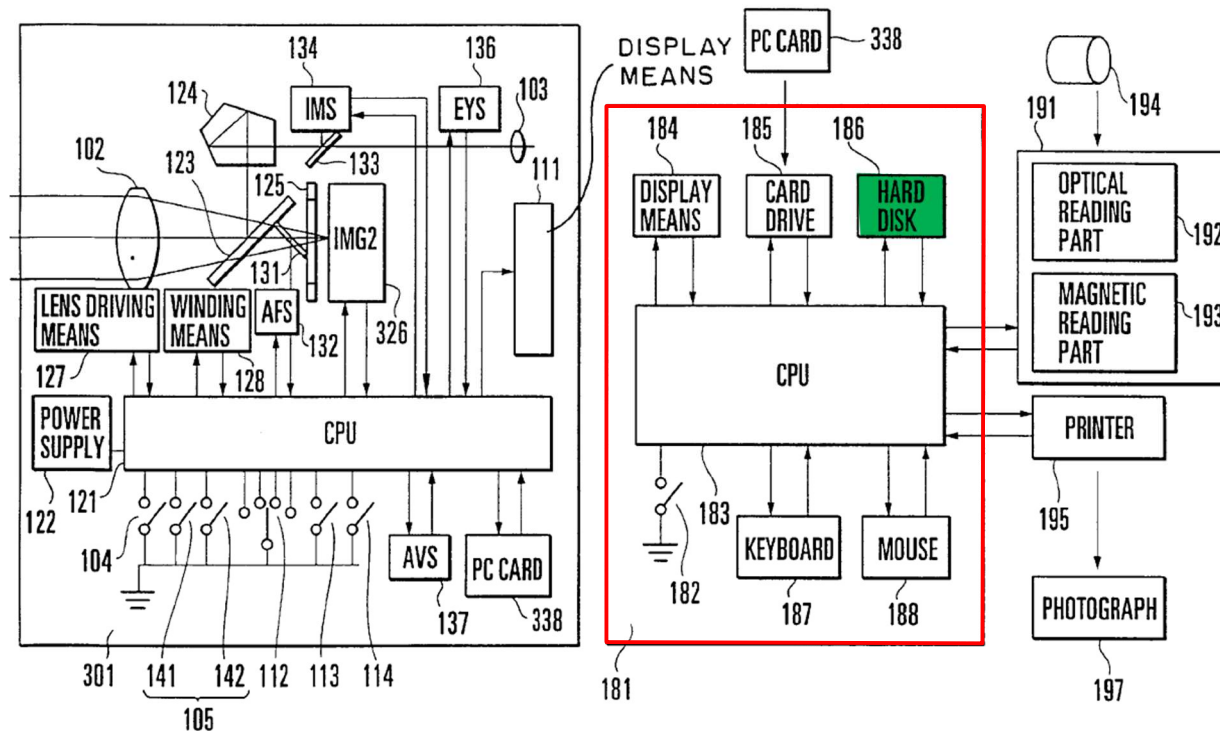
a. [3.pre]: “A computer program product comprising:”

Onuki discloses or suggests “[a] computer program product.” Parulski ¶136. Onuki discloses that an image reproducing apparatus body 181 includes a hard disk 186 that “serves to store an image processing program.” Onuki, 6:36-37, 6:49-51, FIG. 30. When “the power supply switch 182 of the image reproducing apparatus 281 is turned on, the CPU 183 is activated,” and “execution of various control programs is started.” Onuki, 18:41-47, 6:52-54; Parulski ¶136. Such an image processing program executed by the CPU discloses a computer program product. Parulski ¶136; *see supra* § VI.A.3.a ([1.pre]).

b. [3.a]: “a non-transitory computer-readable storage medium on which an image processing program is stored, wherein the image processing program includes”

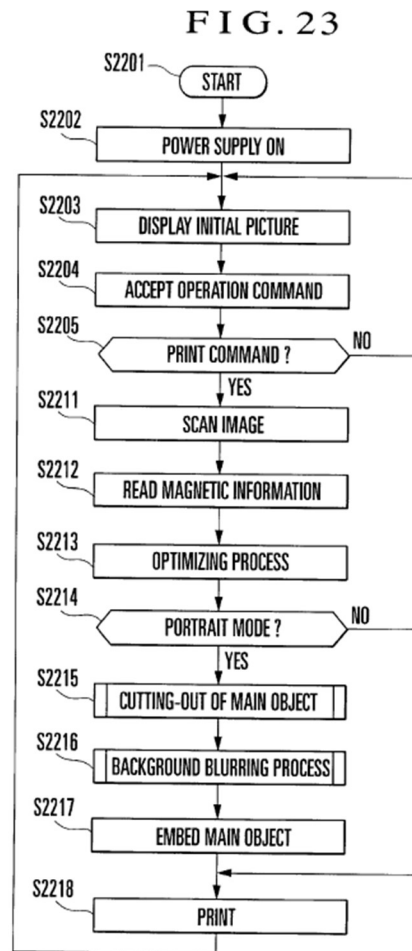
Onuki discloses or suggests “a non-transitory computer-readable storage medium on which an image processing program is stored.” Parulski ¶¶137-138. Onuki discloses a hard disk 186 (non-transitory computer-readable storage medium) that “serves to store an image processing program” (on which an image processing program is stored). Onuki, 6:49-51, FIG. 30; Parulski ¶137.

FIG. 30



Onuki, FIG. 30 (annotated).

One image processing program stored in hard disk 186 is represented in the flow chart of Figure 23, reproduced below. Onuki, 6:49-51, 18:23-26, FIG. 23; Parulski ¶138.



Onuki, FIG. 23. While Onuki presents this flow chart in connection with its second embodiment, which reads the image and related data from film, Onuki discloses that the image processing proceeds “in a similar manner” in Onuki’s Figure 30 embodiment, which reads the image and related data from a PC card 338. Onuki, 22:57-65, FIG. 23; Parulski ¶138. As described in the following sections regarding [3.b]-[3.c], this image processing program discloses or suggests or, in view of Luo-668, renders obvious including the claimed features of claim 3. Parulski ¶138; *infra* §§ VI.A.5.c-VI.A.5.d.

- c. **[3.b]: “a computer program code for acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data, and”**

Onuki discloses or suggests “a computer program code for acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data.” Parulski ¶139. Onuki discloses or suggests “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data” for the reasons explained for [1.b]. *Supra* § VI.A.3.c; Parulski ¶139. As explained for [1.b], this acquiring occurs when a CPU reads an image file from PC card drive 185. *Supra* § VI.A.3.c; Parulski ¶139. A POSITA would have understood that this step would be embodied in computer program code because the computer program that allows Onuki’s image reproducing apparatus to perform image processing is stored in hard disk 186, which is comprised of computer program code. Onuki, 6:49-51, FIG. 30; Parulski ¶139; *supra* § VI.A.5.b ([3.a]).

- d. **[3.c]: “a computer program code for increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene.”**

Onuki in view of Luo-668 renders obvious “a computer program code for increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene.” Parulski ¶¶140-141. Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene” for the reasons explained for [1.c]. *Supra* § VI.A.3.d. A POSITA would have understood that this step would be embodied in computer program code because the computer program that allows Onuki’s image reproducing apparatus to perform image processing is stored in hard disk 186, which is comprised of computer program code. Onuki, 6:49-51, FIG. 30; Parulski ¶140; *supra* § VI.A.5.b ([3.a]).

For example, as explained for [1.c], Onuki discloses a CPU configured to determine whether the shooting scene information indicates that a portrait mode is selected, Onuki, 6:36-42, 18:53-55, FIG. 23, to divide the image into plural regions, Onuki, 6:36-42, 19:15-17, FIG. 25, to determine which region corresponds to the region indicated by the location information, Onuki, 6:36-42, 19:45-58, FIG. 21, and to blur a region in which the person is not located, Onuki, 6:36-42, 20:25-59, FIGS. 27-28, and Onuki in view of Luo-668 renders obvious a CPU configured to increase the sharpness of the region in which the person is located, based on the acquired location information, Onuki, 6:36-42; Luo-668, 11:64-12:4. Parulski ¶141; *supra* § VI.A.3.d.

B. Ground 2: Claims 1-3 Are Obvious over Onuki, Luo-668, and Exif

1. Overview of Exif

Exif was issued by the Japan Electronic Industry Development Association (JEIDA) “as a standard for the image file format (Exif: Exchangeable image file format) used in digital still cameras and related systems.” Exif,² 1, 3; Parulski ¶¶95-100. It was published and publicly accessible by December 1998 and therefore qualifies as a prior-art printed publication to the ’109 patent under pre-AIA § 102(b). Parulski ¶58 (Mr. Parulski testifying that Exif version 2.1 “was

² Citations to Exif use the PDF page numbers.

publicly disseminated by December 1998 without restriction to interested and skilled members of the public,” including himself “and many others that [he] worked with at Kodak that would have met the definition of a person of ordinary skill in the art”; and testifying that “any member of the public had access to Exif-V2.1 at least by December 1998 by accessing the public website for JEIDA in order to purchase a hardcopy of this JEIDA standard”); *see* Ex. 1007, 28, 30 (Reference “6.”) (conference paper published in 1999 citing Exif); Parulski ¶58 (describing public accessibility of Exif); Ex. 1019, ¶¶14-15. It “specifies a standard file format for the image data recorded by digital still cameras (DSC) and related systems, which use a PC Card or other removable memory medium,” and sought to provide “a framework in which these products can be used readily by ordinary consumers.” Exif, 7.

Exif discloses that the image data follows “existing image formats, depending on the image data type,” such as “RGB uncompressed data,” “YCbCr uncompressed data,” and “JPEG compressed data.” Exif, 17. For example, the figure below depicts the basic structure of an image file with JPEG compressed image data:

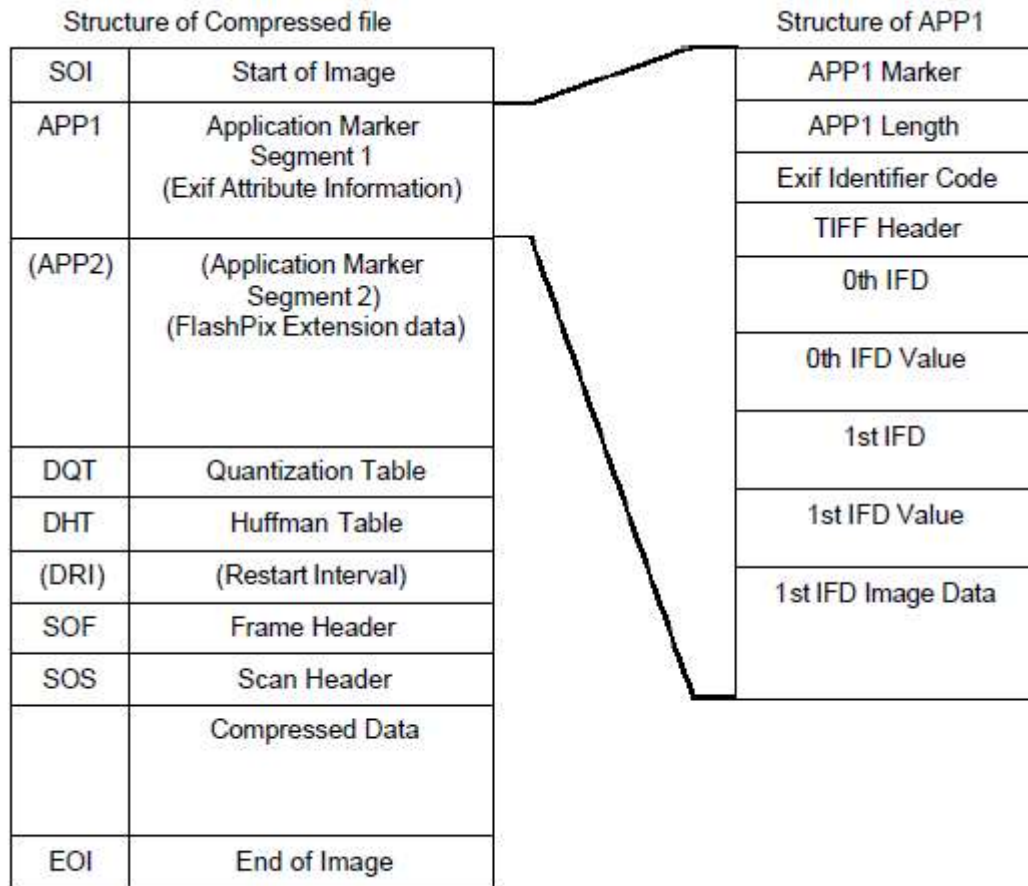


Fig. 6 Basic Structure of Compressed Data Files

Exif, 20 (FIG. 6).

Exif also discloses that the file includes various tags that correspond to a value for various types of attribute information. Exif, 24, 27-61. For example, Exif discloses “Tags Relating to Picture-Taking Conditions.” Exif, 40-41, 52-61. One type of tag relating to picture-taking conditions is Exif’s *ExposureProgram* tag, which is “[t]he class of the program used by the camera to set exposure when the picture is taken.” Exif, 55. A tag value of “7,” for example, indicates “[p]ortrait mode (for closeup photos with the background out of focus).” *Id.* Another type of

tag relating to picture-taking conditions is Exif's *SubjectLocation* tag, which "[i]ndicates the location of the main subject in the scene" in terms of a row and column within the image. Exif, 59. Exif discloses that "[t]he use of a common method of storing attribute information for both compressed and uncompressed data results in a simpler format." Exif, 17.

Because Exif image files are compatible "with standard formats in wide use," they can "be used on personal computers and other information systems." Exif, 8. "The DSC or other system writes data to files in the format specified in this standard," and personal computers include "dedicated software" that can "read all the images, audio and attribute information recorded in conformance with this standard." Exif, 11.

Exif is analogous art to the '109 patent because it is in the same field of endeavor, namely, an image processing technique that uses major object information of images. Ex. 1001, 1:14-15; Exif, 11, 59; Parulski ¶100. For example, Exif provides a *SubjectLocation* tag that "[i]ndicates the location of the main subject in the scene," thus allowing image processing devices to use such information when processing images. Exif, 11, 59; Parulski ¶100. Exif is also reasonably pertinent to at least one problem that the '109 patent sought to solve, including processing images where the major object is not necessarily "located in the central region," because it discloses a standard image file format that includes

attribute data specifying the “location of the main subject in the scene” and specifying if an image was captured in portrait mode, just like the image file in the ’109 patent. Ex. 1001, 1:14-15, 1:27-28, 13:3-20; Exif, 40-41, 55, 59; Parulski ¶100.

2. Independent Claim 1

a. [1.pre]: “An image processing apparatus comprising:”

Onuki discloses or suggests “[a]n image processing apparatus” for the reasons explained in Section VI.A.3.a (Ground 1, [1.pre]). Parulski ¶¶101-102.

b. [1.a]: “a CPU, the CPU executing functions including”

Onuki discloses or suggests “a CPU, the CPU executing functions,” including the functions described in the proceeding sections regarding [1.b]-[1.c], for the reasons explained in Section VI.A.3.b (Ground 1, [1.a]). Parulski ¶¶103-105.

c. [1.b]: “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data, and”

To the extent Patent Owner contends or the Board finds that Onuki does not disclose an “image file,” Onuki discloses or suggests “acquiring ... image data, shooting scene information, and location information of a person in the image data”; Exif discloses or suggests an “image file including image data, shooting

scene information, and location information of a person in the image data”; and it would have been obvious to combine Onuki and Exif to teach this limitation.

Parulski ¶¶106-120.

For the reasons explained for Ground 1, [1.b], Onuki discloses that a digital camera stores “an image signal” and “photo-taking information” “together” in a removable PC card 338, and that the image reproducing apparatus reads the “image signal and photo-taking information stored in the PC card 338” via PC card drive 185 and subjects them to image processing. *Supra* § VI.A.3.c; Onuki, 10:61-67, 18:50-51, 22:18-25, 22:40-65; Parulski ¶108. For the reasons explained for Ground 1, [1.b], Onuki discloses the CPU executing the acquiring function. *Supra* § VI.A.3.c; Onuki, 6:38-41, 22:57-59; Parulski ¶108. And for the reasons explained for Ground 1, [1.b], Onuki’s image signal discloses image data, and Onuki’s photo-taking mode and main object location that make up the photo-taking information disclose shooting scene information and location information of a person in the image data, respectively. *Supra* § VI.A.3.c; Parulski ¶¶109-112, 114. A POSITA would have looked to Exif for details on how to store the image signal, photo-taking mode, and main object location together and provide this information to the image reproducing apparatus for image processing. Parulski ¶114.

Exif “specifies a standard file format for the image data recorded by digital still cameras (DSC)” that “use a PC Card,” like the digital camera disclosed by

Onuki. Exif, 7; Onuki, 22:20-25, 22:40-56. Parulski ¶115. This standard file format (image file) includes both “image data,” Exif, 14-22, and “attribute information,” Exif, 23-61. Parulski ¶116. That attribute information includes tags and associated fields for “Picture-Taking Conditions” like the *ExposureProgram* tag (shooting scene information) and the *SubjectLocation* tag (location information of a person in the image data). Exif, 40-41, 55, 59; Parulski ¶116. Exif’s *ExposureProgram* tag is “[t]he class of the program used by the camera to set exposure when the picture is taken.” Exif, 55; Parulski ¶116. A tag value of “7,” for example, indicates “[p]ortrait mode (for closeup photos with the background out of focus).” Exif, 55. Exif’s *SubjectLocation* tag “[i]ndicates the location of the main subject in the scene” in terms of a row and column within the image. Exif, 59; Parulski ¶116.

A POSITA would have found it obvious to combine Onuki and Exif such that Onuki’s digital camera uses the Exif image file format to store the image signal and photo-taking information “together,” and its image reproducing apparatus acquires this image file to perform the desired image processing on the associated image signal. Parulski ¶117. Because Exif “specifies a standard file format for the image data recorded by digital still cameras (DSC) and related systems,” a POSITA would have been motivated to use Exif’s file format, including its tags for specifying the photo-taking mode and main object location, to ensure compatibility with a wide variety of image reproducing apparatuses that

may process the image. Exif, 7; Parulski ¶117. Exif's file format was known for its "compatibility with standard formats in wide use," allowing such files "to be used on personal computers and other information systems." Exif, 8. Indeed, Exif states that its file is compatible with both "[o]ff-the shelf" and "[d]edicated (system-specific) image processing software running on personal computers." Exif, 11; Parulski ¶117.

A POSITA would have been motivated to use a standard image file like the one disclosed in Exif to transfer the image data and necessary information for Onuki's image processing to the image reproducing apparatus in a single file. Parulski ¶118. A POSITA would have seen such an image file as advantageous because "[w]ith single images or small collections, it is convenient to store the metadata in the same file as the image data, so that a single item on the desktop contains all the information." James R. Milch and Kenneth A. Parulski, *Using Metadata to Simplify Digital Photography*, IS&T's 1999 PICS Conference, pp. 26-30 (1999) ("Milch") (Ex. 1007), at p. 28; Parulski ¶¶57, 118. Using a single file conforming to an industry standard to provide such information would have improved the organization of the data and would have simplified the development and implementation of the image reproducing apparatus obtaining the data necessary to perform the requested image processing, since software for reading

and utilizing the image data and TIFF tags in an Exif file was well known and widely used. Parulski ¶118.

A POSITA would have had a reasonable expectation of success in Onuki's image reproducing apparatus acquiring an Exif image file including Onuki's image signal (e.g., stored as uncompressed or JPEG compressed image data) and photo-taking information (e.g., stored using TIFF tags) "together" for processing because Exif image files were the standard, well-known way for digital cameras to digitally store image data and associated picture-taking conditions together. Onuki, 22:40-65; Exif, 8; Parulski ¶119. Exif describes the applicable digital file format standard at the time and specifies an image file format that includes image data and tags representing picture-taking conditions. Exif, 3, 17-22, 40-41, 52-61. The '109 patent even admits that it was "*well-known to persons skilled in the art*" to "use tags to specify each data item" for "files in Exif format." Ex. 1001, 7:16-18 (emphasis added). Exif also requires personal computers conforming to the standard to include "dedicated software" that can "read all the images, audio and attribute information recorded." Exif, 11. Accordingly, combining Onuki and Exif would have required applying only conventional, well-known techniques for communicating image data and attribute data from a camera to an image reproducing apparatus. Parulski ¶119.

A POSITA would have also expected success because Exif's image file format already provided tags corresponding to Onuki's photo-taking mode and main object location. Parulski ¶120. Onuki's photo-taking mode corresponds to the Exif *ExposureProgram* tag, which is "[t]he class of the program used by the camera to set exposure when the picture is taken." Exif, 55; Parulski ¶120. A tag value of "7," for example, indicates "[p]ortrait mode (for closeup photos with the background out of focus)." Exif, 55. Onuki's main object location corresponds to the Exif *SubjectLocation* tag, which "[i]ndicates the location of the main subject in the scene" in terms of a row and column within the image. Exif, 59; Parulski ¶120. Accordingly, such a design would have been a combination of familiar elements according to known methods to yield predictable results. Parulski ¶120.

- d. **[1.c]: "increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene."**

For the reasons explained for Ground 1, [1.c], Onuki discloses or suggests "decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene"; Luo-668 discloses "increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the

person is not located”; and it would have been obvious to combine Onuki and Luo-668 to teach this limitation. *Supra* § VI.A.3.d; Parulski ¶¶121-131.

3. Independent Claim 2

a. [2.pre]: “A method of image processing comprising:”

Onuki discloses or suggests “[a] method of image processing” for the reasons explained for Ground 1, [1.pre]. *Supra* § VI.A.3.a, Parulski ¶¶101-102, 132.

b. [2.a]: “acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data; and”

For the reasons explained for Ground 2, [1.b], Onuki discloses or suggests “acquiring ... image data, shooting scene information, and location information of a person in the image data”; Exif discloses or suggests an “image file including image data, shooting scene information, and location information of a person in the image data”; and it would have been obvious to combine Onuki and Exif to teach this limitation. *Supra* § VI.B.2.c; Parulski ¶¶106-120, 133.

- c. **[2.b]: “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene,”**

For the reasons explained for Ground 1, [1.c], Onuki discloses or suggests “decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene”; Luo-668 discloses “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located”; and it would have been obvious to combine Onuki and Luo-668 to teach this limitation. *Supra* § VI.A.3.d; Parulski ¶¶121-131, 134.

- d. **[2.c]: “wherein each of the operations of the method of image processing is executed by a CPU.”**

Onuki discloses or suggests “wherein each of the operations of the method of image processing is executed by a CPU” for the reasons explained for Ground 1, [1.a]. *Supra* § VI.A.3.b; Parulski ¶¶103-105, 135.

4. Independent Claim 3

- a. **[3.pre]: “A computer program product comprising:”**

Onuki discloses or suggests “[a] computer program product” for the reasons explained for Ground 1, [3.pre]. *Supra* § VI.A.5.a; Parulski ¶136.

- b. [3.a]: “a non-transitory computer-readable storage medium on which an image processing program is stored, wherein the image processing program includes”**

Onuki discloses or suggests “a non-transitory computer-readable storage medium on which an image processing program is stored” for the reasons explained for Ground 1, [3.a]. *Supra* § VI.A.5.b; Parulski ¶¶137-138.

- c. [3.b]: “a computer program code for acquiring an image file, the image file including image data, shooting scene information, and location information of a person in the image data, and”**

For the reasons explained for Ground 2, [1.b], Onuki discloses or suggests “acquiring ... image data, shooting scene information, and location information of a person in the image data”; Exif discloses or suggests an “image file including image data, shooting scene information, and location information of a person in the image data”; and it would have been obvious to combine Onuki and Exif to teach this limitation. *Supra* § VI.B.2.c; Parulski ¶¶106-120, 138. A POSITA would have understood that this step would be embodied in computer program code for the reasons explained for Ground 1, [3.b]. *Supra* § VI.A.5.c; Parulski ¶139.

- d. **[3.c]: “a computer program code for increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene.”**

For the reasons explained for Ground 1, [3.c], Onuki discloses or suggests “a computer program code for ... decreasing sharpness of an area in which the person is not located based on the acquired location information when the acquired shooting scene information indicates a portrait scene”; Luo-668 discloses “increasing sharpness of an area in which the person is located and decreasing sharpness of an area in which the person is not located”; and it would have been obvious to combine Onuki and Luo-668 to teach this limitation. *Supra* § VI.A.5.d; Parulski ¶¶140-141.

VII. DISCRETIONARY DENIAL IS NOT WARRANTED

A. 35 U.S.C. § 314(a) Does Not Warrant Discretionary Denial

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11, at 5-6 (Mar. 20, 2020) (precedential), and the Office’s interim guidelines dated June 21, 2022 (“Guidance Memo”), do not warrant discretionarily denying institution. There is no active

parallel district court litigation. Ex. 1023. The court in *Longitude Licensing Ltd.*³ v. *Google LLC*, No. 3:23-cv-03046 (N.D. Cal.) dismissed the proceeding under Rule 12(b)(6) upon determining that the claims of the '109 patent (among others) are directed to patent ineligible subject matter under 35 U.S.C. § 101. Ex. 1020. The plaintiff voluntarily dismissed the remaining claims, and the Court entered final judgment and closed the file. Exs. 1022, 1023. No claim construction proceedings were underway, fact discovery had only begun, and the parties had not exchanged any infringement or invalidity contentions (and therefore no § 102/§ 103 issues had been raised or addressed). Although Longitude has appealed the § 101 order, institution is nevertheless appropriate. *See Google LLC v. Geoscope Techs. Pte. Ltd.*, IPR2023-01209, Paper 14, at 10-21 (Feb. 20, 2024) (instituting review where district court determined that the challenged claims were ineligible under § 101 and appeal was pending); *id.*, Paper 22 (denying director review).

Thus, the *Fintiv* factors favor institution because there is no case to stay or trial date (factors 1 and 2); minimal investment by the parties (factor 3); no overlapping issues (factor 4); and the evidence of obviousness is strong (factor 6). Factor 5 is at worst neutral.

³ Longitude Licensing Ltd. “is the exclusive worldwide licensee” of the '109 patent. Ex. 1021, ¶13.

B. 35 U.S.C. § 325(d) Does Not Warrant Discretionary Denial

Noninstitution under § 325(d) would also be improper based on the factors set forth in *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 at 17-18 (Dec. 15, 2017) (precedential). Onuki, Luo-668, and Exif were not considered during examination. *See* Ex. 1001, cover (code (56) (References Cited)). While the '109 patent mentioned that “[s]pecifications for Exif files are laid down by the Japan Electronics and Information Technology Industries Association (JEITA),” Ex. 1001, 6:46-48, Applicant never provided a copy of Exif to the Examiner during prosecution. *See generally* Ex. 1002.

Additionally, Onuki, Luo-668, and Exif differ from the prior art involved during examination. As discussed in Section III.B, the claims that ultimately issued were allowed without rejection. In its remarks after adding these claims and canceling the previously rejected claims, Applicant argued that the previously applied Hyodo reference did “not disclose a specific image processing application implemented at the image processing apparatus side using the location information as specified in the claimed subject matter.” Ex. 1002, 191-192. As discussed in the obviousness analysis above, Onuki discloses this very feature. *Supra* § VI.A.3.d (Ground 1, [1c]).

In its notice of allowance, the Examiner stated that “[n]one of the prior art teaches or suggests increasing the sharpness of image area [sic] where a person is

located and decreasing the sharpness of other image areas, when the shooting scene information associated with an image indicates a portrait scene, as claimed.”

Ex. 1002, 205. As discussed in the obviousness analysis above, Luo-668 discloses increasing the sharpness of an image area where a person is located and decreasing the sharpness of other image areas, and Onuki in view of Luo-668 renders obvious doing so when the shooting scene information associated with an image indicates a portrait scene. *Supra* § VI.A.3.d (Ground 1, [1c]).

Had the Examiner known of Onuki, Luo-668, and Exif, it would not have allowed the claims of the '109 patent to issue. Accordingly, the Board should decline to exercise its discretion to deny institution under § 325(d).

VIII. MANDATORY NOTICES

A. Real Parties-in-Interest Under 37 C.F.R. § 42.8(b)(1)

Google LLC is the real party-in-interest for this Petition.⁴

⁴ Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

B. Related Matters Under 37 C.F.R. § 42.8(b)(2)

To the best knowledge of Petitioner, the '109 patent is or has been involved in the following district court litigation:

Name	Number	Court	Filed
<i>Longitude Licensing Ltd. v. Google LLC</i>	3:23-cv-03046-VC	N.D. Cal.	June 21, 2023

The above district court litigation is currently on appeal to the Court of Appeals for the Federal Circuit, No. 24-1202, filed November 28, 2023.

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Lead Counsel	Back-Up Counsel
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D. Service Information Under 37 C.F.R. § 42.8(b)(4)

Please address all correspondence to lead and back-up counsel at the addresses shown above and Google-Longitude-IPRs@finnegan.com. Petitioner also consents to electronic service by e-mail.

IX. GROUNDS FOR STANDING

Petitioner certifies that the '109 patent is available for *inter partes* review and Petitioner is not barred or estopped from requesting *inter partes* review to challenge the claims on the grounds above. Petitioner filed this Petition within one year of service of the original complaint against Petitioner in the district court litigation.

X. CONCLUSION

Petitioner has established a reasonable likelihood of prevailing with respect to the challenged claims and requests the Board institute *inter partes* review and cancel each challenged claim as unpatentable.

Date: June 21, 2024

Respectfully submitted,

/Erika H. Arner/

Erika H. Arner, Lead Counsel
Reg. No. 57,540

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing **Petition for *Inter Partes* Review** contains 9,857 words, excluding those portions identified in 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

/Erika H. Arner/
Erika H. Arner, Lead Counsel
Reg. No. 57,540

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. §§ 42.6(e) and 42.105, the **Petition for *Inter Partes* Review of U.S. Patent No. 7,945,109, the associated Power of Attorney, and Exhibits 1001-1023** were served via FedEx Priority Overnight on the correspondence address of record with the USPTO as follows:

Albert Penilla
PENILLA IP, APC-PATENT LAW
5619 Scotts Valley Drive, Suite 280
Scotts Valley, CA 95066

A courtesy copy has also been mailed to litigation counsel for Patent Owner at:

David Martinez
ROBINS KAPLAN LLP
2121 Avenue of the Stars
Suite 2800
Los Angeles, CA 90067

Dated: June 21, 2024

By: /Lisa C. Hines/
Lisa C. Hines
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Finnegan, Henderson, Farabow,
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