

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

PATENT OWNER'S PRELIMINARY RESPONSE

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IPR2024-00961

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

TABLE OF EXHIBITS

Number	Description
2001	Declaration of Nikolaos Papanikolopoulos, Ph.D.

I. PRELIMINARY STATEMENT

Pursuant to 37 C.F.R. § 42.107, Patent Owner 138 East LCD Advancements Limited (“138 East” or “Patent Owner”) submits its Preliminary Response to the Petition for *Inter Partes* Review of U.S. Patent No. 7,945,109 (“the ’109 patent”). Paper 1 (“Petition” or “Pet.”). Petitioner Google LLC challenges the validity of claims 1-3 of the ’109 patent.

The Petition does not establish a reasonable likelihood that the asserted references render any of claims 1-3 unpatentable. The asserted references do not disclose all limitations of any challenged claim. The Petition identifies no reference or combination of references that discloses *increasing sharpness* of an area in which the person is located *based on acquired location information* and *when the acquired shooting scene information indicates a portrait scene*. The Board therefore should deny institution for failure to present a likelihood that the Petitioner will prevail on any Ground.

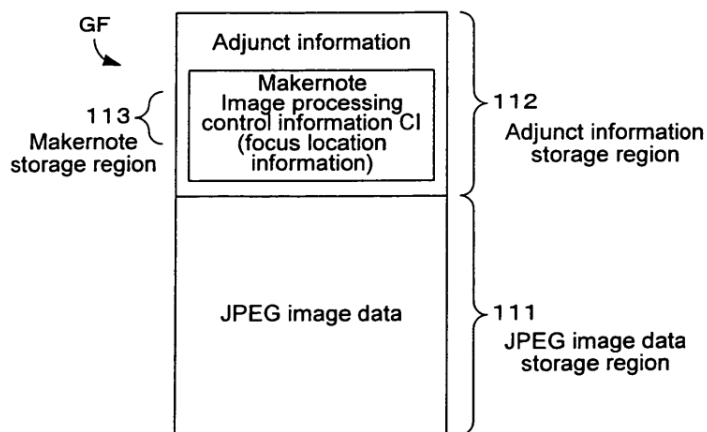
II. THE ’109 PATENT

The ’109 patent discloses more than “portrait mode.” The ’109 patent describes and claims (1) an improved image file, and (2) an improved image processing technique that uses information in the image file to sharpen a person in the image and blur the background. *See, e.g.*, Ex. 1001 at 14:63-15:5. The claimed image file includes image data and control information relating to the shooting

scene setting—for example, “portrait”—and the location of the person in the image data. *Id.* at 4:62-5:10, 6:44-7:21, 8:7-53, 9:65-10:6, 10:34-58, 12:53-67, 13:3-20.

The '109 patent discusses the Exif file format—one of the asserted references here—and provides an example of “an image file that is generated in conformity with the Exif file format.” *Id.* at 5:20-23, Fig. 3.

Fig. 3

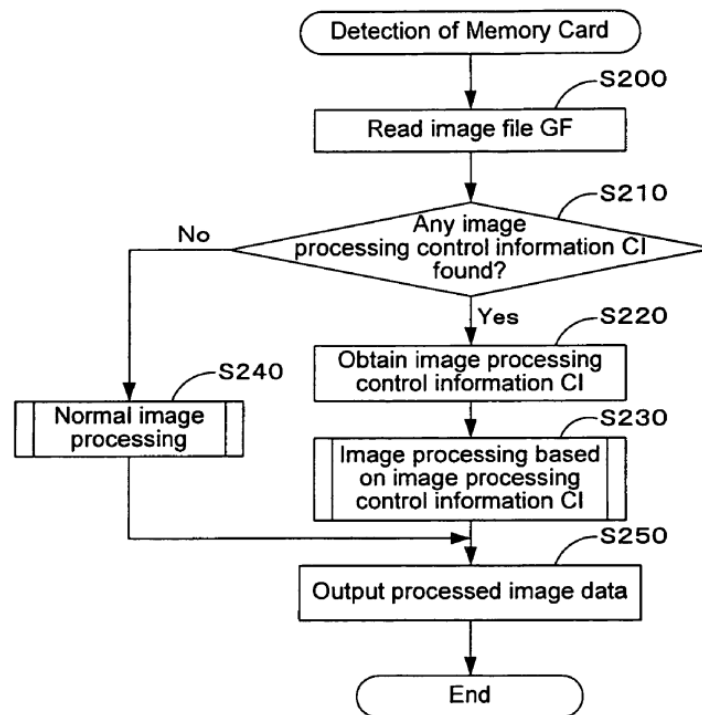


See also id. at 6:44-48 (“The image file that was generated in the digital still camera 20 typically has a file structure that conforms to the image file format standard (Exif) for digital still cameras. Specifications for Exif files are laid down by the Japan Electronics and Information Technology Industries Association (JEITA).”). Important, “[t]he image file that was generated in the digital still camera 20 of the present embodiment contains image processing control information CI that specifies image processing conditions in an image processing device, e.g. focus location information.” *Id.* at 6:48-52.

In Figure 3, the file includes a JPEG image data storage region storing image data and an adjunct information storage region storing “various information regarding the stored JPEG image data.” *Id.* at 6:63-67. The ’109 patent explains that the adjunct information storage region “further comprises a Makernote data storage region”—Exif’s “undefined” region. *Id.* at 7:6-7. The ’109 patent describes storing image processing control information—e.g., shooting scene information and/or location information—in the Makernote storage region. *Id.* at 6:67-7:12. “In other words, an image file GF that is generated in the present embodiment differs from a typical image file in Exif format in that the image file GF comprises image processing control information CI in its Makernote data storage region 113.” *Id.* at 7:12-16.

The ’109 patent explains 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,” because “as long as such a file is used, it is possible to generate an image file that contains image data and image processing control information CI in the shooting device.” *Id.* at 14:30-37.

The ’109 patent describes using the control information (shooting scene information, location information) to process the image data:



Id. at Fig. 7, 9:6-29.

The '109 patent explains that prior image files did not include the claimed information or enable processing techniques that determine the location of a “major object” in an image based on information in the image file. Instead, prior image processing systems assumed that the “major object” appeared in the “central region of an image” and attempted to perform image correction based on that assumption. *Id.* at 1:19-36. But “major objects” are often not located in the center of an image. *Id.* “For example, in the case where an image is shot with a row of mountains in the background, the major object may possibly be located in its side region.” *Id.* The invention’s new image file structure and, important, using its information to facilitate particular image processing “solve the problems noted

above” and “improve the accuracy of image processing by setting and using an appropriate emphasis region for every image data.” *Id.* at 1:40-43.

Claim 1 recites:

1. An image processing apparatus comprising:

[a] a CPU, the CPU executing functions including

[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

[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.

Id. at 14:63-15:5.

III. CLAIM CONSTRUCTION

For purposes of this Preliminary Response, Patent Owner contends that the claim terms should receive their ordinary and customary meaning in light of the specification and prosecution history, as understood by a person of ordinary skill in the art. 37 C.F.R. § 100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005).

IV. LEGAL STANDARD

The Board may not institute an *inter partes* review unless the Petition demonstrates a reasonable likelihood that the petition would prevail with respect to at least one of the claims challenged in the petition. 35 U.S.C. § 314(a).

V. LEVEL OF ORDINARY SKILL IN THE ART

For purposes of this Preliminary Response only, Patent Owner does not dispute the level of skill for a person of ordinary skill in the art (“POSITA”), set forth in the Petition. Pet. at 11. The level of skill in the art does not affect whether to deny institution, because the Petition and its expert do not address certain claim limitations and disclosures from the applied references. Patent Owner does not waive, however, any argument regarding the proper level of skill and reserves the right to later advance additional arguments.

VI. THE PETITION DOES NOT ESTABLISH A REASONABLE LIKELIHOOD THAT THE ASSERTED REFERENCES RENDER UNPATENTABLE ANY CHALLENGED CLAIM.

A. The Petition does not establish a reasonable likelihood that Onuki in view of Luo-668 renders obvious claims 1-3 (Ground 1).

1. Onuki: Overview

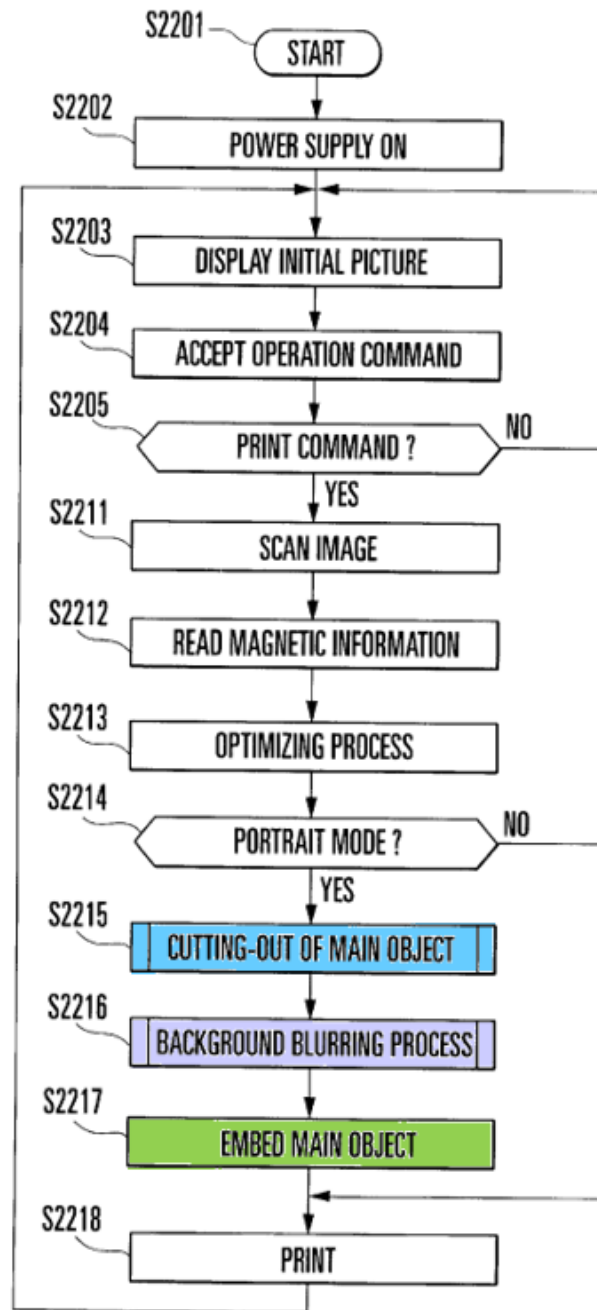
Onuki “relates to an image recording/reproducing system including an image recording apparatus for acquiring an image in a particular fashion intended by the photographer . . . and also including an image reproducing apparatus for reproducing the image acquired by the image recording apparatus after processing

the image in a desired fashion.” Ex. 1005 at 1:8-14. Onuki describes “setting a predetermined photo-taking condition according to selection of a photo-taking mode,” “recording an image,” “recording information of the selected photo-taking mode on the recording medium,” and “performing a process of varying the image on the basis of the photo-taking mode information recorded on the recording medium.” *Id.* at 2:33-40.

Onuki does not disclose an image file including image data and photo-taking information. Rather, Onuki discloses an image recording apparatus that records image information (“an image signal detected by various sensors in the camera”) and, separate, records photo-taking information and uses memory to store the information. *See, e.g., id.* at 6:4-8. For example, Onuki describes using a film scanner that includes (1) an optical reading part, and (2) a magnetic reading part. “[T]he optical reading part 192 reads image information from the film and produces a digital image signal corresponding to the image information, and the magnetic reading part 193 reads photo-taking information recorded on the magnetic layer of the film.” *Id.* at 6:57-66. Onuki explains that “[t]he film scanner 191 performs the film scanning operation under the control of the image reproducing apparatus body 181, and the thus-read image signal and photo-taking information are transferred to the image reproducing apparatus body 181.” *Id.* at 6:66-7:3.

Onuki also discloses a digital camera, but Onuki does not disclose that the digital camera provides an image file including image data and photo-taking information. Onuki describes only “convert[ing] an optical image into an electric signal and record[ing] the resultant electric signal in a memory medium,” and recording the image signal and photo-taking information on a PC card. *Id.* at 22:18-25, 22:40-52. The image signal and the photo-taking information are separate; Onuki does not describe combining or relating the image signal and the photo-taking information in an image file.

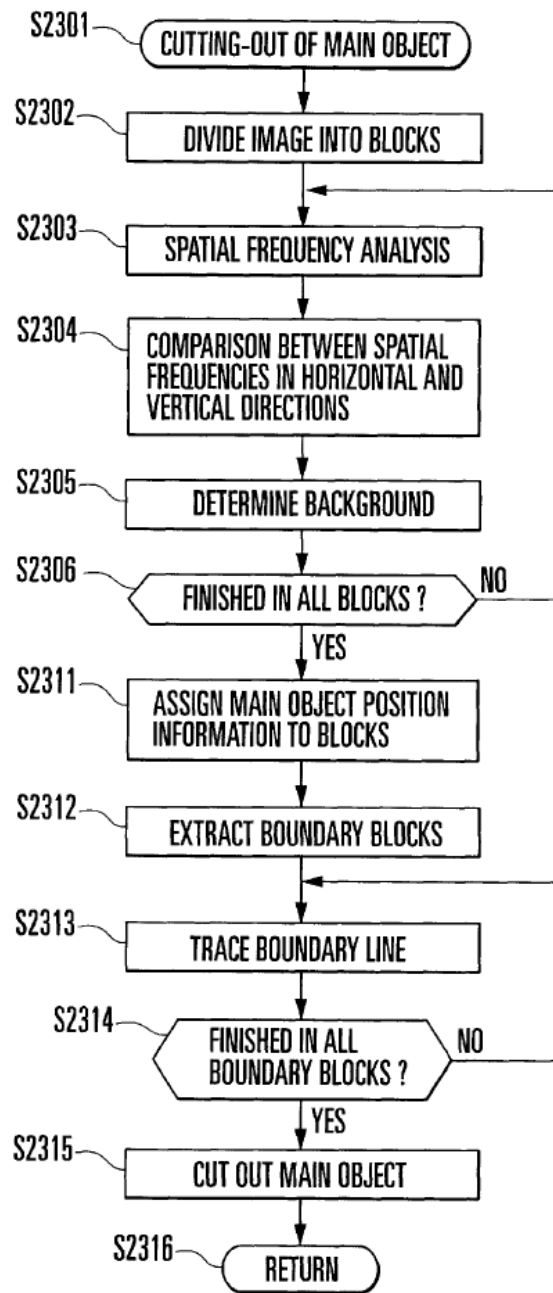
Relevant here, Onuki describes a “portrait” photo-taking mode. *See, e.g., id.* at 16:13-17, Fig. 18. In Onuki, “portrait mode” refers to “a technique of obtaining a background image effectively blurred” and “only a main object is focused.” *Id.* at 15:19-23; *see also id.* at 18:23-20:67. Onuki describes a process that removes (“cuts out”) the main object (blue), adjusts the background (purple), and then re-embeds the main object (green). *Id.* at 18:63-19:6.



Id. at Fig. 23.

To “cut out” the main object, the image reproducing apparatus receives optical data, divides the image into blocks, and analyzes the blocks—for example, performs spatial frequency analysis—to determine whether a block belongs to the

main object or to the background. *Id.* at 19:14-44. Onuki explains that the image reproducing apparatus then updates or “convert[s]” the main object location information that the image recording apparatus provided and assigns the information to a corresponding block. *Id.* at 19:45-58. Then the image reproducing apparatus extracts those blocks that “are more likely to belong to the main object image.” *Id.* at 19:59-64. Onuki draws a boundary line between the main object and the background, and “[b]y tracing the edge, the main object image and the background image are separated from each other.” *Id.* at 20:1-19.



Id. at Fig. 24.

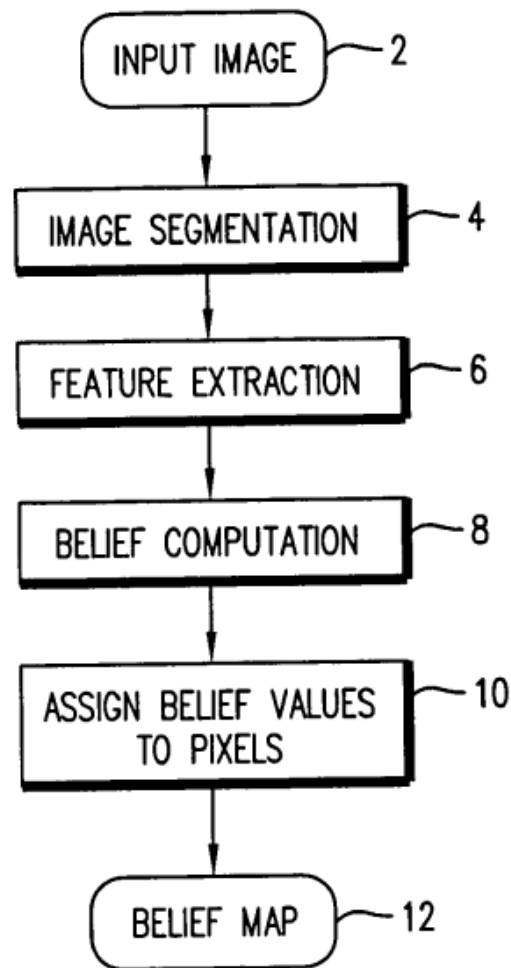
After extracting the main object, Onuki applies a blurring filter to the background. *Id.* at 20:24-67. “A properly-selected blurring filter is then applied only to the background image. After that, the main object image saved without

being subjected to the blurring process is embedded back into the background image.” *Id.* at 21:48-53. Important, Onuki does not describe *sharpening or otherwise adjusting the appearance of the main object*.

Onuki does not disclose an image file including image data, shooting scene information, and location information of a person in the image data. Moreover, Onuki does not disclose increasing sharpness of an area in which the person is located based on acquired location information when the acquired shooting scene information indicates a portrait scene. Ex. 2001 ¶¶ 50-56.

2. Luo-668: Overview

Luo-668 describes “a system and method of modifying an image made up of pixels, by automatically identifying a main subject of the image and altering pixel values to emphasize the main subject.” Ex. 1006 at 1:51-54. “The process of identifying the main subject may include the step of segmenting the image into a plurality of regions based on uniform image characteristics,” “calculating a level of saliency for each of the plurality of regions, and assigning a believe [sic, belief] value to the pixels corresponding to the levels of saliency of the image they are a part of.” *Id.* at 1:57-62.

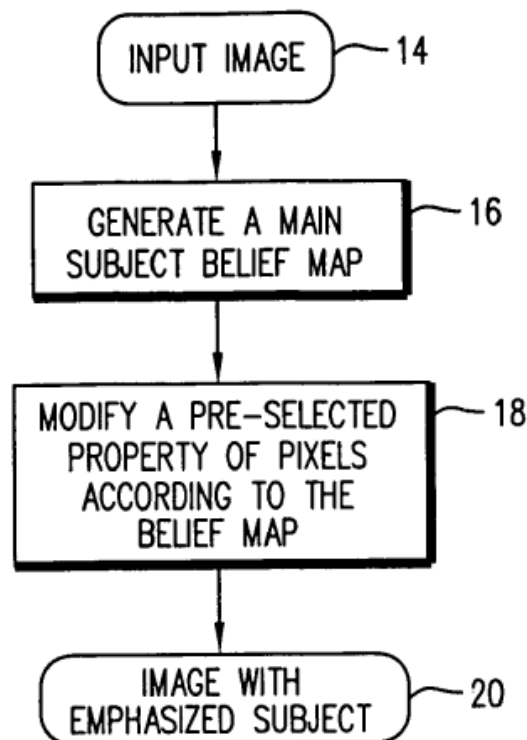


Id. at Fig. 1. Luo-668's process (1) receives an image comprising pixels, (2) analyzes pixel color and texture to segment the image and create "regions," (3) extracts features to apply a "belief value," and (4) creates a "belief map." *Id.* at 5:1-15.

Luo-668 describes calculating belief values and building a belief map using "main subject detection." *Id.* at 5:25-47. Luo-668 does *not* describe acquiring main subject location information. Rather, Luo-668 describes trying to detect the main subject using "region segmentation, perceptual grouping, feature extraction, and

probabilistic reasoning.” *Id.* at 5:39-42. “In particular, a large number of features are extracted for each segmented region in the image to represent a wide variety of visual saliency properties, which are then input into a tunable, extensible probability network to generate a belief map containing a continuum of values.” *Id.* at 5:42-47. In short, Luo-668 describes an extensive pixel-analysis process to detect the main subject and prepare belief values. *See, e.g., id.* at 5:48-7:65; *see also* Ex. 2001 ¶ 58.

Luo-668 describes modifying pixel values based on belief values. *See, e.g.,* Ex. 1006 at 2:4-13.



Id. at Fig. 2. For example, “[t]he present invention contemplates that any of the pixel color properties may be altered in accordance with the gradient of belief values generated during the creation of the main subject belief map.” *Id.* at 9:12-15.

Luo-668 also describes a “process of blurring a region,” including “determining a background threshold and a main subject threshold value for the belief map” and then “computing a blur value for each pixel in the image, and modifying the blur values of pixels in the digital image according to the belief values in such a way that the sharpness of main subject pixels is retained or increased, while the sharpness of the background is reduced.” *Id.* at 11:64-12:4.

Luo-668 does not disclose acquiring an image file including image data, shooting scene information, and location information of a person in the image data. Moreover, Luo-668 does not disclose *increasing or decreasing sharpness based on acquired location information or based on a “portrait” mode*. Ex. 2001 ¶¶ 57-61.

3. The Petition fails to show that Onuki in view of Luo-668 renders obvious all limitations of any challenged claim.

- a. Claim 1: The Petition fails to show that Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located . . . based on the acquired location information when the acquired**

**shooting scene information indicates a portrait scene”
(claim 1[c]).**

The Petition fails to show that Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located . . . based on the acquired location information when the acquired shooting scene information indicates a portrait scene.” *See* Ex. 2001 ¶¶ 62-67. The Petition concedes that Onuki does not teach or suggest increasing sharpness. *See* Pet. at 31. To the contrary, the Petition describes Onuki’s process that “cuts out” the main object and then blurs the background. *Id.* at 26-31. At no point does Onuki describe increasing sharpness or otherwise adjusting the depiction of a main object.

The Petition needs Luo-668 to cover the “increasing sharpness” limitation, but the Petition fails to show that Luo-668 teaches or suggests increasing sharpness *based on acquired location information and when the acquired shooting scene information indicates a portrait scene*. The Petition does not argue, much less cite evidence, that Luo-668 teaches or suggests acquiring location information and shooting scene information and increasing sharpness of an area *based on that information*. Luo-668 does *not* acquire information to inform its processing; it analyzes pixels, generates “belief maps,” and computes and modifies, for example, blur values. *See, e.g.,* Ex. 1006 at 11:55-12:4; *see also id.* at 5:48-7:65. Luo-668 explains that its process calculates belief values “that are related to the confidence

a particular region in an image is the main subject or a background subject.” *Id.* at 4:1-11. Luo-668 describes “modifying the blur values of pixels in the digital image according to the belief values 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.” *Id.* at 11:64-12:4; *see also* Ex. 2001 ¶ 65.¹

Luo-668 discloses analyzing pixels and performing extensive calculations to retain or increase sharpness; Luo-668 does not teach or suggest increasing sharpness *based on acquired information*. Ex. 2001 ¶ 66. The Petition overlooks the complete claim term, which requires not only increasing sharpness but increasing sharpness based on the acquired location information and when the acquired shooting scene information indicates a portrait scene. None of the asserted references disclose this limitation. The Petition relies on hindsight to stitch together the claimed invention. But “[i]n making the assessment of differences, section 103 specifically requires consideration of the claimed invention ‘as a whole.’” *Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 1275 (Fed. Cir. 2004). Indeed,

[w]ithout this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another containing C, and on

¹ Indeed, Petitioner’s expert seems to try to impute general, unspecified knowledge to POSITA regarding “various techniques for increasing and decreasing sharpness,” likely to try to close the gap that remains in the asserted combinations. Ex. 1003 ¶ 70.

that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result—often the very definition of invention.

Id. Telling, during prosecution of the '109 patent, the examiner allowed the claims because “[n]one of the prior art teaches or suggests increasing the sharpness of image area where a person is located . . . when the shooting scene information associated with an image indicates a portrait scene.” Ex. 1002 at 205.

Considering the claim as a whole, Luo-668 does not teach or suggest the “increasing sharpness” limitation. Neither Onuki nor Luo-668 teaches or suggests processing an image area where a person is located based on acquired information. To the contrary, Onuki describes *removing* the main object rather than process that image data. Thus, the Petition fails to argue, much less show, that Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located . . . based on the acquired location information when the acquired shooting scene information indicates a portrait scene.” Ex. 2001 ¶ 67.

b. Claim 2

The Petition fails to show that Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located . . . based on the

acquired location information when the acquired shooting scene information indicates a portrait scene.” § VI.A.3.a, *supra*; Ex. 2001 ¶ 68.

c. Claim 3

The Petition fails to show that Onuki in view of Luo-668 renders obvious “increasing sharpness of an area in which the person is located . . . based on the acquired location information when the acquired shooting scene information indicates a portrait scene.” § VI.A.3.a, *supra*; Ex. 2001 ¶ 68.

B. The Petition does not establish a reasonable likelihood that Onuki in view of Luo-668 and Exif renders obvious claims 1-3 (Ground 2).

1. Exif: Overview

The Exif standard describes a file format. *See generally* Ex. 1008.

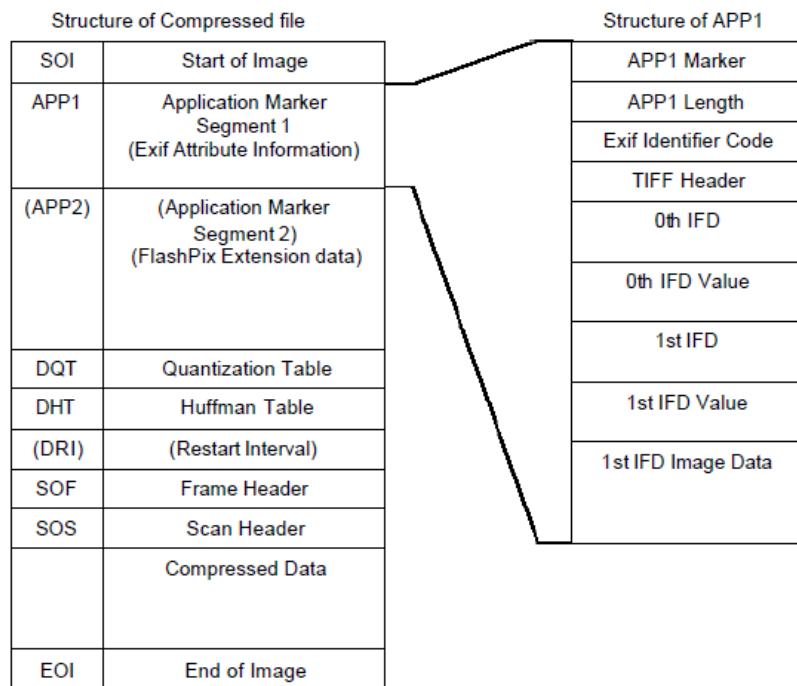


Fig. 6 Basic Structure of Compressed Data Files

Id. at 20.

Exif discloses various “tags” or “fields” and providing “attribute information” in an image file. *Id.* at 3, 8, 12 (noting that “[t]ag” is used as a synonym of “field”). The tags point to attribute information. *Id.* at 17. Relevant here, Exif describes optional “ExposureProgram” and “SubjectLocation” tags. *Id.* at 73. The ExposureProgram tag may record the “class of the program used by the camera to set exposure when the picture is taken.” *Id.* at 55. The SubjectLocation tag “represents the pixel at the center of the main subject relative to the left edge.” *Id.* at 59.

Exif does not describe using the tags to increase the sharpness of an area in which a person is located based on the acquired location information when the shooting scene information indicates a portrait scene as required by the claim.

Ex. 2001 ¶¶ 69-71.

- 2. The Petition fails to show that Onuki in view of Luo-668 and Exif renders obvious all limitations of any challenged claim.**
 - a. Claim 1: The Petition fails to show that Onuki in view of Luo-668 and Exif renders obvious “increasing sharpness of an area in which the person is located . . . based on the acquired location information when the**

acquired shooting scene information indicates a portrait scene” (claim 1[c]).

The Petition fails to show that Onuki in view of Luo-668 renders obvious increasing sharpness based on the acquired location information when the acquired shooting scene information indicates a portrait scene. *See* § VI.A.3.a, *supra*. And the Petition does not argue that Exif teaches or suggests this limitation. Exif does not describe processing image data or using attribute information. Ex. 2001 ¶¶ 72-74.

Again, the Petition relies on hindsight to stitch together three references to try to cover *one* limitation, when none of the references teaches the claim limitation as a whole. Neither Onuki nor Luo-668 nor Exif discloses increasing sharpness of an area in which the person is located *based on acquired location information and when the acquired shooting scene information indicates a portrait scene*. The Petition cites Onuki to provide the claimed “shooting scene information,” Luo-668 to provide “increasing sharpness” (though not based on acquired information), and Exif to provide the acquired information in an image file. The Petition flouts established instructions to consider the claim as a whole.

b. Claim 2

The Petition fails to show that Onuki in view of Luo-668 and Exif renders obvious “increasing sharpness of an area in which the person is located . . . based

on the acquired location information when the acquired shooting scene information indicates a portrait scene.” § VI.B.2.a, *supra*; Ex. 2001 ¶ 75.

c. Claim 3

The Petition fails to show that Onuki in view of Luo-668 and Exif renders obvious “increasing sharpness of an area in which the person is located . . . based on the acquired location information when the acquired shooting scene information indicates a portrait scene.” § VI.B.2.a, *supra*; Ex. 2001 ¶ 75.

VII. CONCLUSION

The Petition does not establish a reasonable likelihood that any of the challenged claims are unpatentable. The Board should deny institution.

Date: October 15, 2024

Respectfully submitted,

s/ Cyrus A. Morton

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CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION

I certify that this Patent Owner's Preliminary Response complies with the word count limit and contains 3,590 words in 14-point Times New Roman font as calculated by the word count feature of Microsoft Office, in compliance with 37 C.F.R. § 42.24(a)(1)(i). This word count is inclusive of all text and footnotes but does not include the table of contents, table of authorities, certificate of service or word count, or appendix of exhibits or claim listing.

Date: October 15, 2024

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CERTIFICATE OF SERVICE

I certify that on October 15, 2024, a copy of Patent Owner's Preliminary Response, including exhibits, was served in its entirety by electronic mail to Petitioner's counsel at the following addresses indicated in Petitioner's Mandatory Notices:

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