

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ams AG, AMS-TAOS USA INC.,
SAMSUNG ELECTRONICS AMERICA, INC., and
SAMSUNG ELECTRONICS CO. LTD.,
Petitioner,

v.

511 INNOVATIONS, INC.,
Patent Owner.

Case IPR2016-01804
Patent 6,490,038 B1

Before KARL D. EASTHOM, KERRY BEGLEY, and
JOHN A. HUDALLA, *Administrative Patent Judges*.

HUDALLA, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314(a) and 37 C.F.R. § 42.108

ams AG, AMS-TAOS USA Inc., Samsung Electronics America, Inc.,
and Samsung Electronics Co., Ltd. (collectively “Petitioner”) filed a Petition
(Paper 3, “Pet.”) requesting an *inter partes* review of claims 126, 127, 132,
135–137, 140, and 141 of U.S. Patent No. 6,490,038 B1 (Ex. 1001, “the
’038 patent”) pursuant to 35 U.S.C. §§ 311–319. Petitioner proffered a

Declaration of R. Jacob Baker, Ph.D., P.E. (Ex. 1009) with its Petition. Patent Owner, 511 Innovations, Inc.,¹ filed a Preliminary Response (Paper 8, “Prelim. Resp.”) to the Petition. In its Preliminary Response, Patent Owner indicated that it filed a statutory disclaimer of claims 126, 135–137, 140, and 141. Prelim. Resp. 1 n.1 (citing Ex. 2003). Accordingly, only claims 127 and 132 will be considered for determining whether to institute *inter partes* review. See 37 C.F.R. § 42.107(e).

Under 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons that follow, we do not institute an *inter partes* review as to claims 127 and 132.

I. BACKGROUND

A. *Related Proceedings*

The parties identify the following proceedings related to the ’038 patent (Pet. 1; Paper 7, 1–2):

511 Innovations, Inc. v. HTC Am., Inc., No. 2:15-cv-01524
(E.D. Tex.);

511 Innovations, Inc. v. Microsoft Mobile Inc., No. 2:15-cv-01525
(E.D. Tex.);

511 Innovations, Inc. v. Samsung Telecomms. Am., LLC, No. 2:15-cv-01526 (E.D. Tex.);

¹ An assignment of the ’038 patent to 511 Innovations, Inc. was recorded on January 11, 2017, at Reel 40944, Frame 162.

511 Innovations, Inc. v. Apple, Inc., No. 2:16-cv-00868 (E.D. Tex.);
511 Innovations, Inc. v. LG Elecs., Inc., No. 2:16-cv-01197
(E.D. Tex.);
511 Innovations, Inc. v. Motorola Mobility LLC, No. 2:16-cv-01198
(E.D. Tex.);
511 Innovations, Inc. v. Pantech Co., No. 2:16-cv-01199 (E.D. Tex.);
and
511 Innovations, Inc. v. Sony Corp., No. 2:16-cv-01200 (E.D. Tex.).

Petitioner also filed additional petitions for *inter partes* review of other patents owned by 511 Innovations, Inc., in the following cases (Pet. 1; Paper 7, 1):

IPR2016-01787 – U.S. Patent No. 8,472,012
IPR2016-01788 – U.S. Patent No. 8,786,844
IPR2016-01792 – U.S. Patent No. 7,110,096
IPR2016-01793 – U.S. Patent No. 7,397,541
IPR2016-01810 – U.S. Patent No. 6,307,629
IPR2016-01818 – U.S. Patent No. 7,113,283
IPR2016-01819 – U.S. Patent No. 6,915,955

B. The '038 Patent

The '038 patent relates to “measuring the color of teeth, fabric or other objects or surfaces with a hand-held probe that presents minimal problems with height or angular dependencies.” Ex. 1001, 1:14–19.

Figure 1 of the '038 patent is reproduced below.

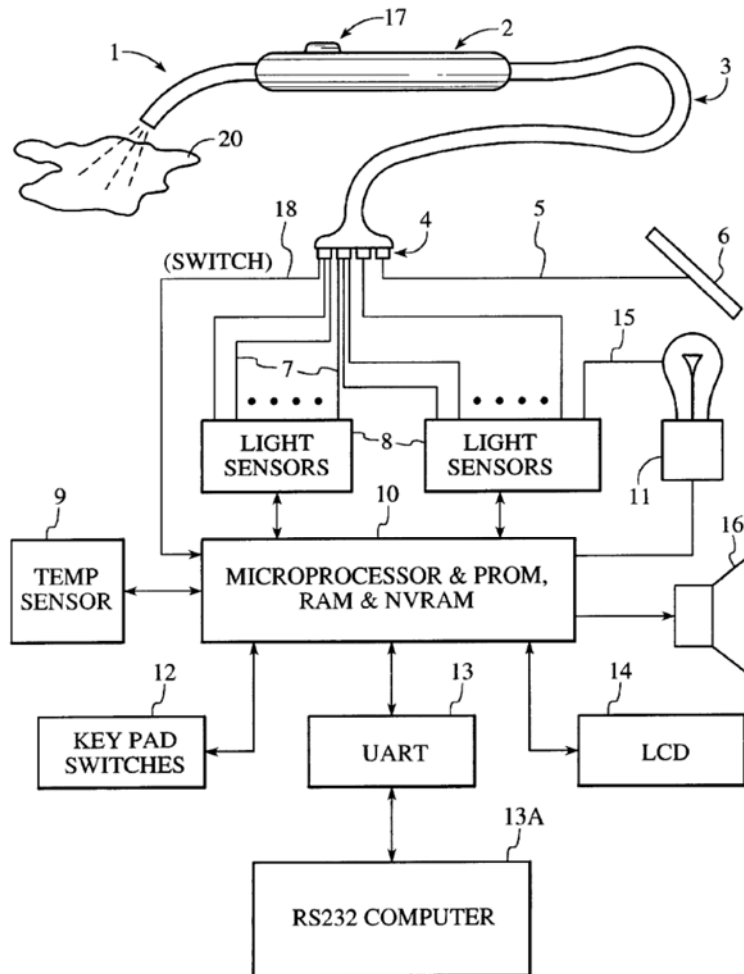


FIG. 1

Figure 1 depicts a “color measuring system” having probe tip 1, which encloses a plurality of optical fibers including a single light source fiber optic and multiple light receiver fiber optics. *Id.* at 5:13–20. The fiber optics within probe tip 1 optically extend through probe body 2 and through fiber optic cable 3 to splicing connector 4. *Id.* at 5:30–33, 5:45–46. From splicing connector 4, light passes to smaller fiber optics 7 and on to light sensors 8, which are coupled to microprocessor 10. *Id.* at 5:30–33, 6:1–5. Light reflected from object 20 enters the fiber optics at the forward end of

probe tip 1, and it is presented to sensors 8 for color measurement and angle/height determination, etc. *Id.* at 6:1–10.

Figure 3 of the '038 patent is reproduced below.

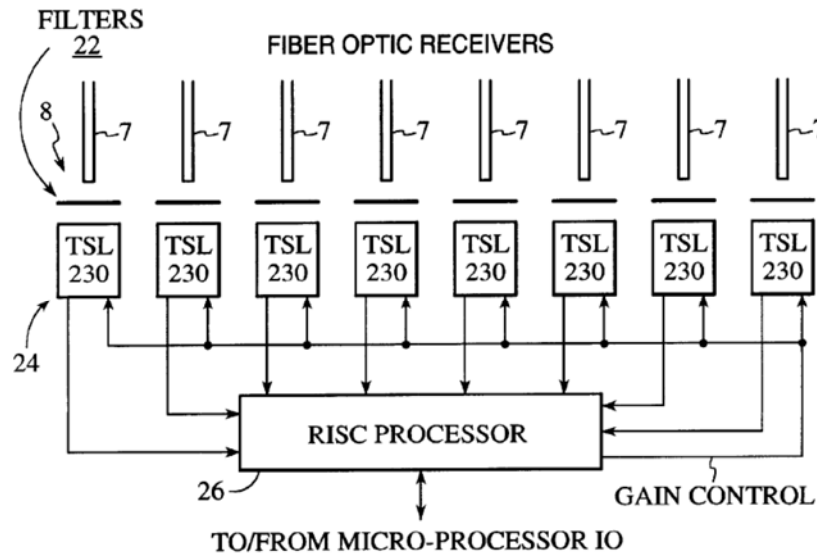


Figure 3 depicts light receiver fiber optics and sensors as described in the '038 patent. *Id.* at 8:48–50. Fibers 7 transmit light thorough color filters 22 to sensing elements 24. *Id.* at 5:59–61, 8:60–62. Sensing elements 24 include light-to-frequency converters and output a signal with a frequency proportional to the intensity of the incident light. *Id.* at 8:62–9:7.

C. Illustrative Claim

Claim 127 of the '038 patent is independent, and claim 132 depends from claim 127. Claim 127 is illustrative of the challenged claims and recites the following:

127. An apparatus comprising:

one or more light receivers receiving light to be spectrally analyzed;

a color filter having a plurality of portions, wherein each of the plurality of portions has a wavelength dependent light transmission property covering a predetermined band of wavelengths, wherein the predetermined bands of the plurality of portions cover a predetermined band or bands of wavelengths to be spectrally analyzed, wherein light from the one or more light receivers is coupled to the plurality of portions of the color filter; and

an optical sensor having a plurality of sensing elements, wherein light received by the one or more light receivers is coupled to the sensing elements through the plurality of portions of the color filter,

wherein light received by the one or more light receivers is spectrally analyzed without using a diffraction grating;

wherein the light is received by a probe, wherein one or more optical sensors determine a distance of the probe with respect to an object or material.

Id. at 34:1–21.

D. Prior Art

Petitioner relies on the following prior art:

Japanese Patent Application Publication No. H01-276028, published Nov. 6, 1989 (Ex. 1004, “JP ’028”);²

U.S. Patent No. 4,515,275 to Mills et al., filed Sept. 30, 1982, issued May 7, 1985 (Ex. 1005, “Mills”); and

U.S. Patent No. 4,381,523 to Eguchi et al., filed Jan. 12, 1981, issued Apr. 26, 1983 (Ex. 1006, “Eguchi”).

² Petitioner relies on a certified English translation of JP ’028. Our citations herein refer to the certified translation.

E. The Asserted Grounds

Petitioner challenges remaining claims 127 and 132 of the '038 patent on the following grounds (Pet. 3):

Reference	Basis	Claims Challenged
JP '028	35 U.S.C. § 103(a)	127 and 132
Mills	35 U.S.C. § 103(a)	127 and 132
Eguchi	35 U.S.C. § 103(a)	127 and 132

F. Claim Interpretation

The Board interprets claims of unexpired patents using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Both parties agree, however, that the '038 patent has expired. *See* Pet. 6; Prelim. Resp. 11. Accordingly, our interpretation of the claims is similar to that of a district court. *See* 37 C.F.R. § 42.100(b); *In re Rambus Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012). Under the standard applied by district courts, claim terms are generally given their plain and ordinary meaning as would be understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony*

Computer Entm't Am. LLC, 669 F.3d 1362, 1365 (Fed. Cir. 2012). We apply the district court standard to the claims of the expired '038 patent.

The parties have not put forward any terms for construction. *See* Pet. 6; Prelim. Resp. 12. Notwithstanding, certain of Patent Owner's arguments relate to how Petitioner maps elements in the prior art to the "probe" recited in claim 127. *See, e.g.*, Prelim. Resp. 18–19, 21–22. Thus, we make the following determination for purposes of this Decision regarding the construction of the term "probe" in claim 127.

The probe described in the '038 patent contains fiber optics that collect light, among other things. Ex. 1001, 3:26–28, 5:16–33, 7:33–41. As such, the district court in the related litigation construed "probe" to mean "fiber-optic instrument to collect light and guide the collected light from one point to another." Ex. 2001, 21. In explaining this construction, the district court found that, in the context of the challenged patent, "a 'probe' is an instrument that is used to collect light from an object," which "is passed on for analysis." *Id.* The district court also determined that the probe in the '038 patent necessarily is associated with fiber optics. *See id.* at 19–20 (citing, *inter alia*, Ex. 1001, 3:26–28, 6:1–11). The court additionally stated that "'probe' is a broad term," and that the extrinsic evidence supported a broad construction whereby "a 'probe' is an instrument that is used for collecting information about something." *Id.* at 21. We find the district court's reasoned analysis persuasive. *Cf. Power Integrations, Inc. v. Lee*, 797 F.3d 1318, 1326–27 (Fed. Cir. 2015) (Although the Board generally is not bound by a previous district court interpretation of a claim term, it is obligated to acknowledge and consider that interpretation in some circumstances.).

On this record, we determine that the district court’s construction comports with the usage of “probe” in the Specification, and we adopt it as our own. We additionally observe that the district court did not construe “probe” as having any particular size or form factor. Although certain statements in the Specification describe the probe as “handheld” (*see, e.g.*, Ex. 1001, 3:26–28), the probe is not universally described in this way (*see, e.g., id.* at 4:10–23). Thus, in the absence of clear and unequivocal evidence indicating that the disclosed probe must be “handheld,” and for purposes of this Decision, we decline to modify the district court’s construction to reflect a particular size or form factor. *See Poly–America, L.P. v. API Indus., Inc.*, 839 F.3d 1131, 1136 (Fed. Cir. 2016) (“[T]he standard for disavowal is exacting, requiring clear and unequivocal evidence that the claimed invention includes or does not include a particular feature.”).

Accordingly, for purposes of this Decision, we construe “probe,” as recited in claim 127 of the ’038 patent, to mean “fiber-optic instrument to collect light and guide the collected light from one point to another.” Based on the current record, we determine that no further terms require explicit construction at this time. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”).

II. ANALYSIS

We now consider Petitioner’s asserted grounds and Patent Owner’s arguments in its Preliminary Response to determine whether Petitioner has

met the “reasonable likelihood” threshold standard for institution under 35 U.S.C. § 314(a).

A. Obviousness Ground Based on JP '028

Petitioner contends claims 127 and 132 would have been obvious over JP '028. Pet. 6–17. Patent Owner disputes Petitioner’s contention. Prelim. Resp. 13–19.

1. JP '028

JP '028 is a Japanese patent application publication directed to a colorimeter that measures the numerical value of the color of the object. Ex. 1004, p. 213, col. 2. Figure 2, reproduced below, illustrates an example.

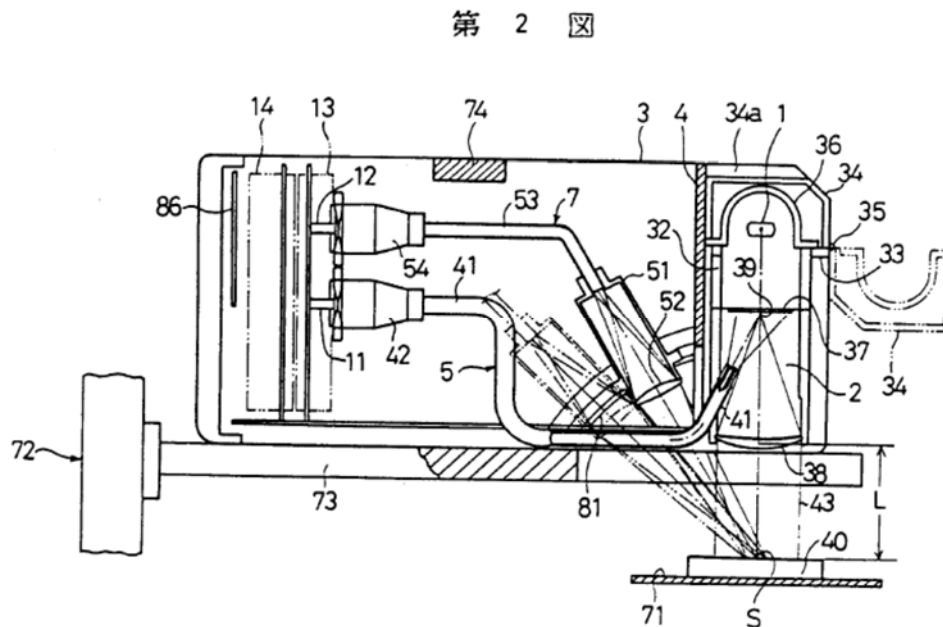


Figure 2 is a vertical sectional side view of colorimeter B contained in oblong machine body 3. *Id.* at p. 215, col. 1, p. 220, col. 2. Colorimeter B includes light source 1 (e.g., a pulse xenon tube), reflecting mirror 36, and projection system 2 for projecting light onto object 40, which reflects light

back to the colorimeter. *Id.* at p. 215, cols. 1–2. Light receiving lens tube 51 with light receiving lens 52 is positioned to receive reflected light from the focus point at measurement position S of object 40. *Id.* at p. 216, col. 1. Light receiving lens tube 51 carries light to diffusion chamber 54 via optical fiber 53. *Id.* Diffusion chamber 54 guides the received light to sensor 12. *Id.*

Sensor 12 is shown in more detail in Figure 1, which is reproduced below.

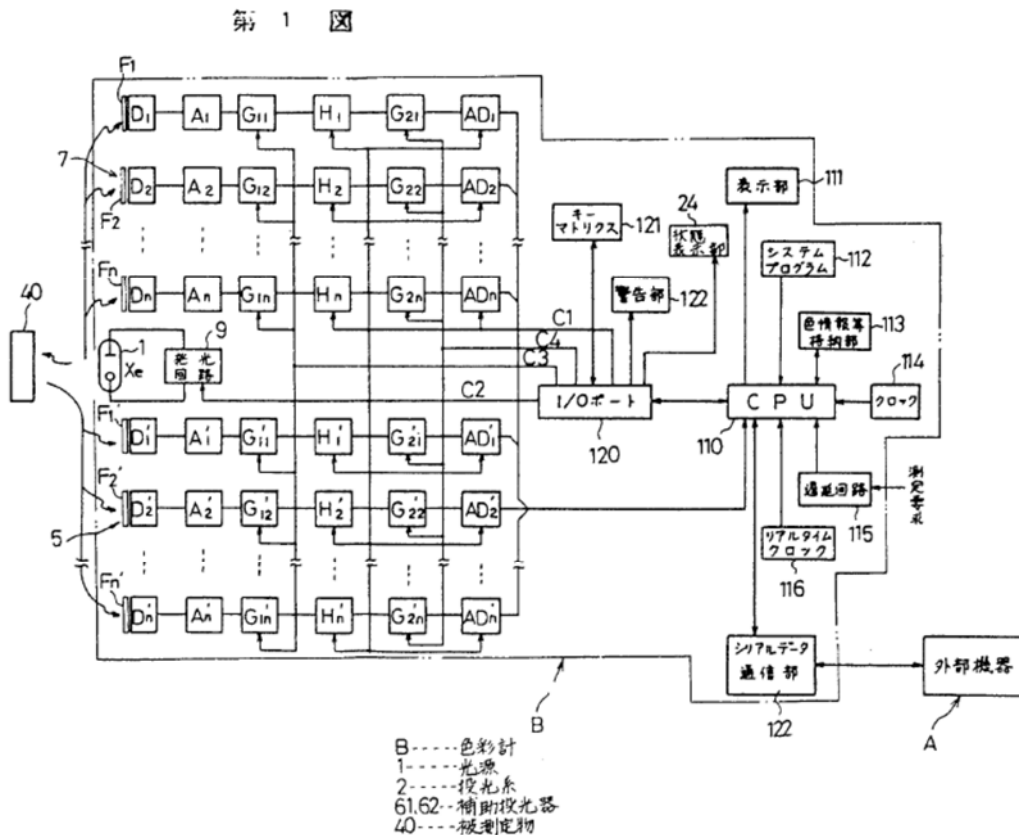


Figure 1 is a block circuit diagram of the colorimeter. *Id.* at p. 220, col. 2. Sensor 12 includes filters $F_1' - F_n'$ that analyze the light for basic color components. *Id.* at p. 217, col. 2. The color components are detected by basic color components detectors $D_1' - D_n'$. *Id.* The outputs of the detectors are amplified by amplification circuits $A_1' - A_n'$ and input to sample hold

circuits $H_1'-H_n'$ via gate circuits $G_{11}'-G_{1n}'$. *Id.* at p. 218, col. 1. The signals stored in the sample hold circuits are converted into digital signals by A/D conversion circuits $AD_1'-AD_n'$ and input to CPU 110 for storage, display, etc. *Id.*

Figure 4 of JP '028 is reproduced below.

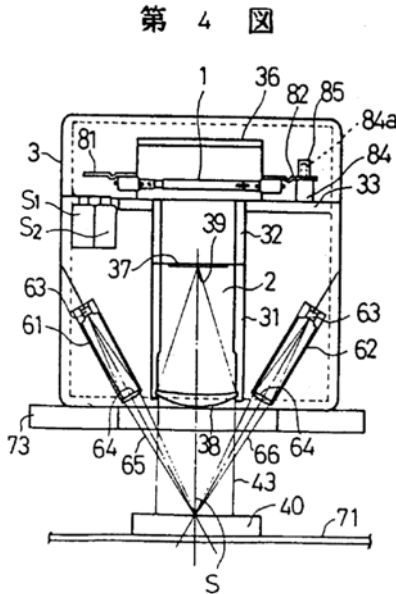


Figure 4 depicts auxiliary projectors 61, 62 on both sides of projection system 2, with each auxiliary projector having light source 63 and projection lens 64. *Id.* at p. 216, col. 1. Auxiliary projectors 61, 62 have auxiliary projection optical paths 65, 66 that intersect at prescribed distance L (see Fig. 2 above) and measurement position S . When optical paths 65, 66 coincide at one point on object 40, machine body 3 and object 40 are appropriately positioned for measurement. *Id.* at p. 216, cols. 1–2. When projection optical paths 65, 66 do not coincide at one point on object 40, object 40 is not appropriately positioned for measurement relative to machine body 3. *Id.* at p. 216, col. 2–p. 217, col. 1. Auxiliary projectors 61, 62 can be flashed alternately or can project light of different

colors to help determine whether object 40 is nearer or farther than prescribed distance L. *Id.*

For purposes of this Decision, we determine that JP '028 qualifies as prior art under at least 35 U.S.C. § 102(b) because JP '028's publication date of November 6, 1989, is more than one year before the January 2, 1996, filing date of the earliest application to which the '038 patent claims priority. *See* Ex. 1001, at [63]; Ex. 1004, at [43].

2. *Claims 127 and 132*

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including the following: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We also recognize that prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). We analyze Petitioner's obviousness grounds with the principles identified above in mind.

In its obviousness analysis for claim 127, Petitioner maps JP '028's colorimeter B to the recited apparatus. Pet. 10 (citing Ex. 1004, p. 220,

col. 1, Fig. 6), 14–15. Petitioner likens light receiving lens 52 and optical fiber 53 to the recited “light receiver” and contends that light coming through these elements passes through color filters $F_1'–F_n'$, which Petitioner maps to the recited “color filter.” Pet. 10–12 (citing Ex. 1004, p. 216, col. 1, p. 217, cols. 1–2, Figs. 1, 2). According to Petitioner, light from color filters $F_1'–F_n'$ then passes to color component detectors $D_1'–D_n'$, which Petitioner maps to the recited “optical sensor.” *Id.* at 12 (citing Ex. 1004, p. 216, col. 1, p. 217, col. 2; Ex. 1009 ¶ 27).

Petitioner contends JP '028's color component filters $F_1'–F_n'$ are “configured as n portions F_1' thru F_n' .” *Id.* at 11 (citing Ex. 1004, p. 217, col. 2; Ex. 1009 ¶ 26). Petitioner contends these portions have “wavelength dependent transmission propert[ies] covering . . . predetermined band[s], of wavelengths” based on JP '028's description of detecting three stimulus values, X, Y, Z, corresponding to colors in the XYZ color specification. *Id.* at 11 (citing Ex. 1004, p. 218, col. 1; Ex. 1009 ¶ 27). Petitioner further contends the color component analysis of light passing through filters $F_1'–F_n'$ by sensors 11, 12 constitutes the recited “spectral[] analy[sis].” *Id.* at 11–12 (citing Ex. 1004, p. 217, cols. 1–2, Fig. 1). Petitioner states JP '028 does not describe a diffraction grating and contends an ordinarily skilled artisan would not have used a diffraction grating when color filters are already being utilized, because this would be unnecessary and redundant. *Id.* at 13 (citing Ex. 1009 ¶ 38).

Petitioner contends JP '028's colorimeter B is a probe that receives light reflected from object 40 in accordance with claim 127. *Id.* at 15 (citing Ex. 1004, p. 215, col. 1, p. 216, col. 1, Fig. 2). Claim 127 additionally recites “one or more optical sensors [that] determine a distance of the probe

with respect to an object or material.” Ex. 1001, 34:1–21. For this limitation, Petitioner cites JP ’028’s description of projecting two different colors for projection optical paths 65, 66 and contends “[l]ight color component intensity measurements by sensor 12 allow determination of when the object 40 is at the prescribed distance L for accurate color measurement” based on whether projected “spots 65a and 66a coincide with each other and the spot for beam 43.” *Id.* at 16 (citing Ex. 1004, p. 214, col. 2–p. 215, col. 1, p. 216, col. 2–p. 217, col. 1, Fig. 9). Petitioner describes these purported intensity measurements as follows:

By analyzing the intensity for each reflected light color based upon one or both of the alternate flashing or different colors from auxiliary projectors 61, 62, the separation or overlap of the projected images 65a, 66a of light 65, 66 from projectors 61, 62 allow determination of an offset direction from the prescribed distance.

Id. (citing Ex. 1004, p. 216, col. 2–p. 217, col. 1, Figs. 10–13).

Patent Owner argues “auxiliary projectors 61, 62 . . . provide light that a user can ‘perceive’ or ‘see’ in order to determine if the object is positioned at the desired distance.” Prelim. Resp. 15–16 (citing Ex. 1004, p. 214, col. 1, p. 215, col. 1, p. 216, col. 2, p. 217, col. 1, p. 220, col. 1). Patent Owner also argues “[t]here is nothing in JP ’028 indicating that any optical sensor is used to determine distance in any way related to the invention claimed in the ’038 patent.” *Id.* at 18. According to Patent Owner, the user “view[s] the auxiliary light projection images and make necessary adjustments.” *Id.* (citing Ex. 1004, p. 216, col. 2).

We are persuaded by Patent Owner’s arguments. Although Petitioner’s analysis of JP ’028 describes how projected optical paths 65, 66 can provide a visual indication of whether or not object 40 is at a prescribed

distance L, Petitioner does not persuasively show that “[l]ight color component intensity measurements by sensor 12” are associated with a determination of distance. Instead, Petitioner twice states that intensity measurements “allow” for distance determination without precisely identifying where such a teaching is found in JP ’028. *See* Pet. 16. Nor does Petitioner cite any testimony from Dr. Baker or other evidence to support such a theory. Furthermore, to the extent JP ’028 states that, outside of a certain range of distances, “measurement cannot be carried out accurately due to the effect of changes in illumination intensity” (Pet. 16–17 (quoting Ex. 1004, p. 216, col. 1)), this is a statement about the limitations of the colorimeter described in JP ’028. This statement, without more, does not support the notion that intensity is used to determine distance in JP ’028.

In addition, and consonant with Patent Owner’s argument, JP ’028 describes user adjustments in response to the separation of projected optical paths 65, 66 to ensure a proper measurement distance. *See id.* at p. 216, cols. 1–2, Figs. 9–11. JP ’028’s teachings about a user perceiving projected images 65a, 66a and adjusting the measurement distance in response (*see* Prelim. Resp. 16–18) undermine Petitioner’s suggestion that sensor 12 within colorimeter B determines that distance.

Because Petitioner does not sufficiently specify where “optical sensors [that] determine a distance” are found in JP ’028, *see* 37 C.F.R. § 42.104(b)(4), we determine that Petitioner has not established a reasonable likelihood of prevailing in showing that claim 127 would have been obvious over JP ’028. Dependent claim 132 depends from and incorporates the limitations in claim 127, and Petitioner’s assertions regarding the additional limitation of claim 132 (*see* Pet. 17) do not cure the deficiencies in

Petitioner's showing regarding claim 127, so we likewise determine that Petitioner has not established a reasonable likelihood of prevailing in showing that claim 132 would have been obvious over JP '028.

B. Obviousness Ground Based on Mills

Petitioner contends that claims 127 and 132 would have been obvious over Mills. Pet. 27–38. Patent Owner disputes Petitioner's contention. Prelim. Resp. 20–24.

1. Mills

Mills is a U.S. patent directed to “grading and sorting fruit and the like according to color, surface blemish, size and/or shape.” Ex. 1005, 1:5–9. Figure 3 of Mills is reproduced below.

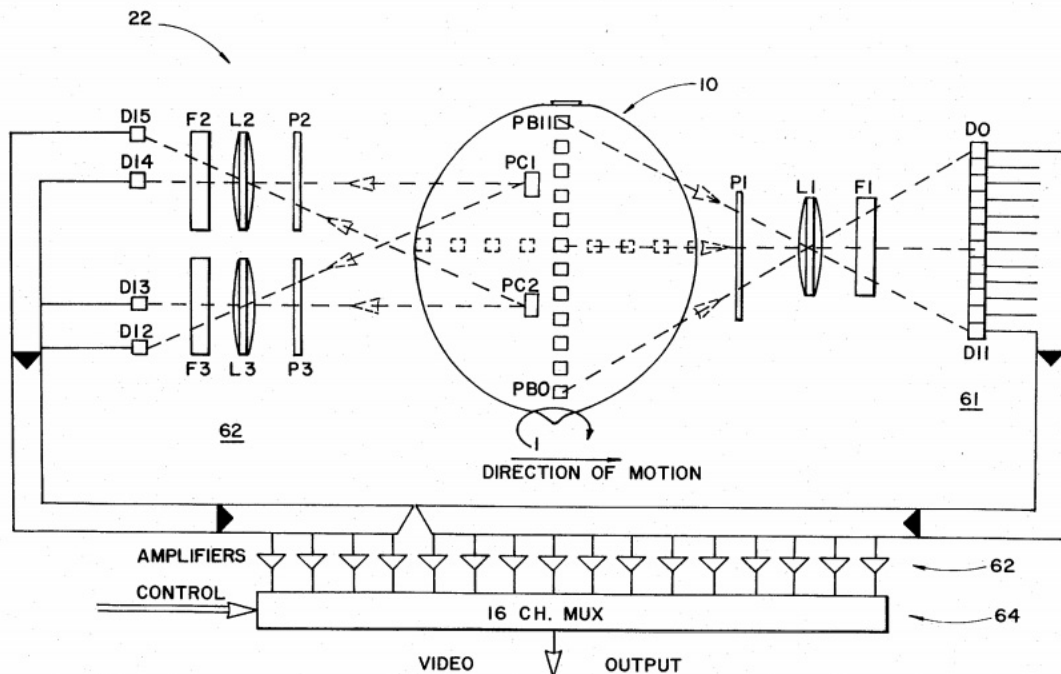


Fig. 3

Figure 3 depicts detector subsystem 22 having scanning diode array 61 for detecting blemishes on fruit 10 and color detector 62 for generating color signals for fruit 10. *Id.* at 5:5–16, 5:61–65. Scanning diode array 61 comprises diodes D0–D11, whereas color detector 62 comprises diodes D12–D15. *Id.* The diodes detect light reflected from fruit 10. *Id.* at 5:15–18. Light from fruit 10 passes through, *inter alia*, filter F1 before reaching diodes D0–D11. *Id.* at 5:23–26. Light from fruit 10 also passes through, *inter alia*, filter F2 before reaching diodes D14 and D15 and filter F3 before reaching diodes D12 and D13. *Id.* at 5:64–6:2. Filters F2 and F3 are bandpass filters at different wavelengths corresponding to different colors. *Id.* at 5:68–6:2. The outputs from detector subsystem 22 pass through amplifiers 62 and multiplexer 64, whereupon the output of multiplexer 64 is converted in A/D converters (Figure 5, box 36), which results in a block of 8-bit bytes. *Id.* at 7:10–15. Each A/D converter 36 is part of a respective microcomputer (Figure 5, box 66), which can store the bytes in memory. *Id.* at 7:15–26.

For purposes of this Decision, we determine that Mills qualifies as prior art under at least 35 U.S.C. § 102(b) because Mills’s issuance date of May 7, 1985, is more than one year before the January 2, 1996, filing date of the earliest application to which the ’038 patent claims priority. *See* Ex. 1001, at [63]; Ex. 1005, at [45].

2. *Claims 127 and 132*

In its obviousness analysis for claim 127, Petitioner maps Mills’s optical scanning unit 18 to the recited apparatus. Pet. 32 (citing Ex. 1005, 1:5–9, 2:17–22; 2:45–64, 4:10–18, Figs. 1, 3), 36–37. For the “light

receivers,” Petitioner cites detector subsystem 22, which receives light from the surface of fruit 10. *Id.* at 32–33 (citing Ex. 1005, 4:67–68, 5:5–18, 5:68–6:8, Figs. 2B, 3). Petitioner maps Mills’s color filters F2, F3 to the recited “color filter” and contends these filters “are configured as filter portions F2 and F3.” *Id.* at 33 (citing Ex. 1005, 5:61–68). Petitioner contends each filter in Mills “has a wavelength dependent light transmission property covering a predetermined band of wavelengths” because each corresponds to a different color, such as red and green. *Id.* (citing Ex. 1005, 5:68–6:2, Fig. 3).

Regarding the light receivers being coupled to the filter portions in claim 127, Petitioner contends that light from fruit 10 entering the cylindrical housing of detector 22 passes through polarizers P2, P3 and lens portions L2, L3 before reaching filters F2, F3. *Id.* at 34–35 (citing Ex. 1005, 5:11–32, 5:61–6:19, Fig. 3).

Petitioner states “light passes from filter F2 to diodes D14-D15 and F3 to diodes D12-D13” where color determination is performed, which Petitioner maps to “spectrally analyz[ing]” a “predetermined band.” *Id.* at 33–34 (citing Ex. 1005, 4:67–5:32, 5:61–6:19, Fig. 3). Petitioner maps these and the other diodes D0–D15 to the recited “plurality of sensing elements.” *Id.* Petitioner notes Mills does not describe a diffraction grating. *Id.* at 35. Similar to the JP ’028 ground, Petitioner contends an ordinarily skilled artisan would not have used a diffraction grating when color filters are already being utilized because this would be unnecessary and redundant. *Id.* (citing Ex. 1009 ¶ 38).

Petitioner maps Mills’s scanning unit 18 to the recited “probe.” Pet. 37–38, 40–41. Petitioner additionally contends Mills’s diodes D0–D15 “are operable to take light intensity measurements varying with distance of

the fruit surface portions PB0-PB11 from the diodes.” Pet. 37 (citing Ex. 1005, 6:22–47). Petitioner explains that “dips in light intensity indicate that the surface of the fruit is further from the diodes D0-D15 than surrounding areas.” *Id.* (citing Ex. 1005, 5:9–26, 5:33–60, 6:20–7:3, 8:38–68, Figs. 3, 4; Ex. 1009 ¶ 32). Petitioner contends this teaches “optical sensors” that “determine a distance” in accordance with claim 127. *Id.*

Patent Owner argues scanning unit 18 does not teach or suggest the “probe.” Prelim. Resp. 21–22. Given our interpretation that a “probe,” within the meaning of the ’038 patent, must be a “fiber-optic instrument” (*see supra* § I.F.), Petitioner must show that Mills’s scanning unit 18 teaches or suggests a fiber-optic instrument. Yet Mills includes no description of fiber optics. In addition, Petitioner makes no showing that an ordinarily skilled artisan considering Mills’s scanning unit 18 would understand it to be a fiber-optic instrument. Thus, we conclude Petitioner has not established a reasonable likelihood of prevailing in showing that claim 127 would have been obvious over Mills. Dependent claim 132 depends from and incorporates the limitations in claim 127, and Petitioner’s additional arguments regarding claim 132 (*see* Pet. 38) do not cure the deficiencies in Petitioner’s showing as to claim 127, so we likewise determine that Petitioner has not established a reasonable likelihood of prevailing in showing that claim 132 would have been obvious over Mills.

C. Obviousness Ground Based on Eguchi

Petitioner contends claims 127 and 132 would have been obvious over Eguchi. Pet. 47–58. Patent Owner disputes Petitioner’s contention. Prelim. Resp. 24–28.

beams A and B are separated from each other by moving blade 2 (having an aperture 2a, shown in Fig. 2) in the direction of arrow y such that images from light rays passing through A and B are allowed to pass alternately. *Id.* at 4:18–21, 5:54–60. According to Eguchi, “[i]nstead of the blade 2, a static shutter such as a liquid crystal, a polarizing filter or a color stripe or color division filter may be employed.” *Id.* at 5:60–62.

Sensor array 3 receives the images from A and B and converts their intensity distributions into electrical video signals, also referred to as intensity distribution signals. *Id.* at 5:63–6:2. If the camera is focused on an object, the intensity distribution of the images A and B will be similar, as shown in Figure 6, reproduced below (*id.* at 4:42–52).

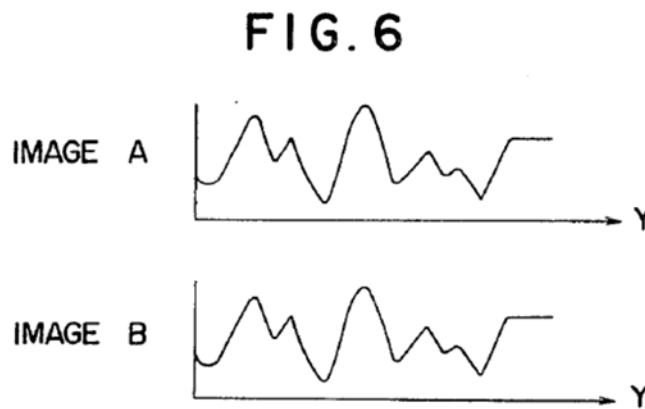


Figure 6 is a block diagram showing the intensity distributions of images A and B when the photographing lens is focused on an object. *Id.* at 2:66–68. In contrast, if lens 1 is out of focus, image A is offset on the y-axis with respect to image B, as shown in Figure 7, reproduced below (*id.* at 4:53–59).

FIG. 7

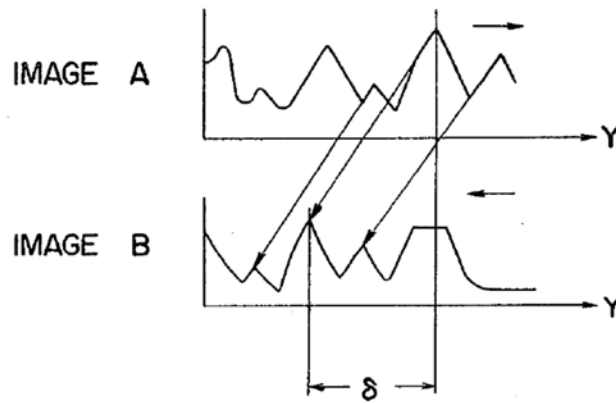


Figure 7 is a diagram showing the intensity distributions of images A and B, offset by a composite shift δ , when the photographing lens is out of focus.

Id. at 3:1–2.

Sensor 3 employs an accumulation mode CCD image sensor array driven by sensor driver 6 to control the charge accumulation time to output serially an intensity distribution signal S_v corresponding to the intensity of each light receiving point over a wide luminance range. *Id.* at 6:4–13.

Sensor driver 6 includes a light-to-frequency conversion circuit (Figure 10, box 21) with circuitry that serves as a time constant to output a square wave signal (S_γ) whose frequency varies with incident light received. *Id.* at 6:61–7:7. Sensor driver 6 outputs clock pulses (Figure 10, lines ϕ_1 , ϕ_2 , ϕ_R) applied to sensor array 3 to output successively signals corresponding to the intensity distribution at a frequency determined by the intensity of the incident light. *Id.* at 7:21–25. This signal is passed through a low-pass filter and amplified to produce intensity distribution signal S_v . *Id.* at 7:25–27.

Again with reference to Figure 9, signal S_v is converted into binary signals D_A and D_B by binary encoder 7 and the binary signals are stored in two memories, A_{DATA} memory 8A and B_{DATA} memory 8B, corresponding to

data obtained from light beam A and light beam B, respectively. *Id.* at 6:14–19. Correlator 9 determines an amount of composite shift δ between images A and B. *Id.* at 6:20–25. To bring the camera into focus, lens 1 must be moved by an amount related directly to the amount and direction of composite shift δ between the images A and B. *Id.* at 5:14–16, 5:28–39. From the composite shift δ , calculator 10 calculates a driving direction and distance Δ and outputs it as electrical signal ΔV . *Id.* at 6:25–34. This signal is used to drive motor M of lens driving device 13 to move lens 1 toward or away from film surface F. *Id.* at 6:34–43.

For purposes of this Decision, we determine that Eguchi qualifies as prior art under at least 35 U.S.C. § 102(b) because Eguchi’s issuance date of April 26, 1983, is more than one year before the January 2, 1996, filing date of the earliest application to which the ’038 patent claims priority. *See* Ex. 1001, at [63]; Ex. 1006, at [45].

2. *Claims 127 and 132*

In its obviousness analysis for Eguchi, Petitioner maps Eguchi’s camera to the recited apparatus of claim 127. Pet. 52 (citing Ex. 1006, 5:46–62), 58–59. Regarding the “light receivers,” Petitioner cites Eguchi’s “autofocus feature [that] receiv[es] light from an object of focus via a lens 1 and half-mirror 4 and around edges of a blade [2] alternately shielding the sensor array 3 from light beams A and B.” *Id.* (citing Ex. 1006, 5:42–60, Fig. 9). Petitioner also notes that “[i]n one embodiment, a color stripe filter or color division filter is used in place of the blade 2,” and it is this alternative arrangement Petitioner maps to the recited “color filter.” *Id.* at 52–53 (citing Ex. 1006, 5:60–62). Dr. Baker testifies that Eguchi “does

not explicitly describe the structure of a color stripe or color division filter,” so Dr. Baker cites descriptions of each type of filter in two patent references other than Eguchi. Ex. 1009 ¶ 39 (citing U.S. Patent No. 3,839,039 (Ex. 1007, “Suzuki”); U.S. Patent No. 3,971,065 (Ex. 1008, “Bayer”)). Dr. Baker explains that “[t]hose having ordinary skill in the relevant art understand that color stripe filters and color division filters separate (or ‘divide’) light into its red, green and blue colored components.” *Id.* ¶ 68 (citing Ex. 1007, 1:29–55). The Petition likewise references an exemplary color stripe filter from Suzuki and an exemplary color division filter from Bayer. Pet. 53 (citing Ex. 1007, 1:29–44; Ex. 1008, 4:58–64, Figs. 3A, 3B). Citing Dr. Baker’s testimony, Petitioner contends an ordinarily skilled artisan “would [have] be[en] motivated to implement the color stripe or color division filter in the respective known manners for such filters” with predictable results. *Id.* (citing Ex. 1009 ¶¶ 39, 68).

For the recitation that each portion of the color filter “has a wavelength dependent light transmission property covering a predetermined band of wavelengths,” Petitioner cites the wavelengths associated with the red, green, and blue bands of the color stripe or color division filters. *Id.* at 54 (citing Ex. 1006, 5:42–60, Fig. 9; Ex. 1008, 4:58–64, Figs. 3A, 3B; Ex. 1009 ¶¶ 39, 68). Petitioner cites the same teachings for the recited “predetermined band or bands of wavelengths to be spectrally analyzed.” *Id.* Petitioner contends “light from the . . . light receivers is coupled to the plurality of portions of the color filter” because light entering Eguchi’s lens 1 and half-mirror 4 “is coupled to the sensor array 3 through the color stripe filter or color division filter.” *Id.* at 54 (citing Ex. 1006, 5:42–60, Fig. 9). Petitioner maps sensor array 3 to the recited “optical sensor” and

contends array 3 includes a linear array of sensors. *Id.* at 54–55 (citing Ex. 1006, 5:63–6:2, 6:6–13, 7:21–27, Figs. 9, 12, 17).

For “spectrally analyz[ing] without using a diffraction grating,” Petitioner notes Eguchi does not describe a diffraction grating. *Id.* at 55. Petitioner further contends, with support from Dr. Baker, that an ordinarily skilled artisan would not have used a diffraction grating with color filters because this would be “unnecessary and redundant.” *Id.* (citing Ex. 1009 ¶ 38).

Petitioner maps Eguchi’s camera to the recited probe. *Id.* at 57 (citing Ex. 1006, 5:46–60). Regarding the “determin[ing] a distance” limitation, Petitioner contends sensor array 3 outputs an intensity distribution signal S_v from which focus adjustment ΔV may be derived; according to Petitioner, focus adjustment ΔV corresponds to a distance of the object from the camera’s lens. *Id.* (citing Ex. 1006, 5:63–6:44, Fig. 9).

Patent Owner argues “[t]here is no mention in Eguchi of performing a spectral analysis of light beams A or B because the spectrum of light beams A and B does not factor into the autofocusing operation.” Prelim. Resp. 25. Patent Owner also argues that Petitioner’s proposed substitution of a color stripe filter or color division filter in place of Eguchi’s blade 2 is based on “bare and unfounded conclusions.” *Id.* Patent Owner further argues “the use of a ‘color stripe or color division filter,’ without more, does not disclose a spectral analysis of received light.” *Id.*

We agree with Patent Owner. We acknowledge Eguchi states that instead of blade 2, “a color stripe or color division filter may be employed.” Ex. 1006, 5:60–62. Although this statement can be taken to show that a skilled artisan would have understood how to incorporate such a filter into

Eguchi's system, it does not imply that a color stripe or color division filter simply could be swapped for blade 2 with no corresponding modifications to the remainder of Eguchi's system. Petitioner states that implementation would be done in "the respective known manners for such filters," but Petitioner's analysis and Dr. Baker's testimony are devoid of detail of how replacing blade 2 with a color stripe or color division filter would achieve spectral analysis. *See* Pet. 53 (citing Ex. 1009 ¶¶ 39, 68). Petitioner does not explain how such a modified system would have spectrally analyzed predetermined bands of wavelengths of light, particularly where Eguchi's described focusing operation does not rely on color filtering of light beams A and B. In the absence of such evidence, Petitioner has failed to "identif[y], in writing and with particularity, . . . the evidence that supports the grounds for the challenge." 35 U.S.C. § 312(a)(3).

Accordingly, Petitioner has not shown a reasonable likelihood that it would prevail with respect to claim 127 as obvious over Eguchi. Because claim 132 depends from claim 127, and because Petitioner's arguments directed to the additional limitation of claim 132 (*see* Pet. 58) do not cure the deficiencies in Petitioner's showing with respect to claim 127, we additionally determine that Petitioner has not established a reasonable likelihood of prevailing in showing that claim 132 would have been obvious over Eguchi.

III. CONCLUSION

Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one remaining claim of the '038 patent challenged in the Petition. Therefore, we do not institute an *inter partes* review as to claims 127 and 132 of the '038 patent.

IV. ORDER

Accordingly, it is

ORDERED that the Petition is denied as to claims 127 and 132 of the '038 patent.

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