

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS INC. and LG ELECTRONICS USA, INC.,
Petitioner,

v.

IMAGE PROCESSING TECHNOLOGIES, LLC,
Patent Owner.

IPR2023-00104
Patent 6,959,293 B2

Before MICHAEL R. ZECHER, BARBARA A. BENOIT, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

BENOIT, *Administrative Patent Judge*.

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

I. INTRODUCTION

LG Electronics Inc. and LG Electronics USA, Inc. (collectively, “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting institution of *inter partes* review of claim 1 (“the challenged claim”) of U.S. Patent No. 6,959,293 B2 (Ex. 1001, “the 293 patent”). Image Processing Technologies, LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”). With prior authorization (Paper 7), Petitioner filed a Preliminary Reply (Paper 8, “Reply”), limited to addressing Patent Owner’s arguments for discretionary denial under 35 U.S.C. §§ 314(a) and 325(d), and Patent Owner filed a Preliminary Sur-reply on these issues (Paper 9, “Sur-reply”).

After considering the Petition, Preliminary Response, Preliminary Reply, and Preliminary Sur-reply, we exercise our discretion under 35 U.S.C. § 325(d) and do not institute *inter partes* review for the reasons explained below.

A. Real Parties in Interest

The Petition identifies LG Electronics Inc. and LG Electronics USA, Inc. as real parties in interest. Pet. 1. Patent Owner identifies only itself as real party in interest. Paper 3 (Patent Owner’s Mandatory Notices), 1.

B. Related Matters

As required by 37 C.F.R. § 42.8(b)(2), each party identifies various judicial or administrative matters that would affect or be affected by a decision in this proceeding. Pet. 1–2; Paper 3, 1–2.

The parties identify the following district court cases: *Image Processing Technologies, LLC v. Samsung Electronics Co.*, No. 2:20-cv-00050 (E.D. Tex.), *Image Processing Technologies, LLC v. Samsung Electronics Co.*, No. 2:16-cv-00505 (E.D. Tex.), and *Image Processing*

Technologies, LLC v. Canon Inc., No. 2:10-cv-03867 (E.D.N.Y.). Pet. 1–2; Paper 3, 1–2. Patent Owner additionally indicates that the ’293 patent is involved in *Image Processing Technologies, LLC v. LG Electronics Inc.*, No. 2:22-cv-00077 (E.D. Tex.). Paper 3, 1.

The parties also each indicate that the sole claim challenged here was involved in three prior Board proceedings. Pet. 1–2; Paper 3, 1–2. Two *inter partes* proceedings were brought by a different petitioner —*Samsung Electronics Co. v. Image Processing Technologies, LLC*, IPR2017-00336 (“IPR 336”) and *Samsung Electronics Co. v. Image Processing Technologies, LLC*, IPR2017-01189 (“IPR 1189”). In a final written decision issued May 9, 2018 in IPR 336, the Board determined that the petitioner had not demonstrated that claim 1 was unpatentable, among other determinations. Ex. 1005, 43–54, 76. In a decision denying institution issued August 18, 2017 in IPR 1189, the Board determined that the petitioner did not demonstrate a reasonable likelihood of succeeding with regard to claim 2 (which depends directly from claim 1) or any other challenged claim. Ex. 1006, 27. Additionally, the Board reversed the Examiner’s rejection that claim 1 was unpatentable in *Ex Parte* Image Processing Technologies, LLC, Reexamination Control No. 90/014,056 (“Reexam 056”). Ex. 1007, 22;¹ Ex. 2001 (reexamination certificate issued January 27, 2020 confirming patentability of claim 1).

¹ All citations to the Board’s Reexamination Decision refer to the page number inserted by Petitioner in the bottom, right-hand corner of each page of Exhibit 1007.

C. The '293 Patent

The '293 patent describes a visual perception device, including a device for processing image signals using histogram calculation units. Ex. 1001, 1:6–10. Figure 3 of the '293 patent illustrates a histogram calculation unit, and is reproduced below with highlighting added by Petitioner (Pet. 5). Ex. 1001, 4:45–46.

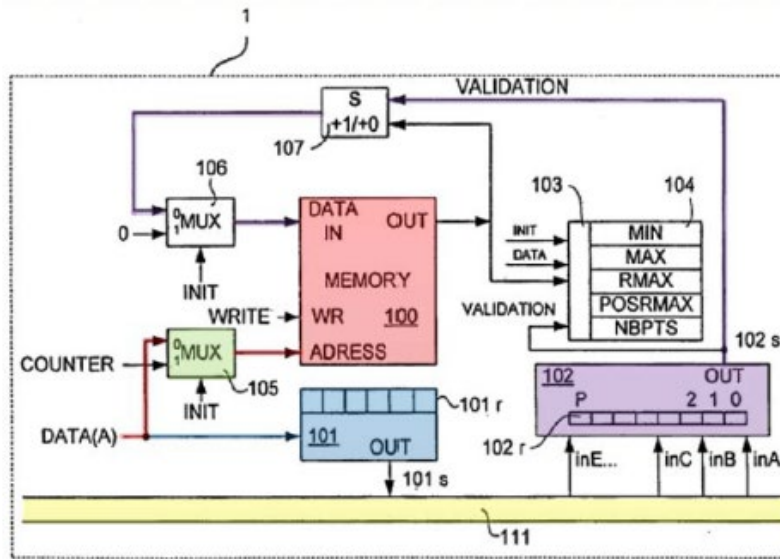


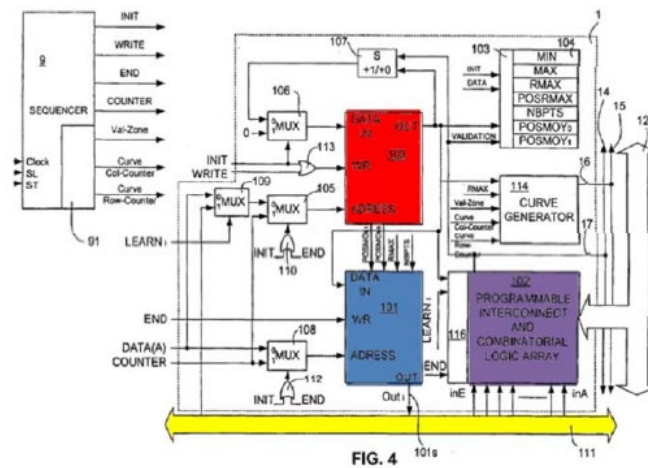
FIG. 3

As shown in highlighted Figure 3 above, histogram calculation unit 1 includes analysis memory 100 (in red), address multiplexer 105 (in green), data input multiplexer 106, incrementation unit 107, classifier 101 (in blue), time coincidences unit 102 (in purple), and test unit 103, which is connected to analysis output registers 104. Ex. 1001, 8:37–43, 9:51–54. Output of classifier 101 (in blue) is connected to bus 111 (in yellow). *Id.* at 9:36.

Analysis output registers 104 receive and store statistical information prepared on the basis of the values of parameter A of signal DATA(A) for each frame. *Id.* at 9:51–57. In particular, after processing a complete frame, statistical information representative of this frame is produced and stored in analysis output registers 104. *Id.* at 10:1–14. This statistical information

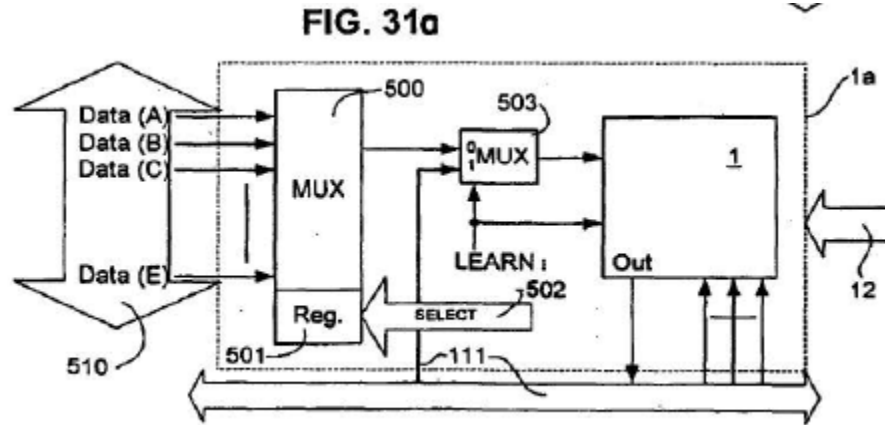
includes minimum values (MIN) and maximum values (MAX) of the histogram, the number of points (NBPTS) of the histogram, the position (POSRMAX) of the maximum of the histogram, and the number of points (RMAX) at the maximum of the histogram. *Id.* These features are determined in parallel with the formation of the histogram by test unit 103.

Figure 4 of the '293 patent illustrates a self-adapting histogram calculation unit with anticipation and learning functionalities, and is reproduced below with highlighting added by Patent Owner (Prelim. Resp. 10). Ex. 1001, 4:47–49.



According to the '293 patent, in the self-adapting embodiment illustrated in Figure 4, the content of the memory of classifier 101 (in blue) is updated automatically. Ex. 1001, 11:14–29. To implement the self-adapting function (i.e., real-time updating of classifier 101), classifier 101 has an addressable memory whose writing is controlled by signal END, which is generated by sequencer 9. *Id.* Histogram calculation unit 1 also includes selection circuit 110 (e.g., an “OR” gate), receiving as its input signals INIT and END and whose output is connected to the selection input of address multiplexer 105. *Id.*

Figure 31a of the '293 patent illustrates a polyvalent histogram calculation unit that can be programmed to process more than one parameter, and is reproduced below (*id.* at 21:18–36).



As shown in Figure 31a above, polyvalent histogram calculation unit 1a comprises histogram calculation unit 1, input multiplexer 500, associated register 501, and learning multiplexer 503. *Id.* In this embodiment, it is possible to use a single histogram calculation unit to process any of parameters Data (A) – Data (E), which are addressed by bus 510 in relation to SELECT command 502. *Id.* at 20:58–66. Additionally, polyvalent histogram calculation units can be operated in a matrix. *Id.* at 21:37–42.

D. Challenged Claim

Claim 1 is the sole challenged claim and is reproduced:

1. A visual perception processor for automatically detecting an event occurring in a multidimensional space (i, j) evolving over time

with respect to at least one digitized parameter in the form of a digital signal on a data bus,

said digital signal being in the form of a succession a_{ijT} of binary numbers associated with synchronization signals enabling to define a given instant (T) of the multidimensional space and

the position (i, j) in this space, the visual perception processor comprising:

the data bus;

a control unit;

a time coincidences bus carrying at least a time coincidence signal; and

at least two histogram calculation units for the treatment of the at least one parameter,

the histogram calculation units being configured to form a histogram representative of the parameter as a function of a validation signal and to determine by classification a binary classification signal resulting from a comparison of the parameter and a selection criterion C,

wherein the classification signal is sent to the time coincidences bus, and wherein the validation signal is produced from time coincidences signals from the time coincidence bus so that the calculation of the histogram depends on the classification signals carried by the time coincidence bus.

Ex. 1001, 26:34–59.

E. The Asserted Grounds of Unpatentability

Petitioner challenges the patentability of the sole challenged claim on the following grounds:

Claim Challenged	35 U.S.C. §	Reference(s)/Basis
1	102	Pirim ²
1	103	Pirim

² WIPO International Publication No. WO 99/36893, published July 22, 1999 (Ex. 1018). *See* Pet. 7 (asserting the reference is prior art under pre-AIA 35 U.S.C. § 102(a), § 102(b), § 102(e), and § 119). As Petitioner notes, the sole named inventor of the '293 patent (Patrick Pirim) is one of the named inventors on the asserted prior art Pirim. Pet. 7.

Claim Challenged	35 U.S.C. §	Reference(s)/Basis
1	103	Pirim, Bolle ³

Pet. 3.

In support of its assertions, Petitioner additionally relies on the Declaration of Dr. Jeffrey J. Rodriguez (Ex. 1002).

1. Overview of Pirim

Pirim describes an image processing system to detect drowsiness. Ex. 1018, 1 (Abstract), 3 (Field of Invention). Pirim indicates that “[t]he present invention discloses an application of the generic image processing system disclosed in” two PCT Applications.⁴ *Id.* at 12:11–15.⁵

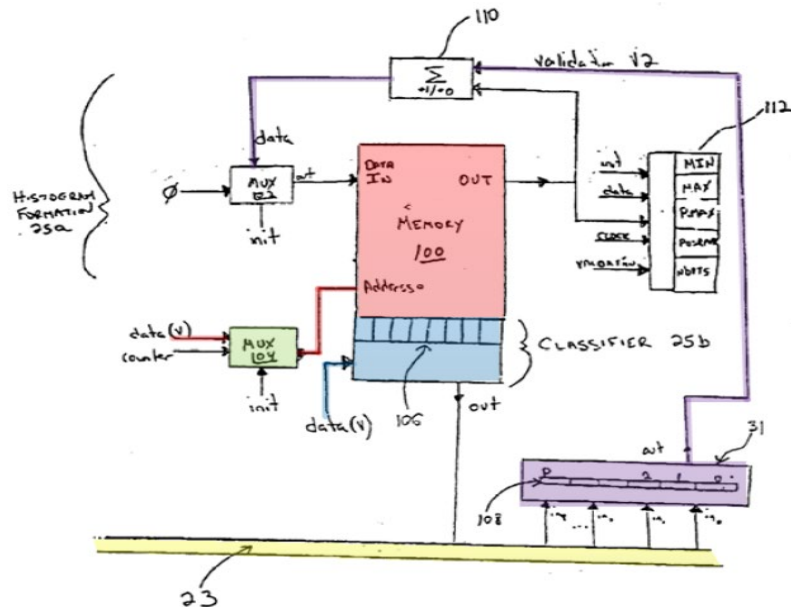
Pirim’s system “for detecting a person falling asleep includes a sensor for acquiring an image of the face of the person, a controller, and a histogram formation unit for forming a histogram on pixels having selected characteristics.” *Id.* at 1 (Abstract); 7:3–5. “The controller controls the histogram formation unit to select pixels of the image having characteristics corresponding” to an eye of the driver. *Id.* at 7:5–7. The controller “form[s] a histogram of the selected pixels” and “analyzes the histogram over time” to identify characteristics of eye opening and closing that are “indicative of the driver falling asleep.” *Id.* at 7:7–10.

³ U.S. Patent No. 5,546,475, issued August 13, 1996 (Ex. 1019). *See* Pet. 17 (asserting the reference is prior art under pre-AIA 35 U.S.C. § 102(b)).

⁴ PCT/FR97/01354 and PCT/EP98/05383 (Ex. 1021, “Pirim 2”).

⁵ All references to the page numbers in Pirim are to the page numbers in Exhibit 1018 inserted by Petitioner at the bottom, right-hand corner of each page—not the original page numbers that appear in the middle of each page.

Figure 14 below, with highlighting added by Petitioner, illustrates an individual histogram formation unit. *Id.* at 10:22; Pet. 11.



As shown in highlighted Figure 14 above, histogram formation block 25 has histogram forming portion 25a, which includes memory 100 (in red) and classifier 25b (in blue) for selecting the criteria of pixels for which the histogram is to be formed. Ex. 1018, 28:17–24; Pet. 11. Classifier 25b enables only data having selected classification criteria to be considered further. *Id.* at 29:20–22. The output of classifier 25b proceeds to bus 23 (in yellow), which also carries the output of other classifiers in the system. *Id.* at 31:6–9; Pet. 11. These signals proceed to validation unit 31 (in purple), which generates a validation signal. *Id.* at 30:19–22, 31:6–11; Pet. 11.

2. Overview of Bolle

Bolle describes an image processing system for recognizing objects using computerized optical scanning devices. Ex. 1019, 1:6–8 (Field of Invention). Bolle indicates that such systems often use histograms to perform this recognition. *Id.* at 1:15–16. Bolle explains that a “common

histogram method either develops a gray scale histogram or a color histogram from a (color) image containing an object,” which then may be compared to a histogram of reference images. *Id.* at 1:16–20.

F. Level of Ordinary Skill in the Art

The level of ordinary skill in the art at the time of the invention is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner asserts that a person of ordinary skill in the art would have had

either (1) a master’s degree in Electrical Engineering or Computer Engineering or the equivalent plus at least a year of experience in the field of image processing, image recognition, machine vision, or a related field or (2) a Bachelor’s Degree in Electrical Engineering or Computer Engineering or the equivalent plus at least three years of experience in the field of image processing, image recognition, machine vision, or a related field.

Pet. 20 (citing Ex. 1002 ¶ 24). At this preliminary stage, Patent Owner has not addressed the level of ordinary skill in the art. *See generally* Prelim. Resp.

For the purpose of this decision, we adopt Petitioner’s provided definition for the level of skill of a person of ordinary skill in the art. We view this definition as reasonable and consistent with the prior art, and is supported by the testimony of Dr. Rodriguez. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of ordinary skill in the art).

G. Claim Construction

In *inter partes* reviews, we construe claims using the same claim construction standard employed in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b) (2020). Under the principles set forth by our reviewing court, the “words of a claim ‘are generally given their ordinary and customary meaning,’” as would have been understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). We construe claim terms only as relevant to the parties’ contentions and only to the extent necessary to resolve the issues in dispute. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Three prior Board proceedings (IPR 336, IPR 1189, and Reexam 056) applied the construction of “the [at least two] calculation units being configured to form a histogram representative of the parameter” (the “common parameter” limitation) as meaning “the histogram calculation units being configured to each form a histogram representative of *at least one common parameter*.” Ex. 1005 (IPR 336 Final Written Decision), 12–14; *see* Ex. 1006 (IPR 1189 Decision Denying Institution), 9; Ex. 1007 (Reexam 056 Decision finding claim 1 patentable), 8.

Petitioner applies that construction here and indicates that no additional claim terms need to be construed. Pet. 20–21. Patent Owner does

not address claim construction at this preliminary juncture. *See generally* Prelim. Resp. For purposes of this Decision, we adopt the Board’s prior construction for the “common parameter limitation.”⁶

II. ANALYSIS

As a threshold matter, we consider whether to exercise our discretion under 35 U.S.C. § 325(d) to deny institution of an *inter partes* review. *See* 37 C.F.R. § 42.4(a) (The Director delegated her authority to determine whether trial should be instituted to the Board.). Section 325(d) of Title 35 of the United States Code states, in relevant part: “In determining whether to institute or order a proceeding under this chapter, chapter 30, or chapter 31, the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” We use a two-part framework for evaluating arguments under § 325(d):

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

⁶ The prior constructions were made under the broadest reasonable interpretation. Neither party has contended that the claim construction would change under the current claim construction standard. Nor do we see any reason in this record to change the Board’s prior well-reasoned claim construction in our consideration whether to exercise our discretion under § 325(d).

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). “[T]he *Becton, Dickinson* factors provide useful insight into how to apply the framework under 35 U.S.C. § 325(d).” *Id.* at 9 (footnote omitted). The non-exclusive *Becton, Dickinson* factors are:

- (a) the similarities and material differences between the asserted art and the prior art involved during examination;
- (b) the cumulative nature of the asserted art and the prior art evaluated during examination;
- (c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;
- (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art;
- (e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art; and
- (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph). *Becton, Dickinson* factors (a), (b), and (d) relate to the first part of the *Advanced Bionics* framework (whether the same or substantially the same art or arguments previously were presented to the Office), and *Becton, Dickinson* factors (c), (e), and (f) relate to the second part of that framework (previous Office error). *Advanced Bionics*, IPR2019-01469, Paper 6 at 9–11.

The parties dispute whether our discretion under 35 U.S.C. § 325(d) should be exercised to deny institution. *See generally* Pet. 22–29; Prelim. Resp. 19–27; Reply 1–4; Sur-reply 1–4.

A. Prior Art and Arguments Previously Presented to the Office

During original examination, the Examiner determined claim 1 was patentable over Pirim and Pirim 2. Ex. 1001, code (56) (including WO 99/36893⁷ and WO 00/011610⁸ in References Cited). Petitioner acknowledges this. Pet. 4.

In the Final Written Decision of IPR 336, the Board was not persuaded by obviousness arguments based on Pirim alone, finding that Pirim’s histogram formation units process a single parameter. Ex. 1005, 45–48. The Board also was not persuaded by alternative obviousness arguments based on the combination of Pirim and Tomitaka.⁹ *Id.* at 49. The Board determined that, because Tomitaka itself used histogram generation units to process different parameters, the combination of Pirim and Tomitaka—replacing Pirim’s histogram units with Tomitaka’s histogram units—necessarily would not teach or suggest at least two histogram calculation units. *Id.* The Board further determined that the petitioner in IPR 336 did not “explain sufficiently why a person of ordinary skill in the art would have had a reason ‘to modify Tomitaka such that the two histogram units processed *the same parameter.*’” *Id.*

In a Decision denying institution of IPR 1189, the Board again considered whether Pirim alone rendered obvious the limitations recited in

⁷ WIPO International Publication No. WO 99/36893 (Pirim). Ex. 1018.

⁸ WIPO International Publication No. WO/2000/011610 corresponds to PCT/EP1998/005383 (Pirim 2). Ex. 3003.

⁹ U.S. Patent No. 5,546,125.

claim 1.¹⁰ Ex. 1006, 8, 11–16. The Board determined that “[n]othing in Pirim suggests a system have two histogram blocks treating the same parameter.” *Id.* at 16. The Board also rejected the argument, based on expert testimony, that “it would be obvious that two histogram units *could* process the same parameter.” *Id.* The Board explained that “obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.” *Id.* (quoting *Belden Inc. v. Berk-Tek LLC*, 805 F.3d, 1064, 1073 (Fed. Cir. 2015)).

The third time the Board considered whether Pirim rendered obvious the limitations recited in claim 1 was in a Decision on appeal that arose from a request for *ex parte* reexamination of the ’293 patent. Ex. 1007, 4. The Board, once again, considered whether Pirim alone disclosed every element of claim 1 and, once again, determined that Pirim did not disclose the “common parameter” limitation. *Id.* at 5–6, 9.

The Board also disagreed with the Examiner’s alternative finding that claim 1 would have been obvious in light of Siegel’s¹¹ teaching of “parallel processors that each process and form a histogram of the same parameter.” *Id.* at 6, 10–17. More specifically, the Board was persuaded of error in the Examiner’s determination that it would have been obvious, in view of Siegel, to add another histogram formation block to Pirim to process the

¹⁰ The Board considered the “common parameter” limitation in the context of considering the petitioner’s challenge to claim 2 that directly depends from claim 1. *See* Ex. 1001, 26:60–64 (claim 2).

¹¹ Howard Jay Siegel et al., *PASM: A Partitionable SIMD/MIMD System for Image Processing and Pattern Recognition*, 30 IEEE Trans. on Computers, 934–45 (1981) (Ex. 2012).

same parameter (*id.* at 10–11) or configure two of Pirim’s existing histogram formation blocks to treat the same parameter (*id.* at 11–13).

The Board also did not agree with the Examiner’s reliance on various alternative combinations of Pirim and Hirota.¹² *Id.* at 17–18. As the Board noted, “Hirota discloses a copying machine that determines automatically a document type, such as color and black-and-white documents, based on histograms.” *Id.* at 18. Subsequent to this Decision, an *ex parte* reexamination certificate issued confirming the patentability of claim 1. Ex. 2001.

B. Petition Grounds Based on Pirim Alone

In the first two grounds asserted here Petitioner yet again relies on Pirim—a reference that was of record during original prosecution and that the Board has indicated in three prior decisions, after considering whether claim 1 would have been obvious over Pirim alone, does not disclose the “common parameter” limitation of claim 1. *See* Pet. 4 (acknowledging Pirim and Pirim 2 were of record).

On these unambiguous facts, we conclude that the first condition of the *Advanced Bionics* framework part 1 is met—Petitioner here in the two grounds based on Pirim presents the same prior art that has been previously presented to the Office. *See Advanced Bionics*, IPR2019-01469, Paper 6 at 8 (indicating that the second part is only reached “if either condition of the first part of the framework is satisfied”).

In addition, Petitioner presents arguments in the two grounds based on Pirim using Pirim 2, which is incorporated by reference into Pirim. *See* Pet. 12–17 (discussing incorporation of Pirim 2 by Pirim), 3 (listing grounds with

¹² U.S. Patent No. 6,118,895, issued Sept. 12, 2000.

regard to Pirim, not Pirim 2), 29 (same). We agree with Patent Owner that, based on the incorporation by reference, “the Office has considered Pirim 2 every time it previously considered Pirim in the process of confirming the validity of claim 1 of the ’293 Patent.” Sur-reply 2 (citing Prelim. Resp. 5–6) (citations omitted). This is in addition to the fact that Pirim 2 was before the Examiner as a separate reference during original prosecution, as Petitioner acknowledges. Pet. 4.

Having determined that the same art as presented in the two grounds based on Pirim alone was presented previously to the Office, we turn to part 2 of the *Advanced Bionics* framework: whether the Office—here, the Board in particular—previously erred in its consideration of Pirim because it overlooked the “replicating discussion” in Pirim 2 that “expressly discloses the ‘common parameter’ requirement” of claim 1, as Petitioner contends. Pet. 27 (Ex. 1021, 37)¹³; *see id.* at 22, 26. Petitioner relies on page 37, lines 7–21 of Pirim 2 that states:

It will be appreciated that the present invention is subject to numerous modifications. In an embodiment in which a color camera is used, the system of the inventor preferably includes histogram formation units for hue and saturation. This enables classification of targets to be made using those characteristics as well. In fact, the invention may be modified by adding histogram formation units for any possible other measurable characteristics of the pixels. Moreover, while the invention has been described with respect to tracking a single target, it is foreseen that multiple targets may be tracked, each with user-defined classification criteria, by replicating the various elements of the invention. For example, assuming the system of the invention included additional histogram units for hue and saturation, the system

¹³ Petitioner also cites Pirim’s incorporation statement on page 12 in support of its arguments that the Board erred in overlooking the Pirim 2 discussion. Pet. 27 (citing Ex. 1018, 12).

could be programmed, using a common controller attached to two histogram formation processors of the type shown in Fig. 11, to track a single target by its velocity, and/or color, and/or direction, etc. In this manner, the system could continue to track a target if, for example, the target stopped and the track based on velocity and direction was lost, since the target could still be tracked by color.

Ex. 1021, 37:7–21; *see, e.g.*, Pet. 27 (citing Ex. 1021, 37); Pet. 46 (citing Ex. 1021, 37:15–21); Pet. 50 (citing Ex. 1021, 37:12–15).

The plain language of Pirim 2 describes using two histogram formation units, but does not describe using them to process a common parameter. Rather, in the paragraph reproduced above, Pirim 2 describes using multiple histogram formation units for different parameters—“for hue and saturation” and “for any possible other measurable characteristics of the pixels.” Pirim 2 here also describes tracking multiple targets, “each with user-defined classification criteria, by replicating the various elements of the invention.” This, however, describes using different user-defined classification criteria for each target and describes replicating unspecified “various elements of the invention” to do so. This paragraph also describes “a common controller attached to two histogram formation processors” “to track a single target” based on different parameters—“velocity, and/or color, and/or direction.” None of this description expressly discloses using two histogram formation units for a common parameter as required by claim 1.

Petitioner provides explanations about how portions of this paragraph might be understood by one of ordinary skill in the art to describe the “common parameter” limitation of claim 1. *See* Pet. 46–47 (“In essence, Pirim discloses . . . But the second histogram processor 22a could still generate . . . A mockup of the additional processor is shown . . .”). The need for this additional explanation, however, undermines Petitioner’s contention

that page 37 of Pirim 2 expressly discloses the “common parameter” limitation and does not show error that the Board overlooked an express disclosure in Pirim 2 based on its incorporation by reference into Pirim.

In addition, Petitioner’s arguments regarding the additional histogram formation units and annotation of Figure 10 of Pirim 2 are substantially similar to the arguments and annotations presented by prior challenges based on Pirim and considered by the Board. *Compare, e.g.*, Pet. 48 (annotation added second histogram processor 22a to Pirim 2, Fig. 10), *with* Reexam 056 Dec. 10–11 (discussion of Examiner’s proposal to add second histogram formation block 28a to Pirim, Fig. 12). That Petitioner adopts similar approaches to argue that Pirim discloses the “common parameter” limitation further undermines Petitioner’s contention that the Board erred. Indeed, like the past challenges to claim 1 that the Board has considered, Petitioner relies on (i) Pirim for all limitations of claim 1, except the “common parameter” limitation and (ii) supplements Pirim in some way (here, arguing that Pirim 2 has express disclosure that purportedly teaches the “common parameter” limitation) to fill the Pirim gap. Petitioner does not point to error in prior Board reasoning, rather Petitioner contends that the Board erred by overlooking an express disclosure in Pirim 2. Pet. 27. In addition, Petitioner has not identified error in the Board’s prior claim construction of the “common parameter” limitation, but rather Petitioner adopts and applies it. *Id.* at 30.

Because we do not agree that Pirim 2 discloses the “common parameter” limitation, we do not perceive any Board error material to patentability revealed by the incorporation issue of additional material from Pirim 2. Petitioner’s contentions regarding Board error in large measure amount to an attempt to fill in the gap left by the Board’s thrice-articulated

conclusion that Pirim does not disclose the “common parameter” limitation of claim 1 by pointing to disclosure in Pirim 2, a reference previously before the Office during original examination.

We note that Petitioner advances an anticipation ground based on Pirim, which is a statutory basis that has not been considered in any of the Board’s prior three decisions that considered single-reference obviousness based on Pirim. *See* Pet. 29–56 (Section XII.A arguing that “[c]laim 1 is anticipated and/or rendered obvious by Pirim”). Standards for anticipation and obviousness are distinct. *Compare* 35 U.S.C. § 102(a), (b), or (e), *with* 35 U.S.C. § 103(a). Advancing a new statutory basis, however, does not demonstrate Board error in its prior consideration of Pirim. Moreover, including a nominal anticipation argument among multiple other obviousness grounds cannot be a workaround to avoid the Board’s exercise of its discretion. In any event, as discussed above, we do not agree that Pirim, even when considering its incorporation by reference of Pirim 2, expressly discloses the “common parameter” limitation of claim 1. Pet. 27 (citing Ex. 1018, 10; Ex. 1021, 37).

Nor are we persuaded that Petitioner’s arguments regarding Pirim, even when considering its incorporation by reference of Pirim 2, warrant reconsideration of whether Pirim discloses every element and limitation of the claimed invention, arranged as in the claim without “any need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of” the reference. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008) (quoting *In re Arkley*, 59 CCPA 804, 455 F.2d 586, 587 (1972)); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). For example, Petitioner contends that two applications of Pirim’s technology—a drowsy driving

application and a weapons targeting application—each “anticipates and/or renders obvious Claim 1.” Pet. 29; *see* Pet. 29–56. Petitioner acknowledges that it relies on “multiple pages from Pirim and its incorporated documents” that includes “generalized material” that Petitioner asserts “applies to all embodiments.” Pet. 30. Petitioner, however, does not sufficiently explain how using generalized material that applies to all embodiments meets the anticipation standard. Rather, Petitioner pivots to obviousness and indicates that, “if Patent Owner were to argue that Petitioner’s evidence as to either embodiment improperly combined disparate embodiments, any such combinations would have been obvious because Pirim explicitly teaches combining the material.” Pet. 30.

For these reasons, we are not persuaded that the additional evidence and facts presented in the Petition warrant reconsideration by the Board of whether Pirim discloses or renders obvious claim 1 of the challenged patent. Rather, we agree with Patent Owner that Petitioner’s arguments present “the same, or substantially the same, art and arguments and do not change the deficient disclosure of Pirim or Pirim 2.” Prelim. Resp. 21. Accordingly, we are not persuaded that Petitioner has demonstrated that the Board previously erred in its consideration of Pirim by overlooking an express disclosure of the “common parameter” limitation of claim 1.

On this record, after weighing the parties’ arguments and evidence, Petitioner’s arguments based on the incorporation by reference of Pirim 2 into Pirim do not persuade us that instituting yet-another *inter partes* review to consider a fourth time whether Pirim discloses the “common parameter” limitation is warranted.

C. Petition Ground Based on Bolle

Turning to the remaining ground, Petitioner asserts that “the art previously considered by the [O]ffice is not the same, substantially the same, or cumulative of Bolle or the combination of Pirim and Bolle.” Pet. 23 (citing *Apple Inc. v. Telefonaktiebolaget LM Ericsson*, IPR2022-00346, Paper 7 at 9–11 (PTAB Aug. 18, 2022)). Petitioner acknowledges that the Board previously considered Pirim combined with one of the Tomitaka, Siegel, or Hirota references. *Id.* at 23–24. Petitioner asserts, however, that its new fourth iteration, a combination of Pirim with Bolle, is not cumulative with any of the previously considered prior art because Bolle teaches the feature expressly identified as missing from the previously considered references, specifically, the “common parameter” limitation required by claim 1. *Id.*

In particular, Petitioner asserts that Bolle discloses calculating two histograms representing a common parameter by disclosing “two hue histograms in two segmented areas of the frame—area 1420 (the grapes) and area 1410 (the leaves).” Pet. 65–66 (citing Ex. 1019, Fig. 14). Figure 14 of Bolle is reproduced below.

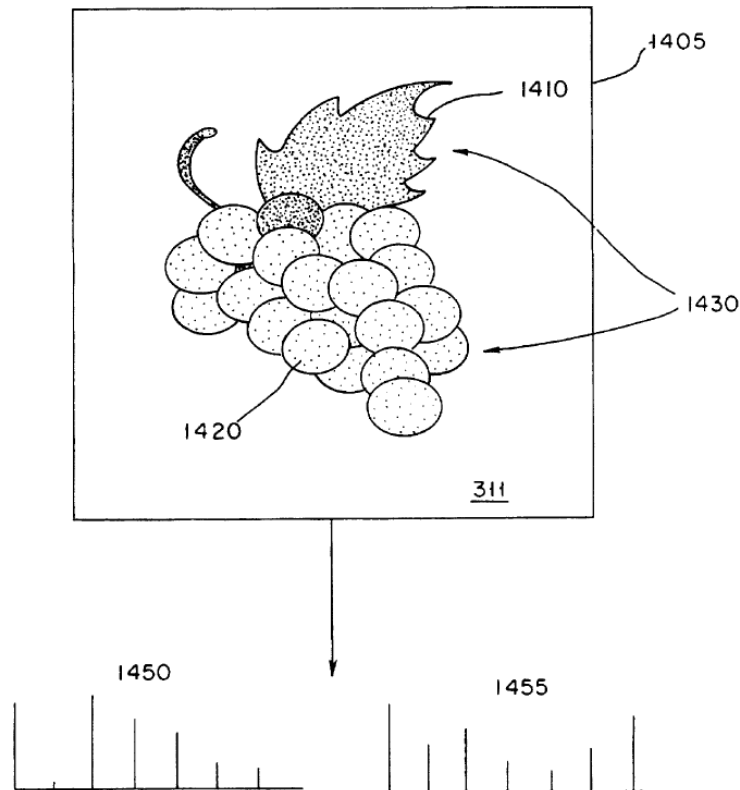


Figure 14, shown above, depicts “image 1405 where segmented object image 130 has two distinct regions, i.e., the leaves 1410 and the grapes 1420.” Ex. 1019, 19:18–20. Figure 14 further depicts histogram 1450 calculated from the leaves 1410 and histogram 1455 calculated from grapes 1420. *Id.* at 19:29–32. Petitioner explains that, “[a]fter the regions are segmented, ‘[t]he regions are histogrammed . . . separately [H]istograms 1450 and 1455 correspond to the first 1410 and second 1420 region, respectively.’” Pet. 66 (citing Ex. 1019, 19:18–31). Petitioner further contends that Pirim teaches tracking multiple targets using “replicated” histogram processors 22a. *Id.* at 66–67 (citing Ex. 1021, 37). According to Petitioner, Pirim could calculate Bolle’s histograms 1450 and 1455 using two separate histogram processors 22a. *Id.* In other words, Petitioner argues that Pirim combined with Bolle teaches the “common

parameter” limitation of claim 1 by replicating Pirim’s histogram processors with a first processor calculating a first histogram based on a first portion of an image and a second processor calculating a second histogram based on a second portion of an image where both histograms are based on a common parameter, hue. *Id.* at 66–68.

Petitioner contends that the above described teachings of Pirim and Bolle are different than the previously considered combinations of Pirim with Tomitaka, Siegal, or Hirota. Pet. 23; Pet. Reply 2–3. First, Petitioner asserts that Tomitaka discloses “one histogram unit for brightness and another for hue.” *Id.* at 23 (citing Ex. 1005, 49). According to Petitioner, the Board determined that Tomitaka’s brightness and hue are different parameters such that Tomitaka failed to teach the “common parameter” limitation of claim 1. In contrast, Petitioner asserts that Bolle discloses forming two histograms based on the common parameter of hue. *Id.*

Petitioner further asserts that Siegel “disclosed the idea of using two histogram units to jointly create one histogram by each processing ‘different pixel segments’ in the same frame and combining their results—a form of parallel processing that would increase the speed of calculation.” *Id.* (emphases in original omitted) (citing Ex. 1005, 9–10). According to Petitioner, the Board “determined that a [person of ordinary skill in the art (‘POSITA’)] would not have been motivated to combine this idea with Pirim, because doing so would not have had the benefit of speeding up the histogram calculation.” *Id.* at 24 (citing Ex. 1005, 10). Petitioner contends that Bolle’s disclosure of calculating separate histograms differs from Siegel’s approach because Bolle does not combine its two histograms. *Id.* at 24.

Lastly, Petitioner asserts that Hirota discloses “two separate histogram units that treated a common parameter . . . [b]ut the Board did not see any motivation to combine Hirota with Pirim.” *Id.* (citing Ex. 1007, 16, 18). Specifically, Petitioner argues that “the Board found that it was not obvious to ‘configure at least two of Pirim’s histogram calculation units to treat one parameter’ based on Hirota’s ‘memories 202 and 204.’” Pet. Reply 2 (citing Ex. 1007, 17–18). According to Petitioner, the combination of Pirim and Bolle is not cumulative of the combination of Pirim and Hirota because Petitioner relies entirely on Pirim’s circuitry and Bolle discloses a motivation to combine by teaching “beneficial uses for its hue histograms, such as training.” *Id.* (citing Ex. 1019, Abstract, 3:10–5:60); Pet. Reply 2 (citing Pet. 57–58).

Patent Owner disagrees and argues that Siegel and Hirota were previously presented to the Office—to teach “two histogram calculation units being configured to form a histogram representative of at least one parameter” and cure Pirim’s deficiency. Prelim. Resp. 22. We agree with Patent Owner that the combination of Pirim and Bolle is cumulative to the previously considered combinations of Pirim with either Siegel or Hirota. Prelim. Resp. 22.

First, Patent Owner asserts that Hirota operates in the same manner as Bolle. Prelim. Resp. 23 (citing Pet. 65–66). In the prior *ex parte* reexamination, the Board considered a combination of Pirim and Hirota, where Hirota was cited by the Examiner as teaching two histogram calculation units, cited as memories 202 and 204, to process the same color parameter. Ex. 1007, 16. The Board considered several rationales for combining Pirim with Hirota as follows:

According to the Examiner, it would have been obvious to add another undisclosed element which the Examiner labels “204a” that would be adjacent and similar to element 204 in Hirota's Figure 13 to process the pixels' video or luminance data. Final Act. 17. Ans. 56. Alternatively, the Examiner concludes that it would have been obvious to use two or more “copies” of Hirota's system in Figure 13 to form two or more histograms of each parameter. Final Act. 17. In yet another alternative, the Examiner concludes that it would have been obvious to configure two of Pirim's existing histogram calculation units to treat the same parameter.

Id.

We agree with Patent Owner that the arguments made with respect to Hirota in the prior reexamination are substantially the same as Petitioner's argument that “a POSITA would have been motivated to use two copies of Pirim's histogram processor 22a to calculate Bolle's two hue histograms.” Prelim. Resp. 23–24 (citing Pet. 67, Ex. 1007, 20). Indeed, as is evident above when discussing the Examiner's rejection during prior reexamination, the Board expressly considered Hirota's disclosure and using “two of Pirim's existing histogram calculation units to treat the same parameter.” Ex. 1007, 17. In addition, the Board similarly considered replicating, or copying, Hirota's system to form two histograms of a parameter. *Id.* Here with Pirim combined with Bolle, in a similar manner, Petitioner proposes using two “replicated” histogram processors to calculate two histograms using the same parameter. Pet. 66–67 (citing Ex. 1019, 19:18–31, Ex. 1021, 37); Prelim. Resp. 23.

We similarly agree with Patent Owner that the proposed combination of Pirim and Bolle is cumulative to the previously considered combination of Pirim and Siegel. Prelim. Resp. 24–25. Petitioner asserts that Bolle teaches that, “[a]fter the regions are segmented, [t]he regions are

histogrammed . . . separately.” Pet. 66 (citing Ex. 1019, 19:18–31). Patent Owner argues that in a similar manner to Bolle’s segmentation approach, Siegel discloses segmenting images and using parallel processing to simultaneously process each segment. Prelim. Resp. 24 (citing Ex. 2012, 2 (“the image can be segmented and each processor assigned a segment”)). In response, Petitioner argues that Bolle differs in that it does not disclose parallel processing because, as the Petition explains, Bolle does not describe the “underlying hardware used to create . . . histograms, beyond noting it can use a general purpose [central processing unit].” Pet. Reply 2–3 (citing Pet. 57). However, we are not persuaded that Bolle’s lack of disclosure of a hardware implementation creates a meaningfully different position than Petitioner’s application of Siegel. Rather, we agree with Patent Owner that, here again, Petitioner presents a proposed combination based on segmenting an image and separately processing each segment in substantially similar a manner as that which was previously considered. Prelim. Resp. 24–25.

On this record, after weighing the parties’ arguments and evidence, we find Patent Owner’s position more persuasive. Petitioner does not show that the combination of Pirim and Bolle cited in the Petition differs in any material, substantial way from the prior art cited in the prior proceedings at the Office.

On this record, after weighing the parties’ arguments and evidence, Petitioner’s arguments concerning the combination of Pirim and Bolle do not warrant reconsideration of whether the subject matter of claim 1 would have been obvious.

D. Additional Arguments Concerning Material Error

With regard to the second part of the *Advanced Bionics* framework, Petitioner additionally argues that “the prior record reflects several other material errors that weigh against discretionary denial.” Pet. 28. Specifically, Petitioner alleges that the Board erred with regard to its prior analysis in its Reexam 056 Decision regarding the combination of Pirim with Hirota by “stating that Pirim’s ‘sole purpose’ is ‘detecting drowsiness’” and “that Pirim could not be modified to address a color parameter.” Pet. 28 (citing Ex. 1007, 19, 20¹⁴).

Even if we were to agree that these were errors material to the patentability of claim 1 (which we do not), Petitioner has not shown error with regard to the Board’s consideration of Pirim alone (as discussed above in Section II.B) or the combination of Pirim with Siegel (as discussed above in Section II.C).

Accordingly, Petitioner’s arguments alleging these additional material errors do not warrant reconsideration of whether the subject matter of claim 1 would have been obvious.

E. Exercising the Board’s Discretion Under 35 U.S.C. § 325(d)

For the reasons articulated above in the context of the two-part framework of *Advanced Bionics*, we conclude that Petitioner here advances “the same or substantially the same prior art or arguments previously” presented to the Office. 35 U.S.C. § 325(d). We recognize the commitment of the Office, as expressed in *Advanced Bionics*, to defer to previous Office

¹⁴ Petitioner’s cites here to original page numbers in the Reexam 056 Decision (Ex. 1007).

evaluations of the evidence of record unless material error is shown, which has not been shown here. *Advanced Bionics*, IPR2019-01469, Paper 6 at 9.

For these reasons, we exercise our discretion to deny *inter partes* review under 35 U.S.C. § 325(d).

III. CONCLUSION

For the foregoing reasons, we do not institute an *inter partes* review under 35 U.S.C. § 314.

IV. ORDER

Accordingly, it is

ORDERED that the Petition is *denied* as to the sole challenged claim of the '293 patent; and

FURTHER ORDERED that no *inter partes* review is instituted.

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