

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AXIS COMMUNICATIONS AB, CANON INC.,
and CANON U.S.A., INC.,
Petitioner,

v.

AVIGILON FORTRESS CORPORATION,
Patent Owner.

Case IPR2018-00138
Patent 8,564,661 B2

Before JANET A. GONGOLA, *Vice Chief Administrative Patent Judge*,
KALYAN K. DESHPANDE and GEORGIANNA W. BRADEN,
Administrative Patent Judges.

DESHPANDE, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Inter Partes Review
35 U.S.C. § 318(a); 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

Axis Communications AB, Canon Inc., and Canon U.S.A., Inc. (collectively, “Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–32 of U.S. Patent No. 8,564,661 B2 (Ex. 1001, “the ’661 patent”). Paper 1 (“Pet.”). Avigilon Fortress Corporation (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

Pursuant to 35 U.S.C. § 314, we instituted *inter partes* review of the ’661 patent, on June 1, 2018, as to claims 1–32 with respect to all grounds set forth in the Petition.¹ Paper 8 (“Dec.”). The Petition sets forth proposed grounds of unpatentability of claims 1–32 of the ’661 patent under 35 U.S.C. §§ 102, 103 as follows (*see* Pet. 11–73):²

¹ On April 24, 2018, the Supreme Court held that a final written decision under 35 U.S.C. § 318(a) must decide the patentability of all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); *see Guidance on the Impact of SAS on AIA Trial Proceedings* (Apr. 26, 2018), <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial> (“Guidance”); *see also PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (citing *SAS* and *Guidance*, and noting “[e]qual treatment of claims and grounds for institution purposes has pervasive support in *SAS*”). Accordingly, we determined Petitioner demonstrated a reasonable likelihood that at least one of the challenged claims of the ’661 patent is unpatentable, such that we instituted an *inter partes* review, and, therefore, we also instituted an *inter partes* review of all of the challenges raised in the Petition.

² Petitioner supports its challenge with the Declaration of John R. Grindon, D. Sc. Ex. 1005.

Reference(s)	Basis	Challenged Claims
Kellogg ³	§ 102	1–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31
Kellogg	§ 103	1–18, 20, 21, 23, 24, and 26–32
Kellogg and Brill ⁴	§ 103	1–32

Patent Owner filed a Response (Paper 11, “PO Resp.”), Petitioner filed a Reply (Paper 15, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 17, “Sur-Reply”). A consolidated oral hearing with IPR2018-00140 was held on February 25, 2019, and the hearing transcript has been entered in the record. Paper 24 (“Tr.”).

We have authority under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. Pursuant to our authority under 35 U.S.C. § 6, we conclude, for the reasons discussed below, Petitioner has shown by a preponderance of the evidence that claims 1–32 of the ’661 patent are unpatentable.

B. Related Proceedings

The parties indicate that the ’661 patent is the subject of IPR2018-00140, which is before the Board and involves the same parties. *See* Prelim. Resp. 25–28; Pet. 72.

³ Christopher James Kellogg, Visual Memory (Apr. 21, 1993) (unpublished B.A. and Master’s thesis) (Ex. 1003, “Kellogg”).

⁴ Frank Z. Brill et al., *Event Recognition and Reliability Improvements for the Autonomous Video Surveillance System*, Image Understanding Workshop (Nov. 20–23, 1998) (Ex. 1004, “Brill”).

C. The '661 Patent

The '661 patent discloses a “system for automatic video surveillance employing video primitives.” Ex. 1001, 1:28–29. The system uses “event discriminators,” which “are identified with one or more objects (whose descriptions are based on video primitives), along with one or more optional spatial attributes, and/or one or more optional temporal attributes.” *Id.* at 6:4–8. For example, the event discriminator “loitering” is where a person (object) is at an automatic teller machine (spatial attribute) for “longer than 15 minutes” (temporal attribute) and “between 10:00 p.m. and 6:00 a.m.” (temporal attribute). *Id.* at 6:8–14. A “rule management tool” provides an interface to a user for “creating video surveillance rules.” *Id.* at 11:14–16.

The system is enabled to track an object, such as a person, vehicle, or light/radio frequency emitter. *Id.* at 16:59–64. A video analysis subsystem performs analysis of the video stream to derive video primitives. *Id.* at 20:56–59. Video primitives include object descriptors that are observable attributes of an object in a video feed. *Id.* at 19:4–6. “[E]vent occurrences are extracted from the video primitives using event discriminators.” *Id.* at 25:36–37. Output is generated based on the event occurrences, and output can take the form of a display of the video feed. *Id.* at 26:4–23.

D. Illustrative Claim

Petitioner challenges claims 1–32 of the '661 patent. Pet. 11–73. Claims 1, 15–21, 24, and 27 are the independent claims at issue. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A method comprising:
detecting an object in a video;
detecting a plurality of attributes of the object wherein each attribute represents a corresponding characteristic of the object;

creating a user rule that defines an event; and
identifying an event of the object by applying the user rule to at least
some of the plurality of attributes of the object,
wherein the plurality of attributes that are detected are independent of
the identified event such that events may be defined that do not
require analysis of all of the plurality of attributes,
wherein the step of identifying the event of the object identifies the
event without reprocessing the video, and
wherein the event is not one of the plurality of attributes.

Ex. 1001, 30:37–51.

II. ANALYSIS

A. Claim Construction

We interpret claims of an unexpired patent using the broadest reasonable interpretation in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b) (2017)⁵; *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard as the claim construction standard to be applied in an *inter partes* review proceeding). Under the broadest reasonable interpretation standard, claim terms are generally given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in the context of the entire disclosure. *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). “[O]nly those terms need be construed that are in controversy, and only to the

⁵ A recent amendment to this rule does not apply here because the Petition was filed before November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018).

extent necessary to resolve the controversy.” *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

1. “Object”

Independent claims 1, 15–17, 20, and 27 recite detecting an “object.” Petitioner argues that the “DEFINITIONS” portion of the ’661 patent specification defines an “object” as “an item of interest in a video.” Pet. 12 (quoting Ex. 1001, 3:16–18). According to Petitioner, the ’661 patent specification further provides examples of an object: “a person, a vehicle, an animal, and a physical subject.” *Id.* (quoting Ex. 1001, 3:16–18). Patent Owner agrees that “object” is defined in the ’661 patent specification, and, accordingly, agrees with Petitioner’s proffered construction. PO Resp. 24 (citing Ex. 1001, 3:16–18).

We agree with Petitioner and Patent Owner. Specifically, we agree that the ’661 patent specification defines “object” as “an item of interest in a video,” and further provides “a person, a vehicle, an animal, and a physical subject” as examples. Ex. 1001, 3:16–18. Accordingly, we construe “object” to mean “an item of interest in a video.”

2. “Event”

Independent claims 1, 15–17, 20, and 27 recite an “event.” Petitioner argues that the “DEFINITIONS” portion of the ’661 patent specification defines an “event” as “one or more objects engaged in an activity.” Pet. 13–14 (quoting Ex. 1001, 3:34–35). According to Petitioner, the ’661 patent specification defines an “activity” as “one or more actions and/or one or more composites of actions of one or more objects.” *Id.* at 14 (citing Ex. 1001, 3:20–21). Petitioner further asserts that the ’661 patent specification identifies examples of an “activity,” including “entering, exiting, and stopping.” *Id.* at 14 (citing Ex. 1001, 3:21–23). Patent Owner agrees that “event” is defined in the ’661 patent specification, and,

accordingly, agrees with Petitioner’s proffered construction. PO Resp. 24 (citing Ex. 1001, 3:20–23).

We agree with Petitioner and Patent Owner. Specifically, we agree that the ’661 patent specification defines “event” as “one or more objects engaged in an activity,” where the “activity” may be “entering, exiting, and stopping.” Ex. 1001, 3:20–23, 3:34–35. Accordingly, we construe “event” to mean “one or more objects engaged in an activity.”

3. “*Independence-based claim elements*”

Independent claims 1, 15–21, 24, and 27 recite “independence-based claim elements.” In its Preliminary Response, Patent Owner argued that the “independence-based claim elements” should be construed to mean “the plurality of detected attributes are detected without regard to or knowledge of a predefined/predetermined list of identified events of interest.” Prelim. Resp. 14. In our decision instituting *inter partes* review, on the record at that stage, we agreed with Patent Owner and construed the “independence-based claim elements” to mean that “the plurality of detected attributes are detected without regard to or knowledge of a predefined/predetermined list of identified events of interest.” Dec. 9–10.

Petitioner asserts that the “independence-based claim elements” should be given their plain and ordinary meaning, and should be construed to only require that “the detection of attributes is independent from, *i.e.*, not affected by, the user rule that tasks the system.” Pet. Reply 2–3. Petitioner argues that such a construction is consistent with the ’661 patent specification, which describes that “the attributes that are detected are independent of the identified event.” *Id.* at 3 (quoting Ex. 1001, 30:45–46) (emphasis omitted).

Petitioner argues that Patent Owner’s construction improperly imports limitations into the meaning of the “independence-based claim elements.” *Id.* at 3–6. Petitioner specifically argues that “[t]here is no reference in the claims to any predefined/predetermined list of events, and the claim construction should not add this unstated concept, which is also unsupported by the ’661 patent specification.” *Id.* at 3 (emphasis omitted).

On the full record before us, we agree with Petitioner that the “independence-based claim elements” should be construed to require that “the detection of attributes is independent from, *i.e.*, not affected by, the user rule that tasks the system.”⁶ Pet. Reply 3. The following three claim elements of independent claim 1 are exemplary of “independence-based claim elements”: (1) “identifying an event of the object by applying the user rule to at least some of the plurality of attributes of the object”; (2) “wherein the plurality of attributes that are detected are independent of the identified event”; and (3) “wherein the event is not one of the plurality of attributes.” See PO Resp. 26; see Ex. 2001, 7. The claims do not recite “a predefined/predetermined list of identified events of interest.” Furthermore, the ’661 patent specification does not provide an express definition for the “independence-based claim elements” requiring that the detection of

⁶ Petitioner argues that Patent Owner’s construction fails to identify “what it means to design the system with ‘regard for’ the events and who or what is prohibited from having ‘knowledge’ of the events of interest.” Pet. Reply 4. Patent Owner similarly argues that it is unknown as to “what it means to not be affected by.” Tr. 37:14–15. We, however, are unable to discern any meaningful distinction between the terms “without regard to or knowledge of” and “affected by.” Our construction uses the term “affected by” because we are persuaded by Petitioner that the scope of the “independence-based limitations” does not require that the detection of attributes is without regard to or knowledge of “a predefined/predetermined list of identified events of interest.”

attributes is not affected by “a predefined/predetermined list of identified events of interest.” Accordingly, based on the full record before us, we see no reason to limit the scope of the “independence-based claim elements” to require the detection of attributes without regard to or knowledge of “a predefined/predetermined list of identified events of interest.”

Patent Owner additionally argues that Petitioner’s construction of the “independence-based claim elements” is incorrect because Patent Owner’s construction is consistent with the “disclaimer made during reexamination” of related U.S. Patent No. 7,868,912 C1 (“the ’912 reexamination”). Sur-Reply 4–5; PO Resp. 28–29. Patent Owner argues that “the challenged claims were patentable over Courtney due to ‘Courtney fail[ing] to teach the independence-based claim elements because said event querying/filtering system relies on a list of predefined/predetermined “events” of interest.’” Sur-Reply 4 (quoting Ex. 2001, 9) (emphasis omitted).

We disagree with Patent Owner. The Examiner in the ’912 reexamination found that Courtney⁷ discloses an “event querying/filtering system” that “relies on a list of predefined/predetermined ‘events’ of interest.” Ex. 2001, 7–8. The Examiner further found that “merely referencing an already determined/detected event with respect to variably selected locations and/or times is not a determination/detection of a new independent event.” *Id.* That is, the Examiner in the ’912 reexamination found that Courtney fails to disclose the “independence-based claim elements.” The Examiner, however, did not provide a construction of the “independence-based claim elements.” The Examiner provided a characterization of Courtney’s “querying/filtering system” and found that Courtney

⁷ U.S. Patent No. 5,969,755, issued Oct. 19, 1999 (Ex. 2008, “Courtney”).

does not meet the “independence-based claim elements.” We see no reason to import the Examiner’s characterization of Courtney as relying on “a list of predefined/predetermined ‘events’ of interest” into the construction of the recited “independence-based claim elements” of the claims.

Patent Owner further argues that Petitioner “waived its right to make this argument by not including it in the Petition.” Sur-Reply 5. Patent Owner argues that the Petition should explain how the claims should be construed and how the construed claims are unpatentable. *Id.* at 6 (citing 37 C.F.R. § 42.104(b)(3)); *see* 37 C.F.R. § 42.104(b)(4). Patent Owner argues that Petitioner had access to the ’912 reexamination, and, therefore, should have addressed the Examiner’s construction in its Petition. *Id.* at 6. Accordingly, Patent Owner argues that Petitioner’s construction is untimely. *Id.* at 5–9.

We do not agree with Patent Owner’s arguments that Petitioner’s claim construction is untimely. Petitioner set forth in its Petition that “[a]ll terms not discussed below should be given their ordinary and customary meaning under the broadest reasonable construction.” Pet. 11. Petitioner maintains that the “independence-based claim elements” should be given their ordinary meaning, and provides arguments responsive to Patent Owner’s construction. Pet. Reply. 2–3. As discussed above, we are not persuaded by Patent Owner that the Examiner in the ’912 reexamination clearly set forth a construction of the “independence-based claim elements,” and, therefore, do not agree with Patent Owner’s argument that Petitioner should have known from the ’912 reexamination to address the Examiner’s construction. Although 37 C.F.R. §§ 42.104(b)(3)–(4) require Petitioner to explain how the challenged claims are to be construed and how the construed claims are unpatentable, not all terms are required to be construed in a petition, and hence, we conclude that Petitioner’s arguments as to the construction

of the “independence-based claim elements” are timely and proper as responsive to Patent Owner’s arguments.

4. *“user rule that defines an event” / “event definition”*

Independent claim 1 recites a “user rule that defines an event.” Independent claims 15–20 and 27 recite similar limitations. Independent claims 21 and 24 recite receiving an “event definition.” Petitioner contends that a “user rule that defines an event” and an “event definition” should be construed to mean “a set of attributes and/or other parameters for identifying an event.” Pet. 15 (citing Ex. 1005 ¶ 134). Petitioner argues that the ’661 patent specification discloses that a “user tasks the system by defining rules” and the “user-defined ‘rules are translated into event discriminators.” *Id.* at 14 (quoting Ex. 1001, 20:66–67, 21:6–8). According to Petitioner, the ’661 patent specification provides an example of an event called “loitering,” where “a ‘person’ object in the ‘automatic teller machine’ space for ‘longer than 15 minutes’ and ‘between 10:00 p.m. and 6:00 a.m.’” *Id.* at 15 (quoting Ex. 1001, 6:8–12). Furthermore, “complex activities . . . can be detected as a combination of simpler ones [such as] a car parking and a person getting out of the car or multiple people forming a group, tailgating.” *Id.* (quoting Ex. 1001, 23:12–15).

Patent Owner contends a person with ordinary skill in the art would have understood that “a rule is ‘a set of conditions (queries) such that when a defined event is detected may trigger a response.’” PO Resp. 32, 33 (quoting Ex. 2007 ¶ 67). Patent Owner specifically argues that Petitioner’s construction “erroneously equates a user rule with an event discriminator, or what Dr. Grindon called a ‘query.’” *Id.* at 31 (citing Ex. 2009, 20:7–11; Ex 2007 ¶ 66). Patent Owner then argues that “[c]reating a rule requires more than merely providing an event discriminator (or query) that returns an event record from a database,” and “a rule

may trigger a response that is performed when a particular event or type of event is detected.” *Id.* (citing Ex. 2007 ¶ 66). Patent Owner argues that the ’661 patent specification “is clearly not using ‘query’ or ‘event discriminator’ interchangeably with the term ‘rule,’ as the specification recognizes that the rules must be translated into event discriminators.” *Id.* at 12 (citing Ex. 1001, 21:6–7).

We agree with Petitioner. The claims require creating “a user rule that defines an event” or receiving an “event definition.” The ’661 patent specification discloses that the “video primitives may include object descriptors referring to an observable attribute of an object.” Ex. 1001, 19:4–6. The ’661 patent specification further discloses that a “user tasks the system by defining rules.” *Id.* at 20:66–67. “The rules are translated into event discriminators, and the system extracts corresponding event occurrences.” *Id.* at 21:6–8. In order “[t]o detect event occurrences in it, an efficient query language is required.” *Id.* at 21:29–30. The ’661 patent specification further discloses that a query may be formulated based on properties of an object, such as “size, speed, color, classification (human, vehicle), or the properties may be scene changing properties.” *Id.* at 21:42–47. The ’661 patent specification provides that an example of a query is “[s]how me any red vehicle,” where the query is decomposed in two sub-queries of whether an object is a vehicle and whether the object’s color is red. *Id.* at 21:49–53.

Based on the ’661 patent specification, we find that a query is composed of attributes or characteristics of objects that may define an event. Queries may include “spatial” or “temporal” modifiers to add further flexibility. *Id.* at 22:23–25. The combination of sub-queries may provide for the recognition of an event, and a rule. *Id.* at 23:22–44. Therefore, sub-queries, which include parameters based on object attributes or characteristics, may be combined to create a rule that defines an event. The ’661 patent specification provides the example of detecting

“if a car turns left and then turns right.” *Id.* at 23:24–26 (reference numerals omitted). The event is a car that turns left and then right, which is a composition of an object (car) with specific attributes or parameters (turning left/right). Although Patent Owner argues that a rule requires more than a query that returns whether an event has occurred (PO Resp. 31–32; Sur-Reply 9–10), we agree with Petitioner that a “response” is not required. *See* Pet. Reply 7 (citing Ex. 1001, 25:56–59 (“the responses, if any, are identified”). Rather, the terms “user rule that defines an event” or an “event definition” are broadly recited such that only an event definition is required. Accordingly, we agree with Petitioner that a “user rule that defines an event” and an “event definition” should be construed to mean “a set of attributes and/or other parameters for identifying an event.”⁸

5. “*Means-Plus-Function*”

Independent claim 15 recites “means for” limitations. Ex. 1001, 31:23–42. Specifically, claim 15 recites a “means for detecting an object in a video,” a “means for detecting a plurality of attributes of the object wherein each attribute represents a corresponding characteristic of the object,” a “means for creating a user rule that defines an event,” and a “means for identifying an event.” *Id.* Petitioner asserts that these are means-plus-function limitations that should be

⁸ Patent Owner argues Petitioner improperly equates “the term ‘user rule that defines an event’ from claims 1–20 and 27–32, with the term ‘event definition’ from claims 21–26” because they “are different terms in the claims of the ’661 patent and are presumed to have different meanings.” PO Resp. 30. Patent Owner, however, fails to provide any further argument or evidence distinguishing “rule that defines an event” from “event definition.” Although we recognize that claims 1–20 and 27–32 require “*creating* a user rule that defines an event” and claims 27–32 require “*receiving* an event definition,” we are not persuaded by Patent Owner that the “user rule that defines an event” and “event definition” should be treated separately and afforded different constructions. *Id.*

construed in accordance with § 112 ¶ 6. Pet. 15–18. Petitioner asserts that the corresponding structure for the various “means for” limitations is a “computer system or the equivalent video processing system.” *Id.* (citing Ex. 1001, 15:9–13, 24:2–17, Figs. 1, 5, 22–23, 26–28; Ex. 1005 ¶¶ 139–150). Patent Owner does not dispute Petitioner’s construction of these limitations. PO Resp. 33–34. Based on the entirety of the record before us, we agree with Petitioner and determine that the corresponding structure for these “means for” limitations is “a computer system or the equivalent video processing system.”

B. Alleged Anticipation of Claims 1–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31 by Kellogg

Petitioner contends claims 1–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31 of the ’661 patent are unpatentable under 35 U.S.C. § 102 as anticipated by Kellogg. Pet. 27–53.

1. Kellogg (Ex. 1003)

Kellogg is directed to technology, titled “visual memory,” which “supports computer vision applications by efficiently storing and retrieving spatiotemporal information.” Ex. 1003, 9. Visual memory includes attribute information, such as descriptions, maps, and environmental models. *Id.* Furthermore, dynamic information could be stored, such as the “description of the vehicle’s local environment, updating it as the vehicle moved.” *Id.*

Visual memory provides for object identity, maintains a history for each object, and extends a database query mechanism to provide spatiotemporal support. *Id.* at 22. Visual memory further includes spatial and temporal classes that provide flexible spatial representations. *Id.* at 24, 36. Using the spatial and temporal representation, visual memory utilizes a powerful and expressive query mechanism. *Id.* at 53.

2. Analysis of Petitioner's Arguments

Petitioner contends claims 1–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31 of the '661 patent are unpatentable under 35 U.S.C. § 102 as anticipated by Kellogg. Pet. 27–53.

Claim 1 recites “detecting an object in a video.” Petitioner argues that Kellogg discloses detecting objects, assigning an object identifier to the object, tracking the detected objects, and storing information on the objects in visual memory. Pet. 27 (citing Ex. 1003, 50, 68–69; Ex. 1005 ¶¶ 230, 232–236).

Claim 1 further recites “detecting a plurality of attributes of the object wherein each attribute represents a corresponding characteristic of the object.” Petitioner contends Kellogg discloses the detection of spatial and temporal attributes of an object, including type, location, duration, and times. *Id.* at 28 (citing Ex. 1003, 24–25, 71, 77–80, Figs. 4–8).

Claim 1 also recites “creating a user rule that defines an event.” Petitioner argues that Kellogg discloses several examples of events that are detected using user-defined rules, such as finding all objects within a certain distance of an object, detecting an unauthorized entry into a monitored area, and detecting when an object remains in a region for a suspicious amount of time, *i.e.*, “loitering.” *Id.* at 28–29 (citing Ex. 1003, 53, 63, 68, 77–80).

Claim 1 additionally recites “identifying an event of the object by applying the user rule to at least some of the plurality of attributes of the object.” Petitioner contends Kellogg “identifies an event based on a user query about an object (*i.e.*, rule),” where the query filters objects to determine which objects satisfy the specification. *Id.* at 30–31 (citing Ex. 1003, 54). Petitioner argues that Kellogg discloses an example that illustrates that a user-defined rule determines all people that intersect an area of interest. *Id.* at 31 (citing Ex. 1003, 55). Petitioner also

argues that the query mechanism of Kellogg analyzes attributes to determine which objects overlap with the area of interest. *Id.* (citing Ex. 1003, 55).

Claim 1 further recites “wherein the plurality of attributes that are detected are independent of the identified event such that events may be defined that do not require analysis of all of the plurality of attributes.” Petitioner contends Kellogg discloses detecting attributes independent of the identified event, where an event can be identified without requiring analysis of all attributes. *Id.* at 32 (citing Ex. 1003, 9, 19, 55, 79–80). Petitioner argues, for example, that the query to determine which person is in an area of interest requires analysis only of the type and location attributes of an object, and does not require analysis of the time, trajectory, and height attributes. *Id.* (citing Ex. 1005 ¶¶ 254–257). Petitioner similarly argues that the “loitering” event analyzes the location and time attributes, but does not require analyzing other attributes. *Id.* (citing Ex. 1003, 79–80).

Claim 1 also recites “wherein the step of identifying the event of the object identifies the event without reprocessing the video.” Petitioner argues that Kellogg discloses that queries are performed on stored data, and, therefore, does not reprocess the video. *Id.* at 33 (citing Ex. 1003, 53–54, 77, 79; Ex. 1005 ¶¶ 263–265).

Claim 1 additionally recites “wherein the event is not one of the plurality of attributes.” Petitioner contends Kellogg discloses the events “approaching,” “loitering,” “entering,” and “unauthorized entry,” that comprise attributes, but the event is not one of the attributes. *Id.* at 34 (citing Ex. 1005 ¶¶ 266–268).

Notwithstanding Patent Owner’s arguments, which we address below, we determine Petitioner has demonstrated by a preponderance of the evidence that independent claim 1 of the ’661 patent is anticipated by Kellogg. Petitioner

provides a similar analysis for claims 2–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31. *Id.* at 34–52. We agree with Petitioner’s arguments for claims 2–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31, and we similarly determine Petitioner has demonstrated by a preponderance of the evidence that claims 2–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31 of the ’661 patent are anticipated by Kellogg. *Id.*

3. *Analysis of Patent Owner’s Arguments*

Patent Owner argues Kellogg fails to (a) disclose a “machine vision system,” (b) disclose the “independence-based claim elements,” (c) disclose “object tracking or detection,” and (d) enable “object or attribute detection.” PO Resp. 34–45; Sur-Reply 11–16. We address these arguments in turn.

a. *“Machine Vision System”*

Patent Owner contends the ’661 patent claims are drawn to a “machine vision system.” PO Resp. 34–35. Patent Owner argues that independent claim 1 recites “a method that ‘detect[s] an object’ and ‘detect[s] a plurality of attributes.’” *Id.* at 34. According to Patent Owner, Kellogg acknowledges the existence of a machine vision system, but is otherwise “completely silent on machine vision.” *Id.* at 35.

We do not agree with Patent Owner. The term “machine vision system” is not recited by ’661 patent claims. Patent Owner does not provide, and we are unable to find, a definition of “machine vision system” in the ’661 patent specification. Patent Owner also does not provide, and we are unable to find, a recitation of a “machine vision system” in the ’661 patent claims that requires the narrowing of the scope of the claims to require a “machine vision system.” Patent Owner’s suggestion that the claims are drawn to a “machine vision system” indicates, at best, that the claims are intended to be used in a “machine vision system” environment. *See* Tr. 48:14–51:22. We, however, are not persuaded to

give weight to the field of use of the claims such that the scope of the claims is limited to that field of use. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999). That is, absent evidence that the claims positively recite limitations requiring a “machine vision system,” we are not persuaded to read “machine vision system” into the claims.

To the extent Patent Owner argues that a method of “detecting objects or attributes” is a “machine vision system,” we find Kellogg discloses this limitation. PO Resp. 35. As discussed above, we agree with Petitioner that Kellogg discloses “detecting an object in a video” and “detecting a plurality of attributes of the object.” Section II.B.2; Pet. 27–28 (citing Ex. 1003, 24–25, 50, 68–69, 71, 77–80, Figs. 4–8). Kellogg specifically discloses detecting objects, assigning an identifier to the object, tracking the detected objects, and storing information on the objects in visual memory. *See* Ex. 1003, 50, 68–69. Kellogg further discloses the detection of spatial and temporal attributes of an object, including type, location, duration, and times. *Id.* at 24–25, 71, 77–80, Figs. 4–8.

b. “Independence-Based Claim Elements”

As discussed above, we construe the “independence-based claim elements” to mean “the detection of attributes is independent from, *i.e.*, not affected by, the user rule that tasks the system.” Section II.A.3. Patent Owner contends Kellogg fails to disclose the “independence-based claim elements.” PO Resp. 35–41. Patent Owner specifically argues that Kellogg requires a user to define spatial, temporal, and spatiotemporal classes, and, therefore, Kellogg does not disclose “the plurality of attributes that are detected are independent of the identified event.” *Id.*

We disagree with Patent Owner. Kellogg discloses storing basic attribute information for an object, such as spatial, temporal, or spatiotemporal information.

Ex. 1003, 53–63. For example, a user may create a rule or query by selecting a region for scene monitoring, and the system will return objects within the specified region. *Id.* at 78. The user may then further specify in the rule or query objects that are people. *Id.* at 79. The system stores attribute information of objects, regardless of the user rule or query specified. *Id.* This allows the user to specify the query, and the visual memory system is able to retrieve objects and attributes based on the specified event. *Id.* That is, for any given monitored scene, the system collects and stores attributes regardless of a rule or query created by a user monitoring the scene.

Furthermore, we agree with Petitioner’s Reply argument that Kellogg’s “Approach Event” discloses the “independence-based claim elements.” Pet. Reply. 11–14. Kellogg collects basic centroid attributes of two objects, such as spatial and temporal information. Ex. 1003, 62–63; *see* Pet. 12. As Petitioner notes, a query by a user to determine the distance between the two objects uses the spatial attribute information to calculate the distance between the two objects. Pet. 12. That is, the spatial and temporal attributes are detected regardless of a later created query by a user, *i.e.*, the detection of attributes is unaffected by the user rule.

Patent Owner further argues that Kellogg discloses “event-indexing,” which merely references an already determined/detected event. PO Resp. 36–41. We are not persuaded by Patent Owner. Kellogg discloses “an indexing mechanism to quickly identify objects meeting sets of constraints.” Ex. 1003, 64. We, however, are unable to discern the relevance of Kellogg’s disclosure of indexing with the “independence-based claim elements.” *See* Tr. 43:12–44:12. Kellogg discloses that the indexing “can improve retrieval performance.” Ex. 1003, 64. Although indexing allow for the fast retrieval of predetermined objects and attributes, such as

temporal or spatial, the indexing is not relevant to Kellogg's disclosure of the detection of attributes.

Patent Owner additionally argues that Kellogg is the same as Courtney, which the Examiner in the '912 reexamination found did not disclose the "independence-based claim elements." PO Resp. 36–41. Patent Owner specifically argues that both Courtney and Kellogg disclose systems that "merely refer to predefined and indexed events that have already been determined." *Id.* at 36. Patent Owner argues that "the reasons that Courtney did not invalidate the claims of the '912 patent apply equally to Kellogg which is no different than Courtney." *Id.* at 41 (citing Ex. 2007 ¶¶ 79–86).

We disagree with Patent Owner. Specifically, we disagree with Patent Owner's arguments that an indexing system fails to disclose the "independence-based claim elements" for the reasons discussed above. Furthermore, we agree with Petitioner that Courtney "was distinguished because it detected a fixed set of 'events,' and users could only select among those 'events.'" Pet. Reply. 8–9. The Examiner in the '912 reexamination stated that "the event querying/filtering system of Courtney fails to teach the independence-based claim elements because said event querying/filtering system relies on a list of predefined/predetermined 'events' of interest." Ex. 2001, 8 (citing Ex. 2008, 3:4–8, 4:62–67, 10:50–64). Indeed, in the portions cited by the Examiner, Courtney discloses indexing events already selected as of interest. Ex. 2008, 4:62–67, 10:50–64. Accordingly, we find that Kellogg is distinguished from Courtney because the Examiner found that Courtney discloses indexing events already selected as of interest, whereas Kellogg discloses the detection of attributes is not affected by the user rule.

c. “Object Tracking or Detection”

Patent Owner contends Kellogg fails to disclose “object tracking or detection.” PO Resp. 42. Patent Owner argues that although Kellogg discloses assigning an object identifier to an object, the assignment of an object identifier “is not an indication of an object being detected.” *Id.* at 43 (citing Ex. 2007 ¶ 76). Patent Owner similarly argues that Kellogg fails to disclose “detecting a plurality of attributes of the object wherein each attribute represents a corresponding characteristic of the object,” and attribute information “is passed to Kellogg by some other unnamed system. *Id.* at 44 (citing Ex. 2007 ¶ 77).

We disagree with Patent Owner. Kellogg specifically discusses video processing and the application of its visual memory system in a scene monitoring application. Ex. 1003, 68. The scene monitoring prototype includes a graphical user interface where a user selects a query region. *Id.* at 78. After the selection of a region, the system retrieves all of the objects within that region. *Id.* That is, the system detects the objects within the user specified region. *Id.* Furthermore, the user may specify which types of objects the system is to detect. *Id.* at 79. For example, the system may return only objects that are people. *Id.* The type of object is an attribute or characteristic of the object. *Id.*

As discussed above, we agree with Petitioner that Kellogg discloses “detecting an object in a video” and “detecting a plurality of attributes of the object.” Section II.B.2; Pet. 27–28 (citing Ex. 1003, 24–25, 50, 68–69, 71, 77–80, Figs. 4–8). As Petitioner notes, Kellogg specifically discloses detecting objects, assigning an object identifier to the object, tracking the detected objects, and storing information on the objects in visual memory. Pet. 27 (citing Ex. 1003, 50, 68–69; Ex. 1005 ¶¶ 230, 232–236). Kellogg further discloses the detection of

spatial and temporal attributes of an object, including type, location, duration, and times. *Id.* at 28 (citing Ex. 1003, 24–25, 71, 77–80, Figs. 4–8).

d. Enablement of “Object Tracking or Detection”

Patent Owner contends Kellogg fails to enable “detecting objects and attributes.” PO Resp. 44–45; Sur-Reply 15–16. Patent Owner argues that “Kellogg provides absolutely no discussion of how to detect objects or attributes in a video.” *Id.* (citing Ex. 2007 ¶ 78). Accordingly, Patent Owner argues that a person with ordinary skill in the art would not be enabled to “create the invention of the claims of the ’661 patent.” *Id.* at 45. Petitioner replies Kellogg discloses “object and attribute detection,” and that the ’661 patent admits that any known object and attribute detection techniques could be used. Pet. Reply 14–15 (citing Ex. 1001, 1:38–2:33, 24:3–29).

We do not agree with Patent Owner. To anticipate, the allegedly anticipatory disclosure must “enable[] the subject matter of . . . the patented invention.” *Elan Pharm., Inc. v. Mayo Found. for Med. Educ. & Research*, 346 F.3d 1051, 1052 (Fed. Cir. 2003). Patent Owner’s argument is predicated on us determining that Kellogg fails to disclose “detecting objects and attributes.” As discussed above, we do not find that Kellogg discloses “detecting attributes and objects.” See Section II.B.2.e. Accordingly, we do not agree with Patent Owner’s argument here. Furthermore, Kellogg discloses detecting and storing object information, including attribute information for an object. Ex. 1003, 24–25, 50, 68–69, 71, 77–80, Figs. 4–8. Kellogg discloses that each object has a unique identity, and objects can be queried based on attributes. *Id.* Accordingly, we find that Kellogg enables “detecting objects and attributes.”

4. Conclusion

Based on the foregoing, we determine Petitioner has demonstrated by a preponderance of the evidence that claims 1–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31 of the '661 patent are unpatentable under 35 U.S.C. § 102 as anticipated by Kellogg.

C. Alleged Obviousness of claims 1–18, 20, 21, 23, 24, and 26–32 of the '661 patent over Kellogg

Petitioner contends claims 1–18, 20, 21, 23, 24, and 26–32 of the '661 patent are unpatentable under 35 U.S.C. § 103 as obvious over Kellogg. Pet. 53–58. As discussed above, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–10, 15–18, 20, 21, 23, 24, 26–28, 30, and 31 of the '661 patent are unpatentable under 35 U.S.C. § 102 as anticipated by Kellogg. Additionally, as discussed below, we determine Petitioner has demonstrated by a preponderance of the evidence that claims 1–32 of the '661 patent are unpatentable under 35 U.S.C. § 103 as obvious over Kellogg and Brill. Accordingly, we need not reach this additional ground asserted by Petitioner.

D. Alleged Obviousness of claims 1–32 of the '661 patent over Kellogg and Brill

Petitioner contends claims 1–32 of the '661 patent are unpatentable under 35 U.S.C. § 103 as obvious over Kellogg and Brill. Pet. 27–53, 58–71.

1. Brill (Ex. 1004)

Brill is directed to the Autonomous Video Surveillance (AVS) system, which “processes live video streams from surveillance cameras to automatically produce a real-time map-based display of the locations of people, objects and events in a monitored region.” Ex. 1004, 4.⁹ Specifically, the AVS system has

⁹ Exhibit 1004 includes page numbers in the original document and page numbers identifying pages within Exhibit 1004. The Petition identifies page numbers using

been enhanced to utilize collateral information sources, camera hand-off, vehicle recognition, and complex-event recognition. *Id.*

2. *Level of Ordinary Skill in the Art*

35 U.S.C. § 103(a) requires a determination of whether “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention *to a person having ordinary skill in the art* to which the claimed invention pertains.” (Emphasis added).

Petitioner argues that a person with ordinary skill in the art would have had “(i) a Bachelor of Science degree in electrical engineering, computer engineering, or computer science, with approximately two years of experience or research related to video processing and/or surveillance systems” or “(ii) equivalent training and work experience in computer engineering and video processing and/or surveillance systems.” Pet. 10–11 (citing Ex. 1005 ¶ 98). Patent Owner argues that “this level of skill is not correct, as it allows for experience in video processing *or* surveillance system, but does not require both.” PO Resp. 20–21 (underlining omitted) (emphasis added). Patent Owner argues that Petitioner’s declarant, Dr. Grindon, has experience in “3D modeling” but “has no experience in video surveillance systems, like that of the ’661 patent.” PO Resp. 21. Petitioner argues that Patent Owner’s level of skill in the art is overly narrow because “[n]one of the challenged claims are restricted to video surveillance environments or situations.” Pet. Reply 18–19.

We disagree with Patent Owner that a person with ordinary skill in the art should have experience limited to “video surveillance systems.” Rather, based on

the page numbers as outlined for Exhibit 1004. Accordingly, we also use the page numbers outlined by Petitioner for Exhibit 1004.

the entirety of the record before us, we determine that a person with ordinary skill in the art would have had experience in video or image processing. We agree with Petitioner's argument that Patent Owner set forth a broader scope of the level of ordinary skill in the art in the context of the '912 reexamination, and that level of ordinary skill in the art is instructive here. Pet. Reply 18 (citing Ex. 2005 ¶ 98). Furthermore, we agree with Petitioner that the claims are not narrowly drawn to "video surveillance," but rather are broadly directed to video processing and the detection of objects and events in videos. *Id.* Accordingly, we apply Petitioner's level of ordinary skill in the art in our analysis below.

Patent Owner's argument regarding Dr. Grindon's expertise goes to the weight we should accord his testimony, and it is within our discretion to assign the appropriate weight to that testimony. *See Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (holding the Board has discretion to give more weight to one item of evidence over another "unless no reasonable trier of fact could have done so"); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) ("[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations."). To the extent Dr. Grindon is more familiar with "3D modelling" and less familiar with "video surveillance," we weigh Dr. Grindon's testimony accordingly.

3. Analysis of Petitioner's Arguments

Independent claim 1 recites "detecting an object in a video." Petitioner argues that Brill discloses a background-model-based technique for object detection. Pet. 58 (citing Ex. 1004, 6–9). Petitioner contends that "[i]t would have been obvious to implement *Brill*'s object detection technique in *Kellogg*'s system for object tracking." *Id.* (citing Ex. 1005 ¶ 460). Specifically, Petitioner argues that a "[person of ordinary skill in the art] would have found it obvious to combine

Kellogg’s visual memory system with the features of *Brill*’s system.” *Id.* at 25 (citing Ex. 1005 ¶ 220). Petitioner asserts that a “[person of ordinary skill in the art] would have been aware of object detection methods, attribute detection methods, and querying mechanisms” and a “[person of ordinary skill in the art] would have combined elements of *Kellogg* and *Brill* to provide enhancements or achieve particular design objectives, while yielding predictable results.” *Id.* (citing Ex. 1005 ¶ 220). Petitioner proposes that such a modification would have been advantageously used, for example, in a store while monitoring a shelf to minimize theft. *Id.* at 26–27 (citing Ex. 1005 ¶ 225). In addition, Petitioner argues both *Kellogg* and *Brill* are related to the AVS system developed by Texas Instruments, and Petitioner’s declarant, Dr. Grindon, asserts that Flinchbaugh¹⁰ describes a system that combines the visual memory system of *Kellogg* and the AVS system of *Brill*. *Id.* at 27 (citing Ex. 1005 ¶¶ 226, 227); Ex. 1005, Ex. C, 146.¹¹ For the remaining elements of claim 1, Petitioner relies on its arguments presented in its anticipation challenge premised on *Kellogg*. *Id.* at 58; *see supra* Section II.B.2.

We agree with Petitioner’s arguments. Notwithstanding Patent Owner’s arguments, which we address below, we determine Petitioner has demonstrated by a preponderance of the evidence that independent claim 1 of the ’661 patent would have been obvious over *Kellogg* and *Brill*. Petitioner provides a similar analysis for claims 2–32. *Id.* at 58–71. We agree with Petitioner’s arguments for claims 2–

¹⁰ Bruce E. Flinchbaugh and Thomas J. Olson, “Autonomous Video Surveillance,” Texas Instruments Corporate Research Laboratories, The International Society for Optical Engineering, 25th AIPR Workshop, (Oct. 16–18, 1996) (Ex. 1005, 233–242, “Flinchbaugh”).

¹¹ Ex. 1005, Ex. C includes page numbers on the reference itself, and page numbers as annotated by Petitioner. Our citation is to the page number on the reference itself.

32, and we similarly determine Petitioner has demonstrated by a preponderance of the evidence that claims 2–32 of the ’661 patent would have been obvious over Kellogg and Brill. *Id.*

4. Analysis of Patent Owner’s Arguments

Patent Owner contends Kellogg fails to disclose a “machine vision system,” the “independence-based claim elements,” and “attribute or object detection.” PO Resp. 34–44. We do not agree with these arguments for the same reasons discussed above. *See supra* Section II.B.3.

Patent Owner further contends Brill “does not fully function.” PO Resp. 45 (citing Ex. 2007 ¶ 105; Ex. 1005, 10); Sur-Reply 17–18. Accordingly, Patent Owner argues that a person with ordinary skill in the art “would not look to implement a machine vision system that does not function as intended on top of Kellogg’s visual memory database.” *Id.* (citing Ex. 2007 ¶ 105). We disagree with Patent Owner. Specifically, we find Petitioner is asserting Brill only for the functionality of “detecting an object in a video.” *See* Pet. Reply 16; Pet. 58. As discussed above, Brill discloses a background-model-based technique for object detection. Ex. 1004, 6–9. Accordingly, we agree with Petitioner that a person with ordinary skill in the art would have been aware of video processing systems utilizing object detection, and a person with ordinary skill in the art would have combined Kellogg and Brill in order to “provide enhancements or achieve particular design objectives.” Pet. 25.

Patent Owner also argues that Brill does not disclose the “independence-based claim elements,” Brill was overcome during prosecution and reexamination, and Brill is an “event-indexing system” like Courtney. PO Resp. 46–54. We do not agree with Patent Owner’s arguments. Petitioner does not argue that Brill discloses the “independence-based claim elements,” and, therefore, Patent Owner’s

argument is not commensurate with the ground of unpatentability set forth by Petitioner. Patent Owner's argument that Brill was overcome during prosecution and reexamination is misplaced because Brill was not discussed during prosecution or reexamination. Rather, prior art *related* to Brill – but not Brill itself – was before the Office. *See id.* at 46. Patent Owner's argument that Brill is an “event indexing system” like Courtney is not persuasive for the same reasons discussed above with respect to Patent Owner's argument that Kellogg is like Courtney. *See supra* Section II.B.3.b.

5. Conclusion

Based on the foregoing, we determine Petitioner has demonstrated by a preponderance of the evidence that claims 1–32 of the '661 patent are unpatentable under 35 U.S.C. § 103 as obvious over Kellogg and Brill.

III. CONCLUSION

Petitioner has shown by a preponderance of the evidence that claims 1–32 of the '661 patent are unpatentable.

IV. ORDER

After due consideration of the record before us, and for the foregoing reasons, it is:

ORDERED that claims 1–32 of the '661 patent are held unpatentable; and

FURTHER ORDERED that because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2018-00138
Patent 8,564,661 B2

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