

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZEBRA TECHNOLOGIES CORPORATION,
Petitioner

v.

LONE STAR SCM SYSTEMS, LTD.,
Patent Owner.

IPR2022-01374
Patent 7,557,711 B2

Before KEN B. BARRETT, AARON W. MOORE, and
RUSSELL E. CASS, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

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I. BACKGROUND

Zebra Technologies Corporation (“Petitioner”) filed a Corrected Petition requesting *inter partes* review of U.S. Patent No. 7,557,711 B2 (“the ’711 patent,” Ex. 1001). Paper 3 (“Pet.”). The Petition challenges the patentability of claims 1, 3–10, 15, 16, and 18. Lone Star SCM Systems, Ltd. (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 10 (“Prelim. Resp.”).

We instituted *inter parties* review on February 24, 2023 (Paper 11, “Inst. Dec.”), Patent Owner filed a Response (Paper 19, “PO Resp.”), Petitioner filed a Reply (Paper 24, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 26, “PO Sur-reply”).

An oral hearing was held on November 29, 2023, and a transcript of the hearing is included in the record, as are the demonstratives. *See* Paper 37 (“Tr.”); Ex. 1020 (Petitioner Demonstratives); Ex. 2026 (Patent Owner Demonstratives).

We issue this Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 and, for the reasons that follow, determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3–10, 15, 16, and 18 are unpatentable.

A. *Related Matters*

Both parties identify, as matters involving or related to the ’711 patent, *Lone Star SCM Systems, Ltd. v. Zebra Technologies Corporation*, No. 6:21-cv-00842 (W.D. Tex.); *Lone Star SCM Systems, Ltd. v. Honeywell International Inc.*, No. 6:21-cv-00843 (W.D. Tex.); and *Lone Star SCM Systems, Ltd. v. Bluebird Inc.*, No. 6:21-cv-00844 (W.D. Tex.). Pet. 1; Paper 6, 1.

Additionally, the parties identify the following Patent Trial and Appeal Board proceedings as involving patents related to the ’711 patent: IPR2022-01375

(U.S. Patent No. 9,646,182); IPR2022-01376 (U.S. Patent No. 9,996,717); and IPR2022-01377 (U.S. Patent No. 10,482,293). *See* Pet. 1–2; Paper 6, 1–2.

B. The '711 Patent

The '711 patent “is directed, in general, to communication systems and, more specifically, to an interrogator, [a] method of discerning metal and radio frequency identification (RFID) objects, and an interrogation system employing the same.” Ex. 1001, 1:14–18. Although the Specification primarily focuses on the interrogation system’s use in a medical environment, it indicates that the system is not limited to use in that environment. *See id.* at 1:33 (“[o]f particular note is a surgical environment”), 13:3–6 (“[the] system may be applied to a wide range of applications and environments such as supply chain management systems in retail facilities or security systems in airports, to name a few”).

According to the Specification, “surgical items must be counted and accounted for before, during and following the conclusion of a surgical procedure,” “[t]he presently available systems to track the surgical items are laboriously time consuming, costly and in many cases antiquated,” and that, “[t]hus, a medical facility can benefit from systems that more efficiently track surgical items.” *Id.* at 14:8–14. The patent explains that “the problem associated with the loss of surgical items, especially surgical items retained within patients, is a serious one.” *Id.* at 2:26–28.

Figure 4 of the '711 patent is reproduced below.

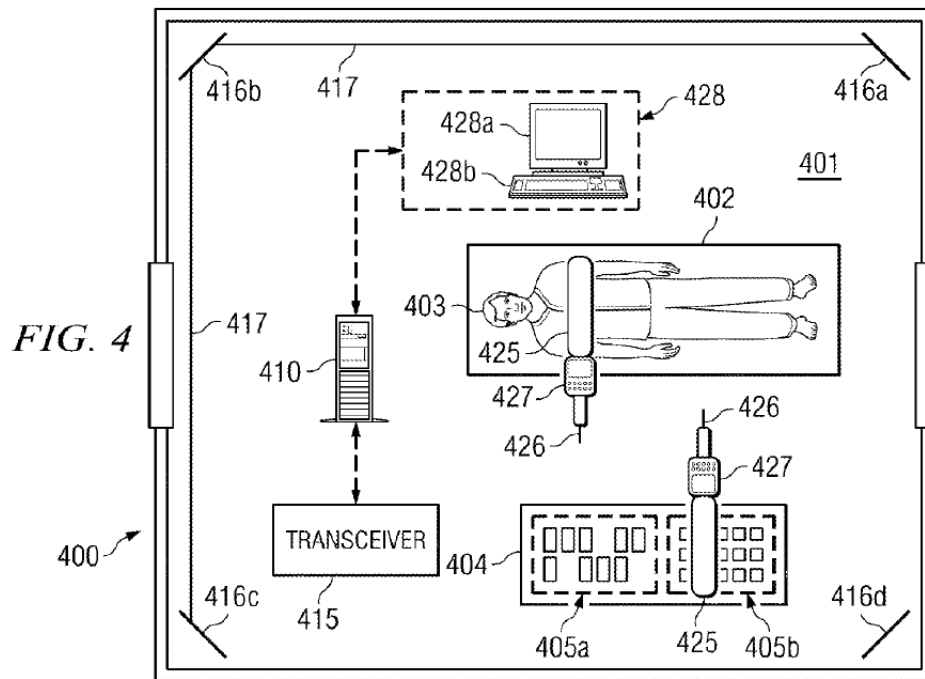


Figure 4 is a “diagram of an embodiment of an interrogation system . . . employable within an operating room of a medical facility.” Ex. 1001, 7:64–67.

The Figure shows “an operating table 402 with a patient 403 thereon and a back table 404 that accommodates a plurality of surgical instruments 405a and disposable items 405b (such as sponges).” *Id.* at 14:30–33. Metal objects in an operating room include surgical instruments, surgically implanted metal structures, and disposable sponges having a metal wire that allows for detection by a metal sensing subsystem. *Id.* at 16:24–30. RFID tags may be applied to surgical instruments and disposable items, such as sponges. *Id.* at 16:39–56.

Also depicted is portable interrogator 425 having internal user interface 427. *Id.* at 14:40 (“an interrogator (e.g., a portable interrogator) 425”); *id.* at 15:19 (“[t]he portable interrogator 425”); Fig. 4. The patent explains that “the

interrogator may be affixed to a table (e.g., the back table 404), stand, wall or ceiling within a facility.” *Id.* at 14:41–42.

The portable interrogator 425 includes “a metal sensing subsystem that provides a first signal having a metal signature representing a presence of a metal object” and “a radio frequency identification (RFID) sensing subsystem that provides a second signal having a RFID signature representing a presence of a RFID object.” *Id.* at 15:1–6. Portable interrogator 425 also includes a control and processing subsystem that discerns a presence of objects from signals. *Id.* at 15:19–22. “The portable interrogator 425 still further includes a position sensor that allows a position of the portable interrogator 425 to be determined.” *Id.* at 15:35–37.

The ’711 patent describes an integrated mode of operation that employs a plurality of inputs, including “metal sensing 552, RFID sensing 554, interrogator location observables 556, RFID position markers 558, RFID/metal calibration markers 560, a patient demographics/history database 562, anatomical databases 564, evidence-based medicine databases 566 and RFID and metal object signature databases 568.” *Id.* at 17:65–18:3 (referring to Figures 5A and 5B). “An adaptive integrating filter 570 processes these inputs to provide a resulting interrogator detected object and location 575.” *Id.* at 18:4–6.

The “integrated mode of operation may employ multiscan, coherent signal processing of diverse multiple inputs to achieve significantly higher detection sensitivities thereby allowing more precise object location and identification” and “[t]he adaptive integrating filter 570 may be a single adaptive filter, such as a Kalman filter, or it may be more complex to meet a specific patient situation.” *Id.* at 18:18–24. “A more precise location of the interrogator may be afforded by integrating an instantaneous output of an internal inertial position sensor with

RFID position markers 558 placed at predetermined anatomical locations on the patient.” *Id.* at 18:25–28.

C. The Challenged Claims

Of the challenged claims, claims 1 and 16 are independent. Claim 1, reproduced below, is illustrative.

1. An interrogation system, comprising:
 - a sensing subsystem configured to provide a signal having a signature representing a presence of a radio frequency identification (RFID) object;
 - a control and processing subsystem configured to discern a presence of said RFID object from said signal; and
 - a single position sensor configured to provide a location of said RFID object in accordance with a movement of said position sensor with respect to said RFID object.

Ex. 1001, 28:64–29:5. Claim 16 is directed to a method corresponding to the system of claim 1.

II. ANALYSIS

We discuss the appropriate level of skill in the art, claim construction, and then Petitioner’s arguments for unpatentability of the challenged claims.

A. Level of Ordinary Skill in The Art

We consider various factors in determining the appropriate level of ordinary skill in the art, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (internal quotation marks and citation omitted).

Petitioner, relying on the testimony of Dr. Sharony, contends that a person having ordinary skill in the art at the time of the alleged invention “would have had at least a bachelor’s degree in electrical engineering, computer science, or a related

field” and “significant experience with detection devices, like RFID and metal detectors.” Pet. 5 (citing Ex. 1002 ¶ 22).

Patent Owner does not address Petitioner’s proposal or offer a different definition, and we determine that Petitioner’s formulation is consistent with the qualifications a person would have needed to understand and implement the teachings of the ’711 patent and the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that the prior art itself may reflect an appropriate level of skill in the art). We thus apply Petitioner’s description of the person of ordinary skill in the art.

B. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2021). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13.¹

Petitioner proposes constructions for the following claim terms: “sensing subsystem configured to . . .”; “a control and processing subsystem configured to . . .”; and “an observable and data.” *See* Pet. 5–12. Patent Owner does not object to the proposed construction of “a control and processing subsystem,” and we construe it to mean “a controller or processor,” for the reasons advanced by Petitioner. *See* Pet. 11–12; PO Resp. 9–10. Patent Owner disputes the

¹ In a related proceeding involving Patent Owner but not Petitioner, the District Court construed certain claim terms in the ’711 patent. *See* Ex. 1015. We have considered those constructions in our analysis. *See* 37 C.F.R. 42.100(b).

constructions of “sensing subsystem configured to . . . ” and “an observable and data.” *See* PO Resp. 10–16. We address those terms below.

1. “*a sensing subsystem*”

Claim 1 recites an “interrogation system” including “a sensing subsystem configured to provide a signal having a signature representing a presence of a radio frequency identification (RFID) object.”

The Petition argued that “sensing subsystem” is a means-plus-function limitation governed by 35 U.S.C. § 112 ¶ 6 and, accordingly, that it is limited to the corresponding structure (and equivalents) disclosed in the Specification for performing the recited function. *See* Pet. 6–10. In the Preliminary Response, Patent Owner argued that “[t]he claims in which ‘sensing subsystem’ appear disclose a sufficiently definite structure that would be understood by a POSITA to have sufficiently definite meaning as the name for structure, making § 112 ¶ 6 inapplicable.” Prelim. Resp. 35. At institution, we preliminarily determined that § 112 ¶ 6 does not apply. *See* Inst. Dec. 9–11.

Now, “[i]n the event [Petitioner] should continue to urge the Board to construe this term as a means-plus-function term subject to 35 U.S.C. § 112 ¶ 6, [Patent Owner] adopts and incorporates by reference its arguments set out in its Preliminary Response” (PO Resp. 10 n.4), and “[w]hile [Petitioner] maintains that § 112 ¶ 6 applies, [Petitioner] focuses on the Petition’s alternative non-§ 112 construction” (Pet. Reply 5). For the following reasons, we again determine that “sensing subsystem” is not governed by § 112 ¶ 6.²

The lack of the word “means” in a claim element creates a rebuttable presumption that § 112 ¶ 6 does not apply. *See Williamson v. Citrix Online, LLC*,

² The District Court similarly concluded that “sensing subsystem” “is not a means-plus-function term subject to § 112 ¶ 6.” *See* Ex. 1015, 4.

792 F.3d 1339, 1348 (Fed. Cir. 2015). “When a claim term lacks the word ‘means,’ the presumption can be overcome . . . if the challenger demonstrates that the claim term fails to ‘recite sufficiently definite structure’ or else recites ‘function without reciting sufficient structure for performing that function.’” *Id.* at 1349 (citation omitted). “Generic terms such as ‘mechanism,’ ‘element,’ ‘device,’ and other nonce words that reflect nothing more than verbal constructs may be used in a claim in a manner that is tantamount to using the word ‘means’ because they ‘typically do not connote sufficiently definite structure’ and therefore may invoke § 112, para. 6.” *Id.* at 1350 (citation omitted).

We conclude that Petitioner has not overcome the presumption against applying § 112, ¶ 6. Petitioner’s critical propositions—that “the ‘sensing subsystem’ term is a nonce word” and that “the purely functional prefix ‘sensing’ does nothing to impart structure to the term ‘subsystem’” (Pet. 6)—are conclusory attorney-argument for which Petitioner points to no adequate evidentiary support. *See Williamson*, 792 F.3d at 1349 (“The standard is whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.”). Accordingly, we maintain our determination that § 112 ¶ 6 does not apply to “a sensing subsystem configured to provide a signal having a signature representing a presence of a radio frequency identification (RFID) object.”

Both parties offered proposed constructions for “sensing subsystem” if the phrase is not deemed to be governed by § 112 ¶ 6. Petitioner’s proposed construction is a “self-contained system for sensing within a larger system” “that performs the function recited in the claim.” Pet. 9, 34.³ Patent Owner’s proposed

³ Patent Owner also argues that “[Petitioner] alternatively proposes construing the term ‘sensing subsystem’ as requiring both RFID and metal detection.” PO Resp.

construction is “a component configured to detect a signal representing an object and convert from one format to another.” PO Resp. 10.

We do not adopt either of the proposed constructions because we conclude they add features from embodiments but fail to identify the required “clear indication in the intrinsic record that the patentee intended” to limit the claims in the manner proposed. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). Instead, we conclude that “sensing subsystem” is “a component configured to detect a signal representing an object,” as proposed by Petitioner, but without “self-contained.” This is functionally the same as Patent Owner’s proposed construction with the conversion concept omitted, and also consistent with the District Court’s construction, which was “components configured to detect and convert a signal representing an object.” *See* Ex. 1015, 4.

2. “*an observable and data*”

Claim 7 recites that the control and processing subsystem is configured to coordinate processing “in conjunction with one of an observable and data.”

Petitioner contends that “‘an observable’ means ‘location information’ and ‘data’ means ‘database information.’” Pet. 12 (citing Ex. 1002 ¶¶ 50–51). Patent Owner asserts that “‘one of an observable and data’ should be construed as ‘one of a characteristic or quality that can be detected, and stored information.’” Prelim. Resp. 49.

At institution, we declined to interpret this term because neither party argued that the construction would make a difference in the patentability analysis. *See*

14. We do not agree. The portion of the Petition cited by Patent Owner (page 7) is squarely in the middle of Petitioner’s means-plus-function argument, not a separate proposed construction. *See* Pet. 6–10 (discussing the proposed mean-plus-function constructions on pages 6–9 and then the proposed non-mean-plus-function construction on page 10).

Inst. Dec. 11–12. Because the fully developed record still does not indicate that the meaning of this term would make a difference in the result, we need not, and therefore do not, construe it. *See AstraZeneca AB v. Mylan Pharm. Inc.*, 19 F.4th 1325, 1345 (Fed. Cir. 2021) (“Claims must be construed only to the extent necessary to resolve the controversy.”) (quoting *Vivid Techs., Inc. v. American Science & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

3. *multiscan, coherent signal processing*

Patent Owner argues that “multiscan, coherent signal processing” should be construed to require “compar[ing] information from a plurality of signals resulting from multiple scans of an object to determine a presence of the object.” PO Resp. 43 (citing Ex. 2022 ¶ 22). In particular, Patent Owner asserts that the term requires “coherently signal processing multiple signals (resulting from multiple scans) of an RFID object to discern the presence of the RFID object.” PO Sur-reply 17. At the hearing, Patent Owner’s counsel explained that multiple scans are important because “[i]t is not unusual when scanning an RFID object for an interrogator to receive only part of the information from the tag and not to receive enough information to be able to discern the presence of a tag” and, “if that happens, it has to scan again” and “keep scanning until it finally got all of the information.” Tr. 43:21–44:1. Thus, according to Patent Owner, multiscan, coherent signal processing “allows the reader to make multiple scans to an object” and “each scan pulls some data and then it collects that data until it has received enough data to determined the location or to discern the presence of the tag.” *Id.* at 44:2–7.

Petitioner responds that “[m]ultiscan, coherent signal processing” is “not a term of art” and that one of ordinary skill “would look to the term’s plain and ordinary meaning.” Pet. Reply 20 (citing Ex. 1016 ¶ 38). According to Petitioner, one of ordinary skill “would appreciate that ‘multiscan, coherent signal processing’

is processing multiple coherent (i.e., ‘in phase’) inputs to improve object detection.” *Id.* at 21 (citing Ex. 1016 ¶¶ 36–41; Ex. 1017, 76). Petitioner argues that Patent Owner’s construction “is inconsistent with the ’711 Patent, which only requires ‘processing of *diverse multiple inputs*,’” and “attempts to import into the claims *an example* from the specification where multiple inputs *can* come from multiple scans, (‘a plurality of signals (*e.g., resulting from multiple scans*).” *Id.* at 19–20 (citing Ex. 1001, 18:18–22, 19:28–33; Ex. 1019, 97:16–98:3).⁴ Thus, Petitioner proposes construing “multi-scan, coherent signal processing” as not requiring multiple scans. *See* Tr. 29:20–24, 30:15–31:21.

We do not agree with Petitioner’s argument that “multiscan, coherent signal processing” does not require multiple scans. As noted above, Petitioner and Dr. Sharony acknowledge that “multiscan, coherent signal processing” is not a term of art and should be given its plain and ordinary meaning, and we find that the plain and ordinary meaning of “multiscan” requires multiple scans because the term is a combination of the prefix “multi,” which means more than one, with “scan.” Interpreting “multiscan” to cover only a single scan would read the prefix “multi” out of the claim term. Similarly, construing “multiscan” to require multiple signals, but not multiple scans, would read “scan” out of the term.

Our understanding is consistent with the ’711 patent, which states as follows:

The integrated mode of operation may employ *multiscan, coherent signal processing* of diverse multiple inputs to achieve significantly higher detection sensitivities thereby allowing more precise object location and identification.

Ex. 1001, 18:18–22 (emphasis added). This sentence indicates that “multiscan, coherent signal processing” processes “diverse multiple inputs” to achieve higher

⁴ Here and elsewhere we substitute italics for bold emphasis used by the parties.

detection sensitivities. However, it does not redefine the ordinary meaning of the term “multiscan” so that it would cover scanning only once rather than scanning multiple times, or cover receiving multiple inputs but not multiple scans.

The ’711 patent also discusses “multiscan, coherent signal processing” in column 19:

The RFID position markers 630-633 may be placed at predetermined locations on the patient 603. Generally, RFID position markers provide “position-unique” mapping of the patient 603 wherein the mapping may employ more or less RFID position markers than those shown in FIG. 6A. When used in conjunction with a sweeping motion of the portable interrogator 625, it may be possible to specifically identify the presence of a metal or a RFID tagged object as being located between two of the RFID position markers. Thus, *a control and processing of the portable interrogatory may employ multiscan, coherent signal processing to coordinate a processing of a plurality of signals (e.g., resulting from multiple scans) from a sensing subsystem to discern a presence of at least one of metal and RFID objects.*

Ex. 1001, 19:20–33 (emphasis added). We do not agree with Petitioner that the parenthetical “(e.g., resulting from multiple scans)” in the above paragraph is sufficient to overcome the ordinary meaning of the term “multiscan,” which would require multiple scans. However, even if we were to find that “multiscan, coherent signal processing” does not require multiple scans, that would not change the outcome as to claims 6 and 18 because, as we discuss below, Petitioner has shown that Andersen teaches multiscan, coherent signal processing under either party’s definition of the term.

We also do not agree with Patent Owner’s apparent position that the term “multiscan” requires multiple scans of the same object or RFID tag. *See* PO Sur-reply 17; Tr. 43:21–44:7. Nothing in the claim language requires that the multiple scans be of the same object, rather than of different objects. Indeed, the portion of column 19 of the ’711 patent specification quoted above describes employing

“multiscan, coherent signal processing” when the user makes “a sweeping motion of the portable interrogator” across “a RFID tagged object” that is “located between two of the RFID position markers.” Thus, the intrinsic evidence indicates that “multiscan, coherent signal processing” can involve the scanning of multiple RFID tags, as well as multiple scans of the same RFID tag.

Finally, we agree with Petitioner that the term “coherent” refers to signals that are in phase. *See* Pet. Reply 21. This understanding is supported by the testimony of Dr. Sharony, who explains that “coherent” signals are signals that are “in phase.” Ex. 1016 ¶ 38. It is also supported by the Collins Dictionary of Electronics, which defines “coherent light” as “light, as produced by a LASER, whose bursts of waves are all in phase, unlike light from other sources,” and defines “coherent oscillator” as “an oscillator whose bursts of waves are all in PHASE, such as light and microwave oscillators of the LASER and MASER type respectively.” Ex. 1017, 76. Patent Owner does not point to evidence to the contrary.

For these reasons, we conclude that “multiscan, coherent signal processing” in claims 6 and 18 means “processing multiple coherent (i.e., ‘in phase’) signals resulting from multiple scans.”

C. Independent Claim 1 in View of Garber and Werb

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the

level of skill in the art; and (4) any objective evidence of obviousness or non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

1. *Garber*

Garber pertains to “RFID devices, including handheld RFID devices, and applications for such devices.” Ex. 1005, 3:25–26. “The devices and applications are described with particular reference to library materials such as books, periodicals, and magnetic and optical media.” *Id.* at 3:29–32.

Garber’s Figure 13 is reproduced below.

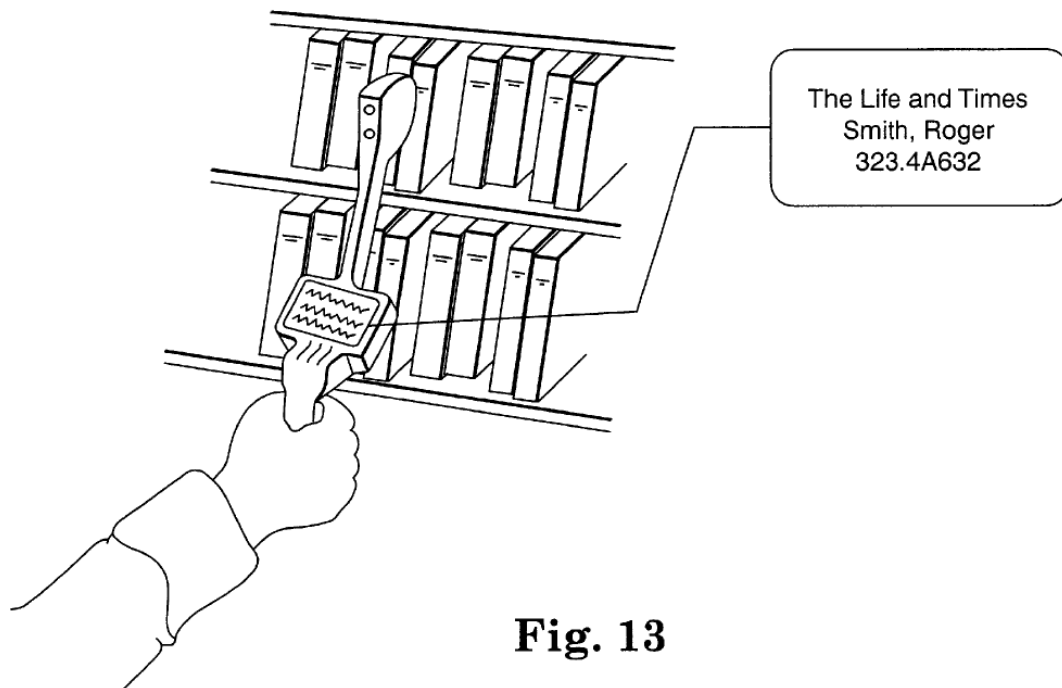


Fig. 13

Garber’s Figure 13 depicts “[a] hand-held RFID device . . . in which the RFID reader, user interface, power source, antenna, processor, and software are all provided in a single integrated unit.” Ex. 1001, 15:42–46.

According to Garber, the hand-held RFID device preferably includes memory, and the memory may be in the form of a handheld computer. *Id.* at 14:59–67. “The portable computer may include . . . a touch-screen display.” *Id.* at 15:1–2. “[T]he functions or methods described . . . are equally applicable to non-

portable RFID devices, and . . . the functions or methods described . . . in reference to non-portable RFID devices are similarly applicable to portable RFID devices.” *Id.* at 14:49–54.

Garber explains that “[a]n interrogation zone may be established by placing spaced detection panels across the exits from the room in which the tagged articles are located, near a conveyor carrying items to be monitored, or the like” and that “[h]and held detection devices may also be used.” *Id.* at 6:54–58.

The reference further explains that “[l]ibrary materials having an RFID tag of [the combination] type could be checked in and out more easily, perhaps without human assistance” and that “the materials would automatically be checked out to a particular patron . . . when the patron passes through a suitable detection zone, and checked back in when the patron re-enters the library with the materials.” *Id.* at 10:11–20.

2. *Werb*

Werb pertains to “location and position identification of mobile and stationary assets, such as items warehoused in a storage facility.” Ex. 1006, 1:5–6. Werb explains that a Real Time Locating System (RTLS) has been used to track assets, and some RTLS’s employ RFID tags. *Id.* at 1:10–11, 1:24–28. According to Werb, “a need exists for a more economical, reliable, and flexible system for coverage of extended facilities, and particularly enclosed facilities where the use of Global Positioning System (GPS) is not possible because communication signals from satellites will not penetrate the structures enclosing the facility.” *Id.* at 3:1–5. Werb discloses a mobile tag reader, that, “[b]y communicating with the tags, . . . can generate information suitable for determining the absolute position of the tag reader and/or the movable tags,” and that “[t]he tag reader may store information about the relative position of assets in its vicinity.” *Id.* at 3:11–17. “The relative

and/or absolute positions of the tag reader and the tagged assets may be determined using a positioning system onboard the tag reader, such as a GPS or an inertial navigation system, or the positions may be determined subsequently by the central controller.” *Id.* at 3:17–20. “[V]arious off-the-shelf technologies, such as speedometers, compasses, gyroscopes, and inertial motion sensors, may be used by the tag reader 3 or central controller 10 to estimate the position of the tag reader 3.” *Id.* at 13:29–31.

3. *Claim 1*

For the reasons explained below, we find that Petitioner has shown that the elements of independent claim 1 are met in this combination,

a. *“[a]n interrogation system”*

Petitioner contends that, to the extent that the preamble is limiting, Garber discloses an interrogation system. Pet. 13. Petitioner asserts that Garber discloses an interrogator in the form of a hand-held RFID device, and points to, *inter alia*, Garber’s description of Figure 4 as depicting “a block diagram of an RFID interrogation system interacting with an RFID tag.” *Id.* at 13 (quoting Ex. 1001, 3:46–47).

Patent Owner does not raise any arguments regarding the preamble and we agree that it is disclosed in Garber.

b. *“a sensing subsystem configured to provide a signal having a signature representing a presence of a radio frequency identification (RFID) object”*

As discussed above in the claim construction section, we determine that this limitation is not governed by 35 U.S.C. § 112 ¶ 6 and that a “sensing subsystem” is “a component configured to detect a signal representing an object.”

Petitioner contends that “Garber discloses a ‘self-contained system for sensing [e.g., Garber’s RFID device] within a larger system [e.g., Garber’s library

identification system]’ that performs the function recited in the claim.” Pet. 22 (citing Ex. 1002 ¶ 82). Essentially, Petitioner contends that Garber discloses an RFID sensing subsystem in the form of an RFID reader having a detector 106 and interrogation source 102. *Id.* at 18. We agree with Petitioner that this discloses “a component configured to detect a signal representing an object” that “provides a signal having a signature representing a presence of a radio frequency identification (RFID) object,” as claimed.

Patent Owner argues that “[Petitioner] seeks to construe the ‘sensing subsystem’ to require both RFID and metal detection.” PO Resp. 27. As explained above, however, that is not correct (*see supra* n.1), and the argument on pages 27–29 of the Response is therefore misplaced.

We conclude that this limitation is disclosed in Garber.

c. *“a control and processing subsystem configured to discern a presence of said RFID object from said signal”*

As discussed above in the claim construction section, we determine that “a control and processing subsystem” means “a controller or processor.”

Petitioner argues that “Garber’s device includes a processor,” as it “discloses the ‘hand-held RFID device is provided in which the RFID reader, user interface, power source, antenna, processor, and software are all provided in a single integrated unit, as shown in FIG. 13.’” Pet. 23 (citing Ex. 1005, 15:43–46). Petitioner further argues that “Garber teaches that its ‘hand-held RFID device can interrogate and identify RFID-tagged items whenever it is activated within range of the items” and that “Garber further teaches that ‘the hand-held device obtains information from the RFID tag, and either immediately displays that information, or immediately displays information stored within the hand-held device that is related to the tagged item.’” Pet. 24 (citing Ex. 1005, 15:63–65, 16:21–25).

Patent Owner does not raise any arguments regarding this limitation and we agree that it is disclosed in Garber.

- d. “a single position sensor configured to provide a location of said RFID object in accordance with a movement of said position sensor with respect to said RFID object”*

Petitioner asserts that “Garber discloses that its interrogation system is configured to provide a location of [an] RFID object (e.g., the RFID tags)” and that, “[w]hile Garber is silent as to a position sensor, Werb expressly discloses the advantageous use of a position sensor in an RFID reader to provide a more accurate location of RFID tags in accordance with a movement of said position sensor with respect to said RFID object.” Pet. 27 (citing Ex. 1002 ¶¶ 90–93). Petitioner points to Werb’s disclosure that “as its mobile tag reader moves within the interrogation system the ‘relative and/or absolute positions of the tag reader and the tagged assets may be determined using a positioning system onboard the tag reader, such as a GPS or an inertial navigation system.’” Pet. 27 (citing Ex. 1006, 3:17–20).

According to Petitioner, Werb discloses that the position of the tag reader “may also be determined and/or predicted, e.g., by using the speed and time of travel of the tag reader 3 in a known direction, by using inertial navigation systems . . . or other devices.” Pet. 28–29 (quoting Ex. 1006, 13:3–6 (emphasis omitted) and citing *id.* 13:29–31 (“inertial motion sensors, may be used by the tag reader 3 . . . to estimate the position of the tag reader 3”). Petitioner concludes that “[t]he Garber-Werb combination thus discloses a position sensor (e.g., inertial motion sensor)” that is “configured to provide a location of said RFID object (e.g., RFID tags) in accordance with a movement of said position sensor with respect to said RFID object (e.g., calculated using know[n] positions of tag reader in at least two locations as reader passes RFID tag).” Pet. 29–30.

Petitioner argues that one of ordinary skill in the art “would have been motivated to modify Garber based on Werb’s express teachings,” including that “[m]onitoring and tracking the location of assets in a facility can be important, for example, for purposes of inventory and process control.” Pet. 51 (citing Ex. 1006, 1:9–10). Petitioner also points to the “advantage” that Werb’s system “using inertial technology and calibration tags” makes it possible to “track and continuously calibrate the position of the tag reader 3” as it moves quickly through the interrogation system.” *Id.* at 52 (citing Ex. 1006, 14:1–17, 14:25–15). Petitioner also argues that “modifying Garber’s hand-held device to include Werb’s position sensor would have been an obvious combination of known prior art elements that yields a predictable result,” that one “could have combined” “using known methods,” where the “position sensor would merely perform the same function . . . as taught by Werb,” and that the result would have been “improved item location tracking.” Pet. 52.

i. “Garber is Defective”

Under the heading “Garber is Defective,” Patent Owner asserts that two U.S. patents that are divisional applications of Garber were disclosed to the Patent Office during the prosecution of the ’711 patent. *See* PO Resp. 16. Patent Owner argues that “[t]he Examiner’s expressed allowance of the claims of the ’711 Patent over the disclosures of [those patents] leads to a reasonable inference that the Examiner considered the teachings presented in the common Garber specifications but found those teachings to be distinct and different from the inventions claimed in the ’711 Patent.” *Id.*

Addressing a similar argument made in the Preliminary Response, we concluded that “Patent Owner has not adequately explained how and to what extent the Examiner ‘considered’ and purportedly ‘discounted the teachings of

Garber.”” Inst. Dec. 15. The Response again makes arguments without pinpoint citations to any document in the record or further explanation of how the teachings of Garber cited in the Petition were “considered” or “discounted” by the Examiner.

We do not agree that Garber is “defective” and, to the extent Patent Owner asks us to disregard Garber, we decline to do so. We further note that the combination presented in the Petition in this IPR relies on Garber *in combination with Werb*. Even if the Examiner “discounted” Garber, there is no reason to think the Examiner discounted the combination now at issue.

ii. Sufficiency of the Combination

Patent Owner argues that Werb’s “devices and methods used to estimate the position of the tag reader . . . are silent as to two important aspects of the ’711 Patent.” PO Resp. 17–18.

Location of the RFID Object

First, Patent Owner argues that “[c]laim 1 requires the interrogation system to have ‘a single position sensor configured to provide a location *of said RFID object* in accordance with a movement of said position sensor with respect to said RFID object,’” but that “Werb only discloses that *the location of the tag reader* can be estimated.” PO Resp. 17–18.

We find this argument unpersuasive because the ’711 patent explains that the location of the reader “provide[s] a location” of the object, as recited in the claims. *See, e.g.*, Ex. 1001, 21:30–33 (“Employing this mitten-like embodiment, the health care individual may move his/her hand over the patient to obtain specific locations of metal and RFID tagged objects based on the location of his/her hand.”).

Technical Impediments

Second, Patent Owner argues that one of ordinary skill in the art would not have been motivated to add Werb's inertial navigation system to the handheld RFID reader in Garber for several technical reasons. *See* PO Resp. 18–19.

Patent Owner argues that “at the time of the priority date of the ’711 Patent, inertial navigation systems were complex, large-scale systems requiring multiple sensors directed to industrial applications and not suitable for handheld RFID devices like the one disclosed in Garber.” *Id.* at 20 (citing Ex. 2017 ¶ 34); *see also id.* at 21–22 (describing large inertial sensors shown in Ex. 2017). Patent Owner next argues that “the power requirements of any inertial navigation system that was available in 2003 would have made such a system incompatible with the handheld RFID reader of Garber.” PO Resp. 23–24. Patent Owner also argues that “the inertial navigation systems at this time were ‘strap down’ devices that must be installed on a level surface and then calibrated in order to operate” and “would not be suitable for a handheld reader that is being carried by a human because the movements of the person would result in a high degree of inaccuracy or ‘drift’ after a few seconds of use.” PO Resp. 24 (citing Ex. 2017 ¶ 42). Patent Owner additionally argues that “[i]f the inertial navigation system of Werb were included to ‘provide a location of said RFID object in accordance with a movement of said position sensor with respect to said RFID object,’ it would need to be highly accurate in order to distinguish between the various books and shelves of a library” but that “even a properly installed inertial navigation system in 2003 could not provide this level of accuracy due to issues with drift inherent in these types of systems.” PO Resp. 24–25.

We find Patent Owner's arguments unpersuasive because they are based on hypothetical combinations other than that proposed by Petitioner. Petitioner's

proposed combination modifies Garber's interrogator to have an inertial position sensor like that taught by Werb, and does not involve incorporation of a large-scale, industrial system as Patent Owner suggests. As Petitioner points out, Werb discloses that "various off-the-shelf technologies, such as . . . inertial motion sensors, may be used by the tag reader 3 or central controller 10 to estimate the position of the tag reader 3." Ex. 1006, 13:29–31; Pet. 52 (quoting the same). As Petitioner also points out, the '711 patent describes inertial position sensors as applicable in *portable* interrogators. *See, e.g.*, Ex. 1001, 19:34–37 ("[E]mploying an inertial position sensor in the portable interrogator 625 allows a more precise determination of the presence and location of a RFID or metal object between these two RFID position markers."), 22:44–45 ("The position sensor 935 may typically be of an inertial type.").

The inoperability opinion of Patent Owner's witness, Mr. Kinney, unpersuasively focuses on the use of an inertial *navigation system* rather than an inertial *position sensor*. *See* Ex. 2017 ¶ 44 (Mr. Kinney testifying that "an inertial navigation system would render the Garber device unsatisfactory and inoperable for its intended purpose because (1) it is too large, (2) it must be installed on a flat surface and, therefore, cannot be carried around by a human operator, (3) it requires too much energy, and (4) it would not be sufficiently accurate even if installed and calibrated correctly."). Dr. Sharony, however, credibly testifies that a person of ordinary skill in the art would have had a reasonable expectation of success in making the proposed modification because the interrogator components, including inertial position sensors, were well-known, that "[i]t would also have been straightforward for a POSITA to modify Garber's interrogator to include Werb's inertial position sensor," and that "such a system would work." Ex. 1002 ¶ 158; *see also* Ex. 1016 ¶ 22 (opining that "it would have been an obvious and

routine matter to combine Werb’s position sensor with Garber’s handheld reader”).⁵

For these reasons, we find that Patent Owner has not identified technical problems that would have precluded the combination of Garber and Werb as described in the Petition.

iii. Single Position Sensor

Patent Owner also argues that “the embodiment of [Werb’s] FIG. 3 determines the position of the tag reader 3 relative to the calibration tags 5,” that “[t]he description of the tag reader 3 of FIG. 3 is silent regarding the use of position sensors (let alone just one position sensor),” and that “the tag reader 3 of FIG. 3 is not determining a position of an RFID object in accordance with a movement of the position sensor with respect to the RFID object akin to the claimed subject matter of the ’711 Patent.” PO Resp. 31. Patent Owner cites its expert for the proposition that “the inertial navigation system taught by Werb would have multiple position sensors.” *Id.* at 31 (citing Ex. 2017 ¶ 45).

Patent Owner then argues that “the Board has previously recognized a distinction between ‘a single position sensor’ as claimed in the ’711 Patent and ‘a position sensor’ recited in the claims of the other related patents,” citing the institution decisions in IPR2022-01375 and IPR2022-01376. *Id.* at 32. Patent Owner concludes that “the claims of the ’711 Patent are limited to just one position sensor.” *Id.* at 33.

Patent Owner further asserts that “the Board acknowledges that Garber does not include a position sensor and the GPS onboard positioning system of Werb is

⁵ The fact that the ’711 patent describes the use of an “inertial position sensor” in the portable interrogator without providing any details on the sensor (*see, e.g.*, Ex. 1001, 19:34–37) suggests that such sensors were known and available at the time of the invention.

not compatible with the handheld (reader) of Garber,” that “[a]ccordingly, [Petitioner] must rely on the only other onboard positioning system of Werb to combine with Garber,” and that “the inertial navigation systems of Werb are not compatible with the portable reader of Garber and would contain more than one position sensor.” PO Resp. 33. Patent Owner concludes that “the combination of Garber and Werb would be inoperative, especially in view of the improper combinations of the references.” *Id.*

These arguments are unpersuasive. We agree that the claim language “a single position sensor configured to provide a location of said RFID object in accordance with a movement of said position sensor with respect to said RFID object” requires a single position sensor configured to provide the claimed information. But Patent Owner’s argument fails to address the combination at issue, where the tag reader includes a single position sensor. *See* Pet. 27–30 (citing, for example, Ex. 1001, 13:29–31: “various off-the-shelf technologies, such as . . . inertial motion sensors, may be used by the tag reader 3 . . . to estimate the position of the tag reader 3”). As explained above, we find that Werb describes a single position sensor and that it would have been obvious to combine that with a system like that disclosed in Garber.

e. Secondary Considerations

Patent Owner argues there is evidence of long felt but unresolved need providing objective indicia of nonobviousness and also makes certain assertions regarding the adoption and possible acquisition of its technology. *See* PO Resp. 55–57. For support, Patent Owner relies solely on the declaration of named-inventor John Volpi. *See* PO Resp. 55–57 (citing only Ex. 2024).

Petitioner argues that there is no nexus to the claimed invention because Patent Owner “has not identified the merits of the claimed invention or *any* product

that embodies the claimed features or is coextensive with them.” Pet. Reply 29. Petitioner also argues that Patent Owner “has not established industry praise or commercial success, let alone a nexus to the merits of the claimed invention.” *Id.*

In order for objective evidence of secondary considerations to be relevant, there must be “a nexus between the merits of the claimed invention and the objective evidence.” *Volvo Penta of the Americas, LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023) (citing *In re GPAC*, 57 F.3d 1573, 1580 (Fed. Cir. 1995)). A nexus can be shown either by a presumption that arises when the objective evidence is tied to a specific product that “embodies the claimed features, and is coextensive with them,” or with a showing that the evidence is a “direct result of the unique characteristics of the claimed invention.” *Id.* (quoting *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000); *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373–74 (Fed. Cir. 2019). The burden of establishing a nexus lies with the patentee. *See Fox Factory*, 944 F.3d at 1373.

We conclude that Patent Owner has not established an entitlement to a presumption of nexus. Patent Owner does not identify any specific product to which the asserted objective evidence is tied, but instead speaks in ambiguous terms such as “[t]he inventions of the ’711 Patent,” “the patented advances,” “the innovations found in the ’711 Patent,” “[Patent Owner]’s technology,” and “RFID sensing systems.” *See* PO Resp. 55–57; PO Sur-reply 25–26. The Sur-reply mentions “RFID systems by Stryker Medical and Surgicount that adopted [Patent Owner]’s inventions” and the “adoption of the inventions by retailers such as Wal-Mart,” but offers no details as to those systems. *See* PO Sur-reply 25. Mr. Volpi’s declaration also lacks any details as to a product or method purportedly embodying the challenged claims. *See* Ex. 2024 ¶¶ 3–9. Without a clear identification and

description of a specific product or method, we cannot find that it embodies or is coextensive with the claims.

Patent Owner also has not established a nexus by showing that the evidence of secondary considerations is the direct result of unique characteristics of the claimed invention. Patent Owner and Mr. Volpi refer to the claimed invention in generalities using ambiguous terms, and do not specifically identify what they consider to be the unique characteristics of the claimed invention. *See, e.g.*, PO Resp. 55 (“[t]he inventions of the ’711 Patent”).

Patent Owner argues that “[t]he inventions of the ’711 Patent addressed a long felt but unresolved need for a better way to track items in a surgical field and other difficult environments.” PO Resp. 55 (citing Ex. 2024 ¶¶ 4–6). Patent Owner makes vague references to “*improvements over existing RFID technology* in order to operate under [the] challenging conditions [of the surgical environment].” *Id.* at 56–57 (emphasis added). Patent Owner also argues that the inventors “later began using *the improved technology* in supply chain and inventory applications, which can also include very challenging conditions, such as numerous tags being placed inside a small space and impediments to the signal transmission between the reader and the tags.” *Id.* at 55–56 (emphasis added) (citing Ex. 2020 ¶ 6).

However, Patent Owner does not clearly explain how any such RFID technology “improvements” are result from the *claimed invention*. Instead, Patent Owner argues that it was the use of RFID technology *generally* that overcame the identified problems that were not solved by other technology such as bar codes and X-ray using a blue thread. Thus, Patent Owner impliedly argues that it was the application of RFID technology to new environments that is the unique characteristic of the invention that addressed a long felt but unresolved need. But

the challenged claims are not limited to any particular environment, as they broadly claim an interrogation system and its use generally.

Patent Owner's commercial success/industry praise arguments also are not persuasive. Patent Owner asserts that "two competitors, Surgicount and Stryker Medical, have since introduced RFID sensing systems to be used in tracking medical supplies and medical devices," that "Stryker Medical expressed an interest in possibly acquiring the inventions and technology being developed by Veroscan," and that "other companies interested in maintaining efficiency in their supply chains have also adopted [Patent Owner]'s technology." PO Resp. 56–57 (citing Ex. 2024 ¶ 8). But Patent Owner again fails to adequately tie these allegations to any unique characteristic of the claimed invention, again referring only to ambiguous "inventions and technology" and pointing only to the use of RFIDs generally. *See, e.g.*, PO Resp. 57 ("Wal-Mart and other large retail stores have begun requiring their vendors and suppliers to provide RFID tags on goods so they can be tracked through warehouses and onto retail showroom floors.").

Even if Patent Owner had established a nexus to the assertion that "Stryker Medical expressed an interest in possibly acquiring the inventions and technology being developed by Veroscan" (PO Resp. 57), we agree with Petitioner that this suggests a lack of industry praise or commercial success (*see* Pet. Reply 29). Patent Owner asserts nothing more definitive than a company "expressed an interest in possibly acquiring the inventions," suggesting the company *declined* to complete the transaction.

In sum, we have reviewed Patent Owner's arguments and evidence regarding objective evidence of nonobviousness and, for the reasons outlined above, do not find them persuasive. And, to the extent Patent Owner's objective indicia evidence is entitled to any weight, it is outweighed by Petitioner's strong

evidence that the challenged claims would have been obvious.⁶ *See, e.g., Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (explaining that “secondary considerations of nonobviousness . . . simply cannot overcome a strong prima facie case of obviousness”).

f. Claim 1 Conclusion

Petitioner has shown that claim 1 would have been obvious in view of Garber and Werb.

D. Independent Claim 16 in View of Garber and Werb

Patent Owner does not offer separate arguments concerning independent claim 16 (*see* PO Resp. 16–33) and, having considered Petitioner’s arguments and evidence (*see* Pet. 49, referring to the analysis for claim 1), we determine that Petitioner has shown that claim 16 would have been obvious in view of Garber and Werb, for the reasons provided in connection with claim 1.

E. Dependent Claims 3–5, 8–10, and 15 in View of Garber and Werb

1. Claim 5

Claim 5 recites that “at least one of said sensing subsystem, said control and processing subsystem, said position sensor and said antenna assembly is located in a portable interrogator” and Petitioner asserts that Garber teaches a handheld RFID device in which the RFID reader, user interface, power source, antenna, processor, and software are all provided in a single integrated unit, as shown in Garber’s Figure 13. *See* Pet. 36–37 (citing Ex. 1005, 15:43–46).

⁶ At least because Patent Owner does not present objective indicia arguments specific to any aspect of the challenged claims (*e.g.*, a particular limitation alone or any claimed invention as a whole), our determinations here regarding independent claim 1 apply to all challenged claims and we do not repeat those determinations when discussing other claims and grounds.

Patent Owner argues that “the Board acknowledges Garber does not include a position sensor and the GPS onboard positioning system of Werb is not compatible with the handheld reader of Garber,” that Petitioner thus “must rely on the only other onboard positioning system of Werb to combine with Garber,” that “the inertial navigation systems of Werb are not compatible with the handheld reader of Garber,” and that “[a]dditionally, the inertial navigation system cannot be integrated into a portable handheld interrogator as required with the sensing subsystem, the control and processing subsystem, and the antenna assembly as recited in Claim 5.” PO Resp. 35.

To the extent this argument is understood, it is unpersuasive. The claim simply requires that “at least one” of the several recited components is in a portable interrogator, and Petitioner has shown that Garber’s RFID reader, user interface, power source, antenna, and processor are all in a single portable device. Patent Owner’s arguments about compatibility are unpersuasive for the reasons explained in connection with claim 1.

We conclude that Petitioner has shown that claim 5 would have been obvious in view of Garber and Werb.

2. *Claim 9*

Claim 9 recites that the “position sensor is an inertial position sensor” and Petitioner asserts that “Werb explicitly discloses its position sensor can be an inertial position sensor.” Pet. 41 (citing Ex. 1006, 3:17–20, 13:29–31).

Patent Owner argues that Werb “does not teach a single inertial position sensor, but rather a more complex, multi-component inertial navigation system” that “was not compatible with the handheld unit of Garber” and “could NOT be employed in a handheld unit like Garber.” PO Resp. 36 (citing Ex. 2017 ¶ 44).

Patent Owner also argues that the '711 Patent “limits the position sensor to a ‘single position sensor’” and the inertial navigation system relied on by [Petitioner] is not an inertial position sensor, let alone a single inertial position sensor.” *Id.*

We find these arguments unpersuasive because, as explained above, Werb discloses that “various off-the-shelf technologies, such as . . . inertial motion *sensors*, may be used by the tag reader 3 or central controller 10 to estimate the position of the tag reader 3.” Ex. 1006, 13:29–31 (emphasis added). This is essentially the same as what is described in the '711 patent. *See, e.g.*, Ex. 1001, 19:34–37 (“[E]mploying an inertial position sensor in the portable interrogator 625 allows a more precise determination of the presence and location of a RFID or metal object between these two RFID position markers.”), 22:44–46 (“The position sensor 935 may typically be of an inertial type.”). Patent Owner’s arguments about Werb’s “inertial navigation system” are unpersuasive for the reasons explained in connection with claim 1.

We conclude that Petitioner has shown that claim 9 would have been obvious in view of Garber and Werb.

3. *Claim 15*

Claim 15 recites that the interrogation system of claim 1 “further compris[es]” “another sensing subsystem configured to provide a signal having a signature representing a presence of an object.”

Petitioner argues that “Garber’s interrogation system . . . would include additional hand-held devices that could communicate with one another” using a wireless LAN and that “[t]hese additional hand-held devices would include another sensing subsystem configured to provide a signal having a signature representing a presence of an object.” Pet 45–46. Petitioner alternatively argues that Garber “discloses that ‘functions and methods’ taught with respect to portable RFID

devices are also present in the non-portable RFID devices,” and that “Garber’s non-portable devices would include another sensing subsystem configured to provide a signal having a signature representing a presence of an object like the one described in Garber’s hand-held devices.” *Id.* at 47. Petitioner concludes that “Garber discloses another ‘self-contained system for sensing [e.g., Garber’s RFID device] within a larger system [e.g., Garber’s library identification system]’ that performs the function recited in the claim.” Pet. 48–49.

Regarding Petitioner’s first argument, Patent Owner contends that the ’711 patent discloses communicating wirelessly, but not with another sensing subsystem. *See* PO Resp. 37 (citing Ex. 1001, 12:5–23). For the second argument, Patent Owner points to Figure 12 of the ’711 patent, which shows both a metal sensing system and an RFID sensing system in single interrogator, to argue that claim 9 concerns “not two autonomous readers or an interrogator that communicates with a LAN, but . . . another sensing subsystem within the interrogation system that detects the presence of another object.” PO Resp. 40.

We agree with Patent Owner that neither Garber’s explanation of how the “Spectrum24” system allows “mobile users to wirelessly communicate between mobile devices and local area networks,” nor Garber’s description of both stationary and portable devices tends to show that Garber’s system would be implemented with multiple interrogation devices. *See* PO Resp. 36–37. However, the portion of Garber that Petitioner cites for processing multiple items explains that the “group of items having RFID elements may be processed essentially simultaneously” by “having *multiple RFID interrogation sources (readers)* mounted in or on the device.” Ex. 1005, 13:30–33 (emphasis added). We conclude this is sufficient to teach or suggest “another sensing subsystem.” Patent Owner’s arguments concerning Figures 12 and 13 are not persuasive because

Garber expressly describes multiple readers in one interrogation device, and because claim 15 is not limited to a portable device.

We conclude that Petitioner has shown that claim 15 would have been obvious in view of Garber and Werb.

4. *Claims 3, 4, 8, and 10*

Patent Owner does not offer separate arguments concerning dependent claims 3, 4, 8, and 10 and, having considered Petitioner's arguments and evidence (*see* Pet. 30–36, 38–44), we determine that Petitioner has shown that these claims would have been obvious in view of Garber and Werb.

F. *Dependent Claims 6, 7, and 18 in View of Garber, Werb, and Andersen*

Claim 6 adds to claim 1 that “[the] control and processing subsystem is configured to employ multiscan, coherent signal processing,” and claim 18 adds a corresponding limitation to claim 16. Petitioner alleges that claims 6 and 18 would have been obvious over Garber, Werb, and Andersen. *See* Pet. 53–55, 57–58.

1. *Overview of Andersen*

Andersen “relates to a paper roll that incorporates RFID components and a system for tracking inventory having RFID components in a warehouse environment.” Ex. 1007, 1:7–10. Andersen describes the multipath error problem as follows:

A warehouse environment is potentially susceptible to multipath errors due to metal or other structures in the warehouse 12 that reflect the electromagnetic waves emitted by the RFID beacons 48. Multipath errors are caused when a radio signal is received directly by an antenna, but then the same signal is received again as it is reflected off an interfering structure.

Id. at 11:22–28.

To address the problem, Andersen explains that “[t]he use of ‘Preprocessing’ filters minimizes the instability effects that multipath may cause by selectively

ignoring beacon multipath measurements.” *Id.* at 11:28–30. “Pre-processing filters can be used on radio signals to filter out any erroneous signals.” *Id.* at 11:30–32. “The signals may then be further refined in a Kalman Filter, which is a known multiple-input software filter that can optimally select or reject, in real time, the sensor inputs based on the quality of the respective sensor measurements.” *Id.* at 11:32–36. “The Kalman filter may reject erroneous sensor inputs to calculate the desired output of the position locating system 28 with the location measurement unit 56, and a Kalman filter provides improved overall navigation accuracy.” *Id.* at 11:35–39.

2. *Claims 6 and 18: Multiscan, Coherent Signal Processing*

Claim 6 depends from independent claim 1 and recites “wherein said control and processing subsystem is configured to employ multiscan, coherent signal processing.” Ex. 1001, 30:17–19.

Petitioner argues that, “[l]ike the ’711 patent, Andersen also discloses a computer processor that uses a Kalman filter and performs multiscan, coherent signal processing to improve the quality and accuracy of an RFID system’s measurements.” Pet. 54. Petitioner asserts that “Andersen discloses that a ‘warehouse environment is potentially susceptible to multipath errors due to metal or other structures in the warehouse 12 that reflect the electromagnetic waves emitted by the RFID beacons 48.” *Id.* at 54–55 (citing Ex. 1007, 11:22–25). “For example,” according to Petitioner, “Andersen describes that ‘[m]ultipath errors are caused when a radio signal is received directly by an antenna, but then the same signal is received again as it is reflected off an interfering structure.’” *Id.* at 55 (citing Ex. 1007, 11:25–28). Petitioner further contends that Andersen “describes a solution to the multipath (i.e., processing *multiple signals scanned from a particular object*) issue using filters such as a Kalman filter.” *Id.*

Patent Owner argues that the combination fails to teach “multiscan, coherent signal processing” because “Garber is silent as to multiscan, coherent signal processing” and multiscan, coherent signal processing is different than Andersen’s correction of multipath errors. PO Resp. 41–43 (citing Ex. 2030 ¶¶ 22–25). Patent Owner argues that Andersen’s multipath errors are different from “multiscan, coherent signal processing” because the latter “compares information from a plurality of signals resulting from multiple scans of an object to determine a presence of the object,” while the former receives multiple versions of the same signal. *Id.* at 43 (citing Ex. 2030 ¶ 22).

Petitioner responds that Andersen “explicitly teaches that its location process utilizes a plurality of signals resulting from multiple scans of an object” by disclosing “a system for *tracking inventory* having RFID components” in which “RFID receivers 50 are *continuously receiving* the RFID beacon signals to *continually determine the position of the RFID receivers.*” Pet. Reply 21 (citing Ex. 1007, 1:8–10). Petitioner also contends that, because Andersen’s receiver 50 “*selects several of the signals for processing,*” and the beacons transmit RF signals at a specific frequency, one of ordinary skill “would appreciate that specific frequency RFID signals would also have a constant phase difference and, thus, be coherent.” *Id.* at 22–23 (citing Ex. 1007, 10:53–54; Ex. 1016 ¶ 38; Ex. 1017, 76).

Relying on Dr. Sharony and Dr. Kia, Petitioner argues that “beacon multipath signals are replicas of the sent signal that have constant phase differences with the sent signal,” and one of ordinary skill “would therefore appreciate [that] Andersen’s ‘selectively ignoring’ means that some multipath measurements can be used to improve detection, whereas, the ‘erroneous signals’ are filtered out.” *Id.* at 23–24 (citing Ex. 1018, 38:1–13; Ex. 1019, 57:22–24; Ex. 1016 ¶¶ 38–42).

Petitioner further argues that Andersen teaches another example of multiscan, coherent signal processing when it describes a second processing step in which “[t]he signals may then be further refined in a Kalman Filter, which is a known *multiple-input* software filter than can optimally select or reject, in real time, the sensor inputs *based on the quality of the respective sensor measurements*.” Pet. Reply 24 (citing Ex. 1007, 11:32–36, 12:41–46). In this step, Petitioner asserts, “Andersen’s Kalman Filter analyzes the multiple signals already processed by the preprocessing filter and further refines those signals to ‘calculate the desired output of the position locating system 28 with the location measurement unit 56, and a Kalman filter provides *improved overall navigation accuracy*.’” *Id.* (citing Ex. 1007, 11:36–40, 12:44–46).

Patent Owner responds that Andersen “solves a very different problem” than the ’711 patent because it only corrects for multipath errors rather than “compar[ing] information from a plurality of signals resulting from multiple scans of an RFID object to determine the presence of the object.” PO Sur-reply 16. Patent Owner argues that “[m]ultipath errors receive multiple versions of the same signal, whereas multiscan, coherent signal processing compares multiple separate signals from the RFID object resulting from multiple scans.” *Id.* at 16. “In solving multipath errors,” Patent Owner argues, “Andersen assumes that the first version of the same signal is not corrupt and discards the other versions of the same signal,” while multiscan, coherent signal processing in the ’711 patent “does not assume that the first scan of the RFID object is clean, performs multiple scans of the RFID object and coherently processes the signals to discern the presence of the RFID object.” *Id.* Additionally, Patent Owner argues that “[t]he ’711 Patent does not mention receiving multiple coherent inputs from multiple objects as set forth by

[Petitioner]” and receiving multiple coherent inputs “has nothing to do with multiscan coherent signal processing.” *Id.* at 19.

Patent Owner also argues that “[t]he position locating system 28 of Andersen operates very differently than the interrogator of the ’711 patent” because “[t]he interrogator of the ’711 Patent includes a sensing subsystem and antenna in cooperation with the control and processing subsystem that discerns the presence of and tracks the location of the RFID object,” while “[t]he position locating system 28 of Andersen oppositely tracks the location of the truck 18 that houses the receiver 50.” PO Sur-reply 18–19. Relying on Dr. Kia, Patent Owner also asserts that “Andersen filters out versions of a signal to minimize the instability effects caused by multipath errors,” such that the multipath effect in Andersen does not help detection. *Id.* at 20 (citing Ex. 1019, 136:21–25).

Patent Owner further argues that Andersen’s Kalman filter “is not being used in Andersen to coherently process multiple signals from a RFID object resulting from multiple scans of the RFID object.” *Id.* This is because, according to Patent Owner, Andersen’s beacons 48 are “not receiving multiple scans from an interrogator and responding to the interrogator with multiple signals for coherent signal processing to discern a match and presence of the beacon 48.” *Id.*

We find that Petitioner has sufficiently shown that the combination of Garber and Andersen discloses that the control and processing subsystem “is configured to employ multiscan, coherent signal processing” as recited in claims 6 and 18. As discussed above, we construe “multiscan, coherent signal processing” to mean “processing multiple coherent (i.e., ‘in phase’) signals resulting from multiple scans.” We find that Andersen teaches processing multiple signals from multiple scans by disclosing “a system for tracking inventory having RFID components” in which “RFID receivers 50 are continually receiving the RFID

beacon signals to continually determine the position of the RFID receivers.”

Ex. 1007, 1:8–10, 10:42–44; *see id.* at 11:3–6 (The receiver is “continually communicating with the RFID beacons 48”). We agree with Dr. Sharony’s testimony that the term continually “basically says that [the receivers] continued to read, and these are the multiscan or multi measurements.” Ex. 1016 ¶ 37.

Andersen also teaches that the receiver 50 “communicates with all beacons 48 in its relative vicinity” and “selects several of the signals for processing.” Ex. 1007, 11:6–9. And, Andersen also teaches that, instead of active RFID beacons, the system may use Radio Frequency Identification Circuits (RFICs), which “are preferably passive and are powered by an external reader,” which would involve having an external reader scan the RFICs to generate signals that are received by a receiver for processing. *Id.* at 13:36–41. Based on these disclosures, as well as the Dr. Sharony’s testimony, we find that Andersen teaches “multiscan” signal processing by processing signals arising from multiple (“continuous”) scans of the same passive RFID, as well as processing signals from multiple scans of different passive RFIDs in the relative vicinity of the receiver. *See* Ex. 1016 ¶¶ 37, 43. We also agree with Petitioner and Dr. Sharony that the processing and further refinement of these signals from multiple scans in a Kalman filter involves “multiscan, coherent signal processing.” *See* Ex. 1007, 11:32–40, 12:41–46.

Additionally, we find that Andersen teaches multiscan *coherent* signal processing. In this regard, we credit Dr. Sharony’s testimony that one of ordinary skill “would appreciate that specific frequency RFID signals would also have a constant phase difference and, thus, be coherent.” Ex. 1016 ¶ 40. We thus agree with Dr. Sharony that “Andersen discloses receiving multiple coherent inputs from multiple objects as part of its location signal processing.” *Id.* ¶ 38.

We do not agree with Patent Owner’s argument that Andersen discloses only receiving multiple signals and does not perform multiple scans. As discussed above, we find that Andersen does disclose analyzing signals from multiple scans, both from the “continual” scanning of the same RFIC/RFID as well as from scanning of multiple RFIC/RFIDs.

We also disagree with Patent Owner’s argument that the combination fails to teach “multiscan, coherent signal processing” because Andersen solves a different problem than the ’711 patent. The claims do not recite the purpose of the “multiscan, coherent signal processing”—they merely recite that the control and processing subsystem “is configured to employ multiscan, coherent signal processing” without further limitation on how that processing is used or what is its purpose. The claims also do not recite specific processing techniques beyond the bare use of the term “multiscan, coherent signal processing” which, as explained above, we find broadly covers “processing multiple coherent (i.e., ‘in phase’) signals resulting from multiple scans.” Therefore, even if Patent Owner were correct that Andersen’s processing was for a different purpose than that described in the ’711 patent specification, or used different processing techniques for carrying out the “multiscan, coherent signal processing,” that would not distinguish Andersen from claims 6 and 18.

Additionally, we do not agree with Patent Owner’s argument that “[t]he position locating system 28 of Andersen operates very differently than the interrogator of the ’711 patent” because “[t]he interrogator of the ’711 Patent includes a sensing subsystem and antenna in cooperation with the control and processing subsystem that discerns the presence of and tracks the location of the RFID object,” while “[t]he position locating system 28 of Andersen oppositely tracks the location of the truck 18 that houses the receiver 50.” *See* PO Sur-reply

18–19. Petitioner does not rely on Andersen to teach these limitations of the ’711 patent claims. To the contrary, Petitioner relies on Garber to teach the interrogator with a sensing subsystem and antenna in cooperation with a control and processing subsystem to determine the presence of an object, and relies on the combination of Garber and Werb to teach a position sensor to provide a location of first and second objects. Petitioner merely relies on Andersen to teach the use of “multiscan, coherent signal processing” by the control and processing system. *See* Pet. 54–55. As discussed above, we find that Petitioner has sufficiently shown that Andersen teaches this limitation.

Finally, we disagree with Patent Owner’s argument that Andersen’s Kalman Filter is not being used “to coherently process multiple signals from a RFID object resulting from multiple scans of the RFID object” but instead “is addressing multipath errors by removing versions of the same signal.” PO Sur-reply 21. As discussed above, we find that Andersen discloses receiving signals from multiple scans of one or more passive RFID objects, and processing those signals in a Kalman filter.

We conclude that Petitioner has shown that claims 6 and 18 would have been obvious in view of Garber, Werb, and Andersen.

3. *Claim 7: Adaptive Integrating Filter*

Claim 7 adds to claim 1 that the “control and processing subsystem includes an adaptive integrating filter and is configured to coordinate a processing of said signal in conjunction with one of an observable and data to discern a presence of said RFID object.” Petitioner alleges that dependent claim 7 would have been obvious over Garber, Werb, and Andersen. *See* Pet. 55–57.

Petitioner asserts that “Andersen teaches the use of a Kalman filter, i.e., an example of the claimed adaptive integrating filter.” Pet. 56. Petitioner further

contends that Garber discloses relying on “an observable” (in the form of location information) and “data” (in the form of information stored within the handheld device) to determine the presence of RFID tags. *Id.* at 56–57.

Patent Owner argues that “the Kalman filter disclosed in [Petitioner’s] combination does not constitute an adaptive integrating filter as taught in the ’711 [p]atent” because “Andersen teaches the use of a pre-processing and a Kalman filter to correct multipath signal errors arising from the transmission of a single signal, as opposed to [c]laim 7 of the ’711 [p]atent which teaches the use of an adaptive integrating filter to process multiple diverse inputs with a signal representing an RFID object to discern the presence of that object.” PO Resp. 47. Patent Owner also argues that “Andersen teaches *filtering out* the erroneous signals received when the original signal ‘is received again as it is reflected off an interfering structure’” unlike claim 7, which “employs an extended plurality of inputs” that are processed “to provide a resulting interrogator detected object and location.” *Id.* at 49 (citing Ex. 1007, 11:22–31; Ex. 1001, 17:62–18:6; Ex. 2022 ¶ 33).

Patent Owner further argues that “a Kalman filter can be applied to many applications including an adaptive integrating filter, and thus “the use of the Kalman filter in the ’711 Patent as an adaptive integrating filter is not the same as—or even analogous to—Andersen’s use of a Kalman filter to address multipath errors.” *Id.* at 50 (citing Ex. 2022 ¶ 34). According to Patent Owner, “[t]he ’711 [p]atent’s use of processing such as Kalman filtering as an adaptive integrating filter is entirely for the purpose of locating the scanned objects” while, “[c]onversely, Andersen uses Kalman filtering to address the problems associated with multipath signals where the signal on the main path is received by the detector along with one or more copies of the same exact signal, delayed and corrupted by

the transmission channel.” *Id.* (citing Ex. 2022 ¶ 35). Patent Owner contends that these two problems “are completely different,” and that Andersen’s solution to improve multipath signal processing “does not address the ’711 [p]atent’s problem of localizing and detecting multiple objects.” *Id.*

Petitioner responds that Patent Owner acknowledges that “[a]n adaptive integrating filter 570 may be a single adaptive filter, *such as a Kalman filter.*” Pet. Reply 26. Petitioner argues that Patent Owner “does not dispute that Andersen teaches an adaptive integrating filter (i.e., a Kalman filter), but whether Andersen *uses* its Kalman filter as described in an embodiment of the ’711 [p]atent specification,” which would result in “importing a limitation into the claims.” *Id.* More specifically, Petitioner contends that “[c]laim 7 includes two requirements: that *the control and processing system* (1) includes an adaptive integrating filter (Kalman Filter) and (2) is configured to coordinate a processing of said signal in conjunction with one of an observable and data to discern a presence of said RFID object.” *Id.* According to Petitioner, claim 7 “does not require that the Kalman filter do anything,” but rather that requirement (2) is performed by “the control and processing subsystem.” *Id.* Petitioner argues that “Andersen teaches a Kalman filter as part of its ‘first onboard computer processor 58,” and that one of ordinary skill “would have been expressly motivated to incorporate Andersen’s Kalman filter into Garber’s device to ‘improve the accuracy of the calculated position information’ of the interrogated tags.” *Id.* (citing Ex. 1007, 11:22–42, 12:39–49).

Patent Owner responds that Petitioner erroneously “attempts to read the adaptive integrating filter out of the claim” and disregards the ’711 patent’s specification, which discloses that “[w]hen coordinating the processing of observables and data, the ’711 [p]atent relies on the adaptive integrating filter.” PO Sur-reply 22 (citing Ex. 1001, 6:56–61, 15:25–29, 18:62–67, 28:23–29).

Patent Owner further contends that Figure 5B of the patent “illustrates an adaptive integrating filter 570 that processes disparate inputs including observables and data to provide a resulting interrogator detected object and location 575.” *Id.* at 22.

“Thus,” according to Patent Owner, “the control and processing subsystem of [c]laim 1 is employing the adaptive integrating filter to coordinate a processing of signals from the objects in conjunction with one of an observable and data to discern a presence of the objects.” *Id.* at 23.

Patent Owner also argues that “Andersen does not teach the use of an adaptive integrating filter as described in [c]laim 7” because “Andersen teaches the use of pre-processing and a Kalman filter to correct multipath signal errors arising from the transmission of a single signal.” PO Sur-reply 23–24. Patent Owner acknowledges that Andersen’s “Kalman filter can assist with navigation accuracy,” but argues that it “performs that task by filtering out erroneous versions of a signal (Ex. 1107 at 11:36–40) as opposed to processing multiple diverse inputs to discern the presence of an object.” *Id.* at 24. Patent Owner also acknowledges that “Andersen refers to an inertial measurement unit 56 and distance sensors to update the Kalman filter during time periods when . . . the Kalman filter updates by the radio frequency direction finding system (‘RFDFS’) 28,” but argues that “[u]pdating the Kalman filter software is still different from processing multiple diverse inputs to discern the presence of an object.” *Id.* Finally, Patent Owner acknowledges that “Andersen discloses that the Kalman filter can use an algorithm to correct for erroneous measurements in the position calculation,” but argues that, “[a]gain, the algorithm is filtering out erroneous versions of a signal for multipath error correction.” *Id.* (citing Ex. 1007, 12:44–46).

We find that Petitioner has sufficiently shown that the combination of Garber and Andersen teach the limitations of claim 7. To begin with, we agree

with Petitioner that claim 7 includes two limitations: (1) that the control and processing subsystem “includes an adaptive integrating filter” and (2) that the control and processing subsystem “is configured to coordinate a processing of said first signal and said second signal in conjunction with one of an observable and data to discern said presence of said first object and said second object.” This understanding flows from the structure of the claim language, which recites that “said control and processing system . . . is configured to coordinate a processing of said first signal and said second signal.” If the inventors intended to require the “adaptive integrating filter” to perform the “coordinate a processing” activity, they could have written the claim to state that “said control and processing system “includes an adaptive integrating filter *which* is configured to coordinate a processing.” Instead, claim 7 states that the control and processing subsystem “includes an adaptive integrating filter *and* is configured to coordinate a processing.” The use of the term “and” makes clear that the “is configured to coordinate a processing” language is performed by the “control and processing subsystem,” not by the “adaptive integrating filter.”

The patent explains that “[t]he adaptive integrating filter 570 may be a single adaptive filter, such as a Kalman filter.” Ex. 1001, 18:2–24. Andersen discloses the use of a Kalman filter in Column 11 of its specification:

The use of “Preprocessing” filters minimizes the instability effects that multipath may cause by selectively ignoring beacon multipath measurements. Preprocessing filters can be used on radio signals to filter out any erroneous signals. *The signals may then be further refined in a Kalman Filter*, which is a known multiple-input software filter that can optimally select or reject, in real time, the sensor inputs based on the quality of the respective sensor measurements.

Ex. 1007, 11:28–42 (emphasis added). Thus, we agree with Petitioner that Andersen discloses an “adaptive integrating filter” as part of a control and

processing subsystem. As noted above, this is all claim 7 requires with respect to the “adaptive integrating filter” limitation.

We do not agree with Patent Owner’s argument that this understanding of the claim language is inconsistent with the ’711 patent specification because, as discussed above, the plain and ordinary meaning of the claim language does not require that the “adaptive integrating filter” perform any particular operations. The portions of the patent cited by Patent Owner are merely exemplary embodiments, and none of those passages define or limit the term “adaptive integrating filter” to require it to perform particular functions or operations beyond those indicated by the term’s ordinary meaning.

We also find that Petitioner has sufficiently proven that the combination of Garber and Andersen discloses a control and processing subsystem that “is configured to coordinate a processing of said signal in conjunction with one of an observable and data to discern a presence of said RFID object,” as the second portion of claim 7 requires. Specifically, Garber teaches that “[t]he handheld RFID device has particular usefulness in item location,” and one of its applications “includes locating items that are believed to be missing.” Ex. 1005, 16:36–37. Garber further teaches that the device can locate items by associating them with a shelf location, and can identify when books are located in the incorrect order on a shelf. Ex. 1005, 17:17–21, 17:44–46, 17:49–60, 18:18–22. Garber also teaches that the control and processing subsystem in its hand-held RFID device carries out the above locating functions. Ex. 1005, 14:59–62, 15:63–65.

Additionally, we agree with Petitioner that Garber discloses locating tags based on “an observable,” i.e., location information. Specifically, Garber discloses that “[w]hen items are associated with a shelf location, by either method above, the operator can use the hand-held device to locate items that are in the wrong

location,” by either reading several RFID tags and processing the data to infer a location, or using location tags on shelves that are read by the hand-held device to indicate that subsequent items read should belong to that location. Ex. 1005, 17:44–46, 17:49–60. Garber also teaches relying upon known “data,” such as “information stored within the hand-held device that is related to the tagged item.” Ex. 1005, 16:19–25; *see id.* at 16:55–17:1.

Finally, we do not agree with Patent Owner’s argument that Andersen’s Kalman filter is different from the “adaptive integrating filter” of claim 7 because Andersen’s filter is used to correct multipath signal errors rather than processing a plurality of inputs to identify and locate an object. As noted above, claim 7 merely states that the control and processing subsystem “includes an adaptive integrating filter,” and does not specify any particular functions or operations that the adaptive integrating filter must perform. Thus, even if Patent Owner were correct that the functions and operations performed out by Andersen’s Kalman filter are different from those performed by the filter described in the ’711 patent, that would not take Andersen’s Kalman filter out of the scope of claim 7.

We conclude that Petitioner has shown that claim 7 would have been obvious in view of Garber, Werb, and Andersen.

4. Motivation to Combine Garber and Andersen

Petitioner argues that one of ordinary skill would have been motivated to combine Garber and Andersen for several reasons. *See* Pet. 58 (citing Ex. 1002 ¶¶ 176–182). First, Petitioner argues that Garber and Andersen are analogous art “because they are in the same field of endeavor—namely, interrogation systems.” *Id.* Petitioner argues that Garber is analogous because it is reasonably pertinent to the technical problem allegedly addressed by the claimed invention” and that Andersen is analogous “because it teaches ‘a system for tracking inventory having

RFID components” and is designed to remedy the deficiencies of prior art inventory tracking systems using bar codes, which can be torn, destroyed, or hidden from view. *Id.* (citing Ex. 1007, 1:8–10, 1:58–2:2, 2:4–5). Additionally, according to Petitioner, Andersen is intended to address multipath errors and teaches that one way to refine radio signals received by RFID tags is by using a Kalman filter. *Id.* at 59–60 (citing Ex. 1007, 11:25–28, 11:32–36).

Petitioner also argues that Andersen “provides ample motivation to add a Kalman filter to Garber’s hand-held device” to provide “correction of multi scanned signal / multipath errors.” Pet. 60 (citing Ex. 1007, 11:25–28, 11:32–36, 12:39–41). “As such,” Petitioner asserts, one of ordinary skill would have found it obvious “to modify Garber’s handheld device, which is used inside a library where shelves and other obstacles can result in multipath errors, to use Andersen’s Kalman filter to address these errors.” *Id.* at 60. Additionally, according to Petitioner, one of ordinary skill “could have combined Andersen’s Kalman filter with Garber’s hand-held device using known methods, and such a filter would merely perform the same function—resolving errors to improve detection accuracy, which is entirely predictable.” *Id.* Finally, Petitioner contends, one of ordinary skill would have had a reasonable expectation of success in making the proposed combination because “[t]he interrogator components described in Garber and Andersen were well-known at the time,” and the modification of Garber’s interrogator to include Andersen’s Kalman filter would have been straightforward for a person of ordinary skill. *Id.* at 60–61.

Patent Owner responds that the combination is based on impermissible hindsight because Petitioner did not explain why one of ordinary skill would have combined Garber and Andersen “to teach a control and processing unit employing an adaptive integrated filter or multiscan, coherent signal processing.” PO Resp.

53. According to Patent Owner, one of ordinary skill would not have been motivated to combine because “the problems solved by the ’711 [p]atent involve multiple signals, not the single signal problem addressed by Andersen.” *Id.* at 54.

We find that Petitioner has sufficiently proven that one of ordinary skill would have been motivated to combine Garber and Andersen. First, we agree with Dr. Sharon that Garber and Andersen are analogous art to the challenged claims of the ’711 patent because all three are directed to an RFID interrogation system and device, and that Garber and Andersen are reasonably pertinent to the technical problem addressed by the claimed invention—creating an interrogation system for identifying and accounting for items that does not require each device to be interrogated separately and allows an identification element to be attached to each item. *See* Ex. 1002 ¶¶ 176–182.

We also agree with Petitioner and Dr. Sharony that the references themselves provide motivations to combine because Garber discloses “identifying multiple tagged items and their location in the reader’s interrogation zone” and Andersen discloses “using a Kalman filter with a position sensor to improve the location accuracy of the tagged items.” Ex. 1002 ¶ 180; Ex. 1016 ¶¶ 51–52. Specifically, we agree with Dr. Sharony that Andersen teaches that multipath errors caused by reflection of a radio signal off interfering structures (such as would be found in a library where Garber’s hand-held RFID reader is intended to be used) can be resolved using a Kalman filter in order “to improve the accuracy of the calculated position information.” Ex. 1002 ¶¶ 179–180; *see* Ex. 1007, 11:25–28, 11:32–36, 12:39–41. We further agree with Dr. Sharony that “it would have been obvious . . . to modify Garber’s handheld device, which is used inside a library where shelves and other obstacles can result in multipath errors, to use Andersen’s Kalman filter to address these errors.” *Id.* ¶ 180. Finally, we agree

that the combination would have been predictable and that one of ordinary skill would have had a reasonable expectation of success. *See id.* ¶¶ 181–182.

For the foregoing reasons, we find that Petitioner has proven by a preponderance of the evidence that one of ordinary skill would have been motivated to combine Garber and Andersen as Petitioner proposes.

G. Grounds 3–6

Grounds 3–6 were presented to the extent the Board determines “RFID sensing subsystem,” “metal sensing subsystem,” and “control and processing subsystem” to be means-plus-function terms. *See* Pet. 61, 70. Petitioner, however, did not argue for such constructions, and Patent Owner did not either. *See* Pet. 60–61, 70–71; PO Resp. 9–16. Because these grounds are premised on claim constructions neither party advances, we do not address them.

H. Patentability Conclusion

Claims 1, 3–10, 15, 16, and 18 of the ’711 patent are unpatentable because they would have been obvious under 35 U.S.C. § 103 in view of Garber, Werb, and Andersen.

I. Objections to Demonstratives

Both parties filed objections to the opposing party’s demonstrative exhibits for use at oral argument. Petitioner contends that certain of Patent Owner’s slides contain new argument not previously made in any paper and evidence not previously asserted or relied on in any paper. *See* Paper 32. Patent Owner similarly contends that certain of Petitioner’s slides contain new argument and evidence not previously referenced or relied on. *See* Paper 34.

The parties’ demonstrative exhibits are not evidence and we do not rely on them herein. *See* PTAB Consolidated Trial Practice Guide 84 (Nov. 2019), available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>

(explaining that demonstrative exhibits are merely “aids to oral argument and not evidence” and, therefore, “the Board has not found that such objections are helpful in many cases”). Accordingly, we do not sustain the parties’ objections.

III. CONCLUSION

Petitioner has met its burden of showing that claims 1, 3–10, 15, 16, and 18 are unpatentable.⁷

Claim(s)	35 U.S.C. § ⁸	Reference(s)	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 3–5, 8– 10, 15, 16	103(a)	Garber, Werb	1, 3–5, 8–10, 15, 16	
6, 7, 18	103(a)	Garber, Werb, Andersen	6, 7, 18	
1, 3–5, 8– 10, 15, 16	103(a)	Garber, Andersen, Martinez, Arndt		
6, 7, 18	103(a)	Garber, Werb, Andersen, Martinez, Arndt		
1, 3–5, 8– 10, 15, 16	103(a)	Garber, Werb, Martinez		
6, 7, 18	103(a)	Garber, Werb, Andersen, Martinez		
Overall Outcome			1, 3–10, 15, 16, 18	

⁷ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

⁸ As explained above, we do not reach Grounds 3–6.

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