

Paper No. 48
Date Filed: January 21, 2026

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SMAXTEC INC. and
SMAXTEC ANIMAL CARE GMBH,

Petitioners,

v.

ST REPRODUCTIVE TECHNOLOGIES, LLC,

Patent Owner,

Case No. IPR2024-00885
Patent No. 8,823,515

ST REPRODUCTIVE TECHNOLOGIES, LLC'S NOTICE OF APPEAL

Patent Owner ST Reproductive Technologies, LLC (“ST”) hereby appeals to the U.S. Court of Appeals for the Federal Circuit from: (i) the Final Written Decision of the Patent Trial and Appeal Board in Case IPR2024-00885, entered on November 20, 2025 (Paper No. 47); and (ii) any underlying orders, decisions, rulings, and opinions. *See* 35 U.S.C. §§ 141(c), 142; 37 C.F.R. §§ 90.2(a), 90.3.

ST files this Notice of Appeal within sixty-three (63) days of the Board’s Final Written Decision. *See* 35 U.S.C. § 142 and 37 C.F.R. § 90.3(a)(1).

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), ST indicates that the issues on appeal include, but may not be limited to: (a) the Board’s determination that claims 1-4 and 15-25 of U.S. Patent No. 8,823,515 were proven unpatentable, including any underlying questions of law or fact; and (b) any finding, determination, judgment, or order supporting or related to the Final Written Decision and decided adversely to Patent Owner.

Pursuant to 37 C.F.R. § 90.2(a), ST is filing this Notice of Appeal with the Director of the United States Patent and Trademark office, *see id.* § 104.2, and a copy of this Notice of Appeal is being filed electronically with the Board, *see id.* § 42.6(b). In addition, pursuant to Federal Circuit Rules 15(a)(1) and 25(b)(1), a copy of this Notice of Appeal is being filed with the Clerk’s Office for the Federal Circuit, along with payment of the required fee.

IPR2024-00885
Patent No. 8,823,515

Respectfully submitted,

Date: January 21, 2026

By: /Daniel L. Moffett/
Daniel L. Moffett
Registration No. 60,715
Counsel for Patent Owner

CERTIFICATE OF FILING

I certify that the foregoing was filed electronically with the Board through the Patent Trial and Appeal Case Tracking System (P-TACTS), and a paper copy was served by Priority Mail Express on January 21, 2026 with the Director of the United States Patent and Trademark Office, at the following address:

Director of the U.S. Patent and Trademark Office
c/o Office of the General Counsel
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

I further certify that a true and correct copy of the foregoing Notice of Appeal, along with the required filing fee, was filed electronically with the Court of Appeals for the Federal Circuit via CM/ECF on January 21, 2026. Per Federal Rule of Appellate Procedure 15(c)(3), one copy of this Notice of Appeal is being filed by Priority Mail Express with the Clerk's office of the United States Court of Appeals for the Federal Circuit on January 21, 2026, at the following address:

Clerk of Court
United States Court of Appeals for the Federal Circuit
717 Madison Place NW
Washington, DC 20439

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), and the parties' agreement to accept electronic service, I certify that a copy of the foregoing ST Reproductive Technologies, LLC's Notice of Appeal was served on counsel of record on January 21, 2026 by delivering a copy via electronic mail to counsel of record for the Petitioners at the following addresses:

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Date: January 21, 2026

Respectfully submitted,

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SMAXTEC INC. and
SMAXTEC ANIMAL CARE GMBH,
Petitioner,

v.

ST REPRODUCTIVE TECHNOLOGIES, LLC,
Patent Owner.

IPR2024-00885
Patent 8,823,515 B2

Before SHARON FENICK, JAMIE T. WISZ, and
ANDREAS BALTATZIS, *Administrative Patent Judges*.

WISZ, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
Dismissing Patent Owner's Motion to Exclude
35 U.S.C. § 318(a); 37 C.F.R. § 42.64

I. INTRODUCTION

smaXtec Inc. and smaXtec Animal Care GmbH (collectively, “Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–4 and 15–25 (the “challenged claims”) of U.S. Patent No. 8,823,515 B2 (Ex. 1001, “the ’515 patent”). Paper 1 (“Pet.”). ST Reproductive Technologies, LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply (Paper 10, “Prelim. Reply”) and Patent Owner filed a Preliminary Sur-Reply (Paper 13, “Prelim. Sur-Reply”). Upon consideration of these filings and the preliminary evidence of record, we determined that Petitioner had demonstrated a reasonable likelihood that it would prevail with respect to at least one of the challenged claims of the ’515 patent (Paper 16, “Institution Decision” or “Inst. Dec.”). Thus, we instituted review with respect to all of the challenged claims.

Patent Owner filed a Patent Owner’s Response (Paper 20, “PO Resp.”). Petitioner filed a Reply (Paper 28, “Pet. Reply”). Patent Owner filed a Sur-Reply (Paper 32, “PO Sur-Reply”).

An oral hearing was held on September 9, 2025, and a transcript of the hearing is included in the record (Paper 46, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6. After considering the parties’ arguments and supporting evidence, we conclude that Petitioner has proven by a preponderance of the evidence that claims 1–4 and 15–25 of the ’515 patent are unpatentable. 35 U.S.C. § 316(e).

II. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies smaXtec Inc. and smaXtec Animal Care GmbH as the real parties-in-interest. *See* Pet. xiii. Patent Owner identifies ST

Reproductive Technologies, LLC and Inguran, LLC as the real parties-in-interest. Paper 45, 1.

B. Related Matters

The parties identify the following district court litigation involving the '515 patent: *ST Reproductive Technologies, LLC d/b/a STInsight v. Smaxtec Inc. and smaXtec Animal Care GmbH*, Case No. 24-cv-00037 (W.D. Wis.), filed on January 18, 2024. Pet. xiii; Paper 45, 1.

Petitioner further identifies “a concurrent *Inter Partes* Review Petition challenging the patentability of U.S. Patent No. 9,844,206, which is a continuation of U.S. Patent No. 8,823,515.” Pet. xiii; *see also* IPR2024-00875, Paper 1.

C. The '515 Patent (Ex. 1001)

The '515 patent relates to “a computer implemented animal management method which matches animal information retrieved from a radiofrequency identification device implanted in an animal with animal information retrieved from a database of at least one computer.” Ex. 1001, 1:14–18. The '515 patent describes the “radiofrequency identification device (‘RFID’ or ‘RFID device’)” as “an object that can be attached to or incorporated into a product, animal, or person typically for the purpose of locating and identif[ying] . . . that object using radio waves.” *Id.* at 1:22–26. According to the '515 patent, conventional RFID devices contain at least “an integrated circuit for storing and processing information, modulating and demodulating a radio frequency (RF) signal and perhaps other specialized functions,” and “an antenna for receiving and transmitting the radio signal.” *Id.* at 1:34–38.

Figure 1 of the '515 patent illustrates a system including an RFID device and is reproduced below.

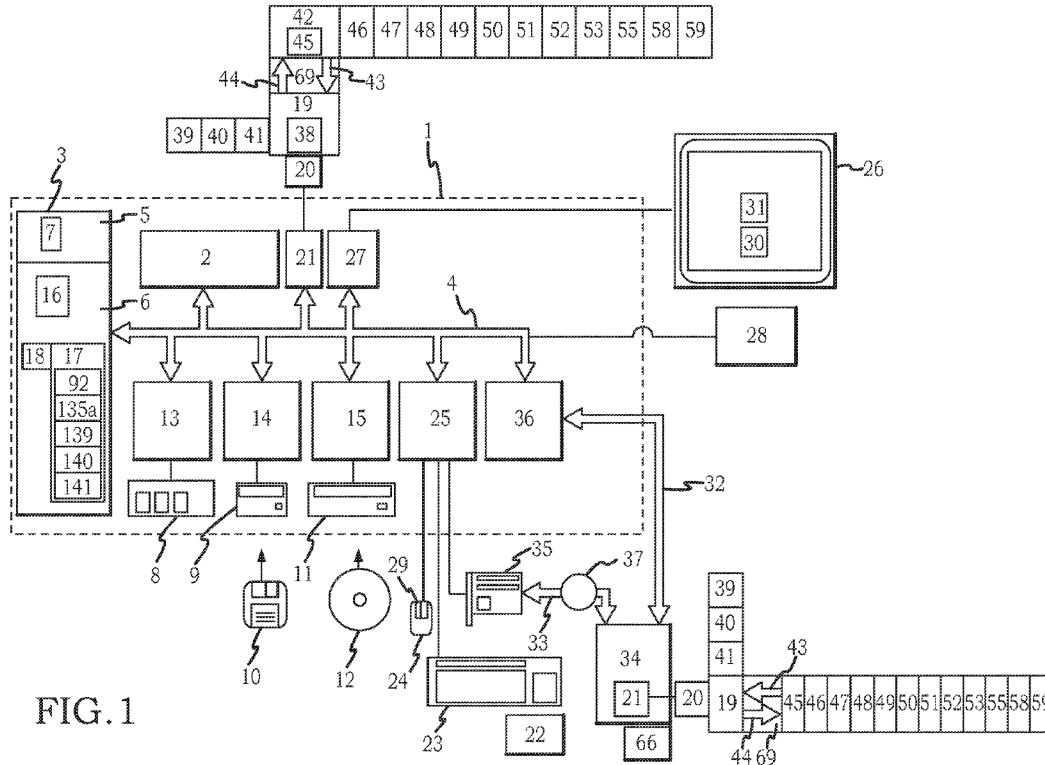


Figure 1 shows a block diagram of an animal management system including an RFID. *Id.* at 3:7–9.

The animal management system is shown as server computer (1) interacting with two RFIDs (19). *Id.* at 6:24–29. Server computer (1) includes at least one processing unit (2) and memory element (3). *Id.* at 5:45–53. Server computer (1) also includes “animal management application (17) which . . . can include a radiofrequency identification (‘RFID’) encoder-decoder application (18) which functions to encode and decode RFID data (38) to and from a RFID device (19).” *Id.* at 6:24–40. “The term RFID (19) for the purposes of this invention can be any type of radiofrequency identification device as [above-]described or otherwise which can be attached, incorporated, implanted, imprinted, or held (individually and collectively referred to herein as ‘implanted’) on or within an RFID object (39).” *Id.* at 7:66–8:4.

The animal management system also includes RFID reader (42), which may transmit radio-frequency carrier signal (43) to RFID (19). *Id.* at 8:19–24. RFID (19) “may respond to the radio-frequency carrier signal (43) with a RFID data signal (44) to send and receive an amount of RFID information (45) from the RFID (19), or the like.” *Id.* at 8:24–27.

Figure 3 illustrates further details of the system and is reproduced below.

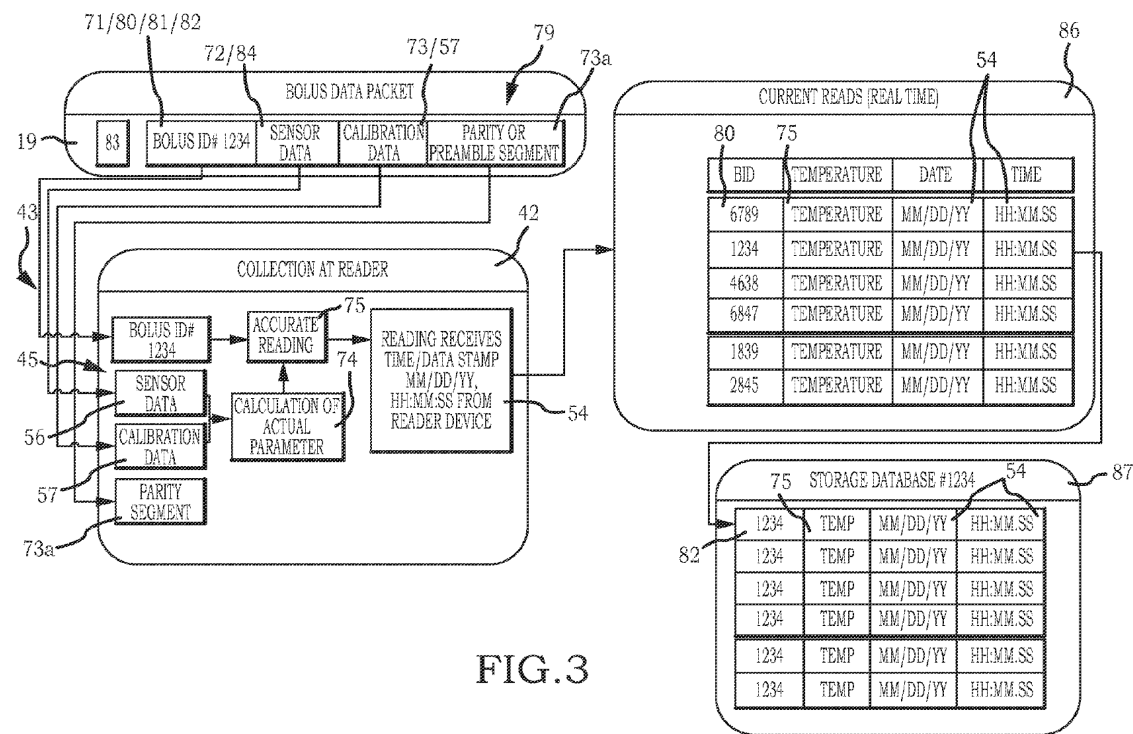


Figure 3 shows a block diagram including an RFID and an RFID reader. *Id.* at 3:13–18.

RFID (19) is “located in the hollow inside of a bolus (79).” *Id.* at 10:18–19. “Certain configurations of the bolus (79) can be ingested by . . . cattle and be retained in a part of the stomach.” *Id.* at 10:19–21. According to the ’515 patent:

A first bit segment (71) of the RFID device (19) implanted in an animal (40) can be encoded or re-encoded with an amount of

RFID object identification information (80) (which can be a bolus identification number (81), animal identification number (82), or the like). A second bit segment (72) of the RFID (19) can be encoded or re-encoded from time to time with sensed RFID object characteristics (84) received from a sensor (83) which can be located within the bolus (79) or otherwise implanted within the RFID object (39) whether an animal (40) or an asset (41). For the purposes of this invention, sensed RFID object characteristics (84) can include without limitation a sensed characteristic of the RFID object (39), animal (40) or asset (41), for example, any one or more of location, temperature, pH, or the like, or any one or more of physiological characteristics of an animal (40) such as temperature, pH, heart rate, blood pressure, partial pressures of dissolved gases, or the like.

Id. at 10:22–38. RFID object identification information (80) and sensed RFID object characteristics (84) can be collected from RFID (19) by RFID reader (42) “when the RFID object (39) passes within sufficiently close proximity of the RFID reader (42).” *Id.* at 10:55–61. The RFID information and sensed object characteristics are then “separated, sorted and loaded into a current reads database table (86) stored in the first RFID memory (52) or in the server computer (1) or in the remote computer (34) memory (as to certain embodiments).” *Id.* at 11:9–14.

D. Illustrative Claims

Petitioner challenges claims 1–4 and 15–25 of the ’515 patent. Pet. 1–2. Claim 1, which is the only challenged independent claim of the ’515 patent, is illustrative of the challenged claims, and is reproduced below¹:

¹ We adopt the bracketed identifiers added by Petitioner.

1. [Pre] A computer implemented method of animal tracking, comprising:

[A] connecting a computer to an RFID device reader;

[B] reading an RFID device implanted in an animal with said RFID device reader;

[C] retrieving an amount of animal identification information from said RFID device implanted in an animal;

[D] linking an amount of animal information of said animal stored in a data base of said computer to said amount of information retrieved from said RFID device implanted in said animal, said amount of animal information stored in said data base of said computer comprising an amount of milk production information or an amount of days milked;

[E] converting said amount of animal information of said animal stored in said database of said computer linked to said amount of information retrieved from said RFID device implanted in said animal into one or more logical variables;

[F] inserting at least one of said plurality of logical variables into at least one logical expression; and.

[G] obtaining a logical value relating to said animal.

Ex. 1001, 17:63–18:17. Challenged claims 2–4 and 15–25 depend from claim 1, either directly or indirectly.

E. Asserted References

Petitioner relies on the following references in its asserted grounds of unpatentability:

Name	Reference	Ex. No.
Brune	US 6,059,733, issued May 9, 2000	1008
Laitinen	US 7,059,275 B2, issued June 13, 2006	1006
Rollins	US 2006/0161443 A1, published Jul. 20, 2006	1037

Name	Reference	Ex. No.
Buchanan	WO 2006/059916 A2, published June 8, 2006	1011
Liao	WO 2007/089184 A1, published Aug. 9, 2007	1010
Trevarthen	Trevarthen, <i>The Importance of Utilising Electronic Identification for Total Farm Management: A Case Study of Dairy Farms on the South Coast of NSW</i> (Bachelor Thesis, University of Wollongong) (Oct. 24, 2005)	1005

F. The Asserted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability:

Ground	Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1	1–2	102/103	Trevarthen
2	3–4	103	Trevarthen and Brune
3	15–25	103	Trevarthen and Rollins
4	1–2	103	Laitinen, Buchanan, and Liao
5	3–4	103	Laitinen, Buchanan, Liao, and Brune
6	15–25	103	Laitinen, Buchanan, Liao, and Rollins

Petitioner supports its contentions with the declarations of Tami M. Brown-Brandl, Ph.D. (Exs. 1003, 1055) and June Munford (Ex. 1031), among other evidence. Patent Owner supports its contentions with

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284 (2011), amended 35 U.S.C. §§ 102 and 103, was effective on March 16, 2013. The ’515 patent claims priority to an application that has a filing date before March 16, 2013, and Petitioner applies the pre-AIA versions of §§ 102 and 103. *See* Pet. 7, 22, 26, 36, 38, 39 (arguing that the asserted references are prior art under pre-AIA § 102(b)). Thus, for purposes of this Decision, we apply the pre-AIA versions of §§ 102 and 103. We note that our analysis in this Decision would not change under AIA law.

declarations from Timothy J. Bowser (Exs. 2001, 2009) and Meredith Knoff (Ex. 2011), among other evidence.

III. ANALYSIS

A. *Legal Standards*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner must explain with particularity how the prior art would have rendered the challenged claims unpatentable. 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104(b)(4) (“The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.”).

1. *Anticipation*

To establish anticipation under 35 U.S.C. § 102, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). Each element of the challenged claim must be found, either expressly or inherently, in the single prior art reference. *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631

(Fed. Cir. 1987). When evaluating a prior art reference in the context of anticipation, the reference must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). “[A] reference can anticipate a claim even if it ‘d[oes] not expressly spell out’ all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would ‘at once envisage’ the claimed arrangement or combination.” *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) (quoting *In re Petering*, 301 F.2d 676, 681 (CCPA 1962)).

In order to be anticipatory, a prior art reference must enable a person of ordinary skill in the art to make the invention without undue experimentation. *See Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1336 (Fed. Cir. 2008). A sufficiently enabling anticipatory reference must put the invention “in the possession” of the person of ordinary skill in the art. *See Impax Labs., Inc. v. Aventis Pharms. Inc.*, 545 F.3d 1312, 1315 (Fed. Cir. 2008).

2. Obviousness

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. *See 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) objective evidence of nonobviousness, i.e., secondary

considerations.³ *See Graham v. John Deere Co. of Kan. City*, 383 U.S. 1, 17–18 (1966).

B. Person of Ordinary Skill in the Art

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

Petitioner asserts that a person of ordinary skill in the art (“POSA”) as of the claimed priority date would have “had at least a bachelor’s degree in animal science, biological engineering, electrical engineering, or computer science, or a related or equivalent field, and three or more years of experience researching, developing, designing and/or evaluating RFID tracking and sensor systems for livestock management.” Pet. 5–6 (citing Ex. 1003 ¶¶ 26–27). Patent Owner does not contest Petitioner’s characterization for purposes of this proceeding. *See* PO Resp. 4.

On this record and for the purposes of institution, we determine this level of skill, with the exception of the open-ended phrases “at least” and “or more,” which we remove from Petitioner’s proposal, comports with the qualifications a person would have needed to understand and implement the teachings of the ’515 patent and the prior art of record.

C. Claim Construction

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc), i.e., as

³ Neither party presents arguments or evidence relating to secondary considerations in this case.

construed in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Id.* at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

In our Institution Decision, we discussed the claim construction of the limitation, “implanted in an animal.” Inst. Dec. 22–24. We address this issue below.

1. Implanted in an Animal

Independent claim 1 includes the limitation of “retrieving animal identification information from an RFID device *implanted in* an animal.” Ex. 1001, 18:1–2. (emphasis added). Dependent claims 2–4 and 15 include the limitation “a plurality of RFID devices implanted in a plurality of animals,” and dependent claim 25 recites “reading an RFID device implanted in an animal.” *Id.* at 18:23–36, 19:6–7, 46–47.

We preliminarily construed the plain and ordinary meaning of “implanted in an animal,” as implanted *within* the animal rather than *on* the animal. Inst. Dec. 23–24.

a) Patent Owner’s Position

Patent Owner argues that “the Board should adopt the construction” of implanted *within* the animal as “consistent with the plain and ordinary meaning of the claim language, the specification, and testimony from both parties’ technical experts.” PO Resp. 4–5. As to the plain meaning, Patent

Owner argues that “even a layperson would understand that ‘implanted *in* an animal’ means implanted within that animal and is distinct from ‘implanted *on* an animal.’” *Id.* at 5. Next, Patent Owner argues that this interpretation is consistent with the ’515 patent Specification. *See id.* at 5–6. For example, the ’515 patent Specification describes an RFID “as one that ‘can be attached, incorporated, implanted, imprinted, or held (individually and collectively referred to herein as “implanted”) on or within an RFID object.’” *Id.* at 6 (citing Ex. 1001, 7:66–8:4). Patent Owner argues that this sentence “*distinguishes* devices that are implanted ‘on’ an RFID object from those that are implanted ‘within’ an RFID object.” *Id.* Finally, Patent Owner argues that declarant testimony indicates one skilled in the art would have understood “implanted in an animal” as distinguishable from an external device. *See id.* at 7 (citing Ex. 1003 ¶¶ 99, 150; Ex. 2009 ¶¶ 38–47).

b) Petitioner’s Position

Prior to institution, Petitioner argued that one skilled in the art “would understand from the [S]pecification that being ‘attached’ to the ear is being ‘implanted;’ further, the device is ‘in’ the ear in the same sense that an earring is also placed ‘in’ the ear.” Prelim. Reply 3 (citing Ex. 1001, 7:66–8:3). Petitioner does not address our preliminary interpretation in the Institution Decision, nor Patent Owner’s response thereto. *See generally* Pet. Reply.

c) Analysis

We adopt Patent Owner’s construction of implanted *in* an animal as meaning implanted *within* an animal. We agree with Patent Owner that this construction is consistent with the plain and ordinary meaning of the claim language, and is further consistent with the Specification. Specifically, we

find that the Specification defines “implanted” as encompassing RFIDs attached or implanted “on or within” an animal, and the plain language of the claim expressly recites “in,” which, we determine corresponds to “within” as described by the ’515 patent Specification. *See* Ex. 1001, 7:66–8:4.

D. Ground 1 Asserted Anticipation/Obviousness of Claims 1 and 2 over Trevarthen Publication⁴

Petitioner contends that claims 1 and 2 are anticipated and/or rendered obvious by Trevarthen. Pet. 6–21. Patent Owner disputes Petitioner’s contentions arguing that Trevarthen does not qualify as a printed publication under 35 U.S.C. § 102(b) (pre-AIA) (PO Resp. 8–21) and Trevarthen does not anticipate or render obvious the challenged claims (PO Resp. 21–27). We address these issues below.

1. Trevarthen (Ex. 1005)

Trevarthen relates to utilizing RFID technology on dairy farms “to enhance total farm management.” Ex. 1005, Abst. As an example, Trevarthen describes a case study of the Cochrane dairy farm, which “has a strong use of RFID technology” and “is well known in the region as one of the most advanced RFID setups.” *Id.* at 69.⁵ According to Trevarthen, each

⁴ The header for section VI.A. of the Petition reads, “Ground 1: Trevarthen Anticipates or Renders Obvious Claims 1–2 and 15–20;” however, only claims 1 and 2 are discussed in this section. Pet. 6. Similarly, only claims 1 and 2 are listed for Ground 1 in the “Identification of Challenges” table in Section II.B. of the Petition. *Id.* at 2. Thus, we treat the reference to claims 15–20 in the header for Section VI.A. as a typographical error and we do not address those claims with regard to Ground 1.

⁵ Petitioner’s exhibits include Bates Numbering, but both parties cite to the original pagination of the documents. For consistency with the parties’

cow in the farm's herd has an RFID tag attached to its right ear and "[t]his RFID tag is utilised to aid in farm management operations from early in a cow[']s life." *Id.* The Cochrane dairy farm uses a software package to aid in herd management and "to also provide the basis for their RFID operations." *Id.* at 71. For example, "[a]s each cow passes through the RFID reader," its "individual information is displayed on two computer screens" and the "information is drawn from the central herd management database." *Id.* at 78. The individual information identifies cows with specific attributes, e.g., "slow milking cows," and "freshly calved cows." *Id.* at 78–79. Trevarthen discloses that the Cochrane farm is considering implementing "milking meters for every milking bail . . . to record the amount of milk each cow has provided at every milking session" because "[a]ttaining milk production figures for every cow from every milking session will provide vastly more information for the farmers to utilise in their farm management decisions." *Id.* at 98.

Beyond the case study, Trevarthen proposes future enhancements for RFID use at dairy farms. *Id.* at 99. RFIDs may include "RFID tags, boluses or microchips" that "provide the same functionality, reliability and accuracy" so that individual farmers can select the device that best suits their requirements. *Id.* As to RFID enhancements, Trevarthen discloses "that it is possible to incorporate temperature sensing abilities into RFID microchips currently . . . which may soon be extended to the livestock industry. Such a device will provide the temperature of the cow along with the cow[']s unique identification number every time the tag is read by an RFID reader."

citations, we refer to the document's page numbers except when noted otherwise.

Id. at 121. According to Trevarthen, “reading this temperature will allow a more rapid response to aid in detection and subsequent treatment of any illnesses that a cow may have attracted.” *Id.* Trevarthen discloses that “when temperature fluctuations are recognised by the system, functionality could be incorporated to allow the system to alert the farmer of such fluctuations via means such as a beeper device that the farmer may carry, sending a text message to their mobile phone, or by similar rapid alert device.” *Id.* at 122.

2. *Whether Trevarthen Is a Prior Art Printed Publication*

Petitioner asserts that Trevarthen qualifies as pre-AIA 35 U.S.C. § 102(b) art because it was publicly available as a printed publication before September 15, 2008. Pet. 7–9; Pet. Reply 1–6. Petitioner supports its contention with the declarations of Dr. Brown-Brandl (Exs. 1003, 1055); June Munford, M.L.I.S. (Ex. 1031), a library information scientist; and Nathaniel Frank-White (Ex. 1030), a records request processor at the Internet Archive (Wayback Machine). *Id.*

Patent Owner argues that Petitioner fails “to prove by a preponderance of the evidence that Trevarthen qualifies as prior art.” PO Resp. 8–21. Petitioner supports its contention with the declarations of Dr. Bowser (Ex. 2009) and Ms. Knoff (Ex. 2011). *See id.*

a) *Legal Standards for Printed Publications*

For a reference to qualify as a printed publication, it “must have been sufficiently accessible to the public interested in the art.” *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009) (quoting *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989)). The touchstone is “public accessibility,” and this “is determined on a case-by-case basis based on the ‘facts and circumstances surrounding the reference’s disclosure to members of the public.’” *Id.*

(quoting *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004)); *see also Samsung Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1369 (Fed. Cir. 2019) (In some cases “public accessibility depends on a careful, case-by-case examination of how a particular reference was disseminated, to whom, for how long, and under what circumstances.”). “A given reference is ‘publicly accessible’ upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art[,] exercising reasonable diligence, can locate it.” *SRI Int’l, Inc. v. Internet Sec. Sys., Inc.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008) (quoting *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1378 (Fed. Cir. 2006)).

“When a reference is uploaded to a website or deposited in a library, the fact that the reference is indexed or cataloged in some way can indicate that it is publicly accessible.” *Samsung*, 929 F.3d at 1369. “But indexing is not ‘a necessary condition for a reference to be publicly accessible’; it is but one among many factors that may bear on public accessibility.” *Voter Verified, Inc. v. Premier Election Sols., Inc.*, 698 F.3d 1374, 1380 (Fed. Cir. 2012) (quoting *In re Lister*, 583 F.3d at 1312). “[W]hile often relevant to public accessibility, evidence of indexing is not an absolute prerequisite to establishing online references . . . as printed publications within the prior art.” *Id.*

b) Analysis

Public accessibility is a legal conclusion based on underlying factual determinations. *Voter Verified*, 698 F.3d at 1380. We determine that Petitioner shows by a preponderance of the evidence that Trevarthen qualifies as a printed publication and thus is prior art to the ’515 patent. In doing so, we weigh evidence both for and against this determination.

(1) Trevarthen was available on the University of Wollongong's online depository

The parties agree that the evidence supports at least the “technical accessibility” of Trevarthen. *See* Pet. 7–8; PO Resp. 17–18. That is, the Internet Archive (Wayback Machine) shows that Trevarthen was available on the University of Wollongong’s Research Online website on September 7 and 12, 2007, and March 22, 2008. Ex. 1031 ¶¶ 27–33; *see also* Ex. 1030, Ex. B. Patent Owner argues that Trevarthen’s mere availability on the Research Online website is not enough to show public accessibility, and we agree. PO Resp. 18–19. But Petitioner does not rely solely on this evidence.

As additional evidence of public accessibility, Petitioner shows that Research Online’s purpose is to “promote[] the scholarly output of the University of Wollongong,” allowing “‘easy discovery’ of uploaded publications ‘via Google and Google Scholar’” thereby increasing their visibility. Pet. 8 (citing Ex. 1027, 150). Petitioner supports this argument with declaratory testimony (e.g., Exs. 1030, 1031) and documentary evidence (Exs. 1027, 1028, 1029). Our reviewing court has held “that where a publication’s purpose is ‘dialogue with the intended audience,’ that purpose indicates public accessibility.” *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1374 (Fed. Cir. 2021) (quoting *Suffolk Techs., LLC v. AOL Inc.*, 752 F.3d 1358, 1365 (Fed. Cir. 2014)).

Patent Owner argues that we “should discount Munford’s ultimate opinion of accessibility because it depends entirely on taking the University’s description of its preferred practice as ‘fact,’” and “expert testimony should be given little to no weight where it simply adopts the statements of others and presents them as opinion.” PO Resp. 12 (citing *Wi-LAN Inc. v. Sharp Elecs. Corp.*, 992 F.3d 1366, 1374–75 (Fed. Cir. 2021)).

Additionally, Ms. Knoff testifies that “during the relevant time period of 2008 and 2009, online institutional repositories were not an effective tool for disseminating research” as compared to more traditional methods of publishing. Ex. 2011 ¶ 18.

We are not persuaded that we should discount Petitioner’s declarant testimony because it is supported by extrinsic evidence. Rather, we credit Petitioner’s evidence that the University of Wollongong used Research Online as an open access digital archive and institutional repository to support scholarly output, such as the Trevarthen thesis. Ex. 1031 ¶ 18; Ex. 1027, 149–150. Even if that was not an effective tool as compared to traditional publishing (Ex. 2011 ¶ 18), the Research Online’s stated purpose to promote scholarly output weighs in favor of Trevarthen’s public accessibility. *See Valve*, 8 F.4th at 1374.

(2) Trevarthen’s download statistics

Petitioner asserts that “Trevarthen was downloaded hundreds of times before September 2008.” Pet. 8 (citing Ex. 1031 ¶¶ 21–26; Ex. 1030, Ex. A). In reply to Patent Owner’s response, Petitioner specifies that “[t]he evidence shows 324 downloads of Trevarthen by September 7, 2007, and 569 downloads less than a year later on March 22, 2008.” Pet. Reply 4 (citing Ex. 1030, 13, 15).

Patent Owner responds that Petitioner “provides no evidence regarding how many unique individuals downloaded the reference, who those individuals are, how those individuals located the reference, or whether the download count is reliable.” PO Resp. 18. Instead, Patent Owner argues that “download counts tracked by institutional repositories are known to be unreliable, and even if they were reliable, all downloads could have resulted from Research Online directly, which has no bearing on

Trevarthen’s findability on Google.” *Id.* at 18–19 (citing Ex. 2011 ¶ 21; Ex. 2009 ¶ 110).

We are not persuaded that we should entirely discount the download statistics in the absence of evidence of unique downloads or individuals. Even if the download numbers do not exactly represent unique downloads by unique individuals, the evidence shows that Trevarthen was downloaded, and therefore distributed, prior to the filing date of the ’515 patent. Accordingly, we find this evidence weighs in favor of Trevarthen’s public accessibility.

(3) The parties’ date-limited Internet searches

Patent Owner argues that even if Trevarthen was made available on Research Online, it would not have been accessible or indexed by a search engine, e.g., Google. PO Resp. 11–13; Ex. 2011 ¶¶ 18–25. Patent Owner’s two declarants performed date-limited Google searches, “using the search terms Petitioners contend a POSA would have used.” PO Resp. 13–15. Patent Owner’s declarants did not locate Trevarthen searching with Google and limiting the publication date prior to September 15, 2009. Ex. 2009 ¶¶ 90–105; Ex. 2011 ¶¶ 32–48. Accordingly, Patent Owner argues that “[e]ven if Trevarthen was technically ‘on’ Google, its absence from search results means that Trevarthen would not have been located with reasonable diligence.” PO Resp. 15.

In reply, Petitioner submits declarant testimony describing the “same searches on Google Scholar that Patent Owner’s expert performed on Google, and in each instance Trevarthen was within the first few pages of search results.” Pet. Reply 3 (citing Ex. 1055 ¶¶ 11–13). Patent Owner challenges Petitioner’s search results for failing “to cite any evidence

showing that Trevvarthen was even made available to Google Scholar before 2009.” PO Sur-Reply 6.

The evidence of record shows that Trevvarthen was not found using date-limited Google searches, but was found using Google Scholar. Ex. 2009 ¶¶ 90–105; Ex. 2011 ¶¶ 32–39; Ex. 1055 ¶¶ 11–13. As such, we find the date-limited searching less helpful in determining whether Trevvarthen was publicly accessible as of September 15, 2009. Even if we weigh Patent Owner’s evidence of Google searches against public accessibility, we do not find this evidence dispositive as “indexing is not ‘a necessary condition for a reference to be publicly accessible’; it is but one among many factors that may bear on public accessibility.” *Voter Verified*, 698 F.3d at 1380.

(4) International Search Report lists Trevvarthen

Petitioner further argues that other evidence corroborates “Trevvarthen’s public accessibility.” Pet. 9. Specifically, Petitioner cites an International Search Report (“ISR”) dated March 18, 2008 in PCT/NZ2007/000286 that lists Trevvarthen as a relevant document. *Id.* (citing Exs. 1028, 1029). Petitioner asserts that the ISR “confirms the pre-September 2008 public accessibility of Trevvarthen to the POSA searching publicly available databases using keywords including ‘cattle’ and ‘RFID.’” *Id.* (citing Ex. 1028; Ex. 1031 ¶¶ 34–39; Ex. 1003 ¶¶ 69–70).

Patent Owner argues that “the International Search Report cannot overcome Bowser’s demonstration that a POSA would not have located Trevvarthen as Petitioner[] suggest[s].” PO Resp. 19. Patent Owner further argues that “the search report does not specify which database or search terms, if any, actually led the examiner to Trevvarthen, nor does it specify the effort required to find Trevvarthen.” *Id.* at 19–20 (citing Ex. 1028, 1). Patent

Owner distinguishes *Valve*, in which “the Court noted that an examiner’s ability to access a reference was probative of public accessibility where the examiner had located the reference through a ‘brief’ internet search.” *Id.* (citing 8 F.4th 1364, 1373–76). In contrast, according to Patent Owner, “Petitioners provide no evidence or argument that the Australian examiner located Trevarthen with an internet search engine, let alone whether such a search was ‘brief.’ Without any evidence showing that the examiner found Trevarthen with reasonable diligence, the International Search Report cannot independently establish Trevarthen’s public accessibility.” *Id.*

Petitioner replies that “[a]ccording to the ISR, the examiner searched ‘DWPI, internet, AusPat, Patent Lens, PCT Gazette, Esp@cenet, [and] GetThePatent.’ Of these sources, the only one that would include a thesis such as Trevarthen is the internet.” Pet. Reply 5 (citing Ex. 1055 ¶¶ 16–17) (internal citation omitted, second alteration by Petitioner). Further, Petitioner argues that “[c]itation of a reference in an ISR with the full URL of the reference is persuasive evidence of public accessibility.” *Id.*

We find the ISR identifying Trevarthen prior to the filing of the ’515 patent to be “highly probative evidence of public accessibility.” *Valve*, 8 F.4th at 1376. Although the ISR does not provide the same level of detail as the declarants’ Internet searches, we find the ISR persuasive evidence that Trevarthen was located using an Internet search. Specifically, the ISR lists the Internet as an electronic database and identifies Trevarthen by its URL, i.e., its location on the Internet. *See* Ex. 1028, 1. And although the *Valve* court highlighted the examiner’s “brief . . . search,” we disagree with Patent Owner’s implication that, to find the ISR probative of public availability, we must look to whether the examiner found the relevant document after only a brief search. *Valve*, 8 F.4th at 1376. Rather, we agree with the general

principle set forth by the *Valve* court, “[i]f an examiner could access the article before the priority date, so could the general public.” *Id.*

(5) *Conclusion*

We find that a preponderance of the evidence supports Petitioner’s argument that Trevarthen was publicly available. Specifically, the evidence shows that the University’s online repository—whose purpose was to promote scholarly output—published Trevarthen, Trevarthen was downloaded from the online repository, and a patent examiner found Trevarthen searching the Internet prior to the filing date. We balance this evidence against Patent Owner’s evidence that date-limited Google searches could not identify Trevarthen. Weighing the evidence, we conclude that Trevarthen was “sufficiently accessible to the public interested in the art” and therefore qualifies as a “printed publication.” *Voter Verified*, 698 F.3d at 1380.

3. *Asserted Anticipation of Claims 1 and 2 over Trevarthen Publication*

Petitioner contends that Trevarthen alone discloses every element of claims 1 and 2. Pet. 6. Patent Owner contends that “Trevarthen does not clearly and unequivocally disclose any system arranged as claimed, forcing Petitioners to pick, choose, and combine various discussions” from different portions of Trevarthen. PO Resp. 22 (citing *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972)). In our Institution Decision, we invited the parties to further brief the anticipation issues in this case. Inst. Dec. 46. We analyze the parties’ arguments with regard to anticipation below.

According to Patent Owner, “Petitioners treat each claim limitation in isolation, relying on unrelated teachings from Trevarthen without addressing whether a POSA would ‘at once envisage’ a combination of those teachings

in a single integrated system arrange as claimed.” PO Resp. 23 (citing *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990); *Kennametal*, 780 F.3d at 1381 (quoting *In re Petering*, 301 F.2d at 681).

Petitioner argues that a person of ordinary skill in the art, reading Trevarthen, would “at once envisage” the claimed arrangement because Trevarthen provides a cohesive disclosure. Pet. Reply 6–7. According to Petitioner, “Trevarthen describes specific proposed improvements to existing farm management systems, which a POSA would understand to describe a single system.” *Id.* at 7 (citing Ex. 1055 ¶¶ 18–24). Petitioner explains that Trevarthen begins (in Chapter 5), by describing usage of RFID technology in existing farms like the Cochrane farm, including tagging cattle with RFID tags. *Id.* (citing Ex. 1005, 34–98). Petitioner also cites to Trevarthen’s disclosure that the Cochrane dairy was interested “in further advancing their RFID operations,” including using “milking meters” to obtain “milk production figures for each cow” to detect problems such a “illness.” *Id.* (citing Ex. 1005, 98).

Petitioner further explains that, in Chapter 6, Trevarthen describes ways to “build upon the current RFID usage” in dairy farms like the Cochrane farm, including “enhancements and ideas which could be considered as future additions to further add value to the utilization of RFID in farm management.” Pet. Reply 7 (citing Ex. 1005, 34–99; Ex. 1055 ¶¶ 55–65). According to Petitioner, “[t]he proposed framework for improving these dairy farms includes ‘RFID readers . . . to record a cow[’]s milk production (in association with milk meters).” *Id.*

We agree with Patent Owner that Petitioner’s anticipation argument involves picking and choosing from different sections of Trevarthen. For example, for limitation 1[A] (a “computer” connected to “an RFID device

reader”), Petitioner relies, *inter alia*, on Trevarthen’s discussion of the Cochrane dairy (Chapter 5), which describes cows with RFID ear tags passing through an RFID reader and having their individual information displayed on two computer screens located in the dairy. *See* Pet. 12–13 (citing Ex. 1005, 78). Further, for limitation 1[B] (“an RFID device implanted in an animal”), Petitioner cites to Chapter 2 (“Literature Review”) and Chapter 6 (“Towards Total Farm Measurement”) of Trevarthen, which discuss boluses and RFID microchips. *See* Pet. 13 (citing Ex. 1005, 20, 22, 24–25, 99–100, 102). For element 1[F] (“inserting at least one of said plurality of logical variables into at least one logical expression”), Petitioner cites to Chapter 6’s discussion of herd management software that can recognize certain patterns in the milk production of each cow, and for element 1[G] (“obtaining a logical value relating to said animal”), Petitioner cites to a different portion of Chapter 6, which discloses that, “if a cow provides a significantly lower amount of milk than their usual output, the system will be able to identify this disparity and alert the operators.” *See* Pet. 18, 20 (citing Ex. 1005, 109, 115; Ex. 1003 ¶ 112) (emphasis omitted).

While Petitioner contends that Trevarthen describes a single system, we find that the Cochrane dairy (described in Chapter 5) is a single system while Chapter 2 provides a background literature review and Chapter 6 discloses potential improvements to the Cochrane dairy’s use of RFID. *See* Ex. 2009 ¶¶ 118–124; Ex. 2010, 118:16–19, 119:12–16. While there may have been reasons for a person of ordinary skill in the art to combine these various disclosures, that issue is more relevant to an obviousness analysis than to anticipation.

Petitioner contends that “Trevarthen’s Chapter 6 provides numerous potential improvements to the farm, which are not mutually exclusive and

which a POSA would ‘at once envisage’ as part of a single farm management system.” Pet. Reply 8 (citing Ex. 1055 ¶ 23). However, we find that Petitioner’s picking and choosing of various disclosures from different sections of Trevarthen is not sufficient to show that a person of ordinary skill in the art would “at once envisage” the claimed arrangement by reading Trevarthen. *See Samsung Electronics Co., Ltd. v. Nanoco Technologies, Ltd.*, IPR2021-00182, Paper 42, 8–12 (PTAB May 16, 2022) (“When a prior-art reference discloses every limitation of the challenged claim only through a combination of multiple embodiments, it does not anticipate the challenged claim.”) (citing *Net MoneyIN*, 545 F.3d 1359 at 1370–71).

Thus, after carefully considering the arguments and evidence, we determine that Petitioner has not shown by a preponderance of evidence that claims 1 and 2 are anticipated by Trevarthen.

4. Asserted Obviousness of Claims 1 and 2 over Trevarthen Publication

The Petition provides an overview of where each of the claim 1 limitations are disclosed by Trevarthen. Pet. 9–21. Patent Owner contends that Petitioner improperly mixes and matches different disclosures from Trevarthen without providing a motivation to combine such disclosures or explaining how Trevarthen would have been modified to achieve the invention. PO Resp. 21–27. We review the parties’ positions below.

a) Independent Claim 1

(1) Preamble

The preamble of claim 1 recites “[a] computer implemented method of animal tracking.” Ex. 1001, 17:63.

Petitioner asserts that “Trevarthen describes a system using herd management software, which the POSA would have understood to be a computer implemented method of animal tracking.” Pet. 11–12 (citing Ex. 1003 ¶ 95; Ex. 1005, 100).

Patent Owner does not dispute that Trevarthen discloses the preamble of claim 1. We are sufficiently persuaded by Petitioner’s arguments and evidence that Trevarthen discloses the preamble of claim 1.⁶

(2) *Limitation 1[A]*

Limitation 1[A] recites “connecting a computer to an RFID device reader.” Ex. 1001, 17:65.

Petitioner asserts that a skilled artisan would have understood that conventionally RFID readers are connected to a computer. Pet. 12 (citing Ex. 1003 ¶¶ 96–97). In support of this assertion, Petitioner cites to Trevarthen’s description of the Cochrane dairy, which explains that, “[a]s each cow passes through *the RFID reader*, their individual information is *displayed on the two computer screens* located in the dairy’ indicating a connection between the RFID reader and the computer.” *Id.* (citing Ex. 1005, 78). Petitioner further contends that Trevarthen describes its system as containing “*mainstream computer network devices ...[which] provide the vital links to* dairy farm devices, such as *RFID readers*.” *Id.* (citing Ex. 1005, 104). According to Petitioner, the “POSA would have understood that the RFID reader collecting such data would be connected to

⁶ Because Petitioner has sufficiently shown that the prior art teaches the preamble, we need not determine whether the preamble is limiting. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

a computer that interfaces with the database.” *Id.* (citing Ex. 1003 ¶ 97; Ex. 1005, 77, 92–93).

Patent Owner contends that Petitioner’s obviousness argument engages in improper mixing and matching of disparate teachings in Trevarthen without supplying a reason to combine them. PO Resp. 25–27. Specifically, Patent Owner argues that Petitioner relies on a description of the Cochrane dairy to show how individual cow information is displayed on computer screens as each cow passes through the RFID reader. *Id.* at 25. However, according to Patent Owner, the Cochrane dairy “is indisputably a separate system from those disclosed in Trevarthen’s ‘theoretical framework’ that Petitioners rely on for other claim elements.” *Id.* at 25–26 (citing Pet. 13 (relying on alleged under-the-skin “microchip” and bolus for element 1[B] when Cochrane dairy employs ear tags), 14 (relying on alleged “RFID reader” discussed in one of Trevarthen’s theoretical systems for element 1[C]), 15–21 (relying on alleged “milk meters,” “data bases,” and “alerts” in various theoretical systems for elements 1[D]–1[G])). Patent Owner further contends that, even within Petitioner’s discussion of element 1[A], they rely on disparate teachings of the “computer screens” at the Cochrane dairy and “computer network devices” from a theoretical “future” system. *Id.* at 26 (citing Pet. 12–13). According to Patent Owner, “Petitioners fail to acknowledge that such disclosures are disparate teachings, let alone provide a reason to combine them to arrive at the claims.” *Id.* (citing Ex. 2009 ¶¶ 125–128).

Patent Owner further argues that Trevarthen’s discussion of “mainstream computer network devices” that may be linked to “RFID readers” in the future cannot separately disclose or render obvious element 1[A] because Trevarthen never explains how such devices were part of any

method, let alone one arranged as claimed. PO Resp. 26 (citing Pet. 12). Trevarthen states that, “[i]deally, farmers will be utilising wireless networks in future arrangements” to potentially “enable an array of devices” such as “mainstream computer network devices” to “provide the vital links to dairy farm devices, such as RFID readers.” *Id.* (citing Ex. 1005, 104; Pet. 12). However, according to Patent Owner, Petitioner fails “to take the required steps of explaining what methods would be modified to incorporate such ‘future arrangements’ and why or how a POSA would pursue such a modification.” *Id.* at 26–27. Lastly, Patent Owner contends that Petitioner never connects the “mainstream computer network devices” relied on for this claim element to the “said computer” limitation recited in elements 1[D] and 1[E]. *Id.* at 27 (citing Ex. 2009 ¶ 129; Pet. 12–17).

We find that Trevarthen teaches or suggests connecting a computer to an RFID device reader. As discussed above, Trevarthen discloses the Cochrane dairy’s use of two computer screens to display individual cow information obtained by an RFID reader. Ex. 1005, 78. We also credit the testimony of Petitioner’s declarant, Dr. Brown-Brandl, that this disclosure indicates that the RFID reader is connected to the computer. Ex. 1003 ¶ 97.⁷

⁷ Patent Owner also argues in its Sur-Reply that Trevarthen does not disclose the actual performance of the step of “connecting a computer to an RFID device reader,” and that Petitioner relies solely on attorney argument for this step. PO Sur-Reply 12. However, as discussed above, Petitioner’s declarant explains that Trevarthen indicates a connection between the RFID reader and the computer, which indicates that the RFID reader is connected to a computer such that “the POSA would have understood Trevarthen to disclose connecting a computer to an RFID device reader.” *See* Ex. 1003 ¶ 97 (citing Ex. 1005, 77–79, 92–93, 104).

We are not persuaded by Patent Owner’s argument that Petitioner’s reliance on the computers connected to RFID device readers from the Cochrane dairy cannot be combined with other aspects of the Trevarthen disclosure. Trevarthen’s abstract describes the purpose of the thesis as “aim[ing] to explore how the electronic identification technology of RFID (Radio Frequency Identification) can be utilised on dairy farms to enhance total farm management.” Ex. 1005, ix. This abstract further explains that the research in the thesis is based upon two case studies of dairy farms located in Australia, which vary in their use of RFID. *Id.* Trevarthen then explains that, “[u]tilising these case studies as a basis, a theoretical framework for implementing RFID on dairy farms is then proposed” and that “[p]ossible enhancements and future developments for RFID components are also identified and suggested throughout this framework.” *Id.* Trevarthen also identifies some of the “potential advantages” of using RFID technology such as “increased efficiencies, greater information availability, reduced feed and labour costs, improved milk quality and volume, improved herd health, ease of herd management and more.” *Id.* at 2.⁸ The abstract concludes that, “[i]t has been found that RFID technology provides the possibility for dramatic enhancements for total farm management, and thus is something that dairy farmers should investigate.” *Id.* at ix.

Chapter 5 of Trevarthen discloses a case study of the Cochrane dairy farm that makes “strong use of RFID technology” and describes how the Cochrane farm tags each cow with a RFID tag that facilitates its automatic identification and “utlise[s] a software package to aid in their herd

⁸ This citation is to the Bates numbering provided by Petitioner.

management.” Ex. 1005, 69–71. Trevarthen describes how “[a]s each cow passes through the RFID reader, their individual information is displayed on the two computer screens located in the dairy” and “[t]his information is drawn from the central herd management database, and the user is able to specify the specific fields of information to be displayed on the screen.” *Id.* at 78. Chapter 5 concludes that, “[t]he Cochrane’s have found great benefits from their use of RFID currently, and are interested in further advancing their RFID operations in the future.” Ex. 1005, 98. Trevarthen then specifically references the desire to implement milk meters at the Cochrane farm to record the amount of milk each cow provides at every milking session, which can be used to detect problems with the cows such as an illness. *Id.*

The next chapter of Trevarthen (Chapter 6 – Towards Total Farm Management), explains:

This chapter will attempt to ***build upon*** the current RFID usage as identified in the case studies, proposing a framework for the use of RFID on dairy farms, while also proposing enhancements and ideas which could be considered as future additions to further add value to the utilisation of RFID in farm management.

Ex. 1005, 99 (emphasis added). Chapter 6 provides proposed RFID enhancements such as the use of herd management software and the analysis of milk production, temperature monitoring, and illness detection. *See, e.g., id.* at 109, 112, 121, 123, 151.

Based on the disclosures discussed herein, we find that a person of ordinary skill in the art would have been motivated to combine Trevarthen’s disclosure of the Cochrane dairy with the suggested further RFID advancements discussed in Trevarthen with a reasonable expectation of success. Trevarthen itself proposes making such enhancements to dairy

farms like the Cochrane farm in order to further add value to the utilization of RFID in farm management. Trevarthen provides further motivation to those of skill in the art to implement these proposed RFID enhancements by describing numerous “potential advantages” of using RFID technology such as “increased efficiencies, greater information availability, reduced feed and labour costs, improved milk quality and volume, improved herd health, ease of herd management and more.” *Id.* at 2.⁹

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[A] is taught or suggested by Trevarthen.

(3) *Limitation 1[B]*

Limitation 1[B] recites “reading an RFID device implanted in an animal with said RFID device reader.” Ex. 1001, 17:66–67.

Petitioner cites to Trevarthen’s disclosure that RFID tags, boluses, or microchips “form the basis of any dairy farm RFID system” and are so commonplace that a number of these devices are available from various vendors. Pet. 13 (citing Ex. 1003 ¶ 98; Ex. 1005, 99–100). According to Petitioner, Trevarthen describes implanting RFID boluses such as a “rumen bolus,” which a person of ordinary skill would have understood as being implanted in a cow’s first stomach compartment by ingestion. *Id.* (citing Ex. 1003 ¶ 99; Ex. 1005, 20, 22, 24, 99–100). Petitioner further cites to Trevarthen’s disclosure of the bio-thermo RFID as an example of an implanted RFID device with temperature sensing capability. *Id.* (citing Ex. 1005, 24–25). Trevarthen also states that, “to derive any use and subsequent benefit from the practice of identifying every cow with RFID tags, a farm requires an RFID reader device.” Ex. 1005, 102 (emphasis

⁹ This citation is to the Bates numbering provided by Petitioner.

omitted). Petitioner concludes that a skilled artisan “would have understood Trevarthen to disclose reading an RFID device implanted in an animal with the RFID device reader connected to a computer.” Pet. 13 (citing Ex. 1003 ¶ 100).

Patent Owner contends that Petitioner has not established that Trevarthen teaches or renders obvious this limitation because the bio-thermo RFID was not yet applicable to livestock. PO Resp. 27 (citing Ex. 2009 ¶ 131). Patent Owner also argues that neither Petitioner nor its expert “provide any explanation to support how or why the general existence of ‘boluses’ establishes that a POSA would have utilized an RFID device implanted in an animal to perform the claimed method.” *Id.* (citing Ex. 2009 ¶¶ 132–133).

We find that Trevarthen teaches or suggests reading an RFID device implanted in an animal with a RFID device reader. We agree with Petitioner that, “Trevarthen has numerous disclosures of RFID devices implanted in animals (such as boluses), one of which is the [b]io-thermo RFID.” Pet. Reply 11 (citing Ex. 1005 3, 20, 22, 24–24, 99–100). Therefore, even assuming *arguendo* that the bio-thermo RFID reader was not yet applicable to livestock, Trevarthen discloses the use of various other RFID devices, including RFID boluses, which may be used in livestock. We also credit the testimony of Petitioner’s declarant, Dr. Brown-Brandl that, Trevarthen discloses an RFID reader and a person of ordinary skill in the art would understand that it could be used to read the RFID devices implanted in animals. *See* Ex. 1005, 86–87; Ex. 1003 ¶¶ 98–100.

We further find that a person of ordinary skill in the art would have utilized an RFID device implanted in an animal to perform the claimed method. There are multiple disclosures throughout Trevarthen of RFID

systems connected to computers, including at the Cochrane dairy. *See, e.g.*, Ex. 1005, 1–2 (stating that “[t]he [RFID] receiver can be a mounted or hand-held computer-controlled device, and when a tag is brought within the reading range of a receiver, the receiver captures the data stored on the tag and forwards this to the host computer”); *see also* 26, 27–28, 66–67, 75–76, 78–79, 89–90, 93–94, 97, 100–101, 106–107, 118, 124, 126, 129–130, 144, 146, 151–157. Trevarthen also discloses four main ways in which RFID can be used for animal identification, including attaching a transponder in a tag form to the animal’s ear, injecting transponders under the animal’s skin, or via a bolus where the RFID transponder is inserted permanently within the animal’s stomach. *Id.* at 3. Given these disclosures, we find that a skilled artisan reading Trevarthen would have been motivated to connect a computer to an RFID device reader and read a RFID device implanted in an animal with said RFID device reader and would have had a reasonable expectation of success in doing so.

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[B] is taught or suggested by Trevarthen.

(4) *Limitation 1[C]*

Limitation 1[C] recites “retrieving an amount of animal identification information from said RFID device implanted in an animal.” Ex. 1001, 18:1–2.

Petitioner asserts that a skilled artisan “would have understood that Trevarthen’s system identified each cow by retrieving animal identification information from the RFID device.” Pet. 14 (citing Ex. 1003 ¶¶ 101–102; Ex. 1005, 102). Petitioner relies on Trevarthen’s disclosure of placing an RFID reader at the dairy entrance to “provide[] the possibility for the reader to serve as the basis for a wide range of optional operations to be conducted

within the dairy that require individual identification of cows (e.g. automatic feeding etc.).” *Id.* (citing Ex. 1005, 86–87, 103, 106, 121) (emphasis omitted).

Patent Owner does not separately argue this limitation other than alleging that Petitioner improperly mixes and matches the disclosure relied on for this limitation with disparate teachings from Trevarthen for limitation 1[A] (“connecting a computer to an RFID reader”). *See* PO Resp. 25–26.

We find that Trevarthen teaches or suggests retrieving information from an implanted RFID based on the disclosure cited Petitioner. *See* Pet. 14 (citing Ex. 1005, 86–87, 103, 106, 121). We also credit the testimony of Dr. Brown-Brandl that one skilled in the art “would have considered the point of using RFID devices is for farms to be able to identify individual cows rapidly and easily,” “especially for large farms that may have hundreds if not thousands of dairy cows,” and that “the point of RFID devices is to be able to retrieve identification information from them by interrogation.” Ex. 1003 ¶¶ 101, 102. We further credit the testimony of Dr. Brown-Brandl that one skilled in the art “would have further understood that Trevarthen[] described a system that identified each cow by retrieving animal identification information from the RFID device when the cow passed the device when entering and/or exiting the dairy.” *Id.* ¶ 102 (citing Ex. 1005, 86–87, 122).

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[C] is taught or suggested by Trevarthen. We further find that one of ordinary skill in the art would have been motivated to combine disclosure of this limitation with the discussion of the RFID reader and computer from the Cochrane farm for the reasons discussed above.

(5) *Limitation 1[D]*

Limitation 1[D] recites “linking an amount of animal information of said animal stored in a data base of said computer to said amount of information retrieved from said RFID device implanted in said animal, said amount of animal information stored in said data base of said computer comprising an amount of milk production information or an amount of days milked.” Ex. 1001, 18:3–9.¹⁰

Petitioner asserts that Trevarthen discloses recording milk production for each individual cow using milk meters and storing that information in the herd management system database. Pet. 15 (citing Ex. 1003 ¶¶ 103–105; Ex. 1005, 100–102, 109, 112). According to Petitioner, the information retrieval disclosed by Trevarthen (for limitation 1[C]), is linked to the disclosed milk production information stored in the database. *Id.* at 15–16.

Petitioner also asserts that Trevarthen additionally “discloses that it retrieves sensed animal temperature information from the RFID device” and “further teaches that these temperature measurements are analyzed to detect ‘fluctuations,’ ‘a rise,’ and/or ‘anomalies’ that might indicate illness or oestrus.” *Id.* at 16 (citing Ex. 1005, 121–122). Accordingly, Petitioner asserts that a “POSA would understand that to perform such analysis, the animal temperature information for each animal is necessarily stored in the

¹⁰ Petitioner contends that the term, “said amount of information retrieved from said RFID device,” in limitations 1[D] and 1[E] lack antecedent basis, but “the Board can still find claim 1 unpatentable even if its outer metes and bounds are not reasonably clear.” Pet. 14–15. We interpret this term as including the “amount of animal identification information from said RFID device” recited in limitation 1[C], and agree with Petitioner that we can make a patentability determination for claim 1. *Id.* at 15.

database, along with the milk production information described above.” *Id.* (citing Ex. 1003 ¶¶ 107–109).

Patent Owner does not separately argue this limitation other than alleging that Petitioner improperly mixes and matches the disclosure relied on for this limitation with disparate teachings from Trevarthen for limitation 1[A] (“connecting a computer to an RFID device reader”). *See* PO Resp. 25–26. Patent Owner also contends that Petitioner does not connect the “mainstream computer network devices” they rely on for limitation 1[A] to the “said computer” recited in element 1[D]. *Id.* at 27.

We find that Trevarthen teaches or suggests limitation 1[D] for the reasons discussed by Petitioner. *See* Pet. 14–17. With regard to Patent Owner’s argument regarding improper mixing and matching, as mentioned above, Trevarthen’s discussion of the Cochrane farm specifically describes the Cochrane’s interest in advancing their RFID operations by implementing milk meters and attaining milk production figures for every cow from every milking session. *See* Ex. 1005, 98. Therefore, we find that a person of ordinary skill in the art would have been motivated to implement milk meters in the Cochrane dairy in the manner described in limitation 1[D] and could have used the computers (e.g., as disclosed as being used in the Cochrane dairy), with a reasonable expectation of success.

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[D] is taught or suggested by Trevarthen.

(6) *Limitations 1[E] and 1[F]*

Limitation 1[E] recites “converting said amount of animal information of said animal stored in said database of said computer linked to said amount of information retrieved from said RFID device implanted in said animal into one or more logical variables.” Ex. 1001, 18:10–14.

Limitation 1[F] recites “inserting at least one of said plurality of logical variables into at least one logical expression.” Ex. 1001, 18:15–16.

Petitioner contends that “Trevarthen describes converting stored milk production information into a logical variable that is entered into a logical expression.” Pet. 17 (citing Ex. 1003 ¶ 110). According to Petitioner, “the POSA would have understood Trevarthen’s calculation of a milk production average, comparison of recent production to usual output, and recognition of patterns, to necessarily require the use of one or more logical expressions having milk production information as input logical variables.” *Id.* (citing Ex. 1003 ¶ 111).

Petitioner further contends that Trevarthen’s disclosure of storing each cow’s milk production information in a database enables the herd management software to “recognise certain *patterns* in the [milk] production of each cow.” *Id.* at 18 (quoting Ex. 1005, 109 (bracketing reproduced from Petition)). According to Petitioner, based on this, “the POSA would have understood that Trevarthen necessarily employed one or more ‘logical expressions’ to ‘recognise certain patterns’” because, for example, a logical expression would be required to look at a time-series of milk production measurements to deduce any such patterns. *Id.* (citing Ex. 1003 ¶ 112). Petitioner contends that, “[t]hese milk production measurements would be understood by the POSA to comprise logical variables inserted into the logical expression.” *Id.* (citing Ex. 1003 ¶ 113).

Petitioner further asserts that Trevarthen discloses that a variance in a cow’s milk production may indicate illness or another issue. *Id.* (citing Ex. 1005, 98, 115). According to Petitioner:

The POSA would have understood that these teachings necessarily included the use of a logical expression to calculate

the “average” or “usual” milk production output for the cow, and to compare the cow’s current output to that average or usual amount. In such a case, the average/usual output would be calculated based on a time-series of historical milk production measurements, and a current milk production measurement would be compared to this average/usual production amount. These milk production measurements would be understood by the POSA to comprise logical variables inserted into the logical expression.

Id. at 18–19 (citing Ex. 1003 ¶ 113). Petitioner also argues that, “[c]onsistent with Trevarthen, the prior art demonstrates that it was well known to use milk production (yield) information, among other information, as logical variables input into a logical expression to detect illness or oestrus in a cow.” *Id.* at 19 (citing Ex. 1003 ¶¶ 114–116; Ex. 1033, 173–180). Petitioner concludes that, “[g]iven that Trevarthen teaches that the logical expression need only perform simple calculations such as computing an average and making a comparison to that average, the POSA could have easily written and implemented such equations in software.” *Id.*

Patent Owner does not separately argue these limitations other than alleging that Petitioner improperly mixes and matches the disclosure relied on for these limitations with disparate teachings from Trevarthen relied upon for limitation 1[A] (“connecting a computer to an RFID reader”). *See* PO Resp. 25–26. Patent Owner also contends that Petitioner does not connect the “mainstream computer network devices” they rely on for limitation 1[A] to the “said computer” recited in element 1[E]. *Id.* at 27.

We find that Trevarthen teaches or suggests limitations 1[E] and 1[F] for the reasons provided by Petitioner. *See* Pet. 17–20. We agree with Petitioner that Trevarthen teaches or suggests incorporating temperature-sensing RFIDs into a farm management system to monitor individual cow

temperature for illness and heat. Ex. 1005, 121–122. Thus, Trevarthen teaches or suggests a system that monitors temperatures (logical variables), and recognizes fluctuations (via a logical expression) using a RFID device implanted in an animal. *See* Ex. 1003 ¶¶ 112–119.

We also find that one of skill in the art would have been motivated to combine the cited disclosures from Trevarthen, e.g., to detect illness in livestock. *See* Pet. 17–19. Trevarthen itself proposes “a framework for the use of RFID on dairy farms” including “enhancements and ideas which could be considered as future additions to further add value” for utilizing RFIDs in farm management. Ex. 1005, 99. The enhancements include RFID boluses (*id.*), utilizing milk meters to detect illness (*id.* at 115), and temperature monitoring by RFID (*id.* at 121–122). We find that each of Petitioner’s proposed improvements appears to apply “the predictable use of prior art elements according to their established functions.” *See KSR*, 550 U.S. at 417. Accordingly, Petitioner has shown by a preponderance of the evidence that one skilled in the art would have been motivated to combine Trevarthen’s teachings in an improved RFID-integrated farm management system with a reasonable expectation of success.

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitations 1[E] and 1[F] are taught or suggested by Trevarthen.

(7) *Limitation 1[G]*

Limitation 1[G] recites “obtaining a logical value relating to said animal.” Ex. 1001, 18:17.

Petitioner asserts that “Trevarthen emphasizes that “animal borne disease” has “driven calls for . . . individual identification and tracking of livestock . . . to reduce the possibility of a disease outbreak.” Pet. 20 (citing

Ex. 1005, 1, 18). Petitioner also cites to Trevarthen’s disclosure that, “if a cow provides a significantly lower amount of milk than their usual output, the system will be able to identify this disparity and *alert the operators . . .*.” *Id.* (citing Ex. 1005, 115). According to Petitioner, “[t]he POSA would have understood that in order to alert the operators, the logical expression must necessarily be solved to obtain a logical value indicating that the animal may be sick.” *Id.* (citing Ex. 1003 ¶ 118).

Patent Owner does not separately argue this limitation other than alleging that Petitioner improperly mixes and matches the disclosure relied on for this limitation with the disparate teachings from Trevarthen cited by Petitioner for limitation 1[A] (“connecting a computer to an RFID reader”). *See* PO Resp. 25–26.

We find that Trevarthen teaches or suggests limitation 1[G] for the reasons provided by Petitioner. *See* Pet. 20–21. We also find that a person of ordinary skill in the art would have been motivated to obtain a logical value relating to a cow in order to determine illness due to the reasons discussed above for the other claim limitations and would have had a reasonable expectation of success in doing so.

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[G] is taught or suggested by Trevarthen.

(8) *Conclusion as to the Obviousness of Claim 1*

After carefully considering the arguments and evidence, for the reasons discussed above, we determine that Petitioner has shown by a preponderance of the evidence that claim 1 of the ’515 patent would have been obvious over Trevarthen.

b) Claim 2

Petitioner presents evidence that Trevvarthen teaches or suggests the limitations of claim 2. Pet. 21. Patent Owner does not separately argue claim 2. Based on the evidence presented in the Petition and for the reasons discussed above for claim 1, we determine that Petitioner has shown by a preponderance of the evidence that claim 2 of the '515 patent would have been obvious over Trevvarthen.

E. Ground 2 Asserted Obviousness of Claims 3–4 over Trevvarthen and Brune

Petitioner contends that claims 3 and 4 are rendered obvious by the combination of Trevvarthen and Brune. Pet. 22–26. Patent Owner disputes Petitioner's contentions. PO Resp. 28–41; PO Sur-Reply 13–18. First, Patent Owner contends that Petitioner fails to show that Ground 2 renders claims 3 and 4 obvious for the same reasons argued for Ground 1. PO Resp. 28. For the reasons discussed above for Ground 1, we disagree with Patent Owner's contentions in this regard. Patent Owner also argues that Ground 2 fails because Petitioner does not provide a reason to combine Trevvarthen and Brune to “retriev[e] an amount of date-time information from said plurality of RFID devices,” as required by claims 3 and 4. *Id.* at 28. We explore this argument further below.

1. Brune (Ex. 1008)

Brune relates to “a method of determining a physiological state of a ruminant animal by mathematically analyzing at least one portion of a history of data representing sensed temperatures within a stomach of the ruminant animal.” Ex. 1008, 1:63–67. Brune describes measuring animal temperature by placing a bolus, including a temperature sensor and a transmitter, in the ruminant animal's stomach. *Id.* at 2:1–5. The bolus

senses a plurality of temperatures in the stomach, “with each temperature representing a temperature at a respective discrete point in time over a time period.” *Id.* at 2:5–9. The bolus then transmits a plurality of air-borne signals to a remote receiver, “with each air-borne signal representing at least one of the sensed temperatures.” *Id.* at 2:9–11. The sensed “temperatures are mathematically analyzed at discrete points in time over the time period” to determine the ruminant animal’s physiological state. *Id.* at 2:12–16.

2. Claim 3

Claim 3 recites the computer implemented method of animal tracking as described in claim 2, further comprising “retrieving an amount of date-time information from said plurality of RFID devices implanted in said plurality of animals.” Ex. 1001, 18:29–32.

Petitioner alleges that Trevarthen in view of Brune renders obvious retrieving date-time information from said RFID device. Pet. 23–25. According to Petitioner, Trevarthen discloses that “fixed readers may be utilized for the purposes of identifying a cow as she enters the milking parlour, and subsequently ***recording the time and date*** of this read to the central herd management database” *Id.* at 23 (citing Ex. 1005, 102, 103 (“[P]lacing the RFID in this position allows data to be automatically recorded regarding the time and date that each cow enters the milking parlour, and should at least be arranged so as to display cow information (displayed via relevant interface of the herd management software) on a computer screen at the end of the dairy.”)). Petitioner also points to Trevarthen’s disclosure of identifying “fluctuations” and “anomalies” in temperature and contends that “[t]he POSA would therefore understand that a time-series of time-date stamped temperature measurements are needed.” *Id.* (citing Ex. 1003 ¶ 122 (citing Ex. 1005, 102–103, 121–122)).

Petitioner also cites to disclosure from Brune that its device sends “a message in the form of an air-borne signal which is transmitted from a bolus implanted within the stomach of a cow.” Pet. 23 (citing Ex. 1008, 4:1–3).

Petitioner provides that Brune further explains:

The message or signal is preferably in the form of a data packet For each message, the data packet includes temperature data representing the *sensed temperature* within the stomach, identification data such as an *identification number which is unique to the specific cow*, and *date and/or time stamp data* corresponding to the *discrete point in time at which the temperature was sensed* by the bolus.

Id. at 23–24 (quoting Ex. 1008, 4:3–11, 2:1–16 (alteration by Petitioner)).

Therefore, according to Petitioner, “identification information, sensed temperature information, and time-date information is retrieved from Brune’s device.” *Id.* at 24 (citing Ex. 1003 ¶ 124).

Petitioner further contends that, “[g]iven the importance of time-stamping to Trevarthen, it would have been obvious for the POSA to modify the RFID device of Trevarthen to include the date-time stamping capability disclosed in Brune” and that, “[a]t a minimum, it would have been obvious to try having the RFID device time-stamp the retrieved information rather than the RFID reader.” Pet. 24. According to Petitioner, “the POSA would have reasonably expected the date-time stamping feature of Brune’s device to work with Trevarthen’s herd management system, at least because the same types of information are being retrieved from a similar implanted bolus.” *Id.* (citing Ex. 1003 ¶ 125; *KSR*, 550 U.S. at 416 (“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.”)).

Patent Owner alleges that Petitioner does not provide a reason to combine Trevarthen and Brune to “retriev[e] an amount of date-time information from said plurality of RFID devices,” as required by claims 3 and 4. PO Resp. 28. According to Patent Owner, Trevarthen retrieves *all* of its data from an “RFID reader” rather than retrieving *any* date-time information from “RFID devices” and Petitioner relies on Brune’s alleged disclosure of an RFID device that provides all of the date-time information to supply this limitation. *Id.* at 29 (citing Pet. 22–25).

Patent Owner further contends that the only reason Petitioner provides for incorporating Brune’s time-stamping technique into Trevarthen’s system is an alleged “importance of time-stamping” to Trevarthen, but Trevarthen already has a time-stamping technique that the experts agree works better for his proposed systems. PO Resp. 29 (citing Pet. 24). According to Patent Owner, there would have been no reason to swap Brune’s device-based time stamping technique with Trevarthen’s RFID reader-based technique because they “independently accomplish similar functions.” *Id.* (citing *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1369 (Fed. Cir. 2012); Ex. 2009 ¶¶ 137–138). Patent Owner also argues that there were specific reasons not to swap Brune’s technique for Trevarthen’s because, in systems like Trevarthen’s where measurements are read “as the cow enters a milking parlour,” the “time-date stamp would be *ideal* to be read at the reader.” *Id.* at 29–30 (citing Ex. 2010, 150:8–21, 152:4–14).

Patent Owner further contends that Petitioner has not established obviousness based on their single unsupported statement that “it would have been *obvious to try* having the RFID device time-stamp the retrieved information rather than the RFID reader” because establishing the “*obvious to try*” rationale requires showing that “there is a design need or market

pressure to solve a problem” and that “there are a finite number of identified, predictable solutions.” PO Resp. 30 (citing Pet. 32; *Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1338–1339 (Fed. Cir 2020) (quoting *KSR*, 550 U.S. 398 at 421). According to Patent Owner, nothing in the art suggests a “design need,” “market pressure,” or “problem” that would prompt a POSA to try Brune’s time-stamping method in Trevarthen because “POAs would have considered the RFID-reader-based method preferable in Trevarthen’s system.” *Id.* at 31. Patent Owner and its declarant further contend that “the system with the device-based timers is more complex and more prone to failure due to issues such as limited battery life, unsynchronized timers, and the need to communicate with the reader.” *Id.* (citing Ex. 2009 ¶¶ 137–138).

We find that a person of ordinary skill in the art would have been motivated to use Brune’s time-stamping in Trevarthen’s system with a reasonable expectation of success. Trevarthen discloses analyzing temperature “fluctuations,” “patterns” and “anomalies,” which requires a time-series of measurements where the date and time of each measurement is known. *See* Ex. 1005, 121–122. We are persuaded by the testimony of Dr. Brown-Brandl that there are advantages to retrieving such information from the RFID device, rather than the RFID reader. *See* Ex. 1055 ¶¶ 25–27. For example, Dr. Brown-Brandl testifies that obtaining the data from the RFID device “ensures that the temperature data is accurately recorded at the moment it is taken (as opposed to when it was reported), providing precise and reliable health monitoring for the cow,” which “is crucial for tracking changes in the cow’s condition over time and identifying any potential health issues promptly.” *Id.* at 26. Dr. Brown-Brandl explains that “retrieving date-time information from the device allows multiple measurements to be taken and stored in the device, and then collectively

transmitted to the reader” and that “[t]aking multiple measurements between reporting furthers the purpose of Trevarthen to detect illness based on a time-series of measurements.” *Id.*

Regarding the perceived deficiencies of obtaining data from the RFID devices, Brune does not mention low battery life as an issue with its device but, rather, indicates that its bolus provides data over “an extended period of time.” Ex. 1008, 3:37–43, cls. 4–9. We also credit the testimony of Dr. Brown-Brandl that synchronicity between devices is not required to detect disease in each animal because it is the individual animal’s time-series of measurements which is important in this scenario. *See* Ex. 1055 ¶ 27. Even assuming that there are some disadvantages in obtaining data from the RFID device, these potential weaknesses do not negate the advantages of retrieving such data from the RFID device itself. “[J]ust because better alternatives exist in the prior art does not mean that an inferior combination is inapt for obviousness purposes.” *In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012). Therefore, we find that one of ordinary skill in the art would have been motivated to use either one of (or a combination of) these measurement methods in order to obtain the most comprehensive picture of a cow’s health.

After carefully considering the arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claim 3 of the ’515 patent would have been obvious over the combination of Trevarthen and Brune.

3. Claim 4

Claim 4 recites the computer implemented method of animal tracking as described in claim 3, further comprising “retrieving an amount of sensed

animal information from said plurality of RFID devices implanted in said plurality of animals.” Ex. 1001, 18:33–36.

Petitioner asserts that Trevarthen discloses this limitation and relies on Trevarthen’s disclosure “that it is possible to incorporate temperature sensing abilities into RFID microchips currently . . . Such a device will provide the temperature of the cow along with the cow[’]s unique identification number every time the tag is read by an RFID reader.” Pet. 25 (citing Ex. 1005, 121) (emphasis omitted). Petitioner further contends that Trevarthen “discloses that ‘RFID temperature sensing is currently available technology’” citing “the [b]io-thermo RFID as an example of an implanted RFID device with temperature sensing capability.” *Id.* (citing Ex. 1005, 24–25, 123). Further, according to Petitioner, retrieving sensed temperature from implanted RFID devices was described in numerous prior art references. *Id.* (citing Ex. 1003 ¶ 128).

Petitioner also cites to Trevarthen’s disclosure that the RFID readers retrieve the sensed temperature information from the RFID device:

[A] ***temperature sensing RFID*** device could be read by fixed RFID readers at the entry to the dairy. Such an arrangement would ensure that ***each cow has their temperature read*** at a regular interval at least twice a day [I]t is proposed that RFID readers also be placed at other high congregation areas throughout the farm Under this approach, more ***temperature readings*** can be gained between milkings, thus providing an ***enhanced ability to detect temperature variations***

Pet. 25–26 (citing Ex. 1005, 122). Thus, Petitioner concludes that Trevarthen discloses retrieving sensed animal temperature from an RFID device coupled to a temperature sensor. *Id.* at 26 (citing Ex. 1003 ¶ 128).

Patent Owner asserts that Petitioner fails to establish that Trevarthen discloses or renders obvious any animal tracking method that incorporates implanted RFID devices that provide “sensed animal information.” PO Resp. 32. According to Patent Owner, the only temperature-sensing RFID device that Trevarthen refers to is the “bio-thermo RFID microchip,” which is “injected into the animal (under the skin).” *Id.* (citing Ex. 1005, 24). Patent Owner contends that Trevarthen acknowledges that such devices were not commercially available or suitable for livestock and that, while it may be “possible to incorporate temperature sensing abilities into RFID microchips” in other applications, that practice had not yet been “extended to the livestock industry.” *Id.* (citing Ex. 121, 123 (noting it was “being investigated”); Ex. 2009 ¶¶ 142–144). Patent Owner also argues that there are several reasons why POSAs would not have used these under-the-skin microchips for livestock, including because they “involve a surgery” and are susceptible to “migrating.” *Id.* at 32–33 (citing Ex. 2010, 63:8–18, 65:2–9).

Patent Owner further argues that “Trevarthen does not disclose any system that incorporated both ‘sensed’ information (*e.g.*, temperature) along with ‘milk’ information into a single method.” PO Resp. 35. Rather, according to Patent Owner, Trevarthen’s “discussions of milk production and temperature-sensing devices reflect disparate teachings without providing a reason to combine them, as required under *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017).” *Id.* Patent Owner alleges that “Trevarthen’s only reference to milk production occur in three discussions of ‘milk meters,’ which are completely disconnected from any discussion of retrieving ‘sensed’ information, such as temperature.” *Id.* at 35–36. Further, according to Patent Owner, “[t]he Cochranes employed basic ear tags without sensors, and there is no reason or motivation to combine them with

an RFID device that ‘sensed animal information.’” *Id.* at 36 (citing Ex. 1005, 69; Ex. 2009 ¶ 157).

Lastly, Patent Owner contends that Petitioner fails to provide a reason to combine the disparate teachings from Trevarthen regarding milk production and temperature-sensing. PO Resp. 39. According to Patent Owner, illness detection would not have provided a reason to incorporate Trevarthen’s milk production techniques with its separate discussion of temperature-sensing. *Id.* at 40. Patent Owner contends that the de Mol reference¹¹ cited by Petitioner, actually shows that the combination of milk production and “other information” (including temperature) would not have successfully detected illness. *Id.* at 40–41 (citing Ex. 1033, 184 (suggesting “additional research” to reduce false positives); Ex. 2009 ¶¶ 167–169).

We find that a preponderance of the evidence supports Petitioner’s argument that one skilled in the art would have been motivated to combine Trevarthen and Brune to “retriev[e] an amount of sensed animal information from said plurality of RFID devices implanted in said plurality of animals.” First, Trevarthen discloses that “RFID temperature sensing is a currently available technology,” “the application of which may soon be extended to the livestock industry.” Ex. 1005, 24, 121, 123. While some prior art references may discuss improvements that a person of skill in the art may want to make to these temperature-sensing RFIDs, that does not negate Trevarthen’s express disclosure of their use and importance in herd management. *See Acorda Therapeutics, Inc. v. Roxane Labs., Inc.*, 903 F.3d

¹¹ R.M. de Mol et al., *Description of a Detection Model for Oestrus and Diseases in Dairy Cattle Based on Time Series Analysis Combined with a Kalman Filter*, 22 Computers and Electronics in Agriculture 171–185 (1999) (Ex. 1033, “de Mol”).

1310, 1333 (Fed. Cir. 2018) (no “[c]onclusive proof of efficacy” required for obviousness) (alteration in original). Rather, the art confirms the availability and benefits of temperature-sensing RFIDs, prior to the filing of the ’515 patent. *See* Ex. 1015, 4671–72 (“these results are encouraging for the use of newly available technologies for monitoring [Reticular temperature]”); Ex. 1016, 434 (“When ingested by a cow, the sensor allows for a continuous, relatively non-invasive, accurate means of monitoring temperature as it travels through the digestive tract. It is expected that an ingested sensor will eventually come to rest in the cow’s reticulum.”); Ex. 1021, 11 (“the rumen bolus is an effective means of continuously measuring body temperature “).

We also find that Petitioner has shown that the combination of Trevarthen and Brune renders obvious a system that incorporates both milk production and temperature sensing into a single method. We do not agree with Patent Owner that Trevarthen’s discussions of milk production are “completely disconnected from any discussion of retrieving . . . temperature.” PO Resp. 35–36. In fact, Trevarthen specifically discusses attaining cow milk production figures using RFID “as a means to detect problems with cows” such as illness. Ex. 1005, 98, 115. We also do not find that the use of ear tags at the Cochrane farm would have dissuaded one of ordinary skill in the art from using an RFID device that sensed animal information. Trevarthen explains that ear tags and bolus “provide the same functionality, reliability and accuracy,” and thus is “a matter of personal preference for the farm owners.” Ex. 1005, 99. Trevarthen also teaches temperature-sensing tags, boluses, or microchips as an improvement for the Cochrane farm, thus providing a person of ordinary skill in the art with the motivation to use implanted sensors. *See id.*; Ex. 1003 ¶¶ 98–99.

We also find that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art would have been motivated to combine temperature and milk production information in order to improve illness detection and would have had a reasonable expectation of success in doing so. We are persuaded by Dr. Brown-Brandl and the cited references that the prior art demonstrates the use of milk production (yield) information, along with other information, to detect illness in a cow. *See* Ex. 1003 ¶¶ 114–116 (citing Ex. 1032, 42–44, 52; Ex. 1033, 178–180; Ex. 1034, 52; Ex. 1035, 2–3, 50–53, 57–58). For example, de Mol expressly describes a detection model that includes data such as milk yield and temperature. *See* Ex. 1033, 181 (“A mastitis alert is given when the conductivity error is rather high and the sum of standardised errors of conductivity, yield and temperature falls outside a certain confidence interval. An illness alert is based on the sum of standardised errors of yield, temperature, activity and concentrates intake.”).

We are similarly not persuaded by Patent Owner’s argument that de Mol demonstrates that the combination of milk production and “other information” (including temperature) would not have successfully detected illness. *See* PO Resp. 40–41 (citing Ex. 1033, 184; Ex. 2009 ¶¶ 167–169). Instead, we find de Mol supports the conclusion that one skilled in the art would have had a reasonable expectation of success in creating a logical expression for detecting illness incorporating animal temperature and milk production, even if de Mol’s specific model required additional improvement to reduce false positive alerts. *See* Ex. 1033, 180–184; Ex. 1055 ¶ 32. We do not agree that de Mol’s invitation to improve the model teaches away or otherwise would have discouraged one of ordinary

skill from following the path set out in *Trevarthen*. See *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994).

After carefully considering the arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claim 4 of the '515 patent would have been obvious over the combination of *Trevarthen* and *Brune*.

F. Ground 3 Asserted Obviousness of Claims 15–25 over Trevarthen and Rollins

Petitioner presents evidence that claims 15–25 are rendered obvious by the combination of *Trevarthen* and *Rollins*. Pet. 26–35. Patent Owner does not separately argue this ground other than to say that Petitioner's arguments fail for the same reasons as to Ground 1. PO Resp. 41–42.

1. Rollins (Ex. 1037)

Rollins, titled “Systems and Methods for Collecting and Managing Animal-Related Information,” is directed to “automating animal-related information collection, tracking, sharing, and management among a variety of users, including users at collection sites of interest as well as users who wish to access the data that has already been collected.” Ex. 1037 ¶ 14.

Figure 1 of *Rollins* is reproduced below.

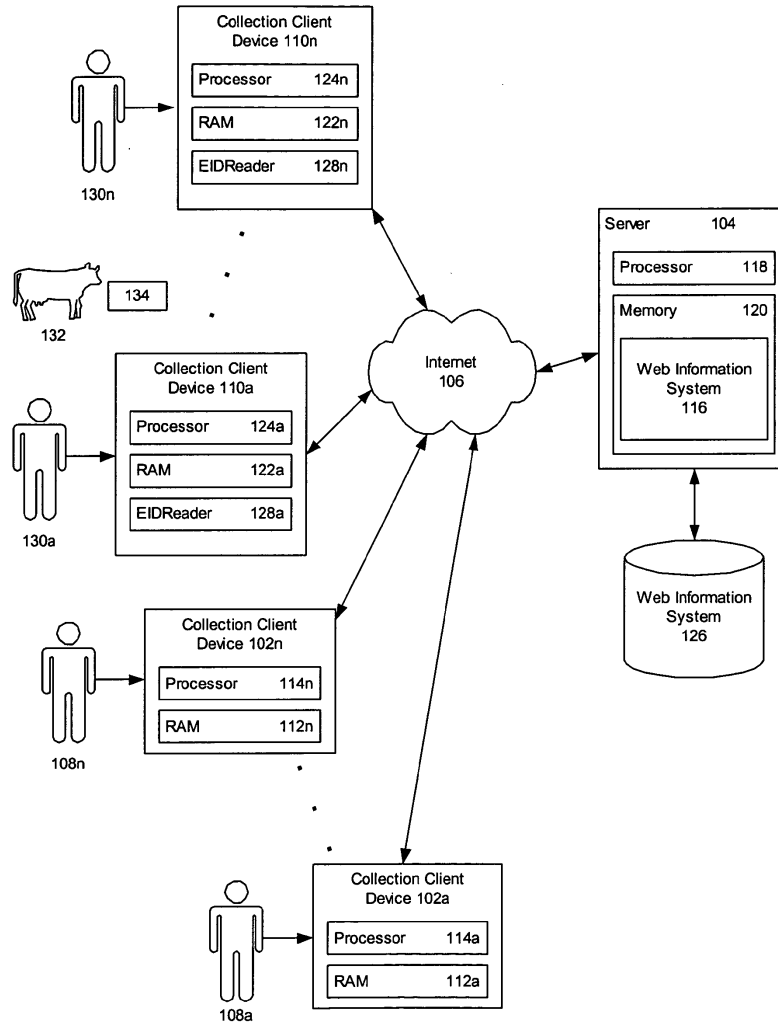


Figure 1

Rollins explains that the system 100 shown in Figure 1 includes “multiple access client devices 102a-n in communication with a server device 104 over a network 106, and operable by respective users 108a-n” and “multiple collection client devices 110a-n in communication with the server device 104 over the network 106.” *Id.* ¶ 33.

According to Rollins, a collection client device can “include or be functionally in communication with an associated data collection-type device such as a RFID reader, an integrated RFID reader/computer . . . , a

bar code scanner, or a passive-type communication data device.” *Id.* ¶ 38.
Figures 2 and 3 of Rollins are reproduced below.

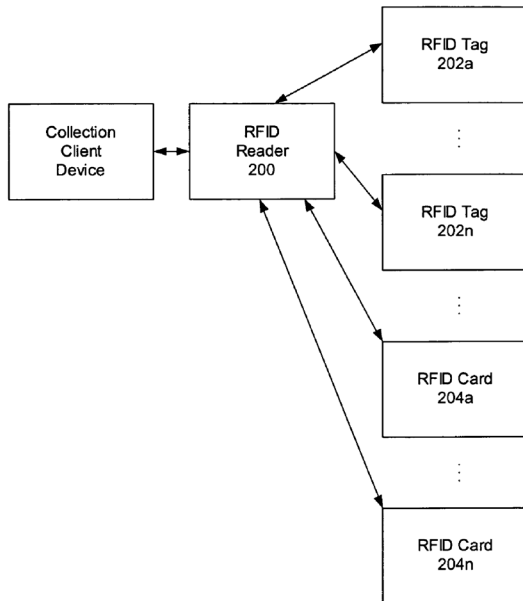


Figure 2

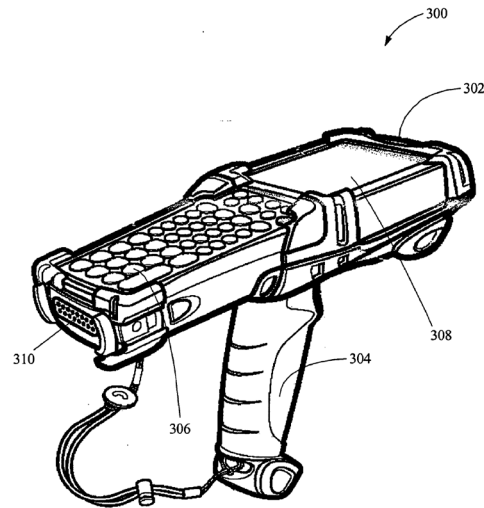


Figure 3

As shown in Figure 2, “a radio frequency identification (RFID) reader 200 can read or otherwise collect information from one or more RFID-type tags 202a-n and/or RFID-type cards 204a-n to obtain and enter data of interest for a collection client device 110a-n.” *Id.* ¶ 49. Figure 3 shows “an integrated RFID reader/computer 300,” which can collect information from RFID-type tags or cards. *Id.* ¶ 52. Rollins explains that “a user operating the integrated RFID reader/computer 300 can direct or otherwise move the RFID scanner 302 towards or in the vicinity of a RFID-type tag or card associated with an animal such as a cow or bull.” *Id.* According to Rollins, “[d]ata from the RFID-tag or card can be collected, transmitted to an associated processor, and stored in an associated memory,” and the “data can be transmitted to the server device 104 via a local wireless network, such as a WI-FI-type network,” “via a cellular data network, such as a GPRS-type

network,” or “via a conventional wired network, such as a cable or PSTN-type network.” *Id.*

Rollins describes that “a collection client device 110a-n can be adapted to receive new animal-related data associated with a particular event or event group, such as setting up a template for collecting information associated with marking and branding a particular group of animals,” wherein “[a]n event can include, but is not limited to, artificial insemination (AI), birth, body condition, breeding, brucellosis, death, implant, pregnancy, pregnancy check, purchase, sale, transfer, vaccination, and weaning.” *Id.* ¶ 72.

2. Conclusions as to the Obviousness of Claims 15–25

Based on the evidence presented in the Petition and for the reasons discussed above for Ground 1, Petitioner shows by a preponderance of the evidence that Trevarthen and Rollins render obvious the limitations of claims 15–25.

G. Ground 4 Asserted Obviousness of Claims 1–2 over Laitinen, Buchanan, and Liao

Petitioner contends that claims 1–2 would have been obvious over Laitinen, Buchanan, and Liao. Pet. 36–51. Patent Owner disputes Petitioner’s contentions. Prelim. Resp. 46–58.

1. Overview of the Asserted References

a) Laitinen (Ex. 1006)

Laitinen relates to a surveillance system used in animal husbandry. Ex. 1006, 2:32–34. “The system consists of three technology levels . . . referred to as local, global and pico level.” *Id.* at 3:21–27.

The three levels are shown in Laitinen Figure 1, reproduced below.

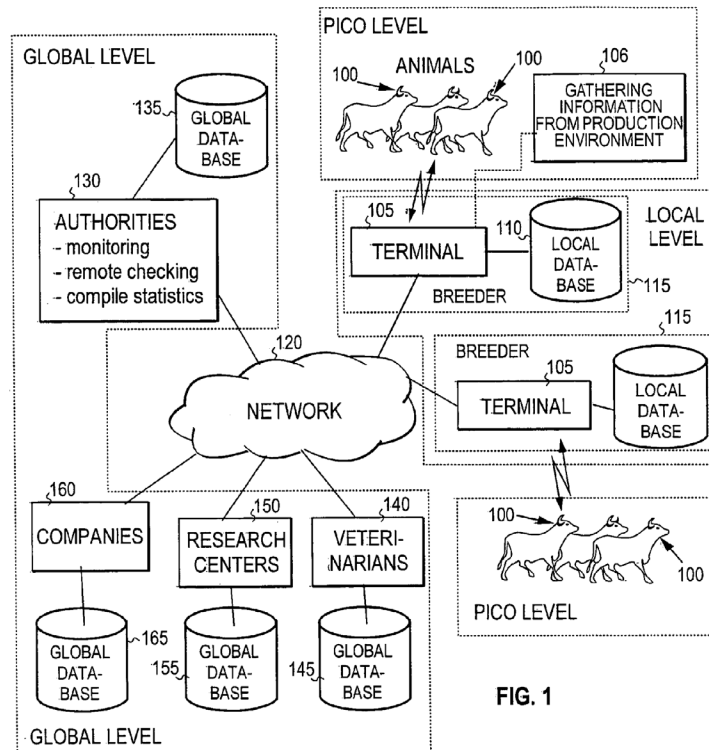


FIG. 1

Figure 1 illustrates the overall architecture of a surveillance system connected to a network, including a pico level, local level and global level.
Id. at 3:5–6.

Laitinen’s pico level is illustrated with pico level device 100 that includes, *inter alia*, the following components:

RF transmitter/receiver used in the creation of a (programmable) radio network with the local level’s terminal unit. This component can also be a mere RF transmitter.

....

Micro controller that coordinates radio transmissions between the pico and the local level and gathers parameter values from the [s]ensors attached to the animals. When necessary, the micro controller protects data saved in the device. As a part of the micro controller or as a separate component, the pico level also features an identifier.

[S]ensor unit connected to the micro controller for the surveillance of the animal's body temperature, occlusion, muscular action, motion or metabolic level. The [s]ensor unit can also be an implant inside the animal, in which case the data it provides can be, for instance, read/transcribed by the pico level equipment using the so-called Radio Frequency Identification Technology. It is also possible the [s]ensor unit includes components suitable for the dispersing of medicaments which enable the individual treatment of animals via a communications network, or detectors which alarm if the pico level device is detached from the animal.

Id. at 3:36–62.

Laitinen describes the “local level” as consisting of “one or more local 115 information systems, located in the farm of one farmer or breeder and tailored to meet its requirements by modifying a normal personal computer, for instance.” *Id.* at 4:5–9. “At the very minimum, a local information system [115] comprises a 105 terminal unit, typically featuring the 110 database into which the terminal . . . compiles information from pico and local levels, as well as from possible other devices 106.” *Id.* at 4:9–17.

“The highest, global, level consists of a computer or computers linked to the communications network 120 and of software in the databases of which information sent by the local level is gathered, organized and refined.” *Id.* at 4:42–45. “Based on the collected animal and farm information and expert knowledge, recommendations, treatment measures and management decisions are taken and prognosticated on the global level.” *Id.* at 4:50–53.

Laitinen describes feeding locally-collected data into “algorithms and knowledge models upheld in the global level systems.” *Id.* at 6:29–31. In one example, Laitinen describes an algorithm for monitoring medication

effects using information about the animal's present condition. *See id.* at 7:4–13, 7:35–56. In another example, Laitinen describes applying the system to monitor the animal's heat with a pico level device by measuring body temperature and movement. *Id.* at 8:5–11.

Laitinen further describes “two different pico level devices connected to a local information system. The pico level control device can be either external (100a) or implanted inside the animal's tissue (100b).” *Id.* at 5:38–43. “The external device can, for instance, measure the animal's body temperature (with a temperature [s]ensor) or movements . . . , or determine the animal's location.” *Id.* at 5:44–47. “The internal device enables, for example, the use of an EKG analysis for the surveillance of the animal's heart rate or an EMG (Electromyography) conveying its muscular tension or level of fatigue.” *Id.* at 5:50–53.

b) Buchanan (Ex. 1011)

Buchanan relates to “a farm management system for providing different levels of access and control to different users.” Ex. 1011, 1:5–6.

Figure 1 of Buchanan illustrates the system and is reproduced below.

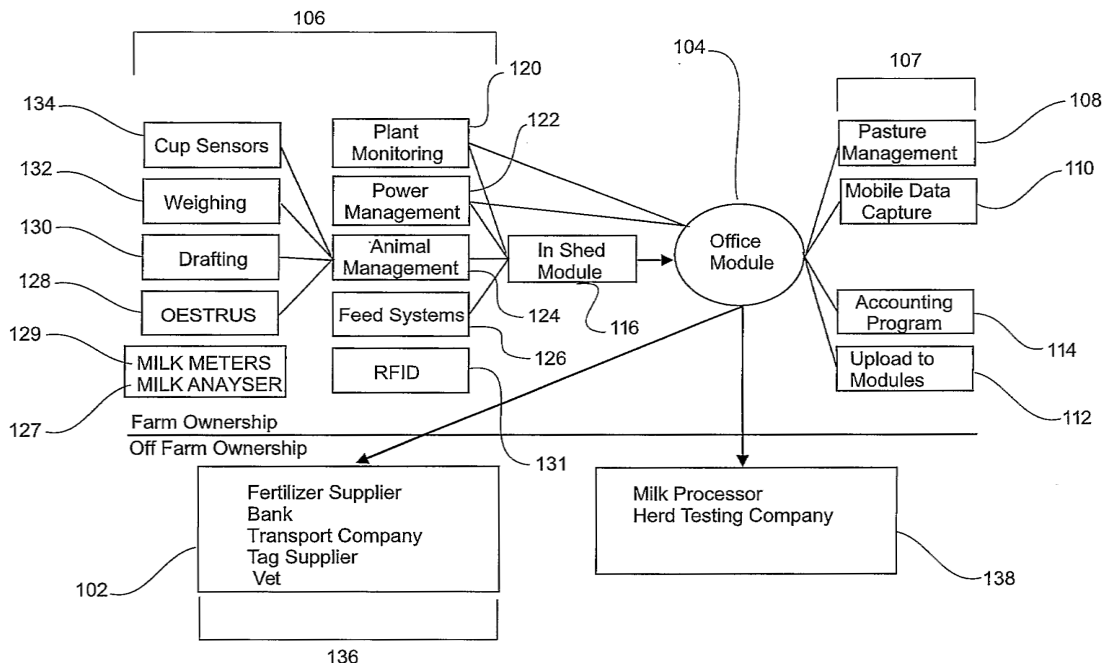


FIGURE 1

Figure 1 is a block diagram of a farm management system implemented for a single farm unit. *Id.* at 10:14–15.

Figure 1 illustrates central office module 104 that communicates with in-shed module 116, located in a milking parlor. *Id.* at 10:15–17. “[I]n-shed module 116 includes data input interfaces to communicate with plant and equipment 106 located in and around the milking shed,” including “physical plant (including vats and coolers) 120, power systems 122, feed systems 126, weigh scales 132, milking cup sensors 134, milk meters 129, in line milk analysers[] 127 and oestrus detectors 128.” *Id.* at 10:19–20, 10:25–27. Equipment 106 includes an animal identification device 131, which “may, for example, be an RFID scanner reading animal identifying data from animal ID tags moving into vicinity of the scanner.” *Id.* at 10:29–11:2.

Buchanan describes cup sensors that detect somatic cell count and milk meters that read milk volume and/or flow rate. *Id.* at 19:28–29. “The program stores these readings to be associated with the particular animal being milked” and “determines if any of the received values are outside of a preset range.” *Id.* at 19:29–32.

According to Buchanan, “[d]etecting when a cow is on heat can be done through the cup sensors checking the milk or alternatively the sensors or camera taking a temperature reading from the cow[’]s stomach, or an external sensor taking a temperature reading of the cow to determine if the cow is on heat.” *Id.* at 21:3–5. “The management system may be programmed to automatically draft cows for artificial breeding when the cows are on heat.” *Id.* at 21:6–8.

c) Liao (Ex. 1010)

Liao relates to a system for providing assistance in managing a dairy farm herd. Ex. 1010, 2:23–30. According to Liao, the described system “is capable of modeling decision processes that cannot be explicitly formulated” and “can provide valuable support to the farmer” in “very complex farm management decision making.” *Id.* at 3:15–18. “[T]he proposed dairy farm decisions relate to insemination, dry-cow states, determining individual animal energy demands, ketosis testing and/or mastitis testing.” *Id.* at 5:10–13.

For example, Liao explains the systems assists with insemination decisions by combining animal identity with other inputs, including:

a respective number of days in milk, a peak milk yield in a latest lactation, a conception rate of any previous lactations (i.e. the average number of inseminations required for the previous conceptions), a heat-detection status, a time period since a last heat date, a number of lactation periods, a body condition

scoring, whether the animal has been selected for culling, and/or an activity status.

Id. at 5:14–23. According to Liao, the output data reflects “whether the animal having this identity should be inseminated within a particular time period.” *Id.* at 5:23–27.

As another example, Liao describes mastitis testing, in which the dairy farm data includes one or more parameters reflecting “a status of a low-activity alarm, a milk conductivity, a relative milk yield, a somatic cell count and a number of days in milk.” *Id.* at 6:32–7:2. According to Liao, the output data reflects “whether the animal with this identity should be tested for mastitis within a particular time period.” *Id.* at 7:2–6.

2. *Independent Claim 1*

a) *Preamble*

The preamble of claim 1 recites “[a] computer implemented method of animal tracking.” Ex. 1001, 17:63.

Petitioner asserts that Laitinen discloses a “system for the surveillance of a group of animals” that comprises “computer[s]” and collects animal and farm information to take “management decisions.” Pet. 40 (citing Ex. 1006, 1:12–18, 4:5–9, 4:23–25, 4:40–53).

Patent Owner does not dispute that Laitinen teaches the preamble of claim 1. *See* PO Resp. 42–59. We are sufficiently persuaded by Petitioner’s argument and evidence that Laitinen teaches the preamble of claim 1.¹²

¹² Because Petitioner has sufficiently shown that the prior art teaches the preamble, we need not determine at this time whether the preamble is limiting. *See Nidec*, 868 F.3d at 1017.

b) Limitation 1[A]

Limitation 1[A] recites “connecting a computer to an RFID device reader.” Ex. 1001, 17:65.

Petitioner asserts that Laitinen discloses the use of RFID devices, specifically Pico devices 100a and 100b, which “employ ‘Radio Frequency Identification Technology’ that can be ‘read/transcribed.’” Pet. 41 (citing Ex. 1006, 3:28–35, 3:53–57). Petitioner argues that one skilled in the art “would have understood that implicit in the use of RFID devices is the need to read those devices with a reader” and that the reader is, in turn, connected to a computer, either individually or through a network as disclosed in Laitinen. *Id.* at 41–42 (citing Ex. 1003 ¶¶ 148–149; Ex. 1006, 4:5–9, 4:23–25, 4:42–45, 6:7–9, Figs. 1–3). Petitioner contends that “Buchanan confirms this understanding” by “explaining the application of RFID readers within its system.” *Id.* at 41–42 (citing Ex. 1011, 11:24–12:7).

Patent Owner does not dispute that the combination of Laitinen and Buchanan teaches limitation 1[A]. *See* PO Resp. 42–59. We are sufficiently persuaded by Petitioner’s arguments and evidence that the combination of Laitinen and Buchanan teaches or suggests limitation 1[A].

c) Limitation 1[B]

Limitation 1[B] recites “reading an RFID device implanted in an animal with said RFID device reader.” Ex. 1001, 17:66–67.

Petitioner asserts that Laitinen discloses reading an implanted RFID device, where “[t]he device can be ‘an **implant** inside the animal, in which case the data it provides can be. . . **read**/transcribed . . . using the so-called **Radio Frequency Identification Technology**’” and a skilled artisan would have understood Laitinen’s implanted device is read with an RFID reader. Pet. 42 (citing Ex. 1003 ¶ 150; Ex. 1006, 3:53–57, 5:38–42).

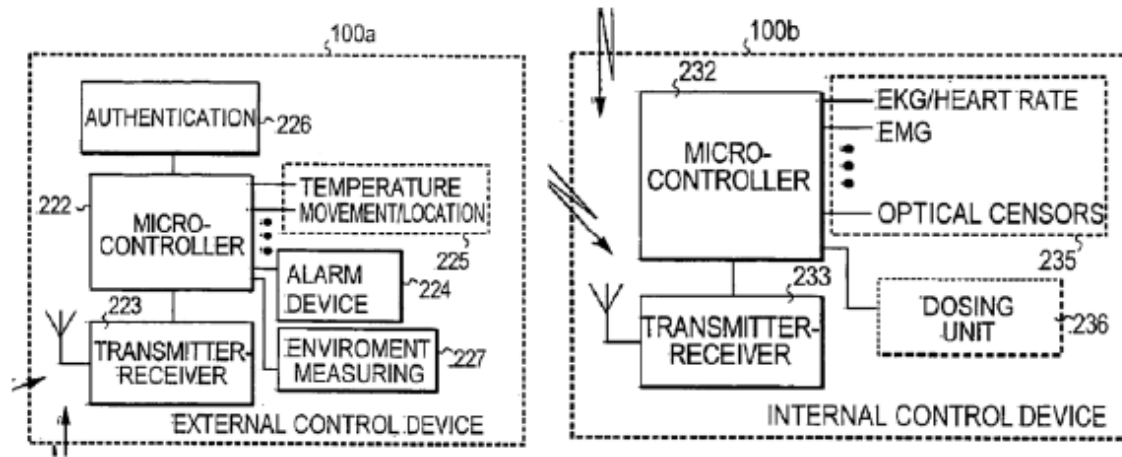
Patent Owner argues that Petitioner fails to identify “an RFID device implanted in an animal.” PO Resp. 54. According to Patent Owner, Petitioner relies solely on Laitinen’s description of a “[s]ensor unit” for this element but this sensor unit cannot serve as the claimed RFID device. *Id.* at 54–55 (citing Pet. 42 (citing Ex. 1006, 3:53–57, 5:38–42)). According to Patent Owner, Laitinen explains that “the ‘pico level device is attached permanently to, *e.g.*, the animal’s ear after its birth’ and that the ‘[s]ensor unit’ is separate and can be can be ‘read/transcribed by the pico level equipment.’” *Id.* at 55 (citing Ex. 1006, 3:28–62; Ex. 2009 ¶¶ 202–204).

Patent Owner contends that Laitinen teaches two distinct RFID devices—one external and one internal—that acquire distinct measurements. PO Resp. 55 (citing Ex. 2009 ¶ 205). According to Patent Owner, Petitioner relies on temperature measurements in order to show that the prior art satisfies the “logical expressions” limitation; however, temperature is only measured with Laitinen’s external device. *Id.* at 56–57 (citing Ex. 1006, 5:50–55; Fig. 2; Ex. 2009 ¶¶ 206–207). In contrast, according to Patent Owner, Laitinen’s internal device only measures “the animal’s heart rate,” “its muscular tension or level of fatigue,” and “oxygen saturation,” which are not relied on by Petitioner for its obviousness rationale. *Id.* at 56–57 (citing Ex. 1006, 5:44–49). Patent Owner further argues that POSAs at the time would have had no reason to use Laitinen’s internal devices to measure temperature because POSAs considered such internal devices to be potentially harmful to animals and potentially unreliable for livestock applications. *Id.* at 57 (citing Ex. 2009 ¶¶ 208–210; Ex. 1006, 5:40–43).

Petitioner replies that “Laitinen expressly discloses an implanted RFID devices that measures, among other things, temperature and movement.” Pet. Reply 24 (citing Ex. 1006, 3:33–57; Ex. 1055 ¶¶ 34–36).

Petitioner also argues that the implanted pico level control device of Laitinen's Figure 2 measures temperature. *Id.* at 25 (citing Ex. 1006, 3:33–57, 5:38–55, 8:9–11). According to Petitioner, “[b]ecause Laitinen’s exemplary internal device measures EKG and EMG and O₂ saturation, with an invitation to include other sensors, a POSA would have understood Laitinen to disclose the internal control device having temperature and movement measuring capabilities.” *Id.* (citing Ex. 1055 ¶ 36). Lastly, Petitioner contends that POSAs would have been motivated to use Laitinen’s internal device to measure temperature because they were well-aware of animal-implantable temperature-sending RFID devices. *Id.* at 25–26 (citing Ex. 1003 ¶¶ 33–41; Ex. 1009 ¶¶ 2, 39, 41; Ex. 1008, 2:4–21; Ex. 1014 ¶¶ 58, 65, 71, Fig. 1; Ex. 1021, 2–5).

Patent Owner responds that “[e]ven if the sensor unit were an RFID device, [Laitinen’s] disclosure as a whole demonstrates that the sensor unit that measures temperature and movement is located external to the animal.” PO Sur-Reply 23. Patent Owner argues that Laitinen’s Figure 2 illustrates two separate devices: (1) external control device 100a, that measures temperature and movement, and (2) internal control device 100b, that measures EKG, and EMG, and includes optical sensors. *Id.* at 23–24 (citing Ex. 1006, Fig. 2, 5:38–55). We reproduce Patent Owner’s excerpted Laitinen Figure 2 below.



See *id.* at 24. Figure 2 “exemplifies two different pico level devices connected to a local information system. The pico level control device can be either external (100a) or implanted inside the animal’s tissue (100b).” Ex. 1006, 5:38–41. External control device 100a includes microcontroller 222, transmitter-receiver 223, alarm device 224, and sensor unit 225 labeled as “temperature” and “movement/location.” *Id.* at 5:44–49. Internal control device 110b includes microcontroller 232, transmitter-receiver 233, and sensor unit 235 labeled as “EKG/heart rate,” “EMG,” and “optical [s]ensors.” *Id.* at 5:50–55. Patent Owner concludes “[t]here is no teaching or suggestion that Laitinen’s implanted [s]ensor unit is capable of providing temperature or movement data.” PO Sur-Reply 24–25 (citing Ex. 1006, 3:53–57).

We find a preponderance of the evidence supports Petitioner’s argument. Specifically, we find Laitinen teaches or suggests a pico level device that includes a sensor unit that can be an implant inside the animal and can be read using RF technology and therefore function as an RFID. Ex. 1006, 3:33–57. Laitinen generally teaches a pico level device that includes an RF transmitter/receiver, an antenna, energy supply, microcontroller and sensor unit. *Id.* at 3:21–62. The sensor unit can

measure temperature, “can also be an implant inside the animal,” and “can be . . . read/transcribed by the pico level equipment.” *Id.* at 3:51–56. Patent Owner reads this disclosure as teaching an implanted sensor unit separate from the pico level device including RF transmitter/receiver. *See* PO Resp. 55; Ex. 2009 ¶¶ 202–204. We disagree. Instead, we read Laitinen as teaching a sensor within the pico level device, which may be an implant.

Laitinen’s Figure 2 also shows a sensor in an implant, by illustrating sensor 235 within internal device 100b, further including transmitter/receiver 232, and microcontroller 232. Ex. 1006, Fig. 2, 5:38–43. Accordingly, Figure 2 supports Petitioner’s argument.

We are further not persuaded by Patent Owner’s argument that Figure 2 precludes an internal device with a temperature sensor by illustrating only external device 100a including temperature sensor 225. Rather, Laitinen describes two exemplary pico level devices, one external and one internal/implanted. Ex. 1006, 5:38–55. Although, Laitinen describes each device as including particular sensors, the descriptions are exemplary (“for instance,” “for example”), not exclusionary. *See id.* “The prior art’s mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution.” *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Laitinen does not discourage locating a temperature sensor in an internal sensor, it merely describes a preferred embodiment of a temperature sensor in an external sensor. *See Merck & Co. v. Biocraft Labs, Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“[I]n a section 103 inquiry, the fact that a specific embodiment is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.” (internal quotations and brackets

omitted)). Accordingly, we disagree that Laitinen’s disclosure as a whole requires an external sensor unit that measures temperature and movement.

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[B] is taught or suggested by Laitinen and Buchanan.

d) Limitation 1[C]

Limitation 1[C] recites “retrieving an amount of animal identification information from said RFID device implanted in an animal.” Ex. 1001, 18:1–2. Petitioner asserts that Laitinen discloses a system of individual animal identification. Pet. 43 (citing Ex. 1006, 2:47–48, 6:2–4 (“Each surveillance device includes a *personalized identifier for the correct identification of the animal* in question.”)). Laitinen also explains that its “pico level device is attached permanently to [an animal], and it *functions like [a] conventional identification tool*.” *Id.* (citing Ex. 1003 ¶¶ 151–152; Ex. 1006, 3:28–35, 3:53–57).

Patent Owner argues that Laitinen does not teach retrieving animal identification information from an RFID device implanted in an animal. *See* PO Resp. 58–59. Patent Owner argues that the Board credited Laitinen as teaching that “the pico level device generally functions like a conventional identification tool and included additional components, such as an RF transmitter/receiver,” but this does not address Petitioner’s failure to contend that the alleged functionality would include the method step of “retrieving an amount of animal identification information from said RFID device implanted in an animal” as claimed.” *Id.* at 58–59 (citing Ex. 2009 ¶¶ 212–213).

We find that Laitinen teaches or suggests retrieving identification information from a RFID device implanted in an animal. Specifically,

Laitinen discloses “a system of individual animal identification” and further discloses that the pico level device generally functions like a conventional identification tool and includes additional components, such as an RF transmitter/receiver. *See* Ex. 1003 ¶¶ 151–152; Ex. 1006, 2:47–48; 3:28–35, 6:7–9. We also credit the testimony of Dr. Brown-Brandl that “[t]he use of implanted RFID devices for animal identification was well-established,” and we, therefore, find that a POSA would have understood Laitinen to disclose an RFID system that includes the method step of retrieving animal identification in order to identify animals. Ex. 1003 ¶ 152 (citing Ex. 1009).

Therefore, we determine that Petitioner has shown by a preponderance of the evidence that limitation 1[C] is taught or suggested by Laitinen and Buchanan.

e) Limitation 1[D]

Limitation 1[D] recites “linking an amount of animal information of said animal stored in a data base of said computer to said amount of information retrieved from said RFID device implanted in said animal, said amount of animal information stored in said data base of said computer comprising an amount of milk production information or an amount of days milked.” Ex. 1001, 18:3–9.

Petitioner asserts that “Laitinen discloses retrieving animal identification information. This information is stored in a database along with associated information for each animal.” Pet. 43–44 (citing Ex. 1006, 2:46–53, 4:42–49, 8:16–23).

Petitioner concedes that Laitinen does not expressly disclose storing milk production information, but asserts Laitinen would have motivated one skilled in the art to do so because it identifies real-time information about milk production as a “*vital*” need. *Id.* at 44 (citing Ex. 1003 ¶ 153–154;

Ex. 1006, 1:36–38). Petitioner further asserts that “Buchanan discloses a farm management system that stores milk production information that satisfies the motivation presented in Laitinen.” *Id.* According to Petitioner, Buchanan describes milk meters for taking milk volume readings of particular animals and storing those readings in a database where the readings are “associated with ‘animal identifiers.’” *Id.* (citing Ex. 1003 ¶ 155; Ex. 1011, 11:18–22, 19:17–30).

Petitioner also asserts that one skilled in the art “would have been additionally motivated to store milk production information in Laitinen’s database, because Laitinen and Liao were both concerned with detecting when a cow was in heat for purposes of artificial insemination” and detecting disease. *Id.* at 45 (citing Ex. 1003 ¶ 157). For example, according to Petitioner, “Liao expressly teaches that peak yield of milk is ‘applicable to insemination decisions.’” *Id.* (citing Ex. 1010, 9:34–11:10). Petitioner also contends that “Liao teaches that milk production information is one of the ‘input parameters’ for deciding whether to test a cow for mastitis.” *Id.* (citing Ex. 1010, 15:16–29, 29:15–35). Petitioner concludes that one skilled in the art would have been able to configure Laitinen’s database to link with Buchanan’s and Liao’s disclosures of “a cow’s stored milk production using each cow’s ‘personalized identifier.’” *Id.* at 46 (citing Ex. 1003 ¶ 159; Ex. 1010, 3:28–31, 6:2–4).

Patent Owner does not separately dispute that the combination of Laitinen, Buchanan, and Liao teaches limitation 1[D]. *See* PO Resp. 42–59. We determine that Petitioner has shown by a preponderance of the evidence that limitation 1[D] is taught or suggested by Laitinen, Buchanan, and Liao.

f) Limitation 1[E]

Limitation 1[E] recites “converting said amount of animal information of said animal stored in said database of said computer linked to said amount of information retrieved from said RFID device implanted in said animal into one or more logical variables.” Ex. 1001, 18:10–14.

Petitioner asserts that a skilled artisan would have been motivated to store milk production information in Laitinen’s database for purposes of detecting oestrus and/or disease. Pet. 46. According to Petitioner, “Laitinen further teaches that ‘data concerning an animal can be obtained . . . throughout the animal’s entire life span’ and that the ‘servers and databases feature **algorithm and models, which are applied in the analysis of these and other possible data.**’” *Id.* (citing Ex. 1006, 5:24–30). Petitioner further contends that Laitinen explains that “**algorithms and knowledge models . . .** are essential to the effectiveness of the system’s services.” *Id.* (citing Ex. 1006, 6:29–32). Petitioner argues that a skilled artisan “would have been motivated to convert milk production information as described in Buchanan and Liao into a logical variable for insertion into one of Laitinen’s algorithms and knowledge models for purposes of detecting oestrus or disease.” *Id.* at 46–47 (citing Ex. 1003 ¶ 159).

Patent Owner does not separately dispute that the combination of Laitinen, Buchanan, and Liao, teaches limitation 1[E]. *See* PO Resp. 42–59. We determine that Petitioner has shown by a preponderance of the evidence that limitation 1[E] is taught or suggested by Laitinen, Buchanan, and Liao.

g) Limitation 1[F]

Limitation 1[F] recites “inserting at least one of said plurality of logical variables into at least one logical expression.” Ex. 1001, 18:15–16.

Petitioner argues the combined art teaches two different logical expressions that meet the requirements of limitation 1[F]. Pet. 47–50. Because we find Petitioner’s arguments persuasive as to the second of the proposed logical expressions (for detecting animal illness (Pet. 47–50)), we do not address Petitioner’s first proposed logical expression (for determining whether a cow is in heat (*id.* at 47)).

Petitioner asserts that “Laitinen discloses a second logical expression that determines the appropriate ‘medical treatment’ for an animal.” *Id.* at 47 (citing Ex. 1003 ¶ 162). According to Petitioner, Laitinen’s “logical expression” is “ $x=f^{-1}(y,z)$, wherein the treatment x is a function of initial state vector y and present state vector z ,” and “[t]he state vectors include the animal’s temperature at different times.” *Id.* (citing Ex. 1006, 7:6–13, 7:35–37).

Petitioner asserts that one of ordinary skill would have been “aware that lowered milk production was also an indicator of illness.” Pet. 48 (citing Ex. 1010, 6:32–7:6; Ex. 1023, 4:13–18; Ex. 1008, 6:48–50). Specifically, Liao describes an expression for mastitis testing that includes a first input parameter reflecting animal identity, and one or more parameters that may include relative milk yield and number of days in milk. Ex. 1010, 6:31–7:6; *see also* Ex. 1023, 4:12–18 (“a more reliable indication signal of heat or illness is obtainable from parameters including one or more of the following: the milk rate of flow, the temperature of a milk flow, [and] the milk yield.”). Accordingly, Petitioner asserts that the person of ordinary skill “would have been motivated to modify the second logical expression of Laitinen, or create a new expression, and to insert milk production information as logical variables, along with temperature, for determining whether a cow is ill and advising on medical treatments.” Pet. 48 (citing

Ex. 1003 ¶ 163); *see also id.* at 50–51 (“[I]t was known to use a multivariate expression that used both temperature and milk yield information, as well as other parameters, as input parameters to determine whether a cow was in oestrus or ill.” (citing Ex. 1033, 173–181; Ex. 1003 ¶ 165)).

Petitioner concludes that “[m]odifying Laitinen’s logical expressions, or creating a new one, to include both temperature and the stored milk production information for the detection of [] illness would have merely involved the application of algebra, which was well within the capabilities of the POSA.” *Id.* at 49 (citing *KSR*, 550 U.S. at 416–17). Accordingly, Petitioner argues that “there was a high probability of success given that the POSA could have used known techniques to implement an expression that uses both temperature and milk yield as input variables.” *Id.* at 49–50 (citing Ex. 1003 ¶ 165).

Patent Owner responds that Laitinen’s second logical expression is an inverse function that “selects a ‘medical treatment’ by identifying prior treatments that produced desirable effects on certain parameters, none of which are ‘milk production.’” PO Resp. 47; Ex. 2009 ¶¶ 184–187; Ex. 1006, 7:35–37. Patent Owner asserts that one skilled in the art would not have added milk production as a parameter to Laitinen’s inverse function because no milk production data is measured when a medicated cow’s milk is withdrawn from production. PO Resp. 48 (citing Ex. 2009 ¶ 188; Ex. 2010, 78:7–80:2). Patent Owner also argues that a milk production parameter would not improve the reliability of Laitinen’s function because “effective medication can cause milk production to increase, decrease, or stay the same.” *Id.* (citing Ex. 2009 ¶ 189). Accordingly, Patent Owner argues that “the record does not support that combining temperature and

milk production into a logical expression was known prior to the invention to aid in distinguishing between illness and other issues.” *Id.* at 50.

Petitioner replies that, as to modifying Laitinen’s medical treatment expression, “[m]edicated animals must still be milked, with the milk discarded, and the yield of the discarded milk is still measured.” Pet. Reply 21 (citing Ex. 1055 ¶ 43; Ex. 1005, 81; Ex. 1050, 2702–2703; Ex. 1051, 751). Apart from Laitinen’s logical expression, Petitioner asserts a “broader argument” that:

(1) Laitinen (and a POSA) was concerned with illness and estrus, (2) Laitinen proposed the use of algorithms and models to analyze animal health, including expressions using temperature for detecting illness and estrus, and (3) it was known to a POSA that milk yield was also correlated with illness and estrus.

Id. at 21–22 (citing Pet. 43–51; Ex. 1052, 44; Ex. 1053, 528). Petitioner concludes that one skilled in the art would “have been motivated to modify Laitinen or ‘create a new’ expression that included both temperature and milk production information as input variables to detect estrus or illness.” *Id.* at 22 (citing Pet. 48–51; Ex. 1055 ¶¶ 37–40; Ex. 1033, 172).

Patent Owner responds that Petitioner does not explain why discarded milk measurements “would be used in Laitinen’s inverse function, such as to assess the effectiveness of a medication.” PO Sur-Reply 22 (citing Ex. 2009 ¶ 232). Patent Owner further argues that we should not consider Petitioner’s argument that one skilled in the art “would have been motivated to ‘create a new expression,’” because that “argument is based on expert testimony, not a patent or printed publication.” *Id.* (citing 35 U.S.C. § 311(b); Pet. Reply 22; Ex. 1055 ¶¶ 37–40).

We find that a preponderance of the evidence supports Petitioner’s argument that one skilled in the art would have been motivated to combine Laitinen and Liao to provide a logical expression for identifying illness, using animal temperature and milk production as variables. Specifically, Laitinen describes a logical expression for identifying medical treatment of illness including animal temperature as a variable. Ex. 1006, 7:4–13, 7:35–55. Laitinen identifies bovine mastitis as a specific illness of concern. *See id.* at 4:60–64. Likewise, Liao teaches a logical expression for testing for illness, i.e., mastitis, that includes relative milk yield and days in milk (“DIM”) as input parameters. Ex. 1010, 6:31–7:6. We further credit Dr. Brown-Brandl’s testimony, supported by van den Berg and de Mol, that one skilled in the art would have been motivated to combine the variables of animal temperature and milk production to provide a logical expression for determining illness, specifically mastitis. *See* Ex. 1003 ¶¶ 163–165; Ex. 1023, 4:12–22; Ex. 1033, 173, 181 (describing a detection model for generating mastitis alerts). The resulting logical expression need not be a modified version of Laitinen’s inverse function for monitoring medical treatment, but instead more broadly include a logical expression to identify animal illness. *See* Ex. 1003 ¶ 189; Ex. 1055 ¶¶ 31–33.

Because we agree with Petitioner’s argument that one skilled in the art would have been motivated to combine the art to generate a logical expression for identifying animal illness, we are not persuaded by Patent Owner’s arguments regarding modifying Laitinen’s specific inverse function or whether milk from a medicated cow would have been discarded or tested. *See* PO Resp. 47–48. Also, we are not persuaded by Patent Owner’s argument that Petitioner’s proposed logical expression for identifying illness is based on expert testimony and not a patent or printed publication. *See*

PO Sur-Reply 22. Both Laitinen and Liao describe logical expressions associated with animal health (medication and illness), and Dr. Brown-Brandl's testimony is further supported by extrinsic evidence, including van den Berg and de Mol. *See* Ex. 1003 ¶¶ 163–165. Of the evidence relied on by Dr. Brown-Brandl, de Mol expressly describes a detection model that includes data such as milk yield and milk temperature. *See* Ex. 1033, 181 (“A mastitis alert is given when the conductivity error is rather high and the sum of standardised errors of conductivity, yield and temperature falls outside a certain confidence interval. An illness alert is based on the sum of standardised errors of yield, temperature, activity and concentrates intake.”).

We are further not persuaded by Patent Owner's argument that de Mol disparages the use of a logical expression for identifying illness as unlikely to succeed for generating too many false positives. *See* PO Resp. 40, 41, 53 (citing Ex. 1033, 184; Ex. 2009 ¶ 199). Instead, we find de Mol supports the conclusion that one skilled in the art would have had a reasonable expectation of success in creating a logical expression for detecting illness incorporating animal temperature and milk product, even if de Mol's specific model required additional improvement to reduce false positive alerts. *See* Ex. 1033, 180–184; Ex. 1055 ¶ 32. “The reasonable expectation of success requirement for obviousness does not necessitate an absolute certainty for success.” *PAR Pharm.*, 773 F.3d at 1198.

We determine that Petitioner has shown by a preponderance of the evidence that limitation 1[F] is taught or suggested by Laitinen, Buchanan, and Liao and that one skilled in the art would have been motivated to combine these teachings with a reasonable expectation of success.

h) Limitation 1[G]

Limitation 1[G] recites “obtaining a logical value relating to said animal.” Ex. 1001, 18:17.

As discussed above, Petitioner asserts that Laitinen describes two logical expressions, wherein the second expression is “for purposes of detecting illness and identifying appropriate medical treatment.” Pet. 50 (citing Ex. 1006, 7:35–37, 8:12–15). Petitioner asserts that the second logical expression, $x=f^{-1}(y,z)$, is being solved for the value x , “wherein x is the appropriate medical treatment for a sick animal.” *Id.* (citing Ex. 1006, 7:35–37; Ex. 1003 ¶ 167).

Patent Owner contends that, “POSAs would not have had reason to input milk yield into Laitinen’s ‘inverse function,’ but if they did, it could not be solved to ‘indicate whether an animal is ill and to identify appropriate medical treatment.’” PO Resp. 54 (citing Pet. 59). According to Patent Owner, “milk yield does not follow a consistent or predictable pattern in response to medication in animals,” and “incorporating milk yield into a logical expression like Laitinen’s would introduce noise and render the system incapable of identifying the appropriate treatment or whether the animal was ill.” *Id.* (citing Ex. 2009 ¶ 201). Patent Owner concludes that Petitioner’s alleged second logical expression would not obtain a “logical value” as claimed. *Id.*

For the reasons discussed above (specifically with regard to limitations 1[E] and 1 [F]), we find that one skilled in the art would have been motivated to combine Laitinen, Buchanan, and Liao to teach or suggest limitation 1[G] with a reasonable expectation of success.

i) Conclusion as to Claim 1

After carefully considering the arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that claim 1 of the '515 patent would have been obvious over Laitinen, Buchanan, and Liao.

3. Claim 2

Petitioner presents evidence that the Laitinen, Buchanan, and Liao combination teaches the limitations of claim 2. Pet. 51. Patent Owner does not separately argue claim 2. For the reasons discussed above for claim 1, Petitioner shows by a preponderance of the evidence that the combination of Laitinen, Buchanan, and Liao teaches or suggests the limitations of claim 2.

H. Ground 5 Asserted Obviousness of Claims 3–4 over Laitinen, Buchanan, Liao, and Brune

Petitioner presents evidence that the combination of Laitinen, Buchanan, Liao, and Brune teaches the limitations of claims 3–4. Pet. 52–54. Patent Owner asserts that Petitioner's arguments fail for claims 3–4 for the same reasons as to Ground 4. PO Resp. 59. Patent Owner presents an additional argument for claim 4, which is we discuss below.

1. Claim 4

Claim 4 recites the computer implemented method of animal tracking as described in claim 3, further comprising “retrieving an amount of sensed animal information from said plurality of RFID devices implanted in said plurality of animals.” Ex. 1001, 18:33–36.

Petitioner asserts that Laitinen discloses a “[s]ensor” for measuring an “animal's body temperature,” wherein the “[s]ensor unit connected to the micro controller” can be “an implant inside the animal” and the data it provides can be “read/transcribed . . . using the so-called Radio Frequency Identification Technology.” Pet. 54 (citing Ex. 1006, 3:51–57, 8:10–12

(“To monitor the animal’s heat with a pico level device, body temperature and movement are usually measured.”). According to Petitioner, the pico RFID device can also provide location information using GPS. *Id.* (citing Ex. 1006, 3:63–67; Ex. 1003 ¶177). Petitioner also cites to Pohlkamp¹³ to demonstrate that “it was well-known to retrieve animal temperature from an implanted RFID bolus having a temperature sensor.” *Id.* (citing Ex. 1009 ¶¶ 39, 41, 53).

Patent Owner contends that Petitioner’s obviousness argument fails because Petitioner only identifies Laitinen’s “[s]ensor unit,” which is not a “RFID device.” PO Resp. 59–60 (citing Pet. 54). Further, Patent Owner notes that Petitioner cites to Laitinen’s statement regarding the measurement of body temperature; however, Laitinen “expressly states that temperature is measured with an external device.” *Id.* (citing Ex. 1006, 5:44–49, Fig. 2; Ex. 2009 ¶ 215).

Based on the evidence presented in the Petition, and for the reasons discussed above for Ground 4 (specifically with regard to limitation 1[B] reciting an implanted RFID device), we find that Petitioner shows by a preponderance of the evidence that the combination of Laitinen, Buchanan, Liao, and Brune teaches or suggests the limitations of claims 3–4.

I. Ground 6 Asserted Obviousness of Claims 15–25 over Laitinen, Buchanan, Liao, and Rollins

Petitioner presents evidence that the combination of Laitinen, Buchanan, Liao, and Rollins teaches the limitations of claims 15–25. Pet. 54–62. Patent Owner asserts that Petitioner’s arguments fail for claims

¹³ Pohlkamp et al., U.S. Patent Pub. No. 2006/0267767, published Nov. 30, 2006 (“Pohlkamp”).

15–25 for the same reasons as to Ground 4. PO Resp. 60. Patent Owner presents an additional argument for claim 25, which is discussed below.

1. Claim 25

Claim 25 recites the computer implemented method of animal tracking as described in claim 21, “wherein reading an RFID device implanted in an animal with said RFID device reader comprises reading an RFID device said RFID device part of a bolus ingested by a bovine animal.” Ex. 1001, 20:44–48.

Petitioner asserts that Laitinen discloses that the pico RFID device may be “implanted.” Pet. 61 (citing Ex. 1006, 5:38–41). Petitioner also contends that “[u]sing boluses as RFID implants was well known by 2008, and the art contained numerous examples of such devices” and that a POSA would have understood that a bolus is implanted in a cow’s stomach by ingestion. *Id.* (citing Ex. 1003 ¶ 194). Thus, according to Petitioner, “[i]t would have been routine for the POSA to have implemented Laitinen’s system with an ingested bolus RFID device.” *Id.* at 61–62.

Patent Owner contends that Petitioner does not cite to any reference or expert testimony to support the assertion that “[u]sing boluses as RFID implants was well known by 2008, and the art contained numerous examples of such devices” and neither Petitioner nor its declarant provide any reason to use a bolus in Laitinen. PO Resp. 60–61 (citing Pet. 61).

Petitioner responds that “Laitinen discloses using implanted RFID devices (Ex1006, 5:38–41), and one well-known implantable RFID device at the time of the ’515 patent was an ingestible bolus.” Pet. Reply 27 (citing Pet. 61–62; Ex. 1003 ¶ 194 (citing Ex. 1005, 20, 22)). Patent Owner also argues that the Petition refers to Dr. Brown-Brandl’s declaration, which cites Trevarthen to confirm that ingested bolus devices were common. *Id.*

Patent Owner responds that Petitioner's "only support for the disclosure of an implantable RFID device configured as an ingestible bolus in Laitinen is limited to Brown-Brandl's unsupported testimony that such a device existed at the time of the '515 patent" in violation of 35 U.S.C. §311(b), which limits the Petition to challenging claims "only on the basis of prior art consisting of patents or printed publications." PO Sur-Reply 26 (citing Pet. Reply, 27 (citing Ex. 1003 ¶ 194)). Patent Owner also alleges that "Petitioners critically fail to address *why* a POSA would have used an 'RFID device' that is 'part of a bolus ingested by a bovine animal' as required." *Id.*

First, we do not agree with Patent Owner that the Petition is in violation of 35 U.S.C. § 311(b). The Petition does not rely on unsupported expert testimony but relies on Trevarthen's disclosure of boluses to support the argument that "[u]sing boluses as RFID implants was well known by 2008." *See* Ex. 1003 ¶ 194 (citing Ex. 1005, 20, 22). Although the Petition cites to the declaration of Dr. Brown-Brandl, which cites to Trevarthen, Petitioner is relying on the declarant's testimony in conjunction with the cited art. Specifically, the pages of Trevarthen cited by Dr. Brown-Brandl discusses the availability of rumen boluses and their pricing. *See* Ex. 1005, 20, 22. We are also persuaded by Dr. Brown-Brandl's testimony that it would have been routine for the POSA to have implemented Laitinen's system with an ingested bolus RFID device because Laitinen teaches using implanted RFID devices and ingested boluses were commonly used as such devices. *See* Ex. 1003 ¶ 194. Picking one of a finite number of known solutions to a known problem is obvious. *See KSR*, 550 U.S. at 421.

Based on the evidence presented in the Petition, and for the reasons discussed above for Ground 4, we find that Petitioner shows by a

preponderance of the evidence that the combination of Laitinen, Buchanan, Liao, and Rollins teaches or suggests the limitations of claims 15–25.

IV. EVIDENTIARY ISSUES

A. Patent Owner’s Motion to Exclude Evidence

Patent Owner moves to exclude Exhibits 1040, 1041, and 1044. Paper 36. We do not rely on any of Exhibits 1040, 1041, and 1044 to decide this matter. Thus we dismiss Patent Owner’s motion to exclude as moot.

V. CONCLUSION¹⁴

Petitioner establishes by a preponderance of the evidence that claims 1–4 and 15–25 of the ’515 patent are unpatentable as follows.

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2	102	Trevarthen		1, 2
1, 2	103	Trevarthen	1, 2	
3, 4	103	Trevarthen, Brune	3, 4	
15–25	103	Trevarthen, Rollins	15–25	
1, 2	103	Laitinen, Buchanan, Liao	1, 2	
3, 4	103	Laitinen, Buchanan, Liao, Brune	3, 4	

¹⁴ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, 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. 16,654 (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).

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
15–25	103	Laitinen, Buchanan, Liao, Rollins	15–25	
Overall Outcome			1–4, 15–25	

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–4 and 15–25 of the '515 patent have been proven to be *unpatentable*;

FURTHER ORDERED that Petitioner's Motion to Exclude is *dismissed as moot*; and

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

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