

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*.

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

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”).

Under 35 U.S.C. § 314(a), the Board “may not authorize an *inter partes* review to be instituted unless . . . the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” After considering the Petition, the Preliminary Response, the Preliminary Reply and Sur-Reply, and the evidence of record, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim challenged in the Petition. Accordingly, we institute an *inter partes* review of claims 1–4 and 15–25 of the ’515 patent, based on all of the grounds identified in the Petition. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018); *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

The following findings of fact and conclusions of law are not final but are made for the sole purpose of determining whether Petitioner meets the threshold for instituting review. Any final decision shall be based on the full trial record, including any response timely filed by Patent Owner. Any

arguments not raised by Patent Owner in a timely-filed Response may be deemed waived, even if they were presented in the Preliminary Response.

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 3, 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 3, 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.

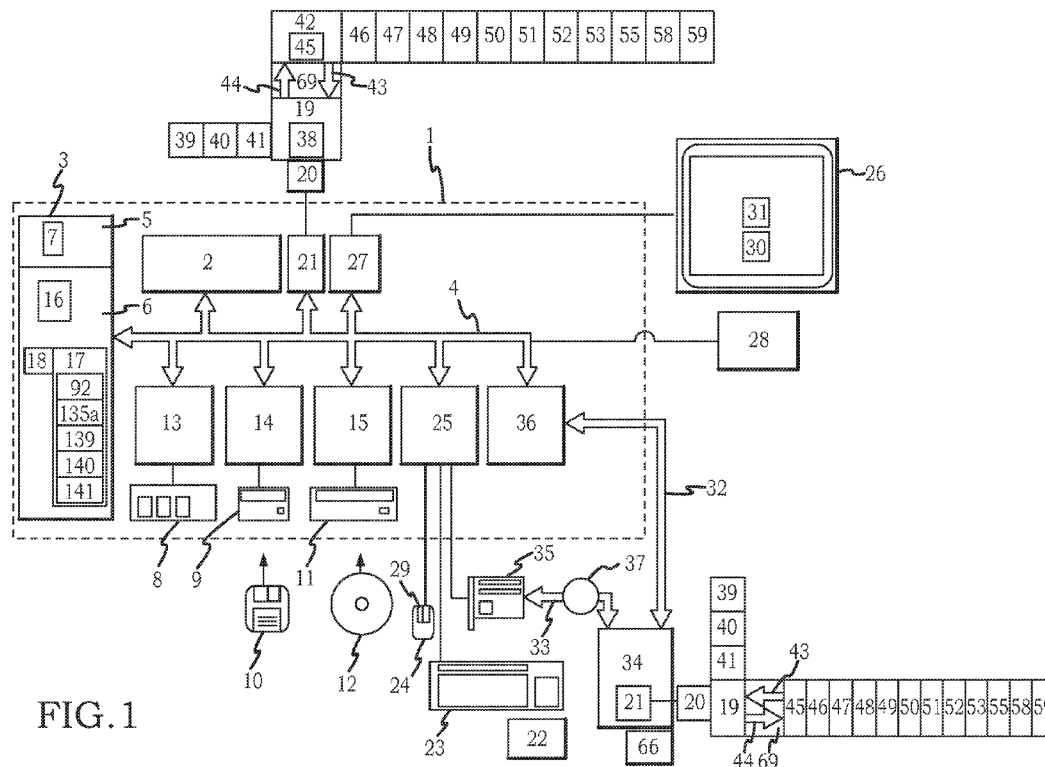


FIG. 1

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.

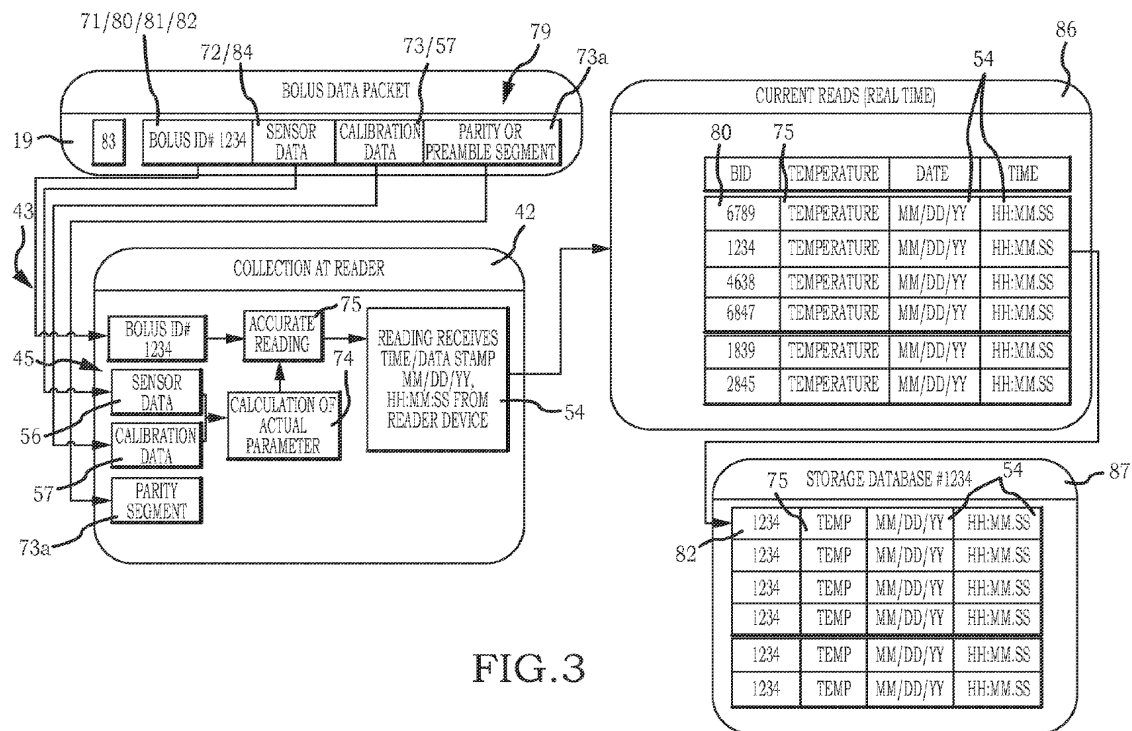


Figure 3 shows a block diagram including an RFID and an RFID reader. *Id.* at 3:13–18.

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. [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.

¹ We adopt the bracketed identifiers added by Petitioner.

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
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. Asserted Grounds of Unpatentability

Petitioner asserts that claims 1–4 and 15–25 of the ’515 patent are unpatentable in view of the following grounds. Pet. 2–3.

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

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.

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

Petitioner relies on the Declaration of Tami M. Brown-Brandl, Ph.D. (Ex. 1003) in support of its contentions. Patent Owner relies on the Declaration of Timothy J. Bowser, Ph.D. (Ex. 2001) in support of its Preliminary Response.

G. Asserted Prior Art

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 69.³ According to Trevarthen, each 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 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–

³ Petitioner’s exhibits include Bates Numbering, but both parties cite to the original pagination of the documents. For consistency with the parties’ citations, we refer to the document’s page numbers.

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.” *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. *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.

3. *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.

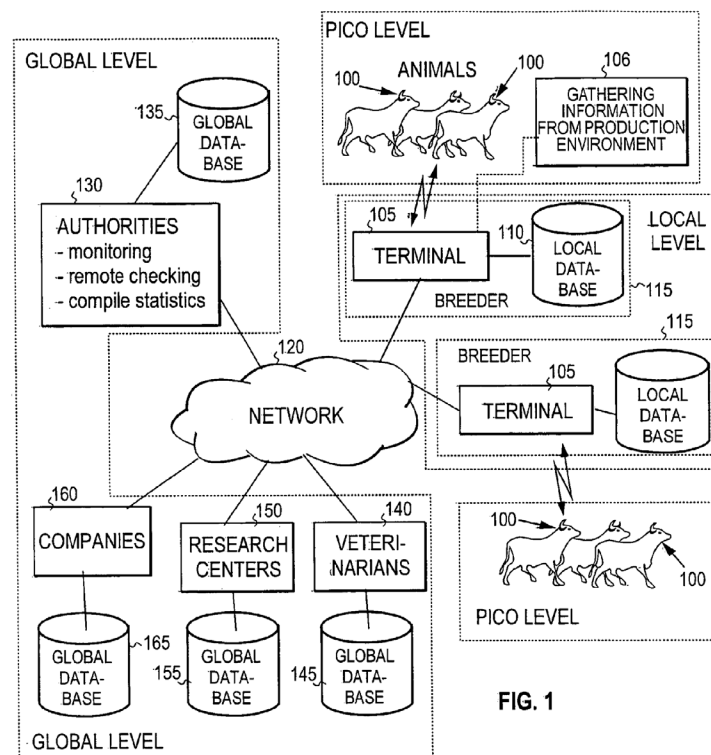


FIG. 1

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 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, 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.

4. 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.

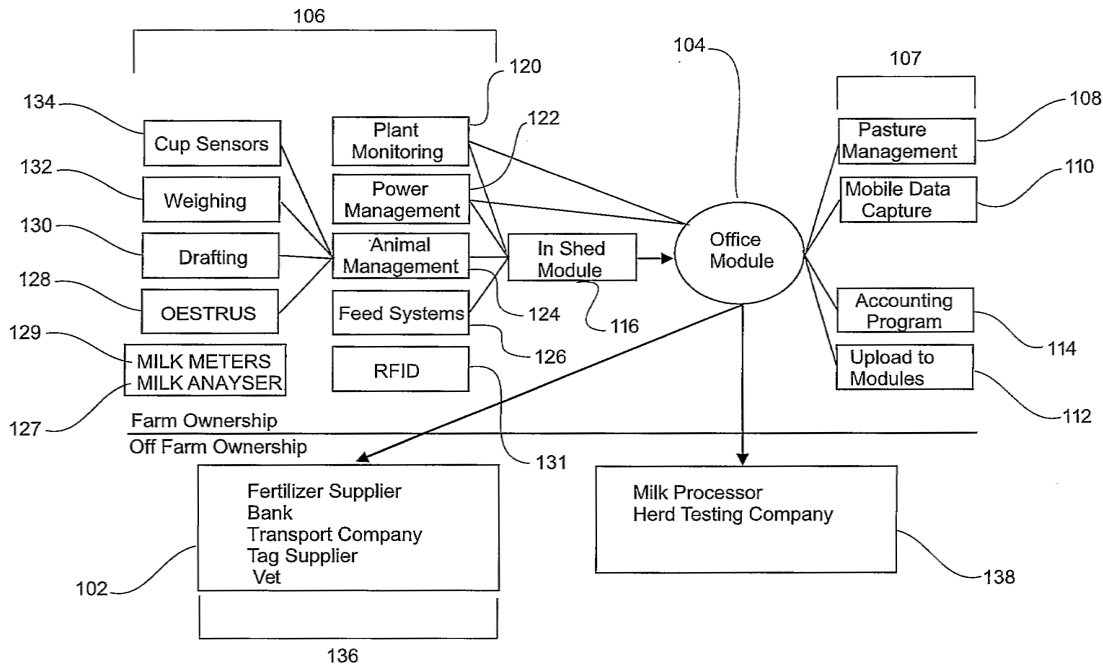


FIGURE 1

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.

5. *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.

6. *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.

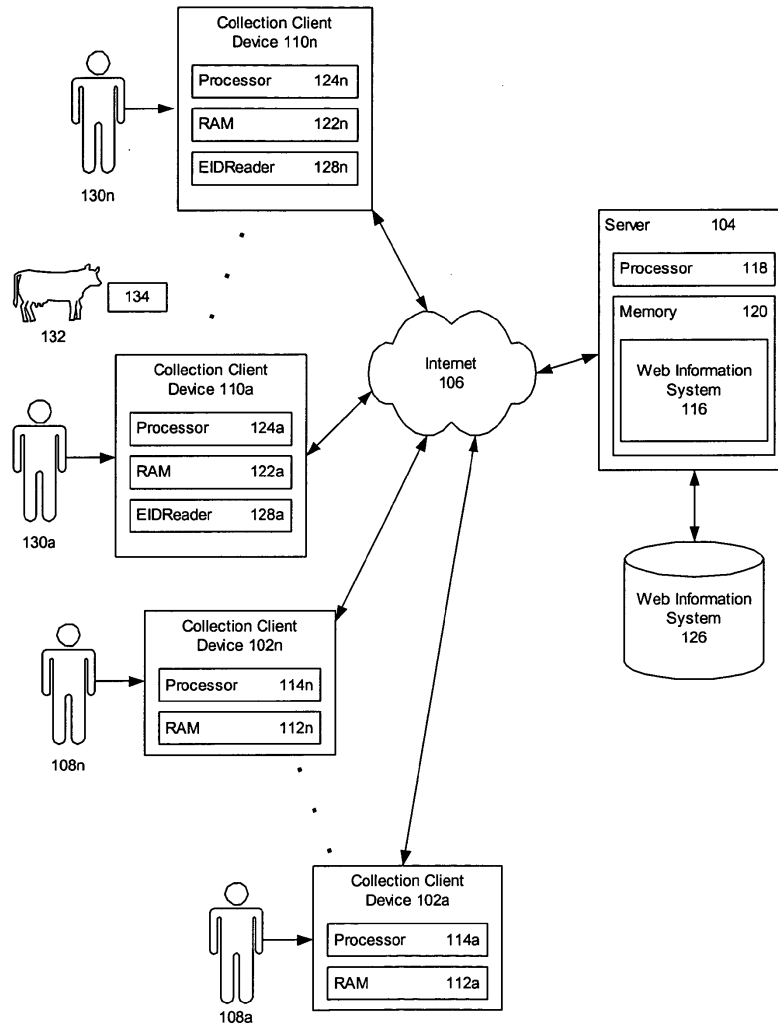


Figure 1

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.

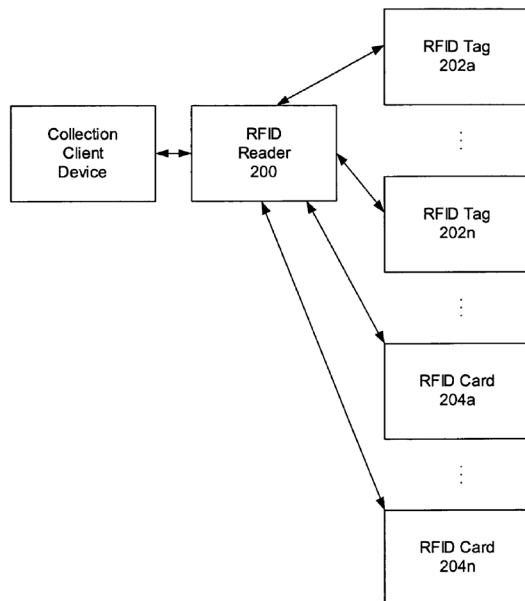


Figure 2

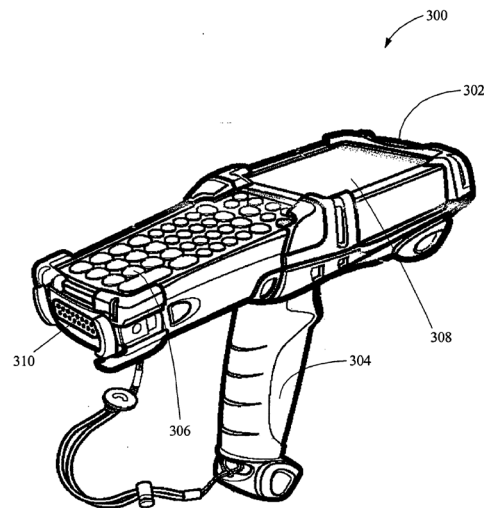


Figure 3

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 110*a-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.

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.⁴ *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 v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner asserts that a person of ordinary skill in the art (“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

⁴ In the present record, neither party presents arguments or evidence relating to secondary considerations.

Ex. 1003 ¶¶ 26–27). Patent Owner does not contest Petitioner’s characterization. *See* Prelim. Resp. 13.

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 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.” *Phillips*, 415 F.3d 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.” *Phillips*, 415 F.3d 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.” *Phillips*, 415 F.3d at 1313.

Although neither party expressly seeks a specific claim construction or definition for any claim term, *see* Pet. 6; Prelim. Resp. 13 (citing Ex. 2001 ¶¶ 20–22, 38), the parties raise one potential claim construction issue prior to our Decision whether or not to institute. Patent Owner argues that Petitioner attempts to broaden the limitation of, “implanted in an animal” (as recited in elements 1[B] and 1[C] and in every other challenged claim by dependency and, in certain cases, through similar limitations) beyond the plain and ordinary meaning. *See* Prelim. Sur-Reply 2–3. We address this issue below.

1. Implanted in an Animal

a) Patent Owner's Position

Patent Owner asserts that Petitioner fails to identify “‘an RFID device implanted in an animal,’ as recited in element 1[B], and every other Challenged Claim.” Prelim. Resp. 54. Patent Owner asserts that “‘implanted in an animal’” requires “‘implantation *inside* of an animal.” Prelim. Sur-Reply 2. Patent Owner argues that this interpretation is consistent with the plain meaning of the claims and the ’515 patent Specification. *See id.* at 2–3. For example, Patent Owner argues that the ’515 patent Specification “distinguishes between implanted ‘on’” and “‘implanted ‘within’ (i.e., ‘in,’ as recited in the claims).” *Id.* at 3 (citing Ex. 1001, 8:1–4).

b) Petitioner's Position

Petitioner asserts that the ’515 patent Specification defines “‘implanted in” to encompass “‘attached.” *See* Prelim. Reply 3. As support, Petitioner quotes the ’515 patent Specification (*id.*), which states “[t]he 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).” Ex. 1001, 7:66–8:4. According to Petitioner, 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.

c) Analysis

At this preliminary stage, we agree with Patent Owner’s arguments as to the plain and ordinary meaning of “‘implanted in an animal,” meaning implanted within the animal rather than on the animal. Although we agree

with Petitioner that the '515 patent Specification defines implanted as encompassing RFIDs attached or implanted “on or within” an animal, the plain language of the claim expressly recites “in,” which, on the present record, we determine corresponds to “within” as described by the '515 patent Specification. We apply that understanding to our discussion of Petitioner’s challenges below.

2. Additional Claim Terms

For purposes of this Decision, we determine that no other claim terms require express construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

D. Ground 1 Asserted Anticipation/Obviousness of Claims 1 and 2 over Trevarthen Publication⁵

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) (Prelim. Resp. 14–23) and Trevarthen does not anticipate or render obvious the challenged claims (Prelim. Resp. 29–45). We address these issues below.

⁵ 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.

1. 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. Patent Owner argues that Petitioner does not establish sufficiently for purposes of institution that Trevarthen qualifies as a printed publication. Prelim. Resp. 14–23. For the reasons explained below, we determine that Petitioner has shown a reasonable likelihood that Trevarthen qualifies as a printed publication before the earliest priority date of the ’515 patent and therefore qualifies as prior art as of its publication date.

a) Legal Standards for Printed Publications

“[A]t the institution stage, the petition must identify, with particularity, evidence sufficient to establish a reasonable likelihood that the reference was publicly accessible before the critical date of the challenged patent and therefore that there is a reasonable likelihood that it qualifies as a printed publication.” *Hulu LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 13 (PTAB Dec. 20, 2019) (precedential). “[T]here is no presumption in favor of institution or in favor of finding a reference to be a printed publication” *Id.* at 16.

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); *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986)). “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 Elecs. Co. v. Infobridge Pte. Ltd.*, 929 F.3d 1363, 1369 (Fed. Cir. 2019). “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 *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) Petitioner’s Position

Petitioner contends that “Trevarthen was published and available for download on October 22, 2006” in the University of Wollongong’s Research Online (“Research Online”) digital archive. Pet. 7–8. Petitioner supports its contention with the declaration of Dr. Brown-Brandl (Ex. 1003); the declaration of June Munford (Ex. 1031), a library information scientist; and the declaration of Nathaniel Frank-White (Ex. 1030), a records request processor at the Internet Archive. *Id.*

Petitioner contends that “Research Online ensures that ‘a digital copy’ of each reference . . . published in the digital repository ‘is available universally on the Internet and located through search engines such as

Google and Yahoo.” *Id.* at 8 (citing Ex. 1031 ¶¶ 16–20; *see also* Ex. 1027, 149). Specifically, Petitioner contends that “[o]nce a publication, like Trevarthen, is ‘loaded onto Research Online [it] is usually available on Google the following day.’” *Id.* (citing Ex. 1031 ¶ 19; *see also* Ex. 1030, Ex. A). Petitioner argues that the Internet Archive shows that Trevarthen was available on “Research Online on September 7 and 12, 2007, and March 22, 2008.” *Id.* (citing Ex. 1031 ¶¶ 27–33; *see also* Ex. 1030, Ex. B). Citing statistics listed on these archived webpages, Petitioner asserts that “Trevarthen was downloaded hundreds of times before September 2008.” *Id.* (citing Ex. 1031 ¶¶ 21–26; *see also* Ex. 1030, Ex. A).

Petitioner further argues that other evidence corroborates “Trevarthen’s public accessibility.” *Id.* at 9. Specifically, Petitioner cites an International Search Report dated March 18, 2008 in PCT/NZ2007/000286 that lists Trevarthen as a relevant document. *Id.* (citing Exs. 1028, 1029). Petitioner asserts that the International Search Report “confirms the pre-September 2008 public accessibility of Trevarthen to the POSA searching publicly available databases using keywords including ‘cattle’ and ‘RFID.’” *Id.* (citing Ex. 1028; Ex. 1030 ¶¶ 34–39; Ex. 1003 ¶ 68).

c) Patent Owner’s Position

Patent Owner argues that Petitioner fails to show that Trevarthen was publicly accessible before the critical date of the ’515 patent. Prelim. Resp. 17. Specifically, Patent Owner contends that Petitioner does “not provide any evidence as to how Trevarthen was indexed by a search engine, let alone how Trevarthen was *meaningfully indexed* such that a POSA would find it with reasonable diligence.” *Id.* at 17. For example, Patent Owner argues that Petitioner’s declarant, Ms. Munford, “did not conduct any keyword searches, identify any search terms that successfully located

Trevarthen, or otherwise verify that Trevarthen would have been ‘available’ on a commercial search engine prior to September 15, 2008.” *Id.* at 18.

In contrast, Patent Owner argues that its declarant, Dr. Bowser, “*did* attempt to recreate a search on Google, but could not locate Trevarthen.” *Id.* at 18 (citing Ex. 2001 ¶¶ 59–82). According to Patent Owner, “Dr. Bowser’s inability to locate Trevarthen on Google prior to September 15, 2008, as Petitioners’ claim a POSA would have done, illustrates that Trevarthen was not locatable before the critical date by a POSA exercising reasonable diligence.” *Id.* at 19.

Patent Owner further argues that Petitioner’s evidence “demonstrates no more than technical accessibility of Trevarthen, which critically is not the same as public accessibility.” *Id.* at 20 (citing *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 773 (Fed. Cir. 2024)). For example, Patent Owner argues that “Trevarthen’s existence on Research Online fails to show how a POSA would have found Trevarthen in the first place. The Wayback Machine archives thus only serve to establish that Trevarthen was technically accessible, i.e., that the reference existed on the Internet, not that it was publicly accessible.” *Id.* at 21 (citing *Samsung Elecs.*, 929 F.3d at 1369). Patent Owner also argues that we should disregard the number of downloads shown by Research Online because, there is “no evidence regarding how many unique individuals downloaded the reference, who those individuals are, or whether the download count is even reliable. Indeed, all downloads could have been initiated by the author, his friends and family, or his faculty advisors.” *Id.* at 22 (citing Ex. 2001 ¶ 82).

Patent Owner makes similar arguments as to the International Search Report. *See id.* at 22–23. For example, Patent Owner argues that “the search report does not specify which database or search terms, if any, actually led

the examiner to Trevarthen.” *Id.* at 23 (citing Ex. 1028, 1). Patent Owner argues that Petitioner further does not “address whether an Australian examiner’s ability to locate a reference from an Australian university stems from personal knowledge that a POSA would not have.” *Id.* (citing Ex. 2001 ¶¶ 86–88).

d) Printed Publication Analysis

On this record for the purposes of institution, we determine that Petitioner has demonstrated a reasonable likelihood that Trevarthen qualifies as a printed publication and prior art to the ’515 patent. *See Hulu*, IPR2018-01039, Paper 29 at 21.

First, we consider Trevarthen’s publication via Research Online. As Petitioner explains, the purpose of Research Online 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’s argument is supported by 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)). Petitioner further explains that Trevarthen’s visibility may be verified by the associated download statistics, indicating “Trevarthen was downloaded hundreds of times before September 2008.” Pet. 8 (citing Ex. 1027, 150; Ex. 1031 ¶¶ 21–26).

We weigh Petitioner’s showing against Patent Owner’s arguments that there is no evidence of indexing, as supported by Dr. Bowser’s competing

search, and no evidence of unique downloads. Prelim. Resp. 18–22; Ex. 2001 ¶¶ 59–82. On this record, we find Petitioner’s evidence to establish a reasonable likelihood of public accessibility, that the purpose of Research Online was to make publications like Trevarthen available to the public, and that the download statistics indicate public accessibility. *See Voter Verified*, 698 F.3d at 1380–81 (weighing evidence supporting public accessibility against a record “devoid of evidence” indicating whether or not a website had been actually indexed by “commercial internet search engines”).

Second, we consider Trevarthen’s listing in an International Search Report. In *Valve*, our reviewing court held that a patent examiner’s identification of a reference through a search for the purposes of locating prior art “is highly probative evidence of public accessibility.” 8 F.4th at 1376. Petitioner’s evidence shows that the Australian Patent Office identified Trevarthen using an internet search with some combination of the search terms, “cattle, rfid, gate etc.” as of March 2008, before the earliest priority date of the ’515 patent. Ex. 1028, 1. On this record, we find this evidence more persuasive than Patent Owner’s speculation that “an Australian examiner’s ability to locate a reference from an Australian university stems from personal knowledge that a POSA would not have.” Prelim. Resp. 23 (citing Ex. 2001 ¶¶ 86–88); *see also Valve* at 1376 (“If an examiner could access the article before the priority date, so could the general public.”).

On this record and for the purposes of institution, we determine that Petitioner has established a reasonable likelihood that Trevarthen was publicly accessible prior to the earliest priority date of the ’515 patent and therefore qualifies as a printed publication under 35 U.S.C. § 102(b) (pre-AIA).

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

Petitioner groups its anticipation and obviousness challenges together in Ground 1 and argues that, “to the extent that the Board does not find that Trevarthen expressly discloses any element, for example the logical variable, logical expression, and logical value of 1[F]-1[G] . . . , configuring Trevarthen’s systems to solve well established mathematical relationships, renders these elements obvious.” Pet. 6. In response, Patent Owner also largely argues the anticipation and obviousness challenges together. *See* Prelim. Resp. 29–45. We analyze the parties’ obviousness arguments for Ground 1 and invite the parties to further brief the anticipation arguments as discussed 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. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Trevarthen discloses the preamble of claim 1.⁶

⁶ 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.

(2) *Limitation 1[A] (a computer and RFID reader)*

Claim 1 recites “connecting a computer to an RFID device reader.”
Ex. 1001, 17:65.

Petitioner asserts that a skilled artisan would have understood that RFID readers are connected to a computer. Pet. 12 (citing Ex. 1003 ¶¶ 96–97). In support of this assertion, Petitioner cites to the Cochrane dairy study, which states 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.* at 12 (citing Ex. 1005, 104). According to Petitioner, the “POSA would have understood that the RFID reader collecting such data would be connected to a computer that interfaces with the database.” *Id.* (citing Ex. 1003 ¶ 97; Ex. 1005, 77, 92–93).

Patent Owner contends that Petitioner has “not pointed to any disclosure in Trevarthen describing or suggesting the step of ‘connecting a computer to an RFID device reader’ in a method arranged as claimed.” Prelim. Resp. 40. Specifically, Patent Owner argues that “Petitioners engage in improper mixing and matching of teachings in Trevarthen by relying on ‘computer screens’ at the Cochrane Dairy and on futuristic ‘computer network devices’ that were not part of any system... without providing a reason to combine such teachings with other disclosures in a manner that would meet the claims.” *Id.* (citing Pet. 12–13).

According to Patent Owner, in the passage relied on by Petitioners, “Trevarthen is describing potential ‘future arrangements’ and devices that potentially ‘could be configured to operate under computer control,’” rather than describing a particular system or method. *Id.* at 42 (citing Ex. 1005, 98). Patent Owner cites to Trevarthen’s disclosure 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,” and contends that “Petitioners fail to take the required steps of explaining what specific methods disclosed in Trevarthen would be modified to incorporate such ‘future arrangements,’ why or how a POSA would pursue such a modification, and how such modification would meet the other claim elements.” *Id.* (citing Ex. 1005, 104; Pet. 12).

We determine that, on this record, Petitioner establishes sufficiently for purposes of institution that Trevarthen teaches or suggests connecting a computer to an RFID device reader. Trevarthen discloses, in the Cochrane dairy, that “[a]s each cow passes through the RFID reader, their individual information is displayed on the two computer screens located in the dairy.” Ex. 1005, 78. We also credit the testimony of Petitioner’s declarant, Dr. Brown-Brandl, that this disclosure indicates a connection between the RFID reader and the computer, which indicates that the RFID reader is connected to the computer. Ex. 1003 ¶ 97.

Patent Owner makes additional arguments regarding Petitioner’s allegedly improper citation of teachings in Trevarthen to teach or render obvious the computer in limitation 1[A] in combination with other claim limitations (i.e., limitations 1[B], 1[C], 1[D], and 1[E]). *Id.* at 40–43. We will address these arguments below in subsection III.D.2.a.(6).

(3) *Limitation 1[B] (reading RFID device implanted in an animal with a RFID device reader)*

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

Petitioner asserts that Trevarthen explains that RFID tags, boluses, or microchips “form the basis of any dairy farm RFID system” and are so commonplace that a number of 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 POSA 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. 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 Trevarthen explained the Bio-thermo RFID was not yet applicable to livestock and Petitioner fails to “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.” Prelim. Resp. 43–44 (citing Ex. 2001 ¶¶ 117–119).

We determine that, on this record, Petitioner establishes sufficiently for purposes of institution that Trevarthen teaches or suggests reading an RFID device implanted in an animal with a RFID device reader. First, even assuming *arguendo* that the Bio-thermo RFID reader is not yet applicable to livestock, Trevarthen discloses the use of RFID boluses, which are used in livestock and are implanted in a cow’s stomach by ingestion. *See* Ex. 1003 ¶ 99; Ex. 1005, 20, 22, 99–100.

Further, on the current record, we find that a POSA would have utilized an RFID device implanted in an animal to perform the claimed method. There are multiple disclosures throughout Trevarthen that RFID systems are connected to computers. *See, e.g.*, Ex. 1005, 1–2, 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 (Chapters 1–2, 4, 5–7, apps. A–B). For example, the Introduction of Trevarthen (Chapter 1), discusses RFID tags and readers and specifically states that the “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.” Ex. 1005, 1–2. Further in this chapter, Trevarthen 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 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.

(4) *Limitation 1[C] (retrieving information from said RFID)*

Claim 1 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).

Patent Owner argues that Trevarthen does not “disclose any animal tracking method that utilizes an RFID device implanted in an animal as required to perform the claimed methods,” and, further, does not disclose “showing a retrieval of any information from an implanted RFID device.” Prelim. Resp. 44. According to Patent Owner, Petitioner “make[s] a conclusory assumption that the ‘identification of cows’ necessarily retrieves animal identification information from an RFID device implanted in an animal without any support or explanation for that conclusion,” therefore, Trevarthen does not disclose the “retrieving” step of the claimed methods. *Id.* (citing Ex. 2001 ¶ 120).

We determine that, on this record, Petitioner establishes sufficiently for the purposes of institution that Trevarthen teaches or suggests retrieving information from an implanted RFID. *See* Pet. 14 (citing Ex. 1005, 86–87, 103, 106, 121). Dr. Brown-Brandl testifies 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.” Ex. 1003 ¶ 101.

Dr. Brown-Brandl further testifies that “the point of RFID devices is to be able to retrieve identification information from them by interrogation.” *Id.* ¶ 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.* (citing Ex. 1005, 122, 86–87).

(5) Limitation 1[D] (linking RFID information to information stored in a database)

Claim 1 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, 18:3–9.⁷

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;

⁷ 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.

Ex. 1005, 102, 112, 100, 101, 109). Petitioner argues that 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 further asserts that “Trevarthen 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 database, along with the milk production information described above.” *Id.* (citing Ex. 1003 ¶¶ 107–109).

Patent Owner does not dispute that Trevarthen teaches limitation 1[D], apart from the arguments as to limitations 1[E] and 1[F] that Trevarthen does not teach software to perform “any of the recited claim steps, including ‘linking’ milk information to information retrieved from an RFID device implanted in an animal (element 1[D])” Prelim. Resp. 37. We will address those arguments further below. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Trevarthen teaches or suggests limitation 1[D].

(6) Limitations 1[E] (converting linked RFID and database information into one or more logical variables) and 1[F] (inserting at least one logical variable into at least one logical expression)

Claim 1 (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.

Claim 1 (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. Patent Owner addresses limitations 1[E] and 1[F] together and we do the same. *See* Prelim. Resp. 33–40.

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 ¶ 112).

Petitioner further asserts that Trevvarthen 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 Trevvarthen, 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, 173–80). Petitioner concludes that, “[g]iven that Trevvarthen 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.*

In response, Patent Owner first argues that Petitioner engages “in improper mixing and matching of disparate teachings from a single reference, without providing a reason to combine those teachings.” Prelim. Resp. 33 (citing *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017)). Specifically, Patent Owner argues that Petitioner improperly combines Trevvarthen's various disclosures from the Cochrane Dairy case study and the

author’s own “theoretical framework.” *See id.* at 34–36. For example, Patent Owner argues that Trevarthen’s discussion of “the Cochrane’s potential ‘implementation of milking meters for every milking bail’ at their farm” is “a system unrelated to RFID technology.” *Id.* at 34 (citing Ex. 1005, 98; Ex. 2001 ¶ 96). Patent Owner also argues that “even if the milking meters were implemented at Cochrane Dairy, they never could or would have been used in the claimed method because the Cochranes employed basic ear tags.” *Id.* (citing Ex. 1005, 69; Ex. 2001 ¶ 97). Patent Owner further contends that Trevarthen’s disclosures of tracking milk production are “not part of an alert or logical expression” and thus “there would have been no reasonable expectation of success in incorporating the disclosure into a method arranged as claimed.” *Id.* at 35–36 (citing Ex. 1005, 98, 108–109, 115; Ex. 2001 ¶¶ 98–100).

We address Patent Owner’s arguments about “mixing and matching of disparate teachings from a single reference” before turning to Patent Owner’s arguments about Petitioner’s application of the art to limitations 1[E] and 1[F]. Patent Owner cites to *Stepan* for the proposition that when “combining multiple embodiments from a single reference . . . there must be a motivation to make the combination and a reasonable expectation that such a combination would be successful.” *Stepan*, 868 F.3d at 1346 n.1, *cited in* Prelim. Resp. 33. Although *Stepan* provides the proper framework for single-reference obviousness, the absence of a reason to combine in that case distinguishes Petitioner’s arguments in this proceeding. Unlike *Stepan*, Petitioner provides an express motivation to combine Trevarthen’s separate disclosures, e.g., to detect illness in livestock. *See* Pet. 17–19. Moreover, 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 (Ex. 1005, 99), utilizing milk meters to detect illness (*id.* at 115), and temperature monitoring by RFID (*id.* at 121–122). On this record, 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, on this record, Petitioner has shown a reasonable likelihood of success that one skilled in the art would have been motivated to combine Trevvarthen’s teachings in an improved RFID-integrated farm management system.

Patent Owner further contends that “[n]othing in the Petition nor the supporting declaration demonstrates that a POSA would have any reason to modify an alleged ‘logical expression’ in Trevvarthen to ‘use milk production (yield) information, among other information, as logical variables input into a logical expression.’” Prelim. Resp. 38 (citing Pet. 18–20; Ex. 1003 ¶¶ 107–108). Patent Owner argues that Petitioner relies on “Trevvarthen’s discussion of an aspirational ‘ability’ to utilize a calculated average that could ‘serve as a means to detect problems with cows,’ but “the mere description of what a system would ‘allow’ cannot serve as a disclosure of a claim element.” *Id.* at 39 (citing *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017); Ex. 2001 ¶ 109). Patent Owner further argues that Petitioner’s supporting documents do not provide any reasons to modify Trevvarthen. *Id.* at 39–40 (citing Ex. 1033, 184; Ex. 2001 ¶ 110).

We determine that, on this record, Petitioner establishes sufficiently for the purposes of institution that Trevvarthen teaches or suggests limitations 1[E] and 1[F]. Pet. 17–20. On this record, we are persuaded by Petitioner’s argument that Trevvarthen 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. As discussed above, Trevarthen discloses that RFID systems are connected to computers and lists four types of RFIDs, including via a bolus, where the RFID transponder is inserted permanently within the animal’s stomach. *Id.* at 1–2, 99. Thus, Trevarthen teaches or suggests a system that includes program instructions to monitor temperatures (logical variables), recognize fluctuations (via a logical expression) and send an alert (by obtaining a logical value related to the animal) using a RFID device implanted in an animal. *See* Ex. 1003 ¶¶ 112–119.

Likewise, we are persuaded by Petitioner’s argument that Trevarthen teaches or suggests incorporating milk meters into a farm management system to monitor individual cows’ milk production for illness. Ex. 1005, 112, 115. In doing so, Trevarthen teaches or suggests a system that includes program instructions to monitor milk output (logical variables), identify a disparity (via a logical expression) and identify illness (by obtaining a logical value related to the animal). *See* Ex. 1003 ¶¶ 112–119. We further agree with Petitioner that a person of ordinary skill in the art would have had a reason to combine these values into a logical expression to more accurately predict illness. Ex. 1003 ¶¶ 112–117; *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.”).

(7) *Limitation 1[G] (obtaining a logical variable)*

Claim 1 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 dispute that Trevarthen teaches or suggests limitation 1[G], apart from its arguments as to limitations 1[E] and 1[F]. *See* Prelim. Resp. 37–38. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Trevarthen teaches or suggests limitation 1[G].

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

Based on the current record, we are sufficiently persuaded by Petitioner’s arguments and evidence that Trevarthen teaches or suggests all of the limitations of claim 1. On the current record, we find that there is a reasonable likelihood that Petitioner will prevail in demonstrating that claim 1 is unpatentable as obvious over Trevarthen.

b) *Claim 2*

Petitioner presents evidence that Trevarthen teaches or suggests the limitations of claim 2. Pet. 21. Patent Owner does not separately argue claim 2 at this stage of the proceeding. Patent Owner may raise any arguments regarding this claim in its Patent Owner Response after institution. On the

present record, Petitioner shows sufficiently that Trevarthen teaches or suggest the limitations of claim 2.

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

As discussed above, Petitioner groups its anticipation and obviousness arguments together for Ground 1. *See* Pet. 6–21. Patent Owner contends that Petitioner does not engage in a proper anticipation analysis for claims 1 and 2 because the Petition improperly “pick[s], choos[es], and combin[es] various unrelated disclosures from Trevarthen.” Prelim. Resp. 30 (citing *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972)). For example, Patent Owner alleges that for claim element 1[A], Petitioner relies on the “computer screen” and “RFID reader” at the Cochrane Dairy Farm discussed in Trevarthen Chapter 5, but for element 1[B], Petitioner relies on Trevarthen’s discussion of “boluses” and “microchip” RFID devices discussed in Chapters 2 and 6, which are unrelated to the Cochrane Dairy. *Id.* at 30 (citing Pet. 12, 13; Ex. 1005, 20, 22, 24–25, 69–100). According to Patent Owner, the “Cochrane Dairy employs an external ‘RFID tag attached to their [cows’] right ear,’” instead of “using any bolus or microchip to identify cattle.” *Id.* (citing Ex. 1005, 69).

Further, Patent Owner also argues that Petitioner “fail[s] to identify any system or method disclosed in Trevarthen that is arranged as claimed with respect to element 1[E] and 1[F].” *Id.* at 37. According to Patent Owner, the “Cochrane Dairy was seeking to potentially use milk meters” and “[t]here is no disclosure or suggestion of using information from milk meters in any logical expression.” *Id.* (citing Ex. 1005, 98; Ex. 2001 ¶¶ 102–103). Additionally, Patent Owner argues that the Cochrane Dairy “used basic ear tags to identify cows, which are not ‘implanted in an animal’ as claimed.”

Id. (citing Ex. 1005, 69–70; Ex. 2001 ¶ 104). Finally, Patent Owner argues that Trevarthen does not describe the Cochrane Dairy’s herd management software as “performing any of the recited claim steps, including ‘linking’ milk information to information retrieved from an RFID device implanted in an animal (element 1[D]), ‘converting’ milk information into a logical variable (1[E]), ‘inserting’ a logical variable[] into a logical expression (1[F]), or ‘obtaining a logical value relating to said animal’ (1[G]).” *Id.* at 37–38 (citing Ex. 2001 ¶ 105).

While we acknowledge Patent Owner’s argument that Petitioner may be relying on disclosures from different sections of Trevarthen for its anticipation challenge, we note that the test for anticipation “is not an ‘ipsissimis verbis’ test” and that “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.” *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990); *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)).

We invite the parties to further brief these anticipation issues, specifically the application of *In re Arkley* to the present case. Pursuant to *SAS* and *PGS*, when instituting on the basis that Petitioner has demonstrated a reasonable likelihood with respect to at least one challenged claim, we must institute on all claims and all grounds challenged in the Petition. *See SAS*, 138 S. Ct. at 1359–60; *PGS*, 891 F.3d at 1360. Thus, this issue will be resolved on a complete trial record.

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

Petitioner contends that claims 3 and 4 are rendered obvious by the combination of Trevarthen and Brune. Pet. 22–26. Patent Owner does not separately argue this ground at this stage of the proceeding other than to say that Petitioner’s arguments fail for the same reasons as to Ground 1. Prelim. Resp. 45. Patent Owner may raise any arguments regarding this ground in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently that Trevarthen and Brune render obvious the limitations of claims 3 and 4.

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 at this stage of the proceeding other than to say that Petitioner’s arguments fail for the same reasons as to Ground 1. Prelim. Resp. 46. Patent Owner may raise any arguments regarding this ground in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently 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. 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. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that Laitinen teaches the preamble of claim 1.⁸

b) Limitation 1[A] (a computer and RFID reader)

Claim 1 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,

⁸ 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.

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]. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that the combination of Laitinen and Buchanan teaches limitation 1[A].

c) Limitation 1[B] (reading RFID device implanted in an animal with a RFID device reader)

Claim 1 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.” Prelim. Resp. 54. According to Patent Owner, Petitioner relies solely on Laitinen’s description of a “[s]ensor unit” for this element but “Laitinen’s sensor unit is explicitly separate from any ‘RFID device’ and therefore cannot serve as the ‘RFID device’ implanted in an animal.” *Id.* (citing Pet. 42 (citing Ex. 1006, 3:53–57, 5:38–42)). Patent Owner further argues that Petitioner cites Laitinen’s teaching “that the ‘pico level device is attached permanently to, e.g., the animal’s ear after its birth’ and that the separate ‘[s]ensor unit’ can be ‘an implant inside the animal, in

which case the data it provides can be, for instance, read/transcribed by the pico level equipment.” *Id.* (citing Ex. 1006, 3:28–62; Ex. 2001 ¶¶ 140–41).

We determine that, on this record, Petitioner establishes sufficiently for the purposes of institution that Laitinen teaches or suggests reading an RFID device implanted in an animal with a RFID device reader. Pet. 42 (citing Ex. 1003 ¶ 150; Ex. 1006, 3:53–57, 5:38–42). Laitinen teaches the pico level device may include a sensor with RF identification technology and may be an implant inside the animal. Ex. 1006, 3:28–57. Laitinen also teaches a specific embodiment with two different pico level devices including an external device for measuring temperature and an internal device for surveilling the animal’s heart. *Id.* at 5:44–53. Dr. Brown-Brandl testifies that one skilled in the art “would have understood that it is implicit that Laitinen’s implanted RFID device is read with an RFID reader.” Ex. 1003 ¶ 150. We are persuaded, for the purposes of institution, by this testimony, given the disclosure of Laitinen’s implanted sensor. *See* Ex. 1006, 3:51–57.

d) Limitation 1[C] (retrieving information from said RFID)

Claim 1 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 and explains that its “pico level device is attached permanently to [an animal], and it ***functions like [a] conventional identification tool.***” Pet. 43 (citing Ex. 1003 ¶¶ 151–152; Ex. 1006, 2:47–48, 3:28–35, 3:53–57, 6:2–4).

Patent Owner argues that Laitinen does not teach retrieving animal identification information from an RFID device. *See* Prelim. Resp. 57–58. For example, Patent Owner argues that Petitioner contends that Laitinen’s pico level device “‘functions like [a] conventional identification tool[1],’ but they never contend that such purported ‘functions’ 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 (citing Ex. 2001 ¶¶ 148–150).

We determine that, on this record, Petitioner establishes sufficiently for the purposes of institution that Laitinen teaches or suggests retrieving identification information from a RFID device implanted in an animal. Pet. 43 (citing Ex. 1006, 2:47–48, 3:28–35, 3:53–57, 6:2–4). Specifically, Laitinen teaches 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, 3:28–35, 6:7–9.

e) Limitation 1[D] (linking RFID information to information stored in a database)

Claim 1 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* Prelim. Resp. 46–

53. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s arguments and evidence that the combination of Laitinen, Buchanan, and Liao teaches limitation 1[D].

f) Limitation 1[E] (converting linked RFID and database information into one or more logical variables)

Claim 1 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* Prelim. Resp. 46–53. On this record and for the purposes of institution, we are sufficiently

persuaded by Petitioner's argument and evidence that the combination of Laitinen, Buchanan, and Liao teaches limitation 1[E].

g) Limitation 1[F] (inserting at least one logical variable into at least one logical expression)

Claim 1 recites "inserting at least one of said plurality of logical variables into at least one logical expression." Ex. 1001, 18:15–16.

Petitioner asserts that "Laitinen discloses a first logical expression to determine if a cow is in heat," where "[a] cow's sensed and recorded temperatures are used as input variables, and the expression determines whether 'alarm limit(s) have been reached.'" Pet. 47 (citing Ex. 1003 ¶ 160; Ex. 1006, 8:5–15). Petitioner further asserts that "Liao teaches that milk production (yield) is also useful for determining whether a cow is in heat and ready for artificial insemination." *Id.* (citing Ex. 1010, 9:34–10:15, 12:3–15). Petitioner argues that one skilled in the art "would have been motivated to modify Laitinen's logical expression, or create a new expression, and insert milk production information as logical variables, along with the temperature, to improve accuracy and reliability at determining whether a cow is in heat." *Id.* (citing Ex. 1003 ¶ 161).

Petitioner further 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 "second 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 also been "aware that lowered milk production was also an indicator of illness." *Id.* at 48 (citing Ex. 1010, 6:32–7:6; Ex. 1023, 4:13–18;

Ex. 1008, 6:48–50). 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.” *Id.* (citing Ex. 1003 ¶ 163).

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 oestrus or 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 argues that “there would have been no reason for a POSA to modify either of [Petitioner’s] alleged ‘logical expressions’ to include the milk information required by the claims.” Prelim. Resp. 47. As to Petitioner’s proposed first logical expression, combining sensed temperature information with stored milk information to identify cows in heat, Patent Owner argues that Liao does not support Petitioner’s combination. *Id.* at 47–48. Patent Owner argues, “[t]o the contrary, Liao teaches that milk production information is *independent* of whether a cow is in heat.” *Id.* (citing Ex. 2001 ¶¶ 124–126). Specifically, Patent Owner argues that Liao’s tables show “‘heat’ is a separate ‘input parameter’ from milk production for recommending whether to inseminate a cow.” *Id.* at 48 (citing Ex. 1010, 10, 12 (tables), 9:27–11:1, 20:16–21:10; Ex. 2001 ¶ 126).

Patent Owner further argues that Petitioner does not explain how one skilled in the art “would have expected success in incorporating milk information from a database into Laitinen’s heat control application.” *Id.* at 48. Patent Owner argues that Laitinen teaches “the ‘heat alarm’ is calculated by the pico level system based on the temperature and movement data that it measures, and the local system merely ‘notices’ and relays the alarm.” *Id.* at 48–49 (citing Ex. 1006, 5:60–64, Fig. 2). By differentiating between the “pico level” and “local level,” Patent Owner implies that Laitinen’s pico level device must function as an RFID, retrieve information from an RFID, include a database with milk information, and generate a logical expression, to meet the claimed limitation. *See id.* at 49.

As to Petitioner’s proposed second logical expression, combining temperature information with stored milk information to identify illness, Patent Owner argues that there was no reason to include milk information in Laitinen’s “inverse function.” *Id.*⁹ More specifically, Patent Owner argues that, unlike temperature and movement information that involve “a series of data acquired from numerous animals that could respond to medication over

⁹ Patent Owner argues that Petitioner “amended Laitinen’s function to recite “ f^{-1} ” instead “ f^1 ” as recited in Laitinen,” whereby the function as written “is not necessarily an ‘inverse function.’” Prelim. Resp. 50 (citing Ex. 2001 ¶ 130). According to Patent Owner, Dr. Bowser explains as “written, Laitinen’s function is not necessarily an ‘inverse function,’ which POSAs would have understood as ‘undoing’ or reversing the effect of a separate operation.” *Id.* (citing Ex. 2001 ¶ 130). Whether or not the logical expression is an inverse function does not appear to be determinative as in either case the logical expression includes initial state vector y and present state vector z , both of which include animal temperature (sensed data). Accordingly, we do not address whether Laitinen’s equation is an inverse function in this Decision, and we invite the parties to brief this issue at trial.

time,” milk information involves “single data points that would not respond to medication over time and thus cannot be implemented into any function as a vector like temperature.” *Id.* at 51 (citing Ex. 2001 ¶ 132). Moreover, according to Dr. Bowser, using peak yield and days in milk to “assess the efficacy of medication makes no sense,” whereby Petitioner does not explain how “Laitinen could incorporate such milk information into a function to achieve the claimed invention.” *Id.* at 51–52 (citing Ex. 2001 ¶ 135).

Finally, Patent Owner argues that Laitinen’s “three hierarchical levels,” including a pico level, local level, and global level, could not be reconfigured without changing “Laitinen’s basic principle of operation.” *Id.* at 52–53 (citing Ex. 1006, 3:21–4:49, 6:29–46). Specifically, Patent Owner argues that Petitioner’s modification would require “[r]econfiguring Laitinen such that the local level system generates a database independent of the pico level measurements.” *Id.* (citing Ex. 2001 ¶ 136).

We determine that, on this record, Petitioner establishes sufficiently for the purposes of institution that the combination of Laitinen, Buchanan, and Liao, teaches or suggests inserting at least one of said plurality of logical variables into at least one logical expression. Pet. 47–50 (citing Ex. 1006, 1:33–35, 4:60–64, 5:24–30, 6:29–32, 7:6–13, 7:35–37, 8:5–15, Fig. 4; Ex. 1010, 6:31–7:6, 12:3–15; Ex. 1003 ¶¶ 160–165). First, we agree with Petitioner that Laitinen and Liao teach logical expressions for determining whether cows are in heat (*see* Ex. 1006, 8:5–15; *see also* Ex. 1010, 12:3–15) and for monitoring cow health (*see* Ex. 1006, 7:4–13; *see also* Ex. 1010, 6:31–7:6). Laitinen teaches temperature as a logical variable to be entered into its logical expressions. Ex. 1006, 8:5–15. Liao teaches milk production and days in milk as logical variables to be entered into its logical expressions. Ex. 1010, 12:3–15. On this record, Dr. Brown-Brandl proposes

a reason to combine the teachings and their logical variables, e.g., to improve accuracy and reliability of the logical expressions, supported by evidence and reasoning. *See* Ex. 1003 ¶¶ 160–165.

We consider Patent Owner’s arguments but do not agree, on this record, that Laitinen’s hierarchy of pico, local, and global levels could not compute the claimed logical expression, either at the local level or considering the three levels as one overall system. Likewise, Petitioner has sufficiently shown, on this record, that Liao would include whether a cow is in heat as an input parameter in a logical expression, along with milk production, for making insemination decisions. *See* Ex. 1010, 9:31–10:15 (“The first set of input parameters D_{rand} constitute a decision basis for a particular type of dairy farm decisions, e.g. with respect to insemination the first parameter indicates the number of days in milk . . . the fourth parameter indicates whether the animal is in heat”); Ex. 1003 ¶¶ 160–165.

On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that the combination of Laitinen, Buchanan, and Liao teaches limitation 1[F].

h) Limitation 1[G] (obtaining a logical variable)

Claim 1 recites “obtaining a logical value relating to said animal.” Ex. 1001, 18:17.

As discussed above, Petitioner asserts that Laitinen describes two logical expressions, a first expression “used for purposes of artificial insemination” and a second expression “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 first logical expression is being solved to determine whether the alarm limit is reached, and if so, a value is

obtained that corresponds to this determination and is used to generate the heat alarm signal.” *Id.* (citing Ex. 1003 ¶ 166). 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). While we acknowledge the issues raised by the parties with respect to the proper statement of the second logical expression (see *supra* note 9), we rely on Laitinen’s second logical expression as one that obtains a logical value and includes initial vector y and present vector z representing temperature.

Patent Owner does not dispute that the Laitinen, Buchanan, and Liao combination teaches limitation 1[G], apart from the its arguments against Petitioner’s showing for limitation 1[F]. *See* Prelim. Resp. 46–58. On this record and for the purposes of institution, we are sufficiently persuaded by Petitioner’s argument and evidence that the Laitinen, Buchanan, and Liao combination teaches limitation 1[G].

i) Conclusion as to Claim 1

Based on the current record, there is a reasonable likelihood that Petitioner will prevail in demonstrating that claim 1 is unpatentable as obvious over Laitinen, Buchanan, and Liao.

2. 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 at this stage of the proceeding. Patent Owner may raise any arguments regarding this claim in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently that the Laitinen, Buchanan, and Liao combination teaches 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 does not separately argue these claims at this stage of the proceeding. Prelim. Resp. 59. Patent Owner may raise any arguments regarding these claims in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently that the combination of Laitinen, Buchanan, Liao, and Brune teaches 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 does not separately argue these claims at this stage of the proceeding. Prelim. Resp. 59–60. Patent Owner may raise any arguments regarding these claims in its Patent Owner Response after institution. On the present record, Petitioner shows sufficiently that the combination of Laitinen, Buchanan, Liao, and Rollins teaches the limitations of claims 15–25.

IV. CONCLUSION

For the forgoing reasons, Petitioner has demonstrated a reasonable likelihood that at least one challenged claim of the '515 patent would have been obvious over the prior art of record. Accordingly, we institute an *inter partes* review on claims 1–4 and 15–25 for all grounds set forth in the Petition.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314, an *inter partes* review is instituted on claims 1–4 and 15–25 of the ’515 patent for all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review of the ’515 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2024-00885
Patent 8,823,515 B2

FOR PETITIONER:

Jeffrey B. Plies
Blaine M. Hackman
DECHERT LLP
jeffrey.plies@dechert.com
blaine.hackman@dechert.com

FOR PATENT OWNER:

Daniel L. Moffett
Megan R. Mahoney
Thomas W. Landers
AKIN GUMP STRAUSS HAUER & FELD LLP
dmoffett@akingump.com
mmahoney@akingump.com
twlanders@akingump.com