

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.

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

PETITION FOR *INTER PARTES* REVIEW

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1001	U.S. Patent No. 8,823,515
1002	Prosecution History of U.S. Patent No. 8,823,515
1003	Declaration of Dr. Tami Brown-Brandl
1004	CV of Dr. Tami Brown-Brandl
1005	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> (Oct. 24, 2005) (Bachelor Thesis, University of Wollongong) (“ Trevarthen ”)
1006	U.S. Patent No. 7,059,275 to Laitinen et al. (“ Laitinen ”)
1007	[Reserved]
1008	U.S. Patent No. 6,059,733 to Brune et al. (“ Brune ”)
1009	US Patent App. Pub. No. 2006/0267767 to Pohlkamp et al. (“ Pohlkamp ”)
1010	International Patent Pub. No. WO2007/089184 to Liao (“ Liao ”)
1011	International Patent Pub. No. WO 2006/059916 to Buchanan et al. (“ Buchanan ”)
1012	[Reserved]
1013	International Patent Pub. No. WO 2004/066720 to Cross et al. (“ Cross ”)
1014	U.S. Patent App. Pub. No. US 2004/0233971 to Meads et al. (“ Meads ”)
1015	J.M. Bewley et al., <i>Comparison of Reticular and Rectal Core Body Temperature in Lactating Dairy Cows</i> , 91 J. Dairy Sci. 4661 (2008)

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1016	L.C. Hicks et al., <i>Comparison of Methods of Measuring Deep Body Temperatures of Dairy Cows</i> , Livestock Environment VI: Proceedings of the 6th International Symposium 432 (May 2001)
1017	K.T. Higgins, <i>Temperature Readings by Remote Control</i> , Food Engineering 63 (May 2003)
1018	T. Mottram et al., <i>Technical Note: A Wireless Telemetric Method of Monitoring Clinical Acidosis in Dairy Cows</i> , 64 Computers and Electronics in Agriculture 45 (November 2008)
1019	[Reserved]
1020	T.M. Brown-Brandl et al., <i>Telemetry System for Measuring Core Body Temperature in Livestock and Poultry</i> , 2001 ASAE International Meeting Sacramento, California, USA, Paper No. 01-4032 (July 30-Aug 1, 2001)
1021	D.J. Prendiville et al., <i>Radiotelemetry Systems for Measuring Body Temperature</i> , Beef Production Series No. 57 (June 2002)
1022	Amended Complaint, D.I. 25, <i>ST Reproductive Technologies, LLC d/b/a STinsight v. Smaxtec Inc. et al.</i> , No. 3:24-cv-00037 (W.D. Wis. Apr. 23, 2024)
1023	U.S. Patent No. 5,568,788 to van den Berg et al.
1024	U.S. Patent App. Pub. No. 2006/0185605 to Renz et al. (“ Renz ”)
1025	U.S. Patent App. Pub. No. 2007/0271320 to Tsuyuzaki (“ Tsuyuzaki ”).
1026	U.S. Patent App. Pub. No. 2005/0145187 to Gray (“ Gray ”)
1027	R. Daly & M. Organ, <i>Research Online: Digital Commons as a Publishing Platform at the University of Wollongong, Australia</i> , 35 Serials Review 149-53 (2009).
1028	International Application No. PCT/NZ2007/000286, International Search Report (March 18, 2008)

Exhibit	Description
1029	International Application No. PCT/NZ2007/000286, Written Opinion of the International Search Authority (March 18, 2008)
1030	Affidavit of Nathaniel E. Frank-White
1031	Declaration of June Munford
1032	R.M. de Mol et al., <i>Results of a Multivariate Approach to Automated Oestrus and Mastitis Detection</i> , 48 <i>Livestock Production Science</i> 219-227 (1997)
1033	R.M. de Mol et al., <i>Description of a Detection Model for Oestrus and Diseases in Dairy Cattle Based on Time Series Analysis Combined with a Kalman Filter</i> , 22 <i>Computers and Electronics in Agriculture</i> 171–185 (1999) (“ de Mol ”)
1034	J.E. Hillerton, <i>Detecting Mastitis Cow-Side</i> , National Mastitis Council Annual Meeting Proceedings 48-53 (2000)
1035	G.M. Hyde, <i>Milk Yield as a Factor in Dairy Herd Management</i> (1979) (Ph.D. dissertation, University of Illinois at Urbana-Champaign)
1036	U.S. Patent No. 5,724,316 to Brunts
1037	U.S. Patent Pub. No. 2006/0161443 to Rollins (“ Rollins ”)
1038	U.S. Patent Pub. No. 2005/0177390 to Young et al.
1039	Prosecution History of U.S. Patent No. 9,844,206

MANDATORY NOTICES UNDER 37 C.F.R. §42.8

Pursuant to 37 C.F.R. §42.8, Petitioner states as follows:

A. Real Parties-in-Interest (37 C.F.R. §42.8(b)(1))

smaXtec Inc. and smaXtec Animal Care GmbH are the real parties-in-interest.

B. Related Matters (37 C.F.R. §42.8(b)(2))

1. Patent Trial and Appeal Board

Petitioner has filed 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.

2. U.S. District Court for the Western District of Wisconsin

The following pending federal district court litigation may affect or be affected by the decision in this proceeding: *ST Reproductive Technologies, LLC d/b/a STinsight v. Smaxtec Inc. and smaXtec Animal Care GmbH*, No. 24-cv-00037 (W.D. Wis.), filed January 18, 2024. Petitioner was served with the initial complaint on February 2, 2024 and an amended complaint on April 23, 2024.

C. Lead and Backup Counsel and Service Information (37 C.F.R. §§42.8(b)(3) and (b)(4))

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I. INTRODUCTION

Petitioner requests *Inter Partes* Review and cancellation of claims 1-4 and 15-25 (“challenged claims”) of U.S. Patent No. 8,823,515 (“the ’515 Patent”) (Ex. 1001). The ’515 patent relates to a computer-implemented animal management system for dairy cows that retrieves sensed animal information from implanted RFID sensors, stores animal information in a database, and analyzes that information. Ex. 1001, 2:29-38.

The prior art describes cattle management systems having nearly identical hardware and software elements as claimed in the ’515 patent. Trevarthen (Ex. 1005) and Laitinen (Ex. 1006) describe cattle management systems comprising implanted RFID sensors that provide animal physiological information (e.g., temperature) to a database for storage and entry into algorithms for purposes of analysis.

Claim 1 of the ’515 patent was allowed because the Examiner found “no mention of the amount of milk production information and amount of days milked information” in the prior art. Ex. 1002, 338, 404. Trevarthen, Laitinen, Liao (Ex. 1010), and Buchanan (Ex. 1011), none of which were before the Examiner, disprove the Examiner’s conclusion, with each describing the importance of tracking milk production.

Grounds 1-3 based on Trevarthen and Grounds 4-6 based on Laitinen, each independently prove that the challenged claims were unpatentable. Trial should be instituted and claims 1-4 and 15-25 should be canceled.

II. REQUIREMENTS FOR INTER PARTES REVIEW UNDER 37 C.F.R. § 42.104

A. Standing

Petitioners certify that (1) the '515 patent is subject to *Inter Partes* Review ("IPR") based on its September 15, 2009 priority date (Ex.1001, (60)), and (2) Petitioners are not barred or estopped from the requested review.

B. Identification of Challenges

Pursuant to 37 C.F.R. §§42.104(b) and 42.22(a)(1), Petitioners request review and cancellation of the challenged claims on the following grounds:

Ground	Claims	Basis	References
1	1-2	§102/§103	Trevarthen
2	3-4	§103	Trevarthen and Brune
3	15-25	§103	Trevarthen and Rollins
4	1-2	§103	Laitinen, Buchanan, and Liao
5	3-4	§103	Laitinen, Buchanan, Liao, and Brune
6	15-25	§103	Laitinen, Buchanan, Liao, and Rollins

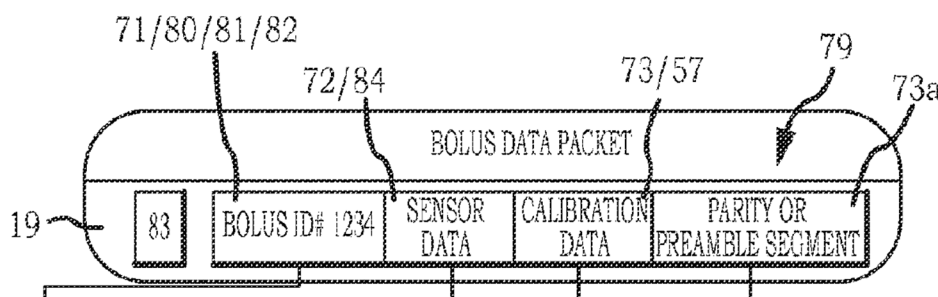
III. THE '515 PATENT

The '515 patent is a national phase entry under 35 U.S.C. § 371(c) of International Application No. PCT/US2010/002509, filed on September 14, 2010,

which claims priority to U.S. Provisional Application No. 61/276,723, filed on September 15, 2009.

A. Specification

The '515 patent (Ex. 1001), is titled “Computer Implemented Animal Management System.” The disclosed system comprises an RFID device (19) contained within an implantable bolus that has sensors to sense animal information such as temperature and pH (Ex. 1001, 10:16-38), depicted in Figure 3 below.



Id., Figure 3, 3:13-18. The specification states that the RFID device is “conventional” and that it, and the sensors, were commercially available. *Id.*, 1:22-56, 10:38-46. Animal information is retrieved from the RFID device by a conventional RFID reader and input into a database. *Id.*, 2:27-47, 10:6-15, 11:9-14. Animal information is analyzed to assess animal health status, such as determining whether the animal’s temperature has exceeded a threshold so that an alert can be issued. *Id.*, 2:48-56, 14:4-12. Comparing sensed values with threshold values (e.g., temperature), like the '515 patent contemplates, was well known in the art. Brown-Brandl, ¶¶90, 47-56.

The disclosed system is implemented using conventional computer technology and software instructions stored on available computer readable media. *Id.*, 4:16-20, 4:64-67, 5:11-17, 5:53-57, 7:50-61. The hardware of the '515 patent's system was known, and similar configurations were common in the prior art. Brown-Brandl, ¶¶89-92.

B. Prosecution History

The as-filed claims were rejected over Ex. 1024 ("Renz") in view of Ex. 1025 ("Tsuyuzaki"). Ex. 1002, 333. The Examiner stated that the "computer implemented animal tracking system taught by Renz includes ... connecting a computer to an RFID reader ... that interrogates an animal's tag ...an [implanted] RFID device ... retrieving an amount of animal identification information ... containing unique animal identification numbers retrieving an amount of date-time information." *Id.*, 334. The Examiner found that Renz did not "mention of linking to the information retrieved from the RFID device an amount of animal information stored in a data base of a computer, converting the information retrieved into a plurality of logical variables, and inserting at least one of the plurality of logical variables into a logical expression." *Id.*

For the "linking" element, the Examiner, however, found it "**very obvious** ... that data read from an RFID reader is usually automatically loaded into a computer

database.”¹ *Id.* The Examiner further explained that Tsuyuzaki also provided missing elements. *Id.*, 334-35.

The Examiner, however, found pending claims 31-33, allowable because the cited art contained “***no mention of the amount of milk production information*** and amount of days milked information” as recited in claim 33. *Id.*, 338. Patent Owner amended claim 21 (issued as claim 1) to recite “linking an amount of animal information of said animal stored in a data base” to “animal information stored in said data base of said computer ***comprising an amount of milk production information or an amount of days milked***” from pending claim 31. *Id.*, 368, 375-76. The Examiner’s allowance again stated that “there is no mention of the amount of milk production information and amount of days milked information.” *Id.*, 404.

IV. LEVEL OF ORDINARY SKILL IN THE ART

The 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

¹ Emphasis in this Petition is added by Petitioner unless otherwise indicated.

and/or evaluating RFID tracking and sensor systems for livestock management.

Brown-Brandl, ¶¶26-27.

V. CLAIM CONSTRUCTION

Claim terms are construed using the standard applied in civil actions under 35 U.S.C. § 282(b), in accordance with “the ordinary and customary meaning” as understood by the POSA and the patent’s prosecution history. 37 C.F.R. § 42.100(b). The Board need only construe terms to the extent necessary to resolve disputes between the parties. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017); 83 Fed. Reg. 51,340, at 51,353 (Nov. 13, 2018). As explained below, the relied upon prior art meets the claim terms under any reasonable interpretation.

VI. CLAIMS 1-4 AND 15-25 OF THE ’515 PATENT ARE UNPATENTABLE

A. Ground 1: Trevarthen Anticipates or Renders Obvious Claims 1-2 and 15-20

As explained below (*infra* §§VI.A.2-VI.A.3) Trevarthen alone discloses every element of claims 1-2. However, 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] (*infra* §§VI.A.2.f-VI.A.2.h), configuring Trevarthen’s systems to solve well established mathematical relationships, renders these elements obvious. *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1338 (Fed. Cir. 2020) (holding an obviousness determination

can rely “on general knowledge of a skilled artisan.”); *see also Dow Jones & Co. v. Abblaise Ltd.*, 606 F.3d 1338, 1349, 1353 (Fed. Cir. 2010) (affirming a determination of “obviousness under [a single prior art reference] in view of general knowledge in the field”) (citing *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 401(2007)). Thus, the anticipation and obviousness challenges are grouped together under Ground 1 because “it is well settled that ‘a disclosure that anticipates under § 102 also renders the claim invalid under § 103, for ‘anticipation is the epitome of obviousness.’” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019) (citations omitted).

1. Trevarthen

Trevarthen (Ex. 1005) is the thesis of Adam Trevarthen of the University of Wollongong. Trevarthen is pre-AIA 35 U.S.C. § 102(b) prior art that was not before the Examiner during prosecution of the ’515 patent. Trevarthen submitted his thesis on October 24, 2005, and it was publicly available as a printed publication before September 15, 2008.

a. Trevarthen’s Public Accessibility

Several indicia, supported by the Declarations of Library Information Scientist, June Munford (Ex. 1031) and Dr. Brown-Brandl, prove the public availability and accessibility of Trevarthen before September 2008. According to the University of Wollongong’s Research Online (“Research Online”), Trevarthen

was published and available for download on October 22, 2006. Research Online was (and is) an open access digital archive and institutional repository that promotes the scholarly output of the University of Wollongong. Research Online ensures that “a digital copy” of each reference of published in the digital repository “is available universally on the Internet and located through search engines such as Google and Yahoo.” Munford, ¶¶16-20 (citing Ex. 1027, 149). Once a publication, like Trevarthen, is “loaded onto Research Online [it] is usually available on Google the following day.” Munford, ¶19 (citing Ex. 1030, Ex. A). The “easy discovery” of uploaded publications “via Google and Google Scholar increases their visibility, and the associated download statistics verify their usefulness.” Ex. 1027, 150. Indeed, Trevarthen was downloaded hundreds of times before September 2008. Munford, ¶¶21-26 (citing Ex. 1030, Ex. A).

The Internet Archive confirms the public accessibility the Trevarthen thesis on Research Online on September 7 and 12, 2007, and March 22, 2008. Munford, ¶¶27-33 (citing Ex. 1030, Ex. B). *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1374-75 (Fed. Cir. 2021) (finding “the contents of webpages available through the Wayback Machine as facts that can be accurately and readily determined from sources whose accuracy cannot reasonably be questioned.”) (cleaned up).

Dr. Brown-Brandl explains that the POSA would have regularly searched for and consulted thesis documents, like Trevarthen, through university libraries and by keyword searching internet search engines. Brown-Brandl, ¶¶27, 68-70; *GoPro, Inc. v. Contour IP Holding LLC*, 908F.3d 690, 693 (Fed. Cir. 2018) (“[W]e have determined that a single cataloged thesis in a university library was ‘sufficiently accessible to those interested in the art exercising reasonable diligence.’” (citing *In re Hall*, 781 F.2d 897, 900 (Fed. Cir. 1986))).

Trevarthen’s public accessibility is further corroborated by the March 18, 2008, International Search Report and Written Opinion of the International Searching Authority, which identified Trevarthen as reference D1. Exs., 1028, 1029. This document confirms the pre-September 2008 public accessibility of Trevarthen to the POSA searching publicly available databases using keywords including “cattle” and “RFID.” Ex. 1028; Munford, ¶¶¶34-39; Brown-Brandl, ¶¶69-70.

b. Trevarthen’s Disclosure

Trevarthen explains that as of 2005 “RFID is becoming globally utilized for implementing individual whole-of-life identification and tracking systems for livestock.” Trevarthen, 10; Brown-Brandl, ¶¶57-67. Trevarthen discloses a case study of the Cochrane dairy farm that makes “strong use of RFID technology.” Trevarthen, 69. Each cow is tagged with an RFID tag that facilitates its automatic

identification, and the farm “utilise[s] a software package to aid in their herd management.” *Id.*, 69-71. For each cow “individual information is displayed” on a computer “provid[ing] a selection of information ... drawn from the central herd management database” with the cows “listed in rows, with their characteristics displayed in the corresponding columns.” *Id.*, 78. When the system identifies “[c]ows requiring additional treatment, such as veterinary treatment, artificial insemination etc., are drafted to the holding paddock to the right of the drafting gates High producing cows, or ... show cows, are directed to a holding paddock to the left of the drafting gates.” *Id.*, 88. The software also alerts operators to issues such as “freshly calved cows, and cows who have had a penicillin injection,” allowing their milk to be segregated and disposed. *Id.*, 78-79.

Trevarthen proceeds to describe a framework that builds upon the Cochrane farm system by using RFID technology and milking meters to “record the amount of milk each cow has provided at every milking session.” *Id.*, 98, 111-112. This production data from the milk meters is automatically entered into a “database” that is part of the herd management software. *Id.*, 100, 112. Trevarthen explains that tracking milk production will “aid to identify any problems that may arise in the herd (such as illness) ... if a cow provides a significantly lower amount of milk than their usual output.” Trevarthen, 115.

Trevarthen’s framework builds also upon the Cochrane dairy study by “incorporat[ing] temperature sensing abilities into RFID microchips,” which is described as “a currently available technology.” *Id.*, 121, 123 (citing Ex. 1017). Indeed, the prior art was replete with examples of temperature sensing RFID devices. Brown-Brandl, ¶¶35-46. Such RFID-sensors are used to detect a temperature “rise,” “fluctuations,” and “anomal[y].” Trevarthen, 121-122.

Trevarthen explains “reading [cow] temperature will ... aid in detection and subsequent treatment of any illnesses that a cow may have attracted ... enabl[ing] the farmer to take action to minimise the spread of the illness” *Id.*, 121. In addition to illness, Trevarthen also explains that a “rise in temperature may also indicate that a certain cow is entering heat. *Id.*, 121-22. It is important to know when this occurs, as “this presents the farmer with a window of opportunity to artificially inseminate the cow.” *Id.*

2. Claim 1

a. 1[Pre]: “A computer implemented method of animal tracking”

To the extent the preamble is limiting, Trevarthen describes a system using herd management software, which the POSA would have understood to be a computer implemented method of animal tracking. Brown-Brandl, ¶95. Trevarthen states the “ability to digitally store herd information is certainly a valuable tool for all farms, and a necessity for those desiring to utilise RFID

Herd management software provides farmers with this ability, providing mechanisms for them to store individual cow data into a database.” Trevarthen, 100.

b. 1[A]: “connecting a computer to an RFID device reader”

The POSA would have understood that conventionally RFID readers, i.e., the device that interrogates an RFID device that is an implant or tag, are connected to a computer. Brown-Brandl, ¶¶96-97. For example, in the Cochrane dairy “[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. Trevarthen, 78. Trevarthen describes that in its system “*mainstream computer network devices ... provide the vital links to* dairy farm devices, such as *RFID readers*.” Trevarthen, 104. Thus, Trevarthen discloses this element.

The POSA would have understood that the RFID reader collecting such data would be connected to a computer that interfaces with the database. Trevarthen, 77 (“This reader retrieves the identification number from the RFID tags” which is “then used to gather data pertaining to each cow from the central database.”). *Id.*, 92-93 (“This [herd management] software application is the underlying component of all of the RFID operations of the dairy. The data contained in this program is

accessed by the RFID readers and utilized to facilitate the relevant automation operations.....”); Brown-Brandl, ¶97.

c. 1[B]: “reading an RFID device implanted in an animal with said RFID device reader”

Trevarthen explains that “RFID tags, boluses or microchips form the basis of any dairy farm RFID system” and that such devices are so commonplace that “[t]here are a number of tags, boluses and microchips available from various vendors.” Trevarthen, 99-100; Brown-Brandl, ¶98. Trevarthen describes implanting RFID boluses. Trevarthen, 99-100; *see also id.*, 20, 22 (disclosing “rumens bolus” and “rumen boluses”), 24 (“injected” RFID microchip). The POSA would have understood that a bolus, by definition, is implanted in a cow, with a rumen bolus implanted in the cow’s first stomach compartment by ingestion. *Id.*, 99; Brown-Brandl, ¶99. Trevarthen cites the Bio-thermo RFID as an example of an implanted RFID device with temperature sensing capability. Trevarthen, 24-25. “To derive any use and subsequent benefit from the practice of *identifying every cow with RFID tags*, a farm *requires an RFID reader* device.” Trevarthen, 102; *see also id.*, 86-87 (“This [RFID] *reader* attains the unique identification number from each cow’s RFID tag”). Thus, the POSA would have understood Trevarthen to disclose reading an RFID device implanted in an animal with the RFID device reader connected to a computer. Brown-Brandl, ¶100.

d. 1[C]: “retrieving an amount of animal identification information from said RFID device implanted in an animal”

The POSA would have understood that Trevarthen’s system identified each cow by retrieving animal identification information from the RFID device.

Brown-Brandl, ¶¶101-102; Trevarthen, 102 (Describing “*identifying every cow* with RFID tags.”)² An RFID reader placed, for example, at the dairy entrance “provides 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.).” Trevarthen, 103; *see also id.*, 106 (“having an RFID reader that is portable provides farmers with the ability to *read the RFID number of individual cattle*”); 86-87, 121.

e. 1[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”

The term “said amount of information retrieved from said RFID device ...” in 1[D] and 1[E] (*infra* §VI.A.2.f) lacks antecedent basis. Regardless of its scope,

² Trevarthen uses the term “tag ... generically” noting “microchips and *boluses* can be used to perform the same functions.” Trevarthen, 99.

to the extent this term includes the “amount of animal **identification** information from said RFID device” in 1[C], the Board can still find claim 1 unpatentable even if its outer metes and bounds are not reasonably clear to the POSA. *Samsung Elecs. Am., Inc. v. Prisia Eng’g Corp.*, 948 F.3d 1342, 1355 (Fed. Cir. 2020) (Indefiniteness “does not necessarily preclude the Board from addressing the patentability of the claims on section 102 and 103 grounds.”)

Trevvarthen discloses “... **record[ing] a cow[']s milk production** ...” in its database. Trevvarthen, 102. “Milk meters provide this valuable ability, **measuring the amount of milk** each cow provides at every milking session.” *Id.*, 112. “[T]his **[milk meter] information** should be automatically recorded in the herd management **database**, and associated with the cow currently ... present.” *Id.*; *see also id.*, 101 (“the information **stored** regarding each cows last recorded volume of **milk production**”), *id.*, 100 (“data can be **automatically entered** through the use of other digital devices (such as **milk meters** ...) linked to this **database**.”), *id.*, 109 (cow’s milk “production history” may be analyzed to recognise “patterns,” thus indicating storage of such information in the database); Brown-Brandl, ¶¶103-105.

As explained for 1[C] (*supra* §VI.A.2.d), the cow is identified when, upon entering the dairy, the RFID reader retrieves the cow’s identification information from the implanted RFID device. The database stores milk production information for “each cow,” the data for each animal is necessarily differentiated using the

cow's animal identification information retrieved from the RFID device. *Id.*, 80 (“the data regarding how much milk each cow is producing is extracted from the ... database ... according to the cow's ... **identification number**.”); *see also id.*, 100 (herd management software enables farmers “to store **individual cow data** into a database” including information from “milk meters”); Brown-Brandl, ¶106. Thus, the Trevarthen system links retrieved animal identification information and milk production information stored in the database.

Additionally, Trevarthen discloses that it retrieves sensed animal temperature information from the RFID device. Trevarthen states that “[i]t is evident from” the literature in this field “that it is possible to incorporate **temperature sensing abilities into RFID microchips** currently Such a device will provide the **temperature** of the cow along with the cows **unique identification number** every time the tag is read by an RFID reader.” Trevarthen, 121, *see also id.*, 122. Trevarthen further teaches that these temperature measurements are analyzed to detect “fluctuations,” “a rise,” and/or “anomalies” that might indicate illness or oestrus. *Id.*, 121-22. The 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. Brown-Brandl, ¶¶107-109. The temperature information for a particular animal and the milk production information for that same animal would be linked in the

database using the animal's identification information. Thus, to the extent that the claim phrase "said amount of information retrieved from the RFID device" includes animal information other than the animal's identification information, this claim element is additionally met since Trevarthen also discloses linking animal temperature information to the milk production information stored in the database.

f. 1[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"

As explained above in 1[D], Trevarthen discloses storing milk production information for an animal that is linked to that animal's identification number. Element 1[E] recites "converting said amount of animal information of said animal stored in said database," i.e., a cow's "milk production or an amount of days milked," into one or more logical variables. As explained below, Trevarthen describes converting stored milk production information into a logical variable that is entered into a logical expression. *Infra* §VI.A.2.g; Brown-Brandl, ¶110. As further explained below, 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. Brown-Brandl, ¶111.

g. 1[F]: “inserting at least one of said plurality of logical variables into at least one logical expression”

As explained above for Element 1[D], Trevarthen discloses storing each cow’s milk production information in a database. This enables the herd management software to “recognise certain *patterns* in the [milk] production of each cow.” Trevarthen, 109. Based on the foregoing, the POSA would have understood that Trevarthen necessarily employed one or more “logical expressions” to “recognise certain patterns.” Brown-Brandl, ¶112. A logical expression would be required to, for instance, look at a time-series of milk production measurements to deduce any such patterns. These milk production measurements would be understood by the POSA to comprise logical variables inserted into the logical expression. Brown-Brandl, ¶113.

Trevarthen further discloses that a variance in a cow’s milk production may indicate illness or another issue. “For example, a cow producing significantly less milk than her *calculated average* may be suffering from an illness, or other stress factor that is reducing her milk production abilities.” Trevarthen, 98. There may be “illness” if “a cow provides a significantly lower amount of milk than their *usual output*” *Id.*, 115. 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. Brown-Brandl, ¶113.

Consistent with Treverthen, 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. Ex. 1033, 173-80 (“de Mol”); Brown-Brandl, ¶¶114-116(citing Ex. 1032, 42-44, 52; Ex. 1034, 52; Ex. 1035, 2-3, 50-53, 57-58). More particularly, de Mol discloses an integrated expression comprising equations (1)-(21) that uses milk yield ($Y_{M,n}$) as logical variables input into equations (1) and (2). *Id.*, 174-180. Output variables from these equations ($\nabla Y_{D,n}$) are then input as variables into matrix (17a) to determine y_n , which is in turn used in equations (7), (11), (15), and (19). *Id.* Thus, the expression in de Mol enables oestrus and illness alerts to be generated based on milk “yield.” *Id.*, 173, 180-81.

Given that Trevarthen teaches that the logical expression need only perform simple calculations such as computing an average and making a comparison to that average, the POSA could have easily written and implemented such equations in software. Indeed, de Mol demonstrates that much more complex expressions for

analyzing milk production to detect disease were known. Brown-Brandl, ¶117; *KSR*, 550 U.S. at 417 (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious....”).

h. 1[G]: “obtaining a logical value relating to said animal”

Trevarthen emphasizes that “animal borne disease” has “driven calls for ... individual identification and tracking of livestock ... to reduce the possibility of a disease outbreak.” *Id.*, 1; *see also id.*, 18 (“The need to control disease outbreaks is obvious...” and that outbreaks could “shut down the food supply.”). As explained above for 1[F], Trevarthen discloses inserting milk production information as logical variables into a logical expression to detect such illness. *Supra* §VI.A.2.g Trevarthen further discloses that, “if a cow provides a significantly lower amount of milk than their usual output, the system will be able to identify this disparity and ***alert the operators***” Trevarthen, 115. The 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. Indeed, it makes little sense to insert logical variables into such a logical expression but then not solve it to obtain such a logical value. Brown-Brandl, ¶118.

Notably, this is consistent with Patent Owner’s infringement theory, which alleges that this claim element is satisfied by “obtaining a logical value” in order to

generate an “alert” in the case of “illness.” Ex. 1022, ¶ 85; Brown-Brandl, ¶119. Accordingly, Trevarthen’s teachings, viewed from the perspective of the POSA prior to September 2008 anticipates or renders claim 1 obvious.

3. Claim 2

- a. **2[A]: “retrieving an amount of animal identification information from a plurality of RFID devices implanted in a plurality of animals”**

Trevarthen’s “herd management” system stores information generated by a plurality of RFID devices implanted in multiple individual cows in a herd.

Trevarthen, 102 (“In order to derive any use and subsequent benefit from the practice of identifying *every cow* with RFID tags, a farm requires an RFID reader device.”); *id.*, 86 (“An RFID reader ... to determine the *identify of each cow*”); Brown-Brandl, ¶120; *supra* §VI.A.2.d.

- b. **2[B]: “correspondingly linking an amount of animal information of said plurality of animals stored in said data base of said computer to said amount of information retrieved from said plurality of RFID device”**

For each of the plurality of cows, the linking element is the same as described above in 1[D] for each individual cow. *Supra* §VI.A.2.e; Brown-Brandl, ¶121. Thus, Trevarthen discloses this element.

B. Ground 2: Trevarthen In View of Brune Renders Claims 3-4 Obvious

1. Brune

Brune (Ex. 1008) is a pre-AIA 35 U.S.C. § 102(b) prior art patent that issued May 9, 2000. Although Brune was before the Examiner, its relevant teaching was clearly overlooked. *Supra* §III.B (citing Ex. 1002, 338, 345) (Examiner was concerned with milk information rather than date-time information)

Brune discloses that a “bolus including a temperature sensor and a transmitter is placed within a stomach of the ruminant animal,” wherein the temperature readings are analyzed to determine the health of the cow. Brune., 2:4-21; Brown-Brandl, ¶¶76-77. Brune’s device sends a “data packet [that] includes temperature data representing the *sensed temperature* ... identification data such as an *identification number which is unique to the specific cow*, and *date and/or time stamp data* corresponding to the *discrete point in time at which the temperature was sensed* by the bolus.” *Id.*, 4:4-11.

If Brune’s system determines that a cow’s core body temperature exceeds a specific threshold, it may indicate sickness. *Id.*, 5:65-6:12. Brune’s system can also use the temperature data to determine whether a cow that “has been exposed to high temperatures [] is experiencing heat stress,” which can result in reduced milk output. *Id.*, 6:38-51.

2. Claim 3: “retrieving an amount of date-time information from said plurality of RFID devices implanted in said plurality of animals.”

Trevarthen in view of Brune renders obvious retrieving date-time information from said RFID device, rendering claim 3 as a whole obvious.

Trevarthen discloses that “fixed readers may be utilized for the purposes of identifying a cow as she enters the milking parlour, and subsequently *recording the time and date* of this read to the central herd management database....”

Trevarthen, 102; *see also id.*, 103 (“[P]lacing the RFID in this position allows data to be automatically recorded regarding the *time and date* that each cow enters the milking parlour, and should at least be arranged so as to display cow information (displayed via relevant interface of the herd management software) on a computer screen at the end of the dairy.”). Additionally, Trevarthen discloses identifying “fluctuations” and “anomalies” in temperature. *Id.*, 121-22. The POSA would therefore understand that a time-series of time-date stamped temperature measurements are needed. Brown-Brandl, ¶122 (citing Trevarthen, 102-103, 121-122).

Brune’s device sends “a message in the form of an air-borne signal which is transmitted from a bolus implanted within the stomach of a cow.” Brune, 4:1-3. Brune explains:

The message or signal is preferably in the form of a data packet For each message, the data packet includes temperature data representing

the *sensed temperature* within the stomach, identification data such as an *identification number which is unique to the specific cow*, and *date and/or time stamp data* corresponding to the *discrete point in time at which the temperature was sensed* by the bolus.

Brune, 4:3-11; *see also id.*, 2:1-16. Thus, identification information, sensed temperature information, and time-date information is retrieved from Brune's device. Brown-Brandl, ¶124.

Given the importance of time-stamping to Trevarthen, it would have been obvious for the POSA to modify the RFID device of Trevarthen to include the date-time stamping capability disclosed in Brune. At a minimum, it would have been obvious to try having the RFID device time-stamp the retrieved information rather than the RFID reader. Additionally, Trevarthen explains that its system works with a variety of boluses, such that "the eventual choice of device to the individual farmer to select the device type that best suits their requirements and farm." Trevarthen, 99. Thus, the POSA would have reasonably expected the date-time stamping feature of Brunes's device to work with Trevarthen's herd management system, at least because the same types of information are being retrieved from a similar implanted bolus. Brown-Brandl, ¶125; *KSR*, 550 U.S. at 416 ("The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.") Moreover, date-time information is simple and well understood. Finally, Trevarthen discloses

including GPS, which provides date-time information as well as location information, into each animal's RFID device. Trevarthen, 123; Ex. 1036, 1:57-2:2, 2:50-53. Brown-Brandl, ¶126.

3. Claim 4: “retrieving an amount of sensed animal information from said plurality of RFID devices implanted in said plurality of animals”

Trevarthen states that “[i]t is evident from” the literature in this field “that it is possible to *incorporate temperature sensing abilities into RFID microchips* currently Such a *device will provide the temperature of the cow along with the cows unique identification number* every time the tag is read by an RFID reader.” Trevarthen, 121. Trevarthen cites the Bio-thermo RFID as an example of an implanted RFID device with temperature sensing capability (Trevarthen, 24-25), states that it was “possible to incorporate temperature sensing abilities into RFID microchips,” (Trevarthen, 121), and discloses that “RFID temperature sensing is currently available technology.” Trevarthen, 123. Indeed, retrieving sensed temperature from implanted RFID devices was described in numerous prior art references. Brown-Brandl, ¶128. The availability of RFID-compatible temperature sensors is further admitted by the '515 patent. Ex. 1001, 10:26-54 (disclosing the “Betachip Thermistor...distributed by BetaTHERM Sensors”).

Trevarthen further discloses that the RFID readers retrieve the sensed temperature information from the RFID device.

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

Trevarthen, 122. Thus, Trevarthen discloses retrieving sensed animal temperature from an RFID device coupled to a temperature sensor. Brown-Brandl, ¶128.

C. Ground 3: Trevarthen In View of Rollins Renders Claims 15-25 Obvious

1. Rollins

Rollins (Ex. 1037) is a pre-AIA 35 U.S.C. § 102(b) prior art patent application that published July 20, 2006. Rollins was not before the Examiner.

Like Trevarthen, Rollins describes “methods and systems for collecting and managing animal-related information.” Rollins, Abstract; Brown-Brandl, ¶¶85-87. This includes the use of client collection computers, a server, and a network (e.g. Internet). *Id.*, Figure 1, [0033], [0034], [0043]. Also like Trevarthen, Rollins discloses the use of RFID tags affixed to cows for animal tracking. *Id.*, [0052]. The tags are read by an RFID reader/computer to identify a particular animal. *Id.*, *see also id.* [0038], [0091]. The collected animal data may include weight [0004, 0086], vaccinations [0078], as well as artificial insemination status, pregnancy,

illness (brucellosis) and body condition. *Id.*, [0072], Figure 13. This tracked animal information is stored in a database (126) connected to a server (104). *Id.*, Figure 1, [0045], [0105], [0112].

Rollins's system "can comprise multiple *access client devices 102a-n* in communication with a *server device 104* over a network **106**, and operable by respective users **108a-n**." Rollins, [0033], Figure 1. "Each *collection client device 110a-n* shown in FIG. 1 can comprise a computer-readable medium" that "comprise[s] a random access memory (RAM) **122a-n** coupled to a collection client processor **124a-n**" that "can execute computer-executable program instructions stored in the memory **122a-n**" (*id.*, [0043]) and "an EID reader application program **128a-n**." *Id.*, [0047].

The POSA would have understood an embodiment of "collection client device **110a-n**" could "include or be functionally in communication with an associated data collection-type device such as a RFID reader." *Id.*, [0038].

Rollins's system uses RFID readers to "collect[s] information relate to animals, such as a herd of cattle wearing a respective RFID device." *Id.*, [0057] Figure 2, Figure 4. "For example, an animal such as a bull 132 can be associated with an identifier 134. Data from the identifier 134 can be obtained by and entered into the collection client device 110a-n. *Id.*, [0048]. Rollins's "network **106** [] can comprise the Internet" or "other suitable types of networks, either wired or

wireless, such as an intranet, local area network, wide area network, a telecommunications network, or broadcast network.” *Id.*, [0033].

2. Claim 15: “providing a server connected to said computer which provides a browser-based user interface which enables an animal tracker to track each of said plurality of animals based on said amount of information retrieved from each said bit segment of said plurality of RFID devices implanted in said plurality of animals”

Trevarthen explains that a “form of *digital network is required* so as to enable the communication of devices between one another, with RFID readers and the central herd management software.” Trevarthen, 103; *see also id.*, 105 (“providing a robust, *quality network is a central component* to enabling the use of RFID devices for farm management practices”). A server is a critical component of any network, especially one’s like Trevarthen that is collecting information for, and disseminating information from, a central herd management database. Thus, the POSA would have understood Trevarthen to teach providing a “server” connected to said computer. *Id.*, 104. Indeed, Trevarthen expressly teaches that “some components of the network utilis[e] direct wired connections to the herd management software and *server application*.”). *Id.*, 104; Brown-Brandl, ¶¶129-130.

Indeed, Rollins includes a “server device **104**.” Rollins, [0041] (“The server device **104** shown in FIG. 1 can comprise a server executing one or more application programs such as a web information system application program

116.”), Figure 1. The server communicates with client computers over a network (e.g., Internet). Figure 1, [0033]. Rollins’s network can be accessed by access client devices **102a-n** that “can comprise a laptop computer or portable processing device with an *Internet browser* application, such as Microsoft Explorer, Apple Safari, and Mozilla Firefox” that “can provide network communications functionality for users operating the access client device **102a-n**.” *Id.*, [0037]; *see also id.*, [0036], [0038], [0046], [0196], [0201]. Other object management systems also included browser-based interfaces prior to September 2008. Ex. 1038, [0055], [0057]. The POSA would have considered it obvious to implement Trevarthen’s system so that the network and the database of tracked information for each animal would have been accessed by “a browser-based user interface. Brown-Brandl, ¶131; *KSR*, 550 U.S. at 416.

With respect to the claim language “enabl[ing] an animal tracker to track each of said plurality of animals based on said amount of information retrieved from each *said bit segment* of said plurality of RFID devices,” the term “said bit segment” lacks antecedent basis. Assuming “said bit segment” could refer to certain digital information contained in the transmission from the cow’s RFID device, then this is disclosed by Trevarthen. Brown-Brandl, ¶¶132-133. As explained above for claims 1 and 4, Trevarthen retrieves the RFID information for each cow, including the animal’s identifier, temperature, and location. The POSA

would have understood that this RFID information is transmitted digitally, and therefore the transmitted RFID information for each cow would comprise at least one bit segment. Indeed, Trevarthen explains that the RFID “standard allows the *bits* communicated by the transponder to be interpretable by the transceiver.” Trevarthen, 23. Thus, claim 15 as a whole is rendered obvious by Trevarthen in view of Rollins.

1. Claim 16: “further comprising providing a computer network connected to said computer”

As described for claim 15 (*supra* §VI.C.2), Trevarthen and Rollins teach providing a computer network connected to said computer. Thus, claim 16 is obvious for the reasons described for claim 15. Brown-Brandl, ¶134.

2. Claim 17: “providing a wide area network to which said computer connects”

The POSA would have understood the “internet” to be a “wide area network,” so claim 17 is obvious for the same reasons as claim 15. *Supra* §VI.C.2. Rollins’s “network 106 [] can comprise the Internet” or “other suitable types of networks” including a “*wide area network*.” Rollins, [0033]. The POSA would have readily been able to configure Trevarthen’s system to connect to a wide area network. Brown-Brandl, ¶135; *KSR*, 550 U.S. at 416.

3. Claim 18: “providing at least one client computer capable of configuration with said executable program instructions connected to said wide area network”

The term “said executable program instructions” lacks antecedent basis. In any event, the POSA would have understood that Trevarthen’s herd management “software” (*id.*, 100) to necessarily comprises executable program instructions. Brown-Brandl, ¶136. Additionally, Rollins discloses that its client device contains an “access client processor **114a** [that] can execute *computer-executable program instructions* stored in the memory **112a**.” Rollins, [0034]. Thus, the POSA would have understood the client device to be a computer. Brown-Brandl, ¶136. Further, these client devices are connected to a wide area network (e.g., Internet). *Id.*, Fig 1. Thus, claim 17 is obvious over Trevarthen and Rollins.

4. Claim 19: “providing a palm device capable of configuration with said executable program instructions connected to said wide area network”

The POSA would have understood that a “palm device” is a type of “personal digital assistant.” Brown-Brandl, ¶137. Indeed, the ’515 patent’s specification does not disclose a “palm” device, instead disclosing “personal digital assistants.” Ex. 1001, 7:58. Similarly, Trevarthen teaches that a “palmtop device” is a type of “personal digital assistant.” Trevarthen, 106. To be operable, the POSA would further understand the PDA/palm device to include executable program instructions and comprises a computer. Brown-Brandl, ¶137. Trevarthen

further discloses linking “directly to real-time data in the herd management database network devices, such as PDAs (Personal Digital Assistants).”

Trevarthen, 104. Because Trevarthen discloses that a “palmtop device” is such a PDA, it discloses this claim element.

Rollins likewise discloses that the client access devices **102a-n** and the client collection devices **110a-n**, both linked to the network, can be “personal digital assistants.” Rollins, [0036], [0046]. PDA’s comprise computers, and to be operable they must contain software, i.e., executable program instructions. Brown-Brandl, ¶138; Rollins, [0034]. additionally, Rollins teaches that the client devices are connected via a wide area network (e.g., Internet). *Id.*, Figure 1, [0033]. Thus, Trevarthen and Rollins render claim 19 obvious.

5. Claim 20: “providing a cellular telephone capable of configuration with said executable program instructions connected to said wide area network”

Trevarthen discloses a “mobile phone” to communicate with the herd management system and receive text alerts. Trevarthen, 122, 124. The POSA would have understood that such a mobile phone would have necessarily included a processor running executable program instructions. Brown-Brandl, ¶139. Furthermore, mobile phones connect over the cellular network, which was considered to be a wide area network. *Id.*

Rollins discloses that the client access devices **102a-n** and the client collection devices **110a-n**, both linked to the wide area network, can be “*cellular phones*.” Rollins, [0036], [0046]. To be operable, the cellular phones must contain software, i.e., executable program instructions. Rollins, [0034]. The POSA would have readily been able to configure Trevarthen’s system to include cellular phones with executable program instructions, such as the one disclosed by Rollins. Brown-Brandl, ¶140; *KSR*, 550 U.S. at 416. Thus, Trevarthen and Rollins render claim 20 obvious.

6. Claim 21: “providing a portable RFID device reader”

Trevarthen explains that “[h]aving an RFID reader that is *portable* provides farmers with the ability to read the RFID number of individual cattle, regardless of the cow’s location on the farm.” Trevarthen, 106-107 (providing examples of portable RFID readers). Rollins also discloses a portable RFID reader in Figure 3. Rollins, [0052]. Thus, Trevarthen and Rollins teach claim 21.

7. Claim 22: “connecting said portable RFID device reader to said client computer”

Trevarthen states that its portable RFID reader can have “a direct network link to it (e.g. wireless network)” or “upload[] to the herd management database at a later time when the device can gain a direct link to the network (i.e. transfer via network cable).” Trevarthen, 107. Under either scenario, Trevarthen’s portable RFID reader is connected to a client computer. Brown-Brandl, ¶142. Rollins

explains that its portable “integrated RFID reader/computer **300** can be used in conjunction with or in lieu of the combination of a separate RFID reader, such as **200**, and a separate collection client device **110a-n**.” Rollins, [0052]. RFID device **300** can, for example, send and receive data to and from a desktop personal computer (*e.g.*, device **108a-n**). *Id.*; Brown-Brandl, ¶142. Thus, Trevarthen and Rollins teach claim 22.

8. Claim 23: “connecting said portable RFID device reader to said wireless palm device”

Trevarthen describes connecting its portable RFID device reader to a PDA, which would include a palm device:

The farmer can [] scan a cow[']s RFID tag with the portable RFID scanner, and the identity and information pertaining to that cow can be provided on the screen of the PDA. The farmer can then use the PDA similar to how they would utilise their host desktop computer, being able to browse the cow[']s information, and should also be allowed to record and update cow information on-site.

Trevarthen, 106-107. Such a configuration would have required connecting the portable RFID device reader to the PDA. Brown-Brandl, ¶143. As noted above, Trevarthen describes a “palmtop” device as being a type of PDA. Trevarthen, 106.

Rollins discloses: (1) that PDAs are a type of client device (Rollins, [0036], [0046]; *supra* §VI.C.4), **110a-n**, (2) that the RFID reader is connected to or integrated with the client device (Rollins, Figure 1, [0038], [0047]), and (3) that the

RFID reader may be portable (Rollins Figure 3, [0052]). From this the POSA would have understood that the portable RFID reader could be connected to the wireless PDA/palm client device. Brown-Brandl, ¶144; *KSR*, 550 U.S. at 416. Thus, claim 23 is rendered obvious by the cited art.

9. Claim 24: “connecting said portable RFID device reader to said cellular telephone”

Rollins discloses: (1) that “cellular phones” are a type of client device (Rollins, Figure 1, [0036], [0046]), (2) that the RFID reader is connected to or integrated with the client device (Rollins, Figure 1, [0038], [0047]), and (3) that the RFID reader may be portable (Rollins Figure 3, [0052]). From this the POSA would have understood that the portable RFID reader could be connected to a cellular phone. Brown-Brandl, ¶145; *KSR*, 550 U.S. at 416.

10. Claim 25: “reading an RFID device said RFID device part of a bolus ingested by a bovine animal”

Trevarthen describes implanting RFID boluses. Trevarthen, 99-100; *see also id.*, 20, 22 (disclosing “rumens bolus” and “rumen boluses”), 24 (“injected” RFID microchip); *supra* §VI.A.2.c. The POSA would have understood that a bolus, by definition, is ingested by a cow, with a rumen bolus residing in the cow’s first stomach compartment. *Id.*, 99; Brown-Brandl, ¶146.

D. Ground 4: Laitinen In View of Buchanan and Liao Render Claims 1-2 Obvious

1. Laitinen

Laitinen (Ex. 1006) is a pre-AIA 35 U.S.C. § 102(b) prior art patent that issued June 13, 2006. Laitinen was not before the Examiner.

Laitinen describes “a system for the surveillance of animals includ[ing] identification and measuring elements attached to the animals” Laitinen, Abstract. Laitinen discloses a three-level architecture comprising a Pico Level, Local Level, and Global Level.

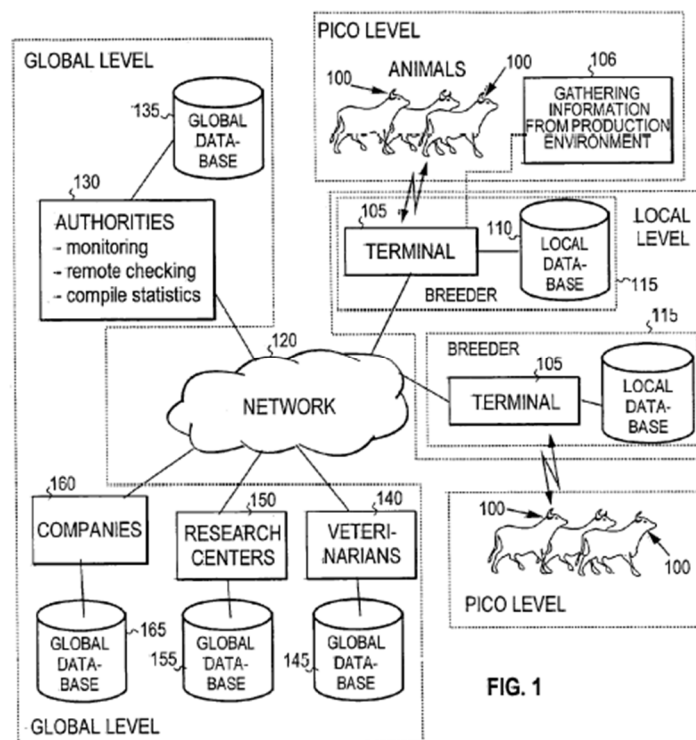


FIG. 1

Id., 3:5-6, Figure 1; Brown-Brandl, ¶142.

“The Pico level ... comprises the technology used directly with the animals.” *Id.*, 3:28-4:4. The pico device includes a “[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.” *Id.*, 3:51-62.

The local level receives information from the pico devices. *Id.*, 6:5-15. The local level “consists in practice of one or more local **115** information systems at the very minimum, a local information system comprises a **105** terminal unit, typically featuring the **110** data base into which the terminal gathers local measuring and surveillance and other important information.” *Id.*, 4:5-41.

The global level “includes 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.*, 4:42-5:3. “[D]ata concerning an animal can be obtained from the pico and local levels throughout the animal's entire life span [G]lobal level servers and databases feature algorithm and models, which are applied in the analysis of these and other possible data.” *Id.*, 5:26-30. Laitinen describes applying its system to assist in reproduction, such as detecting when a cow is in heat and performing artificial insemination. *Id.*, 8:5-26, Figure 5. Laitinen also describes entering animal information into algorithms, such as the animal's present condition, to identify

“necessary medical treatment.” *Id.*, 7:35-56; *see also* 1:33-35 (noting that “infectious diseases” are a “serious problem.”)

2. Buchanan

Buchanan (Ex. 1011) is a pre-AIA 35 U.S.C. § 102(b) prior art PCT patent application that published June 8, 2006. Brown-Brandl, ¶¶78-81. Buchanan was not before the Examiner.

Buchanan discloses a “farm management system” comprising a “database collectively receiving and storing data collected by data collection means in association with animal identifiers of individual animals.” Buchanan, 3:7-23. Animals are identified and tracked using “RFID” tagging. *Id.*, 11:1-2 (“an RFID scanner read[s] animal identifying data from animal ID tags moving into the vicinity of the scanner.”).

Buchanan discloses the monitoring of a cow’s “milk volume” using “cup sensors or milk meters,” wherein the measurements are “associated with the particular animal being milked.” *Id.*, 19:17-31. The system can determine if the milk volume is outside a preset range and, if so, automatically draft the animal. *Id.*, 19:31-20:2.

Like Laitinen, Buchanan is concerned with animal reproduction and discloses automatic drafting of animals for artificial insemination in response to the detection of oestrus. *Id.*, 17:22-27. Buchanan teaches that detecting when a cow is

in heat may involve “sensors ... taking a temperature reading from the cow’s stomach” and sending this information over a network for storage and “retrieval into the farm management system.” *Id.*, 21:3-8.

3. Liao

Liao (Ex. 1010) is a pre-AIA 35 U.S.C. § 102(b) prior art PCT patent application that published August 9, 2007. Brown-Brandl, ¶¶82-84. Liao was not before the Examiner.

Liao describes a system for dairy farm management comprising a computer with a software based “rules engine” and “decision engine” for making dairy farm decisions based on “animal parameters.” Liao, 2:27-3:14. The system includes a data collection unit connected to “a number of animal-related sensor means ... i.e. sensors located on/in animals, or at implements interrelating with the animals, such as milking apparatuses.” *Id.*, 13:9-18.

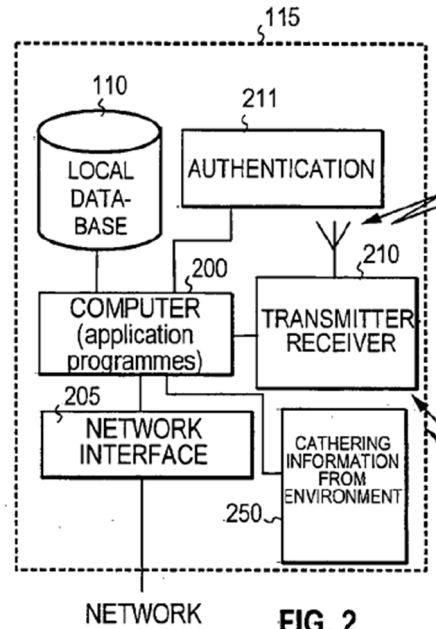
As with Laitinen and Buchanan, Liao is concerned with animal reproduction and artificial insemination. *Id.*, 5:10-13. Liao’s decision engine determines when a cow is in heat and ready for artificial insemination by evaluating parameters for a particular animal, including “peak milk yield.” *Id.*, 5:14-27, 9:34-10:15, 12:3-15. This data is stored in association with a “first input parameter reflecting an animal identity.” *Id.*, 5:14-15, 12:6-8.

Like Laitinen, Liao is also concerned with disease, and teaches evaluating animal parameters including “milk yield” to determine if an animal should be tested for mastitis. *Id.*, 6:31-7:6, 15:16-29, 29:15-35. This data is also stored in association with a “first input parameter reflecting an animal identity.” *Id.*, 6:32-34.

4. Claim 1

a. 1[Pre]: “A computer implemented method of animal tracking”

To the extent the preamble is limiting, it is met by Laitinen’s disclosure of a “system for the surveillance of a group of animals.” *Id.*, 1:12-18. “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.*, 4:50-53. The system comprises “computer[s].” *Id.*, 4:5-9, 4:23-25, 4:40-49.



Id., Figure 2; Brown-Brandl, ¶147.

b. 1[A]: “connecting a computer to an RFID device reader”

Laitinen discloses this element. Pico devices 100a and 100b in Figure 2 employ “Radio Frequency Identification Technology” that can be “read/transcribed.” Laitinen, 3:28-35, 3:53-57. RFID devices **100a** and **100b** are read by transmitter/receiver **210** as depicted in Figure 2, which comprises the RFID reader. Indeed, the POSA would have understood that implicit in the use of RFID devices is the need to read those devices with a reader. Brown-Brandl, ¶148.

Koninklijke Philips, 948 F.3d at 1338 (holding obviousness can rely “on general knowledge of a skilled artisan.”); *see also Dow Jones*, 606 F.3d at 1349 (citing *KSR*, 550 U.S. at 401) (affirming “obviousness under [a single prior art reference] in view of general knowledge in the field”). Buchanan confirms this

understanding, explaining the application of RFID readers within its system.

Buchanan, 11:24-12:7.

Reader **210** of Laitinen is, in turn, connected to computer **200** in information system **115**. Laitinen, 6:7-9 (“The pico level control device is connected to the local information system **115** through a short-range transmitter receiver **223** or **233**. In the local system the transmitter-receiver **210** that receives the measuring/surveillance data is connected to a computer **200** with the necessary software.”); 4:5-9 (information system **115** includes a “personal computer”); 4:23-25 (“personal computer”). The reader is also connected to additional computers through the network, including server **400**. *Id.* at 4:42-45, Figures 1-3; Brown-Brandl, ¶149.

c. 1[B]: “reading an RFID device implanted in an animal with said RFID device reader”

Laitinen discloses reading an implanted RFID device. The 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*.” *Id.*, 3:53-57, 5:38-42. As explained for 1[A] (*supra* §VI.D.4.b), the POSA would have understood the Laitinen’s implanted device is read with an RFID reader. Brown-Brandl, ¶150 .

d. 1[C]: “retrieving an amount of animal identification information from said RFID device implanted in an animal”

Laitinen discloses this element. Laitinen describes its system as “a system of individual *animal identification*.” Laitinen, 2:47-48; *see also id.* 6:2-4 (“Each surveillance device includes a *personalized identifier for the correct identification of the animal* in question.”). Laitinen explains that its “pico level device is attached permanently to [an animal], and it *functions like [a] conventional identification tool*.” Laitinen, 3:28-35; *see also id.*, 3:53-57; Brown-Brandl, ¶¶151-152.

e. 1[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”

As discussed for 1[B] and 1[C] (*supra* §§VI.D.4.c-VI.D.4.d), Laitinen discloses retrieving animal identification information. This information is stored in a database along with associated information for each animal. *Id.*, 2:46-53 (“The invention describes a system of individual animal identification in which the surveillance data is ... saved ... to enable the gathering of data concerning single animals and the creation of comprehensive surveillance information.”), 4:42-49 (database stores “[I]nformation gathered about individual animals ...”), 8:16-23

(“data concerning the animal saved in server’s own database” and database requests may “simply convey the animal’s identifier.”).

While Laitinen does not expressly disclose storing milk production information, it provides an express motivation to do so. Laitinen states that “it is *vital* that real-time *information about the production of ... milk, is available.*” *Id.*, 1:36-38. The POSA would have appreciated that using Laitinen’s database to also track milk production of a cow would facilitate the availability of such information. Brown-Brandl, ¶¶153-154.

Buchanan discloses a farm management system that stores milk production information that satisfies the motivation presented in Laitinen. *Supra* §VI.D.2; More particularly, Buchanan describes milk meters for taking “milk volume readings to be associated with the particular animal being milked,” and sending those readings to an in-shed module. Buchanan, 19:17-30. It is then stored in a “database” where it is associated with “animal identifiers.” *Id.*, 11:18-22; Brown-Brandl, ¶155.

Similarly, Liao stores milk production data (“peak yield”). Liao, 10:1-8. Thus, there were no meaningful impediments to modifying Laitinen’s farm management system to similarly collect and store milk production information as Buchanan and Liao teach. Brown-Brandl, ¶156.

The POSA 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. *Supra* §§VI.D.1, VI.D.3; Brown-Brandl, ¶157. Liao expressly teaches that peak yield of milk is "applicable to insemination decisions." Liao, 9:34-11:10 (identifying peak yield as one of the "input parameters" for insemination decisions); *see also id.*, 12:3-15. Because Laitinen was similarly concerned with determining when a cow was ready for artificial insemination (Laitinen, 8:5-39), the POSA would have been motivated to store Liao's milk production information in Laitinen's database for consideration in the insemination determination. Brown-Brandl, ¶¶157.

The POSA would also have been motivated to store milk production information in Laitinen's database, because Laitinen and Liao were both concerned with disease. Brown-Brandl, ¶158. For example, Liao teaches that milk production information is one of the "input parameters" for deciding whether to test a cow for mastitis. Liao, 15:16-29, 29:15-35. Laitinen was similarly concerned with disease. *Id.*, 1:33-35 ("infectious disease" is a "serious problem[]"); 4:60-64 (analysis of "milk samples" can reveal "latent bovine mastitis"); 7:35-37 (analysis of "animal's present condition" to determine "necessary medical treatment"). The POSA therefore would have been motivated

to store Liao's milk production information in Laitinen's database to detect disease.

Buchanan and Liao disclose storing milk production for each animal, according to each animal's identity. The POSA would have readily been able to configure Laitinen's database to link a cow's stored milk production using each cow's "personalized identifier," rendering 1[D] obvious. Laitinen, 6:2-4, 3:28-31, Brown-Brandl, ¶159; *KSR*, 550 U.S. at 416.

- f. **1[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"**

As explained for 1[D] (*supra* §VI.D.4.e), the POSA would have been motivated to store milk production information in Laitinen's database for purposes of detecting oestrus and/or disease. 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.*" Laitinen, 5:24-30. Similarly, Laitinen explains that "*algorithms and knowledge models* ... are essential to the effectiveness of the system's services." *Id.*, 6:29-32. Thus, the POSA 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. Brown-Brandl, ¶159; *infra* Element 1[F] below.

g. 1[F]: “inserting at least one of said plurality of logical variables into at least one logical expression”

Laitinen discloses a first logical expression to determine if a cow is in heat. *Id.*, 8:5-15. A cow’s sensed and recorded temperatures are used as input variables, and the expression determines whether “alarm limit(s) have been reached.” *Id.*, 8:13-15; Brown-Brandl, ¶160. As indicated for 1[D] (*supra* §VI.D.4.e), Liao teaches that milk production (yield) is also useful for determining whether a cow is in heat and ready for artificial insemination. Liao, 12:3-15; 9:34-10:15. Therefore, the POSA 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. Brown-Brandl, ¶161.

Alternatively, Laitinen discloses a second logical expression that determines the appropriate “medical treatment” for an animal. Brown-Brandl, ¶162. More particularly, Laitinen discloses the logical expression $x=f^1(y,z)$, wherein the treatment x is a function of initial state vector y and present state vector z . Laitinen, 7:35-37, 7:6-13. The state vectors include the animal’s temperature at different times. *Id.*, 7:6-11. Laitinen repeatedly expresses concern for detecting animal disease (*id.*, 1:33-35, 4:60-64), and therefore the POSA would have

understood that the expression determines whether an animal is sick and identifies the appropriate treatment. Brown-Brandl, ¶163. Indeed, it was well-known in the art that temperature correlated with animal illness. Brune, 1:36-38 (“the core body temperature of a cow may rise when the cow is sick ...); Ex. 1023, 4:13-25(temperature is a “reliable indication of ... illness”).

Those of ordinary skill were aware that lowered milk production was also an indicator of illness. Liao, 6:32-7:6 (milk yield used to determine whether an animal should be tested for mastitis); Ex. 1023, 4:13-18 (milk yield a reliable indicator of illness); Brune, 6:48-50 (“heat stress may cause the milk production of a dairy cow to decrease”). Therefore, the POSA 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. Brown-Brandl, ¶163.

By combining temperature and milk production as input variables to a logical expression, the POSA would have understood that dairies would be more effective at determining whether temperature and milk production anomalies were indicators of illness or oestrus, or caused by some other issue. Brown-Brandl, ¶164. For example, a temperature above the upper limit combined with decreased milk production would tend to indicate illness is highly likely, whereas decreased

milk production without elevated temperature may suggest another issue, for example a need to change feed. *Id.* Indeed, van den Berg et al. (Ex 1023) expressly teaches that “one or more of the parameters [including temperature and milk yield] may be combined ... to achieve higher accuracy” in determining whether an animal is ill or in heat. Ex. 1023, 4:12-22.

Modifying 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. *KSR*, 550 U.S. at 416-17. Indeed, even in the 1990’s it was known to use a multivariate expression that used both temperature and milk yield information, as well as other parameters, as input parameters to determine whether a cow was in oestrus or ill. de Mol, 173-81; Ex. 1032, 43-44; Brown-Brandl, ¶165. For instance, de Mol disclosed an integrated expression comprising equations (1)-(21). de Mol 174-80. Milk yield ($Y_{M,n}$) and temperature (T_n) are inserted as variables into equations (1) and (3), respectively. *Id.* at 174-75. The outputs of these equations ($\nabla Y_{D,n}$ and ∇T_n) are then input into matrix (17a) to obtain y_n , which is then used in equations (7), (11), (15), and (19). *Id.* at 177-79. The overall expression is solved to determine if a cow is ill or in estrus and generate an alert. *Id.* at 173, 180-81. Thus, 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. Brown-Brandl, ¶165.

h. 1[G]: “obtaining a logical value relating to said animal”

With respect to its first disclosed logical expression used for purposes of artificial insemination, Laitinen discloses that “when the local system notices that the alarm limit(s) have been reached, it signals a heat alarm....” *Id.*, 8:12-15. The POSA would have understood 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. Brown-Brandl, ¶166. The modified expression in 1[F] would also be solved to obtain a value indicating whether an animal is in heat and ready for artificial insemination.

With regards to its second disclosed logical expression for purposes of detecting illness and identifying appropriate medical treatment, the logical expression is given by $x=f^{-1}(y,z)$, wherein x is the appropriate medical treatment for a sick animal. *Id.*, 7:35-37. The POSA would therefore understand that the equation is being solved for the value x . Brown-Brandl, ¶167. The modified expression discussed in 1[F] (*supra* §VI.D.4.g) would also be solved to obtain value x to indicate whether an animal is ill and to identify appropriate medical treatment.

Finally, this claim element is superfluous as it makes little sense to insert variables into an expression but not solve it. Brown-Brandl, ¶168.

5. Claim 2

- a. **2[A]: “retrieving an amount of animal identification information from a plurality of RFID devices implanted in a plurality of animals”**

Laitinen discloses this element. Laitinen discloses that its system is for “the surveillance of a *group* of animals” Laitinen, 1:12-18, Figure 1. Information is “gathered about individual animals” so that “based on the collected animal and farm information ... treatment measures and management decisions are taken.” *Id.*, 4:45-53. The POSA would have understood from this that the RFID devices would be implanted into a group (i.e, plurality) of animals. Brown-Brandl, ¶169. Indeed, there would be little need to identify individual animals as disclosed in Laitinen, unless a plurality of animals must be distinguished from one another.

- b. **2[B]: “correspondingly linking an amount of animal information of said plurality of animals stored in said data base of said computer to said amount of information retrieved from said plurality of RFID device”**

For each of the plurality of cows, the linking element is the same as described above in 1[D] for each individual cow. *Supra* §VI.D.4.e; Brown-Brandl, ¶170. Thus, Laitinen meets this element.

**E. Ground 5: Laitinen In View of Buchanan, Liao, and Brune
Render Claims 3-4 Obvious**

1. Claim 3: “further comprising retrieving an amount of date-time information from said plurality of RFID devices implanted in said plurality of animals.”

Laitinen in view of Brune renders obvious retrieving date-time information from said RFID device, rendering claim 3 obvious. The POSA would have understood that date-time information is among the information stored in the Laitinen’s databases. Brown-Brandl, ¶171. For example, Laitinen stores the time of administration of medicaments so that the “*time elapsed*” may be calculated. Laitinen, 7:1-3. Further, Laitinen generates an *initial* state vector and a *present* state vector containing temperatures at different points in time, indicating that the dates and times of those measurement must be stored. *Id.*, 7:6-11.

Additionally, Laitinen teaches monitoring temperature and movement to determine if a cow is in heat. *Id.*, 8:5-15. The POSA would have understood that such a system would not look at a single measurement, but would instead look at several measurements over a period of time to filter out anomalies and increase reliability. Brown-Brandl, ¶172. As a result, multiple temperatures and locations would be stored for analysis, each one bearing a date-time stamp. *Id.*

Brune discloses “a bolus implanted within the stomach of a cow.” Brune, 4:1-3. The bolus includes a “temperature sensor and transmitter.” *Id.*, 2:4-5. A plurality of temperature values are sensed and “transmitted” using “air-borne

signals” to a remote receiver. *Id.*, 2:6-11. Each transmitted message includes the temperature data, identification data unique to a specific cow, and “*date and/or time stamp data* corresponding to the *discrete point in time at which the temperature was sensed* by the bolus.” *Id.*, 4:1-11.

In view of Laitinen’s use of date-time information, and Brune’s explicit disclosure of transmitting date/time-stamped animal temperature data from an implanted bolus, the POSA would have been motivated to modify Laitinen’s RFID system to retrieve from the bolus date-time stamp data associated with each retrieved temperature measurement. Brown-Brandl, ¶¶173-174.

The likelihood of success would have been high at least because both Laitinen and Brune are retrieving similar data from an implanted animal sensor, for example, temperature, and date-time information is well understood. Brown-Brandl, ¶175; *KSR*, 550 U.S. at 416. Further, Laitinen teaches that the RFID implant can accommodate a wide variety of sensors and hardware components including for temperature, occlusion, muscular action, motion, metabolic level, medicament disbursements, GPS, EKG, EMG, and oxygen saturation. Laitinen, 3:51-67, 5:50-55. Therefore, adding a simple clock to generate time-stamps would have been relatively easy; for example the use of GPS would provide a date-time source. Ex. 1036, 1:57-2:2, 2:50-53; Brown-Brandl, ¶176.

2. Claim 4: “further comprising retrieving an amount of sensed animal information from said plurality of RFID devices implanted in said plurality of animals”

Laitinen discloses a “[s]ensor” for measuring an “animal’s body temperature,” wherein the “[s]ensor unit connected to the micro controller” can be “an implant inside the animal” and the data it provides can be “read/transcribed ... using the so-called Radio Frequency Identification Technology.” Laitinen, 3:51-57; *see also id.*, 8:10-12 (“To monitor the animal’s heat with a pico level device, *body temperature* and movement are usually measured.”). The pico RFID device can also provide location information using GPS. *Id.*, 3:63-67. Brown-Brandl, ¶177. U.S. Patent Pub. No. 2006/0267767 (Pohlkamp) also demonstrates that it was well-known to retrieve animal temperature from an implanted RFID bolus having a temperature sensor. Ex 1009, [0039], [0041], [0053].

F. Ground 6: Laitinen In View of Buchanan, Liao, and Rollins Render Claims 15-25 Obvious

1. Claim 15: “providing a server connected to said computer which provides a browser-based user interface which enables an animal tracker to track each of said plurality of animals based on said amount of information retrieved from each said bit segment of said plurality of RFID devices implanted in said plurality of animals”

Laitinen discloses a client “*personal computer*” configured as a “terminal unit.” Laitinen, 4:5-12, 4:21-25. Laitinen further discloses that the terminal units can communicate “through a network **120**, e.g., *Internet*.” *Id.*, 4:19-20, Figure 1. The POSA would have understood that if the terminal units could communicate

over the Internet, then it would have been routine to equip them with internet browsers. Brown-Brandl, ¶178. Laitinen also discloses that animal medical and monitoring information is “brought together in the **server 400**” connected to a database. *Id.*, Figure 4, 6:58-61; *see also id.*, Figures 5-6, 4:65-5:3.

Rollins also includes a “server device **104**.” Rollins, [0041] (“The server device **104** shown in FIG. 1 can comprise a server executing one or more application programs such as a web information system application program 116.”), Figure 1. Rollins’s network can be accessed by access client devices **102a-n** that “can comprise a laptop computer or portable processing device with an **Internet browser** application, such as Microsoft Explorer, Apple Safari, and Mozilla Firefox” that “can provide network communications functionality for users operating the access client device **102a-n**.” *Id.*, [0037]; *see also id.*, [0036], [0038], [0046], [0196], [0201]. Other object management systems also included browser-based interfaces prior to September 2008. Ex. 1038, [0055], [0057]. The POSA would have considered it obvious to implement Laitinen’s system so that the network and database of tracked animal information would have been accessed by “a browser-based user interface. Brown-Brandl, ¶179; *KSR*, 550 U.S. at 416.

With respect to the claim language “enabl[ing] an animal tracker to track each of said plurality of animals based on said amount of information retrieved from each **said bit segment** of said plurality of RFID devices,” the term “said bit

segment” lacks antecedent basis. Assuming “said bit segment” could refer to certain digital information contained in the transmission from the cow’s RFID device, then this is disclosed by Laitinen. As discussed above for claims 1 and 4, Laitinen teaches that the RFID pico device sends the animal identifier as well as information about body temperature, occlusion, muscular action, metabolic level, and location. Laitinen, 3:48-53, 3:66-67. The pico device includes a microcontroller that “gathers parameter values from the [s]ensors.” *Id.*, 3:44-50. The POSA would have understood that the foregoing RFID information retrieved from the pico devices is transmitted digitally, and therefore the retrieved RFID data for each cow would comprise at least one bit segment. Brown-Brandl, ¶180. Thus, claim 15 is rendered obvious the cited art.

2. Claim 16: “further comprising providing a computer network connected to said computer”

As discussed for claim 15 (*supra* §VI.F.1), Laitinen and Rollins describe providing a computer network connected to said computer. For example, Laitinen’s terminals are connected to “a network 120, e.g. Internet” 4:19-20, Figure 1. Similarly, Rollins teaches having client devices communicate over a network such as the Internet. Rollins, [0033], [0036], [0037], [0038], [0046], [0196], [0201]. Thus, claim 16 is rendered obvious by the cited art. Brown-Brandl, ¶181.

3. Claim 17: “providing a wide area network to which said computer connects”

As described above, both Laitinen and Rollins describe use of the “Internet” as a network. The POSA would have understood the internet to be a “wide area network.” Rollins is explicit and states that the “network **106** [] can comprise the Internet” or “other suitable types of networks” including a “*wide area network*.” Rollins, [0033]. Thus, claim 17 is rendered obvious by the cited art. Brown-Brandl, ¶182.

4. Claim 18: “providing at least one client computer capable of configuration with said executable program instructions connected to said wide area network”

Laitinen discloses a client “personal computer” configured as a “terminal unit.” Laitinen, 4:5-12, 4:21-25. Laitinen further discloses that “software” for these terminal units can be “downloaded through the communications network.” *Id.*, 4:36-41. The POSA would have understood that such software comprised executable program instructions. Brown-Brandl, ¶183. Further, Laitinen teaches that the terminal units can communicate “through a network 120, e.g., Internet.” *Id.*, 4:19-20, Figure 1. The POSA would have understood that the Internet comprised a wide area network.

Similarly, Rollins discloses that its access client device can contain an “access client processor **114a** can execute computer-executable program instructions stored in the memory **112a**.” Rollins, [0034]. And as set forth above,

Rollins explicitly discloses use of a “wide area network” including the Internet.”

Thus, claim 18 is rendered obvious by the cited art. Brown-Brandl, ¶184.

5. Claim 19: “providing a palm device capable of configuration with said executable program instructions connected to said wide area network”

The POSA would have understood that a “palm device” is a type of “personal digital assistant” or “PDA.” Brown-Brandl, ¶185. Indeed, the ’515 patent’s specification does not disclose a palm device, instead disclosing “personal digital assistants.” Ex. 1001, 7:58. Rollins discloses that the client access devices **102a-n** and the client collection devices **110a-n**, both linked to the wide area network, can be “personal digital assistants.” Rollins, [0036], [0046]. To be operable, the PDA must contain software, i.e., executable program instructions. Brown-Brandl, ¶186; Rollins, [0034]). The POSA would have readily been able to configure Laitinen’s system to use a PDA. *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.”). Thus, claim 19 is rendered obvious by the cited art.

6. Claim 20: “providing a cellular telephone capable of configuration with said executable program instructions connected to said wide area network”

Rollins discloses that the client access devices **102a-n** and the client collection devices **110a-n**, both linked to the wide area network, can be “cellular

phones.” Rollins, [0036], [0046]. To be operable, the cellular phones must contain software, i.e., executable program instructions. Brown-Brandl, ¶187; *see also supra* §VI.C.3 (citing Rollins, [0034]). The POSA would have readily been able to configure Laitinen’s system to use a cellular phones. *KSR*, 550 U.S. at 416. Thus, claim 20 is rendered obvious by the cited art.

7. Claim 21: “providing a portable RFID device reader”

Portable RFID readers were widely used by September 2008 to read implanted RFID devices, and portable readers were advantageous by permitting data retrieval in any location. Brown-Brandl, ¶¶188-189. Indeed, Laitinen expressly states that in prior art systems it was known that the transmitter attached to the animal “sends the measured data to a *portable* receiver.” Laitinen, 2:2-7. Rollins also discloses a portable RFID reader in Figure 3. Rollins, [0052], [0038]. It would have been routine for the POSA to implement Laitinen’s system with a portable RFID reader. *KSR*, 550 U.S. at 416. Thus, claim 21 is rendered obvious by the cited art.

8. Claim 22: “connecting said portable RFID device reader to said client computer”

Laitinen describes the RFID reader **210** being connected to computer/terminal unit **200**. Laitinen, Figure 2, 6:5-9, 9:39. Thus, the POSA would appreciate that the disclosed portable reader could be similarly connected. Brown-Brandl, ¶190.

Rollins explains that its portable “integrated RFID reader/computer **300** can be used in conjunction with or in lieu of the combination of a separate RFID reader, such as **200**, and a separate collection client device **110a-n**.” Rollins, [0052]. RFID device **300** can, for example, send and receive data to and from a desktop personal computer (such as a collection client device **108a-n**). *Id.* It would have been routine for the POSA to implement Laitinen’s system with a portable RFID reader connected to the client computer of Laitinen, e.g., terminal 200. Brown-Brandl, ¶191; *KSR*, 550 U.S. at 416. Thus, for these reasons, and the reasons explained for claim 21 (*supra* §VI.F.7), claim 22 is rendered obvious by the cited art.

9. Claim 23: “connecting said portable RFID device reader to said wireless palm device”

Rollins discloses: (1) that PDAs are a type of client device (Rollins, [0036], [0046]), **110a-n**, (2) that the RFID reader is connected to or integrated with the client device (Rollins, Figure 1, [0038], [0047]), and (3) that the RFID reader may be portable (Rollins Figure 3, [0052]). From this the POSA would have understood that the portable RFID reader could be connected to the wireless PDA/palm client device. Brown-Brandl, ¶192; *KSR*, 550 U.S. at 416. Thus, claim 23 is rendered obvious by the cited art.

10. Claim 24: “connecting said portable RFID device reader to said cellular telephone”

The POSA would have understood that because Rollins discloses cellular phones as a type of client collection device (Rollins, [0036], [0046]; *supra* §VI.C.5), **110a-n**, and because Rollins discloses connecting its portable RFID reader with client collection devices, Rollins necessarily teaches “connecting said portable RFID device reader to said cellular telephone.” Brown-Brandl, ¶193. It would have been routine for the POSA to implement Laitinen’s system by connecting the portable RFID device reader to a cellular telephone as described by Laitinen. Brown-Brandl, ¶193; KSR, 550 U.S. at 416. Thus, claim 23 is rendered obvious by the cited art.

11. Claim 25: “reading an RFID device said RFID device part of a bolus ingested by a bovine animal”

Laitinen discloses that the pico RFID device may be “implanted.” Laitinen, 5:38-41. Using boluses as RFID implants was well known by 2008, and the art contained numerous examples of such devices. The POSA would have understood that a bolus, by definition, is implanted in a cow by ingestion, with a rumen bolus implanted in the cow’s first stomach compartment. Brown-Brandl, ¶194. Thus, the POSA would have understood Laitinen to teach using implanted RFID devices, and ingested bolus devices were very commonly used in cows as of the effective date. It would have been routine for the POSA to have implemented Laitinen’s

system with an ingested bolus RFID device. Thus, claim 25 is rendered obvious by the cited art.

VII. DISCRETIONARY DENIAL IS NOT WARRANTED

A. Section 325(b)

Institution denial based on 35 U.S.C. §325(d) is unwarranted because the arguments and evidence presented here were not previously and/or properly considered. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”), *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8, 17-18 (PTAB Dec. 15, 2017) (precedential as to §III.C.5, first paragraph) (“BD”).

1. *Advanced Bionics* Part One

Trevarthen, Laitinen, Buchanan, Liao, and Rollins were not before the Examiner during prosecution nor are they “substantially the same” as the prior art considered by the Examiner. *Advanced Bionics*, Paper 6 at 13-19. In allowing claim 1, the Examiner asserted that the cited art contained “no mention of the amount of milk production information and amount of days milked information.” Ex. 1002, 338, 404.

Renz (Ex. 1024) relates to a cattle management system but does not disclose a database that stores milk production information in its database, much less enters such information into a logical expression. Tsuyuzaki (Ex. 1025) relates to a

“semiconductor device including an IC relating ... constituted so as to generate a random number and/or probability” but does not disclose applying this technology to managing dairy cattle. Ex. 1025, [0009]. Gray (Ex. 1026) relates to a livestock electronic monitoring system, “described in the context of beef cattle,” and therefore does not address milk production information or an amount of days milked. Ex. 1026, [0012]. In contrast, Trevarthen, Laitinen, Buchanan, and Liao each disclose amount of milk production, and thus are not cumulative with the references meaningfully considered by the Examiner.

Although Brune was before the Examiner, there is no evidence in the prosecution record that it was considered meaningfully, and Brune could not have been considered part of the combinations asserted here because the remaining asserted references were not before the Examiner. *St. Jude Medical, LLC v. Snyders Heart Valve LLC*, IPR2018-00105, Paper 15 at 12 (PTAB May 3, 2018) (instituting where “evidence of record does not demonstrate that the Examiner considered the references in the combinations relied upon by Petitioner or addressed arguments similar to those Petitioner now presents”).

2. *Advanced Bionics* Part Two

The record does not suggest that the Examiner meaningfully considered Brune, which weighs against institution. *Microsoft Corporation v. SurfCast, Inc.*, IPR2022-00590, Paper 9 at 15 (PTAB Oct. 7, 2022) (instituting where cited art

“was not extensively evaluated during examination and was not the basis for a rejection”); *Amazon.com, Inc. v. M2M Sols. LLC*, IPR2019-01205, Paper 14 at 16 (PTAB Jan. 27, 2020) (“a reference that ‘was neither applied against the claims nor discussed by the Examiner does not weigh in favor of exercising the Board’s discretion under § 325(d) to deny a petition”).

There is no evidence in the record that the Examiner meaningfully considered Brune. In the continuation of the ’515 patent, U.S. Patent No. 9,844,206, the Examiner stated that “there is no mention of receiving date-time information received from the RFID device in the prior art.” Ex. 1039, 345. Brune disproves the Examiner’s conclusion. Brune, 4:1-11 (a “*date and/or time stamp data* corresponding to the *discrete point in time at which the temperature was sensed* by the bolus.”). Thus, this later prosecution history “demonstrate[s] that the Examiner erred in the evaluation of the prior art, for example, by ... overlook[ing] specific teachings [Brune] such that the error by the Office was material to the patentability of the challenged claims.” *Advanced Bionics*, Paper 6 at 21. Finally, the “date-time” limitation is only required in challenged claims 3-4, so Brune is relevant as a prior art reference for only two of fifteen challenged claims.

B. Section 314(a)

Under the Director’s Interim Procedure for Discretionary Denials (June 21, 2022) (“IP”), “the PTAB will not deny institution based on *Fintiv* if there is

compelling evidence of unpatentability” (IP, 5), which this Petition provides. That should conclude the *Fintiv* analysis. The *Fintiv* factors nonetheless favor institution based on efficiency, fairness, and patent quality. *Apple v. Fintiv*, IPR2020-00019, Paper 11 at 5 (PTAB Mar. 20, 2020) (“*Fintiv*”) (precedential).

1. Stay Potential

Petitioner plans to seek a pre-institution stay of the district court litigation, but without “specific evidence” how the court will rule, this factor is neutral. *Sand Revolution II v. Continental Intermodal Group–Trucking*, IPR2019-01393, Paper 24 at 7 (PTAB June 16, 2020) (informative).

2. Trial Timing

Because the district court has not set a trial date, Factor 2 weighs against discretionary denial. *NortonLifeLock v. Kajeet*, IPR2022-00001, Paper 20 at 9-10 (PTAB Apr. 21, 2022). Without a trial date any Factor 2 comparison is “speculative.” *NortonLifeLock* at 10; *accord Illumina v. Ravgen*, IPR2021-01271, Paper 12 at 33 (PTAB Jan. 26, 2022). The Western District of Wisconsin’s median time to trial in the year ending December 31, 2023 is 40.5 months, which would

result in a June 2027 trial.³ Institution approximately six months from Petition filing would result in an FWD by November 2025, which favors institution.

Petitioner’s diligence also weighs against discretionary denial – this Petition is filed within three months of being served the initial complaint. *Apple v. Seven Networks*, IPR2020-00156, Paper 10 at 9 n.8 (PTAB June 15, 2020); *Fintiv*, 11 n.21.

3. Litigation Investment

Petitioner filed this petition at an early stage of litigation and no substantive orders have issued, facts that have “weighed against exercising the authority to deny institution[.]” *Seven Networks*, Paper 10 at 11-12 (quoting *Fintiv*, Paper 15 at 11); *Amperex Tech. v. Maxell*, IPR2021-01442, Paper 16 at 10-11 (PTAB Apr. 12, 2022).

4. Issue Overlap

Only claim 1 was asserted in the district court complaint (Ex. 1022, ¶¶ 71-91), whereas additional claims are challenged here. Institution can enhance patent system integrity and meet Petitioner’s interest in resolving invalidity challenges on the challenged claims. *Seven Networks*, Paper 10 at 17.

³ <https://www.uscourts.gov/statistics/table/na/federal-court-management-statistics/2023/12/31-1>

5. Litigation Parties

This Petition involves the same parties as the Wisconsin case, so this factor may “depend[] on which tribunal was likely to address the challenged patent first,” which is likely the Board (*supra* §**Error! Reference source not found.**). *Google v. Parus Holdings*, IPR2020-00846, Paper 9 at 20-21 (PTAB Oct. 21, 2020).

6. Merits

The “strong showing on the merits” presented here weighs against denial. *Seven Networks*, Paper 10 at 20.

VIII. CONCLUSION

For the foregoing reasons, the Petition should be instituted and the challenged claims should be canceled.

Respectfully submitted,

Dated: May 2, 2024

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WORD COUNT CERTIFICATION

Pursuant to 37 C.F.R. §42.24(d), I certify that this Preliminary Response contains 13,942 words (excluding the title page, table of contents, table of exhibits, this certificate, and the certificate of service), as determined by Microsoft Word.

Dated: May 2, 2024

/ Blaine M. Hackman /
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CHALLENGED CLAIM LISTING

Claim 1
1[Pre] A computer implemented method of animal tracking, comprising:
1[A] connecting a computer to an RFID device reader;
1[B] reading an RFID device implanted in an animal with said RFID device reader;
1[C] retrieving an amount of animal identification information from said RFID device implanted in an animal;
1[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;
1[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;
1[F] inserting at least one of said plurality of logical variables into at least one logical expression; and
1[G] obtaining a logical value relating to said animal.
Claim 2
2[Pre] The computer implemented method of animal tracking as described in claim 1, wherein retrieving and linking comprise:
2[A] retrieving an amount of animal identification information from a plurality of RFID devices implanted in a plurality of animals; and
2[B] correspondingly linking an amount of animal information of said plurality of animals stored in said data base of said computer to said amount of

information retrieved from said plurality of RFID device.
Claim 3
The computer implemented method of animal tracking as described in claim 2, further comprising retrieving an amount of date-time information from said plurality of RFID devices implanted in said plurality of animals.
Claim 4
The computer implemented method of animal tracking as described in claim 3, further comprising retrieving an amount of sensed animal information from said plurality of RFID devices implanted in said plurality of animals.
Claim 15
The computer implemented method of animal tracking as described in claim 1, further comprising providing a server connected to said computer which provides a browser-based user interface which enables an animal tracker to track each of said plurality of animals based on said amount of information retrieved from each said bit segment of said plurality of RFID devices implanted in said plurality of animals.
Claim 16
The computer implemented method of animal tracking as described in claim 15, further comprising providing a computer network connected to said computer.
Claim 17
The computer implemented method of animal tracking as described in claim 16, further comprising providing a wide area network to which said computer connects.
Claim 18
The computer implemented method of animal tracking as described in claim 17, further comprising providing at least one client computer capable of

configuration with said executable program instructions connected to said wide area network.
Claim 19
The computer implemented method of animal tracking as described in claim 18, wherein providing at least one client computer capable of configuration with said executable program instructions connected to said wide area network comprises providing a palm device capable of configuration with said executable program instructions connected to said wide area network.
Claim 20
The computer implemented method of animal tracking as described in claim 19, wherein providing at least one client computer capable of configuration with said executable program instructions connected to said wide area network comprises providing a cellular telephone capable of configuration with said executable program instructions connected to said wide area network.
Claim 21
The computer implemented method of animal tracking as described in any one of claim 18, 19, or 20, further comprising providing a portable RFID device reader.
Claim 22
The computer implemented method of animal tracking as described in claim 21, further comprising connecting said portable RFID device reader to said client computer.
Claim 23
The computer implemented animal tracking system as described in claim 21, further comprising connecting said portable RFID device reader to said wireless palm device.

Claim 24

The computer implemented animal tracking system as described in claim 21, further comprising connecting said portable RFID device reader to said cellular telephone.

Claim 25

The computer implemented animal tracking system as described in claim 21, wherein reading an RFID device implanted in an animal with said RFID device reader comprises reading an RFID device said RFID device part of a bolus ingested by a bovine animal.

CERTIFICATE OF SERVICE

I certify that today in:

smaXtec Inc. and smaXtec Animal Care GMBH v. ST Reproductive Technologies, LLC, IPR2024-00885 (U.S. Patent 8,823,515)

I caused to be served a copy of:

Petition
Exhibits 1001-1006, 1008-1011, 1013-1039

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Patent Owner agreed to have the above-listed counsel accept electronic service of the Petition on April 30, 2024. *See* 37 CFR § 42.105(b) (“Upon agreement of the parties, service may be made electronically....”).

Dated: May 2, 2024

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