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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SMAXTEC INC. and
SMAXTEC ANIMAL CARE GMBH,
Petitioners

v.

ST REPRODUCTIVE TECHNOLOGIES, LLC,
Patent Owner

Case IPR2024-00875
Patent No. 9,844,206

**ST REPRODUCTIVE TECHNOLOGIES, LLC'S
PRELIMINARY RESPONSE**

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EXHIBIT LIST

Exhibit	Description
EX2001	Declaration of Dr. Tim Bowser
EX2002	<i>Curriculum Vitae</i> of Dr. Tim Bowser

I. INTRODUCTION

Pursuant to 35 U.S.C. §313, Patent Owner ST Reproductive Technologies, LLC (“ST Repro”) submits this Patent Owner Preliminary Response to smaXtec Inc. and smaXtec Animal Care GmbH’s (“Petitioners”) Petition for *inter partes* review (“IPR”) of claims 1-4, 6, and 17-20 of U.S. Patent No. 9,844,206 (EX1001, “the ’206 Patent”). ST Repro requests that the Board deny institution because Petitioners fail to show a reasonable likelihood of success on any of the asserted Grounds.

The ’206 Patent generally describes and claims an improved animal management system that generates logic-based health and other alerts using a novel combination of milk production information, date and time information, and sensed animal information obtained from radiofrequency identification devices implanted in animals or a plurality of animals. The integration of sensed data taken directly from an implanted device with additional data stored in a database, as claimed, allows the disclosed animal management systems to provide improved, real-time animal alerts for animal health conditions, such as whether they are ill or in heat. As Patent Owner’s expert, Dr. Timothy J. Bowser—a Biosystems and Agricultural Engineering Professor who manages livestock herds using RFID technology at Oklahoma State University—has testified, these aspects of the

claimed inventions allow for early detection and treatment of health events, which is a substantial improvement over prior art systems. *See* EX2001 (“Bowser”).

As a threshold matter, the Board can exercise its discretion to deny institution under 37 C.F.R. §42.104(b) before even reaching the merits. For a claim element common to every Challenged Claim—“enter said sensed animal information retrieved from said RFID device and said animal information stored in said database as logical variables into at least one logical expression”—Petitioners offer *two* constructions without explaining which one they believe to be correct and without providing any substantive argument as to how the Board should proceed with construing the terms. Petitioners’ decision—made presumably to preserve a non-infringement argument in district court—materially impacts the Board’s analysis, as it affects whether the Board analyzes the prior art as an express disclosure or as rendering the claim element obvious. Under 37 C.F.R. §42.104(b), the Board can and should exercise its discretion to deny institution based on Petitioners’ failure to inform the Board of how the claims should be construed.

The Board should also deny institution on the merits. First, Petitioners fail to show that Trevarthen, the base reference for Grounds 1 and 2, was accessible as an electronic reference before the priority date. Moreover, Petitioners have failed to show that either Trevarthen or Laitinen, the primary references for Grounds 3 and 4, teach or suggest multiple claim limitations. For example, neither Trevarthen

nor Laitinen disclose or render obvious a “computer readable media containing program instructions executable to” perform the specific “instructions” recited in the Challenged Claims. In fact, Petitioners all but ignore this element in their grounds. In addition, neither reference discloses or renders obvious entering “an amount of milk production or a number of days in milk” into a “logical expression” as required in every claim challenged in Grounds 1 and 3. And Petitioners fail to identify any disclosure in Laitinen of “an RFID device implanted in an animal” that senses the identified animal information, as recited in all but two of the 24 claims in the ’206 Patent.

In short, the Board should deny institution on all stated grounds because Petitioners fail to identify how the claims should be construed, because Trevvarthen was not shown to be prior art, and because Petitioners fail to show a reasonable likelihood of success on any of the grounds.

II. BACKGROUND

A. The ’206 Patent

The ’206 Patent—titled “Computer Implemented Animal Management System”—issued on December 19, 2017 and claims priority to a provisional application filed on September 15, 2009. EX1001. The ’206 Patent describes and claims computer implemented animal management systems with specific “program instructions executable to” retrieve “sensed animal information” from a

radiofrequency identification (“RFID”) device implanted inside of an animal. *See, e.g.*, EX1001, claims 1 and 17; Bowser, ¶¶26-33. After being retrieved, the sensed animal information, such as temperature, is integrated into a “logical expression” along with additional information stored in a database, such as “an amount of milk production or a number of days in milk.” *Id.* The equation is then “solved” to provide alerts to farmers that are specific to the animals in their herds, including alerts that signal when a cow is ill. *See, e.g.*, EX1001, 14:4-63; Fig. 4; 3:52-57, 14:64-15:22; claims 1, 4; Bowser, ¶¶30-31. Overall, the claimed inventions allow farmers to track the status of their herd in real-time, which is particularly useful in the livestock industry. Bowser, ¶¶30-31.

Contrary to Petitioners’ suggestion, the disclosed animal management systems contain unconventional components and are arranged in unconventional ways. *See, e.g.*, EX1001, 2:30-33 (“[A] broad object of the invention is to provide an inventive RFID implantable in an RFID object such as an animal or other asset and a RFID reader which can retrieve RFID information from the implanted RFID[.]”). Petitioners’ “conventional” argument improperly relies on cherrypicked language from the background of the patent. *See* Petition (“Pet.”), 3. The patent, however, never suggests that the claimed devices are conventional. Rather, the background describes *prior art* devices and their “significant problem[s]” and further explains that the disclosed inventions solve those problems. EX1001, 1:25-

2:19 (describing prior art devices and its problems), 2:20-26 (explaining that “[t]he inventive computer implemented animal management system described herein addresses each of these problems”); Bowser, ¶¶32-33.

That the claimed systems are not simply off-the-shelf devices, as Petitioners suggest, but are specifically configured to function as part of a novel animal management system, is most easily demonstrated by the fact that none of the prior art devices identified in the Petition disclose a system configured as claimed. Indeed, Petitioners do not contend that any prior art anticipates the Challenged Claims. Instead, Petitioners rely on mixing and matching disclosures of disparate case studies and a theoretical system in a 169-page student thesis (“Trevarthen”) and a global surveillance system lacking any disclosure of an integrated, animal tracking system (“Laitinen”).

B. The Challenged Claims

Petitioners challenge claims 1-4, 6, and 17-20, among which claims 1 and 17 are independent. Claim 1 is reproduced below, with the shorthand identifier for each claim element listed in the left column:

1[Pre]	1. A computer implemented animal management system, comprising:
1[A]	a processor communicatively coupled to a non-transitory computer readable media containing program instructions executable to:
1[B]	retrieve animal identification information from an RFID device;

1[C]	retrieve sensed animal information from said RFID device, said sensed animal information generated by a sensor coupled to said RFID device;
1[D]	match said sensed animal information retrieved from said RFID device to animal information of said animal stored in a database including an amount of milk production or a number of days in milk;
1[E]	enter said sensed animal information retrieved from said RFID device and said animal information stored in said database as logical variables into at least one logical expression; and
1[F]	solve said at least one logical expression to obtain a corresponding at least one logical value.

Challenged claims 2-4 and 6 depend from claim 1.

The other independent claim, claim 17, is reproduced below:

17[Pre]	17. A computer implemented animal management system, comprising:
17[A]	a processor communicatively coupled to a non-transitory computer readable media containing program instructions executable to:
17[B]	retrieve animal identification information from an RFID device implanted in an animal;
17[C]	retrieve sensed animal information from said RFID device;
17[D]	retrieve date-time information from said RFID device;
17[E]	match said sensed animal information retrieved from said RFID device to animal information stored in a database;

17[F]	enter said sensed animal information retrieved from said RFID device and said animal information stored in said database as logical variables into at least one logical expression; and
17[G]	solve said at least one logical expression to obtain a corresponding at least one logical value.

Challenged claims 18-20 depend from claim 17.

C. Asserted Art

1. Trevarthen

Trevarthen (EX1005, “Trevarthen”) is an undergraduate thesis paper purportedly submitted by Adam Trevarthen “in fulfilment of the requirements for the award of the degree Bachelor of Information and Communiication [sic] Technology” at the University of Wollongong in Australia. Trevarthen, Abstract (“Publication Details”). Petitioners contend that Trevarthen alone renders obvious claims 1-4 and 6 (Ground 1) and that Trevarthen in combination with Brune renders obvious claims 17-20 (Ground 2). As explained in Section VI below, the Petition fails to establish that Trevarthen is prior art to the ’206 Patent.

Trevarthen purports to provide a theoretical framework for the use of RFID technology in the future. To this end, Trevarthen “investigates” two existing dairy farms in Australia that employ RFID technology, and then uses the two farms as case studies for proposing a “theoretical” or “ideal framework” for future use of RFID technology. Trevarthen, Abstract, ix; *see also id.*, Chapter 4 (describing the

Strong Dairy Farm); Chapter 5 (describing the Cochrane Dairy Farm). At most, Trevarthen speculates that the theoretical framework “may be considered a possible long term goal for dairy farm management practices” and “may also serve to provide possible direction for future research into this field.” Trevarthen, 40. Petitioners’ Trevarthen-based grounds are based on a combination of aspects of the two case studies and Trevarthen’s theoretical and highly speculative framework. *See* Bowser, ¶¶40-45.

Trevarthen’s theoretical framework is aspirational in nature and does not disclose a single cohesive computer implemented animal management system, let alone one arranged as claimed in the ’206 Patent. Instead, Trevarthen discusses various “[p]ossible enhancements and future developments” that “dairy farmers should investigate.” Trevarthen, ix. For several claim elements, Petitioners rely heavily on possible enhancements that were not incorporated into any actual or proposed RFID-based management system. For example, Petitioners rely on Trevarthen’s discussion of the potential use of “milk meters” in combination with “automated feed bins” to suggest that integrating milk production information with sensed animal data acquired from an RFID device would have been obvious. However, Trevarthen explicitly states that such combination is “[b]eyond their current abilities” and never discusses the integration (or potential integration) of such data. *See* Trevarthen, 109; Bowser, ¶¶44-45. Combining disparate elements

of the lengthy Trevarthen in this manner is a common theme in the Petition, as further addressed below. *See* Sections VII.B-C.

2. *Laitinen*

Laitinen (EX1006, “Laitinen”) is a U.S. Patent titled “Surveillance System for Animals.” Petitioners contend that Laitinen in combination with Buchanan and Liao renders obvious claims 1-4 and 6 (Ground 3) and that Laitinen in combination with Brune renders obvious claims 17-20 (Ground 4).

Laitinen discloses a “surveillance system” intended to allow governments and other interest groups to monitor multiple groups of animals at a “global level.” Laitinen, Abstract; Bowser, ¶¶46-58. Laitinen’s surveillance system operates on a “basic principle” that requires “three technology levels,” namely the “local, global and pico level[s].” Laitinen, 3:21-27. Laitinen disparages systems that employ a different basic principle. For example, Laitinen explains that “[o]ne of the downsides of [certain prior systems] is their locality, that is to say, the fact that they offer surveillance and other information only locally, within a certain environment (e.g. one producer) and with regard to a certain purpose.” *Id.*, 2:9-12. According to Laitinen, “[p]racticing animal husbandry always necessitates the interaction of different reference groups with differing interests as far as the size of the group to be controlled and the desired measures are concerned.” *Id.*, 2:13-17. Laitinen further disparages such systems for requiring authorities and specialists to “go

physically to the farm in question” in order to control a particular farm or its animals. *Id.*, 2:17-22. Laitinen thus “aims to create a new kind of a surveillance system which is not hampered by the before-mentioned flaws.” *Id.*, 2:23-27.

As noted above, Laitinen’s surveillance system requires three levels, the lowest of which is the “pico level.” The “pico level” system includes a device used “directly with the animals.” Laitinen, 3:28-29. Laitinen further identifies two distinct pico level devices, one that is “external” and one that is “implanted inside the animal’s tissue (100b).” *Id.*, 5:38-43. The “external device” in Laitinen purportedly can “measure the animal’s body temperature (with a temperature [s]ensor) or movements (various motion [s]ensors, such as acceleration [s]ensors), or determine the animal’s location.” *Id.*, 5:44-49. However, Laitinen fails to further explain how the “body temperature” or “movement” are measured, nor does it identify specific devices capable of doing so. Bowser, ¶¶53-56. Petitioners emphasize one particular use of the external device, namely in a “heat control” application in which a “[c]ensor” purportedly measures “body temperature and movement” and triggers an alarm at the pico level when preset “alarm limit(s) have been reached.” Laitinen, 8:5-15; *see* Pet., 48 (“A cow’s temperature and movement are used as the input variables, and the [alleged] expression determines whether ‘alarm limit(s) have been reached.’”) (quoting Laitinen, 8:13-15); *see also* Laitinen, 5:60-64 (purporting that the “external device” can “signal[] an optical or

audio alarm” if “the set alarm limit” is reached). But Laitinen does not provide examples of an alarm triggered by entering variables into and solving a logical expression. Bowser, ¶¶54-55.

The “implanted” or “internal” device mentioned in Laitinen does not have the same capabilities or functions as the external device. In particular, Laitinen’s internal device does not measure temperature or movement. Laitinen, 3:51-62, 5:38-43, 5:50-6:4, Fig. 2; Bowser, ¶¶53-56. Nor does Laitinen describe it as featuring any “alarm limit.” *Id.* Rather, Laitinen’s internal device enables “the use of an EKG analysis for the surveillance of the animal’s heart rate or an EMG (Electromyography) conveying its muscular tension or level of fatigue,” as well as “the use of optical [s]ensors for the measuring of oxygen saturation, for instance.” Laitinen, 5:50-55. The limited uses of Laitinen’s internal device would allow it to “use[] very little power (about 1 mW).” *Id.*, 58-60; Bowser, ¶55. Notably, Laitinen does not describe any particular embodiment or application that employs the internal device. Bowser, ¶¶55-56.

Laitinen further describes a “local” and “global” level. The global level is the crux of the disclosure and permits the “surveillance” of multiple farms. Bowser, ¶47. Laitinen disparages systems without a global surveillance capability because they limit remote monitoring to a single farm and require authorities and specialists to physically go to a farm to exercise any level of control over it. *Id.*,

2:9-22. Laitinen states that its “new kind of a surveillance system” is not hampered by such “flaws.” *Id.*, 2:23-27.

3. *Brune*

Petitioners rely on U.S. Patent No. 6,059,733 (EX1008, “Brune”), which relates to “a method of monitoring the core body temperature of an animal.” Brune, 1:13-15. Brune’s goal was to determine a “physiological state” of an animal, based only on its temperature. *Id.*, Abstract, 1:63-2:16. Petitioners use Brune in combination with Trevarthen and Laitinen in Grounds 2 and 4 primarily for Brune’s alleged disclosure of a single element in claim 17, namely “retrieving an amount of date-time information from said plurality of RFID devices implanted in said plurality of animals.” Pet., 31-33, 57-58. As explained below, Petitioners fail to explain how Brune addresses the various other missing elements and other deficiencies in the primary asserted references, Trevarthen and Laitinen.

4. *Liao and Buchanan*

Petitioners rely on PCT Publications WO 2007/089184 (EX1010, “Liao”) and WO 2006/059916 (EX1011, “Buchanan”) in combination with Laitinen in Ground 3 primarily for their alleged disclosures of “milk production or a number of days in milk,” which are missing from Laitinen. *See* claim element 1[D]. As explained below, however, there would have been no reason to combine either of these references with Laitinen to achieve the claimed invention. Moreover, with

respect to Buchanan specifically, Petitioners fail to even allege that a POSA would have or could have incorporated any milk-related information from Buchanan into a “logical expression,” as required by the claim element 1[E]. *See* Pet., 47-51 (addressing claim element 1[E] without mentioning Buchanan).

III. PERSON OF ORDINARY SKILL IN THE ART

Petitioners propose that “[t]he person of ordinary skill in the art (‘POSA’) as of the claimed priority date would have had at least a bachelor’s degree in animal science, biological engineering, electrical engineering, or computer science, or a related or equivalent field, and three or more years of experience researching, developing, designing and/or evaluating RFID tracking and sensor systems for livestock management.” Pet., 6. Solely for purposes of this Paper, ST Repro applies Petitioners’ proposal. *See also* Bowser, ¶¶16-19.

IV. CLAIM CONSTRUCTION

In *inter partes* review proceedings, claim terms are given their “ordinary and customary” meanings from the perspective of a person of ordinary skill in the art and in view of the intrinsic record. *See* 37 C.F.R. §42.100(b). Petitioners have not asked for any special constructions for any claim terms. Nor have they argued that the patentees have defined any terms. For this stage of the proceedings, ST Repro does not believe that any claim term or phrase requires a construction. *See also* Bowser, ¶¶20-22.

V. THE PETITION SHOULD BE DENIED FOR FAILING TO COMPLY WITH 37 C.F.R. §§42.104(b)(3)-(4)

Under 37 C.F.R. §42.104(b), every petition must identify “[h]ow the challenged claim is to be construed” and “[h]ow the construed claim is unpatentable.” 37 C.F.R. §42.104(b)(3)-(4) (emphasis added). Petitioners fail to do so, and institution should be denied on that basis. Specifically, Petitioners offer two constructions for claim element 1[E]—which is an element common to every claim in the ’206 Patent—without explaining why the Court should adopt either one, presumably to keep their options open in the related district court litigation. *See also, e.g.*, claim element 17[F]. Petitioners contend that “enter said sensed animal information retrieved from said RFID device and said animal information stored in said database as logical variables into at least one logical expression” could mean either: (1) that “sensed and stored animal information [may] be entered into *separate* logical expression[s]” or (2) that “*both* sensed temperature and stored milk production information [must] be entered as logical variables into the *same* logical expression.” Pet., 17 (emphases in original). Petitioners, however, do not inform the Board which of the two constructions they believe to be correct, nor do they provide any substantive argument as to how the Board should proceed with construing the terms.

Importantly, this is not a distinction without a difference, because it affects whether and how the Board needs to analyze the prior art, particularly in Ground 1.

There, Petitioners contend that Trevarthen expressly discloses the claim element under their first construction. Pet., 17-19. Under Petitioners' second construction, Petitioners ask the Board to analyze a combination of prior art under the obviousness standard. *Id.*, 19-22. As explained in Section VII below, this is a clear failure by Petitioners to provide the requisite particularity the Board requires to assess whether or not the Petition should be instated and is an independent reason to deny the Petition. See 37 C.F.R. §42.104(b)(3)-(4); *TCL Commc'n Tech. Holdings Ltd. et al v. DataQuill Ltd.*, IPR2020-00745, Paper 21 at 16-17 (P.T.A.B. Sep. 18, 2020); *Infinera Corporation v. Core Optical Technologies, LLC*, IPR2018-01259, Paper 13 at 5 (P.T.A.B. Jul. 11, 2019).

VI. PETITIONERS CANNOT SUCCEED ON GROUNDS 1 OR 2 BECAUSE THEY FAIL TO ESTABLISH THAT TREVARTHEN IS A PRINTED PUBLICATION

As a threshold matter, the Board should deny institution of both Grounds 1 and 2 because Petitioners fail to show that the primary reference, an electronic copy of an undergraduate thesis by Trevarthen, qualifies as prior art. Petitioners specifically contend that Trevarthen was available on the University of Wollongong's "Research Online" repository prior to the critical date of the '206 Patent and was locatable "by keyword searching internet search engines." Pet., 7-9. Yet Petitioners' only evidence that Trevarthen was sufficiently indexed on a commercial search engine such that a person of skill in the art would have located

it with reasonable diligence is inadmissible hearsay. Even so, Patent Owner's expert Dr. Bowser's unsuccessful attempts to replicate such "keyword searching" directly contradicts that hearsay, as Dr. Bowser was unable to locate Trevarthen with a keyword search on Google prior to the critical date. As further explained below, Petitioners ultimately fail to provide any evidence or argument as to how or why a person of skill would have found Trevarthen before the critical date, and thus fail to establish that Trevarthen qualifies as prior art. Grounds 1 and 2 should therefore be denied at the outset.

A. Legal Standard for Establishing Public Accessibility

For an electronic reference to qualify as prior art, the reference must be "publicly accessible" before the critical date of the challenged patent. *Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 772 (Fed. Cir. 2018). Public accessibility requires that the reference is "meaningfully indexed" such that it is locatable by a person of ordinary skill in the art exercising reasonable diligence. *Id.* at 772-73; *see also Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1349-50 (Fed. Cir. 2016) (finding electronic reference not publicly accessible where there was no evidence that a query of a search engine would have led to the reference).

Critically, public accessibility of an electronic reference requires more than technical accessibility. *Acceleration Bay*, 908 F.3d at 773. Mere existence of the

reference on the Internet is not sufficient. *See, e.g., id.* (finding article available on university technical library website not publicly accessible); *Blue Calypso*, 815 F.3d at 1349 (finding graduate student report available on personal webpage not publicly accessible); *First Solar Inc. v. Rovshan Sade*, IPR2023-00827, Paper 13 at 18-19 (P.T.A.B. Nov. 16, 2023) (finding installation guide available on company website not publicly accessible). Ultimately, the petitioner bears the burden of establishing that an electronic reference constitutes prior art at all times. *See Acceleration Bay*, 908 F.3d at 772; *see also Blue Calypso*, 815 F.3d at 1350 (“[Petitioner] argues that an internet search engine would have been able to locate the report. But that argument does not allow us to automatically infer that [the] webpage was ‘indexed . . . (through search engines or otherwise)’ and thus locatable by a search engine.”); *see also* *Bowser*, ¶25.

B. Petitioners Fail to Show That Trevarthen was Publicly Accessible Before September 15, 2008

Petitioners fail to show that Trevarthen, the primary reference for Grounds 1 and 2, was publicly accessible before the critical date of the '206 Patent. Trevarthen is an undergraduate thesis by student Adam Trevarthen entitled “The Importance of Utilising Electronic Identification for Total Farm Management: A Case Study of Dairy Farms on the South Coast of NSW.” Trevarthen, i. Petitioners only allege that an online copy of Trevarthen was publicly available and accessible via an Internet search before September 15, 2008—the critical date of

the '206 Patent. *See* Pet., 7-9. Petitioners make no mention of whether an interested party would have found Trevarthen using the University of Wollongong's Research Online repository. Yet nearly all of Petitioners' evidence simply goes to whether or not an electronic copy of Trevarthen technically existed in the Research Online repository. Without any evidence or explanation as to how an interested party would have located Trevarthen with reasonable diligence, Petitioners demonstrate no more than technical accessibility, which does not qualify Trevarthen as prior art. Thus, Petitioners fail to meet their burden in showing that Trevarthen qualifies as a prior art electronic reference.

1. *Petitioners Fail to Demonstrate How a Person of Skill Exercising Reasonable Diligence Would Locate Trevarthen*

Petitioners do not provide any evidence as to how Trevarthen was indexed by a search engine, let alone how Trevarthen was *meaningfully indexed* such that a POSA would find it with reasonable diligence. Petitioners attempt to rely on a declaration from June Munford ("the Munford Declaration") (EX1031), a United States-based library scientist, who concludes that because Trevarthen was available on Research Online prior to September 15, 2008, it therefore would have been locatable to interested parties by keyword searching on a search engine. EX1031, 4, 8-9. But the Munford Declaration critically fails to connect the dots as to how a POSA would have located Trevarthen with reasonable diligence.

The Munford Declaration’s conclusory assertion that Trevarthen “would have been located and indexed by Google” is without evidentiary support. Ms. Munford, who has no experience with or personal knowledge regarding the University of Wollongong or its Research Online repository, relies only on inadmissible hearsay from the University’s repository practices that a digital copy from Research Online is “available” via a search engine. EX1031, 6-8 (citing EX1031, Appendix IA01); *see also* Bowser, ¶81. Ms. Munford did not conduct any keyword searches, identify any search terms that successfully located Trevarthen, or otherwise verify that Trevarthen would have been “available” on a commercial search engine prior to September 15, 2008. Without any additional expertise or personal knowledge regarding a keyword search or the University of Wollongong’s practices for the Research Online repository, Ms. Munford’s declaration cannot carry Petitioners’ burden to prove that Trevarthen was sufficiently indexed and therefore locatable by a POSA. *See MHL Custom, Inc. v. Waydoo USA, Inc.*, No. CV 21-0091-RGA, 2023 WL 5748755, at *4 (D. Del. Sept. 6, 2023) (noting that expert testimony regarding availability on Google only supports technical accessibility where expert did not perform a Google search and did not know what a sufficient Google search would have been); *see also* Bowser, ¶83.

In contrast to Ms. Munford, Patent Owner’s expert Dr. Bowser *did* attempt to recreate a search on Google, but could not locate Trevarthen. Bowser, ¶¶60-80; *see also* EX1003, 40. Dr. Bowser performed a Google search, limiting the date range to before September 15, 2008, of “terms found in the full text of Trevarthen,” as Ms. Munford suggests a POSA would have done. Bowser, ¶¶64-75, 83; EX1031, 8. Based on this searching, the various combinations of search terms either returned very few results—none of which were Trevarthen—or returned tens of thousands or tens of millions of results. Bowser, ¶¶68, 75. Even adding “Trevarthen” to the various combinations of terms did not populate the Trevarthen thesis as a result on Google. Bowser, ¶¶69-74. Dr. Bowser’s inability to locate Trevarthen on Google prior to September 15, 2008, as Petitioners’ claim a POSA would have done, illustrates that Trevarthen was not locatable before the critical date by a POSA exercising reasonable diligence.

Finally, Petitioners do not even allege that a POSA would have found Trevarthen using the Research Online tool. Petitioners make no showing as to any indexing or searching capabilities of Research Online, nor do they address whether a POSA would have been “independently aware” of Research Online. *Kingston Tech. Co., Inc. v. Memory Techs., LLC*, IPR2019-00654, Paper 9 at 21-22 (“[C]onspicuously absent is Petitioner’s explanation of how an interested and ordinarily skilled person would have arrive at the homepage of [the reference’s]

website.”); *see also* Bowser, ¶¶82, 85-86. Petitioners’ failure to even suggest that a POSA would have used the Research Online tool necessarily limits Petitioners to their sole argument that Trevarthen was locatable via keyword searching on the Internet, which as discussed above, Petitioners failed to demonstrate. Petitioners have thus failed to establish that Trevarthen was publicly accessible.

2. *Petitioners Improperly Conflate Technical Accessibility with Public Accessibility*

Petitioners’ purported evidence demonstrates no more than technical accessibility of Trevarthen, which critically is not the same as public accessibility. *Acceleration Bay*, 908 F.3d at 773. Petitioners submit archived copies of Trevarthen on the Research Online repository sourced from the Internet Archive’s Wayback Machine (EX1030, Exs. A-B) and a citation in an International Search Report conducted for a New Zealand-based international patent application (EXS1028-29)—each of which independently and together fail to establish that Trevarthen was locatable by a POSA exercising reasonable diligence.

a) *Wayback Machines Archives Only Demonstrate Technical Accessibility*

Petitioners summarily conclude that the Wayback Machine records of Trevarthen on Research Online “confirms the public accessibility [of] the Trevarthen thesis,” but such evidence only confirms that Trevarthen technically existed on Research Online. Petitioners attempt to rely on a supporting affidavit

from Nathaniel E. Frank-White (“the White Affidavit”) (EX1030), a Records Request Processor at the Internet Archive, who confirmed that he located archives of Trevarthen on Research Online from September 2007 and March 2008 by searching the URL for the Research Online copy of Trevarthen on the Wayback Machine. EX1030, 1, Exs. A-B. But as explained above, Trevarthen’s existence on Research Online fails to show how a POSA would have found Trevarthen in the first place. The Wayback Machine archives thus only serve to establish that Trevarthen was technically accessible, *i.e.*, that the reference existed on the Internet, not that it was publicly accessible. *See Samsung Elecs.*, 929 F.3d at 1369.

The Board has also recently rejected this same offer of proof, including a nearly verbatim affidavit from the same Mr. White, for failing to establish public accessibility in *First Solar Inc. v. Rovshan Sade*. IPR2023-00827, Paper 13 (denying institution where petitioner failed to show publicly accessibility). Specifically, the Board determined that the ability to locate an archived reference on the Wayback Machine only established that the Wayback Machine is searchable by URL. *Id.* at 18. Such evidence failed to show whether “a query of a search engine before the critical date, using any combination of search words, [] would have led to [the reference] appearing in the search results.” *Id.* Similarly here, the Wayback Machine archives and White Affidavit are not evidence that an interested person would either be independently aware of Trevarthen’s URL or that a query of

a search engine would have produced Trevarthen in the search results. Without such evidence, Petitioners' demonstration of technical accessibility has no bearing on Trevarthen's alleged public accessibility.

Petitioners also attempt to equate downloads of Trevarthen to public accessibility, which once again confuses technical accessibility for public accessibility. *See, e.g., MHL Custom*, 2023 WL 5748755, at *3-4 (finding sufficient evidence to support jury finding of no public accessibility despite downloads of reference prior to critical date). The Petition provides no evidence regarding how many unique individuals downloaded the reference, who those individuals are, or whether the download count is even reliable. Indeed, all downloads could have been initiated by the author, his friends and family, or his faculty advisors. *Bowser*, ¶84. Any alleged downloads of Trevarthen, without any evidence of how an interested person would find Trevarthen, cannot meet Petitioners burden in showing public accessibility.

b) The International Search Report Has No Bearing on a POSA's Reasonable Search

Petitioners' final attempt to "corroborate[]" public accessibility with a single citation in an International Search Report fails for the same reasons. Petitioners submit an International Search Report, conducted by the Australian Patent Office on behalf of a New Zealand applicant, to "confirm" that a POSA "searching publicly available databases using keywords" would have found Trevarthen. Pet.,

9; EXS1028-29. Yet as Dr. Bowser’s own searching shows, Petitioners’ conclusory assertion that a POSA would have located Trevvarthen via an internet search engine is inaccurate. Bowser, ¶¶60-80, 87. Petitioners thus cannot “corroborate[]” what they failed to establish in the first instance.

Even so, the International Search Report cannot overcome Dr. Bowser’s demonstration that a POSA would not have located Trevvarthen as Petitioners suggest. The Australian Patent Office examiner seemingly consulted several databases, including the “internet,” but the search report does not specify which database or search terms, if any, actually led the examiner to Trevvarthen. *See* EX1028, 1. Petitioners provide no evidence or argument that a POSA would look to any resource other than an “internet search engine,” nor do they address whether an Australian examiner’s ability to locate a reference from an Australian university stems from personal knowledge that a POSA would not have. *See* Bowser, ¶¶88-90. Petitioners thus fail to demonstrate with any certainty that the examiner located Trevvarthen by “searching publicly available databases using keywords.” Instead, in direct contradiction to Petitioners’ alleged evidence, Dr. Bowser followed the steps Petitioners suggested a POSA would take and could not find Trevvarthen. Bowser, ¶¶60-80. Petitioners therefore fail to establish that Trevvarthen was publicly accessible prior to the critical date, and Grounds 1 and 2 should be denied.

VII. PETITIONERS FAIL TO SHOW A REASONABLE LIKELIHOOD THAT ANY CHALLENGED CLAIM IS UNPATENTABLE

As explained above, the Petition should be denied because it fails to comply with 37 C.F.R. §§42.104(b) and fails to establish the Trevarthen reference is prior art. But even if the Board does not deny institution on those bases, it should nonetheless deny institution under 35 U.S.C. §314(a) because Petitioners fail to show that there is a reasonable likelihood that they will prevail on any of their stated Grounds. For each Ground, Petitioners fail to explain how the prior art discloses—or why and how references would be combined or modified to disclose—each element of each challenged claim. Moreover, to the extent the Board finds that there is a reasonable likelihood of success on the merits as to only a subset of claims, it should exercise its discretion to deny institution, as it regularly does in such cases.

A. Legal Standards

1. *Standard for Instituting Inter Partes Review*

Petitioners bear the burden of showing that there is a “reasonable likelihood” that they will prevail in their challenge for each challenged claim. 35 U.S.C. §314(a); 37 C.F.R. §42.108(c). As the Board has explained, “any petition for *inter partes* review must ‘identif[y] . . . with particularity . . . the grounds on which the challenge to each claim is based.’” *Hopkins Mfg. Corp. v. Cequent Performance Prods., Inc.*, IPR2015-00616, Paper 9 at 7 (P.T.A.B. Aug. 17, 2015) (quoting 35

U.S.C. §312(a)(3)); *Intelligent Bio-Systems, Inc. v. Illumina Cambridge, Ltd.*, 821 F.3d 1359, 1362 (Fed. Cir. 2016) (stressing that “[i]t is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim’”) (quoting 35 U.S.C. §312(a)(3)). Petitioners “have the burden of proof to establish that it is entitled to the requested relief.” 37 C.F.R. §42.20(c).

Under this framework, the Board “address[es] only the basis, rationale, and reasoning put forth by the Petitioners in the Petition, and resolve[s] all vagueness and ambiguity in Petitioners’ arguments against Petitioners.” *Hopkins*, IPR2015-00616, Paper 9 at 7. Furthermore, “[t]he petition must include a detailed explanation of the significance of the evidence” and it “must specify where each element of the claim is found in the prior art patents or printed publications relied upon.” *Id.* (citing 37 C.F.R. §§42.22(a)(2), 42.104(b)(4)). Thus, “[i]t is Petitioners’ responsibility to explain specific evidence that support[s] its arguments, not the Board’s responsibility to search the record and piece together what may support Petitioner’s arguments.” *Id.* at 9 (quotes omitted).

Petitions that fail to comply with these requirements must be denied institution by the Board. For example, in *Plant Science, Inc. v. The Andersons, Inc.*, the Board correctly denied institution because “the Petition (1) [did] not specify

sufficiently where each element of the claims [was] found in the applied references, and (2) [did] not include a detailed explanation of the significance of the evidence.” IPR2014-00941, Paper 9 at 15-16. And in *Hopkins*, the Board denied institution because the petition lacked a detailed explanation of the significance of the evidence and specificity as to the disclosure of each element. IPR2015-00616, Paper 9 at 7 (noting that the Board may “exclude or give no weight to the evidence where a party has failed to state its relevance or to identify specific portions of the evidence that support the challenge”).

The Petition here suffers from the same fatal flaws as the petitions in *Plant Science* and *Hopkins*. For several elements of each challenged claim, Petitioners fail to explain how or why the references disclose the element or would be combined or modified to do so. For these and other reasons explained in detail below, Petitioners have failed to show that there is a reasonable likelihood that it can prevail in its unpatentability challenges.

Moreover, the Board regularly denies institution where petitioners show a reasonable likelihood of success as to only a small subset of challenged claims. *See, e.g., Microsoft Corp. v. Uniloc 2017 LLC*, IPR2019-00843, Paper 7 at 10-11 (P.T.A.B. Oct. 1, 2019); *Salem Fabrication Techs. Grp., Inc. v. Uniglass Eng’g Oy*, IPR2022-01517, Paper 9 at 23-24 (P.T.A.B. Mar. 22, 2023) (citing *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018)). In *Microsoft*, for example, the Board denied

institution where the petitioner “demonstrate[d] a reasonable likelihood of prevailing on at most one claim out of five challenged claims” because instituting a trial with respect to all five claims “would not be an efficient use of the Board’s time and resources.” IPR2019-00843, Paper 7 at 10-11. Accordingly, even if the Board finds that Petitioners established a reasonable likelihood of success as to a subset of the claims, it should nonetheless exercise its discretion and deny institution.

2. *Standard for Obviousness*

“A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. §103(a). But a patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007); *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552 (Fed. Cir. 1983). Rather, in addition to showing that “all claimed limitations are disclosed in the prior art,” Petitioners need to also establish a “reason to combine the teaching of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success from doing so.” *PAR Pharm., Inc. v. TWi*

Pharms., Inc., 773 F.3d 1186, 1193-94 (Fed. Cir. 2014) (quotes omitted). The reason to combine and reasonable expectation of success must be supported by evidence, not conclusory statements. *KSR*, 550 U.S. at 418; *see also* Bowser, ¶¶23-24.

B. Ground 1 — Petitioners Fail to Show That Trevarthen Alone Renders Obvious Claims 1-4 and 6

As explained in Section VI, Ground 1 fails because Petitioners fail to provide sufficient evidence to establish that Trevarthen is prior art. But even if the Board does not reject Ground 1 on that basis, Petitioners nonetheless fail to establish a reasonable likelihood of prevailing on Ground 1 because they do not establish that Trevarthen renders obvious any of the challenged claims.

1. *Element 1[A]: Petitioners Fail to Identify “a Processor Communicatively Coupled to a Non-Transitory Computer Readable Media Containing Program Instructions Executable to” as Claimed*

The Board should deny institution because Petitioners have not pointed to any disclosure in Trevarthen describing or suggesting “a non-transitory computer readable media containing program instructions,” as recited in every challenged claim. *See* 37 C.F.R. §42.104(b)(4) (requiring petitioners to “specify where each element of the claim is found in the prior art”). Instead, Petitioners make the conclusory argument that a POSA would have understood that Trevarthen’s references to “software” and “computer” meet that element, without any actual

support. Pet., 12. At most, Petitioners cite to their expert's declaration at paragraphs 90-91 without any explanation or argument of what those paragraphs contain. That alone is a reason to deny institution on this ground. *Metall Zug AG v. Carl Zeiss Meditec AG*, IPR2020-00911, Paper 8 at 20-22 (denying institution where petitioner cited to expert declaration without explanation because doing so "fail[ed] to satisfy Petitioner's burden of showing with particularity why the patent it challenges is unpatentable"); *see also Hopkins*, IPR2015-00616, Paper 9 at 7 (emphasizing that "[t]he petition must include a detailed explanation of the significance of the evidence") (citing 37 C.F.R. §42.22(a)(2)). But even if it is considered, the testimony in those paragraphs does not support institution. *Bowser*, ¶¶91-98.

As the Board has previously held, claims like the ones here—reciting specific "instructions" stored in a computer's memory and executable by a processor—require petitioners to show that *each* of the recited instructions are stored in or executable by the computer or processor that they identify. For example, in *AOL Inc. v. Coho Licensing LLC*, the Board denied institution on claims reciting "a first memory and a first processor" and "a first set of instructions stored in the first memory," where instructions included "dividing a task into a plurality of task portions." IPR2014-00966, Paper 6 at 3-4, 14 (P.T.A.B. Nov. 20, 2014). With respect to "a first memory and a first processor," the petitioners

identified a “top-level application computer” that they contended “necessarily includes instructions stored in memory.” *Id.*, 8-9. Their expert further opined that “all disclosed operations necessarily require instructions stored in memory to be executed by a processor.” *Id.*, 9. As the Board succinctly stated, “[t]his is not enough.” *Id.* Beyond simply identifying a computer and memory, the petitioners were required to show that “all of the recited sets of instructions are stored in the specific memories recited in claim 1.” *Id.*, 9-10. The petitioners failed to do that in *AOL*, so institution was denied.

Based on reasoning similar to *AOL*’s, the Board in *Garmin* determined that a petitioner failed to identify a “microprocessor” capable of executing the specifically claimed processing instructions. *See Garmin Int’l, Inc. v. LoganTree, LP*, IPR2018-00565, Paper 24 at 25-27 (P.T.A.B. Aug. 28, 2019). In *Garmin*, the claims required “a microprocessor ... capable of receiving, interpreting, storing and responding to [] movement data.” *Id.*, 5-6, 24. The petitioner identified “microprocessor 123” in its Richardson reference as the claimed “microprocessor.” *Id.*, 25. Fatal to the petition, however, was its failure to “assert that Richardson inherently disclose[d] [or rendered obvious] that microprocessor 123” executed instructions for “interpreting or responding to movement data” as claimed. *Id.*, 25-26 (rejecting that Richardson expressly disclosed such instructions). Rather, the petitioner “simply assume[d], without support, that microprocessor 123 executes

these processes.” *Id.*, 26. The petitioner therefore did “not demonstrate sufficiently that Richardson discloses interpreting or responding to movement data using a microprocessor.” *Id.*

Petitioners’ failure to specify where the claim limitations are found in the prior art is even more egregious. Like the petitioners in *AOL* and *Garmin*—who failed to show how the identified memories and processors stored or executed instructions—Petitioners here fail to identify a computer readable media containing program instructions “executable to” perform the “instructions” recited in the claims. They never argue that the alleged “software” or “computer” in Trevarthen contains program instructions “executable to” perform “retrieve,” “match,” “enter,” or “solve” as recited in claim elements 1[B] through 1[F]. *See* Pet., 12-23; Bowser, ¶¶94-95. And when discussing each of these “instruction” elements individually, Petitioners repeatedly identify an alleged function of Trevarthen’s proposed system without contending that the functions are “executable” via “program instructions,” as required by the claims. For example, Petitioners never identify any instructions executable to “retrieve animal identification information from an RFID device.” *See* Pet., 13; claim element 1[B]. They merely allege that “Trevarthen’s system identified each cow by retrieving animal identification information from the RFID device,” which Petitioners argue is accomplished by an “RFID reader device.” *Id.* They do not provide evidence that Trevarthen discloses any processors, computer

readable media, or program instructions “executable to” retrieve that information. Bowser, ¶¶94-95.

Petitioners’ discussion of elements 1[C] through 1[F] follow a similar pattern. *See, e.g.*, Pet., 14 (contending for claim element 1[C] that “the RFID readers retrieve the sensed temperature information from the RFID device” without contending that program instructions are executable to perform such “retrieving”); Pet., 17-18 (contending for claim element 1[E] that Trevarthen describes “entering the sensed temperature information as logical variables into a logical expression of some kind” without contending that program instructions are executable to perform such “entering”); Bowser, ¶96.

Because Petitioners here do not even *allege*—let alone establish—that the claimed instructions are stored or executable in the identified computer or software, the Petition here is even more egregious than the ones rejected in *AOL* and *Garmin*. *See AOL*, IPR2014-00966, Paper 6 at 9 (noting expert’s opinion that “all disclosed operations necessarily require instructions stored in memory to be executed by a processor”); *Garmin*, IPR2018-00565, Paper 24 at 25 (recognizing but dismissing the petitioner’s “assertion that Richardson’s microprocessor 123 executes” processes that execute the claimed instructions); *see also Hopkins*, IPR2015-00616, Paper 9 at 7 (emphasizing that the petition must “specify *where* each element of the claim is found in the prior art”) (emphasis added).

While Petitioners fail to argue that Trevarthen expressly discloses any computer readable media containing the recited program instructions, they also do not rely on inherency. That is, Petitioners never argue that Trevarthen inherently discloses that its “computer” or “software” necessarily “contain[] program instructions executable to” perform any of the claimed instructions, such as an instruction to “retrieve sensed animal information from said RFID device.” *See Garmin*, IPR2018-00565, Paper 24 at 25-27 (rejecting obviousness argument where petitioner failed to “assert that Richardson inherently discloses that microprocessor 123 executes monitor sensors process 154 or track user status process 156”); *see also* *Bowser*, ¶97. Indeed, establishing inherency in an obviousness inquiry is a “high standard” that Petitioners fail to address at all. *Par Pharm.*, 773 F.3d at 1195-96 (noting “high standard” where “the limitation at issue necessarily must be present, or the natural result of the combination of elements explicitly disclosed by the prior art”).

2. *Element 1[C]: Petitioners Fail to Show That Trevarthen Discloses or Renders Obvious “Retriev[ing] Sensed Animal Information from Said RFID Device” as Claimed*

Ground 1 also fails because Petitioners cannot establish that Trevarthen discloses or renders obvious “retriev[ing] sensed animal information from said RFID device” as claimed. *See* Pet., 13-15 (discussing claim element 1[C]). Retrieving “sensed” animal information was not part of any animal management

system described in Trevarthen, as Trevarthen makes explicit. Specifically, Trevarthen states that, while temperature sensing abilities could be incorporated into RFID microchips, that practice had not been “extended to the livestock industry” as of October 2005. Trevarthen, 121; *see also id.*, 123 (explaining that temperature sensing with RFID microchips “in the livestock industry is currently being investigated”).

As Patent Owner’s expert opines, there are good reasons why persons of skill in the art had not successfully incorporated sensed animal information obtained from RFID devices into herd management systems at the time of the invention. Bowser, ¶¶99-105. For example, POSAs would have had concerns that internal microchips could result in tissue damage, infection, or discomfort to the animal. Bowser, ¶102. Moreover, animals, such as cattle, were consistently exposed to abrasive outdoor elements and extreme temperatures, and were known to “roll on the ground,” “immerse themselves in water,” and perform other activities that POSAs believed could hinder sensor functionality and impact measurements. *Id.* (noting further that such devices were unreliable because “a sensor located in the same part of the body may not register uniformly from cow-to-cow”). In short, in view of Trevarthen’s disclosure and general knowledge in the field, POSAs would have had no reason use Trevarthen’s microchip in livestock and no reasonable expectation of success in doing so.

Petitioners also cannot demonstrate that it would have been obvious to reconfigure Trevarthen to “retrieve sensed animal information from said RFID device.” Implicitly acknowledging that Trevarthen fails to disclose a system with this ability, Petitioners instead refer to unspecified “numerous prior art references” and cite a conclusory paragraph from its expert’s declaration. *See* Pet., 14 (citing EX1003, ¶95); Bowser, ¶¶101, 104. But a review of the expert declaration demonstrates that there is no support for Petitioners’ assertion. The expert merely refers back to another section of her declaration discussing “background references,” none of which are relied on for Ground 1. *See* EX1003, ¶95 (citing “Section V.B.1,” which discusses EXS1008, 1014, 1015, 1016, 1017, 1020, and 1021); Bowser, ¶¶103-04. This is an impermissible attempt to incorporate additional arguments and prior art into the Petition by reference, and the Board should disregard it. *See* 37 C.F.R. §42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”); §42.22 (“(a) Each petition . . . must include: . . . (2) A full statement of the reasons for the relief requested, including a detailed explanation of the significance of the evidence . . .”).

Moreover, Petitioners’ reliance on the ’206 Patent’s discussion of “BetaTHERM Sensors” is classic hindsight bias that cannot support obviousness. *See* Pet., 14. The patent discusses BetaTHERM sensors in a section titled

“Mode(s) for Carrying Out the Invention.” EX1001, 4:9-10, 10:53-61. In that section, the inventors explain that a BetaTHERM sensor could be configured within a “bolus” for sensing “physiological characteristics of an animal (40) such as temperature, pH, heart rate, blood pressure, partial pressures of dissolved gases, or the like.” *Id.*, 10:30-11:2. The patent does not suggest in any way that the disclosed configuration was known before the invention. Bowser, ¶104.

Accordingly, Petitioners are using the patent’s disclosure of the invention to reconstruct the claims using hindsight, which is improper. *See LG Display Co., Ltd. et al. v. Innovative Display Technologies LLC*, IPR2014-01092, Paper 17 at 9-10 (P.T.A.B. Mar. 9, 2015) (rejecting an obviousness argument that “appears to be an impermissible hindsight reconstruction of the prior art in light of the patentee’s own disclosure”) (citing *In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991)); *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) (“The invention must be viewed not after the blueprint has been drawn by the inventor, but as it would have been perceived in the state of the art that existed at the time the invention was made.”); Bowser, ¶¶104-05.

3. Element 1[E]: Petitioners Fail to Show That Trevarthen Discloses or Renders Obvious Entering “an Amount of Milk Production or a Number of Days in Milk” into a “Logical Expression” as Claimed

As discussed in Section V, Petitioners have improperly made the strategic decision to proffer two conflicting constructions for this claim element without

providing any substantive argument as to the correct construction, requiring denial of institution. But even if the Board were to apply one or both constructions, Ground 1 fails because Trevvarthen does not disclose or render obvious element 1[E] under either interpretation. By reciting “*said* animal information stored in said database,” claim element 1[E] refers back to the “amount of milk production or a number of days in milk” in element 1[D] and requires such milk information to be entered into the claimed “logical expression.” But Trevvarthen does not disclose or render obvious an animal management system that enters milk information into *any* logical expression, and thus Ground 1 fails regardless of the construction.

a) Petitioners Mischaracterize Trevvarthen’s Sparse Discussion of Milk Production

For both of Petitioners’ constructions, they attempt to show that Trevvarthen enters “an amount of milk production” into a “logical expression” by assuming, incorrectly, that Trevvarthen’s discussions of “milk meters” are related to its separate discussions of RFID technology and software. Petitioners thus engage in improper mixing and matching of disparate teachings from a single reference, without providing a reason to combine those teachings. *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017) (rejecting “single reference” obviousness argument and emphasizing that “combining multiple embodiments from a single reference”

requires “a motivation to make the combination and a reasonable expectation that such a combination would be successful”); Bowser, ¶¶106-08.

One example of Petitioners’ improper mixing and matching is their reliance on Trevarthen’s discussion of “milking meters” at Cochrane Dairy, which was one of the two “case studies” from Trevarthen’s thesis before he proposes his own “theoretical framework.” *See* Section II.C.1. Specifically, Petitioners quote Trevarthen’s statement that “a cow producing significantly less milk than her calculated average may be suffering from an illness” to suggest that Trevarthen’s system included a “logical expression” based on milk production to detect illness. *See* Pet., 18-20 (citing Trevarthen, 98 for both constructions). But that statement was referring to the Cochrane’s potential “implementation of milking meters for every milking bail” at their farm—a system unrelated to RFID technology. Trevarthen, 98; Bowser, ¶108.

In fact, even if the milking meters were implemented at Cochrane Dairy, they never could or would have been used with an RFID device that “sensed animal information” as claimed because the Cochranes employed basic ear tags without sensors of any kind. *See, e.g.*, Trevarthen, 69 (“All cows in the [Cochrane’s] herd have an NLIS-compliant RFID tag attached to their right ear.”); Bowser, ¶109. As Dr. Bowser explains, a basic “ear tag” is a plastic device, often around the size of a credit card, that pierces and fastens to an animal’s ear. Bowser,

¶109. A POSA would have understood that these basic ear tags could include a low frequency RFID transponder to provide identification information on the animal, which was typically gathered at the entrance of a barn or milking parlor. *Id.*; Trevarthen, 3, 20, 25-26, 69-70. Basic ear tags like those employed at Cochrane Farm could not have been used to achieve the claims. For example, they are attached to the ear on the outside of the animal, are not implanted “in an animal,” and do not “sense[] animal information.” Bowser, ¶109.

In all, Petitioners cite three vague disclosures to “milk” in Trevarthen, none of which disclose the invention. First, as noted above, Petitioners refer to the Cochrane’s desire to keep track of milk production at Cochrane Dairy, but not part of an alert or logical expression. Pet., 18 (citing Trevarthen, 98). Rather than include milk information in any logical expression or alert, the Cochranes were considering using milk meters to more regularly “record the amount of milk each cow has provided at every milking session . . . in contrast to the current practice of only gaining these figures once a month through the use of the herd recording services of Dairy Express.” Trevarthen, 98; Bowser, ¶110.

Second, Petitioners refer to Trevarthen’s discussion of recognizing “patterns in the [milk] production of each cow,” which likewise fails to disclose or suggest any alert or logical expression. See Pet., 18 (citing Trevarthen, 109). There, Trevarthen was speculating about possible future capabilities of “Automated Feed-

Dropping Control Units (Feed Bins)” in which milking meters are combined with automatic feed bins. Trevarthen, 108-109, §6.3.3; Bowser, ¶111. Trevarthen never suggested that the combination of feed bins and milking meters could or should be incorporated into any animal tracking software, let alone one that includes a logical expression or alert or that incorporates data from an RFID device implanted in an animal. Bowser, ¶111. Moreover, Trevarthen admits that combining feed bins and milking meters was “[b]eyond their current abilities.” Trevarthen, 109. Thus, even if the disclosure somehow related to a logical expression, there would have been no reasonable expectation of success in incorporating the disclosure into a method arranged as claimed. Bowser, ¶111; *see also Star Sci.*, 655 F.3d at 1376 (holding that a “speculative” disclosure of what “might” or “may” be achieved “does not sufficiently direct or instruct one of skill in this art”).

Third, Petitioners rely on a short, conclusory assertion in Trevarthen’s theoretical framework that “milk meters” can “aid to identify any problems that may arise in the herd (such as illness).” Pet., 18-20; Trevarthen, 115. But as with the other disclosures Petitioners rely on, the short statement does not say anything about whether the milk information is stored, whether the system makes any calculations based on a logical expression, whether the milk meters are used as part of an overall system incorporating implanted RFID devices that sense animal information as claimed, or even how a person of skill might implement or integrate

the milk meters into the system. Bowser, ¶112. At best, Trevarthen is speculating as to what data “might” or “may” be desirable to a farmer, which is insufficient to establish disclosure or obviousness of a claim element. *See Star Sci.*, 655 F.3d at, 1376.

b) Trevarthen Does Not Expressly Disclose Element 1[E] as Alleged Under Petitioner’s First Construction.

With respect to Petitioners’ first proposed construction—namely where milk information and sensed animal information can be entered into separate logical expressions—Petitioners fail to identify any system disclosed in Trevarthen that is arranged as claimed. As noted above, Petitioners rely on Trevarthen’s discussion of “milk meters” at the Cochrane Dairy, which were not incorporated into an overall system like the one in the claims. *See Pet.*, 18-19. Rather, Cochrane Dairy was seeking to potentially use milk meters to gather milk production information on a more regular basis, without relying on a third party service. Trevarthen, 98; Bowser, ¶¶113-15. There is no disclosure or suggestion of using information from milk meters in any logical expression. Moreover, the Cochranes used basic ear tags to identify cows, which are not sensors allowing for the system to “retrieve sensed animal information from said RFID device” as claimed. *See Trevarthen*, 69-70; Bowser, ¶116. In fact, there is no discussion of the Cochranes measuring, analyzing, or otherwise using temperature or any other sensed data as part of their operations, let alone integrated into a system as a logical variable in a logical

expression. Bowser, ¶116. Moreover, the Cochranes employ a specific herd management software, Dairy 2000, that purportedly “provides the ability to store information pertaining to each individual cow.” Trevarthen, 92-93. There is no description of this software performing any of the recited instructions, including entering milk production information and/or temperature data as “logical variables into at least one logical expression.” Bowser, ¶117. Nor is there any discussion of solving such expressions. Bowser, ¶117.

Petitioners’ other cited evidence fares no better, as it also refers to milk meters and not to any RFID-based animal management system arranged as claimed. For example, there is no discussion of how or why milk production information would be entered into the same system that includes “retriev[ing] sensed animal information from [an] RFID device” and that solves logical expressions based on temperature and milk production data. Bowser, ¶118.

c) Trevarthen Does Not Render Obvious Element 1[E]
Under Petitioners’ Second Construction

Petitioners acknowledge that “Trevarthen does not expressly disclose a logical expression” under their second, narrower claim interpretation of Element 1[E], which would require *both* milk information and sensed animal information to be entered into the *same* logical expression (presumably offered to preserve a potential non-infringement argument for the district court action). Pet., 19.

Petitioners, therefore, are forced to contend that it would have been obvious for a

POSA to use both an animal's temperature and its milk production information in a single logical expression in connection with the system arranged as claimed. But Petitioners have not met their burden.

Nothing in the Petition nor the supporting declaration demonstrates that a POSA would have any reason to modify an alleged "logical expression" in Trevarthen to "input both temperature and milk production information as logical variables," regardless of whether temperature and milk are indicators of illness. Pet., 20; Bowser, ¶119. As a threshold matter, a POSA could not "modify Trevarthen's logical expression" at all because Petitioners fail to identify a "logical expression" in Trevarthen to begin with. Petitioners rely on Trevarthen's discussion of hypothetical "functionality" that "could be incorporated to allow the system to alert the farmer of [temperature] fluctuations." Pet., 17 (citing Trevarthen, 121-22). But the mere description of what a system would "allow" cannot serve as a disclosure of a claim element. *See PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993 (Fed. Cir. 2017) (vacating PTAB obviousness determination because explanation that prior art "*could be combined*" or "would have allowed for" the proposed combination is insufficient (emphasis in original)); Bowser, ¶120. Moreover, Petitioners' so-called "example" of an "expression that determines the magnitude, rate of change, or variability of a sequence of temperature measurements and compares these values to corresponding

thresholds” is purely hypothetical and does not identify an actual logical expression in Trevarthen. Pet., 18 (asserting that Trevarthen would have required a “logical expression of some kind” without identifying an actual expression); Bowser, ¶121.

Petitioners’ citations to additional prior art also cannot supply a reason to modify Trevarthen to include a logical expression that integrates milk and sensed temperature information. See Pet., 20. Van den Berg (EX1023), for example, does not state that “analysis of temperature and milk yield ‘may be combined ... to achieve a higher accuracy’ for detecting ‘illness’” as Petitioners suggest. See Pet., 20; Bowser, ¶122. Rather, van den Berg proposed that one or more parameters could “be combined with the dead time” and “[i]n doing so, to achieve a higher accuracy, especially the temperatures of each of the *flows of milk* from the various teats can be determined.” EX1023, 4:20-24 (emphasis added); Bowser, ¶122. Van den Berg then explains that an indication of mastitis can “be obtained in the computer by means of a sensor for electrical conductivity of the milk flow and, if necessary [sic], also by means of a temperature-sensitive sensor.” EX1023, 4:29-34; Bowser, ¶122. Van den Berg therefore suggests, at most, that *milk* temperature can be combined with electrical conductivity measurements to help identify mastitis. Bowser, ¶122. But it never suggests that *sensed* animal temperature

could or should be combined with milk production to detect illness, let alone in a logical expression arranged as claimed. *Id.*

Petitioners’ de Mol reference (EX1033) also fails to provide a reason to enter sensed temperature and milk production information in a logical expression. To the contrary, de Mol teaches away from using—or at least provides a reason *not* to use—its disclosure for identifying illness in a “practical application,” such as an animal management system. In its “Conclusions,” de Mol admits that the “specificity” of its detection model is “too low for practical application, therefore additional research is directed to a reduction of the number of false positive alerts.” EX1033, 184; Bowser, ¶123. In other words, a POSA reviewing de Mol would be discouraged from employing de Mol’s models due to their excessive number of false positives. Bowser, ¶123. This same evidence shows that there would have been no reasonable expectation of success in incorporating equations like de Mol’s into an animal management system such as Trevarthen’s. Bowser, ¶123. Moreover, de Mol cannot provide a reason to modify Trevarthen to achieve the invention in any event because, like van den Berg, de Mol uses *milk* temperature—not sensed *animal* temperature—in its equations. *See, e.g.*, EX1033, Abstract, 173; EX1023, 4:13-18 (referring to “the temperature of a milk flow”); Bowser, ¶123.

* * *

For at least the above reasons, Petitioners fail to establish a reasonable likelihood of prevailing with respect to Ground 1.

C. Ground 2 — Petitioners Fail to Show That Trevarthen and Brune Render Obvious Claims 17-20

Ground 2 challenges claims 17-20 and fails for similar reasons as Ground 1. First, Ground 2 relies on Trevarthen as a primary reference, which Petitioners have failed to establish as prior art. *See* Section VI; *see also* Bowser, ¶¶124-25. Second, Petitioners have failed to show that Ground 2 renders element 17[A] obvious for the same reasons as element 1[A]. Petitioners rely solely on Trevarthen for this element, and they do not contend that Brune addresses Trevarthen’s deficiencies. As discussed in Ground 1, Trevarthen alone fails to disclose or render obvious “a processor communicatively coupled to a non-transitory computer readable media containing program instructions executable to” perform the recited instructions. *See* Section VII.B.1; *see also* Bowser, ¶126. Third, Petitioners have failed to show that Ground 2 renders element 17[C] obvious, which is nearly identical to element 1[C]. Once again, Petitioners rely solely on Trevarthen and do not rely on Brune. And as discussed in Section VII.B.2, Trevarthen fails to disclose or render obvious “retriev[ing] sensed animal information from said RFID device.” Bowser, ¶127.

Petitioners also fail to establish that Ground 2 renders claims 17–20 obvious for an independent reason. With respect to the requirement that “stored” animal

information be entered into a “logical expression” in element 17[F], Petitioners assert that “[a]s explained for 1[E], Trevarthen discloses entering sensed temperature information *and stored temperature information* into a logical expression for the detection of illness.” Pet., 33 (emphasis added). But nothing in the referenced discussion of 1[E] identifies a disclosure of stored temperature information. Rather, for that element, Petitioners identify alleged “sensed temperatures” in Trevarthen and contend that “[t]he POSA would have understood that detecting illness through temperature ‘fluctuations’ or ‘anomalies’ would have included entering the *sensed* temperature information as logical variables into a logical expression of some kind.” Pet., 17–18 (emphasis added); *see also id.*, 17 (“As explained below, Trevarthen describes entering *sensed* temperature information as logical variables into a logical expression, and also entering stored milk production information as logical variables into a logical expression.”) (emphasis added). Nowhere in their discussion of 1[E], however, do Petitioners contend that Trevarthen discloses entering “*stored*” temperature information from a database as a logical variable, or even contend that such a feature would be inherent or obvious. *See id.*, 16–22. Nor do Petitioners rely on Brune to supply that limitation.

Moreover, while claims 17-20 do not recite “an amount of milk production or a number of days in milk” to be entered into a logical expression as recited in

element 1[E], if the Board finds that Petitioners fail to show that Trevarthen discloses or renders obvious that element in Ground 1, it should exercise its discretion and deny institution for Ground 2 as well. *See Microsoft*, IPR2019-00843, Paper 7 at 10-11; *Salem Fabrication*, IPR2022-01517, Paper 9 at 23-24.

D. Ground 3 — Petitioners Fail to Show That Laitinen, Buchanan, and Liao Render Obvious Claims 1-4 and 6

1. *Element 1[A]: Petitioners Fail to Identify “a Processor Communicatively Coupled to a Non-Transitory Computer Readable Media Containing Program Instructions Executable to” as Claimed*

Petitioners cannot establish a reasonable likelihood of success as to Ground 3 because they fail to specify where Laitinen, Buchanan, or Liao disclose “a non-transitory computer readable media containing program instructions,” as recited in claim 1. As in Ground 1, Petitioners fail to identify computer readable media “containing program instructions executable to” perform the instructions recited in claim elements 1[B] through 1[F]. While Petitioners identify an alleged “computer” and “personal computer” in Laitinen, they never argue that those computers contain program instructions “executable to” perform all of the specific instructions recited in claim elements 1[B] through 1[F]. Pet., 12; *see AOL Inc.*, IPR2014-00966, Paper 6 at 3-4, 14 (denying institution where petitioners identified claimed “a first memory and a first processor” but failed to show that the recited “instructions are stored in the specific memories recited in claim 1”); *Garmin*,

IPR2018-00565, Paper 24 at 25 (finding claim not unpatentable where petitioner identified claimed “microprocessor” but failed to show that identified microprocessor was capable of performing the claimed processes); *see also* Bowser, ¶¶129-30. Petitioners also do not rely on Buchanan for any of these limitations.

Petitioners do not address this deficiency in their analysis of individual elements, either. *See* Pet., 43-53. With respect to element 1[B], for example, Petitioners do not contend that the asserted references disclose “a processor communicatively coupled to a non-transitory computer readable media containing program instructions executable to . . . retrieve animal identification information from an RFID device” as claimed. Instead, Petitioners rely on Laitinen’s discussion of a “pico level device” that allegedly “functions like conventional identification tool[s].” Pet., 43 (emphasis removed; bracket in original).

Petitioners never explain what a “conventional identification tool” is or how it “functions.” *See* EX1003, ¶174; *see also* Bowser, ¶131. And they never attempt to identify any “program instruction” executable to perform such function as claimed. Petitioners’ explanation of each “instruction” element is similarly deficient. *See, e.g.,* Pet., 44 (asserting for element 1[C] that “[t]he pico RFID device can provide location information using GPS” without contending that a program instruction as claimed is executable to provide location information); *see also* Bowser, ¶132.

2. *Petitioners Fail to Show That Laitinen Enters “Sensed Animal Information” Into a “Logical Expression” Using an “RFID Device Implanted in an Animal.”*

In all but two of the 24 claims of the '206 Patent, the “sensed animal information” must be retrieved from an “RFID device” that is “implanted in an animal” or “implanted in a plurality of animals.” In an effort to find disclosure of a logical expression in Laitinen, Petitioners is forced to rely solely on “temperature” and “movement” as the claimed “sensed animal information.” *See* Pet., 48-49. But Laitinen is explicit: temperature and movement are obtained solely from an “external” pico device, and *not* any RFID device implanted in an animal. Petitioners fail to even address this defect in their argument, and instead cherry-pick citations throughout the reference relating to the external pico device or to sensors that are a separate component from the pico device altogether.

Petitioners rely on two logical expressions that allegedly incorporate the animal “temperature” and “movement” that they identify as “sensed animal information.” First, Petitioners rely on Laitinen’s “heat control” embodiment, which they allege uses “[a] cow’s temperature and movement . . . as the input variables.” Pet., 48 (citing Laitinen, 8:5-11). Second, Petitioners rely on Laitinen’s “medical treatment” equation, which they contend uses “the animal’s temperature at different times” because, according to Petitioners, “temperature correlated with animal illness.” Pet., 49 (citing Laitinen, 7:6-13, 7:35-37).

However, neither of these alleged logical expressions in Laitinen enter data from an RFID device “implanted in an animal” as claimed. Laitinen explicitly states that both animal temperature and movement are obtained from an *external* pico level device, not an RFID device “implanted in an animal.” See Laitinen, 5:44-47 (“The external device can, for instance, measure the animal’s body temperature (with a temperature [s]ensor) or movements”); Fig. 2 (depicting “external” device with “temperature” and “movement” inputs); Bowser, ¶133-37. Indeed, Petitioners do not even contend with the fact that there are both external and internal pico level devices in Laitinen, which measure different things. Instead, they cite descriptions of a “[s]ensor,” which is explicitly separate from the RFID device. Pet., 44 (citing, Laitinen, 3:51-57); *see also id.*, 36-37 (citing Laitinen, 3:51-62), 52 (citing Laitinen 3:53-57). In the passage Petitioners rely on, Laitinen explains that the “pico level device is attached permanently to, e.g., the animal’s ear after its birth” and that the separate “[s]ensor unit” can be “an implant inside the animal, in which case the data it provides can be, for instance, read/transcribed by the pico level equipment.” Laitinen, 3:28-62; Bowser, ¶138.

In short, Petitioners’ alleged “logical expressions” use temperature and movement measurements, which are only acquired with *external* devices in Laitinen. Petitioners thus fail to show that Laitinen discloses or renders obvious entering sensed animal information retrieved from an RFID device “implanted in

an animal” or “implanted in a plurality of animals” as required by all but two challenged claims. *See* EX1001, claims 2, 3, 6 and 17-20; *see also* Bowser, ¶¶139-40. In view of that, at most, Petitioners could only possibly establish a reasonable likelihood of success as to a small subset of claims (i.e., claims 1 and 4), and the Board should exercise its discretion to deny institution on that basis. *See, e.g., Microsoft Corp.*, IPR2019-00843, Paper 7 at 10-11; *Salem Fabrication*, IPR2022-01517, Paper 9 at 23-24. Moreover, as explained below, the Petition is deficient as to additional limitations that are recited in every challenged claim, and thus Grounds 3 and 4 should be rejected altogether for those additional reasons.

3. *Element 1[E]: Petitioners Fail to Show That Laitinen, Buchanan, and Liao Disclose or Render Obvious “Enter[ing] . . . an Amount of Milk Production or a Number of Days in Milk” Into a “Logical Expression” as Claimed*

Petitioners identify two alleged “logical expressions” in Laitinen, neither of which include “an amount of milk production or a number of days in milk,” namely (1) a “pico level” device that purportedly monitors when an animal is in heat based on temperature and movement measurements and (2) a mathematical function implemented at the “global level” that assesses the efficacy of animal medication across multiple local levels. As explained below, there would have been no reason for a POSA to modify either of these alleged “logical expressions” to include the milk information required by the claims. *See* Bowser, ¶141.

Petitioners contend that “Laitinen discloses a first logical expression” based on a so-called “heat control” application, which fails to incorporate “an amount of milk production or a number of days in milk” as claimed. *See* Pet., 48. As Laitinen explains, “[t]o monitor the animal’s heat with a pico level device, body temperature and movement are usually measured.” Laitinen, 8:5-15. That is, “heat” is detected using temperature and movement data acquired directly from the animal via a pico level device—milk production or days in milk is not a factor. Petitioners’ proposed reason for additionally incorporating the claimed milk information has no merit. Specifically, Petitioners propose that POSAs would have incorporated such information because a second reference, Liao, allegedly “teaches that milk production and DIM information are also useful for determining whether a cow is in heat and ready for artificial insemination.” Pet., 48 (citing Liao, 12:3-15). But Liao does not teach that. To the contrary, Liao teaches that milk production and DIM information are *independent* of whether a cow is in heat. Bowser, ¶¶142-43. As the tables in Liao show, “heat” is a separate “input parameter” from milk production for recommending whether to inseminate a cow. *See* Liao, 10, 12 (tables); *see also id.*, 9:27-11:1 (describing “days in milk,” “peak yield in milk,” and “whether the animal is in heat presently” as “input parameters”), 20:16-21:10 (claim 10 describing “heat-detection status” as an “input parameter”); Bowser, ¶¶142-43. In other words, per Liao, “milk production” or

“days in milk” does not inform a POSA of whether or not the animal is in heat. The POSA would already have that information to provide as an “input” and, therefore, Liao would provide no reason modify Laitinen’s “heat control” application to include milk information to allegedly “improve its accuracy and reliability at determining whether a cow is in heat.” *See* Pet., 48; Bowser, ¶143. Petitioners do not rely on Buchanan for this limitation either.

Additionally, Petitioners fail to explain how a POSA would have expected success in incorporating milk information from a database into Laitinen’s heat control application. Laitinen explains that it monitors heat specifically with a “pico level device.” Laitinen, 8:9-11. Laitinen further explains that “[w]hen the local system notices that the alarm limit(s) have been reached, it signals a heat alarm.” *Id.*, 8:12-14. That is, the “heat alarm” is calculated by the pico level system based on the temperature and movement data that it measures, and the local system merely “notices” and relays the alarm. *See* Laitinen, 5:60-64 (describing pico level system that has “an additional alarm 224,” which can be “signaled electrically to the local, and possibly even to the global, level”); Fig. 2 (depicting “ALARM DEVICE” at pico level). But Petitioners do not contend that the pico level system has a database or any other feature that could incorporate milk information, let alone integrate it into a “logical expression” as claimed. Relatedly, because the pico level device is both the alleged “RFID device” and also the device

that generates the alleged “logical expression,” it is unclear how information “retrieved from said RFID device” would be entered into such a logical expression. Thus, even if there were a reason to try to include milk information in a heat detection system, Petitioners fail to explain *how* such information would be acquired and incorporated into Laitinen’s system to achieve the claimed invention. *See Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1380 (Fed. Cir. 1986) (“At most, these articles are invitations to try monoclonal antibodies in immunoassays but do not suggest how that end might be accomplished.”); *see also* Bowser, ¶¶144-45.

Petitioners’ alternative argument that POSAs would have reconfigured Laitinen’s inverse function “ $x=f^{-1}(y,z)$ ” to include milk production also has no merit, as there was no reason to include that information in Laitinen’s function. First, the inverse function in the Petition does not appear in Laitinen. Laitinen states that “[a]n additional goal can be to find an inverse function $x=f^{-1}(y,z)$ with which the necessary medical treatment could be found.” Laitinen, 7:35-37; Bowser, ¶¶146-47. Without explanation, Petitioners amended Laitinen’s function to recite “ f^{-1} ” instead “ f^{-1} ” as recited in Laitinen. As Dr. Bowser explains, as written, Laitinen’s function is not necessarily an “inverse function,” which POSAs would have understood as “undoing” or reversing the effect of a separate operation. Bowser, ¶147. Rather, Laitinen’s function is referring to a “counter

propagating neural network” that purportedly predicts treatment schemes for animal. *Id.* Laitinen’s “ $x=f^1(y,z)$ ” notation and discussions of a counter propagating neural network could suggest that “ $x=f^1(y,z)$ ” refers to a function that is not a true “inverse function” because it does not necessarily operate to reverse or undo the effects of a separate operation. *Id.* In fact, in the context of predicting treatment schemes for animals, POSAs did not understand an “inverse function” based on a counter propagating neural network to exist. *Id.* Thus, they would have required more guidance than what is disclosed in Laitinen regarding how the function operates and how to implement it in this context. *Id.*

Second, Petitioners argue, incorrectly, that a POSA would have been motivated to add milk production to Laitinen’s “inverse function,” or to create a new function, “to improve reliability of its logical expression determining whether a cow is ill and advising on medical treatment.” *See* Pet., 49-50. But Petitioners fail to explain *how* milk production information would have been incorporated into any function disclosed in Laitinen, let alone with a reasonable expectation of success. Laitinen explains that its function is implemented at the global level and requires “a large sample,” such as “about 1000 elements.” Laitinen, 7:14-19; *id.*, 7:19-22 (explaining that the functions require “a sufficient number of cases”). As Dr. Bowser explains, this makes sense because the inputs into the function—such as “temperature” and “movement,” which Petitioners rely on as the alleged “sensed

animal information”—are a series of data acquired from numerous animals that could respond to medication over time. Bowser, ¶¶148-49. On the other hand, the milk information that Petitioners rely on for obviousness—namely, “days in milk” and “peak yield” as discussed in Liao—are single data points that would not respond to medication over time and thus cannot be implemented into Laitinen’s inverse function. To illustrate, Laitinen’s inverse function analyzes animals’ “present” and “initial state” temperature, where the initial state is the time when medication commenced. Laitinen, 7:6-13; Bowser, ¶149-50. But there is no way to even acquire an animal’s “peak yield” at an “initial state” or “present” time because peak yield is determined only at the end of a lactation period. See Liao, 5:18 (describing “a peak milk yield in a latest lactation”); Bowser, ¶150. Similarly, “days in milk” refers to the current number of days an animal has been in lactation at a given time—it increases by one day each day until lactation ends, regardless of whether medication is administered. Bowser, ¶151. Using such values in an inverse function to assess the efficacy of medication makes no sense. Bowser, ¶152. In short, it is unclear—and Petitioners do not attempt to explain—how Laitinen could incorporate such information in its inverse function to achieve the claimed invention. See *Hybritech*, 802 F.2d at 1380.

More generally, excluding information that was not measured by a “pico level” device—such as an amount of milk production or days in milk—is

consistent with Laitinen’s “basic principle” that requires three hierarchical levels. Laitinen, 3:21-27. That is, Laitinen operates by acquiring data at the “pico level,” storing the pico level data at the “local level,” and analyzing the data from multiple local levels at the “global level.” *Id.*, 3:21-4:49, Figs. 1-6; Bowser, ¶153. For example, Laitinen explains that “algorithms and knowledge models upheld in the global level systems, fed by locally collected data, are essential to the effectiveness of the system’s services.” *Id.*, 6:29-32. The locally collected data “compris[e] certain local measures and their corresponding results, *as measured with the pico devices*,” and the “results are taken to a higher global level system 190 on which the desired analysis is performed.” *Id.*, 6:36-42 (emphasis added). The local levels, i.e., individual farms, are in turn “controlled on the basis of the results of the analysis.” *Id.*, 6:42-46. Reconfiguring Laitinen such that the local level system generates a database independent of the pico level measurements would change Laitinen’s basic principle of operation and would therefore be nonobvious. *See In re Ratti*, 270 F.2d 810, 813 (C.C.P.A. 1959) (finding no reason to combine when there was “a change in the basic principles under which the [base reference] was designed to operate”); Bowser, ¶153.

Moreover, for the reasons explained in Ground 1, Petitioners’ de Mol reference teaches away from combining sensed temperature and milk production information in a logical expression, or at a minimum explains why a skilled artisan

would lack the reason to do so. That is, de Mol explained that the “specificity” of its detection model was “too low for practical application, therefore additional research is directed to a reduction of the number of false positive alerts.” EX1033, 184; Bowser, ¶154. This would have discouraged POSAs from employing such models in any logical expression because the models provide too many false positives. Bowser, ¶154. This same evidence shows that there would have been no reasonable expectation of success in achieving the claimed invention based on Petitioners’ proposed modifications to Laitinen. *Id.*

To the extent Petitioners are relying on de Mol or van den Berg to provide a reason to include both sensed temperature and milk production information into a logical expression as claimed, neither would have provided such reason. Pet., 50-51; *see also* Bowser, ¶155. As explained in Ground 1, when van den Berg and de Mol refer to “temperature,” they are referring to the temperature of *milk*, not sensed temperature from an RFID device. *See, e.g.*, EX1033, Abstract, 173; EX1023, 4:13-18 (referring to “the temperature of a milk flow”). Petitioners cite no evidence demonstrating that POSAs would or could have combined sensed temperature and milk production or days in milk into a logical expression as claimed.

* * *

For these reasons, Petitioners fail to establish a reasonable likelihood of prevailing as to Ground 3.

E. Ground 4 — Petitioners Fail to Show That Laitinen and Brune Render Obvious Claims 17-20

Ground 4 challenges claims 17-20 and fails for similar reasons as Ground 3. First, Petitioners have failed to show that Ground 4 renders element 17[A] obvious for the same reasons as element 1[A]. Petitioners rely solely on Laitinen for this element, and they do not contend that Brune addresses Laitinen’s deficiencies. As discussed in Ground 3, Laitinen alone fails to disclose or render obvious “a processor communicatively coupled to a non-transitory computer readable media containing program instructions executable to” executable to perform the recited instructions. *See* Section VII.D.1; *see also* Bowser, ¶¶156-57. Second, Petitioners have failed to show that Ground 4 renders obvious elements 17[C] and [F] because they fail to show that Laitinen retrieves “sensed animal information” from an RFID device “implanted in an animal,” and they fail to show that Laitinen enters such information into a logical expression. *See* Section VII.D.2; *see also* Bowser, ¶158. Again, Petitioners do not rely on Brune for those specific elements. Instead, Petitioners rely on Brune solely for its purported disclosure of “retriev[ing] date-time information from said RFID device” as recited in claims 17-20, and therefore Ground 4 necessarily falls with Ground 3 and should be dismissed.

Moreover, while claims 17-20 do not recite “an amount of milk production or a number of days in milk” to be entered into a logical expression as recited in element 1[E], if the Board finds that Petitioners fail to show that Laitinen discloses or renders obvious that element in Ground 3, it should exercise its discretion and deny institution for Ground 4 as well. *See Microsoft*, IPR2019-00843, Paper 7 at 10-11; *Salem Fabrication*, IPR2022-01517, Paper 9 at 23-24.

VIII. CONCLUSION

The Board should deny institution for the above reasons.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing ST Reproductive Technologies, LLC's Preliminary Response was served on counsel of record on August 30, 2024 by filing this document through the Patent Trial and Appeal Case Tracking System (P-TACTS), as well as delivering a copy via electronic mail to counsel of record for the Petitioners at the following addresses:

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CERTIFICATE OF COMPLIANCE PURSUANT TO 37 C.F.R. §42.24

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Respectfully submitted,

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