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Paper No. 22
Date Filed:
February 14, 2025

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
PATENT OWNER RESPONSE**

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EXHIBIT LIST

Exhibit	Description
EX2001	Declaration of Dr. Tim Bowser
EX2002	<i>Curriculum Vitae</i> of Dr. Tim Bowser
EX2003	Declaration of Thomas W. Landers, IV in Support of Motion to Appear <i>Pro Hac Vice</i>
EX2004	Declaration of Jonathan M. Hernandez in Support of Motion to Appear <i>Pro Hac Vice</i>
EX2005 (Not filed)	Declaration of Timothy J. Bowser, Ph.D. Pursuant to 37 C.F.R. 42.64(b)(2)
EX2006	DOUG BANIA, BUSINESS VALUATION RESOURCES, LLC, THE COMPREHENSIVE GUIDE TO ECONOMIC DAMAGES, VOL. 2, CH. 38 (Jimmy S. Pappas et al. eds., 7th ed. 2023), https://nevium.com/wp-content/uploads/2023/12/Bania-Chapter-38.-Using-Internet-Analytic-Tools-for-Valuation-and-Damages-Calculations-in-Internet-IP-Infringement-and-Defamation-Cases.pdf
EX2007	Emory University, Goizueta Business School, <i>Become a Google Power User: Tips and Techniques</i> , https://libraries.emory.edu/media/5321
EX2008	A.M. Bellon, <i>Does animal charisma influence conservation funding for vertebrate species under the US Endangered Species Act?</i> , Environmental Economics and Policy Studies (2019)
EX2009	Declaration of Dr. Timothy J. Bowser, Ph.D. in Support of Patent Owner Response
EX2010	Deposition Transcript of Tami M. Brown-Brandl, Ph.D. (January 29, 2025)
EX2011	Declaration of Meredith Knoff
EX2012	<i>Curriculum Vitae</i> of Meredith Knoff
EX2013	Dorothea Salo, <i>Innkeeper at the Roach Motel</i> , 57 Libr. Trends 98 (2008), https://dx.doi.org/10.1353/lib.0.0031

EX2014	Kwame Kodua-Ntim, <i>University Academics' Usage of Open Access Institutional Repositories</i> , 30 J. Libr. Res. Sharing 101 (2021), https://doi.org/10.1080/1072303X.2022.2103227
EX2015	Alex Wood-Doughty et al., <i>Do Download Reports Reliably Measure Journal Usage? Trusting the Fox to Count Your Hens?</i> , 80 Coll. & Rsch. Librs. 694 (2019), https://doi.org/10.5860/crl.80.5.694
EX2016	<i>Frequently Asked Questions on Public Statistics</i> , Cornell Univ.: arXiv, https://info.arxiv.org/help/faq/statfaq.html
EX2017	<i>In-depth guide to how Google Search works</i> , Google Search Cent., https://developers.google.com/search/docs/fundamentals/how-search-works
EX2018	<i>Our new search index: Caffeine</i> , Google Search Cent., https://developers.google.com/search/blog/2010/06/our-new-search-index-caffeine (June 9, 2010)
EX2019	<i>Facts about Google and Competition: How Google Search Works</i> , Google, https://web.archive.org/web/20111104131332/https://www.google.com/competition/howgooglesearchworks.html (Mar. 19, 2016)
EX2020	<i>Grey Literature (in the Health Sciences)</i> , USC Librs.: Rsch. Guides, https://libguides.usc.edu/healthsciences/grey_literature
EX2021	Yazdan Mansourian & Nigel Ford, <i>Search persistence and failure on the web: a “bounded rationality” and “satisficing” analysis</i> , 63 J. Documentation 680 (2007), https://www.emerald.com/insight/content/doi/10.1108/00220410710827754/full/html

I. INTRODUCTION

The Petition fails to show that any of the challenged claims are unpatentable in view of the primary references, Trevarthen and Laitinen, either alone or in combination. With respect to Trevarthen, Petitioners do not meet their burden to prove that the electronic undergraduate thesis was meaningfully indexed and sufficiently locatable to qualify as prior art under the public accessibility standard. And even if it were prior art, Petitioners fail to establish that Trevarthen would render any of the challenged claims obvious. Petitioners rely on disparate disclosures throughout the multi-chaptered thesis to cobble together an obviousness argument, but fail to demonstrate that a person of ordinary skill in the art (“POSA”) would have had a reason to combine those unconnected disclosures. This failure is particularly apparent with respect to the narrower dependent claims 4, 6, and 18-20, which Petitioners give short shrift.

Petitioners’ arguments with respect to Laitinen fare no better. Although claim 1 and its dependent claims require using animal milk production data in connection with other animal data in a logical expression, Laitinen makes no reference to using milk production in any capacity. Petitioners contend that this important claim feature would have been an obvious addition, but in making that argument they mischaracterize the reference and other prior art and improperly rely on hindsight. Petitioners further rely on an *external* sensing device in Laitinen to

satisfy the '206 patent's recitation of an "RFID device *implanted in an animal*," apparently in reliance on an impermissibly broad claim construction. The Board's initial rejection of Petitioners' construction was correct, however, and Laitinen does not otherwise disclose or suggests an implantable device that senses the relevant animal information.

Accordingly, because Petitioners have failed to show by a preponderance of the evidence that any challenged claim is obvious, the Board should issue a Final Written Decision determining no Challenged Claims unpatentable.

II. THE '206 PATENT AND THE CHALLENGED CLAIMS

The '206 Patent claims a novel animal management system that allows farmers to track the status of their herds in real-time, which is particularly useful in the livestock industry. EX2009, ¶¶26-33. The claims recite retrieving "sensed animal information," such as body temperature, from a specialized "RFID device" implanted inside of an animal, as opposed to thorough examination or an external device. EX1001. The sensed animal information is then integrated into a "logical expression" along with additional information stored in a database, including "an amount of milk production or a number of days in milk." *Id.* Using this unique combination of sensed and stored information, the system provides alerts to farmers that are specific to the animals in their herds, including, as recited in

dependent claims 4 and 18, alerts that signal when a cow is ill. *See, e.g.*, EX1001, 14:4-63; Fig. 4; 3:52-57, 14:64-15:22.

Petitioners challenge claims 1-4, 6, and 17-20. Claim 1, reproduced below, is exemplary of the challenged independent claims:

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.

The Challenged Claims also include several dependent claims, which were not addressed at the Institution Decision stage, each of which adds limitations not disclosed in the prior art. Claim 4, for example, requires that the “animal information” stored in the database “comprise[] health information associated with

said animal,” and that the claimed logical value must “indicate[] an occurrence of an illness.” And claim 6 is directed to obtaining animal information from a plurality of animals, *e.g.*, a herd, and solving the logical expression “as to a selected period of time as to said plurality of animals...if a greater than selected number of said illness have occurred.” Dependent claims 18-20 contain similar limitations. EX2009, ¶¶34-41.

III. PERSON OF ORDINARY SKILL IN THE ART

For the purposes of institution, the Board determined that a POSA of the ’206 Patent would have had a bachelor’s degree in animal science, biological engineering, electrical engineering, or computer science, or a related or equivalent field, and three years of experience researching, developing, designing and/or evaluating RFID tracking and sensor systems for livestock management. Paper 18, 18-19. Based on the specific arguments and art raised in the Petition, Patent Owner does not contest the Board’s determination as to the level of skill in the art for purposes of this proceeding. EX2009, ¶¶16-19.

IV. CLAIM CONSTRUCTION – “IMPLANTED IN AN ANIMAL”

The only claim construction dispute involves the meaning of “implanted in an animal,” which Petitioners raised after the Preliminary Response. At the institution phase, the Board correctly determined that “implanted in an animal” and “implanted in a plurality of animals” in challenged claims 2, 3, 6, and 17-20 mean

implanted *within* the animal, as opposed to *on* the animal. Paper 18, 23. Because this construction is consistent with the claims, the specification, and testimony from both parties' technical experts, the Board should adopt the construction in its Final Written Decision.

Beginning with the claim language, even a layperson would understand that “implanted *in* an animal” means implanted within that animal and is distinct from “implanted *on* an animal.” *See Gemstar-TV Guide Int’l, Inc. v. Int’l Trade Comm’n*, 383 F.3d 1352, 1372 (Fed. Cir. 2004) (stating that “in” denotes a location within a materially bounded object). Because construing the disputed terms “involves little more than the application of the widely accepted meaning of commonly understood words,” the Board need not look beyond the claims to confirm its original construction. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005).

The Board’s initial construction also aligns with the patent’s specification. *See Trustees of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1366 (Fed. Cir. 2016) (“[T]he ‘construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.’”) (citations omitted). In a key embodiment of the invention, the RFID is located “in the hollow inside of a bolus” that can be “ingested” by cattle and “retained in a part of the stomach.” EX1001,

10:30-36. This bolus configuration, wherein the RFID is unquestionably “within” the animal, is illustrated in Fig. 3. EX1001, Fig. 3, 3:16-21. When discussing the internal bolus embodiment, the inventors used the precise claim language at issue, describing the ingested RFID devices as “implanted in an animal.” EX1001, 10:36-53. In contrast, when addressing broad applications of the RFID device that may be applied *on* an object, the inventors did not use the phrase “in an animal,” but used more expansive language. *See* EX1001, 8:22-26 (“the functionalities described herein can be applied in general to asset tracking systems...in which an RFID can be attached, applied, implanted or otherwise coupled to an asset (41) such as goods”).

Petitioners contend that “implanted in an animal” includes devices implanted *on* an animal based on a purported definition in the specification, but the language Petitioners rely on refutes their position. The specification describes an RFID device as one that “can be attached, incorporated, implanted, imprinted, or held (individually and collectively referred to herein as ‘implanted’) on or within an RFID object.” EX1001, 8:8-13. Based on this, Petitioners argue that the inventors intended “implanted in an animal” to include an external device “‘attached’ to the ear.” Paper 12, 3. But at most, the cited language defines “implanted.” Nowhere does it suggest that the claim language “in an animal” should be interpreted differently than its plain and ordinary meaning to include “on an animal.” To the

contrary, the sentence Petitioners rely on *distinguishes* devices that are implanted “on” an RFID object from those that are implanted “within” an RFID object. The claims are directed to the latter, and without evidence of a clear intent to deviate from the plain and ordinary meaning of “implanted in an animal” to encompass an external ear tag, there is no basis for adopting Petitioners’ construction. This is particularly true here where Petitioners’ construction would read “in an animal” out of the claims. *See Digital-Vending Servs. Int’l, LLC v. Univ. of Phoenix, Inc.*, 672 F.3d 1270, 1275 (Fed. Cir. 2012) (noting claims should be construed “such that words in a claim are not rendered superfluous”).

Although the claim language and specification alone are sufficient to support the Board’s initial construction, testimony from both parties’ experts provides additional support. Before Patent Owner showed in its preliminary response that the Petition relies on an external device in Laitinen, Petitioners’ expert Dr. Brown-Brandl (“Brown-Brandl”) opined that a “POSA would have understood that a bolus, by definition, is implanted in a cow, with a rumen bolus implanted in the cow’s first stomach compartment.” EX1003, ¶130. She further stated that Trevarthen cites “one” example of an “implantable RFID device[,]” pointing to a subdermal microchip, not an ear tag or other external device. *Id.*; *see also id.* at ¶193-94 (distinguishing between “external” sensors and those “implanted inside the animal’s tissue). Brown-Brandl’s initial understanding that “implanted in an

animal” means implanted *within* an animal is consistent with the testimony of Patent Owner’s expert, Dr. Bowser (“Bowser”). EX2009, ¶¶42-51.

V. GROUNDS 1 AND 2 FAIL BECAUSE PETITIONERS DO NOT ESTABLISH THAT TREVARTHEN IS A PRINTED PUBLICATION

Grounds 1 and 2 cannot support a finding of unpatentability because Petitioners fail to prove by a preponderance of the evidence that Trevarthen qualifies as prior art. Petitioners claim that Trevarthen, an electronic copy of an undergraduate thesis, was publicly accessible to persons of skill who would have located a digital copy of the paper “by keyword searching internet search engines” prior to the critical date of the ’206 Patent. Pet., 7-9; EX1003, ¶¶25, 66-68.

Petitioners support this claim with testimony and documents provided by June Munford (“Munford”), a librarian, who opines that (1) Trevarthen was uploaded to the University of Wollongong’s institutional repository “Research Online” prior to the critical date, and (2) documents uploaded to this repository were “usually available on Google the following day,” and therefore locatable via a Google search query. Pet., 7-9; EX1031, ¶¶16-20.

Petitioners, however, fail to show accessibility by a preponderance of the evidence for at least two reasons. First, the materials Munford relies on *do not* show that Trevarthen would have been “available,” *i.e.*, meaningfully indexed and accessible, on Google as of the critical date. At best, they show that the University gave Google access to items in the repository at some point. But as Meredith

Knoff (“Knoff”), a university librarian with experience conducting academic research across interdisciplinary resources, testified, giving Google access to a webpage or document does not mean that it was in fact indexed or findable through Google, especially at the relevant time. EX2011, ¶¶23-28.

The second reason to discount Munford’s testimony is that her argument depends on taking as true statements in an article describing the University’s intended practice, and not actual, affirmative evidence that these practices were followed with respect to Trevarthen, or any other undergraduate student thesis. This flaw is fatal where both Bowser and Knoff were unable to locate Trevarthen in a date-limited search with the keywords Petitioners identify. EX2009, ¶¶95-111; EX2011, ¶¶32-39.

A. Standard for 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 with no evidence a search engine query would have led to the reference).

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.”).

B. Trevarthen Was Not Publicly Accessible Before September 15, 2009

At institution, the Board credited Petitioners with arguing that the mere inclusion of Trevarthen in the Research Online repository rendered the reference publicly accessible, but Petitioners do not (and cannot) make that argument. The Petition is silent with respect to the existence of any search functionality built into the Research Online platform, let alone whether such functionality would be

effective or what searches would lead to Trevarthen. More definitively, Petitioners do not allege that a POSA would be independently aware of Research Online—a prerequisite to finding Trevarthen accessible via Research Online. Instead, Petitioners contend that Trevarthen was publicly accessible because, and only because, materials in the Research Online repository were accessible via an internet search. *See* Pet., 7-9. As discussed below, however, at most Petitioners’ evidence demonstrates technical accessibility, which does not qualify Trevarthen as prior art.

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

Petitioners’ argument hinges on the ability of a POSA to locate Trevarthen through a search engine query, yet Petitioners do not provide any evidence that Trevarthen was indexed by a search engine, let alone whether Trevarthen was *meaningfully indexed* so a POSA would find it with reasonable diligence.

Petitioners rely on Munford’s testimony that, because Trevarthen was available on Research Online prior to September 15, 2008, it would have been locatable to interested parties by keyword searching on a search engine. EX1031, 4, 8-9. But Munford’s testimony fails to establish that Trevarthen was indexed or that Trevarthen was locatable with reasonable diligence.

a) Petitioners Offer No Evidence of Indexing

Munford’s conclusory assertion that Trevvarthen “would have been located and indexed by Google” is without evidentiary support. Munford, who has no experience with or personal knowledge regarding the University of Wollongong or its Research Online repository, relies only on an article stating that the University’s typical practice is to make a digital copy from Research Online “available” via a search engine. EX1031, 6-8 (citing EX1031, Appendix IA01); EX2011, ¶¶13-17; EX2009, ¶116. As an initial matter, the Board should discount Munford’s ultimate opinion of accessibility because it depends entirely on taking the University’s description of its preferred practice as “fact.” While the Rules of Evidence permit experts to rely on hearsay, expert testimony should be given little to no weight where it simply adopts the statements of others and presents them as opinion. *See Wi-LAN Inc. v. Sharp Elecs. Corp.*, 992 F.3d 1366, 1374–75 (Fed. Cir. 2021) (affirming rejection of expert testimony that merely repeated content of source materials without providing additional analysis); *Cardiovascular Systems, Inc. v. Shockwave Medical, Inc.*, IPR2019-00405, Paper 99 at 53-58, 82 (P.T.A.B. Feb. 2, 2023) (ascribing little probative weight to expert testimony relying on truth of statements from authors who had not been established to have relevant knowledge or lack of bias). And at no point do Munford or Petitioners provide proof that Research Online actually follows such repository practices for undergraduate

theses, nor do they provide any proof as to how, when, or if Trevarthen became “available” via a search engine.

Moreover, Munford’s assumption that Trevarthen became “available” the day after it was uploaded to Research Online runs contrary to Google’s indexing capabilities at the time. As Knoff testified, adding a reference to a university open access repository like Research Online merely provides permission for Google to index the reference, it does not guarantee indexing by Google or any other search engine. EX2011, ¶¶18-25. Particularly prior to September 2008, an undergraduate thesis on a university repository may not have been indexed at all unless a web crawler was sent directly to the webpage. EX2011, ¶25. Thus, without direct support showing that Trevarthen was indexed and available on Google prior to September 15, 2008, Petitioners cannot rely on the assumption that Research Online references are “usually available” the next day to demonstrate public accessibility.

b) Locating Trevarthen Would Have Required More Than “Reasonable Diligence”

Even assuming that the electronic copy of Trevarthen was “available” on Google or other commercial search engines, Petitioners offer no affirmative evidence that such indexing was sufficient to allow an interested party to locate the reference with reasonable diligence. Munford summarily concludes that a POSA would find Trevarthen on a search engine by “entering terms found in the full text

of Trevarthen,” but provides no evidence to support such a conclusion. EX1031, 8. Munford did not conduct any keyword searches, identify any search terms that would successfully locate Trevarthen, or otherwise verify the steps an interested party would take to find Trevarthen on a commercial search engine prior to September 15, 2008. Without any additional expertise or personal knowledge regarding an online search that would lead to Trevarthen, Munford’s declaration cannot carry Petitioners’ burden to prove that Trevarthen was sufficiently indexed to be locatable by a POSA with reasonable diligence. *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* EX2011, ¶¶26-28.

In contrast to Munford, Patent Owner’s experts *did* attempt to recreate the suggested search on Google, but neither could locate Trevarthen. EX2009, ¶¶95-111; EX2011, ¶¶32-39. For example, Bowser performed Google searches, limiting the date range to before September 15, 2009, and using the search terms Petitioners contend a POSA would have used. EX2009, ¶¶95-111; EX1031, 8. By limiting the date range in this way, Bowser’s search returned results that Google identified as most relevant to that time period. EX2011, ¶33. Based on this searching, the

various combinations of search terms either returned very few results—none of which were Trevarthen—or tens of thousands to tens of millions of results.

EX2009, ¶¶97-100. Trevarthen still did not populate as a search result when Bowser added “trevarthen” to the search terms. EX2009, ¶¶101-106. Knoff confirmed Bowser’s results with even more targeted searches for the keywords between January 1, 2006 and September 15, 2009—the relevant time period in which Petitioners allege Trevarthen would have been available on Google—and could not locate Trevarthen. EX2011, ¶¶34-48. According to Knoff, this inability to locate Trevarthen by recreating a POSA’s search engine query demonstrates that Trevarthen would not have been locatable before the critical date. EX2011, ¶¶33-40.

Even if Trevarthen was technically “on” Google, its absence from search results means that Trevarthen would not have been located with reasonable diligence. Google’s indexing of a reference has no impact on its findability. EX2011, ¶¶26-27. Instead, findability via Google relies entirely on Google’s relevance algorithm, which takes into consideration the number of citations and variety of locations where the reference appears. *Id.* For “grey literature” such as an uncited undergraduate thesis, however, Google search results deprioritize such references, making them notoriously difficult to locate. EX2011, ¶28. Moreover, individuals conducting research have a finite amount of search persistence, which

invariably restricts web research to the first few pages of search results. EX2011, ¶¶29-31; *see also Acceleration Bay*, 908 F.3d 765 at 773 (recognizing that “skimming through potentially hundreds of titles” would require more than reasonable diligence). Given that Trevarthen only existed on Research Online and either did not populate at all or not in the first twenty-five pages of results from any combination of the suggested search terms, a POSA would have needed in depth knowledge of discovery tools or independent awareness of Research Online to locate Trevarthen. EX2011, ¶¶31, 39-40. Thus, a POSA would not have located Trevarthen on a search engine with reasonable diligence.

Finally, contrary to the Board’s initial interpretation of Petitioners’ argument, Petitioners do not allege that a POSA would have found Trevarthen using any search functionality within Research Online. 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.”); EX2009, ¶¶113-122. 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.

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

The Board seemingly credited Trevarthen’s existence on Research Online and the “associated download statistics” as evidence that Trevarthen was accessible prior to the critical date. But such a conclusion relies on the flawed assumptions that the download counts are reliable, and the downloads resulted from individuals who located Trevarthen via a Google search. This is both inaccurate and not how Petitioners rely on such evidence. Petitioners’ purported evidence regarding Trevarthen’s existence on Research Online demonstrates no more than technical accessibility of Trevarthen on Research Online, which critically is not the same as public accessibility. *See Acceleration Bay*, 908 F.3d at 773. For the same reason, Petitioners’ additional evidence—archived Wayback Machine copies of Trevarthen on Research Online (EX1030, EXSA-B) and a citation in an International Search Report conducted for a New Zealand-based international patent application (EXS1028-29)—also fails to establish that Trevarthen was locatable via an internet search engine by a POSA exercising reasonable diligence.

a) Wayback Machine Archives Only Demonstrate Technical Accessibility

Petitioners offer Wayback Machine archives of Trevarthen on Research Online to “confirm[] the public accessibility [of] the Trevarthen thesis,” but this exact evidence was recently rejected by the Board as merely showing that a reference was “technically accessible” online. *First Solar*, IPR2023-00827, Paper 13 at 18. In fact, Petitioners provide a nearly verbatim affidavit from Nathaniel E. Frank-White (“the White Affidavit”) (EX1030), a Records Request Processor at the Internet Archive, to the one the Board rejected in *First Solar*. *Id.* at 14-18. In that case, the Board determined that the White Affidavit only established that the webpage existed, not 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.” *See id.* But as explained above, Petitioners only allege that a POSA would have found Trevarthen by keyword searching on an internet search engine. The Wayback Machine archives thus only serve to establish that Trevarthen technically existed on the Research Online repository, not that it was publicly accessible. *See Samsung Elecs.*, 929 F.3d at 1369.

Petitioners also improperly attempt to equate downloads of Trevarthen to public accessibility, which once again confuses technical accessibility for public accessibility. *See MHL Custom*, 2023 WL 5748755, at *3-4 (finding sufficient evidence to support jury finding of no public accessibility despite online

downloads of reference prior to critical date). The Petition provides no evidence regarding how many unique individuals downloaded the reference, who those individuals are, how those individuals located the reference, or whether the download count is reliable. Petitioners likewise fail to show that the alleged downloads resulted from an interested person who located Trevarthen via a search engine. Indeed, download counts tracked by institutional repositories are known to be unreliable, and even if they were reliable, all downloads could have resulted from Research Online directly, which has no bearing on Trevarthen's findability on Google. EX2011, ¶21; EX2009, ¶116. Thus, without any evidence of how an interested person would find Trevarthen in the first instance, any alleged downloads from Research Online cannot meet Petitioners heavy evidentiary 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 Patent Owner's experts show, Petitioners' conclusory assertion that a POSA would have located Trevarthen via an internet search engine

is inaccurate. EX2011, ¶¶32-39; EX2009, ¶¶95-111. Petitioners thus cannot “corroborate[]” what they failed to establish in the first instance.

Even so, the International Search Report cannot overcome Bowser’s demonstration that a POSA would not have located Trevarthen as Petitioners suggest. The Australian Patent Office examiner seemingly consulted several databases, including the “internet,” but contrary to the Institution Decision’s assumption that the examiner identified Trevarthen using an internet search, the search report does not specify which database or search terms, if any, actually led the examiner to Trevarthen, nor does it specify the effort required to find Trevarthen. *See* EX1028, 1. By making this assumption, the Board places undue emphasis on *Valve Corp. v. Ironburg Inventions Ltd.*, which has no application to the facts here. In *Valve*, the Court noted that an examiner’s ability to access a reference was probative of public accessibility where the examiner had located the reference through a “brief” internet search. 8 F.4th 1364, 1373–76 (Fed. Cir. 2021) (determining the reference to be prior art in view of “overwhelming evidence,” including that the inventor himself facilitated the publication of the reference to promote his business to the general public). Here, Petitioners provide no evidence or argument that the Australian examiner located Trevarthen with an internet search engine, let alone whether such a search was “brief.” Without any evidence showing that the examiner found Trevarthen with reasonable diligence, the

International Search Report cannot independently establish Trevarthen's public accessibility. And because Petitioners failed to allege that a POSA would look to any resource other than an "internet search engine," the International Search Report likewise cannot "corroborate[]" Trevarthen's alleged public accessibility. Instead, in direct contradiction to Petitioners' alleged evidence, Bowser and Knoff followed the steps Petitioners suggested a POSA would take and could not find Trevarthen. EX2009, ¶¶95-111; EX2011, ¶¶32-39. Petitioners therefore fail to establish that Trevarthen was publicly accessible prior to the critical date, and Grounds 1 and 2 should be denied.

VI. GROUND 1 AND 2 – PETITIONERS FAIL TO SHOW THAT TREVARTHEN RENDERS CLAIMS 1-4, 6, AND 17-20 OBVIOUS

Petitioners' Grounds 1 and 2 ask the Board to find obviousness based on a combination of disparate statements throughout Trevarthen's 169-page undergraduate thesis, but Petitioners fail to provide the requisite evidence of reasons to combine and expectation of success for the Board to reach that conclusion. Trevarthen comprises multiple "chapters," including a "review" of other literature, case studies of existing dairy farms in Australia, and a discussion of a speculative "theoretical framework" intended to "provide possible direction for future research." EX1005, Chpts. 2-6; EX2009, ¶¶52-57. Petitioners' obviousness grounds rely on a combination of statements throughout these distinct discussions in Trevarthen, including:

- relying on “temperature sensing” microchip from Trevarthen’s literature review for element 1[C] (Pet. 13-15; EX1005, 24-25);
- relying on the recording of “how much milk each cow is producing” at Cochrane Dairy for element 1[D] (Pet. 15; EX1005, 80);
- relying on hypothetical use of “milk meters” in the theoretical framework for elements 1[D] and 1[F] (Pet. 15, 22; EX1005, 112, 122);
- relying on discussion of detecting “fluctuations in the body temperature” in Trevarthen’s theoretical framework for element 1[E] (Pet. 17; EX1005, 121-122);
- relying on discussion of potential use of “milking meters” at Cochrane Dairy for element 1[E] (Pet. 18-19; EX1005, 98);
- citing separate discussions of “treatment” data in theoretical framework and Cochrane Dairy for claim 4 (Pet. 25; EX1005, 89, 93, 101)); and
- describing two distinct “systems” for retrieving temperature data as if they were a single system for claim 6 (Pet. 27, EX1005, 122).

In each of the foregoing examples, Petitioners fail to sufficiently explain why a POSA would combine elements from different discussions in Trevarthen, and do not even address expectation of success. Instead, Petitioners’ obviousness

argument appears to rely on the mere fact that these statements are made in the same undergraduate thesis. That is not the law. *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017) (requiring proof of reason to combine and expectation of success to show single-reference obviousness). For these reasons, and the more detailed reasons provided below, Petitioners have not shown that Trevarthen alone renders the claims obvious.

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

1. All Challenged Claims: Using “Sensed” Information and “Milk” Information in a System Arranged as Claimed

Although Petitioners bear the burden of proving unpatentability based on the claims as properly construed, the Petition proposes two constructions for element 1[E], and fails to take a position on which is correct. Similarly, the Board elected not to provide a preliminary construction of that element in the Institution Decision. Patent Owner objects to being forced to defend the validity of its patent under multiple possible claim constructions in this proceeding as prejudicial, particularly in view of the word count limits. In any event, Trevarthen does not disclose or render obvious the element under either of Petitioners’ proposed interpretations.

Under both potential constructions, claim element 1[E]’s recitation of “said animal information stored in said database” refers to the “amount of milk

production or a number of days in milk” in element 1[D] and requires such information to be entered into a logical expression. The claim further requires “sensed animal information retrieved from said RFID device” to be entered into a logical expression in the same system. EX2009, ¶¶124-125. But Trevarthen does not disclose any system incorporating both types of information into a single integrated system. Rather, its discussions of milk production and temperature-sensing devices reflect disparate teachings without providing a reason to combine them, as required under *In re Stepan Co.*, 868 F.3d 1342, 1346 n.1 (Fed. Cir. 2017).

a) Trevarthen’s References to “Milk Meters” and
“Temperature Monitoring” Involve Disparate Teachings

Trevarthen’s only references to milk production occur in three discussions of “milk meters,” which are completely disconnected from any discussion of temperature monitoring. EX2009, ¶¶126-131. First, Petitioners discuss “milk meters” as a future improvement at Cochrane Dairy, which was a “case study” separate from Trevarthen’s discussion of a “theoretical framework.” Pet., 18-20 (citing EX1005, 98); EX2009, ¶¶127. The Cochranes employed basic “ear tags” that do not include temperature sensors, and there is no mention of temperature monitoring in Trevarthen’s study of the farm. EX2009, ¶131. Second, Petitioners refer to Trevarthen’s discussion of recognizing “patterns in the [milk] production of each cow,” which is also unrelated to any discussion of temperature monitoring. See Pet., 18 (citing EX1005, 109). Trevarthen was speculating about using milk

meters to control automated “feed bins” in the future. EX1005, 108-110; EX2009, ¶132-33. Trevarthen never suggested that the combination of feed bins and milk meters should be integrated into a system that measures temperature with an RFID device. EX2009, ¶134-35. 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; EX1005, 115. But that discussion is part of a standalone section on “Milk Meters.” As with the other disclosures Petitioners rely on, the statement says nothing about using milk meters in a system incorporating RFID devices that sense animal information as claimed. EX2009, ¶136.

Trevarthen’s brief discussions of temperature monitoring are separate and unrelated to any of the foregoing discussions of milk meters. Trevarthen’s background section first mentions a “relatively new bio-thermo RFID microchip” that is “injected into the animal (under the skin)” to allegedly “provide temperature readings.” EX1005, 24; EX2009, ¶137. In a later discussion of the potential use of such devices in a theoretical framework, Trevarthen acknowledges that they are not part of any actual system—let alone in combination with milk meters—because the technology has not yet been “extended to the livestock industry.” EX1005, 121; EX2009, ¶138. In short, Trevarthen’s temperature monitoring and milk production

discussions refer to different systems and there is no suggestion to use them together.

b) POSAs Would Have Had No Reason to Combine Trevarthen's Disparate Teachings to Achieve the Claims

Relying on disparate teachings from a single reference requires establishing a reason to combine those teachings, which Petitioners have failed to do. *See Stepan*, 868 F.3d at 1346 n.1. In the Institution Decision, the Board recognized that “*Stepan* provides the proper framework for single-reference obviousness” and that, in that case, the claims were not obvious because there was no reason to combine disparate teachings within the reference. Paper 18, 37. The Board then credited Petitioners with identifying “detect[ing] illness in livestock” as a “motivation to combine Trevarthen’s separate disclosures” of “milk meters” and “temperature monitoring by RFID.” *Id.*, 38. But detecting illness would not have provided a reason to combine those separate disclosures. EX2009, ¶139.

The purported reason to combine fails because there is nothing in the record to support that combining temperature and milk production enhances illness detection. *See* Pet. 19 (citing EX1003, ¶¶111-116). In an attempt to find support, Brown-Brandl relies on van den Berg, setting out its purported teaching of combining temperature and milk yield to achieve “higher accuracy” in determining illness in the following heavily modified quote:

Indeed, van den Berg et al. (Ex 1023) expressly teaches that “one or more of the parameters [including temperature and milk yield] may be combined ... to achieve **higher accuracy**” in determining whether an animal is ill or in heat.

EX1003, ¶115 (citing EX1023, 4:12-22) (brackets, ellipses, and emphasis in original). In the unmodified quote from van den Berg, however, there is no “express teaching” that temperature and milk yield should be combined to more accurately detect illness:

One or more of the parameters may be combined with the dead time and analyzed by a computer. In 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, 4:20-25; EX2009, ¶¶140-144. As Brown-Brandl admitted, van den Berg was “explaining a way that one could achieve a **higher accuracy of a temperature measurement**,” not illness detection. EX2010, 201:15-20 (emphasis added).

Moreover, in the passage cited by Brown-Brandl, van den Berg does not suggest combining any parameters to distinguish *between* heat and illness, as Petitioners suggest. See Pet. 20. Rather, he posits that the parameters may distinguish between animals that are in heat or ill from animals that are neither in heat nor ill. EX2009, ¶145-46; EX1023, 4:19-21 (“These parameters for ill or estrous animals are different from those for healthy and non-estrous animals.”).

c) POSAs Would Have Had No Expectation of Success in Combining Trevarthen’s Disparate Teachings

A showing of obviousness based on a combination of disparate teachings in a reference further requires proof of a reasonable expectation of success by POSAs, which is not present in Petitioners’ proposed combination. *See Stepan*, 868 F.3d at 1346 n.1. Petitioners cite de Mol in contending that creating a logical expression with both temperature and milk production “would have been easily accomplished,” but that reference demonstrates why POSAs would *not* have expected success in combining temperature and milk yield to determine whether a cow was ill. EX2009, ¶147. Critically, de Mol expressly cautions against using his theoretical model in any “practical application” because it generates too many “false positive alerts.” EX1033, 184 (suggesting “additional research”); EX2009, ¶148. This would have led POSAs to expect failure in trying using the model to achieve the claims. EX2009, ¶¶148-150. As Bowser testified, and Brown-Brandl confirmed, false positive alerts would cost the farmer time, money, and loss of production, defeating the purpose of alerts. *Id.*, ¶149; EX2010, 145:11-13 (“[I]f a system puts out too many alerts, it becomes an obsolete system”).

2. *All Challenged Claims: “Retriev[ing] Sensed Animal Information from Said RFID Device”*

The Board acknowledges that Trevarthen does not disclose incorporating a temperature sensing RFID in an animal management system and relies on a

misapprehension of Trevarthen's disclosure to find that such a device would have been obvious. In the Institution Decision, the Board determined that "Trevarthen does not disclose actually incorporating a temperature sensing RFID," but that it "suggests incorporating commercially available RFID-compatible temperature sensors into an existing RFID system to detect an animal's temperature variations." Paper 18, 34-35. By Trevarthen's own admission, however, the cited devices were *not* commercially available. The only temperature-sensing RFID device that Trevarthen refers to is the "bio-thermo RFID microchip," which is "injected into the animal (under the skin)." EX1005, 24. Trevarthen is explicit that such devices were *not* commercially available or suitable for livestock—there were not even "price estimates available for microchips ***as none have been approved to date.***" EX1005, 22 (emphasis added). Trevarthen further states that, while it may be "possible to incorporate temperature sensing abilities into RFID microchips" in other applications, that practice had not yet been "extended to the livestock industry." *Id.*, 121, 123 (noting it was "being investigated"); EX2009, ¶¶151-156.

Even today, Brown-Brandl is unfamiliar with under-the-skin microchips and identified several reasons why POSAs would not have used them for livestock. She admitted that she does not have "experience or expertise with under-the-skin temperature sensors" and is "not familiar with any systems that use under-the-skin temperature sensors." EX2010, 61:22-63:7. One reason for that is because under-

the-skin sensors “involve a surgery” and do not “minimize the stress on the animals.” *Id.*, 63:8-18. Additionally, POSAs would have been “concerned” that the sensed temperature “could change depending on where [the microchip] is located” on the cow. *Id.*, 64:7-65:1. That is difficult to account for because the sensors are susceptible to “migrating.” *Id.*, 65:2-9 (“[I]f you put it in one place, it might not have stayed in one place.”). Patent Owner’s expert agrees that there are reasons why Trevarthen’s microchip was not commercially available and would not be used in an animal management system. EX2009, ¶157 (testifying that under-the-skin microchips can cause tissue damage and subject to that could hinder under-the-skin sensor functionality and impact measurements).

Implicitly acknowledging that Trevarthen fails to disclose a system capable of retrieving “sensed” data, Petitioners refer to unspecified “numerous prior art references” and cite a conclusory paragraph from its expert’s declaration to suggest it would have been obvious. *See* Pet., 14 (citing EX1003, ¶95). But there is no support for Petitioners’ suggestion. Brown-Brandl merely refers back to “background” references, none of which are relied on for Ground 1. *See* EX1003, ¶95. This is an impermissible attempt to incorporate additional arguments and prior art into the Petition by reference. *See* 37 C.F.R. §42.6(a)(3); §42.22.

In any event, Brown-Brandl’s cited references show that temperature-sensing RFID devices were uncommon and that POSAs would not have used them

in herd management systems. Bewley, for example, acknowledged that his devices were subject to “measurement error” and that “[a]dditional research is needed to evaluate the feasibility of these technologies.” EX1015, 4671–72. Hicks described “implanting a sensor” as “invasive” and “complicated” and suggested further research to determine if they can be used to measure temperature. EX1016, 434. In a paper by Brown-Brandl, she concludes that “before this system can be used in a commercial livestock setting several changes need to be made.” EX1020, 13. The remaining cited references contain similar statements that would have discouraged a POSA from using the device. *See, e.g.*, EX1021, 11 (“[T]he efficiency of the bolus needs to be improved.”); EX1017, 63 (describing a “beta test” with an under-the-skin microchip). As Bowser explains, such statements demonstrate that implanted devices were uncommon at the time of the invention, and POSAs would not have had reason to modify Trevarthen to incorporate them. EX2009, ¶¶158-159.

Petitioners’ reliance on the ’206 Patent’s discussion of “BetaTHERM Sensors” is classic hindsight bias that cannot support obviousness. *See* Pet., 14. The patent explains that the sensor could be used in a particular “bolus” configuration for measuring certain “physiological characteristics of an animal.” EX1001, 10:30-11:2. It never suggests that the disclosed configuration was known before the invention. EX2009, ¶160. Petitioners are using the patent’s disclosure

of the invention to reconstruct the claims, which is improper. *See In re Gorman*, 933 F.2d 982, 987 (Fed. Cir. 1991).

3. All Challenged Claims: “Software” That Performs Each of the Claimed “Program Instructions”

Petitioners fail to establish that Trevarthen discloses or renders obvious one or more processors or storage media that include *all* of the recited “executable program instructions.” For purposes of institution, the Board credited Petitioners for making an “inherency” argument based on their assertion that Trevarthen’s “‘software’ necessarily comprises executable program instructions stored on computer-readable media that runs on a processor.” Paper 18, 32. But merely alleging that unspecified “program instructions” are inherent is not sufficient to meet Petitioners’ burden. *See AOL Inc. v. Coho Licensing LLC*, IPR2014-00966, Paper 6 at 3-4, 14 (P.T.A.B. Nov. 20, 2014) (asserting that “computer ***necessarily includes*** instructions stored in memory” was insufficient to establish disclosure of claimed “instructions” because petition “lack[ed] sufficient detail regarding which specific set of instructions is stored in which specified memory of which specified computer”) (emphasis added). Petitioners must further establish that the specific claimed instructions are “necessarily present” or the “natural result” of the software that they identified. *See Par Pharm., Inc. v. TWi Pharms., Inc.*, 773 F.3d 1186, 1195-96 (Fed. Cir. 2014).

Petitioners fail to meet the “high standard” for establishing inherency. The “software” Petitioners rely on does not *necessarily* include program instructions that “retrieve” information from an RFID device because “[d]ata can be entered into this software application manually.” EX1005, 100. While manually entered data *may* be retrieved using program instructions as described in the ’206 specification, Trevarthen’s software does not *necessarily* have an instruction for retrieving such data. EX2009, ¶167; *Par Pharm.*, 773 F.3d at 1195 (“Inherency, however, may not be established by probabilities or possibilities.”) (quotes omitted).

Moreover, the Petition is deficient because it fails to link any of the alleged instructions to the identified “software.” EX2009, ¶¶162-168. The Federal Circuit’s affirmance of the Board’s Final Written Decision in *Garmin* is instructive. *See Garmin Int’l, Inc. v. Logantree, LP*, 825 F. App’x 894, 899 (Fed. Cir. 2020). Like here, the claims required a processor that performed instructions, namely “a microprocessor” for “interpreting movement data.” 825 F. App’x at 898. The *Garmin* petition identified a “microprocessor,” but failed to take the next step of establishing that microprocessor “interpret[s] movement data” as claimed. *Id.* The Board found that merely establishing that movement data was interpreted was not sufficient to show that the microprocessor itself executed that process. *Id.* The

Petition here suffers from the same flaw because Petitioners fail to allege that the identified processor performs the specific instructions.

4. Claim 4: Using “Health Information” to “Indicate an Occurrence of an Illness”

Petitioners’ conclusory challenge of claim 4 merely refers back to their claim 1 argument, but claim 4 includes significant limitations that the Petition fails to address. Claim 4, when read as a whole, recites a system that uses sensed physiological information from the RFID device plus additional health information associated with the animal to identify whether that animal is ill. EX2009, ¶¶169-170. An embodiment of the claim 4 invention is depicted in Fig. 6 of the ’206 Patent:

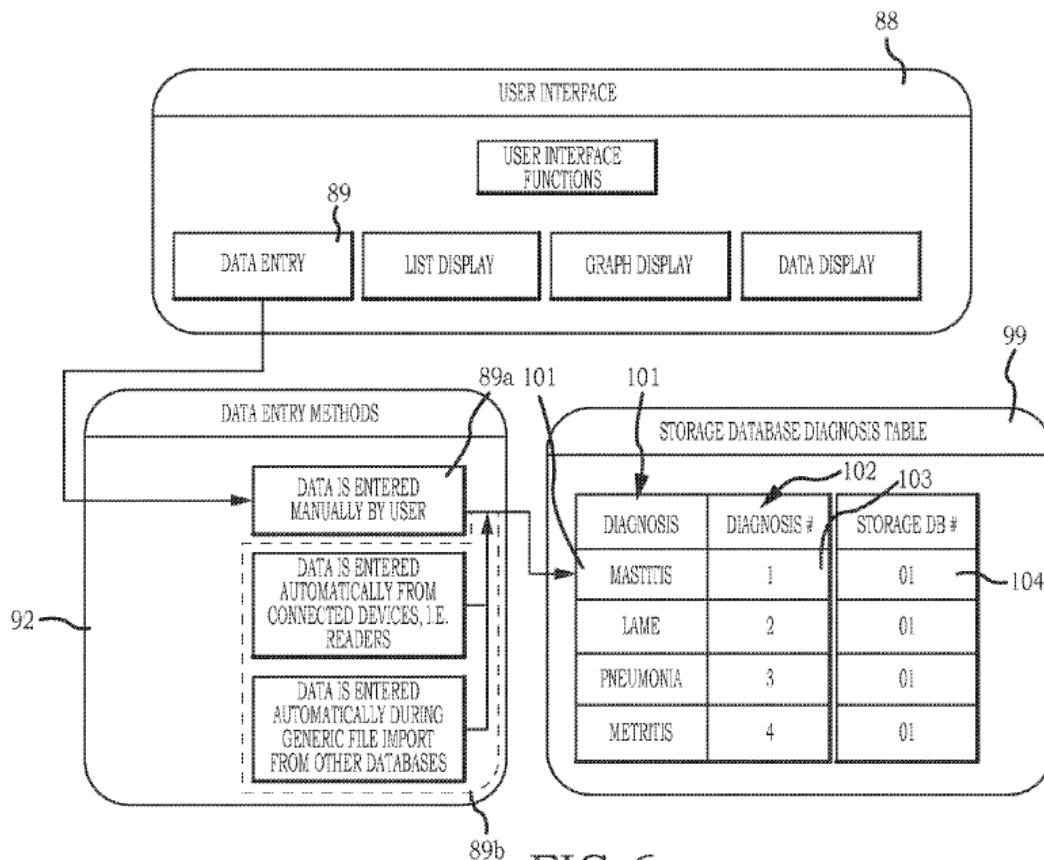


FIG. 6

The embodiment depicted in Fig. 6 uses data entered manually by the user, which may include information relevant to an animal's current health condition, with physiological data collected from RFID devices to determine a diagnosis, *i.e.*, an occurrence of illness. EX2009, ¶¶171-172. In other words, the claim requires more than storing animal information and generating alerts about temperature changes. Petitioners' reliance on their claim 1 discussion, therefore, fails to show that Trevarthen discloses or renders obvious the much narrower claim 4.

a) Trevarthen Does Not Disclose or Suggest the Use of
Stored Animal “Health Information”

The stored animal “health information” of claim 4 is distinct from sensed physiological information, such as temperature, obtained from the RFID device. EX2009, ¶173. The claims distinguish between “sensed animal information” and “animal information...stored in a database,” and require that *both* sets of information be used in the claimed logical expression to generate a logical value. Petitioners acknowledge this distinction by identifying Trevarthen’s description of herd management software that stores “treatment” history of a particular animal as the claimed animal “health information.” *Id.*, ¶174.

Contrary to Petitioners’ conclusory argument, a skilled artisan would not equate treatment history in Trevarthen with “health information” data for use in the claimed logical expression. Trevarthen’s “treatment” data comprises a log of historical treatment information that is commonly used in herd management software to record medications provided to the cow so that the user could determine whether to “withdraw” the cow’s milk from production. *Id.*, ¶174-175; EX2010, 77:7-80:2 (testifying that a treatment log “would be a normal thing” to keep track of the “the day of treatment” and “the medication of treatment” to determine “the withdrawal period”). That log could also include information about other treatments, such as when a cow’s hooves were shaved, to help schedule future treatments. EX2009, ¶174. Such a log of historical treatments is not suited

for use in a logical expression at all. *Id.*, ¶175; EX2010, 82:20-83:5 (testifying that the “only thing I am aware of is a treatment log [that] would be used to know if the – if the milk can go to human consumption”). In fact, the ’206 Patent distinguishes treatment information from the data used to indicate the occurrence of illnesses.

For example, Fig. 7 and its related discussion describe how a treatment plan can be generated and stored. The treatment plan is identified as an *output* of an alternative embodiment of the invention, and not as an input to the diagnosis functionality of Fig. 6. EX2009, ¶175.

Even if “treatments” were interpreted as the relevant type of “health information” recited in claim 4, Trevarthen’s description of herd management software that simply stores treatment history fails to suggest using such information as part of a “logical expression,” let alone one used to indicate illness. Petitioners do not even make the argument that there is some suggestion to combine Trevarthen’s high-level description of herd management software on page 101 and separate description of temperature monitoring twenty pages later to determine an occurrence of illness. Accordingly, a person of skill in the art at the time familiar with herd management software and temperature monitoring techniques would not make the leap to the invention without the benefit of hindsight. EX2009, ¶176.

b) Trevarthen Does Not Disclose or Suggest Generating a Logical Value Indicating an Occurrence of Illness

Any “logical value” obtained from Petitioners’ alleged expressions would not indicate an “occurrence of illness” as claimed. EX2009, ¶177. Petitioners argue that Trevarthen’s unspecified “functionality” to alert farmers to “fluctuations” in a cow’s temperature or milk production equates to indicating an occurrence of illness. But fluctuations in temperature and milk production can and do occur without the presence of an illness, such as when a cow is in estrus or has a reduced feed intake. *Id.*, ¶¶178-185. Thus, the fluctuations only *sometimes* correspond with illness but do not indicate an occurrence of an illness as claimed. *See Dell Techs. Inc. v. LiTL LLC*, IPR2024-00481, Paper 12 at 20, n. 8 (P.T.A.B. May 28, 2024) (finding no disclosure of “information indicative of a current mode of operation” where alleged information only “sometimes correspond[ed] with a current mode of operation”).

As an initial matter, the hypothetical temperature sensing device in Trevarthen is not capable of indicating illness itself. The device would, according to Petitioners, be based on a “relatively new bio-thermo RFID microchip.” EX1005, 24. According to Trevarthen, the device was not capable of providing information on disease identification. *Id.* (“[L]ooking to advance this technology in the future, so as to possibly provide information on an animal’s hormonal changes, blood pressure and *even possibly disease identification.*”) (emphasis

added). To the extent Trevarthen discloses using the RFID temperature sensor to identify an occurrence of diseases, therefore, it would need to be through functionality outside of the device. But Trevarthen provides *no* disclosure on how that could be achieved.

Rather than point to a disclosure in Trevarthen, Petitioners simply equate temperature fluctuation with disease, which is contrary to Trevarthen's teachings and the knowledge in the art. Petitioners' argument turns on Trevarthen's statement that "when temperature fluctuations are recognised by the system, functionality could be incorporated to allow the system to alert the farmer of such fluctuations." Pet. 22 (citing EX1005, 122). But Trevarthen itself teaches that such temperature fluctuations do not equate to illness, stating that they may be caused by "other reasons" such as the "cow is entering heat." EX1005, 121-122; EX2009, ¶178-180. And the experts agree there are several factors that cause temperature fluctuations other than illness, such as the cow's "diurnal" cycle, heat stress, activity levels, outdoor temperature, wind, rain, sunlight, stress, and amount and type of feed . EX2009, ¶¶181-183; EX2010, 65:16-69:19, 74:5-8; EX1003 ¶114.

Trevarthen's milk production-based "alert" would also fail to indicate an occurrence of an illness. Trevarthen states that "if a cow provides a significantly lower amount of milk than their usual output, the system will be able to identify

this disparity and alert the operators to check this cow.” EX1005, 115. But reduced milk production can be caused by factors other than illness, such as “the quality or amount of feed that a cow has been provided.” EX1003, ¶115 (citing EX1005, 80-81, 114); EX2010, 69:20-74:2 (testifying that milk production is “very complicated” and depends on “a lot of different things”); EX2009, ¶184 (“fluctuations in milk production can be also caused by a variety of factors”).

Petitioners further argue that a POSA would combine temperature and milk production into a single expression, but a hypothetical expression that purportedly shows mere variation in temperature and milk production still fails to indicate an illness as claimed. Fluctuations in both temperature and milk production alone would not indicate an occurrence of an illness because those fluctuations could be—and often are—each caused by factors other than illness. EX2009, ¶185.

5. *Claim 6: “Logical Expression” That Determines “If a Greater Than Selected Number of Said Illness Have Occurred” in a “Plurality of Animals” Over “a Selected Period of Time”*

Claim 6 adds multiple additional limitations that Trevarthen likewise fails to disclose or render obvious. Specifically, Trevarthen does not disclose a system capable of (a) detecting illness over a selected period of time or (b) calculating when a threshold number of illnesses has been exceeded. EX2009, ¶187. Nor does Trevarthen provide any reason to add such functionality to the hypothetical “system” Petitioners rely on.

a) Trevarthen Fails to Disclose or Render Obvious a System That Can Detect Illness for a Selected Period of Time

In attempting to identify a system capable of detecting illnesses over a selected period of time using sensed animal information, Petitioners again merge two distinct “systems” in Trevarthen without explaining why a POSA would combine them to arrive at the claims, or even acknowledging they are citing distinct approaches. EX2009, ¶¶188, 198-200. Petitioners argue that “[f]or temperature sensing, Trevarthen discloses that ‘each cow has their temperature read at a **regular interval at least twice a day**’ when the cow enters the dairy which would permit the operator to ‘view patterns of temperature change among the cows.’” Pet. 27 (quoting EX1005, 122) (emphasis by Petitioners); EX2009, ¶¶189-190. Contrary to how Petitioners present their argument, the two quotes from Trevarthen are not describing a single system but are referring to distinct approaches. EX2009, ¶¶191-192. Trevarthen’s discussion of providing temperature at “a regular interval” is made in reference to a “basic” system, whereas “patterns of temperature change among the cows” relates to a distinct “advanced” system. EX1005, 122. Petitioners do not provide any reason why a POSA would have combined elements of the “basic” and “advanced” approaches to arrive at the claimed invention.

Even if it were proper for Petitioners to rely on an unexplained and unsupported combination of Trevarthen’s “basic” and “advanced” approaches,

Trevarthen still fails to render claim 6 obvious because neither approach discloses or suggests the invention. First, Trevarthen’s “basic” system is incapable of detecting illnesses in a plurality of animals as to a selected period of time.

EX2009, ¶193. In this system, RFID readers are placed “at the entry to the dairy” to read temperatures twice a day when the cow is milked in the morning and afternoon. *See* Pet. 26-27; EX1005, 122. But the timing of the measurements prevents the detection of illness over a period of time. As Bowser testifies, a cow’s temperature is “dynamic” and follows a “diurnal” cycle in which it naturally rises and falls over the course of the day. EX2009, ¶193. Because the cows are milked in the morning and afternoon in Trevarthen’s system—when temperatures are at their high and low extremes—essentially *every* temperature recorded would be a deviation from the average temperature. *Id.* As Bowser testifies, to account for the diurnal cycle and determine abnormal fluctuations, one would need additional measurements of each animal between milkings. *Id.*, ¶193; EX2010, 165:9-11 (“If you’re looking to determine the – the cyclic nature of the temperature, you probably have it every hour.”). By design, the system is incapable of detecting abnormal temperature fluctuations and thus would not be capable of detecting illnesses using temperature as a variable. EX2009, ¶194.

Trevarthen’s “advanced” system would also be incapable of detecting illnesses in the herd as to a selected period of time. EX2009, ¶195. Trevarthen

proposes adding RFID readers to “other high congregation areas throughout the farm,” such as “near a water trough in a paddock.” EX1005, 122. According to Trevarthen, “more temperature readings can be gained between milkings, thus providing an enhanced ability to detect temperature variations, and also to view patterns of temperature change among the cows.” EX1005, 122. However, this proposal includes, in Trevarthen’s words, an “obvious flaw” distinguishing it from claim 6. *Id.* Specifically, “the temperature readings are not gained at the same time for the herd (thus making them somewhat incomparable), and it cannot be guaranteed that each cow will be read at any more frequent intervals than at the entrance to the dairy.” *Id.* Claim 6, however, requires the temperature readings to be gained at the same time for the herd, requiring both determining the number of illnesses “as to a selected period of time” and “as to said plurality of animals.” If the temperatures of the individual animals are recorded at different times, then the system cannot detect illness for the “plurality of animals” as to a “selected period of time.” EX2009, ¶196. The advanced system further fails to meet the claims because, as Trevarthen acknowledges, *each* cow will not be read at any more frequent intervals than at the entrance to the dairy (*i.e.*, twice a day at milking times). Therefore, like the basic system, the advanced system cannot detect illness for the entire “plurality of animals” as claimed. *Id.*, ¶197.

b) Trevarthen Fails to Disclose or Render Obvious
Calculating When a Threshold Number of Illnesses Has
Been Exceeded

Trevarthen further fails to disclose calculating the number of illnesses in the herd and issuing an alert “if a greater than selected number of said illness have occurred.” Petitioners acknowledge that and argue that Trevarthen’s “objectives” provide a reason to generate such an alert. *See* Pet. 28. But that is not how a skilled artisan would understand the reference. EX2009, ¶201. Petitioners contend that a POSA would have modified Trevarthen to “issue an alert when a threshold number of illnesses (*i.e.*, a selected number of illnesses) is met or exceeded” to “satisfy Trevarthen’s express objective of early disease outbreak detection.” Pet. 28. But early disease outbreak detection was not Trevarthen’s express objective. EX2009, ¶200. Trevarthen discussed prior disease outbreaks solely in connection with the increased adoption of animal *identification* technology, not illness detection. EX1005, Abstract, 1, 3–5, 17–22, 33. In view of this trend, Trevarthen’s express objective was to identify how individual farmers can utilize the technology to “enhance total farm management, derive additional benefits and maximise return on investment for the farmer.” EX1005, 1; *see also id.*, 7. In other words, Trevarthen was aimed at improving individual farms, not detecting global disease outbreaks as Petitioners contend. EX2009, ¶¶201-202.

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

1. Ground 2 Fails for Similar Reasons as Ground 1

Ground 2 challenges claims 17-20 and fails for similar reasons as Ground 1. EX2009, ¶¶203-206. First, Ground 2 relies on Trevarthen as a primary reference, which Petitioners have failed to establish as prior art. *See* §V. 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. *See* EX2009, ¶¶71-72. As discussed in Ground 1, Petitioners fail to establish that Trevarthen alone discloses or renders obvious “a processor” or “computer readable media” that perform or store the specific recited “instructions.” *See* §VI.A.3. 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 VI.A.2, Trevarthen fails to disclose or render obvious “retriev[ing] sensed animal information from said RFID device.”

With respect to claim 18, Petitioners cannot establish obviousness for the same reasons claim 4 remains patentable. *See* §VI.A.4; EX2009, ¶207. Like claim 4, claim 18 requires incorporating “sensed animal information” and “health information” to obtain “as to a selected period of time” a “logical value” that

“indicates occurrence of an illness of said animal.” Petitioners rely solely on Trevarthen for these limitations and do not rely on Brune. As explained in Section VI.A.4, Trevarthen fails to disclose or render obvious (a) the use of stored animal “health information” in a logical expression as claimed or (b) generating a logical value that indicates “an occurrence of illness.”

Additionally, Petitioners fail to establish the obviousness of claim 19 for reasons discussed for claim 6. §VI.A.5(a); EX2009, ¶208. Like claim 6, claim 19 requires a “logical value” that “indicates a number of occurrences of said illness in a plurality of animals.” And because claim 19 depends from claim 18, that logical value must be determined for the plurality of animals “as to a selected period of time.” Petitioners simply refer back to their claim 6 analysis of the “logical value” limitation in claim 19 and do not rely on Brune. And they fail to show that it would have been obvious based on Trevarthen alone to generate a logical value that indicates a number of illnesses in a plurality of animals as to a selected period of time for the reasons. *See* §VI.A.5(a).

Petitioners also fail to establish the obviousness of claim 20 for the reasons discussed for claim 6. §VI.A.5(b); EX2009, ¶209. Like claim 6, claim 20 requires generating a logical value that “indicates occurrence of a greater than a pre-selected number of said illness in said plurality of animals.” Petitioners again do not rely on a combination with Brune and instead simply refer back to their

discussion of claim 6. However, as explained above, Petitioners fail to establish a reason why POSAs would modify Trevarthen to generate an alert based on the number of illnesses in the herd. *See* §VI.A.5(b).

2. Ground 2 Fails for Additional Independent Reasons

Ground 2 independently fails because Petitioners do not provide a reason to combine Trevarthen and Brune to “retrieve date-time information *from said RFID device*” as recited in claim 17. And while a combination of retrieving date-time information from both an RFID device and reader could potentially satisfy the limitation, Petitioners acknowledge that Trevarthen does not disclose it because, instead of retrieving *any* date-time information from an “RFID device” as claimed, Trevarthen retrieves *all* of its date-time data from an RFID “reader.” Pet. 31-32. Petitioners therefore rely on Brune’s alleged disclosure of an RFID device that provides all of the date-time information. *Id.*, 28-33.

The only reason Petitioners give for replacing Trevarthen’s time-stamping technique with Brune’s time-stamping technique is an alleged “importance of time-stamping to Trevarthen,” but this has no merit because Trevarthen already has a time-stamping technique that the experts agree works better for his proposed systems. *See* Pet. 32. As Petitioners recognize, Trevarthen provides a means of time-stamping that relies entirely on an RFID *reader* and does not use any information from an RFID *device*. Pet., 28, 31. And there would have been no

reason to swap Brune’s device-based time stamping technique with Trevarthen’s RFID reader-based technique because they “independently accomplish similar functions.” *See Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1369 (Fed. Cir. 2012); EX2009, ¶210.

In fact, there were reasons not to swap Brune’s technique for Trevarthen’s. As Petitioners’ expert testified, “there is actually a reason that you want to get the date-time information from the RFID reader instead of the RFID device,” which POSAs would have been aware of. EX2010, 150:2-7, 152:10-14. According to Brown-Brandl, “if every [RFID] device has its own date-time, date-time chips tend to – to not clock time at the same rate,” which “can add up over time.” *Id.*, 150:8-11. But “if you are reading the time-date at the reader, you know that that time stamp is the same time stamp regardless of animal.” *Id.*, 150:12-21 (testifying that such technique can be “very useful” for time-stamping). In fact, in systems like Trevarthen’s where measurements are read “as the cow enters a milking parlor,” the “time-date stamp would be *ideal* to be read at the reader.” *Id.*, 152:4-9 (emphasis added). Bowser similarly testified that POSAs would not have seen a reason to modify Trevarthen to incorporate Brune’s time-stamping technique in view of Trevarthen’s own method of time-stamping. EX2009, ¶211.

Petitioners also cannot establish obviousness via their single unsupported statement that “it would have been obvious to try having the RFID device time-

stamp the retrieved information rather than the RFID reader.” Pet., 32.

Establishing the “obvious to try” rationale requires showing that “there is a design need or market pressure to solve a problem” and that “there are a finite number of identified, predictable solutions.” *See Uber Techs., Inc. v. X One, Inc.*, 957 F.3d 1334, 1338–1339 (Fed. Cir 2020) (quoting *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007)). Petitioners do not address those requirements at all. Nor could they have. Nothing in the asserted art suggests a “design need,” “market pressure,” or “problem” that would prompt a POSA to try Brune’s time-stamping method in Trevarthen. EX2009, ¶212. To the contrary, as explained above, POSAs would have considered the RFID reader-based method preferable in Trevarthen’s system. As Bowser testifies, a system with device-based timers is more complex and more prone to failure due to issues such as limited battery life, unsynchronized timers, and the need to communicate with the reader. *Id.* The same issues do not exist for the reader-based system. *Id.* Moreover, POSAs would not have been aware of only a “finite” number of solutions, as there are various means of time-stamping, such as using “computer software, approximation, photo gates, load cells, image analysis, manual recording, and the milk meters.” *Id.*

Petitioners’ single conclusory statement that “Trevarthen discloses including GPS, which provides date-time information” also cannot support obviousness. *See* Pet. 32-33; EX2009, ¶213. Petitioners fail to explain how including GPS entails

“retriev[ing] date-time information from said RFID device” or otherwise renders it obvious. Pet., 32–33. They merely cite to their expert and an exhibit without any further discussion, which is an improper incorporation-by-reference.

VII. GROUNDS 3 AND 4 – PETITIONERS FAIL TO SHOW THAT THE LAITINEN COMBINATIONS RENDER CLAIMS 1-4, 6, AND 17-20 OBVIOUS

Laitinen, a patent titled “Surveillance System for Animals,” describes a “surveillance system” for governments and other interest groups to monitor multiple animal herds at a “global level.” EX1006, Abstract; EX2009, ¶¶58-70. Laitinen’s surveillance system requires three levels, the lowest of which is the “pico level,” relied on by Petitioners. EX1006, 3:28-29. There are two distinct pico level devices described in Laitinen, one that is “external” and one that is “implanted inside the animal’s tissue (100b).” *Id.*, 5:38-43. Only the “external” Laitinen device, which fails to meet the “implanted in an animal limitation,” can sense an animal’s body temperature, movements, or location. *Id.*, 5:44-49. Petitioners’ rely solely on Laitinen’s “external” device. In fact, Petitioners’ obviousness arguments *require* the external device because the purported motivation turns on measuring “body temperature and movement” in connection with assessing “heat control.” EX1006, 8:5-15. Petitioners do not argue that a POSA would modify the external device to be “implanted in an animal,” nor

explain how a POSA could successfully achieve that modification. For this and the reasons provided below, Laitinen fails to render all Challenged Claims obvious.

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

1. *All Challenged Claims: Incorporating “an Amount of Milk Production or a Number of Days in Milk” Into a “Logical Expression” to Obtain a “Logical Value”*

Petitioners identify two alleged “logical expressions” in Laitinen, neither of which include “an amount of milk production or a number of days in milk.”

Petitioners incorrectly contend that Laitinen teaches (1) a “logical expression” in the form of a system that purportedly monitors heat based on temperature and movement measurements and (2) a mathematical function implemented at the “global level” that assesses the efficacy of animal medication. As explained below, even if the foregoing amount to “logical expressions,” a POSA would have had no reason to modify them to include the recited milk information. EX2009, ¶215.

a) No Reason to Modify Laitinen’s “Heat Monitoring” System to Incorporate Milk Information

Petitioners contend that “Laitinen discloses a first logical expression to determine if a cow is in heat” based on a heat monitoring system that fails to incorporate “an amount of milk production or a number of days in milk” as claimed. See Pet., 48; EX2009, ¶216. Acknowledging that the system does not use the claimed milk information, Petitioners cite Liao’s “days in milk (DIM)” and

“peak milk yield” parameters. To support this combination, Petitioners rely on Brown-Brandl’s testimony that a POSA would have modified Laitinen “to include milk production and days in milk information...to improve its accuracy and reliability at determining whether a cow is in heat.” EX1003, ¶185. But this opinion is premised on a flawed reading of Liao.

Contrary to Brown-Brandl’s declaration, Liao does not teach that “milk production and days in milk information are also useful for determining whether a cow *is in heat* and ready for artificial insemination.” *Id.* (citing Liao, 12:3-15) (emphasis added); *see also* EX2009, ¶¶73-80. Instead, as Brown-Brandl admitted in her deposition, Liao uses milk yield and DIM solely as an *input* to make an “insemination decision,” which is different from detecting heat. EX2010, 175:11-176:2, 181:14-182:14; EX2009, ¶¶217-219. And both Liao and Petitioners’ expert acknowledge cases where an animal should not be inseminated when it *is* in heat, as well as where an animal should be inseminated when it *is not* in heat. EX1010, 10 (chart); 181:18-182:14. Therefore, it does not follow that Liao’s peak yield and DIM parameters are “useful” for detecting heat, let alone that they would improve the “accuracy and reliability” in doing so. EX2009, ¶219.

In crediting Petitioners’ obviousness argument, the Board appears to have misapprehended Liao’s disclosure as teaching “logical expressions for determining whether cows are *in heat*.” Paper 18, 57 (emphasis added). But Liao does not

explain where its “heat” input comes from or what variables, if any, are used to determine heat. EX2010, 183:14-21 (testifying that Liao does not “talk about specific places or sensors [its input data] needs to come from”), 222:5-15 (“verifying” that Liao does not describe a sensor that would detect heat).

Presumably, the Board’s misunderstanding is based on its determination that Liao uses “heat” as “an input parameter in a logical expression, along with milk production, for making insemination decisions.” Paper 18, 58. But, as noted above, making insemination decisions and detecting heat are different determinations with different inputs. Moreover, Liao never suggests that milk production (or DIM) improve the “accuracy and reliability” of insemination decisions, let alone heat detection as Petitioners contend. EX2009, ¶220.

Petitioners’ expert admits that Liao does not “provide any reason why [its] particular input parameters were chosen.” EX2010, 177:8-12. Accordingly, Liao’s use of milk production and DIM to make insemination decisions cannot possibly motivate a POSA to incorporate those parameters into Laitinen’s purported heat detection system.

Liao provides additional reasons why a POSA would not use DIM and milk yield in Laitinen’s heat monitoring system. Laitinen’s heat monitoring system uses a so-called “alarm limit,” which is a type of “Boolean” equation that assesses whether measurements have reached a set point. EX2009, ¶224. Liao explains

that an “insemination decision,” in contrast, relies on many factors, and “often the farmer himself/herself is not explicitly aware of exactly which these factors are, or how they influence the insemination decision.” EX1010, 1:21-25. Liao further states, “[d]airy farm management decision-making is generally a complex task, which is difficult to model mathematically with a satisfying degree of accuracy.” *Id.*, 1:13-15. Thus, “it may be practically impossible to formulate a Boolean, or other mathematical model, for the decision process.” *Id.*, 1:25-27; *see also* EX2010, 169:3-8 (testifying that Liao is a “reliable source of information” and that she would have not “have any reason to doubt any of the assertion in Liao”). These statements would have discouraged a POSA from combining Liao’s parameters into Laitinen’s Boolean “alarm limit.” EX2009, ¶¶221-226.

b) No Reason to Modify Laitinen’s Global Level “Inverse Function” to Incorporate Milk Information

Petitioners’ alternative argument that a POSA would have modified Laitinen’s alleged “logical expression $x=f^{-1}(y,z)$ ” to incorporate milk production information also fails because a POSA would have had no reason to use that information in Laitinen’s specific function. EX2009, ¶¶227-237. The alleged “logical expression” is a type of “inverse function” that selects a “medical treatment” by identifying prior treatments that produced desirable effects on certain parameters, none of which are “milk production.” EX2009, ¶¶227-229; EX1006, 7:35-37. During an initial “educational phase,” the inverse function determines

how the parameters respond to treatment by comparing them before and after the treatment is administered. EX2009, ¶¶230. For example, the function could compare temperature before and after a treatment to determine if it was reduced. *Id.* Once the function is “educated,” it can select an appropriate treatment based on an animal’s current physiological parameters. *Id.* Essentially, the inverse function predicts how the current parameters will respond to various treatments based on how the same parameters responded to treatments in the past, and then selects a treatment that responded favorably. *Id.* Laitinen never suggests using milk production as a parameter.

Because Laitinen fails to disclose or suggest using “milk production” as a parameter, Petitioners contend that a POSA would have modified the inverse function to include that information. *See* Pet. 49-50. However, a POSA could not have done that because the necessary milk production data would not have existed. EX2009, ¶231. The education phase of the function requires input data before *and after* medication is administered. *Id.* But when a cow is given medication, its milk is typically withdrawn from production. *Id.*; EX2010, 78:7-80:2 (testifying that a cow’s milk is “withdrawn” if “treated with certain medications”). When that occurs, no milk production data is measured. EX2009, ¶231. Milk production data simply could not be available when needed in Laitinen’s particular function.

Even if the data were available, a POSA would not understand milk production to “improve the reliability” of Laitinen’s inverse function. *See* Pet. 49-50. For input data to be reliable in the inverse function, there must be a consistent cause-and-effect relationship between the data and the medication in order to signal a medication as “effective.” EX2009, ¶232. That is not the case with milk production, where effective medication can cause milk production to increase, decrease, or stay the same. *Id.* Moreover, POSAs do not base the effectiveness of treatment on milk production because it is not a direct indicator of a cow’s current health status. *Id.*, ¶233. The inverse function has nothing to “learn” about a treatment’s effectiveness based on milk production. *Id.*

Contrary to Petitioners’ contention, the record does not support that combining temperature and milk production into a logical expression was known to aid in distinguishing between illness and other issues. *See* Pet. 50. The only *alleged* support for that proposition is Brown-Brandl’s modified quote from van den Berg that, when read in full, fails to suggest combining milk yield and temperature to “achieve higher accuracy” or that van den Berg was capable of distinguishing between illness and other issues (*e.g.*, heat). *See* §VI.A.1(b); EX2009, ¶236.

Petitioners also fail to demonstrate a reasonable expectation of success in modifying Laitinen’s inverse function to arrive at the claims. As discussed above,

Petitioners' de Mol reference demonstrates the opposite of "a high probability of success" in using "temperature and stored milk production information for the detection of heat or illness." See Pet. 50; §VI.A.1(c); EX2009, ¶237.

c) Laitinen's Alleged "Logical Expressions" Would Not Have Generated a "Logical Value" as Claimed

Even if a POSA had reason to incorporate milk production into Laitinen's alleged logical expression, it could not "be solved to detect if the cow is in heat." See Pet. 51. DIM and milk yield are independent of heat, and any threshold based on those values would not indicate heat. EX2009, ¶238; see §VII.A.1(a). Similarly, if milk yield were input into Laitinen's "inverse function," the modified function could not be "solved to determine if the animal is sick and to identify the appropriate medical treatment." See Pet. 51-52. As Bowser testified, milk yield is not a reliable indicator of the effectiveness of treatment and would introduce noise to the system that renders it incapable of identifying the appropriate treatment or whether the animal was ill. EX2009, ¶239; see §VII.A.1(b).

2. All Challenged Claims: "Computers" That Perform the Claimed "Program Instructions"

Petitioners fail to establish that Laitinen, Buchanan, and Liao disclose or render obvious one or more processors that perform *all* of the "executable program instructions" recited in claim 1. While Petitioners identify an alleged "computer" and "personal computer" in Laitinen, they never argue that those computers

include one or more processors with program instructions “executable to” perform *all* of the specific instructions recited in claim elements 1[B] through 1[F]. *See Garmin*, 825 F. App’x at 899 (affirming Final Written Decision finding claim not unpatentable where petitioner identified claimed “microprocessor” but failed to show that identified microprocessor was capable of performing the claimed processes); EX2009, ¶¶82, 240-243.

As in Ground 1, Petitioners cannot demonstrate the presence of such limitations through inherency because that would require establishing that the specific claimed instructions are “necessarily present” or the “natural result” of the software that they identified. *See Par Pharm.*, 773 F.3d at 1195–96. This is a “high standard” that Petitioners did not address let alone meet in Ground 3. *Id.* For example, the computers that Petitioners rely on do not *necessarily* include program instructions that “retrieve” animal identification information or sensed animal information from an RFID device. EX2009, ¶244. Rather, such data *could* be entered into the alleged computers manually. *Id.* While manually entered data *may* be retrieved using program instructions as described in the ’206 specification, Laitinen does not *necessarily* have an instruction for retrieving manually entered data. Petitioners do not rely on Liao or Buchanan for these limitations.

3. Claims 2, 3, and 6: “RFID Device Implanted in an Animal”

In claims 2, 3, and 6, “sensed animal information” must be retrieved from an “RFID device” that is “implanted in an animal” or “implanted in a plurality of animals,” which requires the RFID device to be located *within* the animal. *See* §IV. In an effort to find disclosure of a logical expression in Laitinen, Petitioners are 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 only from an “external” pico device—*not* an RFID device implanted within an animal. *See* EX1006, 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); EX2009, ¶¶254-256. Petitioners, however, make no showing that it would have been obvious or possible to reconfigure Laitinen’s device to meet the claims. EX2009, ¶¶250.

As addressed above, Petitioners rely on two potential “logical expressions” in Laitinen, both of which incorporate the animal “temperature” and “movement” as the purported “sensed animal information.” EX2009, ¶¶250-253. Specifically, Laitinen’s “heat control” embodiment uses “[a] cow’s temperature and movement...as the input variables,” and the “medical treatment” inverse function is alleged to use “the animal’s temperature at different times” because, according to

Petitioners, “temperature [is] correlated with animal illness.” Pet., 48, 49; EX2010, 164:6-11 (testifying that Laitinen “is using temperature as an input to his function”). But both animal temperature and movement used in these “expressions” is obtained solely from an **external** pico level device in Laitinen, not an RFID device “implanted in an animal” as claimed. See EX1006, 5:44-47, Fig. 2; EX2009, ¶¶254-256.

Although Petitioners never raised the argument that it would have been obvious to modify Laitinen’s external sensors to be implantable in an animal, the Board nevertheless credited unaddressed expert opinion testimony in finding support for a motivation. See Paper 18, 51. In addition to amounting to improper incorporation by reference, this testimony fails to demonstrate obviousness. Specifically, Brown-Brandl opines that a “POSA would have been motivated to use an internal device, to avoid, for example ***the risk of detachment.***” EX1003, ¶194 (emphasis added). Petitioners do not explain how this purported motivation would lead a POSA to the claimed invention specifically (or even rely on this testimony at all), likely because Laitinen itself suggests a different solution to the purported problem. Laitinen explained that the “sensor unit”—which is separate from the RFID device—can include “detectors which alarm if the pico level device is detached from the animal.” EX1006, 3:58-62 . To the extent POSAs had any

concern with “detachment,” therefore, they would have used *that* solution.

EX2009, ¶257.

The Board also cited Laitinen’s discussion of a “[s]ensor unit” as a broader disclosure of an implanted temperature sensor, but that device is explicitly separate from the pico level RFID devices that Petitioners rely on. Notably, neither expert opines that Laitinen’s sensor unit meets the implanted RFID device limitation. Brown-Brandl quotes Laitinen’s statement that its “[s]ensor unit can also be an implant inside the animal,” but she never suggests that the sensor unit itself is the claimed “implanted RFID device.” EX1003, ¶193. Nor can she. In the same sentence that she quotes, Laitinen explicitly says that the sensor unit is separate from the RFID device because the sensor unit is “***read/transcribed by the pico level equipment*** using the so-called Radio Frequency Identification Technology.” *Id.*; EX1006, 3:53-57 (emphasis added); EX2009, ¶¶258-259. That is why Brown-Brandl resorts to asserting that RFID temperature sensing devices “were common as of the effective date.” EX1003, ¶193 (citing EX1003, §V.B). As explained above, her cited devices were not “common.” See §VI.A.2. But even if they were, she fails to provide any reason to modify Laitinen to incorporate them. EX2009, ¶¶260-264.

In short, Petitioners’ alleged “logical expressions” use temperature and movement measurements, which are only acquired with *external* devices in

Laitinen. Petitioners fail to explain why internal temperature-sensing RFID devices would be incorporated into Laitinen, and thus fail to show that Laitinen discloses or renders obvious entering “sensed animal information” retrieved from an RFID device “implanted in an animal” as claimed.

4. Claim 4: Use of Stored Animal “Health Information”

As in Ground 1, Petitioners merely provide a conclusory challenge to claim 4 that refers back to the “second logical expression” in their claim 1 argument, and do not specifically address the additional limitations of claim 4. *See* Pet., 53-54. With respect to the requirement that “health information” be incorporated into the claimed logical expression to generate a logical value, Petitioners merely cite to Laitinen’s references to “[g]athering, assessing and presenting data concerning the animal[’]s health” and “collect[ing]” unspecified “historical data” for “health surveillance.” *Id.*, 53-54 (citing EX1006, 4:12-15, 5:4-8) (emphasis removed). They never contend that such data is entered into the “second logical expression” that they rely on for claim 4. Pet., 54 (“Laitinen renders obvious solving a logical expression by **entering temperature and milk production information** into Laitinen’s second logical expression to solve for a logical value indicating an occurrence of illness and the appropriate medical treatment.”) (emphasis added). EX2009, ¶265.

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

Ground 4 challenging claims 17-20 fails for similar reasons as Ground 3. EX2009, ¶¶266-269. 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 fails to disclose or render obvious “a processor” and “non-transitory computer readable media” with instructions executable to perform each of the claimed processes. *See* §VII.A.2. Second, Petitioners have failed to show that Laitinen retrieves “sensed animal information” from an RFID device “implanted in an animal” or that Laitinen enters this type of information into their alleged logical expressions (which require temperature and/or movement measurements from Laitinen’s external pico level device), as required by elements 17[B], 17[C], and 17[F]. *See* §§VII.A.3. 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.

Petitioners further fail to establish that claim 18 is obvious for the same reasons claim 4 is patentable. *See* §VII.A.4. Like claim 4, claim 18 requires incorporating “sensed animal information” and “health information” to obtain “as

to a selected period of time” a “logical value” that “indicates occurrence of an illness of said animal.” Petitioners rely solely on Laitinen for these limitations and do not rely on Brune. As explained in Section VII.A.4, Laitinen fails to disclose or render obvious the use of stored animal “health information” in a logical expression as claimed or to generate a logical value as claimed.

VIII. CONCLUSION

Petitioners have not established by a preponderance of the evidence that any challenged claim of the '206 Patent is unpatentable. Patent Owner therefore requests that the Board uphold the patentability of each of the challenged claims.

Dated: February 14, 2025

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing ST Reproductive Technologies, LLC's Patent Owner Response was served on counsel of record on February 14, 2025 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

This paper complies with the type-volume limitation of 37 C.F.R. §42.24. The paper contains 13,997 words, excluding the parts of the paper exempted by §42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. §42.6(a)(ii) and the type style requirements of §42.6(a)(iii)&(iv).

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